THORIUM NITRATE STOCKPILE
DRUM CHARACTERIZATION REPORT

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August 2003
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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACO</td>
<td>Analytical Chemistry Organization (at the Y-12 National Security Complex)</td>
</tr>
<tr>
<td>ALARA</td>
<td>As Low As Reasonably Achievable</td>
</tr>
<tr>
<td>atm</td>
<td>atmosphere</td>
</tr>
<tr>
<td>°C</td>
<td>degrees Celsius</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>cm</td>
<td>centimeter</td>
</tr>
<tr>
<td>cm²</td>
<td>square centimeters</td>
</tr>
<tr>
<td>CO₂</td>
<td>carbon dioxide</td>
</tr>
<tr>
<td>DNNSC</td>
<td>Defense National Stockpile Center</td>
</tr>
<tr>
<td>DOE</td>
<td>U.S. Department of Energy</td>
</tr>
<tr>
<td>DOT</td>
<td>U.S. Department of Transportation</td>
</tr>
<tr>
<td>dpm</td>
<td>disintegrations per minute</td>
</tr>
<tr>
<td>°F</td>
<td>degrees Fahrenheit</td>
</tr>
<tr>
<td>ft</td>
<td>foot</td>
</tr>
<tr>
<td>gal</td>
<td>gallon</td>
</tr>
<tr>
<td>h</td>
<td>hour</td>
</tr>
<tr>
<td>HEPA</td>
<td>high efficiency particulate air</td>
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<tr>
<td>IEM</td>
<td>Integrated Environmental Management, Inc.</td>
</tr>
<tr>
<td>in.</td>
<td>inch</td>
</tr>
<tr>
<td>ISO</td>
<td>accepted abbreviation for International Organization for Standardization</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
</tr>
<tr>
<td>L</td>
<td>liter</td>
</tr>
<tr>
<td>LANL</td>
<td>Los Alamos National Laboratory</td>
</tr>
<tr>
<td>lb</td>
<td>pound</td>
</tr>
<tr>
<td>LSA</td>
<td>low specific activity</td>
</tr>
<tr>
<td>m</td>
<td>meter</td>
</tr>
<tr>
<td>MeV</td>
<td>mega electron volt (million electron volts or 10⁶ volts)</td>
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<tr>
<td>mg</td>
<td>milligram</td>
</tr>
<tr>
<td>min</td>
<td>minute</td>
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<tr>
<td>mm</td>
<td>millimeter</td>
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<tr>
<td>mR</td>
<td>milliroentgen</td>
</tr>
<tr>
<td>mrem</td>
<td>millirem</td>
</tr>
<tr>
<td>NO</td>
<td>nitrogen oxide</td>
</tr>
<tr>
<td>NO₂</td>
<td>nitrogen dioxide</td>
</tr>
<tr>
<td>NOₓ</td>
<td>oxides of nitrogen</td>
</tr>
<tr>
<td>NRC</td>
<td>U.S. Nuclear Regulatory Commission</td>
</tr>
<tr>
<td>NTRC</td>
<td>National Transportation Research Center</td>
</tr>
<tr>
<td>NTS</td>
<td>Nevada Test Site</td>
</tr>
<tr>
<td>NucFil</td>
<td>Nuclear Filter Technology</td>
</tr>
<tr>
<td>ORNL</td>
<td>Oak Ridge National Laboratory</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
</tbody>
</table>
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,
- *Executive Summary Report for the Thorium Nitrate Stockpile Stewardship and Disposition Project*, ORNL/TM-2001/14,
- *Analytical Characterization of the Thorium Nitrate Stockpile*, ORNL/TM-2003/54, and

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

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<td>Container inspection checklist and photographs of drums opened and inspected at Hammond Depot.</td>
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<td>B</td>
<td>Container inspection checklist and photographs of drums opened, inspected, and sampled at Hammond Depot. These samples were the first shipment to the analytical laboratory.</td>
</tr>
<tr>
<td>C</td>
<td>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.</td>
</tr>
<tr>
<td>D</td>
<td>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.</td>
</tr>
<tr>
<td>E</td>
<td>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.</td>
</tr>
<tr>
<td>F</td>
<td>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.</td>
</tr>
<tr>
<td>G</td>
<td>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.</td>
</tr>
<tr>
<td>H</td>
<td>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.</td>
</tr>
<tr>
<td>I</td>
<td>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.</td>
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<td>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.</td>
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<td>P</td>
<td>Copies of pertinent correspondence between the DNSC and the DOT.</td>
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<tr>
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<td>Copies of the outputs from the radiation dose modeling performed with MicroShield software.</td>
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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. 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.
Table 2. Summary of the ThN inventories

<table>
<thead>
<tr>
<th>Site</th>
<th>Country of origin</th>
<th>Weight of ThN</th>
<th>Number of drums</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(lb)</td>
<td>(kg)</td>
</tr>
<tr>
<td>Curtis Bay</td>
<td>USA</td>
<td>3,323,314</td>
<td>1,507,430</td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>1,382,658</td>
<td>627,163</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>481,834</td>
<td>218,556</td>
</tr>
<tr>
<td>Curtis Bay total</td>
<td></td>
<td>5,187,806</td>
<td>2,353,149</td>
</tr>
<tr>
<td>Hammond</td>
<td>USA</td>
<td>1,904,085</td>
<td>863,678</td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hammond total</td>
<td></td>
<td>1,904,085</td>
<td>863,678</td>
</tr>
<tr>
<td>Total</td>
<td>USA</td>
<td>5,227,399</td>
<td>2,371,108</td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>1,382,658</td>
<td>627,163</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>481,834</td>
<td>218,556</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7,091,891</td>
<td>3,216,828</td>
</tr>
</tbody>
</table>

*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

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

aValues are rounded to the nearest thousand.
bThe 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.
cThis 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

<table>
<thead>
<tr>
<th>Package configuration designation</th>
<th>DOT Regulations</th>
<th>NTS WAC Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Any labels or marks requiring obliteration?</td>
<td>External contamination?</td>
</tr>
<tr>
<td>IN-1</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>MD-1</td>
<td>N&lt;sup&gt;b&lt;/sup&gt;</td>
<td>N</td>
</tr>
<tr>
<td>MD-2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Probably&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N</td>
</tr>
<tr>
<td>MD-3</td>
<td>Unknown&lt;sup&gt;′&lt;/sup&gt;</td>
<td>N</td>
</tr>
<tr>
<td>MD-4</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>MD-5</td>
<td>Y</td>
<td>Y&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>Requires obliteration of both marking and labeling.
<sup>b</sup>Many packages breached due to gas pressure.
<sup>c</sup>Includes packages containing ThN from French and Indian origins.
<sup>d</sup>Some surface rust but drums seen during the 2002 sampling campaign were in good shape.
<sup>e</sup>Requires overpacking for contamination control.
<sup>f</sup>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.
<sup>g</sup>Requires obliterating “Thorium Nitrate” marking.
### Thorium Nitrate Stockpile Drum Characterization Report

#### 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)

#### Table: Number of drums by column and origin

<table>
<thead>
<tr>
<th>Drum type</th>
<th>Nom. Weight (lb)</th>
<th>Nom. Height (in.)</th>
<th>Nom. Diam. (in.)</th>
<th>Color code</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD-1</td>
<td>272</td>
<td>30</td>
<td>20</td>
<td>Domestic</td>
<td></td>
</tr>
<tr>
<td>MD-2</td>
<td>791</td>
<td>35</td>
<td>24</td>
<td>French</td>
<td></td>
</tr>
<tr>
<td>MD-3</td>
<td>672</td>
<td>35</td>
<td>24</td>
<td>Indian</td>
<td></td>
</tr>
<tr>
<td>MD-4</td>
<td>312</td>
<td>35</td>
<td>24</td>
<td>Domestic</td>
<td></td>
</tr>
<tr>
<td>MD-5</td>
<td>941</td>
<td>39</td>
<td>27.5</td>
<td>French</td>
<td></td>
</tr>
<tr>
<td>MD-6</td>
<td>721</td>
<td>39</td>
<td>27.5</td>
<td>Indian</td>
<td></td>
</tr>
</tbody>
</table>

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.

#### Figure 8: Layout of Building 911 at Curtis Bay Depot.

![Layout of Building 911 at Curtis Bay Depot](image-url)

**Drawing is not to scale**
Fig. 9. Layout of Building 912 at Curtis Bay Depot.
Fig. 10. Layout of Building 913 at Curtis Bay Depot.

<table>
<thead>
<tr>
<th>Drum type</th>
<th>Nom. Weight (lb)</th>
<th>Nom. Height (in.)</th>
<th>Nom. Diam. (in.)</th>
<th>Origin</th>
<th>Color code</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD-1</td>
<td>272</td>
<td>30</td>
<td>20</td>
<td>Domestic</td>
<td></td>
</tr>
<tr>
<td>MD-3</td>
<td>312</td>
<td>35</td>
<td>24</td>
<td>Domestic</td>
<td></td>
</tr>
</tbody>
</table>

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.
OVERHEAD DOORS ARE LOCATED AT BAYS 5, 6, 8, 12, 13, AND 18 ON THE WEST AND EAST SIDES.
OVERHEAD DOORS ARE LOCATED AT BAY C ON SOUTH AND NORTH SIDES.
PERSONNEL DOORS ARE LOCATED AT BAY 1 AND BAY 20.
BARREL DRUMS ARE LOCATED AROUND THE THORIUM NITRATE DRUMS FOR SHIELDING (NOT SHOWN IN DIAGRAM).
THE PALLETS WITH THE SINGLE DRUMS ARE LOCATED IN BAYS 9, 12, AND 15.

**Drums and Pallets of Thorium Nitrate**

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**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.
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.](image)

### 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.](image)
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.

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*

<table>
<thead>
<tr>
<th>Lot number</th>
<th>Drum number</th>
<th>Drum type</th>
<th>Inspected only</th>
<th>Sampled and analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>49</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>IN-1</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>10</td>
<td>46</td>
<td>IN-1</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>20</td>
<td>39</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>42</td>
<td>IN-1</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>28</td>
<td>30</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>4</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>6</td>
<td>IN-1</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>32</td>
<td>45</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>25</td>
<td>IN-1</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>43</td>
<td>44</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>22</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>6</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>40</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>2</td>
<td>IN-1</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

*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).
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.
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.
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

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<th>Lot number</th>
<th>Drum number</th>
<th>Drum type</th>
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*French origin*

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*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

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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, 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.

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. 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.
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

<table>
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<tr>
<th>Lot number</th>
<th>Drum number</th>
<th>Was the lid dented?</th>
<th>Was headspace pressure present?</th>
<th>Did the poly bag push the metal lid up through locking ring?</th>
<th>Did the tape separate with the fiberboard lid rising above the top of the drum?</th>
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</table>

*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.

†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.

‡This drum did not contain a wooden lid on the internal fiberboard drum.

§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), NO₂ (up to 50 ppm), and O₂ (vol %). From the majority of the measurements made with the Dräger Mini-Warn instrument during sampling, NO and NO₂ 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, NO₂, and other NOₓ compounds. The Dräger instrument was limited to measuring the concentration of NO and NO₂ when the
concentration was ≤ 50 ppm. When a direct measurement was made of the gases in the drum, the concentration of NO and NO₂ 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.⁵

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, 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. 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

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### 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}

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<th>CO₂ (vol %)</th>
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<th>N₂ (vol %)</th>
<th>O₂ (vol %)</th>
<th>CO (mg/L)</th>
<th>H₂ (mg/L)</th>
<th>CH₄ (mg/L)</th>
<th>ethane (mg/L)</th>
<th>ethene (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACO² - Lot 4</td>
<td>35.98</td>
<td>18.79</td>
<td>44.09</td>
<td>0.02</td>
<td>6500</td>
<td>180</td>
<td>30</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Drum 55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 4</td>
<td>39.5 (38.6)</td>
<td>0.158 (43.0)</td>
<td>45.8 (10.2)</td>
<td>11.2</td>
<td>1051</td>
<td>21.5</td>
<td>28.7</td>
<td>1.45</td>
<td>6.05</td>
</tr>
<tr>
<td>Drum 55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 6</td>
<td>40.9 (40.8)</td>
<td>0.0929 (45.2)</td>
<td>ND (ND)</td>
<td>9.81</td>
<td>1030</td>
<td>ND</td>
<td>27</td>
<td>1.5</td>
<td>6.2</td>
</tr>
<tr>
<td>Drum 83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 6</td>
<td>42.2 (42.4)</td>
<td>0.1383 (45.4)</td>
<td>47.1 (9.3)</td>
<td>9.81</td>
<td>1030</td>
<td>ND</td>
<td>27</td>
<td>1.5</td>
<td>6.2</td>
</tr>
<tr>
<td>Drum 84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACO² - Lot 18</td>
<td>34.05</td>
<td>16.13</td>
<td>47.88</td>
<td>0.16</td>
<td>11800</td>
<td>200</td>
<td>40</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Drum 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 14</td>
<td>41.4 (41.3)</td>
<td>0.1035 (50.6)</td>
<td>ND (ND)</td>
<td>986</td>
<td>ND</td>
<td>42.7</td>
<td>ND</td>
<td>5.4</td>
<td></td>
</tr>
<tr>
<td>Drum 244</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 21</td>
<td>44.6 (45.4)</td>
<td>0.2867 (35.2)</td>
<td>36.5 (11.9)</td>
<td>12.2</td>
<td>1360</td>
<td>18.2</td>
<td>16.4</td>
<td>0.99</td>
<td>5.38</td>
</tr>
<tr>
<td>Drum 176</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 21</td>
<td>42.8 (42.4)</td>
<td>0.2540 (31.5)</td>
<td>31.5 (9.75)</td>
<td>9.75</td>
<td>1270</td>
<td>20.4</td>
<td>16.6</td>
<td>1.02</td>
<td>5.91</td>
</tr>
<tr>
<td>Drum 176</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACO² - Lot 27</td>
<td>39.96</td>
<td>18.95</td>
<td>39.11</td>
<td>0.24</td>
<td>12500</td>
<td>170</td>
<td>30</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Drum 79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 27</td>
<td>42.2 (43.9)</td>
<td>0.1446 (44)</td>
<td>41.6 (ND)</td>
<td>ND</td>
<td>1170</td>
<td>ND</td>
<td>35.9</td>
<td>1.5</td>
<td>6.28</td>
</tr>
<tr>
<td>Drum 79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 31</td>
<td>44.3 (43)</td>
<td>0.1225 (46.9)</td>
<td>38.9 (12.2)</td>
<td>9.85</td>
<td>1220</td>
<td>18</td>
<td>32</td>
<td>1.48</td>
<td>6.33</td>
</tr>
<tr>
<td>Drum 34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACO² - Lot 33</td>
<td>45.25</td>
<td>16.89</td>
<td>36.38</td>
<td>0.06</td>
<td>9600</td>
<td>200</td>
<td>20</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Drum 117</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 33</td>
<td>31.9 (30.5)</td>
<td>0.0974 (45.5)</td>
<td>48.2 (11.9)</td>
<td>12.9</td>
<td>831</td>
<td>ND</td>
<td>28.1</td>
<td>ND</td>
<td>5.42</td>
</tr>
<tr>
<td>Drum 117</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWRF - Lot 44</td>
<td>35.5 (36)</td>
<td>0.0979 (49.6)</td>
<td>51.8 (10.4)</td>
<td>11.2</td>
<td>1210</td>
<td>18.6</td>
<td>31.1</td>
<td>1.06</td>
<td>6.21</td>
</tr>
<tr>
<td>Drum 262</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Gaseous composition of dry air

<table>
<thead>
<tr>
<th>Sample number</th>
<th>CO₂ (vol %)</th>
<th>NOₓ (vol %)</th>
<th>N₂ (vol %)</th>
<th>O₂ (vol %)</th>
<th>CO (mg/L)</th>
<th>H₂ (mg/L)</th>
<th>CH₄ (mg/L)</th>
<th>ethane (mg/L)</th>
<th>ethene (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACO² - Lot 4</td>
<td>0.035</td>
<td>Tr</td>
<td>78.084</td>
<td>20.947</td>
<td>0.25</td>
<td>0.53</td>
<td>1.7</td>
<td>Tr</td>
<td>Tr</td>
</tr>
</tbody>
</table>

‘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 cm² 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 cm² alpha and 600 dpm/100 cm² 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 cm² 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 cm² 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 cm² alpha and 1,157 dpm/100 cm² beta/gamma.
- The highest direct alpha contamination on the floor of Building 911 was 100,870 dpm/100 cm².
- The highest loose contamination on drums located in Building 911 was 5,112 dpm/100 cm² alpha and 11,997 dpm/100 cm² beta/gamma.
- The highest loose contamination on the floor of Building 912 was 209 dpm/100 cm² beta/gamma.
- The highest direct contamination found on drums was 53,256 dpm/100 cm² in Building 911.
- The highest loose contamination on drums located in Building 912 was 480 dpm/100 cm² alpha and 1,079 dpm/100 cm² 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

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

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

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

*aEstimated 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 $^{230}\text{Th}$ 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 ft³. 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 1 MeV 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>
<thead>
<tr>
<th>Location</th>
<th>Dose rate (mrem/h) at distance of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 cm</td>
</tr>
<tr>
<td>Center of an end</td>
<td>89.4</td>
</tr>
<tr>
<td>Center of a side</td>
<td>93.2</td>
</tr>
<tr>
<td>Center of the top or bottom</td>
<td>93.1</td>
</tr>
<tr>
<td>Corner</td>
<td>23.5</td>
</tr>
</tbody>
</table>

*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. 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


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.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>49</td>
<td>A-5</td>
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<td>A-55</td>
</tr>
<tr>
<td>7</td>
<td>49</td>
<td>2</td>
<td>A-65</td>
</tr>
</tbody>
</table>
[This page intentionally left blank.]
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/300cm² <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 # 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.): NA
Inner Container # 4 Condition/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 # 5 Condition/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 # 6 Condition/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

A-6
Lot No. 2
Drum ID No. 49
Location 15B-3
Site Hammond
Container 85-gallon steel drum

Dose Rate
Surface 32 mR/hr
1 meter 3.2 mR/hr

Inspection/Sample Visual Inspection
Date 6-6-2002
Photo No. 1 of 8

Container Condition Good
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>2</th>
</tr>
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<tbody>
<tr>
<td>Drum ID No.</td>
<td>49</td>
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<tr>
<td>Location</td>
<td>15B-3</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
</tr>
</tbody>
</table>

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

Container Condition
Good – drum ring also in good condition
Lot No. 2
Drum ID No. 49
Location 15B-3
Site Hammond

Inspection/Sample Visual Inspection
Date 6-6-2002
Photo No. 3 of 8

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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Drum ID No.</th>
<th>Location</th>
<th>Site</th>
<th>Inspection/Sample Visual Inspection</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>49</td>
<td>15B-3</td>
<td>Hammond</td>
<td>6-6-2002 4 of 8</td>
</tr>
</tbody>
</table>

1st Poly liner/bag
Sealed - Poly liner/bag - Good Condition
No gasses present
Lot No. 2
Drum ID No. 49
Location 15B-3
Site Hammond

2nd Poly liner/bag – Good Condition
No moisture present
No measurement of gasses present
Lot No. 2
Drum ID No. 49
Location 15B-3
Site Hammond

Another photo of the 2nd poly liner/bag
No holes or tears in liner/bag
No gasses present
Lot No. 2
Drum ID No. 49
Location 15B-3
Site Hammond

Monolith - White in color
Solid and very dry
No measurement of gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>49</td>
</tr>
<tr>
<td>Location</td>
<td>15B-3</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

Inspection/Sample Visual Inspection

- Date: 6-6-2002
- Photo No.: 8 of 8

85-gal container – Good Condition
Sealed/dated - Completed
Hammond Depot
Lot #20 - Drum #39
Visual Inspection
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond*

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): 

Rad Measurements at the time of opening: 
DR at Surface 30mR/hr 
DR at 1 meter 3mR/hr  
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 # 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.): Poly liner/bag

Inner Container # 4 Condition/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.): Poly liner/bag

Inner Container # 5 Condition/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.): Poly liner/bag

Inner Container # 6 Condition/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

---

*A indicates Hammond or Curtis Bay (circle one)
<table>
<thead>
<tr>
<th><strong>Lot No.</strong></th>
<th>20</th>
<th><strong>Inspection/Sample</strong></th>
<th>Visual Inspection</th>
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</thead>
<tbody>
<tr>
<td><strong>Drum ID No.</strong></td>
<td>39</td>
<td><strong>Date</strong></td>
<td>6-6-2002</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>9D-5</td>
<td><strong>Photo No.</strong></td>
<td>1 of 7</td>
</tr>
<tr>
<td><strong>Site</strong></td>
<td>Hammond</td>
<td><strong>Container</strong></td>
<td>85-gallon steel drum</td>
</tr>
<tr>
<td><strong>Container</strong></td>
<td></td>
<td><strong>Condition</strong></td>
<td>Good</td>
</tr>
<tr>
<td><strong>Dose Rate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>32 mR/hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 meter</td>
<td>3 mR/hr</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lot No. 20  
Drum ID No. 39  
Location 9D-5  
Site Hammond  

Inspection/Sample Visual Inspection  
Date 6-6-2002  
Photo No. 2 of 7  

85 gal drum lid – Good Condition  
Ring is also in good condition
Lot No. 20  
Drum ID No. 39  
Location 9D-5  
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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>39</td>
</tr>
<tr>
<td>Location</td>
<td>9D-5</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

- Inspection/Sample Date: 6-6-2002
- Photo No.: 4 of 7

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
Drum ID No.  39
Location  9D-5
Site  Hammond

2nd poly liner/bag – good condition
Small amounts of crystal/moisture inside liner/bag
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>20</th>
<th>Inspection/Sample Date</th>
<th>Visual Inspection Date</th>
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<tbody>
<tr>
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<td>6-6-2002</td>
<td>6-6-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9D-5</td>
<td>Photo No.</td>
<td>6 of 7</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
Drum ID No. 39
Location 9D-5
Site Hammond

Inspection/Sample Date 6-6-2002
Visual Inspection

Photo No. 7 of 7

85 gal drum – Good Condition
Sealed/dated - Completed
Hammond Depot
Lot #28 - Drum #30
Visual Inspection
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  ☐ 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/300cm² <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  ☐ 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  ☐ No

Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): Poly liner/bag
Inner Container # 3 Condition/Description (rusty, leaking, good, etc.): good
Photo Taken of Inner Container # 3: ☑ Yes  ☐ 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

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5 Condition/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 # 6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample Date</th>
<th>Visual Inspection Date</th>
<th>Photo No.</th>
</tr>
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<tbody>
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<td></td>
<td>1 of 7</td>
</tr>
<tr>
<td>Location</td>
<td>9D-3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
<td>Contained Condition</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface</td>
<td>32 mR/hr</td>
<td>3.6 mR/hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 meter</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lot No.</td>
<td>30</td>
<td>Inspection/Sample Visual Inspection Date</td>
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<td>Photo No.</td>
<td>2 of 7</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>9D-3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

85-gal lid – Good Condition
Ring around lid is also in good condition
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample Date</th>
<th>Visual Inspection</th>
</tr>
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<tbody>
<tr>
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<td>28</td>
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<td></td>
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<tr>
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<td>3 of 7</td>
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<tr>
<td>Site</td>
<td>Hammond</td>
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<td></td>
</tr>
</tbody>
</table>

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
Hammond Deport Drum Visual Inspections

Lot No. 30  
Drum ID No. 28  
Location 9D-3  
Site Hammond

Inspection/Sample Visual Inspection  
Date 6-5-2002  
Photo No. 4 of 7

1st poly liner/bag - Bad Condition  
There are holes all in the liner/bag  
No gasses are present
Lot No. 30  
Drum ID No. 28  
Location 9D-3  
Site Hammond  

Inspection/Sample Visual Inspection  
Date 6-5-2002  
Photo No. 5 of 7  

2nd poly liner/bag – Good Condition  
Moisture is present  
No measurement of gasses found
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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>28</td>
</tr>
<tr>
<td>Location</td>
<td>9D-3</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Inspection/Sample Visual Inspection**

- **Date**: 6-5-2002
- **Photo No.**: 6 of 7

85-gal container – Good Condition
Sealed/dated – Completed
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/300cm² <20 <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 #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

Inner Container #5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): __________
Inner Container #5 Condition/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 #6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>45</th>
<th>Inspection/Sample Date</th>
<th>Visual Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>32</td>
<td>6-5-2002</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>9B-3</td>
<td>Photo No.</td>
<td>1 of 7</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
<td>Container Condition</td>
<td>Good</td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 30 mR/hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 meter 3.2 mR/hr</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lot No. 45  
Drum ID No. 32  
Location 9B-3  
Site Hammond  

85 gal lid – Good Condition  
Ring is tight and in good condition
Lot No. 45
Drum ID No. 32
Location 9B-3
Site Hammond

Inspection/Sample Visual Inspection
Date 6-5-2002
Photo No. 3 of 7

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
Hammond Deport Drum Visual Inspections

Lot No. 45
Drum ID No. 32
Location 9B-3
Site Hammond

Inspection/Sample Date Visual Inspection

6-5-2002

4 of 7

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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>32</td>
</tr>
<tr>
<td>Location</td>
<td>9B-3</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Inspection/Sample Visual Inspection**

- **Date:** 6-5-2002
- **Photo No.:** 5 of 7

2nd poly liner/bag – Good Condition
No moisture present
No measurements of gasses present
Lot No. 45
Drum ID No. 32
Location 9B-3
Site Hammond

Inspection/Sample Visual Inspection Date 6-5-2002
Photo No. 6 of 7

Monolith – white in color
Solid - Very dry
No moisture present
No measurement of gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>32</td>
</tr>
<tr>
<td>Location</td>
<td>9B-3</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

Inspection/Sample Visual Inspection Date 6-5-2002 Photo No. 7 of 7

85-gal container – Good Condition
Sealed/dated – Completed
Picture did not properly focus (somewhat blurry image)
[This page intentionally left blank.]
Hammond Depot
Lot #43 - Drum #44
Visual Inspection
## CONTAINER INSPECTION CHECKLIST

### CONTAINER INFORMATION

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

<table>
<thead>
<tr>
<th>Lot #</th>
<th>Drum ID #</th>
<th>Location</th>
<th>Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.)</th>
<th>Outer Container Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Outer Container:</th>
<th>Drum Wall thickness of Outer Container <em>(French and Indian Drums only):</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>44</td>
<td>Warehouse 100W - 15C – 2</td>
<td>85-gal drum</td>
<td>good</td>
<td>☒ Yes <em>(include Drum ID in photo)</em></td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

**Photo Taken of Outer Container:** ☒ Yes *(include Drum ID in photo)*  

**Drum Wall thickness of Outer Container:** Not Applicable  

**Units:**

- Rad Measurements at the time of opening:  
  - DR at Surface: 30mR/hr  
  - DR at 1 meter: 3mR/hr  
  - dpm/300cm²: <20  
  - α & <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

<table>
<thead>
<tr>
<th>Inner Container #1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Inner Container #1 Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Inner Container #1:</th>
<th>Inner Container #1 #2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Inner Container #1 #2 Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Inner Container #1 #2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 gal drum</td>
<td>good</td>
<td>☒ Yes <em>(include Drum ID in photo)</em></td>
<td>Poly liner/bag</td>
<td>good</td>
<td>☒ Yes <em>(include Drum ID in photo)</em></td>
</tr>
</tbody>
</table>

**Photo Taken of Inner Container #1:** ☒ Yes *(include Drum ID in photo)*  

**Inner Container #1 Condition/Description (rusty, leaking, good, etc.):** good

### Inner Container #2

<table>
<thead>
<tr>
<th>Inner Container #2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Inner Container #2 Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Inner Container #2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poly liner/bag</td>
<td>good</td>
<td>☒ Yes <em>(include Drum ID in photo)</em></td>
</tr>
</tbody>
</table>

**Photo Taken of Inner Container #2:** ☒ Yes *(include Drum ID in photo)*  

**Inner Container #2 Condition/Description (rusty, leaking, good, etc.):** good

### Inner Container #3

<table>
<thead>
<tr>
<th>Inner Container #3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Inner Container #3 Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Inner Container #3:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poly liner/bag</td>
<td>good</td>
<td>☒ Yes <em>(include Drum ID in photo)</em></td>
</tr>
</tbody>
</table>

**Photo Taken of Inner Container #3:** ☒ Yes *(include Drum ID in photo)*  

**Inner Container #3 Condition/Description (rusty, leaking, good, etc.):** good

### Inner Container #4

**Photo Taken of Inner Container #4:** No  

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

### Inner Container #5

**Photo Taken of Inner Container #5:** No  

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

### Inner Container #6

**Photo Taken of Inner Container #6:** No  

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

### 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  

**TID placed on container after inspection?** *(Check Box):* ☒ Yes  

**Label seal with date & initials:**

**Checklist completed by:** Tony Cunningham *(signature on file)*  

**Date:** 6-6-02  

---

**A-46**
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>43</th>
<th>Inspection/Sample Condition</th>
<th>Visual Inspection Date</th>
<th>Visual Inspection Photo No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>44</td>
<td></td>
<td>6-6-2002</td>
<td>1 of 7</td>
</tr>
<tr>
<td>Location</td>
<td>15C-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 30 mR/hr, 1 meter 3 mR/hr</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Picture did not properly develop – apparently flash did not function while taking picture
Lot No. 43
Drum ID No. 44
Location 15C-2
Site Hammond

Inspection/Sample Visual Inspection
Date 6-6-2002
Photo No. 2 of 7

55 gal drum lid – Good Condition
Ring is also in good condition
No measurement of gasses present
Lot No. 43  
Drum ID No. 44  
Location 15C-2  
Site Hammond  

Inspection/Sample Visual Inspection  
Date 6-6-2002  
Photo No. 3 of 7  

55 gal inter lid – Good Condition  
Ring has a 3/8 x 3 1/2 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
Hammond Deport Drum Visual Inspections

Lot No. 43  
Drum ID No. 44  
Location 15C-2  
Site Hammond  

Inspection/Sample Visual Inspection  
Date 6-6-2002  
Photo No. 4 of 7  

1st poly liner/bag - Fair Condition  
No gas measurements present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>43</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>44</td>
</tr>
<tr>
<td>Location</td>
<td>15C-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Inspection/Sample**

**Visual Inspection**

- Date: 6-6-2002
- Photo No.: 5 of 7

2nd poly liner/bag - Good Condition
No moisture present
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>43</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>44</td>
</tr>
<tr>
<td>Location</td>
<td>15C-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

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

---

**Hammond Deport Drum Visual Inspections**

*Inspection/Sample Visual Inspection*

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>6 of 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>6-6-2002</td>
</tr>
<tr>
<td>Lot No.</td>
<td>43</td>
</tr>
<tr>
<td>-------------</td>
<td>----</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>44</td>
</tr>
<tr>
<td>Location</td>
<td>15C-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Inspection/Sample**

- **Visual Inspection**
- **Date** 6-6-2002
- **Photo No.** 7 of 7

85-gal container – Good Condition
Sealed/dated - Completed
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/300cm² <20 & <200 Bq

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.

<table>
<thead>
<tr>
<th>Inner Container #</th>
<th>Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Inner Container:</th>
<th>Yes (include Drum ID in photo)</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55 gal drum</td>
<td>good      rusty/powder on inside lid</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Poly liner/bag</td>
<td>good</td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Poly liner/bag</td>
<td>good</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container #</th>
<th>Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Inner Container:</th>
<th>Yes (include Drum ID in photo)</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<td>No</td>
<td></td>
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<td>Yes</td>
<td></td>
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<td>4</td>
<td></td>
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<td></td>
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<td>5</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

**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 test - 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  
Drum ID No. 22  
Location 15D-2  
Site Hammond

Inspection/Visual Inspection
Sample Date 6-6-2002  
Photo No. 3 of 8

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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>22</td>
</tr>
<tr>
<td>Location</td>
<td>15D-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Inspection/Sample Visual Inspection**

- **Lot No.**: 45
- **Drum ID No.**: 22
- **Location**: 15D-2
- **Site**: Hammond

- **Date**: 6-6-2002
- **Photo No.**: 4 of 8

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  
Drum ID No. 22  
Location 15D-2  
Site Hammond  

Inspection/Sample Visual Inspection  
Date 6-6-2002  
Photo No. 5 of 8  

This is a picture of the inside lid of the 55-gal container  
It shows rust/powder on it
Lot No. 45
Drum ID No. 22
Location 15D-2
Site Hammond

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

2nd poly liner/bag – Good Condition
Moisture was in side the liner/bag
No measurement of gasses present
Lot No. 45  
Drum ID No. 22  
Location 15D-2  
Site Hammond  

Inspection/Sample Visual Inspection  
Date 6-6-2002  
Photo No. 7 of 8  

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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>22</td>
</tr>
<tr>
<td>Location</td>
<td>15D-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

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 <20 & <200 By
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 # 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

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):    
Inner Container # 5 Condition/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 # 6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>2</td>
</tr>
<tr>
<td>Location</td>
<td>12C-6</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
</tr>
<tr>
<td>Dose Rate</td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>30 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>3 mR/hr</td>
</tr>
<tr>
<td>Inspection/Visual Inspection</td>
<td>Date</td>
</tr>
<tr>
<td>Photo No.</td>
<td>1 of 7</td>
</tr>
</tbody>
</table>

Condition: Good
Lot No. 49  
Drum ID No. 2  
Location 12C-6  
Site Hammond

85 gal lid – Good Condition  
Ring is also in good condition
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>49</th>
<th>Inspection/Sample Visual Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>2</td>
<td>Date 6-6-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-6</td>
<td>Photo No. 3 of 7</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

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
### Hammond Deport Drum Visual Inspections

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>2</td>
</tr>
<tr>
<td>Location</td>
<td>12C-6</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inspection/Sample Visual Inspection</th>
<th>Date</th>
<th>Photo No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Hammond</td>
<td>6-6-2002</td>
<td>4 of 7</td>
</tr>
</tbody>
</table>

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
Drum ID No. 2
Location 12C-6
Site Hammond

2nd poly liner/bag – Good Condition
Little moisture inside bag
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>49</th>
<th>Inspection/Sample Date</th>
<th>Visual Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>2</td>
<td>Date 6-6-2002</td>
<td>6-6-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-6</td>
<td>Photo No. 6 of 7</td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Monolith – white in color
Broken/cracked in several places
No gasses present
Very dry
Lot No. 49  
Drum ID No. 2  
Location 12C-6  
Site Hammond  

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>18</td>
<td>B-5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>46</td>
<td>B-21</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
<td>42</td>
<td>B-35</td>
</tr>
<tr>
<td>4</td>
<td>29</td>
<td>4</td>
<td>B-55</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>6</td>
<td>B-69</td>
</tr>
<tr>
<td>6</td>
<td>38</td>
<td>25</td>
<td>B-87</td>
</tr>
<tr>
<td>7</td>
<td>47</td>
<td>6</td>
<td>B-99</td>
</tr>
<tr>
<td>8</td>
<td>48</td>
<td>40</td>
<td>B-113</td>
</tr>
</tbody>
</table>
[This page intentionally left blank.]
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/300cm² <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 # 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

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5 Condition/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 # 6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Drum ID No.</th>
<th>Location</th>
<th>Site</th>
<th>Container</th>
<th>Condition</th>
<th>Dose Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8</td>
<td>9C-6</td>
<td>Hammond</td>
<td>85-gallon steel drum</td>
<td>Good</td>
<td></td>
</tr>
</tbody>
</table>

- **Inspection/Sample**
  - **Date**: 6-7-2002
  - **Photo No.**: 1 of 14

- **Visual Inspection & Sampling**
  - **Surface Dose Rate**: 34 mR/hr
  - **1 meter Dose Rate**: 3.4 mR/hr
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>8</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>18</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>9C-6</td>
<td>6-7-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 of 14</td>
</tr>
</tbody>
</table>

85 gal drum – Good Condition
Ring – Good Condition
Lot No. 8  
Drum ID No. 18  
Location 9C-6  
Site Hammond

Inspection/Sample Visual Inspection & Sampling  
Date 6-7-2002  
Photo No. 3 of 14

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
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No.  8
Drum ID No.  18
Location  9C-6
Site  Hammond

Inspection/Sample
Date  6-7-2002
Photo No.  4 of 14

Visual Inspection & Sampling

1st Poly liner/bag - Good Condition
Seal in good condition
No holes in liner/bag
No Gasses present
Lot No. 8
Drum ID No. 18
Location 9C-6
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-7-2002
Photo No. 5 of 14

2nd Poly liner/bag - Good Condition
Seal in good condition
No holes in liner/bag
No Moisture
No Gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>8</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>18</td>
<td>Date 6-7-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-6</td>
<td>Photo No. 6 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

Monolith – White in Color
Solid – very dry
No Gases present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>8</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>18</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>9C-6</td>
<td>6-7-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 of 14</td>
</tr>
</tbody>
</table>

Beginning to drill cores with core bit
No Gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>8</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>18</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>9C-6</td>
<td>Photo No.</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>8</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>18</td>
<td>Date</td>
<td>6-7-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-6</td>
<td>Photo No.</td>
<td>9 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Closing 2nd and 1st Poly liner/bag for final closure
No holes in liner/bag
No Gasses present
Lot No. 8  
Drum ID No. 18  
Location 9C-6  
Site Hammond  

Inspection/Sample Date 6-7-2002  
Photo No. 10 of 14  

Visual Inspection & Sampling

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  
Drum ID No. 18  
Location 9C-6  
Site Hammond  

Inspection/Sample Visual Inspection & Sampling  
Date 6-7-2002  
Photo No. 11 of 14  

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
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>8</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>18</td>
<td>Date</td>
<td>6-7-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-6</td>
<td>Photo No.</td>
<td>12 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This photograph shows the larger of the 2 samples
Core sample is 900gm
No holes in liner/bag
No Gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>8</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>18</td>
<td>Date</td>
<td>6-7-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-6</td>
<td>Photo No.</td>
<td>13 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This photograph shows the smaller of the 2 samples
527 gm sealed in a plastic liner/bag
No Gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Drum ID No.</th>
<th>Location</th>
<th>Site</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>18</td>
<td>9C-6</td>
<td>Hammond</td>
<td>Date 6-7-2002</td>
<td>Photo No. 14 of 14</td>
</tr>
</tbody>
</table>

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 at the time of opening: DR at Surface 30mR/hr DR at 1 meter 2.8mR/hr Dpm/300cm² <20α & <200βγ
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 #3 Condition/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 #4 Condition/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 #5 Condition/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 #6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface: 30 mR/hr, 1 meter: 2.8 mR/hr</td>
</tr>
<tr>
<td>Inspection/Sample Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Photo No.</td>
<td>1 of 11</td>
</tr>
<tr>
<td>Container Condition</td>
<td>Good</td>
</tr>
</tbody>
</table>
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 10
Drum ID No. 46
Location 12D-1
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 2 of 11

Lid of 85-gal drum - Good Condition
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Drum ID No.</th>
<th>Location</th>
<th>Site</th>
<th>Inspection/Sample</th>
<th>Date</th>
<th>Photo No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>46</td>
<td>12D-1</td>
<td>Hammond</td>
<td>Visual Inspection &amp; Sampling</td>
<td>6-10-2002</td>
<td>3 of 11</td>
</tr>
</tbody>
</table>

55gal drum-good condition
no gases present
ring - good condition
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 of 11</td>
</tr>
</tbody>
</table>

1st poly-liner/bag- Good Condition
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>Photo No.</td>
<td>5 of 11</td>
</tr>
</tbody>
</table>

Site: Hammond

2nd Poly-liner/bag- Good Condition
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

Inspection/Sample

<table>
<thead>
<tr>
<th>Date</th>
<th>Photo No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-10-2002</td>
<td>6 of 11</td>
</tr>
</tbody>
</table>

3rd Poly-liner/bag- Good Condition
No gasses present
You can see water crystals/wet damp inside of liner
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
<td>Date 6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>Photo No. 7 of 11</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

Monolith-white in color
Chunks/broken
Damp/wet inside
Took pH reading color Red-0 scale
No gasses present
### Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No. 8 of 11</td>
</tr>
</tbody>
</table>

Pictures indicates drilling for core samples
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 of 11</td>
</tr>
</tbody>
</table>

No gasses present
Drilling for core samples did not work had to use chisel to get sample
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 of 11</td>
</tr>
</tbody>
</table>

No gasses present
Replaced ring and lid on 55gal drum
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>10</th>
<th>Inspection/Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>46</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>Date</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>6-10-2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 of 11</td>
</tr>
</tbody>
</table>

85 gal drum lid and ring secured
Drum sealed/dated/completed
[This page intentionally left blank.]
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/300cm² <20α & <200 β
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 # 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.): Polyliner/bag
Inner Container # 4 Condition/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.): Polyliner/bag
Inner Container # 5 Condition/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.): Polyliner/bag
Inner Container # 6 Condition/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  
Drum ID No. 42  
Location 9C-2  
Site Hammond  
Container 85-gallon steel drum  
Dose Rate Surface 32 mR/hr  
          1 meter 3 mR/hr  

Inspection/Sample Visual Inspection & Sampling  
Date 6-07-2002  
Photo No. 1 of 17  
Container Condition Good
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
<th>Location</th>
<th>9C-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Date</td>
<td>6-07-2002</td>
<td>Visual Inspection &amp; Sampling</td>
<td>2 of 17</td>
</tr>
</tbody>
</table>

85 gal drum lid – Good Condition
Ring is also in good condition
Lot No. 23
Drum ID No. 42
Location 9C-2
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
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 23
Drum ID No. 42
Location 9C-2
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-07-2002
Photo No. 4 of 17

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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
<td>Photo No.</td>
<td>5 of 17</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1st Poly liner/bag – Good Condition
Liner is sealed and in good condition
No measurement of gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 23
Drum ID No. 42
Location 9C-2
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-07-2002
Photo No. 6 of 17

2nd Poly liner/bag – Good Condition
No moisture
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
<td>Photo No.</td>
<td>7 of 17</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Monolith - White in color  
Solid - dry  
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Drum ID No.</th>
<th>Location</th>
<th>Site</th>
<th>Inspection/Sample Date</th>
<th>Photo No.</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>42</td>
<td>9C-2</td>
<td>Hammond</td>
<td>6-07-2002</td>
<td>8 of 17</td>
<td></td>
</tr>
</tbody>
</table>

This shows the drill bit with the vacuum adapter in place
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Inspection/Sample**

<table>
<thead>
<tr>
<th>Date</th>
<th>6-07-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo No.</td>
<td>9 of 17</td>
</tr>
</tbody>
</table>

**Visual Inspection & Sampling**

Here is the 1st core sample taken
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

Inspecte/Sample Visual Inspection & Sampling  
Date 6-07-2002  
Photo No. 10 of 17

This picture shows how the vacuum system works  
We are drilling for the 2nd core sample  
No gasses are present
Lot No.    23
Drum ID No.  42
Location  9C-2
Site    Hammond

Inspection/Sample
Date      6-07-2002
Photo No.  11 of 17

Visual Inspection & Sampling

Another picture of the drill and vacuum system operating
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
<td>Photo No.</td>
<td>12 of 17</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lifting the drill and vacuum cover shows a piece of the core sample
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
<td>Photo No.</td>
<td>13 of 17</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A close-up picture of the 2nd core sample still in the core block. No gasses present.
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 23  
Drum ID No. 42  
Location 9C-2  
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-07-2002  
Photo No. 14 of 17

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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
<td>Photo No.</td>
<td>15 of 17</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Both core holes drilled with one core sample already taken out
This picture shows a clean cut with the drill
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>42</td>
</tr>
<tr>
<td>Location</td>
<td>9C-2</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

Inspection/Sample Visual Inspection & Sampling

Date 6-07-2002

Photo No. 16 of 17

55-gal drum ring placement – Good Condition
Ring is installed upside down for easy access
No gasses present
Lot No. 23
Drum ID No. 42
Location 9C-2
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-07-2002
Photo No. 17 of 17

85-gal container – Good Condition
Sealed/dated - Completed
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

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Hammond Depot
Lot #29 – Drum #4
Inspect, Sample & Analyze
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

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 3.0mR/hr DR at 1 meter 3.0mR/hr Dpm/300cm² <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 # 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
Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 
Inner Container # 5 Condition/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 # 6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>29</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>4</td>
<td>Date 6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9B-4</td>
<td>Photo No. 1 of 12</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
<td></td>
</tr>
<tr>
<td>Container Condition</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 30 mR/hr 1 meter 3 mR/hr</td>
<td></td>
</tr>
</tbody>
</table>
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Drum ID No.</th>
<th>Inspection/Sample Date</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>4</td>
<td>6-07-2002</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>9B-4</td>
<td>Photo No.</td>
<td>2 of 12</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

85 gal drum lid – Good Condition
Ring is also in good condition
Lot No. 29  
Drum ID No. 4  
Location 9B-4  
Site Hammond  

Inspection/Sample Visual Inspection & Sampling  
Date 6-07-2002  
Photo No. 3 of 12  

55 gal containers lid – Good Condition  
Ring is bolted with a 3/8 x 3-1/2 bolt  
55 gal drum is placed in an 85 overpack with vermiculite  
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>4</td>
</tr>
<tr>
<td>Location</td>
<td>9B-4</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Visual Inspection & Sampling**

- **Date**: 6-07-2002
- **Photo No.**: 4 of 12

1st poly liner/bag – Good Condition
Seal is in good condition
No gassed present
Lot No. 29
Drum ID No. 4
Location 9B-4
Site Hammond

Inspection/Sample
Date 6-07-2002
Photo No. 5 of 12

Visual Inspection & Sampling

2\textsuperscript{nd} poly liner/bag – Good Condition
Moisture crystals present inside bag
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>29</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
<th>6-07-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>4</td>
<td>Date</td>
<td>6 of 12</td>
</tr>
<tr>
<td>Location</td>
<td>9B-4</td>
<td>Photo No.</td>
<td>6 of 12</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No.     29
Drum ID No.  4
Location    9B-4
Site        Hammond

Inspection/Sample   Visual Inspection & Sampling
Date                6-07-2002
Photo No.           8 of 12

The drill bit is lifted from the core sample
Some particles fall over core
Both core samples are in view
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>29</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>4</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9B-4</td>
<td>Photo No.</td>
<td>9 of 12</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Both core samples lying on top of core block – both are in good condition
No gasses present
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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>29</th>
<th>Inspection/Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>4</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Location</td>
<td>9B-4</td>
<td>Date 6-07-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No. 11 of 12</td>
</tr>
</tbody>
</table>

55 gal drum lid secured and in good condition
Ring on upside down to tighten bolts
No gasses are present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>29</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>4</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>9B-4</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 of 12</td>
</tr>
</tbody>
</table>

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

Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3mR/hr Dpm/300cm² <20α & <200β
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 # 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

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5 Condition/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 # 6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
</tr>
<tr>
<td>Dose Rate</td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>32 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>3 mR/hr</td>
</tr>
<tr>
<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Photo No.</td>
<td>1 of 16</td>
</tr>
<tr>
<td>Container</td>
<td>Good</td>
</tr>
<tr>
<td>Condition</td>
<td>Good</td>
</tr>
</tbody>
</table>
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 30
Drum ID No. 6
Location 9D-1
Site Hammond

Inspection/Sample
Date 6-07-2002
Photo No. 2 of 16

Visual Inspection & Sampling

85 gal drum lid – Good Condition
Ring on drum lid is in good condition
Lot No. 30
Drum ID No. 6
Location 9D-1
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-07-2002
Photo No. 3 of 16

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 packaged in a 85 gal overpack with vermiculite
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
<td>Photo No.</td>
<td>4 of 16</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Another picture of the 55 gal drum lid
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
<td>Date 6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
<td>Photo No. 5 of 16</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

This shows the difficulty at getting to some of the 3/8 bolts
Underneath and bent
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 30
Drum ID No. 6
Location 9D-1
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-07-2002
Photo No. 6 of 16

1st Poly liner/bag – Good Condition
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
<td>Photo No.</td>
<td>7 of 16</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2nd poly liner/bag – Good Condition
No moisture
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 30
Drum ID No. 6
Location 9D-1
Site Hammond

Inspection/Sample
Visual Inspection & Sampling
Date 6-07-2002
Photo No. 8 of 16

Monolith - white in color
Solid - very dry
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
<td>Photo No.</td>
<td>9 of 16</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Close-up of drill right before drilling of a core sample
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
<td>Photo No.</td>
<td>10 of 16</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Close-up of drill, drilling through monolith block
No gasses present
Lot No. 30  
Drum ID No. 6  
Location 9D-1  
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-07-2002
Photo No. 11 of 16

A look at the vacuum system for the drill
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>30</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
<td>Photo No.</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>A hole were the drill left after core sample was taken out</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The black dots are the plastic housing on the vacuum cover</td>
</tr>
</tbody>
</table>
Lot No. 30
Drum ID No. 6
Location 9D-1
Site Hammond

Here is a picture of the core that was taken
No gasses present
Lot No. 30
Drum ID No. 6
Location 9D-1
Site Hammond

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

Inspection/Sample Date 6-07-2002
Visual Inspection & Sampling
Photo No. 14 of 16
Lot No. 30
Drum ID No. 6
Location 9D-1
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.
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot No.</td>
<td>30</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>6</td>
</tr>
<tr>
<td>Location</td>
<td>9D-1</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Date</td>
<td>6-07-2002</td>
</tr>
<tr>
<td>Photo No.</td>
<td>16 of 16</td>
</tr>
</tbody>
</table>

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/300cm² <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 # 3 Condition/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 # 4 Condition/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 # 5 Condition/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 # 6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 32 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3 mR/hr</td>
</tr>
<tr>
<td>Inspection/Sample Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Photo No.</td>
<td>1 of 10</td>
</tr>
<tr>
<td>Condition</td>
<td>Good</td>
</tr>
</tbody>
</table>

Site Hammond

Container 85-gallon steel drum

Dose Rate

Surface 32 mR/hr

1 meter 3 mR/hr
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
<td>Photo No.</td>
<td>2 of 10</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

85-gal drum – Good Condition
Another picture of outer 85-gal drum in case prior picture was too dark
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
<tr>
<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Photo No.</td>
<td>3 of 10</td>
</tr>
</tbody>
</table>

Lid and ring of 85-gal drum – Good Condition
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
<td>Photo No.</td>
<td>4 of 10</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

55gal drum-good condition
No gases present
Ring-good condition
Lot No. 38
Drum ID No. 25
Location 15C-5
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 5 of 10

1st poly-liner/bag- Good Condition
No gasses present
### Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
<td>Photo No.</td>
<td>6 of 10</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2nd Poly-liner/bag- Good Condition
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
<td>Photo No.</td>
<td>7 of 10</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Monolith-white in color
Chunks / broken
Damp/wet inside
Took pH reading color Red-0 scale
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 of 10</td>
</tr>
</tbody>
</table>

Another view of using chisel and hammer to make samples fit container
No gasses present
Lot No. 38
Drum ID No. 25
Location 15C-5
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 9 of 10

No gasses present
Replaced ring and lid on 55gal drum
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>38</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>25</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>15C-5</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 of 10</td>
</tr>
</tbody>
</table>

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: Not Applicable
Units:

Rad Measurements @ the time of opening: DR at Surface 32mR/hr DR at 1 meter 3mR/hr Dpm/300cm^2 <20 & <200 Bq

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 -- damp inside
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 # 3 Condition/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 # 4 Condition/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 # 5 Condition/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 # 6 Condition/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
Drum ID No. 6
Location 12D-1
Site Hammond
Container 85-gallon steel drum
Dose Rate Surface 32 mR/hr
1 meter 3 mR/hr

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 1 of 11
Container Condition Good
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>47</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 of 11</td>
</tr>
</tbody>
</table>

Lid of 85 gal drum - Good Condition
Lot No. 47
Drum ID No. 6
Location 12D-1
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 3 of 11

55-gal drum-good condition
No gases present
Ring-good condition
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

Inspection/Sample Visual Inspection & Sampling
Date       6-10-2002
Photo No. 4 of 11

1st poly-liner/bag- Good Condition
No gasses present
Lot No. 47
Drum ID No. 6
Location 12D-1
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 5 of 11

2nd Poly-liner/bag- Good Condition
No gasses present
Wet crystals formed in the bag/ chunky pieces visible
Monolith-white in color
Chunks/broken
Damp/wet inside
Took pH reading color Red-0 scale
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Drum ID No.</th>
<th>Location</th>
<th>Site</th>
<th>Inspection/Sample</th>
<th>Date</th>
<th>Photo No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>6</td>
<td>12D-1</td>
<td>Hammond</td>
<td>Visual Inspection &amp; Sampling</td>
<td>6-10-2002</td>
<td>7 of 11</td>
</tr>
</tbody>
</table>

No gasses present
Picture indicates chisel and hammer used to break up chunk pieces to fit inside 2ltr bottles.
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

| Inspection/Sample Visual Inspection & Sampling |
| Date | 6-10-2002 |
| Photo No. | 8 of 11 |

No gasses present
Chunks were molded to fit container
1st sample 830grms
2nd sample 655grms
Replacing ring and lid on 55-gal drum
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

Lot No. 47
Drum ID No. 6
Location 12D-1
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 10 of 11

No gasses present
Replaced ring and lid on 55gal drum
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>6</td>
</tr>
<tr>
<td>Location</td>
<td>12D-1</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
</tr>
</tbody>
</table>

**Inspection/Sample**

- **Visual Inspection & Sampling**
- **Date**
- **Photo No.**
- **6-10-2002**
- **11 of 11**

85 gal drum lid and ring secured
Drum sealed/dated/completed
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/300cm² <20α & <200β
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 # 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

Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):
Inner Container # 5 Condition/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 # 6 Condition/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
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No.</td>
<td>1 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Container</td>
<td>Good</td>
</tr>
<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
<td>Condition</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose Rate</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>32 mR/hr</td>
<td></td>
</tr>
<tr>
<td>1 meter</td>
<td>3.2 mR/hr</td>
<td></td>
</tr>
<tr>
<td>Lot No.</td>
<td>48</td>
<td>Inspection/Sample Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No.</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>6-10-2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 of 14</td>
</tr>
</tbody>
</table>

Lid of 85 gal drum - Good Condition
Lot No. 48
Drum ID No. 40
Location 12C-5
Site Hammond

55-gal drum-good condition
no gases present
ring-good condition
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 of 14</td>
</tr>
</tbody>
</table>

No gasses present
This picture shows the position/ difficulty of removing bolt from ring
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date 6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No. 5 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

1st poly-liner/bag- Good Condition  
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No.</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>6-10-2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 of 14</td>
</tr>
</tbody>
</table>

2nd Poly-liner/bag- Good Condition
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No.</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

Monolith-white in color
Solid
No gasses present
Light moisture
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td>Photo No.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 of 14</td>
</tr>
</tbody>
</table>

Pictures shows drilling for core samples
No gasses present
Lot No. 48
Drum ID No. 40
Location 12C-5
Site Hammond

Inspection/Sample Visual Inspection & Sampling
Date 6-10-2002
Photo No. 9 of 14

Picture shows drilling for core samples
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No.</td>
<td>10 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Picture of core after drilling for sample
Shows core still inside of block
No gasses present
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No.</td>
<td>11 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Picture of 2 cores after drilling for sample
Shows 2 cores still inside of block
No gasses present
Hammond Depot Drums Sampled for Off-site Analyses (First Sample Shipment)

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date 6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No. 12 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
</tr>
</tbody>
</table>

Bad (blurry) picture of 2 core samples
1<sup>st</sup> weights 491 grams
2<sup>nd</sup> weights 536 grams
No gasses present
Lot No. 48
Drum ID No. 40
Location 12C-5
Site Hammond

No gasses present
Replacing lid on 55gal drum
<table>
<thead>
<tr>
<th>Lot No.</th>
<th>48</th>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
<td>40</td>
<td>Date</td>
<td>6-10-2002</td>
</tr>
<tr>
<td>Location</td>
<td>12C-5</td>
<td>Photo No.</td>
<td>14 of 14</td>
</tr>
<tr>
<td>Site</td>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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)
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.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I-3</td>
<td>149</td>
<td>C-5</td>
</tr>
<tr>
<td>2</td>
<td>I-4</td>
<td>206</td>
<td>C-17</td>
</tr>
<tr>
<td>3</td>
<td>I-5</td>
<td>251</td>
<td>C-27</td>
</tr>
<tr>
<td>4</td>
<td>I-6</td>
<td>300</td>
<td>C-39</td>
</tr>
<tr>
<td>5</td>
<td>I-7</td>
<td>358</td>
<td>C-51</td>
</tr>
<tr>
<td>6</td>
<td>I-9</td>
<td>780</td>
<td>C-63</td>
</tr>
<tr>
<td>7</td>
<td>I-11</td>
<td>537</td>
<td>C-75</td>
</tr>
<tr>
<td>8</td>
<td>I-12</td>
<td>589</td>
<td>C-85</td>
</tr>
<tr>
<td>9</td>
<td>I-13</td>
<td>637</td>
<td>C-97</td>
</tr>
<tr>
<td>10</td>
<td>I-14</td>
<td>714</td>
<td>C-107</td>
</tr>
</tbody>
</table>
Curtis Bay Depot
Lot #I-3 – Drum 149
Inspect, Sample & Analyze
**CONTAINER INSPECTION CHECKLIST**

**CONTAINER INFORMATION**

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

Lot #: 1-3 Drum ID #: 149 Location: Warehouse 911 – Column F – Row 6

<table>
<thead>
<tr>
<th>Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.):</th>
<th>55-gal drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer Container Condition/Description (rusty, leaking, good, etc.):</td>
<td>fair</td>
</tr>
<tr>
<td>Photo Taken of Outer Container: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
<tr>
<td>Drum Wall thickness of Outer Container (French and Indian Drums only):</td>
<td>0.1565 Units: in</td>
</tr>
<tr>
<td>Rad Measurements at the time of opening: DR at Surface 42mR/hr DR at 1 meter 4.5mR/hr dpm/300cm² ext. contamination Headspace Gas Measurements: Hydrocarbons 0.0ppm NOx 0.0ppm</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):</th>
<th>Cardboard &amp; Shredded paper for packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 1 Condition/Description (rusty, leaking, good, etc.):</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #1: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
<tr>
<td>Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):</td>
<td>1st poly liner/bag</td>
</tr>
<tr>
<td>Inner Container # 2 Condition/Description (rusty, leaking, good, etc.):</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #2: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
<tr>
<td>Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):</td>
<td>2nd poly liner/bag</td>
</tr>
<tr>
<td>Inner Container # 3 Condition/Description (rusty, leaking, good, etc.):</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #3: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
<tr>
<td>Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):</td>
<td>3rd poly liner/bag</td>
</tr>
<tr>
<td>Inner Container # 4 Condition/Description (rusty, leaking, good, etc.):</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #4: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
<tr>
<td>Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):</td>
<td>4th poly liner/bag</td>
</tr>
<tr>
<td>Inner Container # 5 Condition/Description (rusty, leaking, good, etc.):</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #5: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
<tr>
<td>Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):</td>
<td></td>
</tr>
<tr>
<td>Inner Container # 6 Condition/Description (rusty, leaking, good, etc.):</td>
<td></td>
</tr>
<tr>
<td>Photo Taken of Inner Container #6: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
<tr>
<td>Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):</td>
<td></td>
</tr>
<tr>
<td>Inner Container # 7 Condition/Description (rusty, leaking, good, etc.):</td>
<td></td>
</tr>
<tr>
<td>Photo Taken of Inner Container #7: Yes (include Drum ID in photo)</td>
<td>No</td>
</tr>
</tbody>
</table>

**CONTENTS INFORMATION**

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

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

---

C-6
<table>
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<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
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<td>Inspection/Sample</td>
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<tr>
<td>Disposition</td>
<td>Analyze</td>
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<tr>
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<td>Column</td>
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<tr>
<td>Time</td>
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<tbody>
<tr>
<td>Photo No.</td>
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<tr>
<td>Container</td>
<td>55-gallon steel drum</td>
</tr>
<tr>
<td>Container Condition</td>
<td>Fair</td>
</tr>
<tr>
<td>Container Wall Thickness</td>
<td>0.1565 in</td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 42 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 4.5 mR/hr</td>
</tr>
</tbody>
</table>

![Image of drum label with Lot No. 3, Drum No. 149, Gross WT 297.00 kgs, Net WT 267.50 kgs]
<table>
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<th>General Information</th>
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<tbody>
<tr>
<td>Site</td>
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<tr>
<td>Lot No.</td>
</tr>
<tr>
<td>Drum ID No.</td>
</tr>
<tr>
<td>Inspection/Sample</td>
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<tr>
<td>Disposition</td>
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<table>
<thead>
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</tr>
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<tbody>
<tr>
<td>Warehouse</td>
</tr>
<tr>
<td>Row</td>
</tr>
<tr>
<td>Column</td>
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</tbody>
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<table>
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<tr>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Photo No.</td>
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Round cardboard lid covering the shredded paper – good condition
No gasses present
### General Information

<table>
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<tr>
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<tbody>
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<td>Visual Inspection &amp; Sampling Analyze</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<tbody>
<tr>
<td>Time</td>
<td>10:30</td>
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</tbody>
</table>

### Other Information

- Photo No. 3 of 9
- Colorful shredded paper
- No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

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

Inspection/Sample Disposition: Visual Inspection & Sampling
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

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<tbody>
<tr>
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<tr>
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<td>Analyze</td>
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### Physical Location of Drum

<table>
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<tbody>
<tr>
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### Inspection/Sample Date & Time

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</table>

### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>6 of 9</th>
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</thead>
</table>

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

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<tr>
<td>Drum ID No.</td>
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</table>

**Inspection/Sample Disposition**

| Visual Inspection & Sampling Analyze |

**Other Information**

- **Photo No.** 7 of 9
- 4th poly liner/bag – good condition
- No gasses present

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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<tbody>
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<tr>
<td>Time</td>
<td>10:30</td>
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</table>
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

**General Information**

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</tr>
<tr>
<td>Drum ID No.</td>
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</tr>
<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
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<td>Lot No.</td>
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</tr>
<tr>
<td>Drum ID No.</td>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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### Physical Location of Drum

<table>
<thead>
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### Inspection/Sample Date & Time

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<tbody>
<tr>
<td>Time</td>
<td>10:30</td>
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</tbody>
</table>

### Other Information

- Photo No. 9 of 9
- Sealed & dated - complete
Curtis Bay Depot
Lot #I-4 – Drum #206
Inspect, Sample & Analyze
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

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

Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 4.0mR/hr dpm/300cm² 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 # 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.): 4th Poly liner/bg

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.): 5th Poly liner/bag

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.): 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 |
| - Drum ID No. | 206 |
| - Inspection/Sample Disposition | Visual Inspection & Sampling 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 |
| - Condition | Good |
| - Dose Rate |  |
| - Surface 1 meter | 30 mR/hr 4.0 mR/hr |
### General Information
- **Site:** Curtis Bay  
- **ThN Origin:** Indian  
- **Lot No.:** 4  
- **Drum ID No.:** 206  
- **Inspection/Sample Disposition:** Visual Inspection & Sampling 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
Drum ID No.: 206

Inspection/Sample Visual Inspection & Sampling
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

<table>
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<tr>
<th>Site</th>
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## Physical Location of Drum

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## Inspection/Sample Date & Time

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## Other Information

- Photo No. 4 of 8
- 1st polyliner/bag – good condition
- No gasses present
### General Information

<table>
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<tbody>
<tr>
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### Physical Location of Drum

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### Other Information

- Photo No. 5 of 8
- 2<sup>nd</sup> polyliner/bag – good condition
- No gasses present

![Label Image]
## Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

### General Information

<table>
<thead>
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<th>Site</th>
<th>Curtis Bay</th>
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### Physical Location of Drum

<table>
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### 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
Drum ID No. 206

Inspection/Sample Disposition
Visual Inspection & Sampling 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**

<table>
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<tr>
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**Inspection/Sample Visual Inspection & Sampling Disposition**

**Physical Location of Drum**

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**Other Information**

<table>
<thead>
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<th>Photo No.</th>
<th>8 of 8</th>
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</table>

Sealed & dated - complete
Curtis Bay Depot
Lot #I-5 – Drum #251
Inspect, Sample & Analyze
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

---

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/300cm² 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 # 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.): 4th Poly liner/bg
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.):
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.): 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 #: Label Seal with Date & Initials

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

---

C-28
### General Information

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
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<td>5</td>
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<tr>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
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<tbody>
<tr>
<td>Row</td>
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### Inspection/Sample Date & Time

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### Other Information

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<td>Container</td>
<td>85-gallon steel drum</td>
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<td>Condition</td>
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<th>Dose Rate</th>
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<th>34 mR/hr</th>
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<tr>
<td></td>
<td>1 meter</td>
<td>4.5 mR/hr</td>
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Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Indian
- **Lot No.**: 5
- **Drum ID No.**: 251
- **Inspection/Sample Visual Inspection & Sampling**
- **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

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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

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### Other Information

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The shredded paper under the 55 gal lid
No gasses present
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**Inspection/Sample Date & Time**

- Date: 7-3-2002
- Time: 09:25

**Physical Location of Drum**

- Warehouse: 911
- Row: 2
- Column: E

**Other Information**

- Photo No.: 4 of 9

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

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**Other Information**

| Photo No. | 5 of 9                     |

2\textsuperscript{nd} poly liner/bag – good condition
No gasses present
### General Information

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### Other Information

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3<sup>rd</sup> poly liner/bag – good condition
No gasses present
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4th poly liner/bag – good condition
No gasses present
**General Information**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

Photo No. 8 of 9

Indian – Thorium Nitrate – white – gravel/rock looking – dry
No gasses present
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<td>Photo No.</td>
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Sealed/Dated – Completed
Curtis Bay Depot
Lot #I-6 – Drum #300
Inspect, Sample & Analyze
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

<table>
<thead>
<tr>
<th>Lot #</th>
<th>Drum ID</th>
<th>Location</th>
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<tbody>
<tr>
<td>I-6</td>
<td>300</td>
<td>Warehouse 911 – Column F - Row 5</td>
</tr>
</tbody>
</table>

- **Site**: Hammond or Curtis Bay (circle one)
- **Outer Container Type/Capacity**: 85-gal drum
- **Outer Container Condition/Description**: good
- **Photo Taken of Outer Container**: Yes
- **Drum Wall thickness of Outer Container**: NA (85-gal drum)
- **Rad Measurements at the time of opening**: DR at Surface 32mR/hr, DR at 1 meter 4.5mR/hr, dpm/300cm²  \(4\) ext. contamination
- **Headspace Gas Measurements**: Hydrocarbons 0.0ppm, NOx 0.0ppm
- **Inner Container #1 Type/Capacity**: 55-gal Container (w/ cardboard lining)
- **Inner Container #1 Condition/Description**: fair
- **Photo Taken of Inner Container #1**: Yes
- **Inner Container #2 Type/Capacity**: Shredded paper for packaging
- **Inner Container #2 Condition/Description**: good
- **Photo Taken of Inner Container #2**: Yes
- **Inner Container #3 Type/Capacity**: 1st poly liner/bag
- **Inner Container #3 Condition/Description**: good
- **Photo Taken of Inner Container #3**: Yes
- **Inner Container #4 Type/Capacity**: 2nd poly liner/bag
- **Inner Container #4 Condition/Description**: good
- **Photo Taken of Inner Container #4**: Yes
- **Inner Container #5 Type/Capacity**: 3rd poly liner/bg
- **Inner Container #5 Condition/Description**: good
- **Photo Taken of Inner Container #5**: Yes
- **Inner Container #6 Type/Capacity**: 4th poly liner/bg
- **Inner Container #6 Condition/Description**: good
- **Photo Taken of Inner Container #6**: Yes
- **Inner Container #7 Type/Capacity**: 5th poly liner/bg
- **Inner Container #7 Condition/Description**: good
- **Photo Taken of Inner Container #7**: Yes

CONTENTS INFORMATION

- **Matrix**: 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
- **TID placed on container after inspection**: Yes
- **TID(s)**: Label Seal with Date & Initials

**Checklist completed by**: T. Cunningham (signature on file)  
**Date**: 7-03-02
<table>
<thead>
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<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
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<tr>
<td>Condition</td>
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<tr>
<td>Dose Rate Surface</td>
<td>32 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>4.5 mR/hr</td>
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</table>
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

**General Information**

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**Other Information**

<table>
<thead>
<tr>
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Picture of the 55 gal container – fair condition

No gasses present
### General Information
- **Site**: Curtis Bay
- **ThN Origin**: Indian
- **Lot No.**: 6
- **Drum ID No.**: 300
- **Inspection/Sample Disposition**: Visual Inspection & Sampling 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

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### Other Information

- Photo No. 4 of 10
- 1st poly liner/bag – good condition
- No gasses present
### General Information

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### Visual Inspection & Sampling

| Inspection/Sample Disposition | Analyze |

### Physical Location of Drum

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### Other Information

| Photo No. | 5 of 10 |

2\textsuperscript{nd} poly liner/bag – good condition  
No gasses present
General Information
Site: Curtis Bay
ThN Origin: Indian
Lot No.: 6
Drum ID No.: 300
Inspection/Sample Disposition: Visual Inspection & Sampling
          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
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

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

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### Inspection/Sample Date & Time

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### Other Information

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Thorium Nitrate – solid – dry
No gasses present
### General Information

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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

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Close-up of Thorium Nitrate particles

No gasses present
## General Information

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## Physical Location of Drum

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## Inspection/Sample Date & Time

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## Other Information

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Scaled & 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/300cm² 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 # 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/bag
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.): 4th Poly liner/bag
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.):
Inner Container # 7 Condition/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**

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<tr>
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<td>Drum ID No.</td>
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**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- 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
- Condition: Good

**Dose Rate**

- Surface: 32.0 mR/hr
- 1 meter: 4.4 mR/hr
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**Physical Location of Drum**

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**Other Information**

Photo No. 2 of 9

55-gal container – shows the ring already off the drum
No gasses present
**General Information**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

- Photo No. 3 of 9

1st layer – shredded paper
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

### General Information

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### Other Information

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

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## Physical Location of Drum

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## Other Information

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<th>Photo No.</th>
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2nd poly liner/bag – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Indian
- **Lot No.**: 7
- **Drum ID No.**: 358
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
  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**

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**Inspection/Sample**

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**Physical Location of Drum**

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**Other Information**

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

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### Physical Location of Drum

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### Other Information

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Thorium Nitrate – gravel looking – solid – dry  
No gasses present
### General Information

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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

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### Other Information

Photo No. 9 of 9

Sealed & dated - complete
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: 0.1565 Units: in

Rad Measurements at the time of opening: DR at Surface 30mR/hr DR at 1 meter 4.5mR/hr dpm/300cm² 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.*

<table>
<thead>
<tr>
<th>Inner Container #</th>
<th>Type/Capacity</th>
<th>Condition/Description</th>
<th>Photo Taken of Inner Container</th>
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</table>
| #1                | Poly Liner, Fiber 20 Gal, Poly Bag | fair | ☒ Yes (include Drum ID in photo)
| #2                | Shredded paper for packaging | good | ☒ Yes (include Drum ID in photo)
| #3                | 1st poly liner/bag | good | ☒ Yes (include Drum ID in photo)
| #4                | 2nd Poly liner/bag | good | ☒ Yes (include Drum ID in photo)
| #5                | 3rd Poly liner/bag | good | ☒ Yes (include Drum ID in photo)
| #6                | 4th Poly liner/bag | good | ☒ Yes (include Drum ID in photo)
| #7                | 5th Poly liner/bag | good | ☒ Yes (include Drum ID in photo)

**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
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<tr>
<td>Photo No.</td>
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<tr>
<td>Container</td>
<td>85-gallon steel drum</td>
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<tr>
<td>Condition</td>
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<td>Surface 1 meter</td>
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<td>1 meter</td>
<td>4.5 mR/hr</td>
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### General Information

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### Physical Location of Drum

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### Other Information

- Photo No. 2 of 9
- 55-gal container – there was no ring on the 55-gal drum
- No gasses present
**General Information**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

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<th>Photo No.</th>
<th>3 of 9</th>
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Shredded paper in container
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

**General Information**
- Site: Curtis Bay
- ThN Origin: Indian
- Lot No.: 9
- Drum ID No.: 780
- Inspection/Sample Disposition: Analyze

**Physical Location of Drum**
- Warehouse: 911
- 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
Drum ID No.: 780

Inspection/Sample Visual Inspection & Sampling
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

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**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

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### Inspection/Sample Date & Time

- **Date**: 7-3-2002
- **Time**: 09:15

### Other Information

- **Photo No.**: 6 of 9

- 3" poly liner/bag – good condition
- No gasses present
### General Information

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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

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### Other Information

- Photo No. 7 of 9
- 4th poly liner/bag – good condition
- No gasses present
**General Information**

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**Inspection/Sample Date & Time**

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**Other Information**

Photo No. 8 of 9

Indian – Thorium Nitrate – gravel looking – solid – dry
No gasses present
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<td>Photo No.</td>
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Scaled & dated - complete
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Curtis Bay Depot
Lot #I-11 – Drum #537
Inspect, Sample & Analyze
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

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  No

Drum Wall thickness of Outer Container (French and Indian Drums only): 0.1565
Rad Measurements at the time of opening: DR at Surface 44mR/hr
DR at 1 meter 4.0mR/hr  dpm/300cm² 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  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  No

Inner Container #3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 1st poly liner/bag
Inner Container #3 Condition/Description (rusty, leaking, good, etc.): good

Photo Taken of Inner Container #3:  Yes  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  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  No

Inner Container #6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bg
Inner Container #6 Condition/Description (rusty, leaking, good, etc.): good

Photo Taken of Inner Container #6:  Yes  No

Inner Container #7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 5th Poly liner/bg
Inner Container #7 Condition/Description (rusty, leaking, good, etc.): good

Photo Taken of Inner Container #7:  Yes  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
Drum ID No.: 537

Inspection/Sample Visual Inspection & Sampling
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

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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

- Photo No. 2 of 8
- Shredded paper for packaging
- No gasses present
### General Information

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#### Inspection/Sample Disposition
- Visual Inspection & Sampling
- 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**

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**Inspection/Sample**

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**Physical Location of Drum**

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**Other Information**

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

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**Physical Location of Drum**

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**Other Information**

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3rd poly liner/bag – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

**General Information**

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**Visual Inspection & Sampling**

**Disposition**

**Inspection/Sample Date & Time**

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**Physical Location of Drum**

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**Other Information**

Photo No. 6 of 8

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

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**Physical Location of Drum**

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**Other Information**

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Thorium Nitrate – white gravel looking – solid – dry
No gasses present
**General Information**

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**Other Information**

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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/300cm² 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 # 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.): 4th poly liner/bg
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.):
Inner Container # 7 Condition/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
Drum ID No.: 589

Inspection/Sample Date & Time
Date: 7-2-2002
Time: 9:50

Physical Location of Drum
Warehouse: 911
Row: 9
Column: F

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

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**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

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### 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

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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Analyze**

### Physical Location of Drum

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### 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**

<table>
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<tr>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

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**Other Information**

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

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

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

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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

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### Other Information

| Photo No. | 7 of 9 |

4\textsuperscript{th} poly liner/bag – good condition  
No gasses present
### General Information

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### Other Information

Photo No. 8 of 9

Thorium Nitrate – solid – white – gravel shape - dry
No gasses present
### General Information

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### Physical Location of Drum

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### Other Information

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Scaled & dated - completed
Curtis Bay Depot
Lot #I-13 – Drum #637
Inspect, Sample & Analyze
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

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

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<thead>
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<tr>
<td>I-13</td>
<td>637</td>
<td>Warehouse 911 – Column F – Row 2</td>
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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/300cm² 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.

<table>
<thead>
<tr>
<th>Inner Container #</th>
<th>Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Condition/Description (rusty, leaking, good, etc.)</th>
<th>Photo Taken of Inner Container: Yes (include Drum ID in photo)</th>
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<tbody>
<tr>
<td>1</td>
<td>55-gal Cardboard</td>
<td>good</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Shredded paper for packaging</td>
<td>good</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>1st poly liner/bag</td>
<td>good</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>2nd Poly liner/bag</td>
<td>good</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>3rd Poly liner/bg</td>
<td>good</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>4th Poly liner/bg</td>
<td>good</td>
<td>Yes</td>
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<td>7</td>
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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
Drum ID No.: 637

Inspection/Sample Disposition: Visual Inspection & Sampling 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
Condition: Fair

Dose Rate: Surface 35.0 mR/hr
           1 meter 4.2 mR/hr
## General Information

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## Physical Location of Drum

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## Inspection/Sample Date & Time

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## Other Information

<table>
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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
Drum ID No.: 637

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

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### Physical Location of Drum

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### Other Information

- Photo No. 4 of 8
- 2nd poly liner/bag – good condition
- No gasses present
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### Other Information
- Photo No.: 5 of 8
- 3rd poly liner/bag – good condition
- No gasses present
### General Information

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### Other Information

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4th poly linerバッグ – good condition
No gasses present
General Information

Site  Curtis Bay
ThN Origin  Indian
Lot No.  13
Drum ID No.  637

Inspection/Sample Visual Inspection & Sampling
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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

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Scaled & 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/300cm² 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 # 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/bag
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.): 4th poly liner/bag
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.): 5th poly liner/bag
Inner Container # 7 Condition/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

C-108
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<td><strong>Column</strong></td>
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<table>
<thead>
<tr>
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<tr>
<td><strong>Date</strong></td>
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<td><strong>Time</strong></td>
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<tr>
<td><strong>Photo No.</strong></td>
<td>1 of 7</td>
</tr>
<tr>
<td><strong>Container</strong></td>
<td>55-gallon steel drum</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>Fair</td>
</tr>
<tr>
<td><strong>Dose Rate</strong></td>
<td>Surface 38.0 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 4.5 mR/hr</td>
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Picture of exterior of drum did not take
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<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
<td>14</td>
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<tr>
<td>Drum ID No.</td>
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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<tr>
<td>Container</td>
<td>55-gallon steel drum</td>
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<tr>
<td>Condition</td>
<td>Fair</td>
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</table>

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**

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<td>Drum ID No.</td>
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**Inspection/Sample Visual Inspection & Sampling**

**Disposition Analyze**

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

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

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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

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### Other Information

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2nd poly liner/bag – good condition
No gasses present
General Information
Site: Curtis Bay
ThN Origin: Indian
Lot No.: 14
Drum ID No.: 714
Inspection/Sample Disposition: Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Second Sample Shipment)

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**Physical Location of Drum**

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**Other Information**

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Thorium Nitrate – dry – solid – white – gravel shape
No gasses present
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Scaled & 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.

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<td>D-5</td>
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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 in Units: in
Rad Measurements at the time of opening: DR at Surface 44 mR/hr DR at 1 meter 4.0 mR/hr dpm/300 cm² ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0 ppm NOx 0.0 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 # 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.: 1
Drum ID No.: 52

Inspection/Sample Disposition: Visual Inspection & Sampling

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

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<thead>
<tr>
<th>Site</th>
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<tbody>
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<td>Drum ID No.</td>
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### Inspecton/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 gases present
General Information
Site: Curtis Bay  
ThN Origin: French  
Lot No.: 1  
Drum ID No.: 52

Inspection/Sample Disposition: Visual Inspection & Sampling 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
Drum ID No.: 52

Inspection/Sample Disposition
Visual Inspection & Sampling 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
Drum ID No.: 52

Inspection/Sample Disposition: Visual Inspection & Sampling 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 in
Rad Measurements at the time of opening: DR at Surface 42 mR/hr DR at 1 meter 3.8 mR/hr dpm/300 cm^2 ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0 ppm  NOx 0.0 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 # 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 #: Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file)  Date: 7-08-02
## General Information

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**Inspection/Sample**

- **Disposition**: Analyze

**Visual Inspection & Sampling**

## Physical Location of Drum

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## Inspection/Sample Date & Time

- **Date**: 7-8-2002
- **Time**: 13:30

## Other Information

- **Photo No.**: 1 of 5
- **Container**: 55-gallon steel drum
- **Condition**: Fair
- **Container Wall Thickness**: 0.1565 in
- **Dose Rate**
  - **Surface**: 42 mR/hr
  - **1 meter**: 3.8 mR/hr

---

### Additional Image

A close-up image of a drum showing the label information.
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: French
- **Lot No.**: 2
- **Drum ID No.**: 49
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **Analyse**

**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**

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**Inspection/Sample Visual Inspection & Sampling Disposition Analyze**

**Physical Location of Drum**

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<tr>
<td></td>
<td>1 meter 3.8 mR/hr</td>
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2nd poly liner/bag – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

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**Inspection/Sample Disposition**

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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>Dose Rate</th>
<th>Surface</th>
<th>1 meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 of 5</td>
<td></td>
<td>42 mR/hr</td>
<td>3.8 mR/hr</td>
</tr>
</tbody>
</table>

Thorium Nitrate – Some gravel pieces but most is Powder – white – dry
No gasses present
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
</tr>
<tr>
<td>Lot No.</td>
<td>2</td>
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<td>Drum ID No.</td>
<td>49</td>
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
</tr>
</tbody>
</table>

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>9</td>
</tr>
<tr>
<td>Column</td>
<td>E</td>
</tr>
</tbody>
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### Inspection/Sample Date & Time

<table>
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<tr>
<td>Time</td>
<td>13:30</td>
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<tr>
<td>Dose Rate</td>
<td>Surface 42 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.8 mR/hr</td>
</tr>
</tbody>
</table>

Sealed & dated - Complete
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 in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 4.0mR/hr dpm/300cm² 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: 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
Drum ID No.: 95

Inspection/Sample Disposition: Visual Inspection & Sampling 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

---

[Image of drum label]
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

### General Information
- **Site**: Curtis Bay
- **ThN Origin**: French
- **Lot No.**: 3
- **Drum ID No.**: 95
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **Analyse**

### 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
Drum ID No.: 95

Inspection/Sample Disposition
Visual Inspection & Sampling
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
Drum ID No.  95

Inspection/Sample Disposition  Visual Inspection & Sampling

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

SITE: CURTIS BAY - FRENCH
WAREHOUSE - 912  ANALYZE
LOT #: 3  DRUM ID #: 95
ROW: 5  COLUMN: E
### General Information

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<td>Drum ID No.</td>
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### Other Information

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<tbody>
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<td>Surface</td>
</tr>
<tr>
<td>44 mR/hr</td>
<td>1 meter</td>
</tr>
<tr>
<td>4.0 mR/hr</td>
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Sealed/Dated – Completed
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 in
Rad Measurements at the time of opening: DR at Surface 44 mR/hr DR at 1 meter 4.0 mR/hr dpm/300 cm² ext. contamination
Headspace Gas Measurements: Hydrocarbons 0.0 ppm  NOx 0.0 ppm

Please note how all inner containers (including bags) are sealed regardless if they are damages 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.): 3rd Poly liner/bag
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 #: Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-08-02
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<tr>
<th><strong>General Information</strong></th>
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<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
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<td>Disposition</td>
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<tbody>
<tr>
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![Drum Image](image-url)
### General Information

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<tbody>
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<tr>
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<tr>
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</table>

**Inspection/Sample**

- **Disposition**: Analyze
- **Visual Inspection & Sampling**: Visual Inspection & Sampling

### Physical Location of Drum

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<tr>
<th>Warehouse</th>
<th>912</th>
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<tbody>
<tr>
<td>Row</td>
<td>3</td>
</tr>
<tr>
<td>Column</td>
<td>E</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
<td>ThN Origin</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.0 mR/hr</td>
</tr>
</tbody>
</table>

2nd polyliner/bag – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**
- Site: Curtis Bay
- ThN Origin: French
- Lot No.: 4
- Drum ID No.: 29
- Inspection/Sample Disposition: Visual Inspection & Sampling 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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<td>Lot No.</td>
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<tr>
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<td>29</td>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

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<tr>
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**Inspection/Sample Date & Time**

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**Other Information**

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<th>Surface</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.0 mR/hr</td>
</tr>
</tbody>
</table>

Sealed & dated - Complete
[This page intentionally left blank.]
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/300cm²  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.): 3rd Poly liner/bag
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.**: 6
- **Drum ID No.**: 100

**Inspection/Sample Visual Inspection & Sampling 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**

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<tbody>
<tr>
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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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<tr>
<td></td>
<td>1 meter 4.0 mR/hr</td>
</tr>
</tbody>
</table>

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

![Image of a drum with labels showing site, warehouse, lot, and drum ID information.]
**General Information**

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.0 mR/hr</td>
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2nd poly liner/bag – good condition
No gasses present
# Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

## General Information

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## Inspection/Sample Date & Time

<table>
<thead>
<tr>
<th>Date</th>
<th>7-8-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>13:45</td>
</tr>
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## Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>4 of 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 42 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 4.0 mR/hr</td>
</tr>
</tbody>
</table>

Thorium Nitrate – Powder – white – dry
No gasses present
## General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
</tr>
<tr>
<td>Lot No.</td>
<td>6</td>
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<tr>
<td>Drum ID No.</td>
<td>100</td>
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<table>
<thead>
<tr>
<th>Inspection/Sample Disposition</th>
<th>Visual Inspection &amp; Sampling Disposition</th>
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<tbody>
<tr>
<td>Analyze</td>
<td></td>
</tr>
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## Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>Row</th>
<th>Column</th>
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</thead>
<tbody>
<tr>
<td>912</td>
<td>2</td>
<td>E</td>
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## Inspection/Sample Date & Time

<table>
<thead>
<tr>
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<th>Time</th>
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## Other Information

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<tr>
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<th>Dose Rate</th>
<th>Surface</th>
<th>1 meter</th>
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<tbody>
<tr>
<td>4 of 5</td>
<td>42 mR/hr</td>
<td>4.0 mR/hr</td>
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</tr>
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</table>

Sealed & dated - Complete
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/300cm² 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
Droyness: 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

<table>
<thead>
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<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
<td>51</td>
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</table>

**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- 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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
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<td>Lot No.</td>
<td>9</td>
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<td>Drum ID No.</td>
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

<table>
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<td>Column</td>
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**Inspection/Sample Date & Time**

| Date  | 7-8-2002 | Time | 12:30 |

**Other Information**

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<thead>
<tr>
<th>Photo No.</th>
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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 44 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.8 mR/hr</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
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<td>Lot No.</td>
<td>9</td>
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<tr>
<td>Drum ID No.</td>
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</table>

| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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<tbody>
<tr>
<td>Row</td>
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<td>Column</td>
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### Inspection/Sample Date & Time

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### Other Information

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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 44 mR/hr</td>
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<tr>
<td></td>
<td>1 meter 3.8 mR/hr</td>
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</tbody>
</table>

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

<table>
<thead>
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<th>Site</th>
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<tbody>
<tr>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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<td>Row</td>
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### Inspection/Sample Date & Time

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<th>Surface</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.8 mR/hr</td>
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</tbody>
</table>

Thorium Nitrate – Powder – white – dry
No gasses present
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<td>Drum ID No.</td>
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<table>
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<th>Visual Inspection &amp; Sampling Disposition</th>
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<tbody>
<tr>
<td>Analyze</td>
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### Physical Location of Drum

<table>
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<tr>
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<td>Row</td>
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### Inspection/Sample Date & Time

<table>
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### Other Information

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.8 mR/hr</td>
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</table>

Sealed & dated - Complete
[This page intentionally left blank.]
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 in
Rad Measurements at the time of opening: DR at Surface 44mR/hr DR at 1 meter 5.0mR/hr dpm/300cm² 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.): 3rd Poly liner/bag
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 #: Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file)  Date: 7-02-02
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<tr>
<th><strong>General Information</strong></th>
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<tbody>
<tr>
<td>Site</td>
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<td></td>
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<tr>
<td>ThN Origin</td>
<td>French</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lot No.</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>94</td>
<td></td>
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<tr>
<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
<td></td>
<td></td>
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<tr>
<td>Disposition</td>
<td>Analyze</td>
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<table>
<thead>
<tr>
<th><strong>Physical Location of Drum</strong></th>
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<tbody>
<tr>
<td>Warehouse</td>
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<tr>
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<tbody>
<tr>
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<td></td>
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<td>Time</td>
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<tr>
<td>Photo No.</td>
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<tr>
<td>Container</td>
<td>55-gallon steel drum</td>
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<td></td>
</tr>
<tr>
<td>Container Condition</td>
<td>Fair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container Wall</td>
<td>0.1565 in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 44 mR/hr</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>1 meter 5.0 mR/hr</td>
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### General Information

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</tr>
<tr>
<td>Drum ID No.</td>
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</table>

**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

- Warehouse: 911
- Row: 6
- Column: E

### Inspection/Sample Date & Time

<table>
<thead>
<tr>
<th>Date</th>
<th>7-2-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
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</tbody>
</table>

### 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
Drum ID No.: 94

Inspection/Sample Disposition: Visual Inspection & Sampling
Analyse

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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**

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<tbody>
<tr>
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<td>Analyze</td>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
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<td>Row</td>
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**Inspection/Sample Date & Time**

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**Other Information**

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>5.0 mR/hr</td>
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</table>

French – Thorium Nitrate – Powder – white – dry
No gasses present
### General Information

<table>
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<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
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<tbody>
<tr>
<td>Analyze</td>
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</table>

### 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
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 in
Rad Measurements at the time of opening: DR at Surface 44mR/hr, DR at 1 meter 4.2mR/hr, dpm/300cm² ext contamina-
tion
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.): 3rd 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

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
- **Drum ID No.**: 42

### 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 Wall Thickness**: 0.1565 in
- **Condition**: Fair
- **Dose Rate**:
  - Surface: 44 mR/hr
  - 1 meter: 4.2 mR/hr
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
<td>42</td>
</tr>
</tbody>
</table>

**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- 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

1" poly liner/bag – good condition
No gasses present
**General Information**

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<td>Drum ID No.</td>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
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<td>Row</td>
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<tr>
<td>Column</td>
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**Inspection/Sample Date & Time**

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**Other Information**

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<th>Photo No.</th>
<th>3 of 8</th>
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- Dose Rate
  - Surface: 44 mR/hr
  - 1 meter: 5.0 mR/hr

2nd poly liner/bag – good condition
No gasses present
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<tr>
<td>Drum ID No.</td>
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<td>Inspection/Sample</td>
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<tr>
<td>Disposition</td>
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**Physical Location of Drum**

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<td>Column</td>
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**Inspection/Sample Date & Time**

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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>4 of 8</th>
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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
Drum ID No.: 42

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

Physical Location of Drum
Warehouse: 911
Row: 8
Column: E

Disposition
Visual Inspection & Sampling
Analyze

Close-up of the Powder (Thorium Nitrate)
No gases present
General Information
Site Curtis Bay
ThN Origin French
Lot No. 11
Drum ID No. 42

Inspection/Sample Disposition
Visual Inspection & Sampling 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

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<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<td>Surface 44 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 5.0 mR/hr</td>
</tr>
</tbody>
</table>

This photo shows the ThN material being weighed for shipment
No gasses present
## General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
<td>Drum ID No.</td>
<td>42</td>
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</tbody>
</table>

### Inspection/Sample Disposition

- Visual Inspection & Sampling
- 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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

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 in
Rad Measurements at the time of opening: DR at Surface 44 mR/hr DR at 1 meter 3.8 mR/hr dpm/300cm² 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.): 3rd Poly liner/bag
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

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<thead>
<tr>
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### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
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<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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### Inspection/Sample Date & Time

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<th>Date</th>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>1 of 5</th>
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<tr>
<td>Container</td>
<td>55-gallon steel drum</td>
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<tr>
<td>Condition</td>
<td>Fair</td>
</tr>
<tr>
<td>Container Wall Thickness</td>
<td>0.1565 in</td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 44 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.8 mR/hr</td>
</tr>
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</table>
### General Information

<table>
<thead>
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<td>Drum ID No.</td>
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<td>Visual Inspection &amp; Sampling</td>
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### Physical Location of Drum

<table>
<thead>
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<td>Row</td>
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### Inspection/Sample Date & Time

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### 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

<table>
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<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### 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**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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<td>1 meter 3.8 mR/hr</td>
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<tr>
<td>Thorium Nitrate</td>
<td>Powder – white – dry</td>
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<td>No gasses present</td>
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### General Information

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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

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<tr>
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<td>1 meter</td>
<td>3.8 mR/hr</td>
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Sealed/Dated – Completed
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/300cm² 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

<table>
<thead>
<tr>
<th>Site</th>
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<td>Drum ID No.</td>
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**Inspection/Sample**

**Disposition**

**Visual Inspection & Sampling**

**Dispose**

**Analyze**

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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<td>Row</td>
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### Inspection/Sample Date & Time

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<th>Photo No.</th>
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<td>Container</td>
<td>85-gallon steel drum</td>
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<td>Condition</td>
<td>Good</td>
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<table>
<thead>
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<th>Surface</th>
<th>38 mR/hr</th>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.5 mR/hr</td>
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Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

<table>
<thead>
<tr>
<th>General Information</th>
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<tbody>
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<td>Site: Curtis Bay</td>
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<td>ThN Origin: French</td>
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<td>Lot No.: 14</td>
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<td>Visual Inspection &amp; Sampling</td>
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<th>Physical Location of Drum</th>
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<td>Warehouse: 911</td>
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<tbody>
<tr>
<td>Photo No.: 2 of 6</td>
</tr>
</tbody>
</table>

Dose Rate: 38 mR/hr at 1 meter, 4.5 mR/hr at 1 meter

55-gal drum – fair condition
Ring on the container was in very bad condition – the ring was replaced
No gasses present
**General Information**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
</tr>
<tr>
<td>Lot No.</td>
<td>14</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>78</td>
</tr>
<tr>
<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Disposition</td>
<td>Analyze</td>
</tr>
</tbody>
</table>

**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>4</td>
</tr>
<tr>
<td>Column</td>
<td>E</td>
</tr>
</tbody>
</table>

**Inspection/Sample Date & Time**

<table>
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<tr>
<th>Date</th>
<th>7-3-2002</th>
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<tbody>
<tr>
<td>Time</td>
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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>3 of 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 38 mR/hr, 1 meter 4.5 mR/hr</td>
</tr>
</tbody>
</table>

1st poly liner/bag – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: French
- **Lot No.**: 14
- **Drum ID No.**: 78
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
  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
Drum ID No.: 78

Inspection/Sample Disposition: Visual Inspection & Sampling 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
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<thead>
<tr>
<th>General Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
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<tr>
<td>ThN Origin</td>
<td>French</td>
</tr>
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<td>Lot No.</td>
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<td>Drum ID No.</td>
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<tr>
<td>Warehouse</td>
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<tr>
<td>Column</td>
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<thead>
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</tr>
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<tr>
<td>Time</td>
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<tr>
<td>Photo No.</td>
<td>6 of 6</td>
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<tr>
<td>Dose Rate</td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>38 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>4.5 mR/hr</td>
</tr>
</tbody>
</table>

Sealed & dated - Complete
Curtis Bay Depot
Lot #F-16 – Drum #57
Inspect, Sample & Analyze
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

CONTAINER INSPECTION CHECKLIST
CONTAINER INFORMATION

Site: Hammond or Curtis Bay (circle one)

<table>
<thead>
<tr>
<th>Lot #</th>
<th>F-16</th>
<th>Drum ID #: 57</th>
<th>Location</th>
<th>Warehouse 912 – Column F – Row 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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/300cm² 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 #: 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
Drum ID No.: 57

Inspection/Sample Disposition Visual Inspection & Sampling 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
<table>
<thead>
<tr>
<th><strong>General Information</strong></th>
<th></th>
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<tbody>
<tr>
<td>Site</td>
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<td>Disposition</td>
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<td>912</td>
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<th></th>
</tr>
</thead>
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<td>Date</td>
<td>7-8-2002</td>
</tr>
<tr>
<td>Time</td>
<td>14:30</td>
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</table>

<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo No.</td>
<td>2 of 5</td>
</tr>
</tbody>
</table>

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
Drum ID No. 57
Inspection/Sample Visual Inspection & Sampling
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 gases present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**
- Site: Curtis Bay
- ThN Origin: French
- Lot No.: 16
- Drum ID No.: 57
- Inspection/Sample Disposition: Visual Inspection & Sampling 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
Drum ID No.: 57

Inspection/Sample Disposition Visual Inspection & Sampling

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
Curtis Bay Depot
Lot #F-17 – Drum #6
Inspect, Sample & Analyze
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

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/300cm² 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
</tr>
<tr>
<td>Lot No.</td>
<td>17</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>6</td>
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</table>

| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

## Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
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</thead>
<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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## Inspection/Sample Date & Time

<table>
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## Other Information

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<tr>
<th>Photo No.</th>
<th>1 of 5</th>
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<tbody>
<tr>
<td>Container</td>
<td>55-gallon steel drum</td>
</tr>
<tr>
<td>Condition</td>
<td>Fair</td>
</tr>
<tr>
<td>Container Wall Thickness</td>
<td>0.1565 in</td>
</tr>
<tr>
<td>Dose Rate Surface</td>
<td>45 mR/hr</td>
</tr>
<tr>
<td>Dose Rate 1 meter</td>
<td>4.0 mR/hr</td>
</tr>
</tbody>
</table>

No gasses present
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>French</td>
</tr>
<tr>
<td>Lot No.</td>
<td>17</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>6</td>
</tr>
<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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</table>

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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### Inspection/Sample Date & Time

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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>2 of 5</th>
</tr>
</thead>
</table>

- **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
Drum ID No.: 6

Inspection/Sample
Disposition: Visual Inspection & Sampling
Analyse

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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: French
- **Lot No.**: 17
- **Drum ID No.**: 6
- **Inspection/Sample**
- **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
Drum ID No. 6

Inspection/Sample Disposition
Visual Inspection & Sampling 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
Curtis Bay Depot
Lot #F-19 – Drum #58
Inspect, Sample & Analyze
## CONTAINER INSPECTION CHECKLIST

### CONTAINER INFORMATION

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

<table>
<thead>
<tr>
<th>Lot #:</th>
<th>F-19</th>
<th>Drum ID #:</th>
<th>58</th>
<th>Location:</th>
<th>Warehouse 912 – Column F – Row 4</th>
</tr>
</thead>
</table>

**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/300cm²
- 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 #(#): Label Seal with Date & Initials

Checklist completed by: T. Cunningham *(signature on file)*  Date: 7-08-02
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
<th>ThN Origin</th>
<th>French</th>
<th>Lot No.</th>
<th>19</th>
<th>Drum ID No.</th>
<th>58</th>
<th>Inspection/Sample Disposition</th>
<th>Visual Inspection &amp; Sampling Analyze</th>
</tr>
</thead>
</table>

### 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

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<td>15:00</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Site</th>
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<td>Dose Rate</td>
<td>Surface 36 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.0 mR/hr</td>
</tr>
</tbody>
</table>

1st poly liner/bag – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**
- Site: Curtis Bay
- ThN Origin: French
- Lot No.: 19
- Drum ID No.: 58
- Inspection/Sample Disposition: Visual Inspection & Sampling
  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

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<td>Visual Inspection &amp; Sampling</td>
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<tr>
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<td>Analyze</td>
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## Physical Location of Drum

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<th>Surface</th>
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<tbody>
<tr>
<td>1 meter</td>
<td>3.0 mR/hr</td>
<td></td>
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</tbody>
</table>

Thorium Nitrate – Powder – white – dry
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Third Sample Shipment)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: French
- **Lot No.**: 19
- **Drum ID No.**: 58
- **Inspection/Sample Disposition**: Visual Inspection & Sampling 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.

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<td>108</td>
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<td>18*</td>
<td>212</td>
<td>E-19</td>
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<td>3</td>
<td>22**</td>
<td>8</td>
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<td>119</td>
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<td>11</td>
<td>61</td>
<td>86</td>
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<tr>
<td>12</td>
<td>65*</td>
<td>107</td>
<td>E-141</td>
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</table>
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/300cm² <20 α & <200β
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/bg (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
- **Drum ID No.**: 108
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **Analysis**: 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
- **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)
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<tr>
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Dose Rate

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<tbody>
<tr>
<td>Surface</td>
<td>24 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</table>

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

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#### Inspection/Sample

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#### Physical Location of Drum

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#### Inspection/Sample Date & Time

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#### 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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**

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**Inspection/Sample Visual Inspection & Sampling 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

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### Physical Location of Drum

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</tr>
<tr>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</tbody>
</table>

*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
TH Origin Domestic
Lot No. 17
Drum ID No. 108
Inspection/Sample
Disposition Visual Inspection & Sampling
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
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<th>ThN Origin</th>
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<td>1 meter</td>
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<tr>
<td>Wooden Lid (on inner fiber/overpack container) – good condition</td>
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<td></td>
<td>No gasses present</td>
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### General Information

<table>
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#### Inspection/Sample Disposition
- Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

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### Inspection/Sample Date & Time

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<tr>
<td>Time</td>
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### 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**

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**Inspection/Sample Disposition**

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**Physical Location of Drum**

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<tbody>
<tr>
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**Inspection/Sample Date & Time**

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**Other Information**

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**Dose Rate**

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</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>2.5 mR/hr</td>
</tr>
</tbody>
</table>

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
<table>
<thead>
<tr>
<th><strong>General Information</strong></th>
<th></th>
<th>Inspection/Sample Disposition</th>
<th>Visual Inspection &amp; Sampling Analyze</th>
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| **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
Drum ID No.: 108
Inspection/Sample Disposition: Visual Inspection & Sampling 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
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/300cm² <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/bag
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

E-20
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 18
Drum ID No.: 212
Inspection/Sample Disposition: Visual Inspection & Sampling 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
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

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Dose Rate

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<td>1 meter</td>
<td>2.5 mR/hr</td>
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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
Drum ID No.   212

Inspection/Sample Disposition    Visual Inspection & Sampling
Visual Inspection & Sampling    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
Drum ID No.: 212

Inspection/Sample
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
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### Other Information

**Photo No.** 5 of 10

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<td>1 meter</td>
<td>2.5 mR/hr</td>
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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
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### Physical Location of Drum

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<td></td>
<td>1 meter 2.5 mR/hr</td>
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- 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
Drum ID No.        212

Inspection/Sample Disposition         Visual Inspection & Sampling
                                      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
Drum ID No.: 212
Inspection/Sample Disposition: Visual Inspection & Sampling 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

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## Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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Thorium Nitrate – monolith – white – solid - dry
No gasses present
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 18
Drum ID No.: 212

Inspection/Sample Date & Time
Date: 7-09-2002
Time: 14:10

Physical Location of Drum
Warehouse: 912
Row: 6
Column: C

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/300cm² <20 α & <200β
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/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.): 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 #: 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
Drum ID No.: 8
Inspection/Sample Disposition: Visual Inspection & Sampling
Analyse

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

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### Physical Location of Drum

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1st poly liner/bag – good condition

No gasses present
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Fiber lid – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

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2nd poly liner/bag – good condition
No gasses present
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- **Inspection/Sample**
- **Disposition**
- **Visual Inspection & Sampling**
- **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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 22
- **Drum ID No.**: 8
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **Analyse**

**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
Drum ID No.: 8
Inspection/Sample Disposition: Visual Inspection & Sampling
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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

<table>
<thead>
<tr>
<th>General Information</th>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
<td></td>
</tr>
<tr>
<td>Lot No.</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Location of Drum</th>
<th>Warehouse 912</th>
<th>Row 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Column D</td>
<td></td>
</tr>
</tbody>
</table>

| Inspection/Sample Date & Time| Date 7-10-2002 | Time 13:30     |

<table>
<thead>
<tr>
<th>Other Information</th>
<th>Photo No. 8 of 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr, 1 meter 2 mR/hr</td>
</tr>
<tr>
<td></td>
<td>4th poly “thin film” liner/bag - good condition</td>
</tr>
<tr>
<td></td>
<td>No gasses present</td>
</tr>
</tbody>
</table>

E-40
**General Information**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>22</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>8</td>
</tr>
<tr>
<td>Inspection/Sample Visual Inspection &amp; Sampling Disposition</td>
<td>Analyze</td>
</tr>
</tbody>
</table>

**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>4</td>
</tr>
<tr>
<td>Column</td>
<td>D</td>
</tr>
</tbody>
</table>

**Inspection/Sample Date & Time**

<table>
<thead>
<tr>
<th>Date</th>
<th>7-10-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>13:30</td>
</tr>
</tbody>
</table>

**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>9 of 10</th>
</tr>
</thead>
</table>

Dose Rate

- Surface 22 mR/hr
- 1 meter 2 mR/hr

Thorium Nitrate – monolith – white – solid - dry
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**
- **Site:** Curtis Bay
- **ThN Origin:** Domestic
- **Lot No.:** 22
- **Drum ID No.:** 8
- **Inspection/Sample Disposition:** Analyze
- **Visual Inspection & Sampling:**

**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/300cm² <20 α & <200 β γ 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/bag
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

E-44
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 28
Drum ID No.: 240

Inspection/Sample
Disposition: Visual Inspection & Sampling
Analyse

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
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  
Drum ID No.: 240

Inspection/Sample Disposition  
Visual Inspection & Sampling 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
Drum ID No.    240

Inspection/Sample Disposition Visual Inspection & Sampling

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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 28
- **Drum ID No.**: 240
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **Date**: 7-1-2002
- **Time**: 12:30

**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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
<td>28</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>240</td>
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**Inspection/Sample Date & Time**

<table>
<thead>
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<th>7-1-2002</th>
</tr>
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<tbody>
<tr>
<td>Time</td>
<td>12:30</td>
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</tbody>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>5</td>
</tr>
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<td>Column</td>
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**Other Information**

<table>
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<tr>
<th>Photo No.</th>
<th>5 of 10</th>
</tr>
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<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.0 mR/hr</td>
</tr>
</tbody>
</table>

2nd poly liner/bag shows a bubble that is from the pressure buildup inside the 3rd poly bag.
No gasses present.
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>28</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>240</td>
</tr>
<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
</tr>
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</table>

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>5</td>
</tr>
<tr>
<td>Column</td>
<td>D</td>
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</table>

### Inspection/Sample Date & Time

<table>
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<tr>
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<tbody>
<tr>
<td>Time</td>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>6 of 10</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface 22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter 3.0 mR/hr</td>
</tr>
</tbody>
</table>

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
Drum ID No.: 240

Inspection/Sample Disposition: Visual Inspection & Sampling

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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 28
- **Drum ID No.**: 240

**Inspection/Sample Date & Time**
- **Date**: 7-1-2002
- **Time**: 12:30

**Physical Location of Drum**
- **Warehouse**: 911
- **Row**: 5
- **Column**: D

**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
Drum ID No.  240
Inspection/Sample Disposition  Visual Inspection & Sampling 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
Drum ID No.           240

Inspection/Sample Disposition Visual Inspection & Sampling 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

<table>
<thead>
<tr>
<th>Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.)</th>
<th>30-gal drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer Container Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Outer Container: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Drum Wall thickness of Outer Container (French and Indian Drums only):</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Rad Measurements at the time of opening:</td>
<td>DR at Surface 22 mR/hr  DR at 1 meter 3.0 mR/hr dpm/300cm² &lt;20 α &amp; &lt;200 βγ</td>
</tr>
<tr>
<td>Headspace Gas Measurements</td>
<td>CH4: 4.6% LEL  NO: +50 ppm  NOx: +50 ppm</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>30-gal Black Rigid Poly Drum Liner w/ Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 1 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #1: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</td>
<td>1st Poly liner/bag</td>
</tr>
<tr>
<td>Inner Container # 2 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #2: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</td>
<td>Cardboard/Fiber Drum Container</td>
</tr>
<tr>
<td>Inner Container # 3 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #3: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</td>
<td>2nd Poly liner/bag</td>
</tr>
<tr>
<td>Inner Container # 4 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #4: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</td>
<td>3rd Poly liner/bag</td>
</tr>
<tr>
<td>Inner Container # 5 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #5: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</td>
<td>Wooden lid</td>
</tr>
<tr>
<td>Inner Container # 6 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #6: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</td>
<td>Labpack container</td>
</tr>
<tr>
<td>Inner Container # 7 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #7: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
<tr>
<td>Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</td>
<td>4th Poly liner/bag (thin film)</td>
</tr>
<tr>
<td>Inner Container # 8 Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #8: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

CONTENTS INFORMATION

<table>
<thead>
<tr>
<th>Matrix (i.e. monolith, powder, cubes, etc.)</th>
<th>Monolith</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>white</td>
</tr>
<tr>
<td>Particle Size:</td>
<td>Monolith</td>
</tr>
<tr>
<td>Dryness:</td>
<td>Very Dry</td>
</tr>
<tr>
<td>Moisture or Liquids Present:</td>
<td>None</td>
</tr>
<tr>
<td>Are there contents inside the container other than Thorium Nitrate: ☑ Yes ☐ No  If yes, describe</td>
<td></td>
</tr>
<tr>
<td>TID placed on container after inspection? (Check Box): ☑ Yes ☐ No  TID #(s): Label Seal with Date &amp; Initials</td>
<td></td>
</tr>
</tbody>
</table>

Checklist completed by: T. Cunningham (signature on file)   Date: 7-09-02
**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 29
- **Drum ID No.**: 30
- **Inspection/Sample Disposition**: Visual Inspection & Sampling 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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

<table>
<thead>
<tr>
<th><strong>General Information</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>Curtis Bay</td>
</tr>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
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<tr>
<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Disposition</td>
<td>Analyze</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Physical Location of Drum</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse</td>
<td>912</td>
</tr>
<tr>
<td>Row</td>
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<tbody>
<tr>
<td>Date</td>
<td>7-09-2002</td>
</tr>
<tr>
<td>Time</td>
<td>14:45</td>
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<tbody>
<tr>
<td>Photo No.</td>
<td>2 of 10</td>
</tr>
<tr>
<td>Dose Rate</td>
<td>Surface 24 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

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

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<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
<td>29</td>
</tr>
<tr>
<td>Drum ID No.</td>
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**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- Analyze

## Physical Location of Drum

<table>
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<tr>
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## Inspection/Sample Date & Time

- Date: 7-09-2002
- Time: 14:45

## Other Information

<table>
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<tr>
<th>Photo No.</th>
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**Dose Rate**

- Surface: 24 mR/hr
- 1 meter: 2.6 mR/hr

1° 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

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- **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
- **Drum ID No.**: 30
- **Inspection/Sample**: Visual Inspection & Sampling
- **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
- **Drum ID No.**: 30
- **Inspection/Sample 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
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### Inspection/Sample Disposition

- Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

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### 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
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

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### 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
Drum ID No.: 30

Inspection/Sample Disposition
Visual Inspection & Sampling: 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
Drum ID No.: 30
Inspection/Sample Disposition Visual Inspection & Sampling 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/300cm² <20 α & <200β
Headspace Gas Measurements CH₄ 0.0% LEL 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/bag
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
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<tr>
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<tr>
<td>Disposition</td>
<td>Analyze</td>
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<tr>
<th><strong>Physical Location of Drum</strong></th>
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<tbody>
<tr>
<td>Warehouse</td>
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<tr>
<td>Row</td>
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<tr>
<td>Dose Rate</td>
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<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>3.0 mR/hr</td>
</tr>
<tr>
<td>Container</td>
<td>30-gallon steel drum</td>
</tr>
<tr>
<td>Condition</td>
<td>Good</td>
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<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
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<tr>
<td></td>
<td>1 meter 3.0 mR/hr</td>
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The lid of the black plastic drum liner – since lid is not raised – typically indicates no internal pressure
No gasses present
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<td>1 meter</td>
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</table>

1st poly liner/bag – good condition
No gasses present
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 30
Drum ID No.: 171
Inspection/Sample Disposition: Visual Inspection & Sampling - 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.
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After opening the 2nd poly liner/bag – a picture is taken showing the 3rd poly liner/bag. No gasses present.
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

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

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- 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

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<td>Lot No.</td>
<td>30</td>
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<tr>
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<td>171</td>
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<th>Visual Inspection &amp; Sampling Disposition</th>
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## Physical Location of Drum

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## Inspection/Sample Date & Time

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<td>6-28-2002</td>
<td>11:40</td>
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<th>Surface</th>
<th>22 mR/hr</th>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.0 mR/hr</td>
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</table>

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
- **Drum ID No.**: 171
- **Inspection/ Sample Disposition**: Visual Inspection & Sampling
  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

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>ThN Origin</td>
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<td>Lot No.</td>
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<td>Drum ID No.</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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</tr>
<tr>
<td></td>
<td>1 meter 3.0 mR/hr</td>
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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/300cm² <20 αting & <200βing
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/bag
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
Drum ID No.: 267
Inspection/Sample Disposition: Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

<table>
<thead>
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<table>
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<td>Photo No.</td>
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<tr>
<td>Dose Rate</td>
<td>Surface 24 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.2 mR/hr</td>
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</tbody>
</table>

After opening the 30-gal drum, the black plastic lid is shown – good condition
No gasses present
### General Information

<table>
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<tbody>
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<td>Visual Inspection &amp; Sampling</td>
<td>Analyze</td>
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### Physical Location of Drum

| Warehouse | 911 |
| Row       | 3   |
| Column    | D   |

### Inspection/Sample Date & Time

| Date     | 7-01-2002 |
| Time     | 11:40     |

### Other Information

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
</tr>
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</table>

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

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<th>Site</th>
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<tbody>
<tr>
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

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<tr>
<th>Photo No.</th>
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</tr>
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</table>

- **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

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<tbody>
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- Inspection/Sample Disposition: Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

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### Inspection/Sample Date & Time

- Date: 7-01-2002
- Time: 11:40

### Other Information

<table>
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- Dose Rate:
  - Surface: 24 mR/hr
  - 1 meter: 3.2 mR/hr

- 2nd poly liner/bag – good condition
- No gasses present
## General Information

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## Physical Location of Drum

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## Inspection/Sample Date & Time

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<td>Dose Rate 1 meter</td>
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3rd poly liner/bag – good condition
No gasses present
### General Information

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### Physical Location of Drum

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### Other Information

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### Dose Rate

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<td>1 meter</td>
<td>3.2 mR/hr</td>
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</table>

The wooden lid on the innermost fiber (lab-pack) drum – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**

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<td>Drum ID No.</td>
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**Inspection/Sample Disposition**

| Inspection/Sample | Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
</tr>
</tbody>
</table>

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
- **Drum ID No.**: 267

**Inspection/Sample Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**

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<th>Site</th>
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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 24 mR/hr</td>
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<tr>
<td></td>
<td>1 meter 3.2 mR/hr</td>
</tr>
</tbody>
</table>

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/300cm² <20 α & <200 β γ

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/bag

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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>37</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>19</td>
</tr>
<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
</tr>
</tbody>
</table>

**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>10</td>
</tr>
<tr>
<td>Column</td>
<td>B</td>
</tr>
</tbody>
</table>

**Inspection/Sample Date & Time**

<table>
<thead>
<tr>
<th>Date</th>
<th>7-10-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>09:30</td>
</tr>
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</table>

**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>1 of 10</th>
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</table>

<table>
<thead>
<tr>
<th>Dose Rate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Container</th>
<th>30-gallon steel drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>Has indentations on lid</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
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<tr>
<td>Inspection/Sample</td>
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<tr>
<td>Disposition</td>
<td>Analyze</td>
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## Physical Location of Drum

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## Other Information

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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

Black plastic lid from 30-gal poly drum liner – good condition
No gasses present
**General Information**

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</thead>
<tbody>
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<table>
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<th>Visual Inspection &amp; Sampling Disposition</th>
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<tr>
<td></td>
<td>Analyze</td>
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<tbody>
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<td></td>
<td>1 meter</td>
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</tr>
</tbody>
</table>

1<sup>st</sup> poly liner/bag – good condition
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**

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<tr>
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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>4 of 10</th>
</tr>
</thead>
</table>

| 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

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<td>Visual Inspection &amp; Sampling Analyze</td>
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## Physical Location of Drum

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<td>Dose Rate</td>
<td>Surface</td>
</tr>
<tr>
<td></td>
<td>1 meter</td>
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2nd poly liner/bag – good condition
No gasses present
### General Information

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### Other Information

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<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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3rd poly liner/bag – good condition
No gasses present
### General Information

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### Other Information

<table>
<thead>
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<th>Photo No.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

Wooden lid on innermost fiber (lab-pack) drum – good condition
No gasses present
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
<td>37</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>19</td>
</tr>
</tbody>
</table>

#### Inspection/Sample Disposition
- Visual Inspection & Sampling
- 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
Drum ID No. 19

Inspection/Sample Visual Inspection & Sampling
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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 37
Drum ID No.: 19
Inspection/Sample Disposition: Visual Inspection & Sampling 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)*

<table>
<thead>
<tr>
<th>Lot #</th>
<th>45</th>
<th>Drum ID #</th>
<th>105</th>
<th>Location:</th>
<th>Warehouse 911 – Column A - Row 2</th>
</tr>
</thead>
</table>

**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)*  
**Drum Wall thickness of Outer Container** *(French and Indian Drums only):* Not Applicable  
**Rad Measurements at the time of opening:** DR at Surface 22 mR/hr DR at 1 meter 2.8 mR/hr dpm/300cm² <20 α & <200 βγ  
**Headspace Gas Measurements:** CH4 NA (did not measure) 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)*  
**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)*

**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)*

**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)*

**Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.):** 3rd Poly liner/bag  
**Inner Container # 5 Condition/Description (rusty, leaking, good, etc.):** good  
**Photo Taken of Inner Container #5:** Yes *(include Drum ID in photo)*

**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)*

**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)*

**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)*

### 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 ☐  
**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**

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
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<tr>
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<tr>
<td>Drum ID No.</td>
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</table>

**Inspection/Sample Visual Inspection & Sampling**

**Disposition Analyze**

**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
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<tbody>
<tr>
<td>Row</td>
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**Inspection/Sample Date & Time**

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**Other Information**

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<tr>
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<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>22 mR/hr</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.8 mR/hr</td>
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<table>
<thead>
<tr>
<th>Container</th>
<th>30-gallon steel drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>good</td>
</tr>
</tbody>
</table>

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.
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**Inspection/Sample Disposition**

- Visual Inspection & Sampling: Analyze

### Physical Location of Drum

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### 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**

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**Inspection/Sample Data**

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Another view of the internal pressure on this drum
No gasses present
General Information

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Inspection/Sample Disposition

- Visual Inspection & Sampling Analyze

Physical Location of Drum

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Inspection/Sample Date & Time

- Date: 6-28-2002
- Time: 09:30

Other Information

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<thead>
<tr>
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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface: 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter: 2.8 mR/hr</td>
</tr>
</tbody>
</table>

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

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 45
- **Drum ID No.**: 105
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **Inspection/Sample Date & Time**: Date 6-28-2002, Time 09:30

**Physical Location of Drum**

- **Warehouse**: 911
- **Row**: 2
- **Column**: A

**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
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<thead>
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<th><strong>General Information</strong></th>
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<tr>
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<tr>
<td>Surface</td>
<td>22 mR/hr</td>
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<tr>
<td>1 meter</td>
<td>2.8 mR/hr</td>
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</table>

2nd poly liner/bag – good condition
No gasses present exterior to bag
General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 45
Drum ID No.: 105

Inspection/Sample Disposition: Visual Inspection & Sampling 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
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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
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<td></td>
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<td>2.8 mR/hr</td>
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Final poly liner/bag – good condition (“thin film” plastic – thickness similar to “Saran” wrap or similar grocery product)
No gasses present
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

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<tbody>
<tr>
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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.
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<tbody>
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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.
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<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
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</table>

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

Rad Measurements at the time of opening:

DR at Surface 20 mR/hr DR at 1 meter 2.8 mR/hr dpm/300cm² <20 α & <200 βγ

Headspace Gas Measurements CH4 NO NA (did not measure) 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

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<tr>
<td></td>
<td>1 meter 2.8 mR/hr</td>
</tr>
<tr>
<td>Container</td>
<td>30-gallon steel drum</td>
</tr>
<tr>
<td>Condition</td>
<td>good</td>
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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.
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

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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
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**Inspection/Sample**

| Visual Inspection & Sampling Disposition | Analyze |

**Physical Location of Drum**

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1” 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)
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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)
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</tr>
<tr>
<td>Lot No.</td>
<td>48</td>
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<tr>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

<table>
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### Inspection/Sample Date & Time

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<th>Dose Rate</th>
<th>Surface</th>
<th>20 mR/hr</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.8 mR/hr</td>
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</table>

This picture shows 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

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### Other Information

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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)
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<td><strong>Inspection/Sample</strong></td>
<td>Visual Inspection &amp; Sampling</td>
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<td><strong>Disposition</strong></td>
<td>Analyze</td>
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<tr>
<td><strong>Dose Rate</strong></td>
<td>Surface: 20 mR/hr, 1 meter: 2.8 mR/hr</td>
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</tbody>
</table>

This photograph shows the lab-pack lid (thin film paper attached to the underside of the wooden lid)
No gasses present
**General Information**

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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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**Physical Location of Drum**

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.8 mR/hr</td>
</tr>
</tbody>
</table>

Last plastic “thin film” liner before coring
No gasses present
**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 48
- **Drum ID No.**: 119
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **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
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<tr>
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<tbody>
<tr>
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| **Physical Location of Drum**           |                  |                  |
| Warehouse                              | 911              | Row              |
|                                        |                  | 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/300cm² <20 α & <200 βγ
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
Drum ID No. 86
Inspection/Sample Disposition Visual Inspection & Sampling
Analyse

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

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

<table>
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<td>Time</td>
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</tbody>
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### 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
Drum ID No.: 86
Inspection/Sample Disposition: Visual Inspection & Sampling 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

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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

## Physical Location of Drum

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## Other Information

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Dose Rate

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<tbody>
<tr>
<td>1 meter</td>
<td>2.4 mR/hr</td>
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Fiber lid from outermost fiber drum inside of 30-gal drum – good condition
No gasses present (breathing zone)
### General Information

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### 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

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**Inspection/Sample Disposition**

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<td>Surface 23 mR/hr, 1 meter 2.4 mR/hr</td>
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3rd poly liner/bag – good condition
No gasses present (breathing zone)
### General Information

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#### Inspection/Sample

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Dose Rate

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</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>2.4 mR/hr</td>
</tr>
</tbody>
</table>

Wooden lid on the innermost fiber drum (lab-pack) – good condition
No gasses present (breathing zone)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 61
- **Drum ID No.**: 86
- **Inspection/Sample Disposition**: Analyze
- **Visual Inspection & Sampling**

**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  
Drum ID No.   86  

**Inspection/Sample**  

Visual Inspection & Sampling  

**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**

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**Inspection/Sample**  
**Disposition**

- Visual Inspection & Sampling
- Analyze

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

- Date: 7-09-2002
- Time: 14:15

**Other Information**

- Photo No.: 10 of 10
- Dose Rate: 23 mR/hr (Surface), 2.4 mR/hr (1 meter)

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
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.5 mR/hr dpm/300cm² <20 α & <200β
Headspace Gas Measurements CH4 NA (did not measure) 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/bg (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

<table>
<thead>
<tr>
<th>Site</th>
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<td>Lot No.</td>
<td>65</td>
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<tr>
<td>Drum ID No.</td>
<td>107</td>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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### Physical Location of Drum

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<thead>
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### Other Information

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<td>Dose Rate</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>2.5 mR/hr</td>
</tr>
<tr>
<td>Container</td>
<td>30-gallon steel drum</td>
</tr>
<tr>
<td>Condition</td>
<td>Has indentations on lid</td>
</tr>
</tbody>
</table>

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.
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

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<td><strong>Drum ID No.</strong></td>
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<td><strong>Inspection/Sample Disposition</strong></td>
<td>Visual Inspection &amp; Sampling Analyze</td>
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<td><strong>Dose Rate</strong></td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</table>

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)
<table>
<thead>
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<th><strong>General Information</strong></th>
<th></th>
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<tbody>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Analyze</td>
</tr>
</tbody>
</table>

| **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

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<td>Analyze</td>
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### Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</tbody>
</table>

Fiber drum lid from outermost fiber drum inside of 30-gal drum – good condition
No gasses present (in breathing zone)
### General Information

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<tbody>
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### Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</table>

2nd poly liner/bag – good condition
No gasses present (in breathing zone)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fourth Sample Shipment)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 65
- **Drum ID No.**: 107
- **Inspection/Sample Disposition**: Visual Inspection & Sampling
- **Visual Inspection & Sampling 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**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</table>

Wooden lid mounted on innermost fiber drum/lab-pack – good condition
No gasses present (in breathing zone)
### General Information

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<tbody>
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<td>Drum ID No.</td>
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

Date: 7-09-2002  
Time: 14:30

**Other Information**

| Photo No. | 8 of 11 |

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<td>1 meter 2.5 mR/hr</td>
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Lab-pack container lid – may be integral part of wooden lid that is mounted on the fiber (lab-pack) drum – thin film paper  
No gasses present (in breathing zone)
**General Information**

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**Inspection/Sample**

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**Physical Location of Drum**

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<tr>
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<td>2.5 mR/hr</td>
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</table>

4\(^{th}\) poly liner/bag – thin film plastic

No gasses present (in breathing zone)
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 65
Drum ID No.: 107

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 gases present (in breathing zone)
## General Information

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<tbody>
<tr>
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<td>1 meter</td>
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</table>

Sealed & dated - Complete
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.

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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/300cm² <20 α & <200β
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/bag
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

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
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<tr>
<td>Drum ID No.</td>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

## Physical Location of Drum

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<th>913</th>
</tr>
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<tbody>
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## Inspection/Sample Date & Time

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<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>26 mR/hr</th>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.1 mR/hr</td>
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<table>
<thead>
<tr>
<th>Container</th>
<th>30-gallon steel drum</th>
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<tbody>
<tr>
<td>Condition</td>
<td>good</td>
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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.
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**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
- **Drum ID No.**: 78
- **Inspection/Sample Disposition**: Visual Inspection & Sampling 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**

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**Other Information**

| Photo No.     | 4 of 10   |

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<tbody>
<tr>
<td>1 meter</td>
<td>2.1 mR/hr</td>
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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).
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<tr>
<td>1 meter</td>
<td>2.1 mR/hr</td>
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</table>

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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

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**Inspection/Sample Disposition**

| Visual Inspection & Sampling | Analyze |

**Physical Location of Drum**

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**Other Information**

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- **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

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- **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
Drum ID No.: 78
Inspection/Sample Disposition: Visual Inspection & Sampling 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
- **Drum ID No.**: 78
- **Inspection/Sample**
- **Disposition**: Visual Inspection & Sampling
- **Analyse**

### 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

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### 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/300cm² <20 α & <200 β γ
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/bag
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

F-18
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 3
Drum ID No.: 57

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
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

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<td>Surface</td>
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Black plastic lid (from drum liner) – good condition
No gasses present (in breathing zone)
### General Information

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1st poly liner/bag – good condition
No gasses present (in breathing zone)
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### Inspection/Sample Date & Time

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### Other Information

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Dose Rate
- Surface: $\leq 25 \text{ mR/hr}$
- 1 meter: $\leq 2.5 \text{ mR/hr}$

Fiber lid (from outermost fiber drum) – good condition
No gasses present (in breathing zone)
### General Information

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<tr>
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<td>Drum ID No.</td>
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**Inspection/Sample**

| Disposition | Visual Inspection & Sampling | Analyze |

**Physical Location of Drum**

<table>
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### Other Information

- **Photo No.** 5 of 11
- **Dose Rate**
  - Surface: $\leq 25$ mR/hr
  - 1 meter: $\leq 2.5$ mR/hr

- 2nd poly liner/bag – good condition
- No gasses present (in breathing zone)
# Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

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- Dose Rate:
  - Surface: \( \leq 25 \text{ mR/hr} \)
  - 1 meter: \( \leq 2.5 \text{ mR/hr} \)

- 3rd poly liner/bag – good condition
- No gasses present (in breathing zone)
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Dose Rate

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<td>1 meter</td>
<td>$\leq 2.5 \text{ mR/hr}$</td>
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Wooden lid [mounted to inner fiber drum (lab-pack)] – good condition

No gasses present (in breathing zone)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

General Information
Site Curtis Bay
ThN Origin Domestic
Lot No. 3
Drum ID No. 57
Inspection/Sample Visual Inspection & Sampling
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 $\leq 25$ mR/hr
1 meter $\leq 2.5$ 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)
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<td>1 meter 2.5 mR/hr</td>
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4th poly liner/bag (thin film plastic) — good condition
No gasses present (in breathing zone)
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ThN material – monolith – solid – white - dry
No gasses present (in breathing zone)
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**Inspection/Sample Visual Inspection & Sampling**

**Disposition Analyze**

**Physical Location of Drum**

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**Dose Rate**

- Surface $\approx 25 \text{ mR/hr}$
- 1 meter $\approx 2.5 \text{ mR/hr}$

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/300cm² <20 α & <200 β

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/bag
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

F-32
<table>
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<tr>
<td>Dose Rate</td>
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<td>1 meter 2.0 mR/hr</td>
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30-gal drum – good condition
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Black plastic lid on drum liner – good condition

No gasses present (in breathing zone)
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1<sup>st</sup> poly liner/bag – good condition
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Fiber lid on outermost fiber drum – good condition
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<tr>
<td><strong>Time</strong></td>
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<tr>
<td><strong>Surface</strong></td>
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</tr>
<tr>
<td><strong>1 meter</strong></td>
<td>2.0 mR/hr</td>
</tr>
</tbody>
</table>

2nd poly liner/bag – good condition
No gasses present (in breathing zone)
### General Information

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<tr>
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- Inspection/Sample Disposition: Visual Inspection & Sampling  Analyze

### Physical Location of Drum

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### 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
Drum ID No. 248

Inspection/Sample
Disposition
Visual Inspection & Sampling
Analyse

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)
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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)
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ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)
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**Inspection/Sample Disposition**

Visual Inspection & Sampling

**Analyze**

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### 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/300cm² <20 α & <200 βγ
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/bag
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
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**Inspection/Sample**

| Disposition | Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

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<td>1 meter</td>
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30-gal drum – good condition (drum released pressure when bolt was loosened on drum ring)
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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

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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)
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**Inspection/Sample Disposition**
- Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

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- 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**

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**Inspection/Sample Visual Inspection & Sampling**

**Disposition Analyze**

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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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 12
Drum ID No.: 136

Inspection/Sample Visual Inspection & Sampling
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.
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Analyze |

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Wooden lid (on innermost fiber drum – sometimes referred to as a lab-pack in this documentation) – good condition
No gasses present (in breathing zone)
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

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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)
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### Other Information

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- **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**

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ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)
### General Information

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Sealed & dated – Complete
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/300cm² <20 α & <200 β
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

F-58
### General Information

<table>
<thead>
<tr>
<th>Site</th>
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### Physical Location of Drum

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<tbody>
<tr>
<td>1 meter</td>
<td>2.0 mR/hr</td>
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30-gal drum – good condition (drum released pressure as bolt was loosened on drum ring)
### General Information

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**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- Analyze

### Physical Location of Drum

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- Date: 7-12-2002
- Time: 11:30

### Other Information

- Photo No.: 2 of 10

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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**

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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Analyze |

**Physical Location of Drum**

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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 gases present (in breathing zone)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

**General Information**

Site: Curtis Bay  
ThN Origin: Domestic  
Lot No.: 14  
Drum ID No.: 123

**Inspection/Sample Disposition**  
Visual Inspection & Sampling 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**

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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

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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**

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Wooden lid [on inner fiber (lab-pack) drum] – good condition
Drum vented - No gasses present (in breathing zone)
### General Information

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### Other Information

| Photo No. | 8 of 10   |

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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
Drum ID No.: 123

Inspection/Sample Date & Time
Date: 7-12-2002
Time: 11:30

Physical Location of Drum
Warehouse: 913
Row: 7
Column: C

Disposition
Visual Inspection & Sampling
Analyze

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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

**General Information**
- **Site:** Curtis Bay
- **ThN Origin:** Domestic
- **Lot No.:** 14
- **Drum ID No.:** 123
- **Inspection/Sample Disposition:** Visual Inspection & Sampling
- **Inspection/Sample Date & Time:**
  - **Date:** 7-12-2002
  - **Time:** 11:30

**Physical Location of Drum**
- **Warehouse:** 913
- **Row:** 7
- **Column:** C

**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/300cm²  <20 α & <200 β
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/bag
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):
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 #: Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-11-02
### General Information

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
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<tr>
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<tr>
<td>Drum ID No.</td>
<td>239</td>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Analyze |

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>913</th>
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</thead>
<tbody>
<tr>
<td>Row</td>
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<td>Column</td>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.1 mR/hr</td>
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30-gal drum – good condition
## General Information

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## Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.1 mR/hr</td>
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</tbody>
</table>

- 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
- **Drum ID No.**: 239
- **Inspection/Sample Disposition**: Visual Inspection & Sampling, 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**

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**Visual Inspection & Sampling**

**Inspection/Sample**

**Disposition**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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Fiber drum lid (from outermost fiber drum) good condition
No gasses present (in breathing zone)
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<tr>
<td><strong>1 meter</strong></td>
<td>2.1 mR/hr</td>
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2nd poly liner/bag – good condition
No gasses present (in breathing zone)
### General Information

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### Physical Location of Drum

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### Inspection/Sample Date & Time

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Dose Rate

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<tbody>
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<td>1 meter</td>
<td>2.1 mR/hr</td>
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3rd poly liner/bag – good condition
No gasses present (in breathing zone)
### General Information

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### Physical Location of Drum

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### Other Information

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<th>Photo No.</th>
<th>7 of 9</th>
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</table>

**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

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## Inspection/Sample

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<th>Disposition</th>
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## Inspection/Sample Date & Time

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## Other Information

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<tr>
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<tr>
<td>1 meter</td>
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<td>2.1 mR/hr</td>
</tr>
</tbody>
</table>

- ThN material – monolith – white – solid - dry
- No gasses present (in breathing zone)
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 15
Drum ID No.: 239
Inspection/Sample Disposition: Visual Inspection & Sampling
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
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/300cm² <20 α & <200 βγ

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
PhotoTaken 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/bag
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
Drum ID No.: 11
Inspection/Sample Disposition: Visual Inspection & Sampling

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

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<tbody>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### 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

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### Inspection/Sample

- **Inspection/Sample Visual Inspection & Sampling**
- **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

1\textsuperscript{st} poly liner/bag – good condition (raised bag indicates internal pressure inside of drum packaging)

No gasses present (in breathing zone)
## General Information

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### Inspection/Sample Date & Time

- **Date**: 7-10-2002
- **Time**: 10:45

### Physical Location of Drum

- **Warehouse**: 912
- **Row**: 1
- **Column**: B

### 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
Drum ID No.: 11

Inspection/Sample Disposition
Visual Inspection & Sampling 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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

**General Information**

<table>
<thead>
<tr>
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**Inspection/Sample**

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<th>Visual Inspection &amp; Sampling</th>
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**Physical Location of Drum**

<table>
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<td>Row</td>
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**Inspection/Sample Date & Time**

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**Other Information**

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**Dose Rate**

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<tr>
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</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</table>

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
Drum ID No.: 11

Inspection/Sample Visual Inspection & Sampling
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 gases present (in breathing zone)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

**General Information**
Site: Curtis Bay  
ThN Origin: Domestic  
Lot No.: 20  
Drum ID No.: 11  
Inspection/Sample Visual Inspection & Sampling  
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

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### Inspection/Sample Date & Time

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</table>

ThN material – monolith – solid – dry - white  
No gasses present (in breathing zone)
**General Information**

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<tbody>
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<td>Drum ID No.</td>
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</table>

**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- 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/300cm²  <20 α & <200 β

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/bag
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 #: 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  
Drum ID No.: 182

**Inspection/Sample Date & Time**

Date: 7-12-2002  
Time: 15:00

**Physical Location of Drum**

Warehouse: 913  
Row: 4  
Column: B

**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

<table>
<thead>
<tr>
<th>Site</th>
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</tr>
</thead>
<tbody>
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<tr>
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## Physical Location of Drum

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## Inspection/Sample Date & Time

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.0 mR/hr</td>
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</table>

Black drum lid – photograph did not take
No gasses present (in breathing zone)
### General Information

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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### Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>22 mR/hr</td>
<td>2.0 mR/hr</td>
</tr>
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</table>

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
Drum ID No.: 182

Inspection/Sample: Visual Inspection & Sampling
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         |
| Drum ID No.            | 182        |
| Inspection/Sample      | Visual Inspection & Sampling |
| 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
Drum ID No.: 182
Inspection/Sample Disposition
Visual Inspection & Sampling 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

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### Physical Location of Drum

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### 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**

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<tbody>
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**Physical Location of Drum**

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<tr>
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4th poly liner/bag – good condition
No gasses present (in breathing zone)
**General Information**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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<td>9 of 10</td>
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<td>22 mR/hr</td>
<td>2.0 mR/hr</td>
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</table>

ThN material – monolith – solid – dry - white
No gases present (in breathing zone)
### General Information

<table>
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<tr>
<td>Drum ID No.</td>
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</table>

**Inspection/Sample**

- 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/300cm² <20 α & <200 β Gy
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/bag
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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>52</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>194</td>
</tr>
</tbody>
</table>

**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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</table>

**Inspection/Sample Date & Time**

<table>
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<tr>
<th>Date</th>
<th>7-10-2002</th>
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<tbody>
<tr>
<td>Time</td>
<td>09:45</td>
</tr>
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**Other Information**

<table>
<thead>
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<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>26 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

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**

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<tr>
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</thead>
<tbody>
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</table>

**Visual Inspection & Sampling**

**Inspection/Sample Disposition**

- Visual Inspection & Sampling
- Analyze

**Physical Location of Drum**

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**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)
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**Inspection/Sample**

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1st poly liner/bag – good condition (raised bag indicates internal pressure buildup internal to the packaging)

No gasses present (in breathing zone)
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<tr>
<td>Dose Rate</td>
<td>Surface 26 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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</tbody>
</table>

Fiber lid of outermost fiber drum – good condition (raised lid indicates internal pressure buildup internal to the packaging)
No gasses present (in breathing zone)
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**Inspection/Sample**

| Disposition | Visual Inspection & Sampling | Analyze |

**Physical Location of Drum**

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**Other Information**

| Photo No.   | 5 of 11 |

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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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</tbody>
</table>

2nd poly liner/bag – good condition (raised bag indicates internal pressure buildup internal to the packaging)

No gasses present (in breathing zone)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

**General Information**

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**Other Information**

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<th>6 of 11</th>
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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

**Drum ID No.**  
194

**Inspection/Sample**  
Visual Inspection & Sampling

**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**

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**Physical Location of Drum**

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</thead>
<tbody>
<tr>
<td>Time</td>
<td>09:45</td>
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</tbody>
</table>

**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 gases present (in breathing zone)
General Information
Site Curtis Bay
ThN Origin Domestic
Lot No. 52
Drum ID No. 194
Inspection/Sample Visual Inspection & Sampling
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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 52
- **Drum ID No.**: 194
- **Inspection/Sample 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
Drum ID No.: 194

Inspection/Sample

Disposition: Visual Inspection & Sampling
Analyse

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
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: Not Applicable

Rad Measurements at the time of opening: DR at Surface 22 mR/hr  DR at 1 meter 2.0 mR/hr  dpm/300cm² <20 α & <200 βγ
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/bag
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 #: Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-02
<table>
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</table>

| 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)
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### 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)
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1st poly liner/bag – good condition (raised bag indicates internal gas pressure buildup inside of packaging)

No gasses present (in breathing zone)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

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**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)
<table>
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<tr>
<td>Time</td>
<td>14:15</td>
<td></td>
<td></td>
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</tbody>
</table>

- **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

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**Inspection/Sample**

| Disposition | Visual Inspection & Sampling | Analyze |

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Dose Rate**

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<tbody>
<tr>
<td>1 meter</td>
<td>2.0 mR/hr</td>
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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

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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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 58
- **Drum ID No.**: 97
- **Inspection/Sample Disposition**: Visual Inspection & Sampling 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
Drum ID No.: 97

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)
Curtis Bay Depot Drums Sampled for Off-site Analyses (Fifth Sample Shipment)

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<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.0 mR/hr</td>
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</table>

ThN material – monolith – solid – dry - white
No gasses present (in breathing zone)
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 58
Drum ID No.: 97
Inspection/Sample Disposition: Visual Inspection & Sampling 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
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.

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<td>2</td>
<td>35</td>
<td>203</td>
<td>G-17</td>
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<td>39*</td>
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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
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 & <200 βγ
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/bag
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
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### Physical Location of Drum

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<td>3.2 mR/hr</td>
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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.
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 34
- **Drum ID No.**: 80
- **Inspection/Sample 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
- **Drum ID No.**: 80

### 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 34
- **Drum ID No.**: 80
- **Inspection/Sample Disposition**: Archive
- **Visual Inspection & Sampling**

**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

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
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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.
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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 | Drum ID No. | 80 | Inspection/Sample Disposition | Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 34
- **Drum ID No.**: 80
- **Inspection/Sample 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
<table>
<thead>
<tr>
<th>General Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
</tr>
<tr>
<td>ThN Origin</td>
</tr>
<tr>
<td>Lot No.</td>
</tr>
<tr>
<td>Drum ID No.</td>
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<tr>
<td></td>
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<tr>
<td>Disposition</td>
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</table>

<table>
<thead>
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<tbody>
<tr>
<td>Warehouse</td>
</tr>
<tr>
<td>Row</td>
</tr>
<tr>
<td>Column</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Inspection/Sample Date &amp; Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>Time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Information</th>
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<tbody>
<tr>
<td>Photo No.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose Rate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>3.2 mR/hr</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.)</th>
<th>30-gal drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer Container Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Outer Container:</td>
<td>Yes (include Drum ID in photo)</td>
</tr>
<tr>
<td>Drum Wall Thickness of Outer Container <em>(French and Indian Drums only)</em></td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Units:</td>
<td></td>
</tr>
<tr>
<td>Rad Measurements at the time of opening:</td>
<td>DR at Surface 26 mR/hr DR at 1 meter 3.4 mR/hr dpm/300cm² &lt;20 α &amp; &lt;200β</td>
</tr>
<tr>
<td>Headspace Gas Measurements</td>
<td>CH4 0.0% LEL NO 3.4 ppm NOx 27.4 ppm</td>
</tr>
</tbody>
</table>

*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)

### 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)

### 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)

### 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)

### 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)

### 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)

### 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)

### Inner Container #8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bg (thin film)
- **Inner Container #8 Condition/Description (rusty, leaking, good, etc.):** good
- **Photo Taken of Inner Container #8:** Yes (include Drum ID in photo)

### 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
Drum ID No.: 203

Inspection/Sample Disposition: Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 35
- **Drum ID No.**: 203
- **Inspection/Sample 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.
<table>
<thead>
<tr>
<th>General Information</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td></td>
</tr>
<tr>
<td>Curtis Bay</td>
<td></td>
</tr>
<tr>
<td>ThN Origin</td>
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<tr>
<td>Domestic</td>
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<tr>
<td>Lot No.</td>
<td>Inspection/Sample</td>
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<tr>
<td>35</td>
<td>Disposition Archive</td>
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<tr>
<td>Drum ID No.</td>
<td></td>
</tr>
<tr>
<td>203</td>
<td></td>
</tr>
</tbody>
</table>

| Physical Location of Drum               |                              |
| Warehouse                               | Row                           |
| 911                                     | 7                             |
|                                         | Column                        |
|                                         | B                             |

| Inspection/Sample Date & Time           |                              |
| Date                                    | Time                          |
| 6-28-2002                               | 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
### Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

#### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
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</tr>
<tr>
<td>Drum ID No.</td>
<td>203</td>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
</tr>
</tbody>
</table>

#### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
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<tbody>
<tr>
<td>Row</td>
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</tr>
<tr>
<td>Column</td>
<td>B</td>
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</tbody>
</table>

#### Inspection/Sample Date & Time

<table>
<thead>
<tr>
<th>Date</th>
<th>6-28-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>10:00</td>
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</table>

#### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>4 of 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>26 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>3.4 mR/hr</td>
</tr>
</tbody>
</table>

Fiber lid (on outermost fiber drum inside of container) – good condition
No gasses present in fiber drum’s headspace
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
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<tr>
<td>Lot No.</td>
<td>35</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>203</td>
</tr>
</tbody>
</table>

### Disposition

- Inspection/Sample Disposition
- Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 35
- **Drum ID No.**: 203
- **Inspection/Sample 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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
<td>Drum ID No.</td>
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**Inspection/Sample Date & Time**

<table>
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**Other Information**

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**Physical Location of Drum**

<table>
<thead>
<tr>
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<th>911</th>
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</thead>
<tbody>
<tr>
<td>Row</td>
<td>7</td>
</tr>
<tr>
<td>Column</td>
<td>B</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
<th>ThN Origin</th>
<th>Domestic</th>
<th>Lot No.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Drum ID No.</td>
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**Inspection/Sample**

<table>
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<tr>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
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<tbody>
<tr>
<td>Row</td>
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<td>Column</td>
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**Inspection/Sample Date & Time**

<table>
<thead>
<tr>
<th>Date</th>
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<th>Time</th>
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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>8 of 12</th>
</tr>
</thead>
</table>

**Dose Rate**

<table>
<thead>
<tr>
<th>Surface</th>
<th>26 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>3.4 mR/hr</td>
</tr>
</tbody>
</table>

“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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
<td>35</td>
</tr>
<tr>
<td>Drum ID No.</td>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
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</thead>
<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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**Inspection/Sample Date & Time**

<table>
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<tbody>
<tr>
<td>Time</td>
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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>9 of 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 26 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.4 mR/hr</td>
</tr>
</tbody>
</table>

4th poly liner/bag – good condition
No gasses present in breathing zone
## General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
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</tr>
<tr>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
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## Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
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</tr>
<tr>
<td>Column</td>
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</table>

## Inspection/Sample Date & Time

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
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</table>

## Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>10 of 12</th>
</tr>
</thead>
</table>

### 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<td>Lot No.</td>
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<tr>
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<td>203</td>
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</tbody>
</table>

### Inspection/Sample Disposition
- Visual Inspection & Sampling 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
Drum ID No.: 203

Inspection/Sample Disposition
Visual Inspection & Sampling 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
Rad Measurements at the time of opening: DR at Surface 24 mR/hr  DR at 1 meter 3.0 mR/hr  dpm/300cm² <20 α & <200 β γ
Headspace Gas Measurements

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
Drum ID No. 75

Inspection/Sample Visual Inspection & Sampling
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
Drum ID No.: 75

Inspection/Sample Date & Time
Date: 7-1-2002
Time: 11:55

Physical Location of Drum
Warehouse: 911
Row: 2
Column: D

Disposition Archive

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
<table>
<thead>
<tr>
<th>General Information</th>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
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<tr>
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<tr>
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<td>911</td>
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<tr>
<td></td>
<td></td>
<td>1 meter 3.0 mR/hr</td>
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1st poly liner/bag – good condition
No pressure present in bag – no gases present in breathing zone
### General Information

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### Physical Location of Drum

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### 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
Drum ID No.: 75

Inspection/Sample Disposition
Visual Inspection & Sampling 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

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### Physical Location of Drum

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<td>1 meter</td>
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3rd poly liner/bag – good condition  
No gases present in breathing zone.
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<tr>
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<td>1 meter</td>
<td>3.0 mR/hr</td>
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</table>

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  
Drum ID No.: 75

**Visual Inspection & Sampling**

**Inspection/Sample 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
Drum ID No.: 75

Inspection/Sample Date & Time
Date: 7-1-2002
Time: 11:55

Physical Location of Drum
Warehouse: 911
Row: 2
Column: D

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.
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<tr>
<td>1 meter</td>
<td>3.0 mR/hr</td>
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</table>

ThN material – dry – solid – monolith - white
No gases present in breathing zone.
**General Information**

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<tr>
<td></td>
<td>1 meter 3.0 mR/hr</td>
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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/300cm²  <20 α  <200 β γ

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

G-46
## General Information

<table>
<thead>
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### Inspection/Sample

<table>
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<tr>
<th>Disposition</th>
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### Physical Location of Drum

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<thead>
<tr>
<th>Warehouse</th>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>1 of 9</th>
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</table>

- **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

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<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr, 1 meter 3.2 mR/hr</td>
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</table>

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
Drum ID No.: 6
Inspection/Sample Disposition: Visual Inspection & Sampling 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
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<th><strong>Visual Inspection &amp; Sampling</strong></th>
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Dose Rate
- Surface: 22 mR/hr
- 1 meter: 3.2 mR/hr

Fiber drum lid – good condition
No gasses present in the breathing zone
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<td>1 meter 3.2 mR/hr</td>
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<th>second poly liner/bag – good condition</th>
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<tbody>
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<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
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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**

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<tbody>
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**Inspection/Sample Date & Time**

- Date: 7-1-2002  
- Time: 10:00

**Physical Location of Drum**

- Warehouse: 911  
- Row: 2  
- Column: C

**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

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### Physical Location of Drum

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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr, 1 meter 3.2 mR/hr</td>
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</table>

4\textsuperscript{th} 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
Drum ID No.: 6

Inspection/Sample Visual Inspection & Sampling
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
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) |
| Drum Wall Thickness of Outer Container (French and Indian Drums only): | Not Applicable |
| Rad Measurements at the time of opening: | DR at Surface 26 mR/hr DR at 1 meter 3.4 mR/hr dpm/300cm² <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) |
| 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) |
| 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 |
| PhotoTaken of Inner Container #3: | ☑ Yes (include Drum ID in photo) |
| 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) |
| 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) |
| 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) |
| 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) |
| 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) |

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

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**Inspection/Sample Disposition**: Visual Inspection & Sampling Archive

### Physical Location of Drum

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<th>Warehouse</th>
<th>911</th>
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<tr>
<td>Row</td>
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### Inspection/Sample Date & Time

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<tbody>
<tr>
<td>1 meter</td>
<td></td>
<td>3.4 mR/hr</td>
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30-gal container – good condition
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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</tr>
<tr>
<td></td>
<td>1 meter 3.4 mR/hr</td>
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</table>

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
- **Drum ID No.**: 35

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### 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

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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

### Physical Location of Drum

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### Other Information

| Photo No. | 4 of 11 |

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<td>3.4 mR/hr</td>
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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
Drum ID No.: 35

Inspection/Sample Disposition
Visual Inspection & Sampling 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

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### Physical Location of Drum

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Dose Rate

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<td>1 meter</td>
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3rd poly liner/bag – good condition

No gases present in breathing zone
General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 40
Drum ID No.: 35

Inspection/Sample Visual Inspection & Sampling
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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

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**Physical Location of Drum**

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<tr>
<td>1 meter</td>
<td>3.4 mR/hr</td>
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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
Drum ID No. 35

Inspection/Sample
Disposition Archive

Visual Inspection & Sampling

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

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## Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.4 mR/hr</td>
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ThN material – white, solid, monolithic structure - dry
No gases present in breathing zone
### General Information

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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

### Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.4 mR/hr</td>
</tr>
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Sealed & dated - Complete
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/300cm² <20 α & <200 β
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
<table>
<thead>
<tr>
<th><strong>General Information</strong></th>
<th></th>
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<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
<td>41</td>
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<td>142</td>
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<td>Engagement Date &amp; Time</td>
<td>Visual Inspection &amp; Sampling</td>
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<tr>
<td>Physical Location of Drum</td>
<td></td>
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<tr>
<td>Warehouse</td>
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<td>Column</td>
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<td>Inspection/Sample Date &amp; Time</td>
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<tr>
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<tr>
<td>Dose Rate Surface</td>
<td>22 mR/hr</td>
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<tr>
<td>Dose Rate 1 meter</td>
<td>2.6 mR/hr</td>
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30-gal drum in good condition
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

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**Other Information**

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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**

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**Inspection/Sample Visual Inspection & Sampling Disposition Archive**

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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1st poly liner/bag – good condition
Opening liner/bag with utility knife
HEPA HVAC exhaust working properly
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

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**Visual Inspection & Sampling Disposition Archive**

**Physical Location of Drum**

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
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</table>

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
Drum ID No.: 142

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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

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| Physical Location of Drum    |                |                               |
| Warehouse                    | 911            | Row                           |
|                              |                | Column                        |
|                              |                | 10                            |
|                              |                | B                             |

| Inspection/Sample Date & Time|                |                               |
| Date                        | 6-27-2002      | Time                          |
| 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

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</table>

This picture shows the final plastic bag in good condition (4th poly liner/bag)
No gases present in breathing zone
# General Information

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## Physical Location of Drum

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## Other Information

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<td>Surface: 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter: 2.6 mR/hr</td>
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</table>

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

<table>
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<tr>
<th>Field</th>
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### Physical Location of Drum

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### 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 41
- **Drum ID No.**: 142

**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/300cm² <20 α & <200 β γ

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/bg (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
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### Physical Location of Drum

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<tr>
<td>6-28-2002</td>
<td>09:00</td>
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</tbody>
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### 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

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### Inspection/Sample

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| Photo No. | 2 of 13 |

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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.
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1st poly liner/bag – good condition  
No gases present in the breathing zone.
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>42</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>154</td>
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<table>
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<tr>
<th>Inspection/Sample Disposition</th>
<th>Visual Inspection &amp; Sampling Archive</th>
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<tbody>
<tr>
<td>Date</td>
<td>6-28-2002</td>
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<tr>
<td>Time</td>
<td>09:00</td>
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### Physical Location of Drum

<table>
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<tr>
<th>Warehouse</th>
<th>Row</th>
<th>Column</th>
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<tbody>
<tr>
<td>911</td>
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### Other Information

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<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.0 mR/hr</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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</thead>
<tbody>
<tr>
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**Inspection/Sample Date & Time**

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**Other Information**

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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr, 1 meter 3.0 mR/hr</td>
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</table>

2nd poly liner/bag – good condition
No gases present in the breathing zone.
### General Information

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### Physical Location of Drum

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### Inspection/Sample Date & Time

Date 6-28-2002  
Time 09:00

### Other Information

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</table>
| 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
Drum ID No.: 154

Inspection/Sample Date & Time
Date: 6-28-2002
Time: 09:00

Physical Location of Drum
Warehouse: 911
Row: 5
Column: A

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.
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<td>Warehouse</td>
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<td>Photo No.</td>
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<tr>
<td>Surface 1 meter</td>
<td>22 mR/hr</td>
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A picture of the lab-pack lid after the wooden lid has been removed
No gases present in the breathing zone.
**General Information**

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<tr>
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<th>Curtis Bay</th>
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**Physical Location of Drum**

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**Other Information**

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<th>Photo No.</th>
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</table>

**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**

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Dose Rate

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<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>3.0 mR/hr</td>
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</table>

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
Drum ID No.   154

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.
# Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

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<thead>
<tr>
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<th>Surface</th>
<th>22 mR/hr</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
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</table>

Sampler removing sample from 30-gal container
No gases present in the breathing zone.
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<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
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<tr>
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<td>Archive</td>
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<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
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<tr>
<td></td>
<td>1 meter 3.0 mR/hr</td>
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Sealed & dated - Complete
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

Rad Measurements at the time of opening:
- DR at Surface: 24 mR/hr
- DR at 1 meter: 2.8 mR/hr
- dpm/300cm²: <20
- α: <200
- γ:

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
<table>
<thead>
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<tr>
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<tr>
<td><strong>Warehouse</strong></td>
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<td><strong>Time</strong></td>
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<tr>
<td><strong>Dose Rate</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Surface</strong></td>
<td>24 mR/hr</td>
</tr>
<tr>
<td><strong>1 meter</strong></td>
<td>2.8 mR/hr</td>
</tr>
</tbody>
</table>

30-gal drum – good condition
Drum vented gas as bolt on drum ring was loosened for removal.
### General Information

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- **Inspection/Sample Disposition**: Visual Inspection & Sampling Archive

### Physical Location of Drum

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### 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  
Drum ID No.: 179  

**Inspection/Sample**

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.
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

### General Information

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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

**Physical Location of Drum**

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<tbody>
<tr>
<td>1 meter</td>
<td>2.8 mR/hr</td>
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</table>

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.
<table>
<thead>
<tr>
<th>General Information</th>
<th>Curtis Bay</th>
<th>Visual Inspection &amp; Sampling</th>
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<tr>
<td></td>
<td>1 meter 2.8 mR/hr</td>
<td></td>
</tr>
</tbody>
</table>

HEPA exhaust duct positioned inside of poly bags removing gases inside of container headspace
No gases present in the breathing zone
### General Information

<table>
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<tbody>
<tr>
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<tr>
<td>Lot No.</td>
<td>43</td>
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<tr>
<td>Drum ID No.</td>
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.8 mR/hr</td>
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The thin paper layer/lid on the inner lab-pack after the wooden lid has been removed
No gases present in the breathing zone
<table>
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<tbody>
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<td><strong>Lot No.</strong></td>
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<tr>
<td><strong>Surface</strong></td>
<td>24 mR/hr</td>
</tr>
<tr>
<td><strong>1 meter</strong></td>
<td>2.8 mR/hr</td>
</tr>
</tbody>
</table>

Last (4\textsuperscript{th} poly liner/bag) before ThN material
No gases present in the breathing zone
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 43
- **Drum ID No.**: 179

**Inspection/Sample**
- **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
- **Drum ID No.**: 179

**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
Curtis Bay Depot
Lot #50 – Drum #3
Inspect, Sample & Archive
**CONTAINER INSPECTION CHECKLIST**

**CONTAINER INFORMATION**

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

<table>
<thead>
<tr>
<th>Lot:</th>
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<th>3</th>
<th>Location: Warehouse 911 – Column B – Row 1</th>
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<tbody>
<tr>
<td>Lot #:</td>
<td>50</td>
<td>Drum ID #:</td>
<td>3</td>
<td>Location: Warehouse 911 – Column B – Row 1</td>
</tr>
</tbody>
</table>

**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/300cm² <20 α & <200 β γ

Headspace Gas Measurements:
- CH4 NA *(did not measure)*
- 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 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 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 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 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 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 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 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 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

G-112
General Information

Site Curtis Bay
ThN Origin Domestic
Lot No. 50
Drum ID No. 3

Inspection/Sample Disposition
Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 50
- **Drum ID No.**: 3
- **Inspection/Sample 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: $24 \text{ mR/hr}$
  - 1 meter: $3.2 \text{ mR/hr}$

Another picture of the 30-gal drum – picture shows black plastic lid (from inner drum liner) visible following outer metal lid removal.
**General Information**

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<thead>
<tr>
<th>Site</th>
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**Physical Location of Drum**

<table>
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**Inspection/Sample Date & Time**

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</tbody>
</table>

**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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

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<td>Archive</td>
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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 24 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.2 mR/hr</td>
</tr>
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</table>

The cardboard/fiber drum lid – good condition
No gases present in breathing zone
**General Information**

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<tbody>
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**Physical Location of Drum**

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
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2nd poly liner/bag – good condition
No gases present in breathing zone
# Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

## General Information

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## Physical Location of Drum

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## Inspection/Sample Date & Time

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<tbody>
<tr>
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<td>3.2 mR/hr</td>
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</table>

3rd poly liner/bag – good condition
No gases present in breathing zone
General Information

Site: Curtis Bay  
ThN Origin: Domestic  
Lot No.: 50  
Drum ID No.: 3  
Inspection/Sample Disposition: Visual Inspection & Sampling 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

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### Physical Location of Drum

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### 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
Drum ID No.: 3

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**

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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

**Physical Location of Drum**

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**Other Information**

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<tbody>
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<td>1 meter</td>
<td>3.2 mR/hr</td>
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</table>

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/300cm² <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/bag
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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>51</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>155</td>
</tr>
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</table>

| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
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<tbody>
<tr>
<td>Row</td>
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### Inspection/Sample Date & Time

<table>
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<tbody>
<tr>
<td>Time</td>
<td>14:40</td>
</tr>
</tbody>
</table>

### 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

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<td>Dose Rate</td>
<td>Surface</td>
</tr>
<tr>
<td></td>
<td>1 meter</td>
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</tbody>
</table>

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
Drum ID No.: 155

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
- **Drum ID No.**: 155

**Inspection/Sample Date & Time**

- **Date**: 6-28-2002
- **Time**: 14:40

**Physical Location of Drum**

- **Warehouse**: 911
- **Row**: 10
- **Column**: C

**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

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<th>22 mR/hr</th>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
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*2nd poly liner/bag – good condition
No gases present in the breathing zone*
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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

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**Dose Rate**

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<td>1 meter</td>
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3\textsuperscript{rd} poly liner/bag – good condition

No gases present in the breathing zone
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### Visual Inspection & Sampling

| Inspection/Sample Disposition | Archive |

### Physical Location of Drum

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| Photo No.   | 7 of 11 |

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<tr>
<td></td>
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This picture shows the wooden lid covering the final fiber drum, 4th poly liner/bag & ThN material.
No gases present in the breathing zone.
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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.
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<tr>
<th>Photo No.</th>
<th>9 of 11</th>
</tr>
</thead>
</table>

- 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

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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

### Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
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</tbody>
</table>

Thorium nitrate material – solid - dry
No gases present in the breathing zone
General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 51
Drum ID No.: 155

Inspection/Sample Disposition: Visual Inspection & Sampling 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/300cm² <20 α & <200Bγ
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/bag
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 #: 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
Drum ID No.: 48
Inspection/Sample Disposition: Visual Inspection & Sampling 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
Drum ID No. 48

Inspection/Sample Disposition Visual Inspection & Sampling

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
Drum ID No.: 48

Inspection/Sample Disposition: Visual Inspection & Sampling 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

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## 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

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<tr>
<td></td>
<td>26 mR/hr</td>
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After removing the fiber lid – you see the 2nd poly liner/bag in good condition
No gases present in breathing zone
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

Site: Curtis Bay  
ThN Origin: Domestic  
Lot No.: 56  
Drum ID No.: 48  
Inspection/Sample 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

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### Inspection/Sample

- **Visual Inspection & Sampling**
- **Disposition** Archive

### Physical Location of Drum

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### Other Information

| Photo No. | 7 of 11 |

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
</tr>
</tbody>
</table>

Wooden lid (mounted to interior fiber/lab-pack drum) – good condition (lid protects ThN material)

No gases present in breathing zone
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

- **Site:** Curtis Bay
- **ThN Origin:** Domestic
- **Lot No.:** 56
- **Drum ID No.:** 48

**Inspection/Sample**

- **Visual Inspection & Sampling 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

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<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
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## Physical Location of Drum

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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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- Site: Curtis Bay
- ThN Origin: Domestic
- Lot No.: 56
- Drum ID No.: 48
- Inspection/Sample 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

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<tr>
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Sealed & dated – Complete
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

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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

Rad Measurements at the time of opening: DR at Surface 20 mR/hr DR at 1 meter 2.8 mR/hr dpm/300cm² <20 α & <200 β γ

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
<table>
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<tr>
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<tr>
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| Inspection/Sample Disposition       | Visual Inspection & Sampling 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
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<tr>
<td>Photo No.</td>
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</tr>
</tbody>
</table>

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

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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

### Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.8 mR/hr</td>
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</tbody>
</table>

1st poly liner/bag – good condition (opening bag with utility knife)
No gases present in breathing zone
## Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

### General Information

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#### Inspection/Sample

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#### Physical Location of Drum

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#### Other Information

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<tbody>
<tr>
<td></td>
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Picture shows the fiber drum lid (on outermost fiber drum) – good condition
No gases present in breathing zone
**General Information**

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**Inspection/Sample**

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**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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 60
- **Drum ID No.**: 285

**Inspection/Sample Visual Inspection & Sampling 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

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## Physical Location of Drum

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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
- **Drum ID No.**: 285
- **Inspection/Sample 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
- Drum ID No.: 285

Inspection/Sample
- Date: 6-27-2002
- Time: 11:00

Physical Location of Drum
- Warehouse: 911
- Row: 10
- Column: A

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.
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

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**Visual Inspection & Sampling**

**Physical Location of Drum**

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Picture shows final (4th) poly liner/bag in good condition

No gases present in breathing zone
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
<td>60</td>
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<tr>
<td>Drum ID No.</td>
<td>285</td>
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<td>Visual Inspection &amp; Sampling</td>
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<tr>
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<td>Archive</td>
</tr>
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</table>

### Physical Location of Drum

<table>
<thead>
<tr>
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<th>911</th>
</tr>
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<tbody>
<tr>
<td>Row</td>
<td>10</td>
</tr>
<tr>
<td>Column</td>
<td>A</td>
</tr>
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### Inspection/Sample Date & Time

<table>
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<tr>
<th>Date</th>
<th>6-27-2002</th>
</tr>
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<tbody>
<tr>
<td>Time</td>
<td>11:00</td>
</tr>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>12 of 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface</td>
</tr>
<tr>
<td></td>
<td>1 meter</td>
</tr>
</tbody>
</table>

The 1st core sample weighed approximately 901 gms.
### General Information
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 60
- **Drum ID No.**: 285

### 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
Drum ID No.             285

Inspection/Sample Disposition                Visual Inspection & Sampling 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/300cm² <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
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<tr>
<th>General Information</th>
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<td>Drum ID No.</td>
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<table>
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<tbody>
<tr>
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<td>Column</td>
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<tr>
<td>Date</td>
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<tbody>
<tr>
<td>Surface</td>
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<tr>
<td>1 meter</td>
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30-gal drum – good condition
Drum vented gas when initially loosening the bolt on the drum ring.
## Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

### General Information

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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<td>Surface 24 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 3.0 mR/hr</td>
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</table>

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
Drum ID No.: 00

Inspection/Sample Disposition: Visual Inspection & Sampling 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
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<tr>
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<tr>
<td>Dose Rate</td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>24 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>3.0 mR/hr</td>
</tr>
</tbody>
</table>

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
Drum ID No.: 00
Inspection/Sample Disposition
Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 64
- **Drum ID No.**: 00

**Visual Inspection & Sampling 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
Drum ID No.: 00

Inspection/Sample
Visual Inspection & Sampling
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
Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 64
- **Drum ID No.**: 00

**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
Drum ID No.: 00

Inspection/Sample Disposition
Visual Inspection & Sampling 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**

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<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tr>
<td>Drum ID No.</td>
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**Disposition**

| Visual Inspection & Sampling Archive |

**Physical Location of Drum**

<table>
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**Inspection/Sample Date & Time**

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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>10 of 11</th>
</tr>
</thead>
</table>

- 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
Drum ID No.: 00

Inspection/Sample Disposition
Visual Inspection & Sampling 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
Curtis Bay Depot
Lot #71 – Drum #192
Inspect, Sample & Archive
# Curtis Bay Depot Drums Sampled for On-site Archive (First Drum of Archived Samples)

## 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/300cm² <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

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G-182
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
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<tr>
<td>Drum ID No.</td>
<td>192</td>
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**Inspection/Sample**

**Disposition**

**Visual Inspection & Sampling Archive**

### Physical Location of Drum

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<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
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### Inspection/Sample Date & Time

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### Other Information

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Dose Rate

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<td>3.2 mR/hr</td>
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30-gal drum – good condition
Gases vented from drum when bolt on drum ring was loosened.
## General Information

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<td>1 meter</td>
<td>3.2 mR/hr</td>
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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**

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<tr>
<th>Site</th>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

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</table>

**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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
<td>71</td>
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<tr>
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<th>Visual Inspection &amp; Sampling Archive</th>
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<td></td>
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</tbody>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
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<tbody>
<tr>
<td>Row</td>
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<td>Column</td>
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**Inspection/Sample Date & Time**

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>3.2 mR/hr</td>
</tr>
</tbody>
</table>

Fiber drum lid (after opening 1st poly liner/bag) – fiber lid good condition
No gases present in breathing zone.
**General Information**

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<tbody>
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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

**Physical Location of Drum**

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**Other Information**

<table>
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<tr>
<th>Photo No.</th>
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**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

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- 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
Drum ID No.: 192

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**

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**Visual Inspection & Sampling**

**Disposition**

**Physical Location of Drum**

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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**

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<tbody>
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<td>1 meter</td>
<td>3.2 mR/hr</td>
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ThN material – solid form – white – monolith - dry
No gases present in breathing zone.
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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 an “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.

<table>
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<td>2</td>
<td>19**</td>
<td>52</td>
<td>H-17</td>
</tr>
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<td>3</td>
<td>24**</td>
<td>102</td>
<td>H-29</td>
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<td>25*</td>
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<td>H-43</td>
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<td>202</td>
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[This page intentionally left blank.]
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/300cm² <20 α & <200β
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/bag
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

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<tbody>
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<tr>
<th>Container</th>
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<tr>
<td>Condition</td>
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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**

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<td>1 meter 2.5 mR/hr</td>
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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

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<th>Surface</th>
<th>24 mR/hr</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.5 mR/hr</td>
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</table>

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

<table>
<thead>
<tr>
<th>Site</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
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### Physical Location of Drum

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Fiber drum lid (on outermost fiber drum) – good condition
No gases present in the breathing zone.
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2"nd poly liner/bag – good condition
No gases present in the breathing zone.
# Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

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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**

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**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.
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

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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.
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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 - +50 mm
Drum vented – all gases evacuated through HEPA exhaust
ThN material – monolith – solid – white - dry
### General Information

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**Inspection/Sample Date & Time**

- **Date**: 7-10-2002
- **Time**: 10:10

**Physical Location of Drum**

- **Warehouse**: 912
- **Row**: 4
- **Column**: A

**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/300cm2 <20 α & <200 β γ
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/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): 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

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<tr>
<td>7-10-2002</td>
<td>14:30</td>
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### 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

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Inspection/Sample Disposition

Visual Inspection & Sampling Archive

Physical Location of Drum

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Other Information

| Photo No.  | 2 of 10 |

Dose Rate

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1st poly liner/bag – good condition
No gases present in the breathing zone
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 19
Drum ID No.: 52
Inspection/Sample Disposition: Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

**General Information**
- Site: Curtis Bay
- ThN Origin: Domestic
- Lot No.: 19
- Drum ID No.: 52
- Inspection/Sample 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
Drum ID No.: 52
Inspection/Sample Disposition
Visual Inspection & Sampling 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
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

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Wooden lid (mounted to innermost lab-pack/fiber drum) – good condition
No gases present in the breathing zone
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Paper layer lid on lab-pack underneath the wooden lid typically tears upon wooden lid removal.

No gases present in the breathing zone.
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**Inspection/Sample**

**Disposition**

**Visual Inspection & Sampling**

**Archive**

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</table>

## Inspection/Sample Date & Time

**Date** 7-10-2002  **Time** 14:30

## Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>8 of 10</th>
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<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.2 mR/hr</td>
</tr>
</tbody>
</table>

4th poly liner/bag – good condition
No gases present in the breathing zone
**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 19
- **Drum ID No.**: 52
- **Inspection/Sample Date & Time**: Date 7-10-2002, Time 14:30

**Physical Location of Drum**

- **Warehouse**: 912
- **Row**: 8
- **Column**: D

**Inspection/Sample Visual Inspection & Sampling Disposition Archive**

**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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
<td>52</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

<table>
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<th>10 of 10</th>
</tr>
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</table>

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/300cm² <20 α & <200 βγ

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/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.): 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

CONTENT 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>24</td>
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<tr>
<td>Drum ID No.</td>
<td>102</td>
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**Inspection/Sample Disposition**

Visual Inspection & Sampling Archive

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
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<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
<td>D</td>
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### Inspection/Sample Date & Time

<table>
<thead>
<tr>
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<tbody>
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<td>Time</td>
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</table>

### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>1 of 12</th>
</tr>
</thead>
</table>

- **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
- **Drum ID No.**: 102

### 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**

<table>
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<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
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<td>Lot No.</td>
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</tr>
<tr>
<td>Drum ID No.</td>
<td>102</td>
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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**Inspection/Sample Date & Time**

<table>
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<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.1 mR/hr</td>
</tr>
</tbody>
</table>

This picture shows were the drum lid bolts are placed with respect to the lid.
<table>
<thead>
<tr>
<th>General Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
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<tr>
<td>ThN Origin</td>
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<td>Lot No.</td>
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<td>Drum ID No.</td>
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
</tr>
<tr>
<td>Physical Location of Drum</td>
<td></td>
</tr>
<tr>
<td>Warehouse</td>
<td>912</td>
</tr>
<tr>
<td>Row</td>
<td>2</td>
</tr>
<tr>
<td>Column</td>
<td>D</td>
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<tr>
<td>Inspection/Sample Date &amp; Time</td>
<td></td>
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<tr>
<td>Date</td>
<td>7-10-2002</td>
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<td>Time</td>
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<td>Other Information</td>
<td></td>
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<tr>
<td>Photo No.</td>
<td>4 of 12</td>
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<tr>
<td>Dose Rate</td>
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<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.1 mR/hr</td>
</tr>
<tr>
<td>1st poly liner/bag – good condition</td>
<td></td>
</tr>
<tr>
<td>No gases present in the breathing zone.</td>
<td></td>
</tr>
</tbody>
</table>
### General Information

**Site**  Curtis Bay  
**ThN Origin**  Domestic  
**Lot No.**  24  
**Drum ID No.**  102  
**Inspection/Sample Date & Time**  
  **Date**  7-10-2002  
  **Time**  14:00  

### Physical Location of Drum

**Warehouse**  912  
**Row**  2  
**Column**  D  

### 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
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### Physical Location of Drum

<table>
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### Inspection/Sample Date & Time

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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>6 of 12</th>
</tr>
</thead>
</table>

- Dose Rate
  - Surface: 22 mR/hr
  - 1 meter: 2.1 mR/hr

2\textsuperscript{nd} poly liner/bag – good condition
No gases present in the breathing zone
**General Information**

<table>
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<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
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<td>Drum ID No.</td>
<td>102</td>
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</tbody>
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**Inspection/Sample Date & Time**

- **Date**: 7-10-2002
- **Time**: 14:00

**Physical Location of Drum**

- **Warehouse**: 912
- **Row**: 2
- **Column**: D

**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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
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#### Physical Location of Drum

<table>
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#### Inspection/Sample Date & Time

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#### Other Information

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.1 mR/hr</td>
</tr>
</tbody>
</table>

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
Drum ID No.: 102

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

<table>
<thead>
<tr>
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<tbody>
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<td>Visual Inspection &amp; Sampling</td>
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## Physical Location of Drum

<table>
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## Other Information

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<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.1 mR/hr</td>
</tr>
</tbody>
</table>

*4th poly liner/bag (thin film plastic) – good condition
No gases present in the breathing zone*
**General Information**

<table>
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<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Drum ID No.</td>
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<td>Inspection/Sample</td>
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**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
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**Inspection/Sample Date & Time**

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**Other Information**

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**Dose Rate**

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>2.1 mR/hr</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
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<tr>
<td>Lot No.</td>
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<tr>
<td>Drum ID No.</td>
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**Inspection/Sample**

| Visual Inspection & Sampling Disposition Archive |

**Physical Location of Drum**

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</tr>
<tr>
<td></td>
<td>1 meter 2.1 mR/hr</td>
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</table>

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  
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/300cm² <20  
α  
<200  
βγ

Headspace Gas Measurements  
CH₄ NA  
NO  
N₂  
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  
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  
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  
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  
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  
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  
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  
No

Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 4th Poly liner/bg (thin film)

Inner Container # 8 Condition/Description (rusty, leaking, good, etc): good

Photo Taken of Inner Container #8: Yes  
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

□ Yes □ No  TID #(s): Label Seal with Date & Initials

TID placed on container after inspection? *(Check Box)*: Yes  
No

Checklist completed by: T. Cunningham (signature on file)  
Date: 7-01-2002
### General Information

| Site       | Curtis Bay         |
| ThN Origin | Domestic           |
| Lot No.    | 25                 |
| Drum ID No. | 25               |

**Inspection/Sample Disposition**

Visual Inspection & Sampling Archive

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
<td>D</td>
</tr>
</tbody>
</table>

### 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
Drum ID No.: 25

Inspection/Sample Disposition
Visual Inspection & Sampling 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
Drum ID No.: 25

Inspection/Sample Disposition: Visual Inspection & Sampling 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

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</tbody>
</table>

Opening the 1st poly bag shows the fiber drum lid raised but in good condition. No gases present in the breathing zone.
### General Information

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<th>Surface</th>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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2"nd 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.
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**Other Information**

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- 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**

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</tr>
<tr>
<td>Dose Rate 1 meter</td>
<td>2.6 mR/hr</td>
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</table>

Wooden lid (mounted to inner lab-pack/fiber drum) – good condition
No gases present in the breathing zone.
## General Information

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**Inspection/Sample Disposition**

**Visual Inspection & Sampling 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

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### Physical Location of Drum

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<td>Surface 24 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

ThN material – solid – dry – white – good condition
No gases present in the breathing zone.
**General Information**

<table>
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<tr>
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</thead>
<tbody>
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**Inspection/Sample**

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**Other Information**

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<thead>
<tr>
<th>Dose Rate</th>
<th>Surface 24 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Outer Container Type/Capacity (Metal 55 Gal, Poly 40 Gal, etc.)</th>
<th>30-gal drum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer Container Condition/Description (rusty, leaking, good, etc.)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Outer Container:</td>
<td>Yes (include Drum ID in photo)</td>
</tr>
<tr>
<td>Drum Wall Thickness of Outer Container:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Photo Taken of Drum Wall Thickness:</td>
<td>Yes (include Drum ID in photo)</td>
</tr>
<tr>
<td>Rad Measurements at the time of opening:</td>
<td>$22 \text{ mR/hr}$ at Surface, $2.2 \text{ mR/hr}$ at 1 meter, $&lt;20 \alpha$ &amp; $&lt;200 \beta$</td>
</tr>
<tr>
<td>Headspace Gas Measurements</td>
<td>CH$_4$ 5.2% LEL, NO $&lt;50$ ppm, NOx $&lt;50$ ppm</td>
</tr>
</tbody>
</table>

**CONTENTS INFORMATION**

| 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) |
| 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) |
| 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) |
| 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) |
| Inner Container #5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.) | 3rd Poly liner/bag |
| Inner Container #5 Condition/Description (rusty, leaking, good, etc.) | good |
| Photo Taken of Inner Container #5: | Yes (include Drum ID in photo) |
| 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) |
| 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) |
| 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) |

| 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 |
| 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**

<table>
<thead>
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<th>Site</th>
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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

**Physical Location of Drum**

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<tbody>
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**Other Information**

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<thead>
<tr>
<th>Photo No.</th>
<th>1 of 10</th>
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</table>

**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

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<td>Dose Rate</td>
<td>Surface 22 mR/hr, 1 meter 2.2 mR/hr</td>
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</table>
| 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. |
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## Visual Inspection & Sampling

### Disposition
Archive

### Physical Location of Drum

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### Dose Rate

- Surface: 22 mR/hr
- 1 meter: 2.2 mR/hr

1\textsuperscript{st} 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.
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<tr>
<td>1 meter</td>
<td>2.2 mR/hr</td>
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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
Drum ID No.: 202
Inspection/Sample Disposition: Visual Inspection & Sampling 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**

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**Physical Location of Drum**

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Dose Rate

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<td>1 meter</td>
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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.
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Wooden lid – good condition (mounted on inner lab-pack/fiber drum)
No gases present in the breathing zone.
## General Information

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### 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.
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</tr>
<tr>
<td></td>
<td>1 meter 2.2 mR/hr</td>
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ThN material – monolith – white – solid - dry
No gases present in the breathing zone.
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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

Rad Measurements at the time of opening: DR at Surface 24 mR/hr DR at 1 meter 3.2 mR/hr dpm/300cm² <20 α & <200 β/γ
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/bag
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 #(#): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-09-2002
### General Information

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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

**Physical Location of Drum**

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### Other Information

**Photo No.**

1 of 9

**Dose Rate**

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<tbody>
<tr>
<td>1 meter</td>
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30-gal drum – drum lid had a significant “kink” (drum pressurization sign)
Gases vented from drum during drum lid removal operations.
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<tr>
<td>Surface</td>
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<td>1 meter</td>
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Black plastic lid – good condition (mounted on inner rigid drum liner)
No gases present in the breathing zone
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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

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### Other Information

| Photo No. | 3 of 9 |

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<td>1 meter</td>
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1\textsuperscript{st} poly liner/bag – good condition

No gases present in the breathing zone
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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
Drum ID No.: 152

Inspection/Sample Date & Time
Date: 7-9-2002
Time: 13:50

Physical Location of Drum
Warehouse: 912
Row: 10
Column: C

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
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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
Drum ID No.: 152

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**

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ThN material – monolith – white – solid - dry
No gases present in the breathing zone
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<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
</tr>
</tbody>
</table>

**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>10</td>
</tr>
<tr>
<td>Column</td>
<td>C</td>
</tr>
</tbody>
</table>

**Inspection/Sample Date & Time**

<table>
<thead>
<tr>
<th>Date</th>
<th>7-9-2002</th>
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<tbody>
<tr>
<td>Time</td>
<td>13:50</td>
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</table>

**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>9 of 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 24 mR/hr, 1 meter 3.2 mR/hr</td>
</tr>
</tbody>
</table>

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/300cm² <20 α & <200 β
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.

<table>
<thead>
<tr>
<th>Inner Container # 1 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>30-gal Black Rigid Poly Drum Liner w/ Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 1 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #1: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container # 2 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>1st Poly liner/bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 2 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #2: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container # 3 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Cardboard/Fiber Drum Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 3 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #3: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container # 4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>2nd Poly liner/bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 4 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #4: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container # 5 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>3rd Poly liner/bg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 5 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #5: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container # 6 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Wooden lid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 6 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #6: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container # 7 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>Lab-pack container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 7 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #7: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inner Container # 8 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.)</th>
<th>4th Poly liner/bag (thin film)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner Container # 8 Condition/Description (rusty, leaking, good, etc)</td>
<td>good</td>
</tr>
<tr>
<td>Photo Taken of Inner Container #8: ☑ Yes (include Drum ID in photo)</td>
<td>☐ No</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>47</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>204</td>
</tr>
<tr>
<td>Inspection/Sample</td>
<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Disposition</td>
<td>Archive</td>
</tr>
</tbody>
</table>

**Physical Location of Drum**

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>10</td>
</tr>
<tr>
<td>Column</td>
<td>E</td>
</tr>
</tbody>
</table>

**Inspection/Sample Date & Time**

<table>
<thead>
<tr>
<th>Date</th>
<th>7-9-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>13:00</td>
</tr>
</tbody>
</table>

**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>1 of 10</th>
</tr>
</thead>
</table>

- **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
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

**General Information**

**Site**  
Curtis Bay

**ThN Origin**  
Domestic

**Lot No.**  
47

**Drum ID No.**  
204

**Inspection/Sample Disposition**  
Visual Inspection & Sampling 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.
<table>
<thead>
<tr>
<th><strong>General Information</strong></th>
<th></th>
<th><strong>Visual Inspection &amp; Sampling Archive</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>Curtis Bay</td>
<td></td>
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<td>ThN Origin</td>
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<td>Inspection/Sample Disposition</td>
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<tr>
<td>Drum ID No.</td>
<td>204</td>
<td></td>
</tr>
</tbody>
</table>

| **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.
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

**General Information**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<td>Drum ID No.</td>
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**Inspection/Sample Disposition Archive**

**Physical Location of Drum**

<table>
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**Inspection/Sample Date & Time**

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**Other Information**

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**Dose Rate**

<table>
<thead>
<tr>
<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>1.7 mR/hr</td>
</tr>
</tbody>
</table>

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
Drum ID No.: 204

Inspection/Sample Disposition: Visual Inspection & Sampling 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
Drum ID No.: 204

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

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<th>Surface</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>1.7 mR/hr</td>
</tr>
</tbody>
</table>

Wooden lid (mounted on innermost fiber/lab-pack drum) – good condition
No gases present in the breathing zone.
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<td>Lot No.</td>
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</tr>
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<td>Drum ID No.</td>
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<table>
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<tr>
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<th>Visual Inspection &amp; Sampling</th>
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<tbody>
<tr>
<td>Disposition</td>
<td>Archive</td>
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### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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</tr>
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<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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### Inspection/Sample Date & Time

<table>
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<tr>
<th>Date</th>
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<tbody>
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<td>Time</td>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>8 of 10</th>
</tr>
</thead>
</table>

- **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.
<table>
<thead>
<tr>
<th>General Information</th>
<th></th>
<th>Inspection/Sample Disposition</th>
<th>Visual Inspection &amp; Sampling Archive</th>
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</thead>
<tbody>
<tr>
<td>Site</td>
<td>Curtis Bay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lot No.</td>
<td>47</td>
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</tr>
<tr>
<td>Drum ID No.</td>
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<tr>
<td>Physical Location of Drum</td>
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</tr>
<tr>
<td>Warehouse</td>
<td>912</td>
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<tr>
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<td></td>
<td>Column</td>
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<tr>
<td>Inspection/Sample Date &amp; Time</td>
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<td>Time</td>
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<td>Other Information</td>
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<tr>
<td>Photo No.</td>
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</tr>
<tr>
<td>Dose Rate</td>
<td></td>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 meter</td>
<td>1.7 mR/hr</td>
</tr>
</tbody>
</table>

ThN material – solid – monolith – white - dry
No gases present in the breathing zone.
### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>47</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>204</td>
</tr>
<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
</tr>
</tbody>
</table>

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>10</td>
</tr>
<tr>
<td>Column</td>
<td>E</td>
</tr>
</tbody>
</table>

### Inspection/Sample Date & Time

<table>
<thead>
<tr>
<th>Date</th>
<th>7-9-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>13:00</td>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>10 of 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 1.7 mR/hr</td>
</tr>
</tbody>
</table>

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

Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm² <20 α & <200β
Headspace Gas Measurements CH4 NO N2 O2 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/bag
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 #(#): 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
Drum ID No. 110

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**

<table>
<thead>
<tr>
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<tr>
<th>Physical Location of Drum</th>
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**Inspection/Sample Date & Time**

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**Other Information**

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<th>Photo No.</th>
<th>2 of 10</th>
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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**

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**Inspection/Sample Date & Time**

Date: 7-10-2002  
Time: 09:15

**Physical Location of Drum**

Warehouse: 912  
Row: 10  
Column: A

**Inspection/Sample Visual Inspection & Sampling Disposition Archive**

**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
Drum ID No.: 110

Inspection/Sample Disposition
Visual Inspection & Sampling 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

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2nd poly liner/bag – good condition
No gases present in the breathing zone.
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3rd poly liner/bag – good condition
No gases present in the breathing zone.
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Wooden lid (mounted on innermost fiber drum) – good condition
No gases present in the breathing zone.
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- 4\textsuperscript{th} poly liner/bag – good condition
- No gases present in the breathing zone.
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ThN material – white – solid – monolith - dry
No gases present in the breathing zone.
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<tbody>
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<td>1 meter</td>
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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: Not Applicable

Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm² <20 α & <200β
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/bag
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 #: Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-10-2002
### General Information

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### 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
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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
Drum ID No.  241

Inspection/Sample Disposition  Visual Inspection & Sampling

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
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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
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<th>Surface</th>
<th>22 mR/hr</th>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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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**

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<tbody>
<tr>
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<tr>
<td>Lot No.</td>
<td>59</td>
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**Inspection/Sample Date & Time**

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** Physical Location of Drum**

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**Other Information**

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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
Drum ID No.: 241

Inspection/Sample Disposition
Visual Inspection & Sampling 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
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4th 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

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### Inspection/Sample Disposition

| Visual Inspection & Sampling Archive |

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### Dose Rate

- Surface: 22 mR/hr
- 1 meter: 2.6 mR/hr

ThN material – white – dry – solid – monolith
No gases present in breathing zone.
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**Inspection/Sample Disposition**
- Visual Inspection & Sampling 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/300cm² <20 α & <200β

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/bag
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
Drum ID No.: 159

Inspection/Sample

Disposition

Visual Inspection & Sampling 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

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<th>Details</th>
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### Inspection/Sample Date & Time

| Date       | 7-10-2002 |
| Time       | 10:15     |

### Other Information

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Dose Rate

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<tr>
<th>Distance</th>
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<tbody>
<tr>
<td>Surface</td>
<td>24 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

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

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<tr>
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<td>1 meter 2.6 mR/hr</td>
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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.
<table>
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<tr>
<th>General Information</th>
<th>Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)</th>
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<tbody>
<tr>
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<td>1 meter</td>
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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
Drum ID No.: 159

Inspection/Sample Disposition
Visual Inspection & Sampling 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.
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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
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Wooden lid – good condition
No gases present in the breathing zone.
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4th poly liner/bag – good condition (inflated condition of bag shows gas generation from the ThN material)
No gases present in the breathing zone.
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<thead>
<tr>
<th>Dose Rate</th>
<th>Surface 24 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

ThN material – white – solid – monolith - dry
No gases present in the breathing zone.
General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 62
Drum ID No.: 159

Inspection/Sample Disposition
Visual Inspection & Sampling 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/300cm² <20 α & <200 β
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/bag
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

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<thead>
<tr>
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## Physical Location of Drum

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## Inspection/Sample Date & Time

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## Other Information

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- **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

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<td>2.5 mR/hr</td>
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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.
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<tr>
<td></td>
<td>2.5 mR/hr</td>
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1<sup>st</sup> 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.
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 70
- **Drum ID No.**: 3
- **Inspection/Sample Disposition**: Archive
- **Visual Inspection & Sampling**: 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
- **Dose Rate 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

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Inspection/Sample Disposition: **Visual Inspection & Sampling Archive**

### Physical Location of Drum

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### 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**

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.5 mR/hr</td>
</tr>
</tbody>
</table>

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

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### Physical Location of Drum

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<tbody>
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Wooden lid – good condition
No gases present in the breathing zone.
### General Information

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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

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<tr>
<th>Photo No.</th>
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</tr>
</thead>
</table>

- **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.
<table>
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<tr>
<th><strong>General Information</strong></th>
<th></th>
<th><strong>Inspection/Sample Disposition</strong></th>
<th><strong>Visual Inspection &amp; Sampling Archive</strong></th>
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| **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

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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

### Physical Location of Drum

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| Photo No. | 10 of 10 |

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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 in
Rad Measurements at the time of opening: DR at Surface 42mR/hr DR at 1 meter 4.0mR/hr dpm/300cm² 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 # 3 Condition/Description (rusty, leaking, good, etc):
Photo Taken of Inner Container #3: No  (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

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Inspection/Sample Visual Inspection & Sampling

Disposition Archive

Physical Location of Drum

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Inspection/Sample Date & Time

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Other Information

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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

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## Inspection/Sample Disposition

| Visual Inspection & Sampling Archive |

## Physical Location of Drum

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</tr>
<tr>
<td>Column</td>
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</tbody>
</table>

## 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>France</td>
</tr>
<tr>
<td>Lot No.</td>
<td>F-18</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>55</td>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
</tr>
</tbody>
</table>

### Physical Location of Drum

<table>
<thead>
<tr>
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<th>911</th>
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### Inspection/Sample Date & Time

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<td>Time</td>
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</table>

### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>3 of 5</th>
</tr>
</thead>
</table>

- Dose Rate
  - Surface: 42 mR/hr
  - 1 meter: 4.0 mR/hr

- 2\textsuperscript{nd} poly liner/bag – good condition
- No gases present in the breathing zone.
**General Information**

<table>
<thead>
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</thead>
<tbody>
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

**Physical Location of Drum**

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<table>
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**Other Information**

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<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.0 mR/hr</td>
</tr>
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</table>

French ThN material – powder form – some chunky pieces – dry – white
No gases present in the breathing zone.
### General Information

<table>
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<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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### Physical Location of Drum

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### Other Information

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<tbody>
<tr>
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<td>Surface: 42 mR/hr, 1 meter: 4.0 mR/hr</td>
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</tbody>
</table>

Sealed & dated – Complete
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/300cm²  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 # 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/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.):  4th poly liner/bag
Inner Container # 5 Condition/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  
Drum ID No.: 14

**Inspection/Sample Date & Time**

Date: 7-2-2002  
Time: 13:50

**Physical Location of Drum**

Warehouse: 911  
Row: 4  
Column: E

**Inspection/Sample Visual Inspection & Sampling**

Disposition: Archive

**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**

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
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<td>ThN Origin</td>
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<td>I-1</td>
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<td>Drum ID No.</td>
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Inspection/Sample Disposition Visual Inspection & Sampling Archive

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>2 of 8</th>
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| 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**

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
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<td>1-1</td>
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**Inspection/Sample Date & Time**

- **Date**: 7-2-2002
- **Time**: 13:50

**Physical Location of Drum**

- **Warehouse**: 911
- **Row**: 4
- **Column**: E

**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

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## Physical Location of Drum

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## Inspection/Sample Date & Time

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## Other Information

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<th>Surface</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>5.0 mR/hr</td>
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</table>

2nd poly liner/bag – good condition
No gases present in the breathing zone.
## General Information

<table>
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<th>Site</th>
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<tbody>
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<tr>
<td>Lot No.</td>
<td>I-1</td>
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<td>Drum ID No.</td>
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</table>

- **Inspection/Sample Disposition**
- **Visual Inspection & Sampling Archive**

## Physical Location of Drum

<table>
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<th>911</th>
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</table>

## 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.
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

**General Information**

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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

Date: 7-2-2002  
Time: 13:50

**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>6 of 8</th>
</tr>
</thead>
</table>
| 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.
<table>
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<th>General Information</th>
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<tbody>
<tr>
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<th>Surface</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>5.0 mR/hr</td>
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</table>

ThN material – Indian – cubes / chunks - dry
No gases present in the breathing zone.
### General Information

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<tbody>
<tr>
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Inspection/Sample Visual Inspection & Sampling Disposition Archive

### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

<table>
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<tr>
<th>Photo No.</th>
<th>8 of 8</th>
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</table>

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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/300cm² 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 # 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/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.):  
Inner Container # 5 Condition/Description (rusty, leaking, good, etc):  

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

**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  

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

Checklist completed by: T. Cunningham *(signature on file)*  
Date: 7-03-2002
### General Information

<table>
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<tr>
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<td>Drum ID No.</td>
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### Visual Inspection & Sampling

**Inspection/Sample Date & Time**

- **Date:** 7-3-2002
- **Time:** 11:00

### Physical Location of Drum

- **Warehouse:** 911
- **Row:** 3
- **Column:** E

### 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**

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**Inspection/Sample Visual Inspection & Sampling Disposition Archive**

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

<table>
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**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>2 of 7</th>
</tr>
</thead>
</table>

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
Drum ID No.: 99

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

1\textsuperscript{st} poly liner/bag – good condition
No gases present in the breathing zone.
### General Information

<table>
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<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<tbody>
<tr>
<td>Time</td>
<td>11:00</td>
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</tbody>
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### 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

<table>
<thead>
<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
<td>1-2</td>
</tr>
<tr>
<td>Drum ID No.</td>
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</table>

Inspection/Sample Date & Time

- Date: 7-3-2002
- Time: 11:00

Physical Location of Drum

- Warehouse: 911
- Row: 3
- Column: E

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.
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

**General Information**
- Site: Curtis Bay
- ThN Origin: India
- Lot No.: I-2
- Drum ID No.: 99
- Inspection/Sample 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

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<tbody>
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## Physical Location of Drum

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## Inspection/Sample Date & Time

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## Other Information

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<table>
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<th>Dose Rate</th>
<th>Surface</th>
<th>42 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.6 mR/hr</td>
</tr>
</tbody>
</table>

Sealed & dated – Complete
Curtis Bay Depot
Lot #I-8 – Drum #371
Inspect, Sample & Archive
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Site: Hammond or Curtis Bay (circle one)

Lot #: 1-8, 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)
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/300cm² 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)

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)

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)

Inner Container #4 Type/Capacity (Poly Liner, Fiber 20 Gal, Poly Bag, etc.): 3rd 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)

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

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
Drum ID No.: 371
Inspection/Sample Disposition: Visual Inspection & Sampling 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

<table>
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<tr>
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<tbody>
<tr>
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<td>Drum ID No.</td>
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<th>Inspection/Sample</th>
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<tr>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.5 mR/hr</td>
</tr>
</tbody>
</table>

Cover / Shredded paper – good condition
No gases present in breathing zone
General Information
Site: Curtis Bay
ThN Origin: India
Lot No.: I-8
Drum ID No.: 371

Inspection/Sample Date & Time
Date: 7-2-2002
Time: 9:10

Physical Location of Drum
Warehouse: 911
Row: 10
Column: F

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**

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**Inspection/Sample Disposition**

| Inspection/Sample | Visual Inspection & Sampling Archive |

**Physical Location of Drum**

<table>
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**Inspection/Sample Date & Time**

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**Other Information**

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- 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**

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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

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**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

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## Physical Location of Drum

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## Inspection/Sample Date & Time

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## Other Information

<table>
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<th>Photo No.</th>
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- 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

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<thead>
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<tbody>
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### Physical Location of Drum

<table>
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### Other Information

<table>
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<th>Photo No.</th>
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</tr>
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</table>

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<td>I-8</td>
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<td>Drum ID No.</td>
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## Visual Inspection & Sampling Disposition

### Physical Location of Drum

<table>
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## Inspection/Sample Date & Time

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## Other Information

<table>
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### 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

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<tr>
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### Physical Location of Drum

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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>4.5 mR/hr</td>
</tr>
</tbody>
</table>

Closeup of ThN material cubes/chunks in the drum
No gases present in the breathing zone.
### General Information

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<tr>
<th>Site</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

<table>
<thead>
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<tbody>
<tr>
<td>Photo No.</td>
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</table>

| 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 #:       1-10       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/300cm² 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 # 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/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.): 4th poly liner/bag
Inner Container # 5 Condition/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
- **Drum ID No.**: 484
- **Inspection/Sample Disposition**: Visual Inspection & Sampling 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

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<tr>
<th>Site</th>
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<tbody>
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

### Physical Location of Drum

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### Inspection/Sample Date & Time

**Date** 7-2-2002  **Time** 09:35

### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>2 of 9</th>
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</table>

**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
Drum ID No.: 484

Inspection/Sample Disposition
Visual Inspection & Sampling 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.**: 1-10
- **Drum ID No.**: 484
- **Inspection/Sample Disposition**: Archive
- **Visual Inspection & Sampling**

### 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
- **2™ poly liner/bag – good condition**
- **No gases present in the breathing zone**.
### General Information

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### Physical Location of Drum

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### 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**

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<td>1 meter 4.0 mR/hr</td>
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4th poly liner/bag – good condition
No gases present in the breathing zone.
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<td>1 meter</td>
<td>4.0 mR/hr</td>
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ThN material – Indian – cubes / chunks – solid - white
No gases present in the breathing zone.
Curtis Bay Depot Drums Sampled for On-site Archive (Second Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: India
- **Lot No.**: I-10
- **Drum ID No.**: 484

**Inspection/Sample Date & Time**
- **Date**: 7-2-2002
- **Time**: 09:35

**Physical Location of Drum**
- **Warehouse**: 911
- **Row**: 3
- **Column**: F

**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

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Sealed & dated – Complete
APPENDIX I

CURTIS BAY DEPOT
DRUMS SAMPLED FOR ON-SITE ARCHIVE
(THIRD DRUM OF ARCHIVED SAMPLES)
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.

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Curtis Bay Depot
Lot #1 - Drum #111
Inspect, Sample & Archive
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

Lot #: 1    Drum ID #: 111    Location: Warehouse 913 – Column F – Row 2

Site: Hammond or Curtis Bay (circle one)

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

Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm² <20 α & <200β γ
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/bg (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

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  
Drum ID No.: 111

**Inspection/Sample Date & Time**

Date: 7-12-2002  
Time: 08:15

**Physical Location of Drum**

Warehouse: 913  
Row: 3  
Column: F

**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.
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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.
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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

## Physical Location of Drum

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| Photo No.  | 3 of 9     |

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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.
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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.
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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

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### Visual Inspection & Sampling

- **Inspection/Sample Disposition**: Archive

### Physical Location of Drum

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### 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
Drum ID No. 111

Inspection/Sample Date & Time
Date 7-12-2002
Time 08:15

Physical Location of Drum
Warehouse 913
Row 3
Column F

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

<table>
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### Physical Location of Drum

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<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</table>

ThN material – monolith – white – solid - dry
No gases present in the breathing zone.
**General Information**

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**Physical Location of Drum**

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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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</tbody>
</table>

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/300cm2 <20 α & <200β

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

<table>
<thead>
<tr>
<th>Site</th>
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<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
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<th>Inspection/Sample Disposition</th>
<th>Visual Inspection &amp; Sampling Archive</th>
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### Physical Location of Drum

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<td>Row</td>
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### Inspection/Sample Date & Time

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### Other Information

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<tr>
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<th>Surface</th>
<th>22 mR/hr</th>
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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30-gal drum – good condition
### General Information

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### Other Information

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### Dose Rate

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1st poly liner/bag – good condition
No gases present in the breathing zone.
**General Information**

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*Inspection/Sample Disposition*  
Visual Inspection & Sampling Archive

**Physical Location of Drum**

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**Other Information**

<table>
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Dose Rate

- Surface: 22 mR/hr
- 1 meter: 2.6 mR/hr

Fiber drum lid – good condition  
No gases present in the breathing zone.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

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**Inspection/Sample Visual Inspection & Sampling Disposition Archive**

**Physical Location of Drum**

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**Other Information**

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<th>Photo No.</th>
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**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**

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<tr>
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<td>1 meter 2.6 mR/hr</td>
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3rd poly liner/bag – good condition
No gases present in the breathing zone.
## General Information

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## Physical Location of Drum

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Wooden lid – good condition
No gases present in the breathing zone.
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<td><strong>Dose Rate</strong></td>
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<tr>
<td><strong>Surface</strong></td>
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<tr>
<td><strong>1 meter</strong></td>
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</table>

4th poly liner/bag – good condition  
No gases present in the breathing zone.
### General Information
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 4
- **Drum ID No.**: 142
- **Inspection/Sample 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**

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<td>Visual Inspection &amp; Sampling Archive</td>
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**Physical Location of Drum**

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**Inspection/Sample Date & Time**

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**Other Information**

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</table>
| 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

Outer Container Type/Capacity (French and Indian Drums only): Not Applicable
Outer Container Thickness of Outer Container: Units:
Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm² <20 α & <200β
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
Drum ID No. 111

Inspection/Sample Disposition
Visual Inspection & Sampling 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
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### Physical Location of Drum

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Black plastic lid – good condition
No gases present in the breathing zone.
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1st poly liner/bag – good condition
No gases present in the breathing zone
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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

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Fiber drum lid (outermost fiber drum) – good condition
No gases present in the breathing zone.
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2" poly liner/bag – good condition
No gases present in the breathing zone.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 5
- **Drum ID No.**: 111
- **Inspection/Sample 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
Drum ID No.  111

Inspection/Sample Date & Time
Date  7-12-2002
Time  13:45

Physical Location of Drum
Warehouse  913
Row  8
Column  F

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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**
- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 5
- **Drum ID No.**: 111

**Visual Inspection & Sampling**
- 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.
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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

**Physical Location of Drum**

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**Inspection/Sample Date & Time**

Date: 7-12-2002  
Time: 13:45

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<tbody>
<tr>
<td></td>
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Sealed & dated – Complete
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

Rad Measurements at the time of opening: DR at Surface 22 mR/hr DR at 1 meter 2.6 mR/hr dpm/300cm² <20 α & <200Bq
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/bag
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

I-42
<table>
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| Visual Inspection & Sampling |
| Archive                   |

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30-gal metal drum – Picture did not take
## Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

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### 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

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1st poly liner/bag – good condition  
No gases present in the breathing zone
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

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**Visual Inspection & Sampling Archive**

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Fiber drum lid – Picture did not take
No gases present in the breathing zone.
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2nd poly liner/bag – good condition
No gases present in the breathing zone
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3rd poly liner/bag – good condition
No gases present in the breathing zone.
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<tr>
<td>ThN Origin</td>
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<td></td>
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<tr>
<td>Lot No.</td>
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<td></td>
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</tr>
<tr>
<td>Drum ID No.</td>
<td>175</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 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
- **Drum ID No.**: 175
- **Inspection/Sample 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

<table>
<thead>
<tr>
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</thead>
<tbody>
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<tr>
<td>Drum ID No.</td>
<td>175</td>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
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## Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>913</th>
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</thead>
<tbody>
<tr>
<td>Row</td>
<td>8</td>
</tr>
<tr>
<td>Column</td>
<td>D</td>
</tr>
</tbody>
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## Inspection/Sample Date & Time

<table>
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<tr>
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<tbody>
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<td>Time</td>
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## Other Information

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<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.
### General Information

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 6
- **Drum ID No.**: 175
- **Inspection/Sample Disposition**: Archive
- **Visual Inspection & Sampling**: 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/300cm² <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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
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<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>7</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>59</td>
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</table>

### Visual Inspection & Sampling

**Inspection/Sample Disposition**

<table>
<thead>
<tr>
<th>Inspection/Sample</th>
<th>Visual Inspection &amp; Sampling</th>
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</thead>
<tbody>
<tr>
<td>Date</td>
<td>7-12-2002</td>
</tr>
<tr>
<td>Time</td>
<td>09:15</td>
</tr>
</tbody>
</table>

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>Row</th>
<th>Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>913</td>
<td>1</td>
<td>E</td>
</tr>
</tbody>
</table>

### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>1 of 10</th>
</tr>
</thead>
</table>

#### Dose Rate

<table>
<thead>
<tr>
<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
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<td>Disposition</td>
<td>Archive</td>
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## Physical Location of Drum

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<td>Row</td>
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</table>

## Inspection/Sample Date & Time

<table>
<thead>
<tr>
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<tbody>
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## Other Information

<table>
<thead>
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<th>2 of 10</th>
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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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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### Physical Location of Drum

<table>
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<tbody>
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</tr>
<tr>
<td>Column</td>
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### Inspection/Sample Date & Time

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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
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</table>

- 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

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<tbody>
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### Physical Location of Drum

<table>
<thead>
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<th>Warehouse</th>
<th>913</th>
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</thead>
<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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### Inspection/Sample Date & Time

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<th>7-12-2002</th>
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<tbody>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
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</table>

- **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
Drum ID No.: 59

**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.
<table>
<thead>
<tr>
<th>General Information</th>
<th>Visual Inspection &amp; Sampling Disposition Archive</th>
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</thead>
<tbody>
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<td>Lot No.</td>
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<td>Drum ID No.</td>
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<td>Inspection/Sample Date &amp; Time</td>
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<td>Physical Location of Drum</td>
<td>Disposition</td>
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<td>Warehouse</td>
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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
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</table>

3” poly liner/bag – good condition
No gases present in the breathing zone.
General Information

Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 7
Drum ID No.: 59
Inspection/Sample Disposition: Visual Inspection & Sampling 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

<table>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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### Other Information

<table>
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<th>Photo No.</th>
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</tr>
</thead>
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- **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
- **Drum ID No.**: 59
- **Inspection/Sample Disposition**: Visual Inspection & Sampling 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
Drum ID No. 59
Inspection/Sample Disposition Visual Inspection & Sampling 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/300cm² <20 α & <200Bq
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/bg (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 #: 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
- **Drum ID No.:** 127
- **Inspection/Sample 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
## Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

### General Information

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
<tr>
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<td>Drum ID No.</td>
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### Physical Location of Drum

<table>
<thead>
<tr>
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<td>Row</td>
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### Inspection/Sample Date & Time

<table>
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<tbody>
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### Other Information

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<th>2 of 11</th>
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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

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
Drum ID No. 127
Inspection/Sample
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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
<th>Inspection/Sample Disposition</th>
<th>Visual Inspection &amp; Sampling Archive</th>
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<tbody>
<tr>
<td>ThN Origin</td>
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<td></td>
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## Physical Location of Drum

<table>
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## Inspection/Sample Date & Time

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<th>Time</th>
<th>10:15</th>
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</thead>
</table>

## 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.
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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.
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling | Archive |

**Physical Location of Drum**

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**Other Information**

| Photo No. | 6 of 11 |

- **Dose Rate**
  - Surface: 22 mR/hr
  - 1 meter: 2.6 mR/hr

3" 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
- **Drum ID No.**: 127

**Inspection/Sample Date & Time**

- **Date**: 7-12-2002
- **Time**: 10:15

**Physical Location of Drum**

- **Warehouse**: 913
- **Row**: 6
- **Column**: D

**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
Drum ID No.: 127

Inspection/Sample Disposition
Visual Inspection & Sampling 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.
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<tr>
<td></td>
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*4th poly liner/bag – good condition*
*No gases present in the breathing zone.*
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Inspection/Sample Disposition | Visual Inspection & Sampling Archive

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ThN material – monolith – white – solid – dry
No gases present in the breathing zone.
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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/300cm² <20 α & <200Bγ

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

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</table>

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

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<thead>
<tr>
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<td></td>
<td>1 meter</td>
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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

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**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)*

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### Inspection/Sample Date & Time

**Date** 7-12-2002  **Time** 10:45

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*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 Date & Time
Date: 7-12-2002
Time: 10:45

Physical Location of Drum
Warehouse: 913
Row: 4
Column: D

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.

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**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)

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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.
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**Inspection/Sample**

- **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)*

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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
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**Inspection/Sample Visual Inspection & Sampling**

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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

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>913</th>
</tr>
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<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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### Inspection/Sample Date & Time

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<tr>
<td>Time</td>
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</table>

### Other Information

<table>
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<tr>
<th>Photo No.</th>
<th>7 of 11</th>
</tr>
</thead>
</table>

**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**

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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</tr>
<tr>
<td>Lot No.</td>
<td>9</td>
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<tr>
<td>Drum ID No.</td>
<td>24</td>
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**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**

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<thead>
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**Other Information**

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<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.0 mR/hr</td>
</tr>
</tbody>
</table>

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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

<table>
<thead>
<tr>
<th>Site</th>
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<tr>
<td>ThN Origin</td>
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<td>Visual Inspection &amp; Sampling</td>
</tr>
<tr>
<td>Disposition</td>
<td>Archive</td>
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</tbody>
</table>

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**

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<tr>
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**Other Information**

<table>
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<th>Photo No.</th>
<th>10 of 11</th>
</tr>
</thead>
</table>

- **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**

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<thead>
<tr>
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<th>Curtis Bay</th>
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</thead>
<tbody>
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<th>Visual Inspection &amp; Sampling</th>
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</thead>
<tbody>
<tr>
<td>Disposition</td>
<td>Archive</td>
</tr>
</tbody>
</table>

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**

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**Other Information**

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<table>
<thead>
<tr>
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<th>Surface</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.0 mR/hr</td>
</tr>
</tbody>
</table>

Sealed & dated - Complete
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/300cm² <20 α & <200 Bq

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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
<td>Domestic</td>
</tr>
<tr>
<td>Lot No.</td>
<td>10</td>
</tr>
<tr>
<td>Drum ID No.</td>
<td>135</td>
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</tbody>
</table>

| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>913</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
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</tr>
<tr>
<td>Column</td>
<td>D</td>
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</table>

### Inspection/Sample Date & Time

<table>
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<tr>
<th>Date</th>
<th>7-12-2002</th>
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<tbody>
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<td>Time</td>
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### Other Information

<table>
<thead>
<tr>
<th>Photo No.</th>
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</tr>
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<table>
<thead>
<tr>
<th>Dose Rate</th>
<th>Surface</th>
<th>22 mR/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

30-gal drum – good condition
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**
- Site: Curtis Bay
- ThN Origin: Domestic
- Lot No.: 10
- Drum ID No.: 135
- Inspection/Sample 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

<table>
<thead>
<tr>
<th>Site</th>
<th>Curtis Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
<td>Lot No.</td>
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</tr>
<tr>
<td>Drum ID No.</td>
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- **Inspection/Sample Disposition**
- **Visual Inspection & Sampling Archive**

### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
<td>D</td>
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</tbody>
</table>

### 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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

| Site | Curtis Bay |
| ThN Origin | Domestic |
| Lot No. | 10 |
| Drum ID No. | 135 |

**Inspection/Sample Visual Inspection & Sampling 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.
<table>
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<tr>
<th><strong>General Information</strong></th>
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<tbody>
<tr>
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<td><strong>Lot No.</strong></td>
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<tbody>
<tr>
<td><strong>Warehouse</strong></td>
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<td><strong>Time</strong></td>
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</tr>
<tr>
<td><strong>Dose Rate</strong></td>
<td>Surface 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

2<sup>nd</sup> poly liner/bag – good condition
No gases present in the breathing zone.
### General Information

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</thead>
<tbody>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

### Physical Location of Drum

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<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

3rd poly liner/bag – good condition
No gases present in the breathing zone.
<table>
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<tr>
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<tbody>
<tr>
<td>Site</td>
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<td>Drum ID No.</td>
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<td>Inspection/Sample</td>
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<td>Disposition</td>
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<td>Photo No.</td>
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<tr>
<td>Dose Rate</td>
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</table>

*Wooden lid – good condition
No gases present in the breathing zone.*
## General Information

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</tr>
<tr>
<td>Drum ID No.</td>
<td>135</td>
</tr>
</tbody>
</table>

### 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
Drum ID No.   135

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

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<table>
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<tr>
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<th>Visual Inspection &amp; Sampling Archive</th>
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<tbody>
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<tr>
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<th>Surface</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</table>

Sealed & dated - Complete
Curtis Bay Depot
Lot #13 - Drum #124
Inspect, Sample & Archive
CONTAINER INSPECTION CHECKLIST

CONTAINER INFORMATION

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/300cm² <20 α & <200β
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
Drum ID No.: 124
Inspection/Sample Disposition
Visual Inspection & Sampling 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
Drum ID No.: 124
Inspection/Sample 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
- Drum ID No.: 124
- Inspection/Sample Disposition: Visual Inspection & Sampling 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.
# Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

## General Information

<table>
<thead>
<tr>
<th>Site</th>
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<tr>
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**Inspection/Sample Disposition**

Visual Inspection & Sampling Archive

## Physical Location of Drum

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**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

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<tr>
<td>1 meter</td>
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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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**
- Site: Curtis Bay
- ThN Origin: Domestic
- Lot No.: 13
- Drum ID No.: 124

**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**

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<tr>
<td></td>
<td>1 meter</td>
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Wooden lid – good condition
No gases present in the breathing zone.
### Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

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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

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4"th 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**

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</table>

ThN material – monolith – white – solid – dry
No gases present in the breathing zone.
**General Information**

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<tr>
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<td>1 meter 2.6 mR/hr</td>
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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/300cm² <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/bg (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
Drum ID No.     83

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

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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

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<th>1 meter</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>22 mR/hr</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

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

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<tbody>
<tr>
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<tr>
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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

### Physical Location of Drum

<table>
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<th>913</th>
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<tbody>
<tr>
<td>Row</td>
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<tr>
<td>Column</td>
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### Inspection/Sample Date & Time

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### Other Information

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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

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Inspection/Sample Disposition Visual Inspection & Sampling Archive

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Dose Rate

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<tbody>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</table>

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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

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**Inspection/Sample Disposition**

- Visual Inspection & Sampling 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

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3” 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
Drum ID No. 83

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
Drum ID No. 83

Inspection/Sample Disposition Visual Inspection & Sampling

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.
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<td>1 meter 2.6 mR/hr</td>
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<td></td>
<td>No gases present in the breathing zone</td>
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</tbody>
</table>
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 21
- **Drum ID No.**: 83
- **Inspection/Sample 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/300cm² <20 α & <200β
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/bg (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 #: Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002
### General Information

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<td>ThN Origin</td>
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<td>Visual Inspection &amp; Sampling Archive</td>
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### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
<th>913</th>
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<tbody>
<tr>
<td>Row</td>
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### Inspection/Sample Date & Time

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### Other Information

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<tr>
<th>Photo No.</th>
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<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr, 1 meter 2.6 mR/hr</td>
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</tbody>
</table>

30-gal drum – good condition
# Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

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## Inspection/Sample Disposition

- **Inspection/Sample**
- **Visual Inspection & Sampling 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

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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
Drum ID No.: 200

Inspection/Sample Disposition
Visual Inspection & Sampling 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.
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2"nd 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

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### 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

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**Inspection/Sample Disposition Visual Inspection & Sampling Archive**

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**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**

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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

**Physical Location of Drum**

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<th>913</th>
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**Inspection/Sample Date & Time**

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<tr>
<td>Time</td>
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**Other Information**

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<th>Photo No.</th>
<th>8 of 11</th>
</tr>
</thead>
</table>

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**

<table>
<thead>
<tr>
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<tbody>
<tr>
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<tr>
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</tr>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</table>

4th poly liner/bag – good condition (inflated bag indicates gas generation from ThN material)
No gases present in the breathing zone.
### General Information

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### 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**

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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

**Physical Location of Drum**

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<tbody>
<tr>
<td>1 meter</td>
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Sealed & dated – Complete
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/300cm² <20 α & <200Bγ
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/bag
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
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<thead>
<tr>
<th><strong>General Information</strong></th>
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<td>ThN Origin</td>
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<td>Surface</td>
<td>22 mR/hr</td>
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<td>1 meter</td>
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30-gal drum – good condition
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Black plastic lid – good condition
No gases present in the breathing zone.
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| Physical Location of Drum            |                              |
| Warehouse                            | Row                          |
| 913                                  | 4                            |
|                                      | Column                       |
|                                      | C                            |

| Inspection/Sample Date & Time        |                              |
| Date                                 | Time                         |
| 7-12-2002                            | 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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

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Dose Rate

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<tbody>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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Fiber drum lid (on outermost fiber drum inside of 30-gal drum) – good condition
No gases present in breathing zone.
**General Information**

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**Inspection/Sample Disposition Visual Inspection & Sampling Archive**

**Physical Location of Drum**

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<tr>
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*2nd poly liner/bag – good condition
No gases present in the breathing zone.*
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### 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.
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<td>Dose Rate</td>
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</tr>
<tr>
<td>Surface 22 mR/hr</td>
<td></td>
</tr>
<tr>
<td>1 meter 2.6 mR/hr</td>
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Wooden lid – good condition
No gases present in the breathing zone.
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<td></td>
<td>1 meter</td>
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Lab-pack paper layer lid – broken upon removal of wooden lid
No gases present in the breathing zone.
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<tbody>
<tr>
<td></td>
<td>1 meter</td>
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4th poly liner/bag – good condition
No gases present in the breathing zone.
## General Information

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### Inspection/Sample Disposition

- **Visual Inspection & Sampling**
- **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

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<tr>
<th>Site</th>
<th>Curtis Bay</th>
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<tbody>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<td>Time</td>
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<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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</tbody>
</table>

Sealed & dated – Complete
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/300cm² <20 α & <2008γ

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 #(): Label Seal with Date & Initials

Checklist completed by: T. Cunningham (signature on file) Date: 7-12-2002
<table>
<thead>
<tr>
<th><strong>General Information</strong></th>
<th></th>
<th><strong>Inspection/Sample Disposition</strong></th>
<th><strong>Visual Inspection &amp; Sampling Archive</strong></th>
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<tr>
<td>Site</td>
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| **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  
Drum ID No.: 00  
Inspection/Sample 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

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### Physical Location of Drum

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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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</table>

1st poly liner/bag – good condition
No gases present in the breathing zone.
### General Information

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### Physical Location of Drum

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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</table>

Fiber drum lid – good condition
No gases present in the breathing zone.
**General Information**

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**Visual Inspection & Sampling**

**Disposition** Archive

**Physical Location of Drum**

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**Other Information**

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**Dose Rate**

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</thead>
<tbody>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

2"nd 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

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### Other Information

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<th>Photo No.</th>
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</table>

- **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).
<table>
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<tr>
<th><strong>General Information</strong></th>
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| **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.
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<tr>
<td>1 meter</td>
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</table>

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/300cm² <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/bag
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

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<thead>
<tr>
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### Physical Location of Drum

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### Inspection/Sample Date & Time

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<tr>
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<td>1 meter 2.6 mR/hr</td>
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30-gal drum – good condition
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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

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<tbody>
<tr>
<td>ThN Origin</td>
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<tr>
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<tr>
<td>Inspection/Sample Disposition</td>
<td>Visual Inspection &amp; Sampling Archive</td>
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### Physical Location of Drum

<table>
<thead>
<tr>
<th>Warehouse</th>
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<tr>
<td>Row</td>
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<tr>
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<td>Surface 22 mR/hr</td>
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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

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**Inspection/Sample Disposition**

- Visual Inspection & Sampling Archive

**Physical Location of Drum**

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**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
Drum ID No.: 149

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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

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| Photo No. | 6 of 11 |

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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
Drum ID No.: 149

Inspection/Sample Date & Time
Date: 7-12-2002
Time: 11:15

Physical Location of Drum
Warehouse: 913
Row: 8
Column: C

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.
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

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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.
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- **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.
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ThN material – monolith – white – solid – dry

No gases present in the breathing zone.
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**Inspection/Sample Disposition**

**Visual Inspection & Sampling Archive**

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Sealed & dated - Complete
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

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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/300cm² <20 α & <200 βγ

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
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| 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.
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**Inspection/Sample Disposition**

| Visual Inspection & Sampling Archive |

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## 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**

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1st poly liner/bag – good condition  
No gases present in the breathing zone.
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Fiber drum lid – good condition
No gases present in the breathing zone.
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**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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

Site: Curtis Bay  
ThN Origin: Domestic  
Lot No.: 46  
Drum ID No.: 24  
Inspection/Sample Disposition: Archive  
Visual Inspection & Sampling

**Physical Location of Drum**

Warehouse: 913  
Row: 3  
Column: B  
Physical Location: 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

3" poly liner/bag – good condition  
No gases present in the breathing zone.
### General Information

<table>
<thead>
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</thead>
<tbody>
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<td>Drum ID No.</td>
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**Visual Inspection & Sampling**

**Inspection/Sample Disposition**

**Physical Location of Drum**

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**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.
Curtis Bay Depot Drums Sampled for On-site Archive (Third Drum of Archived Samples)

**General Information**

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**Physical Location of Drum**

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<tbody>
<tr>
<td></td>
<td>1 meter</td>
<td>2.0 mR/hr</td>
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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.
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### Inspection/Sample Disposition

| Visual Inspection & Sampling | Archive |

### Physical Location of Drum

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4th poly liner/bag – good condition
No gases present in the breathing zone.
### General Information

**Site**  | Curtis Bay  
**ThN Origin**  | Domestic  
**Lot No.**  | 46  
**Drum ID No.**  | 24  

**Inspection/Sample Disposition**  | Visual Inspection & Sampling 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
Drum ID No. 24
Inspection/Sample Disposition  Visual Inspection & Sampling 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/300cm² <20 α & <200Bq

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/bg (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**

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**Inspection/Sample**

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Dose Rate

<table>
<thead>
<tr>
<th>Surface</th>
<th>22 mR/hr</th>
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<tbody>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
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30-gal drum – good condition
No gases present in the breathing zone.
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<tr>
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<td>1 meter 2.6 mR/hr</td>
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</table>

- Black plastic lid – good condition
- No gases present in the breathing zone.
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<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
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1st poly liner/bag – good condition
No gases present in the breathing zone.
## General Information

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| Inspection/Sample Disposition | Visual Inspection & Sampling Archive |

## Physical Location of Drum

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## 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**

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**Inspection/Sample**

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2nd poly liner/bag – good condition
No gases present in the breathing zone.
General Information
Site: Curtis Bay
ThN Origin: Domestic
Lot No.: 63
Drum ID No.: 5
Inspection/Sample 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

3\textsuperscript{rd} poly liner/bag – good condition
No gases present in the breathing zone.
**General Information**

- **Site**: Curtis Bay
- **ThN Origin**: Domestic
- **Lot No.**: 63
- **Drum ID No.**: 5

**Inspection/Sample**
- **Date**: 7-12-2002
- **Time**: 11:30

**Physical Location of Drum**
- **Warehouse**: 913
- **Row**: 5
- **Column**: C

**Disposition**
- **Visual Inspection & Sampling Archive**

**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.
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Lab-pack paper layer lid – broken upon removal of the wooden lid.
No gases present in the breathing zone.
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**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**

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<td>Column</td>
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</tr>
</tbody>
</table>

**Inspection/Sample Date & Time**

<table>
<thead>
<tr>
<th>Date</th>
<th>7-12-2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>11:30</td>
</tr>
</tbody>
</table>

**Other Information**

<table>
<thead>
<tr>
<th>Photo No.</th>
<th>10 of 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose Rate</td>
<td>Surface 22 mR/hr</td>
</tr>
<tr>
<td></td>
<td>1 meter 2.6 mR/hr</td>
</tr>
</tbody>
</table>

ThN material – monolith – white – solid - dry
No gases present in the breathing zone.
<table>
<thead>
<tr>
<th>General Information</th>
<th>Visual Inspection &amp; Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>Archive</td>
</tr>
<tr>
<td>Curtis Bay</td>
<td></td>
</tr>
<tr>
<td>ThN Origin</td>
<td></td>
</tr>
<tr>
<td>Domestic</td>
<td></td>
</tr>
<tr>
<td>Lot No.</td>
<td>Inspection/Sample Disposition</td>
</tr>
<tr>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Drum ID No.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Location of Drum</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse</td>
<td>Row</td>
</tr>
<tr>
<td>913</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Column</td>
</tr>
<tr>
<td></td>
<td>C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inspection/Sample Date &amp; Time</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>7-12-2002</td>
</tr>
<tr>
<td>Time</td>
<td>11:30</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Other Information</th>
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</thead>
<tbody>
<tr>
<td>Photo No.</td>
<td>11 of 11</td>
</tr>
<tr>
<td>Dose Rate</td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>22 mR/hr</td>
</tr>
<tr>
<td>1 meter</td>
<td>2.6 mR/hr</td>
</tr>
</tbody>
</table>

Sealed & dated - Complete
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.

<table>
<thead>
<tr>
<th>Shipment No.</th>
<th>Lot Number</th>
<th>Page No.</th>
<th>Shipment No.</th>
<th>Lot Number</th>
<th>Page No.</th>
</tr>
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<tbody>
<tr>
<td>6990-001-001</td>
<td>8</td>
<td>J-5</td>
<td>6990-001-005</td>
<td>17</td>
<td>J-15</td>
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<td><strong>Hammond Depot</strong></td>
<td></td>
<td></td>
<td><strong>Curtis Bay Depot</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1st Sample Shipment</strong></td>
<td></td>
<td></td>
<td><strong>4th Sample Shipment</strong></td>
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<td></td>
</tr>
<tr>
<td>8 Drum Lots</td>
<td></td>
<td></td>
<td>12 Drum Lots</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.088 kg</td>
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<td>14.936 kg</td>
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<td></td>
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<td>(includes 741 form)</td>
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<tr>
<td>6990-001-003</td>
<td>I-3</td>
<td>J-7</td>
<td>6990-001-006</td>
<td>2</td>
<td>J-17</td>
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<td><strong>Curtis Bay Depot</strong></td>
<td></td>
<td></td>
<td><strong>5th Sample Shipment</strong></td>
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<tr>
<td><strong>2nd Sample Shipment</strong></td>
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<td></td>
<td><strong>10 Drum Lots</strong></td>
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<td></td>
</tr>
<tr>
<td>10 Drum Lots</td>
<td></td>
<td></td>
<td>11.759 kg</td>
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<td></td>
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<td>(includes 741 form)</td>
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<tr>
<td>6990-001-004</td>
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<td>J-11</td>
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<tr>
<td><strong>Curtis Bay Depot</strong></td>
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<td></td>
<td></td>
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<td></td>
</tr>
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<td><strong>3rd Sample Shipment</strong></td>
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</tr>
<tr>
<td>13 Drum Lots</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>15.408 kg</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(includes 741 form)</td>
<td></td>
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</tr>
</tbody>
</table>
Shipment No. 6990-001-001
(First Sample Shipment)
## Sample Shipping Documentation

### SHIPPER'S DECLARATION FOR DANGEROUS GOODS

**Shipper**
D.E.A. - Hammond Depot  
3200 Sheffield Avenue  
Hammond, IN 46327-1001  
219-937-5383

**Consignee**
Southwest Research Institute  
Attn: John P. Nageman  
6220 Colorado Road  
San Antonio, TX 78238  
210-522-2633

**FedEx**
Federal Express

**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 consignor, a forwarder or an IATA cargo agent.

**TRANSPORT DETAILS**
This shipment is within the limitations prescribed for:  

<table>
<thead>
<tr>
<th><strong>Type of Container</strong></th>
<th><strong>Transport</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CARGO</td>
<td>AIRCRAFT ONLY</td>
</tr>
</tbody>
</table>

**Airport of Departure:**

**Airport of Destination:**

**NATURE AND QUANTITY OF DANGEROUS GOODS**
Proper Shipping name, Class or Division, UN Number or Identification Number, Packaging Group (if required), and all other required information

- Radioactive material, Type A package, 7, UN2915, II, 5.1/1
- Th228, Th230, Solid/Nitrates - Radioactive Material - 10.088kg Thorium Nitrate, 1 (one) x  
  Type A Package, 1.13E+02 MBq - All Packed in UN3171
- II-Yellow, TI: 0.3, 60.2 cm Diameter x 87 cm Height

**Additional Handling Information**
NA

**ERG Box:** 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/packaged, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

**Emergency Telephone Number (Required for US Origin or Destination Shipments):**

**Name/Title of Signatory**
Frank J. Falgier, QA Specialist

**Place and Date**
Hammond Depot, Hammond, IN - 6/12/2002

**Signature**
[Signature]

**IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENTAL TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.**
Shipment No. 6990-001-003
(Second Sample Shipment)
SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper
DLA - Curtis Bay Depot
710 E. Ordnance Road
Baltimore, MD 21226-1742
(0) 410-962-2346

Consignee
Southwest Research Institute
Attn: John P. Hageman
6220 Culebra Road
San Antonio, TX 78238
(0) 210-522-2633

Air Waybill No. 835674245624
Page of Pages
Shipper's Reference Number
(optional) 6990-001-003

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.

Shipment type: (N/A - non-applicable)

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, S.17
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, II: 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
CHMREC - (800)424-9300

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 labeled/packaged, and are in all
respects for proper condition for transport according to applicable
International and National Governmental Regulations.

Emergency Telephone Number (Required for US Origin or Destination Shipments)
CHMREC - (800)424-9300

Name/Title of Signatory: Allen Bixler
QA Specialist
Place and Date: Curtis Bay Depot
Baltimore, MD - 7/10/2002

Signature (see warning above)
<table>
<thead>
<tr>
<th>1. SHIPPER'S RIS</th>
<th>2. RECEIVER'S RIS</th>
<th>3. TRANSACTION NO.</th>
<th>4. CORRECTION NO.</th>
<th>5. PROCESS CODE</th>
<th>6. ACTION CODE</th>
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<td></td>
</tr>
</tbody>
</table>

| OF SHIPPER       | OF RECEIVER      |                    |                   |                |
| Defense Logistics Agency | SOUTHWEST RESEARCH INSTITUTE |                    |                   |                |
| Stockpiles       |                   |                    |                   |                |
| Turtle Bay Depot | 5220 CULEBRO RD.  |                    |                   |                |
| 110 E. Ordnance Road | SAN ANTONIO, TX 78232 |                    |                   |                |
| Baltimore, MD 21224-1742 |                  |                    |                   |                |

15. TRANSFER AUTHORITY - CONTRACT, WM 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

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<tr>
<th>CARR. ID</th>
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<th>MONTH</th>
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<td></td>
<td></td>
<td></td>
<td>2002</td>
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<td>2</td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

21. MISCELANEOUS

| 3        | C. RECEIPT   |
| 4        | D. RECEIVER'S MEASUREMENT |
| 5        | E. RECEIVER'S CORRECTION |

22. TOTAL GROSS WEIGHT

23. TOTAL VOLUME

C. CONCISE NOTE ATTACHED YES NO X

D. CONCISE NOTE ATTACHED YES NO X

18. U.S.C., SECTION 1001; ACT OF JUNE 25, 1968; 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.
### Transfer Series

<table>
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<tr>
<th>LN NO.</th>
<th>IDENTIFICATION</th>
<th>NO. OF ITEMS</th>
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<th>MT. COMP.</th>
<th>Q.</th>
<th>COUNTRY</th>
<th>K.</th>
<th>MEAS.</th>
<th>WEIGHT %</th>
<th>ELEMENT</th>
<th>ISOTOPES</th>
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</table>

#### Shipper's Data

- Date: 7/10/02
- Signature: [Signature]

#### 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]
Shipments No. 6990-001-004  
(Third Sample Shipment)
**Shipper's Declaration for Dangerous Goods**

- **Shipper:** DLA - Curtis Bay Depot
  
  710 E. Ordinance Road
  
  Baltimore, MD 21226-1742
  
  (301) 410-962-2346
  
- **Consignee:** Southwest Research Institute
  
  Attn: John P. Hageman
  
  6220 Culebra Road
  
  San Antonio, TX 78238
  
  (210) 216-522-2633

Two completed and signed copies of this Declaration must be handed to the operator.

**Transport Details**

- This shipment is within the limitations proscribed for: Cargo Aircraft Only

**Airport of Departure**

- [FedEx Logo]

**Nature and Quantity of Dangerous Goods**

**Proper Shipping Name:** Radioactive material, Type A package, 7, UN2915, II, 5.1

**Description:** Th228, Th230, Solid/Nitrate - Radioactive material - 15.408 kg Thorium Nitrate, 1 (one) x Type A Package, 1.728E+02 MBq - All Packages One

**Additional Handling Information**

**ERG Nos.:** 153(UN2915), 162(UN2976-Domestic DOT), 140(UN1477-Subsidiary Risk)

**Emergency Telephone Number:** CHEMTREC - 800-424-9300

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/packaged, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

**Name/Title of Signatory:** Allen Bixler

**Place and Date:** Curtis Bay Depot

**Signature:** 7/10/2002

---

**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.
DOE/NRC FORM 741

U. S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION
NUCLEAR MATERIAL TRANSACTION REPORT

1. SHIPPER'S RIS|2. RECEIVER'S RIS|3. TRANSACTION NO.| 4. CORRECTION NO. | 5. PROCESS CODE | 7. ACTION CODE | COPY
| VOK | VTF | 9000002 | SHIPPER A | A | [1] | [1] |

| OF SHIPPER | OF RECIEVER | OF SHIPPER | OF RECEIVER | | |
Defense Logistics Agency / Stockpile | SOUTHWEST RESEARCH INSTITUTE | 6220 CULEBRA RD. | SAN ANTONIO, TX 78232 | | |
Curtiss Bay Depot | | | | | |
710 S. Ordinance Road | | | | | |
Baltimore, MD 21225-1742 | | | | | |

15. TRANSFER AUTHORITY - CONTRACT, BM DRAFT, OR ORDER NUMBER | 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
| 4 | CRR No.| TRANSP. NO. | MODEL NO. | MONTH/YEAR |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

21. MISCELLANEOUS

R. CONSISE NOTE ATTACHED | YES NO |
| | X |
C. CONSISE NOTE ATTACHED | YES NO |
| | X |

18. U.S.C., SECTION 1001; ACT OF JUNE 25, 1946; 52 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.
**Sample Shipping Documentation**

<table>
<thead>
<tr>
<th>LN</th>
<th>IDENTIFICATION NO.</th>
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<th>P</th>
<th>COUNTRY</th>
<th>K</th>
<th>MEAS.</th>
<th>ELEMENT</th>
<th>WEIGHT &amp; ISOTOPE</th>
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</tr>
</tbody>
</table>

**Transfer Series**

**Signature of Authorized Official and Date Signed**

---

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**

**Shipper**
DKA - Curtis Bay Depot  
710 E. Ordnance Road  
Baltimore, MD 21226-1742  
(0) 410-962-2345

**Air Waybill No.** 835674245120  
**Page 1 of 1 Pages**

**Consignee**
Southwest Research Institute  
Attn: John P. Hageman  
6220 Culebra Road  
San Antonio, TX 78238  
(0) 210-522-2633

Two completed and signed copies of this Declaration must be handed to the operator.

**TRANSIT DETAILS**

This shipment is within the limitations prescribed for:  
(Cargo Aircraft Only)

**Airport of Departure**

**Airport of Destination**

**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.

**Shipment type:** (Please non-applicable)

**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, 1.875E+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(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/recorded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations.

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.

Name/Title of Signatory: Allen Bixler  
QA Specialist

Place and Date: Curtis Bay Depot  
Baltimore, MD - 7/18/2002

Signature (See warning above)
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. Ordnance Road
Baltimore, MD 21226-1742
(301) 410-962-2346

Consignee
Southwest Research Institute
Attn: John P. Hagaman
6220 Culebra Road
San Antonio, TX 78230
(210) 522-2633

Air Waybill No. 835674245110
Page 1 of 1 Pages
Shipper's Reference Number (optional) 6990-001-006

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:

CARGO AIRCRAFT
ONLY

Airport of Departure:

Airport of Destination:

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
ERC Nos.: 163(UN2915), 162(UN2976-Domestic DOT), 140(UN1477-Subsidiary Risk)
Emergency Telephone Number
CHENTREC - 800-424-9300

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/packarded, and are in all
respects in proper condition for transport according to applicable
International and National Governmental Regulations.

Emergency Telephone Number (Required by US Origin or Destination Shipment)
CHENTREC - 800-424-9300

Name/Title of Signatory: Allen Bixler
QA Specialist
Place and Date: Curtis Bay Depot
Baltimore, MD - 7/15/2002
Signature: (see warning above)
APPENDIX K

CHAIN OF CUSTODY AND SAMPLE ANALYSES REQUEST FORMS
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.

<table>
<thead>
<tr>
<th>Shipment No. or Archive Drum No.</th>
<th>Lot Number</th>
<th>Page No.</th>
<th>Shipment No. or Archive Drum No.</th>
<th>Lot Number</th>
<th>Page No.</th>
</tr>
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<td>6990-001-A1</td>
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K-3
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<td>6990-001-A3 Curtis Bay Depot 3rd Archived Drum 16 Drum Lots</td>
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Shipment No. 6990-001-001
(1st Sample Shipment)
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<tr>
<th>Sample ID No.</th>
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<th>Sample Collection Date &amp; Time</th>
<th>Sample Description</th>
<th>Mass (mg)</th>
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<td>HDD017086-1-2002</td>
<td>1 x 2 liter</td>
<td>6-2-02 10:30 AM</td>
<td>Floridura Nitrite Drum Sampling Project 300g</td>
<td>1571</td>
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</table>

**Notes:**
- Mass includes any packing materials inside the sample container with the Tn-1 container.
- Sample is stored and shipped at approximately 1°C.
- Sample is shipped to the laboratory at approximately 1°C.

**Sample Analysis:**
- Trace metals (IAP): ICP-MS, EPA Method 7471
- Total metals (IAP): ICP-MS, EPA Method 7471
- Nickel, Cadmium, lead, mercury (IAP): ICP-MS, EPA Method 7471
- Copper, zinc, manganese, iron, nickel (Ganesh): ICP-MS, EPA Method 7471

**Sample Handling:**
- Sample is shipped to the laboratory at approximately 1°C.
- Sample is stored and shipped at approximately 1°C.

**Sample Location:**
- Sample is stored and shipped at approximately 1°C.
- Sample is shipped to the laboratory at approximately 1°C.

**Sample Transport:**
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored and shipped at approximately 1°C.

**Sample Storage:**
- Sample is stored at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Release:**
- Sample is released to the laboratory at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Analysis:**
- Trace metals (IAP): ICP-MS, EPA Method 7471
- Total metals (IAP): ICP-MS, EPA Method 7471
- Nickel, Cadmium, lead, mercury (IAP): ICP-MS, EPA Method 7471
- Copper, zinc, manganese, iron, nickel (Ganesh): ICP-MS, EPA Method 7471

**Sample Handling:**
- Sample is shipped to the laboratory at approximately 1°C.
- Sample is stored and shipped at approximately 1°C.

**Sample Location:**
- Sample is shipped to the laboratory at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Transport:**
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Storage:**
- Sample is stored at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Release:**
- Sample is released to the laboratory at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Analysis:**
- Trace metals (IAP): ICP-MS, EPA Method 7471
- Total metals (IAP): ICP-MS, EPA Method 7471
- Nickel, Cadmium, lead, mercury (IAP): ICP-MS, EPA Method 7471
- Copper, zinc, manganese, iron, nickel (Ganesh): ICP-MS, EPA Method 7471

**Sample Handling:**
- Sample is shipped to the laboratory at approximately 1°C.
- Sample is stored and shipped at approximately 1°C.

**Sample Location:**
- Sample is shipped to the laboratory at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Transport:**
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Storage:**
- Sample is stored at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.

**Sample Release:**
- Sample is released to the laboratory at approximately 1°C.
- Sample is transported to the laboratory at approximately 1°C.
- Sample is stored at approximately 1°C.
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ED No.</th>
<th>Lot ID No.</th>
<th>Sample Container Type Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyst(s) &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tr>
<td>HD1090001-2002</td>
<td>6-10-02 @ 9:30 AM</td>
<td>1 x 2-3liter HDPB</td>
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<td>10</td>
<td>218*</td>
<td>1857</td>
<td>1749</td>
<td>Monel 600</td>
<td>Total Metals / Mercury (Method SW846-6020, 7471) Oxidizer Test (Method UN ST/SG/AC.10/1, Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectrometry – to be consistent with IBA 941.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
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*Mass includes any packing materials inside of the sample containers with the ThN material.

<table>
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<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>6-10-02 / 293D</td>
<td>6-10-02 / 161D</td>
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<tr>
<td>RM / Broker</td>
<td>Sam Hodges</td>
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<td>6-10-02 / 161D</td>
<td>6-12-02 / 1Z00</td>
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<td>Airbill No. 63167224566</td>
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<td>RSO</td>
<td>John P. Hagerman</td>
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<td>6-12-02 / 1400</td>
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</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagerman, 6200 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-3720 (info@swri.org)
### Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>TAN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
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<td>6-7-02 @ 1130</td>
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<td>1232</td>
<td>1232</td>
<td>Moocolithic</td>
<td>Total Metals &amp; Isotopes (Methods SW846-8123, 7447)</td>
<td>23 days</td>
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*Note: Tare weight includes any packing materials inside of the sample container with the TAN material.*

### Chain of Custody Receipt and Release Signatures

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<th>Printed Name</th>
<th>Signature</th>
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<th>Release Date/Time</th>
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<td>6-10-02 / 0939</td>
<td>6-10-02 / 1610</td>
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<td>PA/Broker</td>
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<td>Forwarder</td>
<td>AirTrak No. 815674245594</td>
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</table>

**RSC**

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): 210-522-2613 (F): 210-522-5720 (joh@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
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<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<td>130 (g)</td>
<td>1277 (g)</td>
<td>1147 (g)</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
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<td>180 days (other metals)</td>
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<td>Radionuclides—Thorium &amp; Uranium (Gamma Spectrometry—to be consistent with EPA 508.1 Method)</td>
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</tbody>
</table>

* Tare weight includes any packing material inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
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<th>Release Date/Time</th>
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<td></td>
<td>6-10-02 / 0930</td>
<td>6-10-02 / 1610</td>
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<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>6-10-02 / 1610</td>
<td>6-12-02 / 1205</td>
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<tr>
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<td>John P. Hageman</td>
<td></td>
<td>6-19-02 / 1400</td>
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</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 5220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (P) 210-522-5728 (phk@sri.com)
**Thorium Nitrate Drum Sampling Project**

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD900701-2002</td>
<td>6-7-02 @ 1300</td>
<td>1 x 2-liter HDPE</td>
<td>5</td>
<td>33</td>
<td>120*</td>
<td>1170</td>
<td>1049</td>
<td>Mo/Al/Na</td>
<td>Total Metals / Mercury</td>
<td>28 days (24 h)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/6G/AC1.10/11 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

**Chain of Custody Receipt and Release Signatures**

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Teo Cunningham</td>
<td></td>
<td>6-10-02 / 0930</td>
<td>6-10-02 / 1510</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>6-10-02 / 1110</td>
<td>6-12-02 / 1220</td>
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<tr>
<td>FedEx</td>
<td>Airbill No. 835748245646</td>
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<td>6-12-02 / 1400</td>
<td></td>
</tr>
<tr>
<td>RSO</td>
<td>John P. Heggeman</td>
<td></td>
<td>6-13-02 / 1800</td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Heggeman, 2200 Cañostra Blvd, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (john@swri.org)
## Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>TDM Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analytes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDS810651-2002</td>
<td>6-10-02 @ 12:30 PM</td>
<td>1 x 2-liter HDEP</td>
<td>25</td>
<td>38</td>
<td>1205</td>
<td>1091</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hi)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>Oxygen Test (Method: UN ST/SG/AC.1031 Rev. 3)</td>
<td>180 days (other metals)</td>
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<td>Radiometrics - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with HDS 901.1 Method)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Tare weight includes any packing materials inside of the sample container with the TDM material.

### Chain of Custody Receiver and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date / Time</th>
<th>Release Date / Time</th>
</tr>
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<tbody>
<tr>
<td>Sample Collector</td>
<td>Tony Carvalho</td>
<td></td>
<td>6-10-02 / 0930</td>
<td>6-10-02 / 1510</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>6-10-02 / 1610</td>
<td>6-12-02 / 1</td>
</tr>
<tr>
<td>Pades</td>
<td>Airbill No. 835674345646</td>
<td></td>
<td>6-12-02 /</td>
<td></td>
</tr>
<tr>
<td>RSO</td>
<td>John P. Hageman</td>
<td>John P. Hageman</td>
<td>6-12-02 / 1400</td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**

Southwest Research Institute, Attn: John P. Hageman, 8220 Culebra Road, San Antonio, TX 78238 (O) 210-322-2613 (F) 210-322-5720 (john@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>Thin Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analytes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EID4710001-2032</td>
<td>6-10-02 @ 11:30 AM</td>
<td>1 x 2-liter HDPE</td>
<td>6</td>
<td>47</td>
<td>115*</td>
<td>1650</td>
<td>1445</td>
<td>Monolith</td>
<td>Total Nitrate / Mercury (Methods SW/146-6820, SW/7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method US/ST/SG/AC.10/11/Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radiomucibles - Thorium &amp; Uranium (Gammar, Spectroscopy - to be consistent with EPA.401.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside the sample container with the TN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>6-10-02 / 9990</td>
<td>6-10-02 / 16:10</td>
</tr>
<tr>
<td>FM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>6-10-02 / 16:10</td>
<td>6-10-02 / 12:00</td>
</tr>
<tr>
<td>Postal</td>
<td>Alsip No. 835674545545</td>
<td>[Signature]</td>
<td>6-12-02 / 12:00</td>
<td></td>
</tr>
<tr>
<td>RSO</td>
<td>John Hageman</td>
<td>[Signature]</td>
<td>6-13-02 / 11:00</td>
<td></td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagaman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2635 (F) 210-522-5720 (info@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum No.</th>
<th>Lot No.</th>
<th>Sample Container Unit Wt. (gms)</th>
<th>Sample Container rim Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analytes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD4310061-2002</td>
<td>5-10-02 @ 10:50 AM</td>
<td>1 x 2-Liter HDPE</td>
<td>40</td>
<td>48</td>
<td>116*</td>
<td>143</td>
<td>.027</td>
<td>MonoMin</td>
<td>Total Metals / Mercury (Methods SW846-6120, -74771)</td>
<td>28 days (final)</td>
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<td>Oxidizer Test (Method UN ST7/GHAC.10/1.1.Rev.3)</td>
<td>180 days (toxic metals)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*This weight includes any receiving materials inside the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
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<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>B. A. TC</td>
<td>5-10-02 / 09:20</td>
<td>5-10-02 / 16:10</td>
</tr>
<tr>
<td>P&amp;I / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>5-10-02 / 16:10</td>
<td>6-12-02 / 12:00</td>
</tr>
<tr>
<td>FPO</td>
<td>Airbill No. 8356/1245645</td>
<td>John P. Hageman</td>
<td>6-12-12 / 12:00</td>
<td>6-12-02 / 14:00</td>
</tr>
</tbody>
</table>

### Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2533 (F) 210-522-5720 (lab@swri.org)
Shipment No. 6990-001-003
(2\textsuperscript{nd} Sample Shipment)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

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<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI3020712002</td>
<td>07-02-02 12:50</td>
<td>1 - 2 Liter Container</td>
<td>149</td>
<td>3</td>
<td>121</td>
<td>1149</td>
<td>1028</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Fg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN STSG/AC.10/11.Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>2-9-00/10/15</td>
<td>2-10-00/10/15</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>01/01/00/01/00</td>
<td>01/01/00/01/00</td>
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<tr>
<td>FedEx</td>
<td>Airbill No. 83574245624</td>
<td>[Signature]</td>
<td>01/01/00/01/00</td>
<td>01/01/00/01/00</td>
</tr>
</tbody>
</table>

*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 (info@swri.org)
## Thorium Nitrate Drum Sampling Project

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<th>Sample ID No.</th>
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<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI4030712002</td>
<td>07-03-02 16:15</td>
<td>1-2 Liter Container</td>
<td>206</td>
<td>4</td>
<td>121</td>
<td>1276</td>
<td>1155</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Method SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11, Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>7-7-22/14:57</td>
<td>2-20-22/10:55</td>
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</tr>
<tr>
<td>P/M / Broker</td>
<td>Stan Hedges</td>
<td>6-25-21/10:55</td>
<td>8-20-21/12:00</td>
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<td>02-02-21/12:00</td>
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**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 (john@swri.org)
## Thorium Nitrate Drum Sampling Project

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<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Methods</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>C/5030712002</td>
<td>07-03-02 09:25</td>
<td>1 - 2 Liter Container</td>
<td>251</td>
<td>5</td>
<td>121</td>
<td>1354</td>
<td>1235</td>
<td>Cubes</td>
<td>Total Metals * Mercury (Methods SW846-6020, 7471)</td>
<td>23 days (Hg)</td>
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<td></td>
<td>OXidizer Test (Method UN ST/SG/AC.10/11.Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
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<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

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<th>Receipt Date / Time</th>
<th>Release Date / Time</th>
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<tbody>
<tr>
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<td>Tony Cunningham</td>
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<td>10/10/07 23:00</td>
<td>11/02/07</td>
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<td>PM / Broker</td>
<td>Stan Hedges</td>
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<td>09/10/07 10:55</td>
<td>09/10/07 12:00</td>
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<tr>
<td>FedEx</td>
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---

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 622C Culebra Road, San Antonio, TX 78238 (C) 210-522-2653 (F) 210-522-5720 (info@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThIN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CN60307122002</td>
<td>07-03-02 08:45</td>
<td>1 – 2 Liter Container</td>
<td>300</td>
<td>6</td>
<td>121</td>
<td>1507</td>
<td>1386</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Methods SW846-5020, 7471)</td>
<td>24 days (Hg)</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method LN 87/SC/AC10/11, Rev.3)</td>
<td>180 days</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radium-226, Thorium &amp; Uranium (Gamma Spectroscopy-to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThIN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receive Date/Time</th>
<th>Release Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tory Cunningham</td>
<td>[Signature]</td>
<td>03-31-07 08:15</td>
<td>08-09-07 01:55</td>
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<tr>
<td>FM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
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<td>08-09-07 01:55</td>
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<td>02-07-10 19:00</td>
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</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John F. Hageman, 5220 Culebra Road, San Antonio, TX 78238 (O) 210-522-3630 (F) 210-522-5720 (jfh@swri.org)
## Thorium Nitrate Drum Sampling Project
### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C70030710002</td>
<td>03-03-02 10:00</td>
<td>1 - 2 Liter Container</td>
<td>308</td>
<td>7</td>
<td>121</td>
<td>1209</td>
<td>1088</td>
<td>Cubes</td>
<td>Total Metals, Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UNST/SG/AC 10/11, Rev. 3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>2/9/02/0/15</td>
<td>2/9/02/0/15</td>
</tr>
<tr>
<td>FM/Driver</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/02/06/105</td>
<td>02/01/06/1200</td>
</tr>
<tr>
<td>Fedex</td>
<td>Airbill No. 35574145624</td>
<td>[Signature]</td>
<td>02/01/10/1200</td>
<td>02/01/10/1200</td>
</tr>
</tbody>
</table>

*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 (john@swri.org)*
# Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date &amp; Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH112237123022</td>
<td>07-02-22 10:50</td>
<td>1 – 2 Liter Container</td>
<td>537</td>
<td>11</td>
<td>121</td>
<td>1412</td>
<td>1291</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Methods SW846-5026, 7471) Oxidizer Test (Method USNavy NCGA-AC1041, Rev. 3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be confirmed with EPA 9011.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

---

**Chain of Custody Receipt and Release Signatures**

<table>
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<tr>
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<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tory Cunningham</td>
<td>[Signature]</td>
<td>7-3-02 12:15</td>
<td>2-8-02 1:15</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>070709 11:55</td>
<td>070710 13:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No: 835274241624</td>
<td>[Signature]</td>
<td>070709 11:55</td>
<td>070710 13:00</td>
</tr>
</tbody>
</table>

---

*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 (info@swr.org)*
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI120207120902</td>
<td>07-02-02 9:50 *</td>
<td>1 - 2 Liter Container</td>
<td>L89</td>
<td>12</td>
<td>121</td>
<td>1178</td>
<td>1057</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11 Rev. B)</td>
<td>183 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packaging materials inside of the sample container with the ThN material.

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>T. Cunningham - Signature on file</td>
<td>7/1/02-1055</td>
<td>7/1/02-1055</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Starr Hodges</td>
<td>J. J. Hodges</td>
<td>02/07/04 - 1055</td>
<td>02/07/04 - 1055</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No.</td>
<td>855679475624</td>
<td>02/07/10 - 1300</td>
<td>02/07/10 - 1300</td>
</tr>
</tbody>
</table>

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 CFC film to delineate correct sample time.
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>TNN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C113020712002</td>
<td>07-03-02 10:05</td>
<td>1 - 2 Liter Container</td>
<td>637</td>
<td>13</td>
<td>121</td>
<td>1169</td>
<td>1048</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Methods SW846-8020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test, UN S92/SG/AC.10/3Rev.3</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radiouclide: Thorium &amp; Uranium, Gamma Spectroscopy - to be consistent with EPA 901.1 Method</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packaging materials inside of the sample container with the TNN material.

Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>T. Cunningham - Signature on File</td>
<td>7/10/12 - 10:45</td>
<td>7/10/12 - 10:55</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hooges</td>
<td>Signature</td>
<td>12/07/10 - 10:55</td>
<td>12/07/10 - 12:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835074245624</td>
<td>Signature</td>
<td>12/07/10 - 12:00</td>
<td></td>
</tr>
</tbody>
</table>

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 (john.p.hageman@swri.org)

*CHANGED TIME TO REFLECT CORRECT SAMPLE TIME - CHNG TIME ON SAMPLE LABEL TO REFLECT THIS TIME
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Container Type and No. of Containers</th>
<th>Sample Collection Date/Time</th>
<th>Drum No.</th>
<th>Drum ID No.</th>
<th>Net Wt. (gms)</th>
<th>Gross Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analysis &amp; Analytical Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C11409012002</td>
<td>E-2 Liter Containers</td>
<td>07/02/02 11:55</td>
<td>714</td>
<td>14</td>
<td></td>
<td></td>
<td>Cubes</td>
<td>Total Metals/Mercury (Method SF0164-6290, Method SF0061 Rev.3), Uranium (Method SF0312 Rev.3), Radionuclides-Thorium &amp; Uranium (Gamma Spectrometry to be consistent with EPA 9011 Method)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Holding Time (days)</th>
<th>Total (Hg) (ppm)</th>
<th>Other metals</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>180</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chain of Custody</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>John P. Hageman, 7/6/02</td>
<td>10:35</td>
<td>7/6/02 10:35</td>
</tr>
<tr>
<td>Stan Hodges</td>
<td>7/6/02 10:35</td>
<td>7/6/02 10:35</td>
</tr>
<tr>
<td>Phil Bender</td>
<td>7/6/02 10:35</td>
<td>7/6/02 10:35</td>
</tr>
<tr>
<td>Artbill No. 85647957674</td>
<td>7/6/02 10:35</td>
<td>7/6/02 10:35</td>
</tr>
<tr>
<td></td>
<td>7/6/02 10:35</td>
<td>7/6/02 10:35</td>
</tr>
</tbody>
</table>

*This worksheet includes any packing material inside of the sample container with the THM material.*

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6200 Culebra Road, San Antonio, TX 78238, (O): 210-322-2633 (F): 210-322-5710, hotmail.com
[This page intentionally left blank.]
Shipment No. 6990-001-004
(3rd Sample Shipment)
Chain of Custody and Sample Analyses Request Forms

**Thorium Nitrate Drum Sampling Project**
**Sample Data, Request & Chain of Custody Form**

<table>
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<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Methods</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF100075/2002</td>
<td>07-06-02 13:45</td>
<td>1 – 2 Liter Container</td>
<td>52</td>
<td>1</td>
<td>121</td>
<td>1604</td>
<td>1482</td>
<td>Powder</td>
<td>Total Metals, Mercury (Methods SW846-6020, -7471), Oxidizer Test (Method UN ST/SG/AC.10/11, Rev.3), Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td>28 days (Hg), 18C days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

**Chain of Custody Receipt and Release Signatures**

<table>
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<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>T Cunningham Signature in Ink</td>
<td>3:10:02 / 10/30</td>
<td>7:10:02 / 10/30</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02:07:10 / 10/30</td>
<td>02:07:10 / 10/30</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No.</td>
<td>[Signature]</td>
<td>02:07:10 / 10/30</td>
<td>02:07:10 / 10/30</td>
</tr>
</tbody>
</table>

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

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<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF200307123002</td>
<td>07/03/02 13:30</td>
<td>1 - 2 Liter Container</td>
<td>49</td>
<td>2</td>
<td>121</td>
<td>1482</td>
<td>1563</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7411)</td>
<td>28 days (Fig)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Methods UN STPG/A.C.10/11. Rev.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

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</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="image" alt="Signature" /></td>
<td>7-11-02 10:30</td>
<td>7-14-02 10:30</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Sam Hodges</td>
<td><img src="image" alt="Signature" /></td>
<td>02/01/02 13:00</td>
<td>02/01/02 13:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835674245613</td>
<td><img src="image" alt="Signature" /></td>
<td>02/01/02 13:00</td>
<td>02/01/02 13:00</td>
</tr>
</tbody>
</table>

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 (john@swri.org)
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<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>TnN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Methods</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF3080?12002</td>
<td>97-04-02 14:15</td>
<td>1 - 2 Liter Container</td>
<td>95</td>
<td>3</td>
<td>1.21</td>
<td>1335</td>
<td>1114</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SGA C.10/1 Rev 3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the TnN material.

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="signature1.png" alt="Signature" /></td>
<td>2/4/2021 9:37 PM</td>
<td>2/4/2021 9:37 PM</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td><img src="signature2.png" alt="Signature" /></td>
<td>2/7/2020 1:30 PM</td>
<td>2/7/2020 1:30 PM</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 885674445613</td>
<td><img src="signature3.png" alt="Signature" /></td>
<td>2/7/2020 1:30 PM</td>
<td>2/7/2020 1:30 PM</td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (D) 210-522-2633 (F) 210-522-5723 (info@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container: Tare Wt (gms)</th>
<th>Sample Container: Gross Wt (gms)</th>
<th>TN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF408D712D82</td>
<td>07-06-02</td>
<td>1 - 2 Liter Container</td>
<td>29</td>
<td>4</td>
<td>121</td>
<td>1207</td>
<td>1066</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6020, T471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td>14:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11, Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radioactive Elements (Gamma Spectroscopy - to be consistent with EPA 5011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the TN material.

## Chain of Custody Receipt & Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7/11/02 02:30</td>
<td>7/12/02 02:30</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>02/01/10 10:30</td>
<td>02/01/10 12:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835614245613</td>
<td></td>
<td>02/01/10 10:30</td>
<td>02/01/10 12:00</td>
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</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, 2420 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@swri.org)
# Chain of Custody and Sample Analyses Request Forms

## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF6080712002</td>
<td>07-08-02 13:45</td>
<td>1 – 2 Liter Container</td>
<td>100</td>
<td>6</td>
<td>122</td>
<td>114</td>
<td>1019</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7-71)</td>
<td>28 days (Tg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN SLSE/SGC2.1G/11.2 Rev. 3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

Tare weight includes any packing materials inside of the sample container with the ThN material.

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Terry Cunningham</td>
<td>[Signature]</td>
<td>24-Mar-2020/0730</td>
<td>24-Mar-2020/0230</td>
</tr>
<tr>
<td>PMI Broker</td>
<td>Stan Hedges</td>
<td>[Signature]</td>
<td>02/7/20/1930</td>
<td>02/7/20/1360</td>
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<tr>
<td>FedEx</td>
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<td>[Signature]</td>
<td>02/7/20/1930</td>
<td>02/7/20/1360</td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-322-2633 (F) 210-322-5710 (info@swri.org).
Thorium Nitrate Drum Sampling Project  
Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF00807/12902</td>
<td>07-08-22 12:30</td>
<td>1 – 2 Liter Container</td>
<td>31</td>
<td>9</td>
<td>122</td>
<td>1218</td>
<td>1096</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11,Rev.3) Radioactive – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9014 Method)</td>
<td>28 days (Hg) 183 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>07/01/2000/07/30</td>
<td>07/01/2000/07/30</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/01/2000/07/30</td>
<td>02/01/2000/13/00</td>
</tr>
<tr>
<td>FedEx Airbill No.</td>
<td>83674265613</td>
<td>[Signature]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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)
<table>
<thead>
<tr>
<th>Sample Data Request &amp; Chain of Custody Form</th>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Sample Container ID No.</th>
<th>Sample Container Description</th>
<th>Lab ID No.</th>
<th>Lab ID No.</th>
<th>Sample Matrix</th>
<th>Reagent &amp; Analytical Method(s)</th>
<th>Total Meas. Mercury (Method)</th>
<th>Omission Test (Method)</th>
<th>UN2811/ST/SQAC 10/18 Rev. 3</th>
<th>Sample Received &amp; Released:</th>
<th>Release Date/Time</th>
<th>Chain of Custody Receipt &amp; Release Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTF00020702002</td>
<td>07/02/02</td>
<td>11:40</td>
<td>1–2 Later Container</td>
<td>94</td>
<td>Lab ID No.</td>
<td>10</td>
<td>121</td>
<td>1186</td>
<td>Powder</td>
<td>Total Meas. Mercury (Method)</td>
<td>Omission Test (Method)</td>
<td>UN2811/ST/SQAC 10/18 Rev. 3</td>
<td>Sample Received &amp; Released:</td>
<td>Release Date/Time</td>
<td>Chain of Custody Receipt &amp; Release Signature</td>
</tr>
</tbody>
</table>

*The weight includes any packing materials inside of the sample container with the Tnk material.*

**Sample Coordinator:** Tony Cunningham  
**Print Name:**  
**Position:**  
**Lab ID No.:**  
**Airbill No.:**  
**Fax:**  

*Laborator Name & Address:*  
Southwest Research Institute, Apts: John P. Hagmann, 6220 Collier Road, San Antonio, TX 78238 (6) 210-348-6203 (F) 210-348-5720 (V) 348-5720 (F)

*Signature:*  

**Print Name:**  
**Position:**  
**Lab ID No.:**  
**Airbill No.:**  
**Fax:**
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Collector</th>
<th>Date &amp; Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF11020712002</td>
<td>07-02-02</td>
<td>09:40</td>
<td>1 - 2 Liter Container</td>
<td>42</td>
<td>11</td>
<td>121</td>
<td>1255</td>
<td>1134</td>
<td>Powder</td>
<td>Total Metals, Mercury (Methods SW846-6025, -7471) Oxidizer Test (Method UN ST/SGAC.14/11.Rev.31) Radioactivity - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7/10-02/0730</td>
<td>7/10-02/0730</td>
</tr>
<tr>
<td>FM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/07/10/0130</td>
<td>02/07/10/0130</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No.</td>
<td>[Signature]</td>
<td>02/07/10/0130</td>
<td>02/07/10/0130</td>
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*Channeled time to reflect time on sample label.*
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF13G0712002</td>
<td>07-08-02 12:45</td>
<td>1-2 Liter Container</td>
<td>137</td>
<td>13</td>
<td>122</td>
<td>1266</td>
<td>1444</td>
<td>Powder</td>
<td>Total Metals / Mercury</td>
<td>28 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3)</td>
<td>(Fig)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td>180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7-15-10/0730</td>
<td>2-10/10/0730</td>
</tr>
<tr>
<td>PM/Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>07-10/0730</td>
<td>07-10/0730</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835074245613</td>
<td>[Signature]</td>
<td>07-10/0730</td>
<td>07-10/0730</td>
</tr>
</tbody>
</table>

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 (info@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material No. Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF140307142003</td>
<td>07-03-02 09:55</td>
<td>1 - 2 Liter Container</td>
<td>78</td>
<td>14</td>
<td>12.1</td>
<td>134.5</td>
<td>1128</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-8602C, -74711) Oxidizer Test (Method UN SW/SIG/AC 10/11, Rev.3) Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials aside of the sample container with the ThN materials.

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Torre Cunningham</td>
<td>T. Cunningham - Signature on File</td>
<td>7/10/02 0730</td>
<td>7/10/02 0730</td>
</tr>
<tr>
<td>PM/Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/07/10 0730</td>
<td>02/07/10 1300</td>
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<tr>
<td>FedEx</td>
<td>[Aibill No. 835674245613]</td>
<td>[Signature]</td>
<td>02/07/10 1300</td>
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</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (F) 210-522-5730 (jh@swri.org)

*Change EOD Time to reflect time on sample label*
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF1500012002</td>
<td>07-08-02</td>
<td>12 Liter Container</td>
<td>57</td>
<td>16</td>
<td>122</td>
<td>1481</td>
<td>1359</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6920, 7471): Oxidizer Test (Method USEPA 8430); Radiocarbon Analyses - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901/1 Method)</td>
<td>28 days (Hg); 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>2-14-20</td>
<td>2-14-20</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/10/2000</td>
<td>02/10/2000</td>
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<td>02/10/2000</td>
<td>02/10/2000</td>
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</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78233 (O) 210-522-2633 (F) 210-522-5773 (fph@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF: 78807: 2802</td>
<td>07-08-02 13:10</td>
<td>1 - 2 Liter Container</td>
<td>6</td>
<td>17</td>
<td>121</td>
<td>1308</td>
<td>1187</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471) Oxidizer Test (Method ST/SG/AC.10/11_Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td>28 days (1Lg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

<table>
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<tr>
<th>Position</th>
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<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7/01/2012 1:00 PM</td>
<td>7/01/2012 1:00 PM</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>7/01/2012 1:00 PM</td>
<td>7/01/2012 1:00 PM</td>
</tr>
<tr>
<td>FedEx</td>
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<td>[Signature]</td>
<td>07/01/2012 1:00 PM</td>
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</tr>
</tbody>
</table>

### Laboratory Name & Address:

Southwest Research Institute. Attn: John P. Hagerman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5723 (info@swri.org)
# Thorium Nitrate Drum Sampling Project

Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date &amp; Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum No.</th>
<th>Let ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF15067120002</td>
<td>07-08-02, 15:00</td>
<td>1 - 2 Liter Container</td>
<td>58</td>
<td>19</td>
<td>121</td>
<td>1371</td>
<td>1250</td>
<td>Powder</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC 10/1.1.Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radiomaterials - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

* Tare weight includes any packing materials inside of the sample container with the ThN material.

---

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>22-DEC-2023</td>
<td>22-DEC-2023</td>
</tr>
<tr>
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</tbody>
</table>

---

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5920 (ph@swri.org)
Shipment No. 6990-001-005
(4th Sample Shipment)
**Thorium Nitrate Drum Sampling Project**

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD17100712002</td>
<td>07-10-02 11:00</td>
<td>1 – 2 Liter Container</td>
<td>108</td>
<td>17</td>
<td>122</td>
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<td>1199</td>
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<td>Total Metals / Mercury (Method SW846-6030, -7471)</td>
<td>28 days (Hz)</td>
</tr>
<tr>
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<td>Oxidizer Test (Method ST/SG/AC.10/1.1/Rev.3)</td>
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<td></td>
<td>Radioactivity – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 991.1 Method)</td>
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</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

**Chain of Custody Receipt and Release Signatures**

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
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<td>PM / Breker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>10/07/15 08/15</td>
<td>01/15/13/00</td>
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<tr>
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<td>Airbill No. 835674245120</td>
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<td>01/15/13/00</td>
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</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hagan, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (F) 210-522-5720 (jhh@swri.org)
## Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD180907125002</td>
<td>09-09-02 04:10</td>
<td>1 – 2 Liter Container</td>
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<td>18</td>
<td>122</td>
<td>1164</td>
<td>1042</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471) Oxidizer Test (Method UN STI/SG/AC.13/11 Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
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</tbody>
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*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<td></td>
<td>7-9-02 14:10</td>
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<tr>
<td>PMT Broker</td>
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<td></td>
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<td>02-07-15 08:45</td>
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<tr>
<td>FedEx</td>
<td>Airbill No. 8356742Y5120</td>
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</tr>
</tbody>
</table>

### 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 FOR SAMPLE LABEL*
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
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<th>Sample Container Type and No. of Containers</th>
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<th>Lot ID No.</th>
<th>Sample Tare Wt (gms)</th>
<th>Sample Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
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<td>CD22100712002</td>
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<td>121</td>
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<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
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<td></td>
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<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
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<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
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*Tare weight includes any packing materials inside of the sample container with the ThN material.*

## Chain of Custody Receipt and Release Signatures

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<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/15/10:45</td>
<td>02/15/13:06</td>
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<tr>
<td>Fedex</td>
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<td>[Signature]</td>
<td>02/15/13:00</td>
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</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2533 (F) 210-522-3720 (jph@wrri.org)
**Thorium Nitrate Drum Sampling Project**

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<td>CD28010712002</td>
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<td>129</td>
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<td>Total Metal / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
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<td>Oxidizer Test (Method UN ST/SG/AC.10/11,Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radioactivity: Thorium &amp; Uranium (Gamma Spectroscopy) to be consistent with EPA 901.1 Method</td>
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</tbody>
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*Tare weight includes any packing materials inside of the sample container with the ThN material.

**Chain of Custody Receipt and Release Signatures**

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<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7-15-02 1230</td>
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<td>PM / Broker</td>
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</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2630 (F) 210-522-5720 (john@swri.org)

* If COLD TIME is required, please sampling time.
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD29090712002</td>
<td>07-09-02 14:45</td>
<td>1 – 2 Later Container</td>
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<td>29</td>
<td>122</td>
<td>1341</td>
<td>1219</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SWE446-6020, -7471), Oxidizes Test (Method UN ST/SAC.10/11.Rsv.3) Racionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EFC 904.1 Method)</td>
<td>23 days (Hg), 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>07/02/1400</td>
<td>09/07/1000</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
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<td>07/15/1000</td>
<td>09/07/1300</td>
</tr>
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<td>FedEx</td>
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<td>09/07/1300</td>
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</tbody>
</table>

## Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 5220 Calabria Road, San Antonio, TX 78238 (O) 210-522-2613 (F) 210-522-5726 (info@swri.org)

*Change date to reflect service date on sample label.*
## Thorian Nitrate Drum Sampling Project
### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<td>180 days (other metals)</td>
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<td>1392</td>
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<td>Rad nuclides - Thorian &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
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</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>6/24/07 11:40</td>
<td>7/15/07 02/04/07</td>
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<tr>
<td>PM Broker</td>
<td>Stan Hodges</td>
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<td>6/27/07 884+</td>
<td>08/15/1300</td>
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</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (P) 210-522-5720 (jph@swri.org)

*Modified time to request time on sample label*
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD36910712002</td>
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<td>267</td>
<td>36</td>
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<td>Monel</td>
<td>Total Metals / Mercury (Methods SW846-0200, 7471)</td>
<td>28 days (1Hg)</td>
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<td>11:40</td>
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<td>Oxidizer Test (Method UN S77/GAC.101.1 Rev 3)</td>
<td>180 days (other metals)</td>
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<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
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</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
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<th>Release Date/Time</th>
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<td>Sample Coordinator</td>
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<td>7-01-02/14:00</td>
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<td>PMI Broker</td>
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<td>08/05/11 10:45</td>
<td>08/05/11 13:00</td>
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<td>08/05/11 13:00</td>
<td>08/05/11 13:00</td>
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</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hingmar, 6250 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (ph@swri.org)
## Thorium Nitrate Drum Sampling Project
### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type &amp; No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Net Wt (gms)</th>
<th>TmN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
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<td>1 – 2 Liter Container</td>
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<td>28 days (H2)</td>
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<td>180 days (other metals)</td>
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<td></td>
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<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight: includes any packing materials inside of the sample container with the TmN material.*

### Chain of Custody Receipt and Release Signatures

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<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7/6/02 10:30</td>
<td>7/15/02 18:35</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/15/02 08:15</td>
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**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Colubra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (johnp@swri.org)
<table>
<thead>
<tr>
<th>Chain of Custody and Sample Analyses Request Forms</th>
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**Thorium Nitrate Drum Sampling Project**

<table>
<thead>
<tr>
<th>Sample Drum</th>
<th>Requested Analyses &amp; Analytical Methods (Method(s) SW-846, 2021)</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD352986/12302</td>
<td>Total Metals/Mercury (Method SW-846, 2021); Radiometric Test (Method LN 7477); Geiger Counter (Method LN 7478); Gamma Spectroscopy (Method LN 7479)</td>
<td>6/21/22 10:30am</td>
</tr>
</tbody>
</table>

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample Container</th>
<th>Sample Material</th>
<th>Sample Weight (gms)</th>
<th>Material Variance</th>
<th>Drum No.</th>
<th>Lot Id No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container 1</td>
<td>Th in N</td>
<td>15.59</td>
<td>21</td>
<td>105</td>
<td>45</td>
</tr>
</tbody>
</table>

**Sample Collection**

<table>
<thead>
<tr>
<th>Sample Container Type and No. of Containers</th>
<th>Sample Collection Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 Liter Container</td>
<td>06-28-22 09:30</td>
</tr>
</tbody>
</table>

**Release Date/Time**

| Release Date/Time | 6/21/22 10:30am |

**Signature**

<table>
<thead>
<tr>
<th>Signature</th>
<th>Chain of Custody Request and Release Signatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tony Cunningham</td>
<td>Shila Hodges</td>
</tr>
</tbody>
</table>

**Position**

| PM/Booker | 835-734-5700 |

**Laboratory Name & Address**

<table>
<thead>
<tr>
<th>Laboratory Name &amp; Address</th>
<th>Southwestern Research Institute, Am.</th>
<th>835-734-5700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am.</td>
<td>509-734-5700</td>
<td></td>
</tr>
</tbody>
</table>

K-50
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analytes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD48278612002</td>
<td>06-27-02 1:44:55</td>
<td>1 – 2 Liter Container</td>
<td>19</td>
<td>48</td>
<td>122</td>
<td>1614</td>
<td>1492</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.1011 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time 1</th>
<th>Release Date/Time 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>6-27-02 14:45</td>
<td>7-15-02 09:45</td>
</tr>
<tr>
<td>PM/ES Eaker</td>
<td>Stan Hodge</td>
<td></td>
<td>03775 06:15</td>
<td>06/15/13 00:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No.</td>
<td></td>
<td>8356742157120</td>
<td>03/15/13 13:00</td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagerman, 6220 Culebra Road, San Antonio, TX 75258 (C) 210-522-2833 (F) 210-522-5720 (jph@swri.org)
### Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD61090712002</td>
<td>07-09-02 14:15</td>
<td>1 - 2 Liter Container</td>
<td>86</td>
<td>61</td>
<td>122</td>
<td>1251</td>
<td>1129</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Method SW846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11 Rev 3) Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td>24 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Net weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>Cunningham - Scannable wa</td>
<td>7-4-02/14:18</td>
<td>7-5-02/08:45</td>
</tr>
<tr>
<td>P.M./Broker</td>
<td>Stan Hedges</td>
<td></td>
<td>7-15-02/06:15</td>
<td>02/07/15 13:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hagens, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5730 (jph@swri.org)

*CHANGED DATE/TIME TO REFLECT DATA ON SAMPLE LOG & SPREADSHEET.*
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>Sample Matrix</th>
<th>TN Material Net Wt (gms)</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD5593712002</td>
<td>07-09-02 1430</td>
<td>1-2 Liter Container</td>
<td>107</td>
<td>65</td>
<td>122</td>
<td>1176</td>
<td>Monolith</td>
<td>1054</td>
<td>Total Metals / Mercury (Methods SW846-6C20, - 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11,Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radioactivity - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the TN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>T. Cunningham Date Signature Office</td>
<td>7-9-02/1430</td>
<td>7-15-02/10875</td>
</tr>
<tr>
<td>PM Broker</td>
<td>Stan Hedges</td>
<td></td>
<td>7-15-02/10875</td>
<td>007/15/1360</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835674245210</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (G) 210-522-2633 (F) 210-522-5730 (jph@sri.org)*

*Changed date to reflect date delineated in sample casing spreadsheet.*
Shipment No. 6990-001-006
(5th Sample Shipment)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD02123712302</td>
<td>07-12-02 08:00</td>
<td>1 - 2 Liter Container</td>
<td>78</td>
<td>2</td>
<td>121</td>
<td>1270</td>
<td>1:49</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7/12/02 10:00</td>
<td>7/15/02 08:45</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>7/10/15 10:45</td>
<td>7/18/15 12:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835674275110</td>
<td>[Signature]</td>
<td>7/20/15 11:30</td>
<td></td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John F. Hagemeier, 5220 Calibra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (info@sri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD03110112002</td>
<td>07-11-02 14:00</td>
<td>1 – 2 Liter Container</td>
<td>57</td>
<td>3</td>
<td>121</td>
<td>1258</td>
<td>1137</td>
<td>Monelith</td>
<td>Total Metals / Mercury (Methods SW845-4020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UNST/SG/AC.1041.3, Rev.3)</td>
<td>189 days</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Gross weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>2-11-02 12:00</td>
<td>2-11-02 12:45</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>007615 / 18950</td>
<td>020716 / 1800</td>
</tr>
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<td>FedEx</td>
<td>Airbill No. 83567425310</td>
<td></td>
<td>020716 / 1302</td>
<td></td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Att: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2613 (F) 210-522-5720 (lab@swri.org)
### Thorium Nitrate Drum Sampling Project
#### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD11110712002</td>
<td>07-11-02 14:15</td>
<td>1 - 2 Liter Container</td>
<td>248</td>
<td>11</td>
<td>121</td>
<td>1126</td>
<td>1005</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3)</td>
<td>180 days (other metal(s))</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radiouclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 501.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

---

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7-11-02/12:15</td>
<td>7-15-02/10:15</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>08/03/03 10:00</td>
<td>08/03/03 12:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835674244510</td>
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<td>08/07/03 15:00</td>
<td></td>
</tr>
</tbody>
</table>

---

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2613 (F) 210-522-3720 (lab@swri.org)
### Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>TnN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD(2):247:2603</td>
<td>07-12-02 09:00</td>
<td>1-2 Liter Container</td>
<td>136</td>
<td>12</td>
<td>121</td>
<td>1803</td>
<td>1682</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW946-6320)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method SS/ST/SG/AC.10/11.Rev.3)</td>
<td>130 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

* Tare weight includes any packing materials inside of the sample container with the TnN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7-12-02/09:00</td>
<td>7-15-02/09:00</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>0015/1000</td>
<td>0015/1000</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 835671245110</td>
<td>[Signature]</td>
<td>0015/1000</td>
<td>0015/1000</td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-1720 (jph@awri.org)
Chain of Custody and Sample Analyses Request Forms

Thorium Nitrate Drum Sampling Project
Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Net Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB14110512902</td>
<td>07-12-02 11:30</td>
<td>1 - 2 Liter Container</td>
<td>123</td>
<td>14</td>
<td>121</td>
<td>1341</td>
<td>1220</td>
<td>Monolithic</td>
<td>Total Metals: Mercury (Methods SW846-6220. -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date / Time</th>
<th>Release Date / Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>Signature</td>
<td>7-12-02 11:30</td>
<td>7-15 02-01</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>Signature</td>
<td>7-15 02 08:16</td>
<td>02-01 13:20</td>
</tr>
<tr>
<td>FedEx</td>
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<td>Signature</td>
<td>02-07 15 13:20</td>
<td></td>
</tr>
</tbody>
</table>

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 (info@swri.org)

*CHANGED DATE TO REFLECT PROPER DATE ON LABEL*
### Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD:5110712002</td>
<td>07-11-02 15:00</td>
<td>1 - 21 Liter Container</td>
<td>235</td>
<td>15</td>
<td>121</td>
<td>1163</td>
<td>1042</td>
<td>Monolith:</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UNST/SG/AC.10711.Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPPh 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

* Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>24-02 1/500</td>
<td>24-02 1/45</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodge</td>
<td></td>
<td>02/07/15 1/85</td>
<td>02/07/13 00</td>
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<td>FedEx</td>
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</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220Celebra Road, San Antonio, TX 78238 (O) 210-522-2635 (F) 210-522-5720 (ph@swri.org).
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>THN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD20103712502</td>
<td>07-10-02</td>
<td>1 – 2 Liter Container</td>
<td>11</td>
<td>20</td>
<td>121</td>
<td>1345</td>
<td>1224</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW 846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td>10:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11,Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the THN material.

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>2/15/02 08:45</td>
<td>2/15/02 10:45</td>
</tr>
<tr>
<td>PM &amp; Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>83517142451160</td>
<td>02/01/15 10:45</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No.</td>
<td>[Signature]</td>
<td>02/01/15 13:00</td>
<td></td>
</tr>
</tbody>
</table>

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 (jhag@swri.org)
## Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD44120712002</td>
<td>07-12-02 15:00</td>
<td>1 - 2 Liter Container</td>
<td>182</td>
<td>44</td>
<td>121</td>
<td>1157</td>
<td>1036</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN S78G/AC.10/11.Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Radiomelides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 501.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

---

**Chain of Custody Receipt and Release Signatures**

<table>
<thead>
<tr>
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<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="signature1.png" alt="Signature" /></td>
<td>07/12/02 15:00</td>
<td>07/12/02 3:45</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td><img src="signature2.png" alt="Signature" /></td>
<td>02/15/02 10:45</td>
<td>02/15/02 12:00</td>
</tr>
<tr>
<td>FedEx</td>
<td>Airbill No. 83167424510</td>
<td><img src="signature3.png" alt="Signature" /></td>
<td>02/15/02 12:00</td>
<td></td>
</tr>
</tbody>
</table>

---

**Laboratory Name & Address:**

Southwest Research Institute, Attn: Jchb. P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2533 (F) 210-522-5720 (jchb@swri.org)
## Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Methods</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD52103712882</td>
<td>07-10-02 09:45</td>
<td>1 - 2 Liter Container</td>
<td>194</td>
<td>52</td>
<td>122</td>
<td>1476</td>
<td>1354</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11, Rev.3)</td>
<td>130 days (other metals)</td>
</tr>
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<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

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<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>244/08/0495</td>
<td>25/02/0495</td>
</tr>
<tr>
<td>PM Broker</td>
<td>Stan Hodges</td>
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<td>02/01/08/15</td>
<td>03/01/08/15</td>
</tr>
<tr>
<td>FedEx</td>
<td>Arbill No. 8354774245110</td>
<td></td>
<td>02/07/01/1300</td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Fagerman, 6220 Calabra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (info@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

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<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>e56420949007</td>
<td>07-02-02 14:15</td>
<td>1 – 2 Liter Container</td>
<td>97</td>
<td>53</td>
<td>121</td>
<td>1209</td>
<td>1088</td>
<td>Monolith</td>
<td>Total Metals / Mercury</td>
<td>28 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/ST/AC.10/11,Rev.3)</td>
<td>(Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td>180 days</td>
</tr>
</tbody>
</table>

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<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7/2-02/02/14</td>
<td>7/2-02/02/14</td>
</tr>
<tr>
<td>PM / Brokes</td>
<td>Stan Hodges</td>
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<td>02/07/08/15</td>
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<td>02/07/08/15</td>
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</table>

### Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O): 210-522-2613 (F) 210-522-5720 (john@swri.org)
[This page intentionally left blank.]
Archive Drum No. 6990-001-A1
(1st Drum of Archived Samples)
**Thorium Nitrate Drum Sampling Project**

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD34010712002</td>
<td>07-01-02</td>
<td>1 – 2 Liter Container</td>
<td>80</td>
<td>34</td>
<td>120</td>
<td>1375</td>
<td>1252</td>
<td>MonoBite</td>
<td>Total Metals / Mercury (Methods SW846-6925, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td>11:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method: UN ST/SG/AD.2.1 React.3)</td>
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</tr>
<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radioactive isotopes - Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

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**Chain of Custody Receipt and Release Signatures**

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<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>2/6/07 / 1005</td>
<td>2/15/07 / 1410</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Star Hodges</td>
<td></td>
<td>1/19/07 / 1000</td>
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<td>Yard 71-3</td>
<td>Dunn + O'Sullivan</td>
<td></td>
<td>1/19/07 / 1000</td>
<td>5/2/07 / 1300</td>
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</tbody>
</table>

---

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6230 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-3720 (jph@swri.org)
### Thoria Nitrate Drum Sampling Project

#### Sample Data, Request & Chain of Custody Form

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<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyzes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD35289612902</td>
<td>36-28-02 10:30</td>
<td>1 - 2 Liter Container</td>
<td>203</td>
<td>35</td>
<td>129</td>
<td>1589</td>
<td>937</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, - 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>523</td>
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<td>Oxidizer Test (Method UN ST/SG/AAC.10/11.Rev 3)</td>
<td>180 days (other metals)</td>
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<td>1460</td>
<td></td>
<td></td>
<td>Radionuclides — Thorium &amp; Uranium (Gamma Spectroscopy — to be consistent with EPA 9011.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

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</tr>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>6/20/03 10:00</td>
<td>7/20/03 10:10</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Star Hodges</td>
<td></td>
<td>8/07/03 11:00</td>
<td>8/07/03 13:00</td>
</tr>
<tr>
<td>Event 913</td>
<td>Drum # 6990-001-11</td>
<td></td>
<td>8/07/03 15:00</td>
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</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hagerman, 6220 Culebra Road, San Antonio, TX 78238 (O): 210-522-2833 (F): 210-522-5720 (jph@swri.org)
### Thorium Nitrate Drum Sampling Project

#### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collector Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD38010712302</td>
<td>07-01-22 11:55</td>
<td>1 - 2 Liter Container</td>
<td>75</td>
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<td>121</td>
<td>1165</td>
<td>1044</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW 846-6020, -7471)</td>
<td>28 days (Hg)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UNST/SG/AC.10/11, Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
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<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="signature1.png" alt="Signature" /></td>
<td>7/1/02 11:11</td>
<td>7/1/02 10:10</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Sun Hodges</td>
<td><img src="signature2.png" alt="Signature" /></td>
<td>07/02/10</td>
<td>07/02/10 07/15/100</td>
</tr>
<tr>
<td>Downstream 1AO-CD1-A1</td>
<td>Mike Hodges</td>
<td><img src="signature3.png" alt="Signature" /></td>
<td>07/01/15</td>
<td>07/01/15 07/01/15</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>TN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Remarks / Analyses &amp; Analytical Methods(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD56310712002</td>
<td>37-01-C2</td>
<td>1 - 2 Liter Container</td>
<td>6</td>
<td>39</td>
<td>122</td>
<td>1523</td>
<td>1401</td>
<td>Mono.ith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Oxidizer Test (Method UNST/SQ/AC 1044 Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Radioactive - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the TNM materials.

Chain of Custody Receipt and Release Signatures:

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7-01-01/1045</td>
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<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>07/15/13/180</td>
<td>07/15/13/200</td>
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<tr>
<td>Bldg: 913</td>
<td>Drum # 09000011</td>
<td>[Signature]</td>
<td>07/15/13/200</td>
<td>07/15/13/200</td>
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Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 2620 Culebra Road, San Antonio, TX 78238 (O) 210-522-2631 (F) 210-522-5720 (iph@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD40C1712C05</td>
<td>07-01-02 11:23</td>
<td>1 – 2 Liter Container</td>
<td>15</td>
<td>40</td>
<td>119</td>
<td>1250</td>
<td>1131</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.1/01 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EFA 901.1 Method)</td>
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</tbody>
</table>

*Note: weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
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<tr>
<td>PM / Bookkeeper</td>
<td>Stan Hodges</td>
<td></td>
<td>1/10/2020</td>
<td>1/10/2020</td>
</tr>
</tbody>
</table>

### 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 (ph@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Date, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD4127612002</td>
<td>06-27-02 12:50</td>
<td>1 - 2 Liter Container</td>
<td>142</td>
<td>41</td>
<td>123</td>
<td>1333</td>
<td>1060</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6820, -1471); Oxidizer Test (Method UN ST/SIF/AC.10/II.1 Rev.3) Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EMP 901.1 Method)</td>
<td>28 days (mg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<td>Tony Cunningham</td>
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<td>02-01/123</td>
<td>03-01/1310</td>
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<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/15/15/10/10</td>
<td>02/15/13/00</td>
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<tr>
<td>[Date] 9/13</td>
<td>[Signature]</td>
<td>[Signature]</td>
<td>02/15/15/10/10</td>
<td>02/15/13/00</td>
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</tbody>
</table>

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 (info@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD42286G12002</td>
<td>06-28-02 09:00</td>
<td>1 - 2 Liter Container</td>
<td>154</td>
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<td>122</td>
<td>1349</td>
<td>1227</td>
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<td>Total Metals / Mercury (Methods SW846-0020, -7431)</td>
<td>28 days (Hg)</td>
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<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN STSG/AC.10/1.1 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
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</tr>
</tbody>
</table>

* Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
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<th>Signature</th>
<th>Receipt Date/Time</th>
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<tbody>
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<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>6-28-02 09:00</td>
<td>6-28-02 10:10</td>
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<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>6-27-13 10:10</td>
<td>6-27-13 13:00</td>
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<tr>
<td>BBQ 6/13</td>
<td>Drum # 6440-001-1</td>
<td>[Signature]</td>
<td>6-27-13 13:00</td>
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</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Att: John P. Higeman, 6320 Culebra Road, San Antonio, TX 78238 (O): 210-522-2633 (F): 210-522-5720 (ehs@swri.org)
### Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD43280612002</td>
<td>06-28-02 11:00</td>
<td>1 - 2 Liter Container</td>
<td>179</td>
<td>41</td>
<td>120</td>
<td>1199</td>
<td>1079</td>
<td>Mondolin</td>
<td>Total Metals / Mercury (Methods SW345-6020, -7471) Oxidizer Test (Method UNST/SG/AC.10/011, Rev.3) Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Sample weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
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<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>6-21-02 11:00</td>
<td>7-5-02 10:12</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>6-24-02 10:00</td>
<td>6-25-02 12:00</td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (P) 210-522-5720 (obj@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Net Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD50280612002</td>
<td>06-28-02 11:15</td>
<td>1 - 2 Liter Container</td>
<td>3</td>
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<td>113</td>
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<td>1337</td>
<td>Monolith</td>
<td>Total: Metals / Mercury (Methods SW 846-6020, -7471)</td>
<td>28 days (Hg)</td>
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<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td>Oxidizer Test (Method UN STD/SEG/AC 10.11, Rev.3)</td>
<td>180 days (ether metals)</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

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<table>
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<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>6-28-02/111</td>
<td>7-15-02/101</td>
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<tr>
<td>PM of Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>06-28-02/1010</td>
<td>07-20-03/1200</td>
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<tr>
<td>Bldg 413</td>
<td>Drum # 6110-64-11</td>
<td>[Signature]</td>
<td>02-08-03/1300</td>
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Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78258 (O) 210-522-2633 (F) 210-522-5720 (jmh@swri.org)
### Thorium Nitrate Drum Sampling Project

#### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD51280612002</td>
<td>96-28-02. 14:30</td>
<td>1 - 2 Liter Container</td>
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<td>Total Metals / Mercury (Methods SW846-6020, - 7471)</td>
<td>28 days</td>
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<tr>
<td></td>
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<td>Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3)</td>
<td>150 days</td>
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<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

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<th>Release Date/Time</th>
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<tr>
<td>Sample Coordinator</td>
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<td></td>
<td>6-21-92, 14:00</td>
<td>7-15-92, 10:00</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodge</td>
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<td>02/17/95, 10:10</td>
<td>02/17/95, 13:00</td>
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<td>Drum # - 01.11 Warehouse 913</td>
<td></td>
<td></td>
<td>02/17/95, 13:00</td>
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</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagerman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (info@swri.org)
## Thorium Nitrate Drum Sampling Project
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<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>THN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analytes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD568187.2802</td>
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<td>1 – 2 Liter Container</td>
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<td>122</td>
<td>1523</td>
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<td>Total Metals / Mercury (Methods SW946-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
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<td>Oxidizer Test (Method UN ST/S8G/AC.10/11 Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
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<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the THN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="signature1.png" alt="Signature" /></td>
<td>07/01/10</td>
<td>09/10/10</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td><img src="signature2.png" alt="Signature" /></td>
<td>07/15/13</td>
<td>13/00</td>
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<tr>
<td><em>Blow 913</em></td>
<td>Drum # 6440001-11</td>
<td><img src="signature3.png" alt="Signature" /></td>
<td>07/15/13</td>
<td>13/00</td>
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*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
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<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Net Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>TnN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD602765122002</td>
<td>05-27-02 11:00</td>
<td>1 - 2 Liter Container</td>
<td>285</td>
<td>60</td>
<td>119</td>
<td>1402</td>
<td>393</td>
<td>Menolite</td>
<td>Total Metals: Mercury (Methods SW846-6000, 7471) Oxidizer Test (Method LN STP36/AC 16/1 Rev.3) Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the TnN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>6:27:46/1/10</td>
<td>2:41:29/1/10</td>
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<tr>
<td>FM / Broker</td>
<td>Stan Hodges</td>
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<td>12/07/13/1/10</td>
<td>8:07/13/1/10</td>
</tr>
<tr>
<td>Block 913</td>
<td>Drum 4 6:48:10:11</td>
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<td></td>
<td></td>
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</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Flanagan, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jpf@swri.org)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
</table>
| CD64C1C7E2002 | 07-01-02                    | 1 - 2 Liter Container                      | 00          | 64        | 120                                          | 1185                          | 1065                   | Monolith      | Total Metals / Mercury (Methods SW846-6020, -7471), 
|              | 14x20                       |                                            |             |           |                                              |                              |                        |               | Oxidizer Test (Method UN ST/SG/AC.11/1. Rev.3) 
|              |                             |                                            |             |           |                                              |                              |                        |               | Radionuclides – Thorium & Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method) |

*Tare weight includes any packing materials inside the sample container with the ThN material.

<table>
<thead>
<tr>
<th>Position</th>
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<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tr>
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<td>Stan Hodges</td>
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<td>09-05-1100</td>
<td>09-05-1100</td>
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<tr>
<td>Bldg. 9 / 13</td>
<td>Mike Jones</td>
<td></td>
<td>09-05-1100</td>
<td>09-05-1100</td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 6223 Culebra Road, San Antonio, TX 78238 (O) 210-522-2603 (F) 210-522-5720 (info@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type &amp; No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>Th(\text{N}) Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD71280612002</td>
<td>06-28-02 14:00</td>
<td>1 - 2 Liter Container</td>
<td>192</td>
<td>71</td>
<td>122</td>
<td>1222</td>
<td>1100</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7421) Oxidizer Test (Method UN ST/SG/A.C.10/11,Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>180 days (other metals)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the Th\(\text{N}\) material.

## Chain of Custody Receipt and Release Signatures

<table>
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<tr>
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<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="signature.png" alt="Signature" /></td>
<td>02/02/2010</td>
<td>02/02/2010</td>
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<tr>
<td>PM / Broker</td>
<td>Sam Hodges</td>
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<td>02/14/2010</td>
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<tr>
<td><strong>BLOG 913</strong></td>
<td>Drum #1280601101</td>
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<td>02/13/2000</td>
</tr>
</tbody>
</table>

*Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 9220 Culebra Road, San Antonio, TX 78258 (O) 210-522-2633 (F) 210-522-5720 tichii@swri.org*
Archive Drum No. 6990-001-A2
(2nd Drum of Archived Samples)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare wt (gms)</th>
<th>Sample Container Gross wt (gms)</th>
<th>ThN Material Net wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD1610027142002</td>
<td>07-10-02</td>
<td>1 - 2 Liter Container</td>
<td>230</td>
<td>16</td>
<td>122</td>
<td>1260</td>
<td>1138</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (15g)</td>
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<td></td>
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<td></td>
<td>Oxidizer Test (Method UNST/SG/AC.1041/1 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
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</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="image" alt="Signature" /></td>
<td>2/10/02 1030</td>
<td>7/15/02 0930</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td><img src="image" alt="Signature" /></td>
<td>8/30/99 0930</td>
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<tr>
<td>BLDG 713</td>
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</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-322-2635 (F) 210-322-5720 (John@swrir.com)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD19100071 2002</td>
<td>06-15-02 14:30</td>
<td>1 - 2 Liter Container</td>
<td>52</td>
<td>19</td>
<td>121</td>
<td>1209</td>
<td>1383</td>
<td>Monel</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/11 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
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<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
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</tbody>
</table>

* Tare weight includes any packing materials inside of the sample container with the ThN material.

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>Signature</td>
<td>7-10-02 14:30</td>
<td>7-18-02 09:30</td>
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<tr>
<td>PM / Broker</td>
<td>Star Hodges</td>
<td>Signature</td>
<td>07-15-09 04:30</td>
<td>07-15 11:30</td>
</tr>
</tbody>
</table>

## Laboratory Name & Address:

Southwest Research Institute, Attn: John P. Hageman, 6220 Callebra Road, San Antonio, TX 78238 (G) 210-522-2633 (F) 210-522-5720 (jph@swr-i.org)
# Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD241001129302</td>
<td>01-10-02 14:00</td>
<td>1 – 2 Liter Container</td>
<td>102</td>
<td>24</td>
<td>121</td>
<td>1447</td>
<td>1326</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-0620, 7471) Crude Test (Method UN ST/SG/AC.10/11, Rev. 2) Radionucleides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td>36 days (Hg)</td>
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<td></td>
<td></td>
<td>180 days (other metals)</td>
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</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>T. Cunningham, Signature on file</td>
<td>7-10-02, 14:00</td>
<td>7-15-02, 09:30</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>ST. Hodges</td>
<td>020715, 09:30</td>
<td>020715, 13:30</td>
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</tbody>
</table>

**Laboratory Name & Address:**

Southwest Research Institute, Attn: John P. Hageman, 5226 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5710 (jph@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD25010712002</td>
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<td>1 – 2 Liter Container</td>
<td>25</td>
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<td>120</td>
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<td>Total Metals / Mercury (Methods SW846-5020, 7473)</td>
<td>25 days (Hg)</td>
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<td>Oxidizer Test (Method UN ST/SC/AC1C/11.Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
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<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
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</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

## Chain of Custody Receipt and Release Signatures

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<th>Receipt Date/Time</th>
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<td>FM / Broker</td>
<td>Stan Hodges</td>
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<td>2001-02-14:30</td>
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<tr>
<td></td>
<td>BLDG 913</td>
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</tbody>
</table>

## 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 (job@swri.org)
### Thorium Nitrate Drum Sampling Project

#### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type &amp; No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>TN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD25090712002</td>
<td>07-09-02 15:30</td>
<td>1 – 2 Liter Container</td>
<td>202</td>
<td>26</td>
<td>121</td>
<td>1157</td>
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<td>Monolith</td>
<td>Total Metals / Mercury (Method SW846-0020, - 7471)</td>
<td>28 days (Big)</td>
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<td>Oxidizer Test (Method UN SN59AC.1011 Rev.3)</td>
<td>180 days (Other Metals)</td>
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<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
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</tbody>
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*Note: Tare weight includes any packing materials inside of the sample container with the TN material.

#### Chain of Custody, Receipt and Release Signatures

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<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7-15-02 1330</td>
<td>7-15-02 1030</td>
</tr>
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<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>02/715 1030</td>
<td>02/715 1330</td>
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</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, A. 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

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot. ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Methods</th>
<th>Holding Time (days)</th>
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<tr>
<td>CD32090712002</td>
<td>07-06-02 13:50</td>
<td>1 - 2 Liter Container</td>
<td>152</td>
<td>32</td>
<td>121</td>
<td>1153</td>
<td>1031</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Method SW846-0020, -7471)</td>
<td>28 days (1Hg)</td>
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<td></td>
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<td>Oxidizer Test (Method UN ST/SGAC 10/11, Rev 3)</td>
<td>180 days (other metals)</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Radiomachides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
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<td>7-9-02 1350</td>
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<td>Stan Hodges</td>
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<td>7-15-02 1020</td>
<td>08-15-1330</td>
</tr>
<tr>
<td>Blog 913</td>
<td>John P. Hageman</td>
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<td>08-15-1330</td>
<td></td>
</tr>
</tbody>
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### 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 (FAX) swir@swri.org
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE-470001-1022</td>
<td>07-09-02 13:00</td>
<td>1 - 2 Liter Container</td>
<td>204</td>
<td>47</td>
<td>121</td>
<td>1328</td>
<td>1207</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-69020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC. 10/1. Rev 5)</td>
<td>183 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>T. Cunningham - Signature on File</td>
<td>7/4/02 13:00</td>
<td>7/15/02 10:30</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hedges</td>
<td>H. Hedges</td>
<td>02/07/15 10:30</td>
<td>02/07/15 13:30</td>
</tr>
<tr>
<td>Bldg 913</td>
<td>Drum #6960.001-12</td>
<td>H. Hedges</td>
<td>02/07/15 13:30</td>
<td></td>
</tr>
</tbody>
</table>
| Sample | Date/Time | Type and No. of Containers | ID No. | Mat. No. | Mat. 100% | Mat. 200% | Mat. 300% | Chain of Custody
|--------|-----------|----------------------------|--------|----------|-----------|-----------|-----------|------------------
| 03/11/02 | 09:35 | 1 - 2 liter Container | 100 | 57 | 122 | 124 | 1122 |

The weight includes any packing materials inside the sample container with the TIN material.

The signing authority is required to release the TIN material.

Position | Name | Signature
--- | --- | ---
Sample Coordinator | Tony Cunningham |
PM/Driver | Shari Hodges |
## Thorium Nitrate Drum Sampling Project
### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collect or Date &amp; Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Loc. ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Methods</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDS910807120002</td>
<td>07-10-32 10:40</td>
<td>1 - 2 Liter Container</td>
<td>241</td>
<td>59</td>
<td>122</td>
<td>1149</td>
<td>1027</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471), Oxidizer Test (Method UN-3156), Radioactivity - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg), 48 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7/10/02 19:00</td>
<td>7/15/02 09:30</td>
</tr>
<tr>
<td>PM/Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>07/05/02 08:30</td>
<td>07/05/02 12:30</td>
</tr>
<tr>
<td>BLOG 913</td>
<td>Dem 4 6960-001-A2</td>
<td>[Signature]</td>
<td>07/05/02 12:30</td>
<td></td>
</tr>
</tbody>
</table>

---

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 5220 Culebra Road, San Antonio, TX 78238 (O): 210-522-2651 (F): 210-522-5720 (jph@swri.org)
### Thorium Nitrate Drum Sampling Project

#### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tape Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThM Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD62100712002</td>
<td>07-10-02 10:15</td>
<td>1-2 Liter Container</td>
<td>159</td>
<td>62</td>
<td>121</td>
<td>1264</td>
<td>1143</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AEC 10/11, Rev.3)</td>
<td>110 days (other metals)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample containers with the ThM material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>Ω</td>
<td>7/10/02 10:15</td>
<td>7/10/02 07:30</td>
</tr>
<tr>
<td>PM Broker</td>
<td>Stan Hodges</td>
<td>Σ</td>
<td>7/24/02 10:30</td>
<td>7/24/02 09:30</td>
</tr>
<tr>
<td>Bldg 93</td>
<td>Dang 1660 01/12</td>
<td>Ψ</td>
<td>7/24/02 13:00</td>
<td>7/24/02 13:30</td>
</tr>
</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagerman, 6250 Culebra Road, San Antonio, TX 78238 (D) 210-522-2631 (F) 210-522-5720 (john@swri.org)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB70100120C2</td>
<td>07-10-02</td>
<td>1 - 2 Liter Container</td>
<td>3</td>
<td>70</td>
<td>121</td>
<td>1132</td>
<td>1011</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UNST/ST/AC.1041, Rev3)</td>
<td>180 days (other metals)</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rad/raclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

---

Chain of Custody Receipt and Release Signatures:

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>02/22/2006</td>
<td>02/22/2006</td>
</tr>
<tr>
<td>PM/ Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>03/13/2006</td>
<td>03/13/2006</td>
</tr>
<tr>
<td>Bldg 9/3</td>
<td>Dim # 64940001-12</td>
<td>[Signature]</td>
<td>02/15/2006</td>
<td>02/15/2006</td>
</tr>
</tbody>
</table>

---

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**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum IE No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analytes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF18030712002</td>
<td>07-03-02 1030</td>
<td>1 - 2 Liter Container</td>
<td>55</td>
<td>18</td>
<td>121</td>
<td>1232</td>
<td>1.111</td>
<td>Powder</td>
<td>Total Metals / Mercury</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC. 10/11 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

**Chain of Custody Receipt and Release Signatures**

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>2-05-12 10:50</td>
<td>2-10-12 09:30</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/19/09 09:30</td>
<td>02/19/09 18:30</td>
</tr>
<tr>
<td>BDIK 913</td>
<td>3009.1400.001.12</td>
<td>[Signature]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78258 (O) 210-522-2633 (F) 210-522-5720 [info@swri.org]
## Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date &amp; Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>Tin Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1020712092</td>
<td>07-02-02 13:50</td>
<td>1 - 2 Liter Container</td>
<td>14</td>
<td>I</td>
<td>121</td>
<td>1222</td>
<td>1101</td>
<td>Cubes</td>
<td>Total Metals / Mercury</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN- ST/SG/AC.1011.Rev.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the TEN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7/8/02 / 4:05</td>
<td>7/8/02 / 4:15</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>8/8/05 / 10:20</td>
<td>8/8/05 / 13:30</td>
</tr>
<tr>
<td>Aithinlo. D.</td>
<td>[Signature]</td>
<td>[Signature]</td>
<td>8/8/05 / 13:30</td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John F. Hingeman, 5220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (john@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>Th(_2)O(_4) Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI2030712002</td>
<td>05-03-02 11:00</td>
<td>1 - 2 Liter Container</td>
<td>95</td>
<td>2</td>
<td>121</td>
<td>1576</td>
<td>1355</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Method SW846-6020)</td>
<td>28 days</td>
</tr>
<tr>
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<td></td>
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<td>Gasifier Test (Method UN ST/SGA/C.16/1.1 Rev.3)</td>
<td>180 days</td>
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<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the Th\(_2\)O\(_4\) material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tommy Cunningham</td>
<td>[Signature]</td>
<td>7/3/02/100</td>
<td>7/4/02/1055</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02/07/09/1055</td>
<td>02/07/10/1350</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location Name &amp; Address:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southwest Research Institute, Attn: John P. Hagerman, 5220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2613 (F) 210-522-5722 (<a href="mailto:jph@swri.org">jph@swri.org</a>)</td>
</tr>
</tbody>
</table>
### Thorium Nitrate Drum Sampling Project

*Sample Data, Request & Chain of Custody Form*

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Ernum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyzes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN502712002</td>
<td>07-02-02 09:10</td>
<td>1-2 Liter Container</td>
<td>371</td>
<td>8</td>
<td>121</td>
<td>1255</td>
<td>1134</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SGAC.10/11. Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 501.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

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<tr>
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<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7-5-02/10:55</td>
<td>7-5-02/10:15</td>
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<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>07/07/09/10:55</td>
<td>07/07/09/13:00</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>THN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI10020712002</td>
<td>07-02-02</td>
<td>1 – 2 Liter Container</td>
<td>484</td>
<td>10</td>
<td>121</td>
<td>1181</td>
<td>1060</td>
<td>Cubes</td>
<td>Total Metals / Mercury (Methods SW845-6020, -7471)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SC/AC.1041 Rev.3)</td>
<td>180 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Rad oxoclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method3)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the THN material.

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7-6-02/8:15</td>
<td>7-10-02/9:15</td>
</tr>
<tr>
<td>FM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>2-10-18/1:55</td>
<td>2-15-18/1:55</td>
</tr>
</tbody>
</table>

**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 (info@swri.com)
Archive Drum No. 6990-001-A3
(3\textsuperscript{rd} Drum of Archived Samples)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum No.</th>
<th>Lot ID No.</th>
<th>Sample Net Wt (gms)</th>
<th>Sample Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD01120712002</td>
<td>07-15-02 08:15</td>
<td>1 - 2 Liter Container</td>
<td>111</td>
<td>1</td>
<td>121</td>
<td>1406</td>
<td>1285</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW 846-6020, -7471) Oxidizer Test (Method UN ST/SG/AC.10/11.Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td>28 days (Hg); 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
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<th>Receipt Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinat</td>
<td>Tony Cunningham</td>
<td>[signature]</td>
<td>24/03/015</td>
<td>21/05/11/20</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>[signature]</td>
<td>08/07/15</td>
<td>11/20</td>
</tr>
<tr>
<td>BLOC 913</td>
<td>Drum # GPA0-001.45</td>
<td>[signature]</td>
<td>08/07/15</td>
<td>14/00</td>
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</tbody>
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Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hegeman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2613 (F) 210-522-5720 (jph@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Weight (gms)</th>
<th>Sample Container Gross Weight (gms)</th>
<th>Sample Material Net Weight (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (Days)</th>
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<tbody>
<tr>
<td>CD041207120C2</td>
<td>07-12-02 14:30</td>
<td>1 - 2 Liter Container</td>
<td>142</td>
<td>4</td>
<td>121</td>
<td>176</td>
<td>1255</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -747)</td>
<td>28 days (Hg)</td>
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<td>Oxidizer Test (Method UN 7420/GCML.10/11, Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radioactive - Th + U (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
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</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

## Chain of Custody Receipt and Release Signatures

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<tr>
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<th>Signature</th>
<th>Receipt Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>2/20/23 14:30</td>
<td>2/23/23 11:20</td>
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<td>PM / Broker</td>
<td>Stan Hodges</td>
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<td>02/13/23 11:20</td>
<td>02/13/23 14:00</td>
</tr>
<tr>
<td>Bldg 413</td>
<td>Block 0240 021.13</td>
<td></td>
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<td></td>
</tr>
</tbody>
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Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagerman, 6220 Culebra Road, San Antonio, TX 78238 (G) 210-522-2633 (F) 210-522-3720 (John@swri.org)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>Thin Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD05120712002</td>
<td>07-12-02 13:45</td>
<td>1 – 2 Liter Container</td>
<td>111</td>
<td>5</td>
<td>121</td>
<td>1285</td>
<td>1137</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW/846-6020, -74/71) Oxidizer Test (Method UNS710/AC.101/11-Rev.3) Radiochemicals – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the Thin material.

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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7/12/02 12:34 PM</td>
<td>7/15/02 11:22 PM</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>02/02/03 11:20 PM</td>
<td>02/05/03 14:00 PM</td>
</tr>
<tr>
<td>BLDG 913</td>
<td>080.001.13</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: Jche P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (G) 210-522-2453 (F) 210-522-5720 (jph@swri.org)
# Thorium Nitrate Drum Sampling Project

## Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date &amp; Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gm)</th>
<th>Sample Container Gross Wt (gm)</th>
<th>ThN Material Net Wt (gm)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD061207122002</td>
<td>07-12-02 10:30</td>
<td>1 – 2 Liter Container</td>
<td>175</td>
<td>6</td>
<td>121</td>
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<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7471)</td>
<td>38 days (Hg)</td>
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<td>Oxidizer Test (Method UN ST/SG/AAC.201.11.1/Rev.3)</td>
<td>140 days (other metals)</td>
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<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

## Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
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<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7/22/21 1000</td>
<td>7/25/21 1120</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>7/14/21 1120</td>
<td>7/16/21 1440</td>
</tr>
<tr>
<td>Bldg 913</td>
<td></td>
<td></td>
<td>7/14/21 1120</td>
<td>7/16/21 1440</td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O): 210-522-2633 (F) 210-222-5720 (info@swri.org)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD07120712D02</td>
<td>07-12-02 09:15</td>
<td>1-2 Liter Container</td>
<td>59</td>
<td>7</td>
<td>121</td>
<td>1426</td>
<td>1365</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW-46-0020, -7471) Oxi/id: Test (Method UN ST/SG/AC.10/11 Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

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**Chain of Custody Receipt and Release Signatures**

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<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>07/24/09/11</td>
<td>07/24/11/11</td>
</tr>
<tr>
<td>PM: Broker</td>
<td>Stan Eades</td>
<td>[Signature]</td>
<td>07/15/11/10</td>
<td>07/15/11/15</td>
</tr>
<tr>
<td>BLDG #913</td>
<td>DRUM # GCB0001A3</td>
<td>[Signature]</td>
<td>07/15/14/00</td>
<td>07/15/14/00</td>
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</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hagan, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (info@swri.org)
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD08120712002</td>
<td>07-12-02 10:15</td>
<td>1 – 2 Liter Container</td>
<td>E23</td>
<td>8</td>
<td>121</td>
<td>1305</td>
<td>1184</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471) Oxidizer Test (Method UN STSG/AC.10/11 Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9011 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

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**Chain of Custody Receipt and Release Signatures**

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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>Signature</td>
<td>2/12/02 16:25</td>
<td>2/15/02 11:20</td>
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<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td>Signature</td>
<td>02/07/15 11:20</td>
<td>02/07/15 14:00</td>
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<tr>
<td>BLDG 413</td>
<td>Drum # 6460.001.43</td>
<td>Signature</td>
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</tbody>
</table>

---

**Laboratory Name & Address:**

Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-525-5720 (john@swri.org)
## Thorium Nitrate Drum Sampling Project
### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD091237232002</td>
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<td>1 – 2 Liter Container</td>
<td>24</td>
<td>9</td>
<td>121</td>
<td>1195</td>
<td>1072</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW#46-020, -7471) Oxidizer Test (Method UNST/SG/AC.10-11 Rev.3) Radioactivity - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>7/12/02 11:45</td>
<td>7/15/02 11:30</td>
</tr>
<tr>
<td>PM &amp; Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>07/18/02 11:20</td>
<td>07/15/04</td>
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<td>300-001-010-001 A3 (200 cts)</td>
<td></td>
<td></td>
<td>08/07/02 14:00</td>
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</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-4730 (john@swri.org)
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
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<th>Sample ID No.</th>
<th>Sample Collection Date/Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
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<th>Holding Time (days)</th>
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<tbody>
<tr>
<td>CD16120712002</td>
<td>07-12-02 09:30</td>
<td>1 - 2 Liter Container</td>
<td>135</td>
<td>10</td>
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<td>1685</td>
<td>1554</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UNS/SG/AC10/11,Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="signature1.png" alt="Signature" /></td>
<td>07/12/02 09:30</td>
<td>07/12/11 12:00</td>
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<td>PM Broker</td>
<td>Stan Hodges</td>
<td><img src="signature2.png" alt="Signature" /></td>
<td>08/17/11 11:00</td>
<td>09/17/11 14:00</td>
</tr>
</tbody>
</table>

*Sample ID No. 913 Drum # 6900-60143

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 [joh@swri.org]
<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analytes &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tr>
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<td>1 – 2 Liter Container</td>
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<td>13</td>
<td>122</td>
<td>1352</td>
<td>1230</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>28 days (Hg)</td>
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<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN STGD/AC.10/11 Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
<td></td>
<td></td>
<td>Radioactive isotopes – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 9101 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

**Chain of Custody Receipt and Release Signatures**

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<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td></td>
<td>24-22 / 14:50</td>
<td>24-22 / 14:20</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
<td></td>
<td>09-015 / 11:20</td>
<td>09-015 / 14:00</td>
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<tr>
<td>BLDG 9/3</td>
<td>0490-001-13</td>
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<td></td>
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</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hagman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2531 (F) 210-522-5720 jph@swr.org.
## Thorium Nitrate Drum Sampling Project

### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD01110712002</td>
<td>07-11-02 14:45</td>
<td>1 - 2 Liter Container</td>
<td>83</td>
<td>21</td>
<td>121</td>
<td>1421</td>
<td>1300</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-64(20, - 7471))</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UN ST/SG/AC.10/1 Rev 3)</td>
<td>&amp; 80 days (other metals)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 601.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td><img src="Signature" alt="Signature" /></td>
<td>7-11-02 14:45</td>
<td>7-15-02 11:20</td>
</tr>
<tr>
<td>PM Broker</td>
<td>Stan Hodges</td>
<td><img src="Signature" alt="Signature" /></td>
<td>02/07/15 11:00</td>
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<td>BOC 690-001-25</td>
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<td></td>
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</tr>
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</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hagemeier, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2633 (F) 210-522-5720 (jph@srii.org)
### Thorium Nitrate Drum Sampling Project
#### Sample Data, Request & Chain of Custody Form

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding, Time (days)</th>
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</thead>
<tbody>
<tr>
<td>CD23128712002</td>
<td>07-12-92 10:30</td>
<td>1 - 2 Liter Container</td>
<td>200</td>
<td>23</td>
<td>121</td>
<td>1361</td>
<td>1240</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW 846-6020, 7471) Oxidizer Test (Method UN ST/SG/AC.10.11 Rev.3) Radionuclides - Thorium &amp; Uranium (Gamma Spectroscopy - to be consistent with EPA 9011 Method)</td>
<td>24 days (Hg) 180 days (other metals)</td>
</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

#### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
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<th>Signature</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>02-14-15/11:00</td>
<td>02-15-15/11:00</td>
</tr>
<tr>
<td>PM/E Broker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>02-14-15/11:00</td>
<td>02-15-15/11:00</td>
</tr>
</tbody>
</table>

**Laboratory Name & Address:**
Southwest Research Institute, Attn: John P. Hageman, 6220 Callera Road, San Antonio, TX 78258 (O) 210-522-2633 (F) 210-522-5720 (info@sri.com)
## Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
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<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
<th>ThN Material Net Wt (gms)</th>
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<tr>
<td>CDR1207130G2</td>
<td>07-12-02 14:00</td>
<td>1 - 2 Liter Container</td>
<td>159</td>
<td>27</td>
<td>121</td>
<td>1477</td>
<td>1356</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, 7421)</td>
<td>28 days (Hg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total Metals / Mercury (Methods SW846-6020, 7421)</td>
<td>180 days (other metals)</td>
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</tr>
</tbody>
</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.*

### Chain of Custody Receipt and Release Signatures

<table>
<thead>
<tr>
<th>Position</th>
<th>Printed Name</th>
<th>Signature</th>
<th>Receipt Date/Time</th>
<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>![Signature]</td>
<td>7/12/02 1/400</td>
<td>7/15/02 1/120</td>
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<tr>
<td>PM / Broker</td>
<td>Stan Hoggie</td>
<td>![Signature]</td>
<td>07/07/02 1/120</td>
<td>07/07/02 1/120</td>
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</table>

**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 (ph@swri.org)
### Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
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<th>Lot ID No.</th>
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<th>Sample Container Gross Wt (gms)</th>
<th>ThM Material Net Wt (gms)</th>
<th>Sample Matrix</th>
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<tbody>
<tr>
<td>CE31138712002</td>
<td>07-12-02 11:00</td>
<td>1 - 2 Lites Container</td>
<td>00</td>
<td>31</td>
<td>121</td>
<td>1221</td>
<td>1100</td>
<td>Monolith</td>
<td>Total Metals / Mercury (Methods SWB46-6020, -7471) Oxilizer Test (Method UNST/ST/SG/AC.1011, Rev.3) Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td>28 days (Hg) 180 days (other matrix)</td>
</tr>
</tbody>
</table>

*Note: Tare weight includes any packing materials inside of the sample container with the TEN material.*

### Chain of Custody Receipt and Release Signatures

<table>
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<tr>
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<th>Signature</th>
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<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
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<td>7/12/06 11:00</td>
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<td>PM / Breker</td>
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<td>[Signature]</td>
<td>08/05/11 12:00</td>
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<td>[Signature]</td>
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<td>08/05/14 00:00</td>
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</table>

**Laboratory Name & Address:**

Southwest Research Institute, Attn: John P. Hageman, 6220 Culebra Road, San Antonio, TX 78238 (C) 210-522-4533 (F) 210-522-4720 (john@swri.org)
<table>
<thead>
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<th>Lot ID No.</th>
<th>Sample Container Tare Wt (gms)</th>
<th>Sample Container Gross Wt (gms)</th>
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<td>CD31720712002</td>
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<td>124</td>
<td>1123</td>
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<td>28 days (Hg) 180 days (other metals)</td>
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</table>

*Tare weight includes any packing materials inside of the sample container with the ThN material.

---

**Chain of Custody Receipt and Release Signatures**

<table>
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<th>Release Date/Time</th>
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<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
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<td>7-12-11/11/11</td>
<td>7-15-11/11/11</td>
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</tbody>
</table>

---

**Laboratory Name & Address:**
Southwest Research Institute, Att: John P. Hagnasir, 6220 Culebra Road, San Antonio, TX 78238 (O) 210-522-2635 (F) 210-522-5720 (joh@swri.org)
### Thorium Nitrate Drum Sampling Project

**Sample Data, Request & Chain of Custody Form**

<table>
<thead>
<tr>
<th>Sample ID No.</th>
<th>Sample Collection Date / Time</th>
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<th>Lot ID No.</th>
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<th>Sample Container Gross Wt (gms)</th>
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<th>Sample Matrix</th>
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<td>CD451209120C2</td>
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<td>1330</td>
<td>1209</td>
<td>Monel</td>
<td>Total Metals / Mercury (Method SW846-6020, 7471)</td>
<td>24 days (Hg)</td>
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<td>Oxidizer Test (Method UN ST/SG/AEC.10/11, Rev.3)</td>
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<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 501.1 Method)</td>
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</table>

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<th>Release Date/Time</th>
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</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
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<td>2/22/14:45</td>
</tr>
<tr>
<td>PM / Broker</td>
<td>Stan Hodges</td>
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<td>02/15/16:00</td>
<td>02/15/16:45</td>
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<tr>
<td>Bldg 912</td>
<td>Drum # 5570 001-43</td>
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<td>02/15/16:00</td>
<td>02/15/16:45</td>
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</table>

**Laboratory Name & Address:**
Southwest Research Institute, Ann: 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
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<table>
<thead>
<tr>
<th>Sample ID No.</th>
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<th>Sample Container Type and No. of Containers</th>
<th>Drum ID No.</th>
<th>Lot ID No.</th>
<th>Sample Container Tare Wt. (gms)</th>
<th>Sample Container Gross Wt. (gms)</th>
<th>ThN Material Net Wt. (gms)</th>
<th>Sample Matrix</th>
<th>Requested Analyses &amp; Analytical Method(s)</th>
<th>Holding Time (days)</th>
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<tr>
<td>CD631209120062</td>
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<td>1 - 2 Liter Container</td>
<td>5</td>
<td>63</td>
<td>121</td>
<td>145</td>
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<td>Monolith</td>
<td>Total Metals / Mercury (Methods SW846-6020, -7471)</td>
<td>24 days (Hg)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Oxidizer Test (Method UNST/SG/AC.10471, Rev.3)</td>
<td>180 days (other metals)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Radionuclides – Thorium &amp; Uranium (Gamma Spectroscopy – to be consistent with EPA 901.1 Method)</td>
<td></td>
</tr>
</tbody>
</table>

* Tare weight includes any packing materials inside of the sample container with the ThN material.

### Chain of Custody Receipt and Release Signatures

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<th>Signature</th>
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<th>Release Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Coordinator</td>
<td>Tony Cunningham</td>
<td>[Signature]</td>
<td>7/26/02 11:30</td>
<td>7/26/02 11:30</td>
</tr>
<tr>
<td>PM / Bricker</td>
<td>Stan Hodges</td>
<td>[Signature]</td>
<td>7/26/02 11:30</td>
<td>7/26/02 11:30</td>
</tr>
<tr>
<td>BLD6713</td>
<td>[Signature]</td>
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</tbody>
</table>

Laboratory Name & Address:
Southwest Research Institute, Attn: John P. Hageman, 5220 Culebra Road, San Antonio, TX 78238 (C) 210-522-2633 (F) 210-522-5720 (jph@swri.org)
APPENDIX L

RADIOLOGICAL DOCUMENTATION
[This page intentionally left blank.]
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.

<table>
<thead>
<tr>
<th>Record</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation Work Permits</td>
<td>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.</td>
<td>L-5</td>
</tr>
<tr>
<td>Contamination and Radiation Surveys of Warehouses</td>
<td>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.</td>
<td>L-11</td>
</tr>
<tr>
<td>Air Sample Count Records</td>
<td>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</td>
<td>L-31</td>
</tr>
<tr>
<td>Drum Survey Records</td>
<td>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.</td>
<td>L-37</td>
</tr>
</tbody>
</table>
Radiation Work Permits
RADIATION SAFETY PROCEDURE

CONTROL OF RADIOLOGICAL WORK

ATTACHMENT 1

RADIATION WORK PERMIT

Permit No: 20020206001
Expiration Date: 6/12/02
Type: \( \text{\textcolor{red}{\times}} \) Routine

Description and Location of Work: GENERAL WORK IN WAREHOUSE, MOVING DRUMS, SURVEYS, ETC. OPENING OF DRUMS NOT PERMITTED ON THIS RWP

SURVEY INFORMATION

General Area Exposure Rates (mR/hr):
\( \text{\textcolor{red}{\times}} \) See Map

Maximum Accessible Exposure Rates (mR/hr):
\( \text{\textcolor{red}{\times}} \) See Map

Removable Contamination (cpm/100 cm²):
\( \leq 5 \text{ mR/hr} \)
\( \leq 80 \text{ mR/hr @ CONTACT WITH PALLET} \)
\( \leq 20 \text{ DPM} \times, \leq 1000 \text{ DPM} \), \( \text{X} \) See Map

ALARA REVIEW

Estimated Total Dose (Maximum Individual): \( \leq 50 \text{ mrem} \)

Pre-job Briefing by: ROSE MERRILL
Post-job Briefing by:

Dose Reduction Techniques to be Employed: MOVING IDENTIFIED DRUMS TO A LOW DOSE STAGING AREA

DOSEMETERS REQUIREMENTS

\( \text{\textcolor{red}{\times}} \) TL/PL Badge
\( \text{\textcolor{red}{\times}} \) Finger Ring
\( \text{\textcolor{red}{\times}} \) SRPD
\( \text{\textcolor{red}{\times}} \) B2A
\( \text{\textcolor{red}{\times}} \) Alarming Dosimeter

\( \text{\textcolor{red}{\times}} \) Stay-Time Estimate:

\( \text{\textcolor{red}{\times}} \) Other (Specify): Finger Ring & SRPD Required When Handling Drums

PROTECTIVE EQUIPMENT

\( \text{\textcolor{red}{\times}} \) Coveralls
\( \text{\textcolor{red}{\times}} \) Lab Coat
\( \text{\textcolor{red}{\times}} \) Hood
\( \text{\textcolor{red}{\times}} \) Rubber Gloves
\( \text{\textcolor{red}{\times}} \) Booties
\( \text{\textcolor{red}{\times}} \) Respirator
\( \text{\textcolor{red}{\times}} \) Taped Seams
\( \text{\textcolor{red}{\times}} \) HP Coverage
\( \text{\textcolor{red}{\times}} \) Stationery Air Sampler

Other Precautions and Special Instructions:

Authorized by (Signature of RSO):

Authorized by (Signature of CHP):

terminated by (Signature of RSO):

Date: 6/1/02

Date: 6/11/02

Date: 6/3/02
RADIATION SAFETY PROCEDURE

CONTROL OF RADIATIONAL WORK

ATTACHMENT 1
RADIATION WORK PERMIT

<table>
<thead>
<tr>
<th>Permit No:</th>
<th>Hammond Danger-002</th>
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Description and Location of Work:
- Inspection and Sample Drum
- Handle Keeping Inside Contamination Area

SURVEY INFORMATION
- General Area Exposure Rates (mR/hr):
  - < 20 mR/hr behind PB shield (Estimated)
- Maximum Accessible Exposure Rates (mR/hr):
  - < 40 mR/hr - Contact with Drum
- Removable Contamination (dis/100 cm²):
  - To be determined

ALARA REVIEW
- Estimated Total Dose (Maximum Individual):
  - 0.003 mSv (0.3 mrem) Attended
  - OSHA Cal Estimate for a total of 12 hrs.
- Actual Total Dose (Maximum Individual):
  - 0.003 mSv (0.3 mrem)

Pre-Job Briefing by: Perra Merkel
Post-Job Briefing by:

Dose Reduction Techniques to be Employed:
- PB blankets, extension tools to be used

DOSIMETRY REQUIREMENTS
- TLD/Film Badge
- Finger Ring
- SRPD
- BZA
- Alarming Dosimeter
- Stay-Time Estimate:
- Other (Specify): Other

PROTECTIVE EQUIPMENT
- Coveralls
- Lab Coat
- Hood
- Rubber Gloves
- Booties
- Respirator
- THK
- Taped Seams
- HP Coverage
- Stationary Air Sampler
- Pre-job Bioassay
- Post-job Bioassay
- Special Briefing inc.
- Other Precautions and Special Instructions:

Authorized by Signature of RSO:
- Perra Merkel
- Date: 6/14/02

Authorized by Signature of CSP:
- Date: 6/14/02

Termination (Signature of RSO):
- Date: 6/11/02

L-7
# ATTACHMENT 1
## RADIATION WORK PERMIT

<table>
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<th>Permit No.:</th>
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</table>

### Description and Location of Work:
Sampling, Inspection and Decal of drums inside containment cell.

### Survey Information:
- **General Area Exposure Rates (mR/hr):** <10
- **Maximum Accessible Exposure Rates (mR/hr):** <50
- **Removable Contamination (dpm/100 cm²):**
  - **External:** <2000 µcpw, <1000 dpm/cm² except for header and lip area.
  - **Internal contamination will be very high inside inner package.**

### ALARA REVIEW:
- **Estimated Total Dose (Maximum Individual):** <500 mrem
- **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 ventilation.

### Dosimetry Requirements:
- **X TLD/Film Badge**
- **X Finger Ring**
- **X SRPD**
- **X BZA**
- **X Alarming Dosimeter**

### Protective Equipment:
- **X Coveralls**
- **X Lab Coat**
- **X Hood**
- **X Rubber Gloves**
- **X Booties**
- **X Respirator**
- **X Taped Seams**
- **X HP Coverage**
- **X Stationary Air Sampler**

### Other Precautions and Special Instructions:
- **Authorized by (Signature of RSD):** [Signature]
- **Date:** 6/28/02
- **Authorized by (Signature of CHP):** [Signature]
- **Date:**
- **Terminated by (Signature of RSD):** [Signature]
- **Date:** 7/19/02
**RADIATION SAFETY PROCEDURE**

**CONTROL OF RADIOLOGICAL WORK**

---

**ATTACHMENT 1**

**RADIATION WORK PERMIT**

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**SURVEY INFORMATION**

- General Area Exposure Rates (mR/hr):
  - 75 Bq/m² @ 100 cm from drums,
  - Walkway = 45 mR/hr

- Maximum Accessible Exposure Rates (mR/hr):
  - 120 mR/hr @ contact with drums on angel

- Removable Contamination (dpm/100 cm²):
  - ≤ 250 dpm/100cm² • X See Map
  - < 1000 dpm/100cm² • A, Y

**ALARA REVIEW**

- Estimated Total Dose (Maximum Individual): □ TBD Attached
- Actual Total Dose (Maximum Individual):

- Pre-job Briefing by: R. Merkel
- Post-job Briefing by:

**DOSIMETRY REQUIREMENTS**

- □ TL0/Film Badge
- □ Finger Ring
- □ SRPD
- □ BZA
- □ Alarming Dosimeter

**PROTECTIVE EQUIPMENT**

- □ Coveralls
- □ Lab Coat
- □ Hood
- □ Rubber Gloves
- □ Boots

- □ Rubber
- □ Respirator
- □ Taped Seams
- □ XHP Coverage
- □ Stationary Air Sampler

**Other Precautions and Special Instructions:** Dress req. may be modified at discretion of HAP.

**Authorized by (signature of RSO):**

R. Merkel / R. Merkel

Date: 6/21/02

**Authorized by (signature of CHP):**

Date:

**Terminated by (signature of RSO):**

R. Merkel / R. Merkel

Date: 7/19/02
Contamination and Radiation Surveys of Warehouses
INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number: L-12

Instrument/SN: 
Calibration Due: 11/15/02

Site Name: Heading

Location: JHMD WAREHOUSE

Purpose: INITIAL SURVEY

Survey Performed By (Printed): 
Survey Performed By (Signature): 

Battery OK

GRV OK

Source Check OK

Grid Dimensions:
0 meters
0 inches

0 centimeters

Notes:
Contact w/ pallets was up to 80 m/ hr, contact w/ pre-selected OCM was up to 40 m/ hr.
All spheres were < 50 m/ hr, < 100 m/ hr.

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INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number: ____________________________  Page __________ of __________

Instrument SN: RO-2 # 5965  Calibration Due: 11/10/02

Site Name: Howard Depot  Date: ____________________________  Time: ____________________________

Location: East Side of Bldg.

Verifying Dose Rates on Exterior After Welding

Survey Performed By: (Print): P. MERKEL

Grid Densities: x

0.0 Meters  0 Feet

0.1 Meters  0.1 Inches

Source Check OK

Notes: Exterior Dose Rates are at Contact with Roll-Up Door
INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
RADIOLOGICAL SURVEY FORM

Survey Number: ____________________________

Instrument/IM: 60-2 * 09985
Calibration Due: 11/10/02
Site Name: HAMMOCK DEPOT
Date: __________
Calibration Due: 4/23/03
Location: ENSIN WAREHOUSE

Instrument/IM: 2929 * 124197
Calibration Due: __________
Purpose: INITIAL SURVEY

Survey Performed By (Print):
Rogel Mirell
Survey Performed By (Signature):

Primary OK
PSM OK
Source Check OK

Grid Dimensions:

X: __________
Y: __________
0 meters
0 feet
0 inches
0 centimeters

Notes:
ALL SITES < SGR. SGR = 23 cpm, < 100 DPM B'Y
## INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
### RADIATIONAL SURVEY FORM

<table>
<thead>
<tr>
<th>Survey Number:</th>
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<td>Ross Merkel</td>
<td>Survey Performed By (Engineer)</td>
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| Battery OK | KV OK | Source Check OK | Grid Dimension | | |
|------------|-------|-----------------|----------------|-----------------|
|            |       |                 | N/A            | N/A             |

| 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 |

Notes: PLEASE SEE ATTACHED MAPS
Drum Layout in Warehouse B-911, B-912 & B-913 at the Curtis Bay Depot

See attached for results.
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<tr>
<th>Sample No./Location</th>
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<th>Date/Time of Count</th>
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<th>(3) Sample count time (min)</th>
<th>(4) Net Sample count rate (2 - 3 - 1) cpm</th>
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**Notes:**

- Project No.: 2002-006.01
- Project Location: Curtis Bay, MD

**Signature:** [Signatures]
## Sample Count Record

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**Signed Name:**

**Project No.:** 20021006-04

**Notes:**

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RDP 018 (Rev. 001) - Attachment 1
# Integrated Environmental Management, Inc.

## Sample Count Record

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<th>Sample No./Location</th>
<th>Date/Time Collected</th>
<th>Date/Time of Count</th>
<th>Inst. Model and Serial No.</th>
<th>Inst. Efficiency (c/s)</th>
<th>(2) Avg. Daily Eq. Rate (cpm)</th>
<th>(3) Sample Counts</th>
<th>(4) Sample Count Rate (2 + 3 - 5 cpm)</th>
<th>(5) dpm (4 + 6 cpm)</th>
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Printed Name: [Signature]
Project No.: 2007006.04
Notes: [Signature]

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Copyright © Integrated Environmental Management, 1998
RSF-019 (Rev. 2011) - Attachment 1
### Drum Layout in Warehouses B-911, B-912, & B-913 at the Curtis Bay Depot

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<td>10</td>
<td>80/40</td>
<td>120/80</td>
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**Legend:**
- `X/X` denotes contact/30cm dose rates in mR/hr (see top corner for orientation)
- □ denotes 9/4 dose rate in mR/hr taken @ waist level

**Location of Contact Dose Rate in mR/hr**

**Sprinkler House**
Drum Layout in Warehouses B-911, B-912 & B-913 at the Curtis Bay Depot

* SEE ATTACHED FOR RESULTS
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<th>Sample No./Location</th>
<th>Date/Time Collected</th>
<th>Data/Time of Count</th>
<th>Inst. Model and Serial No.</th>
<th>Inst. Efficiency (c/s)</th>
<th>(1) Avg. Daily Bkg Rate (cpm)</th>
<th>(2) Sample counts</th>
<th>(3) Sample count time (hr)</th>
<th>(4) Net Sample count rate (2-3 - 1) dpm</th>
<th>(5) dpm (4 ÷ Effi)</th>
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Printed Name: Rod Hesse, Kevin Kozy
Signature: Rod Hesse, Kevin Kozy

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RSP-019 (Rev. 001) - Attachment 1
# Integrated Environmental Management, Inc.

## Sample Count Record

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<tr>
<th>Sample No./Location</th>
<th>Date/Time Collected</th>
<th>Date/Time of Count</th>
<th>Inst. Model and Serial No.</th>
<th>Inst. Efficiency (c/d)</th>
<th>(1) Avg. Daily Bag Rate (c/d)</th>
<th>(2) Sample Counts</th>
<th>(3) Sample count time (min)</th>
<th>(4) Net Sample count rate</th>
<th>(5) dpm (4 x ET)</th>
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**Priced Name:**

Roel Merkel, Kevin Kozal

**Project No.:** 2002006.04

**Notes:**

2. RPG-019 (Rev. 001). Attachment 1
Drum layout in Warehouses B-811, B-812, and B-813 at the Curtis Bay Depot.
Air Sample Count Records
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<th>Description</th>
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<th>Date &amp; Time of Count (EST)</th>
<th>Sample Time (min)</th>
<th>Sample Count Rate (cpm)</th>
<th>Sample Gross Count (cpm)</th>
<th>Sample Blank Count (cpm)</th>
<th>Sample Blank Count Rate (cpm)</th>
<th>Sample Blank Count Rate (cpm)</th>
<th>Blank Count Rate (cpm)</th>
<th>Net Count Rate (cpm)</th>
<th>Sample Volume (L)</th>
<th>Activity (pCi)</th>
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<td>167 7 167</td>
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*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^-5 x V x Efficiency

Health Physics Technician: RIVERKEL
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<th>Date &amp; Time of Collection</th>
<th>Emission Type (check)</th>
<th>Instrument Model/Serial No.</th>
<th>AIR SAMPLE COUNT RECORD</th>
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<td>Gamma (γ)</td>
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**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 10^7 x V x Efficiency

MCC = $\frac{2.71 \times 10^5}{1.6}$

Health Physics Technicians: P. MEXEL
Drum Survey Records
## INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
### SAMPLE COUNT RECORD

<table>
<thead>
<tr>
<th>Sample No./Location</th>
<th>Date/Time Collected</th>
<th>Date/Time of Count</th>
<th>Inst. Model and Serial No.</th>
<th>Inst. Efficiency (cpsi)</th>
<th>(1) Avg. Daily Disp. Rate (cpm)</th>
<th>(2) Sample Counts</th>
<th>(3) Sample count time limit</th>
<th>(4) Net Sample count rate (2 + 3 - 1) cpm</th>
<th>(5) cpm (4 + Eff)</th>
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<td>1531</td>
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<td>2 7 11 2067</td>
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<td>2 7 10 207</td>
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</tr>
</tbody>
</table>

**Printed Name:** R. MERKEL  
**Project No.:** 2001006.04  
**Signature:** R. MERKEL  
**Notes:** All limits were <20 Bq/mL  
**Location:** Hammond Depot
Drum Inspection / Sampling in Warehouse B-911 at the Curtis Bay Depot

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<td>20/2.8</td>
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**Surveys performed using RO-2**

**Note:** **/** = CONTACT/ONE METER

**Foreign drums from this building were bagged due to contamination found with law. They were not smeared. Laws were up to 300 CPM**

**Doors**

**Notes**

1 - 30-gallon drum
2 - 55-gallon drum
3 - 85-gallon drum
4 - 40-gallon drum
### INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
#### SAMPLE COUNT RECORD

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<th>Sample No./Location</th>
<th>Date/Time Collected</th>
<th>Date/Time of Count</th>
<th>Inst. Model and Serial No.</th>
<th>Inst. Efficiency (ICDU)</th>
<th>(1) Avg. Daily Bkg. Rate (cEng)</th>
<th>(2) Sample counts</th>
<th>(3) Sample count time (min)</th>
<th>(4) Mod Sample count rate (2-3, % cEng)</th>
<th>(5) rpm</th>
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</tbody>
</table>

**Printed Name:** Rob Merkel  
**Project No.:** 2002006.04  
**Notes:** LARGE AREA WIPES TAKEN ON EACH DRUM WE ARE ALL <2000 cPm/LAW-1 AND <1000 cPm/LAW-2.

Copyright © Integrated Environmental Management, 1999

ASL-019 Rev. 001 - Attachment 1
## Drum Inspection / Sampling in Warehouse B-912 at the Curtis Bay Depot

### Table

<table>
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### Notes

- **Survey performed using 80-2.
- Note: **80/80** = contact/one meter.
- Foreign drums from this area were passed due to contamination found with LAA. They were not smeared. Laws were up to ~200 cm.

### Doors

- 1 - 30-gallon drum
- 2 - 55-gallon drum
- 3 - 85-gallon drum
- 4 - 40-gallon drum
### INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
**SAMPLE COUNT RECORD**

<table>
<thead>
<tr>
<th>Sample No./Location</th>
<th>Date/Time Collected</th>
<th>Date/Time of Count</th>
<th>Inst. Model and Serial No.</th>
<th>Inst. Efficiency (in %)</th>
<th>(1) Avg. Daily Beg. Rate (cpm)</th>
<th>(2) Sample counts</th>
<th>(3) Sample count time (min)</th>
<th>(4) Net Sample (2 + 3)</th>
<th>(5) Low 1.5% Error</th>
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</table>

**Printed Name:**  
Robb Maree

**Project No.:**  
2002-006-04

**Signature:**  
 Robb Maree

**Project Location:**  
Curtis Bay, NJ

**Note:** Large area wipes taken on each drum were all <20 cpmpd/10gal and <1000 cpmpd/240 gal.
# Drum Inspection / Sampling in Warehouse B-913 at the Curtis Bay Depot

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**Surveys performed using RD-2**

**Note:** **/** = contact/one meter

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<td>2 - 55-gallon drum</td>
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<td>3 - 85-gallon drum</td>
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Printed Name: D. ROSS MERCE  
Signature:  
Project No.: 2002-006-04  
Printed Name: D. ROSS MERCE  
Signature:  
Project Location: Curtis Bay, FL

Notes: LARGE AREA WIPES TAKEN ON EACH DRUM WERE ALL < 200 DPM/LAU AND < 1000 DPM/LAU B, C.
## INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.
### SAMPLE COUNT RECORD

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<th>Date/Time of Count</th>
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<th>Inst. Efficiency (in%)</th>
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<th>(2) Sample counts</th>
<th>(3) Sample count time (min)</th>
<th>(4) Net Sample count rate</th>
<th>(5) dpm (4 x EF)</th>
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<td>125/20</td>
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<tr>
<td>27-159</td>
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<td>121</td>
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</tbody>
</table>

**Printed name:**

**Signature:**

**Project No.:** 200206103X

**Notes:** LARGE AREA WIPES TAKEN ON EACH DRUM WERE ALL <20 BPM/LAW/DRUM AND <1000 BPM/LAW A, Y.
APPENDIX M

POTENTIAL MECHANISMS FOR GENERATION OF HEADSPACE GAS IN THE MD-1 DRUMS
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 NOx 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.

\[
\text{Ca(OH)}_2 + 2\text{HNO}_3 \rightarrow \text{Ca(NO}_3)_2 + 2\text{H}_2\text{O} \quad \text{(M-1)}
\]

Equation M-4 shows that carbon dioxide would be formed if nitric acid reacted with calcium carbonate.

\[
\text{CaCO}_3 + 2\text{HNO}_3 \rightarrow \text{Ca(NO}_3)_2 + \text{CO}_2 + \text{H}_2\text{O} \quad \text{(M-2)}
\]

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 CO2. 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)\textsubscript{2} 92%, MgO 1.4%, SiO\textsubscript{2} 1.1%, Mn\textsubscript{2}O\textsubscript{3} 0.8%, and CaCO\textsubscript{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 CO₂ 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., CO₂ versus O₂ 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.

\[
\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O} \quad (\text{M-3})
\]

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 NO₂), 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, N₂:O₂), 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 NOₓ type gases (NO, N₂O, etc.) and HNO₃
CO and CO₂
H₂O, N₂, O₂

Solution (ideal)
H₂O and HNO₃, but no carbonates, etc.
Distinct solid phases

- Ca(OH)$_2$
- CaCO$_3$
- Ca(NO$_3$)$_2$·nH$_2$O, 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.

**M.2 REFERENCE**

APPENDIX N

DEPARTMENT OF ENERGY’S EXPERIENCE WITH PRESSURIZED DRUMS
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>
<thead>
<tr>
<th>Date</th>
<th>Site</th>
<th>Container (material)</th>
<th>Incident description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>ANL-E</td>
<td>55-gal drum</td>
<td>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.</td>
<td>Silva 1992</td>
</tr>
<tr>
<td>1992</td>
<td>ANL-W</td>
<td>Not identified</td>
<td>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.</td>
<td>DOE April 1992</td>
</tr>
<tr>
<td>1991</td>
<td>Fernald</td>
<td>55-gal drum</td>
<td>Drum containing waste materials violently ruptured when moved with a forklift. Chemical reaction of wastes in drum produced hydrogen, which overpressurized the drums.</td>
<td>DOE January 1991</td>
</tr>
<tr>
<td>1992</td>
<td>Fernald</td>
<td>55-gal drum inside an 85-gal overpack</td>
<td>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 biogenic nitrification sludge.</td>
<td>DOE September 1992</td>
</tr>
<tr>
<td>1992</td>
<td>RFETS</td>
<td>55-gal drum</td>
<td>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.</td>
<td>DOE August 1992</td>
</tr>
<tr>
<td>1992</td>
<td>Paducah</td>
<td>Container not identified</td>
<td>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.</td>
<td>DOE July 1992</td>
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<tr>
<td>1992</td>
<td>Hanford</td>
<td>55-gal drums</td>
<td>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.</td>
<td>DOE August 1992a</td>
</tr>
</tbody>
</table>

---

Table N-1. Significant events of DOE pressurized drum experience
Table N-1. (continued)

<table>
<thead>
<tr>
<th>Date</th>
<th>Site</th>
<th>Container (material)</th>
<th>Incident description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>PNNL</td>
<td>Drum (capacity not identified)</td>
<td>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.</td>
<td>DOE January 1995</td>
</tr>
<tr>
<td>1995</td>
<td>Grand Junction (GJPO)</td>
<td>55-gal drum (new open-top metal drum)</td>
<td>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.</td>
<td>Rust Geotech, Inc. June 1995</td>
</tr>
</tbody>
</table>

*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.

REFERENCES


APPENDIX O

FOLLOW-UP DRUM PRESSURE TESTING
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.
Follow-up Drum Pressure Testing

- 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.

![MD-1 package with flat drumhead.](image-url)
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).

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**Fig. O-2.** MD-1 drumhead showing corrugated drumhead.

**Fig. O-3.** Schematic of air pressure control board.
Follow-up Drum Pressure Testing

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.
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).

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>
<thead>
<tr>
<th>Pressure reading (psig)</th>
<th>Drumhead deflection (in.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.030</td>
<td>No leak</td>
</tr>
<tr>
<td>10</td>
<td>0.251</td>
<td>No leak</td>
</tr>
<tr>
<td>12</td>
<td>0.408</td>
<td>Leak between ends of locking ring</td>
</tr>
<tr>
<td>10</td>
<td>0.400</td>
<td>No leak</td>
</tr>
<tr>
<td>11</td>
<td>0.408</td>
<td>No leak</td>
</tr>
<tr>
<td>12</td>
<td>0.420</td>
<td>Leak between ends of locking ring</td>
</tr>
<tr>
<td>13</td>
<td>0.432</td>
<td>More severe leak</td>
</tr>
<tr>
<td>0</td>
<td>0.265</td>
<td>Permanent drum deformation. A similar permanent deformation of the drum bottom was observed.</td>
</tr>
</tbody>
</table>
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.](image)

**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.

O-14
### Table O-2. Results of second pressurization test of MD-1 package

<table>
<thead>
<tr>
<th>Pressure reading (psig)</th>
<th>Drumhead deflection (in.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.040</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.059</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.082</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.105</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.124</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.141</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.159</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.178</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0.193</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.207</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0.225</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.018</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0.252</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.040</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0.297</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.094</td>
<td>Bump felt on drumhead at gap in lock ring ends</td>
</tr>
<tr>
<td>14</td>
<td>0.349</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.162</td>
<td>Large crease at gap in lock ring ends</td>
</tr>
<tr>
<td>15</td>
<td>0.636</td>
<td>No leak</td>
</tr>
<tr>
<td>0</td>
<td>0.468</td>
<td></td>
</tr>
</tbody>
</table>

### 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.
Follow-up Drum Pressure Testing

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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Fig. P.1. Letter from DNSC to DOT concerning the potential shipment of ThN classified as “Radioactive materials, LSA, n.o.s”.
Mr. F. Kevin Reilly  
Director  
Defense Logistics Agency  
Defense National Stockpile Center  
8725 John J. Kingman Road, Suite 4616  
Ft. Belvoir, Virginia 22060-6223  

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  
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.”.
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...
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, DNSSC-O, DNSSC-G, ORNL:P.Singley, ORNL:W. Hermes
P. Singley/ORNL/(865) 576-2068/10/10/02/mjp

Fig. P.3. Letter from DNSSC to DOT concerning the potential use of ISO containers as a shipping package (cont.).
Mr. F. Kevin Reilly  
Director, Environmental Management  
Defense Logistics Agency  
8725 John J. Kingman Road, Suite 3229  
Ft. Belvoir, Virginia 22060-6223

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
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.
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

\[ X := \left( 19 + \frac{4.25}{12} \right) \text{ft} \quad X = 19.354 \text{ ft} \quad \gamma = \frac{1}{433.592} \text{lb} \]

\[ Y := \left( 7 + \frac{9.875}{12} \right) \text{ft} \quad Y = 7.823 \text{ ft} \quad \text{cm} := \frac{1}{0.3937} \text{in} \]

\[ Z := \left( 7 + \frac{8.5}{12} \right) \text{ft} \quad Z = 7.708 \text{ ft} \]

Assume that the intermodal container is holding 40,000 lb of thorium nitrate which has a density of 1.65 g/cm³.

\[ m := 40 \cdot 10^3 \text{lb} \quad \rho := 1.65 \frac{\text{g}}{\text{cm}^3} \quad \rho = 103.006 \frac{\text{lb}}{\text{ft}^3} \]

\[ v := \frac{m}{\rho} \quad v = 388.326 \text{ft}^2 \quad xy = X/Y \text{ and } xz = X/Z \]

\[ y = (Y/X)x \text{ and } z = (Z/X)x \quad y = xy = x[(Y/X)x][Z/X] \]

\[ x^3 = v[(Y/X)(Z/X)] \quad x = [(Y/X)(Z/X)]^{1/3} \]

\[ y = \frac{Y}{X} \quad y = 5.421 \text{ ft} \]

\[ z = \frac{Z}{X} \quad z = 5.341 \text{ ft} \]

\[ t = 0.125 \text{ in} \quad t = 0.0104 \text{ ft} \quad \text{The thickness, } L, \text{ of the intermodal container walls is assumed to be greater than 0.125 in, but 0.125 in is used for conservatism.} \]

The volume of the 40,000-lb block of ThN is 13.411 ft x 5.341 ft x 5.421 ft = 388.326 ft³. Because of round-off errors, Microshield calculates the volume to be 388.296 ft³. 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.

\[ x_{\text{half}} := \frac{x}{2} \quad x_{\text{half}} = 3.353 \text{ ft} \]

\[ y_{\text{half}} := \frac{y}{2} \quad y_{\text{half}} = 2.711 \text{ ft} \]

\[ z_{\text{half}} := \frac{z}{2} \quad z_{\text{half}} = 2.671 \text{ ft} \]

\[ s_{\text{dose}} := 100 \text{cm} \quad s_{\text{dose}} = 3.281 \text{ ft} \]

\[ x_{\text{Air}} := X - x \quad x_{\text{Air}} = 5.943 \text{ ft} \]

\[ x_{\text{AirGap}} := \frac{x_{\text{Air}}}{2} \quad x_{\text{AirGap}} = 2.971 \text{ ft} \]

\[ x_{\text{dose}} := x + x_{\text{AirGap}} + s_{\text{dose}} \quad x_{\text{dose}} = 19.674 \text{ ft} \]
MicroShield Dose Rate Modeling of an ISO Container Loaded with 40,000 lb of Thorium Nitrate

\[ Y_{Air} := Y = Y \quad Y_{Air} = 2.402 \text{ ft} \quad Y_{Air} \left( \frac{Y_{Air}}{2} \right) = Y_{Air} \left( \frac{2}{2} \right) \quad Y_{Air} = 1.201 \text{ ft} \]

\[ Y_{dose} := Y + Y_{Air} + t + s_{dose} \quad Y_{dose} = 9.913 \text{ ft} \]

\[ z_{Air} := Z - z \quad z_{Air} = 2.367 \text{ ft} \]

\[ z_{dose} := z + z_{Air} + t + s_{dose} \quad z_{dose} = 9.816 \text{ ft} \]

Assume that the air gap does not exist, i.e., \( x_{AirGap} = y_{AirGap} = z_{AirGap} = 0 \).

\[ x_{AirGap} := 0.00 \text{ ft} \quad x_{dose} := x + x_{AirGap} + t + s_{dose} \quad x_{dose} = 18.703 \text{ ft} \]

\[ y_{AirGap} := 0.00 \text{ ft} \quad y_{dose} := y + y_{AirGap} + t + s_{dose} \quad y_{dose} = 8.712 \text{ ft} \]

\[ z_{AirGap} := 0.00 \text{ ft} \quad z_{dose} := z + z_{AirGap} + t + s_{dose} \quad z_{dose} = 8.633 \text{ ft} \]

Assume that the thorium nitrate is spread throughout the intermodal container with uniform density.

\[ V := X \cdot Y \cdot Z \quad V = 1 \, 167 \times 10^3 \text{ ft}^3 \]

\[ \rho_{\text{spread}} := \frac{m}{V} \quad \rho_{\text{spread}} = 34.273 \text{ lb ft}^{-3} \]

\[ \rho_{\text{spread}} = 0.249 \text{ gm cm}^{-3} \]

\[ X_{half} := \frac{X}{2} \quad X_{half} = 9.677 \text{ ft} \]

\[ Y_{half} := \frac{Y}{2} \quad Y_{half} = 3.911 \text{ ft} \]

\[ Z_{half} := \frac{Z}{2} \quad Z_{half} = 3.854 \text{ ft} \]

\[ X_{dose} := X + t + s_{dose} \quad X_{dose} = 22.645 \text{ ft} \]

\[ Y_{dose} := Y + t + s_{dose} \quad Y_{dose} = 11.114 \text{ ft} \]

\[ Z_{dose} := Z + t + s_{dose} \quad Z_{dose} = 11.000 \text{ ft} \]
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
- Width: 234.94 cm
- Height: 238.445 cm

Dose Points
- X: 0 cm
- Y: 0 cm
- Z: 0 cm
- # 1: 590.965 cm
  - 19 ft 4.7 in
- # 2: 590.965 cm
  - 19 ft 4.7 in

Shields
- Shield Name: Source
- Material: ThN-Di/Res
- Density: 0.549
- Dimension: 1167.04 ft
- Air Gap: .01 ft

Source Input
- Grouping Method: Standard Indices
- Number of Groups: 25
- Lower Energy Cutoff: 0.015
- Photons < 0.015: Excluded
- Library: Grove

Nuclides | Curies | Becquerels | $\mu$Ci/cm$^2$ | Bq/cm$^2$
--- | --- | --- | --- | ---
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-214 | 8.1559e-001 | 3.0177e+010 | 2.4680e-002 | 9.1315e+002
Br-214 | 1.1811e-003 | 5.913e+007 | 4.9101e-005 | 1.6617e+000
Ca-243 | 3.864e-008 | 1.4297e+003 | 1.1693e-009 | 4.3236e-005
Ca-243m | 2.4150e-005 | 8.9356e+007 | 7.3079e-007 | 2.7039e+002
Pb-210 | 7.5360e-004 | 2.7143e+007 | 2.2199e-005 | 8.2136e-001
Pb-212 | 8.1559e-001 | 3.0177e+010 | 2.4680e-002 | 9.1315e+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 | 1.4844e-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.
### 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

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<th>Energy (MeV)</th>
<th>Activity (photons/sec)</th>
<th>Fluence Rate (MeV/cm²/sec)</th>
<th>Fluence Rate (MeV/cm²/sec)</th>
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<td>No Buildup</td>
<td>With Buildup</td>
<td>No Buildup</td>
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**TOTALS:**

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<th>Fluence Rate (MeV/cm²/sec)</th>
<th>Fluence Rate (MeV/cm²/sec)</th>
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**Fig. Q.1. MicroShield model of dose at 1 cm from end of ISO (continued).**
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<th>Activity (photons/sec)</th>
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<th>Fluence Rate (MeV/cm²/sec)</th>
<th>Exposure Rate (mSv/hr)</th>
<th>Exposure Rate (mSv/hr)</th>
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Fig. Q.1. MicroShield model of dose at 1 cm from end of ISO (continued).
Fig. Q.2. MicroShield model of dose at 1 m from end of ISO.
## 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

<table>
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<tr>
<th>Energy (MeV)</th>
<th>Activity (photons/sec)</th>
<th>Fluence Rate (MeV cm(^{-2}) sec(^{-1}))</th>
<th>Fluence Rate (MeV cm(^{2}) sec(^{-1}))</th>
<th>Exposure Rate (mCi/hr)</th>
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### Results - Dose Point # 2 - (22,645,3,911,3,854) ft

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<th>Fluence Rate (MeV cm(^{2}) sec(^{-1}))</th>
<th>Exposure Rate (mCi/hr)</th>
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Fig. Q.2. MicroShield model of dose at 1 m from end of ISO (continued).
### Table of Dose Rate Measurements

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<td>With Buildup</td>
<td>No Buildup</td>
<td>With Buildup</td>
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**Fig. Q.2.** MicroShield model of dose at 1 m from end of ISO (continued).
Fig. Q.3. MicroShield model of dose at 1 cm from side of ISO.
### MicroShield Dose Rate Modeling of an ISO Container Loaded with 40,000 lb of Thorium Nitrate

#### 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

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<th>Energy (MeV)</th>
<th>Activity (photons/sec)</th>
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<th>Fluence Rate (MeV/cm²/sec)</th>
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**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

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<th>Activity (photons/sec)</th>
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Fig. Q.3. MicroShield model of dose at 1 cm from side of ISO (continued).
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<th>Activity (photons/sec)</th>
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<th>Exposure Rate (mR/hr)</th>
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<td>No Buildup</td>
<td>With Buildup</td>
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Fig. Q.3. MicroShield model of dose at 1 cm from side of ISO (continued).
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
#1 335.28 cm
   X: 0 cm, 0.0 in
   Y: 0 cm, 0.0 in
   Z: 2.95 cm, 9 ft 8.1 in
#2 1.19 cm
   X: 0 cm, 0.0 in
   Y: 1.19 cm, 3 ft 10.9 in
   Z: 2.95 cm, 9 ft 8.1 in

Shields
<table>
<thead>
<tr>
<th>Shield Name</th>
<th>Dimension</th>
<th>Material</th>
<th>Density</th>
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</tr>
<tr>
<td>Shield 1</td>
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<td>Air Gap</td>
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Source Input
Grouping Method: Standard Indices
Number of Groups: 25
Lower Energy Cutoff: 0.015
Photons < 0.015: Excluded

Library: Grov

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<tr>
<th>Nuclide</th>
<th>curies</th>
<th>becquerels</th>
<th>μCi/cm³</th>
<th>Bq/cm³</th>
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Fig. Q.4. MicroShield model of dose at 1 m from side of ISO (continued).
Fig. Q.4. MicroShield model of dose at 1 m from side of ISO (continued).
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Fig. Q.4. MicroShield model of dose at 1 m from side of ISO (continued).
Fig. Q.5. MicroShield model of dose at 1 cm from top of ISO.
Fig. Q.5. MicroShield model of dose at 1 cm from top of ISO (continued).
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

**Case Title:** ISO top spread out  
**Description:** Rad Field at 1 m from the ISO top-spread out source  
**Geometry:** 13 - Rectangular Volume

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**Fig. Q.6.** MicroShield model of dose at 1 m from top of ISO.
### 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

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<th>Energy (MeV)</th>
<th>Activity (photons/sec)</th>
<th>Fluence Rate (MeV/cm²/sec)</th>
<th>Fluence Rate (MeV/cm²/sec)</th>
<th>Exposure Rate (mR/hr)</th>
<th>Exposure Rate (mR/hr)</th>
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<td>9.541e+02</td>
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**TOTALS:** 9.799e+10  5.277e+03  1.131e+04  8.114e+00  1.806e+01

#### Results - Dose Point #2 - (11,114,3,854,9,677) ft

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<th>Fluence Rate (MeV/cm²/sec)</th>
<th>Exposure Rate (mR/hr)</th>
<th>Exposure Rate (mR/hr)</th>
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Fig. Q.6. MicroShield model of dose at 1 m from top of ISO (continued).
### Table: MicroShield Dose Rate Modeling of an ISO Container Loaded with 40,000 lb of Thorium Nitrate

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<th>Fluence Rate (MeV/cm²/sec)</th>
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<td>With Buildup</td>
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**TOTALS:** 9.799e+10 1.425e+10 2.900e+04 2.203e+01 4.637e+01

Fig. Q.6. MicroShield model of dose at 1 m from top of ISO (continued).
Fig. Q.7. MicroShield model of dose at 16 ft from end of ISO.
MicroShield Dose Rate Modeling of an ISO Container Loaded with 40,000 lb of Thorium Nitrate

Page : 2
DOS File: ISOEND16.MS5
Run Date : October 24, 2002
Run Time: 4:43:51 PM
Duration : 00:00:10

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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

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<th>Activity (photons/sec)</th>
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<th>Exposure Rate (mR/hr)</th>
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Results - Dose Point # 2 - (35.3644,3.9113,3.854) ft

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Fig. Q.7. MicroShield model of dose at 16 ft from end of ISO (continued).
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<th>Fluence Rate MeV/m^2/sec</th>
<th>Exposure Rate µR/hr</th>
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Fig. Q.7. MicroShield model of dose at 16 ft from end of ISO (continued).
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3. R. M. Canon [1 CD]
4. D. W. DePaoli [1 CD]
5. L. D. Duncan [1 CD]
6. T. O. Early [1 CD]
7. M. B. Hawk [1 hard copy, 1 CD]
8. W. C. Hayes [1 CD]
9–10. W. H. Hermes [2 hard copies, 2 CDs]
11. D. J. Hill [1 CD]
12. C. Y. Horton [1 CD]
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