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Characterization of Past and Present Waste Streams from the 325 Radiochemistry Building

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Date Published
December 1993

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Prepared for the U.S. Department of Energy
Assistant Secretary for Environment, Safety and Health

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Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

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ORIGINAL

Date Received: 10/26/93		INFORMATION RELEASE REQUEST		Reference: WHC-CM-3-4	
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			ID Number (include revision, volume, etc.) WHC-EP-0696		
			List attachments.		
			Date Release Required November 19, 1993		
Title: Characterization of Past and Present Waste Streams from the 325 Radiochemistry Bldg			Unclassified Category UC-570		Impact Level 4
New or novel (patentable) subject matter? ☒ No ☐ Yes If "Yes", has disclosure been submitted by WHC or other company? ☐ No ☐ Yes (Disclosure No(s))			Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions? ☒ No ☐ Yes (Identify)		
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Title of Journal					
CHECKLIST FOR SIGNATORIES					
Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval		
			Name (printed)	Signature	Date
Classification/Unclassified Controlled Nuclear Information	☒	☐	S. J. AMIA	<i>S. J. Amia</i>	6-9-93
Patent - General Counsel	☒	☐	SW Berglin	<i>SW Berglin</i>	10/28/93
Legal - General Counsel	☒	☐			
Applied Technology/Export Controlled Information or International Program	☐	☒			
WHC Program/Project	☒	☐	M. M. MCCARTHY	<i>M. M. McCarthy</i>	26 Oct 93
Communications	☐	☒			
RI Program/Project	☒	☐	RF Guercia	<i>RF Guercia</i>	11/17/93
Publication Services	☒	☐	SM Neale	<i>SM Neale</i>	12/7/93
Other Program/Project	☐	☒			
Information conforms to all applicable requirements. The above information is certified to be correct.					
References Available to Intended Audience ☒ Yes ☐ No Transmit to DOE-HQ/Office of Scientific and Technical Information ☒ Yes ☐ No Author/Requestor (Printed/Signature) <i>DR Duncan</i> Date <i>6/7/93</i> Intended Audience ☐ Internal ☐ Sponsor ☒ External Responsible Manager (Printed/Signature) <i>P. MERTENS</i> Date <i>6/7/93</i>			INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP Stamp is required before release. Release is contingent upon resolution of mandatory comments.
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EXECUTIVE SUMMARY

During the next two decades the transuranic wastes now stored in the burial trenches and storage facilities at the Hanford Site are to be retrieved, processed at the Waste Receiving and Processing Facility, and shipped to the Waste Isolation Pilot Plant near Carlsbad, New Mexico for final disposal. Over 6.8% of the transuranic waste to be retrieved for shipment to the Waste Isolation Pilot Plant has been generated at the 325 Radiochemistry Building by the Westinghouse Hanford Company (Westinghouse Hanford) and Battelle's Pacific Northwest Laboratories (PNL).

The purpose of this report is to characterize the radioactive solid wastes generated at the 325 Building by Westinghouse Hanford Company and PNL using process knowledge, existing records, and oral history interviews. The 325 Building is currently operated by PNL for the U.S. Department of Energy.

The 325 Radiochemistry Building, also called the Applied Chemistry Building, was originally built to safely house and handle multi-curie level chemical development work with high activity substance. Tasks performed at this facility have included chemistry and analysis, radioactive materials processing, safeguards and materials management, waste management, technical research and development, and operational health physics. Programs supported by the 325 Facility have included, but are not limited to, the following:

- Reclamation of Uranium and Plutonium by Extraction (RECUPLEX) process
- Reduction-Oxidation (REDOX) process
- Plutonium-Uranium Extraction (PUREX) process
- Plutonium Reclamation Facility (PRF)
- Nuclear Waste Vitrification Project (NWVP)
- Fast Flux Test Facility (FFTF)
- Liquid Metal Fast Breeder Reactor (LMFBR) program.

Section 2.0 provides further details of the 325 Facility's physical plant and the operations that occurred there.

Because the 325 Building is a research facility, the work performed in this building has been extremely varied. Section 3.0 discusses the analyses done at 325 and the types of solid waste generated. A brief description of the systems currently in place to handle 325 gaseous and liquid wastes also is included in this section.

All solid wastes originating at the 325 Building are packaged for onsite/offsite storage or disposal. The waste packages are designed to safely contain the waste during transportation and storage, and to meet the criteria of the storage/disposal unit. Waste packaging and reporting requirements have undergone significant changes throughout the history of the 325 Building. Current and historical packaging and handling procedures for radioactive wastes at the 325 Building are provided in Section 4.0.

Information on the radioactive wastes generated at the 325 Radiochemistry Building can be found in a number of existing documents and databases. The most important of these are the Solid Waste Information Tracking System database and Solid Waste Burial Records.

Facility personnel also provide excellent information about past waste generation and the procedures used to handle that waste. Sections 5.0 through 8.0 were compiled using these sources to characterize the radioactive wastes, especially TRU wastes, generated at the 325 Radiochemistry Building.

Between 1970 and 1992, 77,494 containers of radioactive solid waste were generated by Westinghouse Hanford and PNL at the 325 Building. These containers represent over almost 3.3 million kg (7.2 million lb) of waste occupying 14,730 m³ (520,190 ft³) of space. Sections 5.0 through 8.0 provide an in depth look at the waste generated by Westinghouse Hanford and PNL in the analytical laboratories, the 325A Annex and the 325B Annex, respectively. Specific information about the radioactive waste generated includes the following:

- Weight and volume of the waste
- Container types and numbers
- Physical description of the waste
- Radiological Components
- Hazardous Constituents
- Current Storage/Disposal Locations.

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LIST OF TERMS

325	Radiochemistry Building (Applied Chemistry Laboratory)
325A	High Level Radiochemistry Facility
325B	Shielded Analytical Laboratory
325C	Fluorine Gas Storage
325D	Maintenance Shop
AEC	Atomic Energy Commission (now DOE)
AMU	Aqueous Makeup
Bldg	Building
BNWL	Battelle Pacific Northwest Laboratories
CEPOD	Catalyzed Electrochemical Plutonium Oxide Dissolution
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
D&D	Decontamination and Decommissioning
DOE	Department of Energy
DOT	U.S. Department of Transportation
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FFTF	Fast Flux Test Facility
FRP	Fiberglass Reinforced Plywood
FSAR	Final Safety Analysis Report
GE	General Electric
HEDL	Hanford Engineering Development Laboratory
HEPA	High Efficiency Particulate Air
HLRF	High Level Radiochemistry Facility (325A)
HNO ₃	nitric acid
IAD	Immediate Action Directive
LLW	Low Level Waste
LMFBR	Liquid Metal Fast Breeder Reactor
MFP	Mixed Fission Products
MW	Mixed Waste
NDA	Nondestructive Assay
NRC	Nuclear Regulatory Commission
NWVP	Nuclear Waste Vitrification Project
PCB	Polychlorinated biphenyls
PNL	Pacific Northwest Laboratories
PRF	Plutonium Reclamation Facility
PSAR	Preliminary Safety Analysis Report
PSE	Preliminary Safety Evaluation
PUREX	Plutonium Uranium Extraction Plant
R-SWIMS	Richland Solid Waste Information Management Systems
RCRA	Resource Conservation and Recovery Act
RECUPLEX	Reclamation of Uranium and Plutonium by Extraction
REDOX	Reduction-Oxidation
RHO	Rockwell Hanford Operations
RLWS	Radioactive Liquid Waste System

LIST OF TERMS (cont)

SAL	Shielded Analytical Laboratory
SAR	Safety Analysis Report
SARP	Safety Analysis Report for Packaging
SDAR	Storage/Disposal Approval Record
SGSAS	Segmented Gamma Scan Assay System
SNM	Special Nuclear Material
SWBR	Solid Waste Burial Record
SWITS	Solid Waste Information and Tracking System
SWSDR	Solid Waste Storage and Disposal Record
TRU	Transuranic
TRUSAF	Transuranic Storage and Assay Facility
WAC	Waste Acceptance Criteria
WADCO	Westinghouse Hanford Company (used in early 1970's)
Westinghouse Hanford	Westinghouse Hanford Company
WIPP	Waste Isolation Pilot Plant
WRAP	Waste Receiving and Processing Facility

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to characterize, as far as possible, the solid waste generated by the 325 Radiochemistry Building since its construction in 1953. Solid waste as defined in this document is any containerized or self-contained material that has been declared waste. This characterization is of particular interest in the planning of transuranic (TRU) waste retrieval operations including the Waste Receiving and Processing (WRAP) Facility. Westinghouse Hanford Company (Westinghouse Hanford) and Battelle Pacific Northwest Laboratory (PNL) activities at Building 325 have generated approximately 4.4% and 2.4%, respectively, of the total volume of TRU waste currently stored at the Hanford Site.

1.2 BACKGROUND

Since 1944, the production of defense related materials at the Hanford Site has generated radioactive wastes. The bulk of these wastes have been disposed of or stored in the 200 East and 200 West Area burial grounds and waste storage facilities.

In the period between 1944 and 1970, both TRU and low-level wastes (LLW) were disposed of in shallow land trenches with no attempt to segregate these materials by their chemical or radioactive natures. In 1970 the Atomic Energy Commission (AEC, now the U.S. Department of Energy [DOE]) directed that AEC sites segregate "waste with known or detectable contamination of transuranium nuclides" from other waste types (*Immediate Action Directive 0511-21* [AEC 1970]). Transuranic radionuclides are those with an atomic number greater than 92. The AEC further directed that these wastes be packaged and stored as contamination-free packages for at least 20 years. The 20-year interim storage period was to allow time to study permanent disposal options for TRU contaminated wastes.

The Immediate Action Directive (IAD) did not provide a detailed definition for TRU waste in 1970. AEC contractors implemented the IAD to the best of their ability with the instrumentation then available. In 1973, the *Atomic Energy Commission Manual* (AEC 1973) further defined TRU waste as material contaminated with certain alpha-emitting radionuclides with half-lives greater than 20 years and activity greater than 10 nCi/g. The radionuclides included were ^{233}U and its daughter products, as well as plutonium and transplutonium nuclides with the exception of ^{238}Pu and ^{241}Pu . In 1982, the TRU waste segregation limits were raised to 100 nCi/g and included ^{238}Pu and ^{241}Pu as stated in DOE Order 5820.1, *Management of Transuranic Material* (DOE 1982).

In addition to radioactive materials, Hanford production plants and support operations used a wide variety of chemicals. Many of these chemicals are currently classified as dangerous or hazardous by the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology). When dangerous or hazardous wastes are found in radioactive wastes, they are termed "mixed" wastes.

During the time much of the mixed waste at the Hanford Site was generated, there were no definitions or regulations governing the storage, disposal, or documentation of mixed

wastes. In 1987, the DOE issued a mixed byproduct ruling stating that the hazardous components of mixed waste are regulated by the *Resource Conservation and Recovery Act of 1976* (RCRA) (DOE 1987). In November 1987, the EPA authorized Ecology to regulate the hazardous constituents of mixed waste at Hanford.

During the next two decades, the TRU waste now stored in the 200 Area burial trenches and storage facilities is to be retrieved, processed at the WRAP Facility, and shipped to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico for final disposal. Approximately 6.8 percent of the total volume of TRU waste to be retrieved for shipment to WIPP has been generated by the 325 Facility.

1.3 SOURCES

Data for this study were compiled from a variety of sources. Each of the major sources used is listed below with a few explanatory notes. Greater detail on each of the data sources can be found in the body of this document as the information from each is discussed.

Documents that describe the Building 325 processes and experiments, including the *Safety Analysis Report for the 325 Radiochemistry Building* (Anderson and Hanthorn 1977), *Past Practices Technical Characterization Study - 300 Area Hanford Site* (Gerber 1992), and *Analytical Chemistry Laboratory Manual, Volumes 2 and 3* (HEDL 1975a and 1975b) were used to determine the solid wastes that may have been generated at Building 325 during its 40 year history.

Documents that describe Building 325 Waste Packaging and Handling Procedures, including the *Hanford Site Radioactive Solid Waste Acceptance Criteria* (Willis and Triner 1991) and the *Waste Management Manual* (WHC 1987), were used to describe packaging and handling practices.

Interviews with current and former Building 325 personnel were used to gather information regarding unusual waste contents and historical waste handling and packaging procedures.

Characterization data was primarily derived from the *Solid Waste Information and Tracking System* (SWITS) database. The SWITS database was created in 1991, primarily with the solid waste data from the Richland Solid Waste Information Management System (R-SWIMS). The SWITS database contains information about radioactive wastes, both TRU and LLW, buried or stored in the 200 Areas since 1970. Data in SWITS were originally taken from *Solid Waste Burial Records* (SWBRs) and their replacements, the *Solid Waste Storage and Disposal Records* (SWSDRs). Both SWBRs and SWSDRs, which will be jointly referred to as "burial records" in this document, often contain supplementary forms such as shipment manifests, NRC 741 Forms, etc.

Hazardous waste components were determined using information from the SWITS database, SWBRs, SWSDRs, and personnel interviews. Additional information was obtained from *Reactive and Unstable Chemicals in Transuranic Retrievable Waste at the Hanford Site*, WHC-EP-0603 (Reddinger 1992) and an internal report examining hazardous components of solid waste.

1.4 SCOPE

The major sections of this document and the topics they cover are outlined briefly below. Because of the many tables and figures included in this report, they appear at the end of each section.

Section 2.0 provides a brief description of the Building 325 physical plant and the operations that occurred there. A short history of the significant occurrences and changes at Building 325 follows this description.

Section 3.0 identifies the Solid Waste Streams that arose from Building 325 activities. The types and amounts of solid waste that may have been generated from each of the waste streams are estimated.

Section 4.0 discusses the waste handling and packaging procedures used at Building 325. Historical changes in waste handling, packaging, and record keeping are also reviewed in this section.

Section 5.0 through 8.0 contain the results of a search for actual waste container data including database searches, literature reviews, and personnel interviews. These sections describe what is known about the physical, radiological, and hazardous characteristics of the radioactive solid waste generated in the 325 laboratories by Westinghouse Hanford (Section 5.0) and PNL (Section 6.0), as well as waste generated in the hot cells located in 325A (Section 7.0) and 325B (Section 8.0).

Section 9.0 lists the references used in the compilation of this report.

Appendix A contains the original SWITS data runs that form the basis for most of the tables and figures found in Section 5.0. Appendices B and C provide the same data for the tables and figures found in Sections 6.0 and 7.0, respectively; Appendices D and E provide the data for the tables and figures in Section 8.0

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2.0 DESCRIPTION OF THE 325 RADIOCHEMISTRY BUILDING (APPLIED CHEMISTRY LABORATORY)

Originally built to safely house and handle multicurie level chemical development work with high activity substances, construction of the 325 Radiochemistry Building was completed in 1953. In the years since 1953, the building has been modified to support a variety of tasks and organizations. The tasks performed here have included chemical analysis, radioactive materials processing, safeguards and materials management, waste management, technical research and development, laboratory maintenance, and operational health physics. Programs supported by the 325 Facility have included support of the Reclamation of Uranium and Plutonium by Extraction (RECUPLEX) process, the Reduction-Oxidation (REDOX) process, the Plutonium Uranium Extraction (PUREX) process, the Plutonium Reclamation Facility (PRF), the Nuclear Waste Vitrification Project (NWVP), the Fast Flux Test Facility (FFTF), the Liquid Metal Fast Breeder Reactor (LMFBR) Program, and many others (Anderson and Hanthorn 1977).

The 325 Building is now called the Applied Chemistry Laboratory and consists of five sections; 325 main Radiochemistry Building, 325-A High Level Radiochemistry Facility, 325-B Shielded Laboratory Annex, 325-C Fluorine Gas Storage, and 325-D Maintenance Shop. The purpose of this section is to describe the 325 Building facilities and to summarize its history, so that solid waste generating activities can be compared to the status of the facility.

2.1 LOCATION

The 325 Radiochemistry Building is located within the 300 Area of the DOE's Hanford Site. The Hanford Site occupies 148,000 hectares (365,000 acres) of arid steppe on the southeastern part of Washington State, approximately 72 km (45 miles) north of the Oregon Border (Figure 2-1). The 300 Area is located about a mile north of the Richland city limits on the bank of the Columbia River which bounds it on the east (Figure 2-2). It is bounded on the west by Stevens Drive (shown on map, but not labeled). Roughly rectangular in shape, the 300 Area included about 152 hectares (375 acres) in 1975. Subsequently, the 300 Area was expanded northward for added waste management facilities.

2.2 PHYSICAL PLANT

The 325 Building has about 13,000 m² (140,000 ft²) of floor area, 5,200 m² (56,000 ft²) of which are used for laboratory space. The basement and three upper floors house several shielded hot cells and numerous laboratories. First floor laboratories are separated by moveable metal partitions, while basement and second floor laboratories are separated by concrete block partitions. Ventilation hoods and gloveboxes are common equipment in the building. A photograph of the 325 Building is provided in Figure 2-3.

In general, the 325 Radiochemistry Building consists of (1) a central portion containing general purpose laboratories modified for low-level radiochemical work by provision of special ventilation and work enclosures, (2) a south (front) wing containing office space, locker rooms and lunch rooms, and (3) east and west wings containing shielded enclosures with remote manipulators for high level radiochemical work. Some of the low level laboratories house a

variety of standard and special research instruments. For example, emission spectrographs, mass spectrometers, spectrophotometers, flame photometers, electron microscopes, and radiation measuring instruments can be found. The process study and analytical laboratories are equipped with some 40 hoods and 30 gloveboxes for safe work with radioactive materials (Anderson and Hanthorn 1977).

The central portion of the building is 59.1 m x 59.8 m (194 ft x 196 ft) overall, on three floors (basement, ground, and second), and contains over 100 laboratories and offices. The south wing is 22.6 m x 40.5 m (74 ft x 133 ft) on two floors and contains offices, a conference room, a machine shop, a lunch room, and rest rooms. The east wing (325-A), housing the shielded process research hot cells, is 14.6 m x 39.6 m (48 ft x 130 ft), and the west wing (325-B), the shielded analytical facility, is 16.2 m x 16.5 m (53 ft x 54 ft).

A breakdown of the current space usage of the building is as follows:

Laboratories	4,314 m ²	(46,415 ft ²)
Offices	1,312 m ²	(14,114 ft ²)
Shops	171 m ²	(1,840 ft ²)
Storage	103 m ²	(1,113 ft ²)
Common	6,561 m ²	(70,593 ft ²)
Light Industrial	931 m ²	(10,017 ft ²)
Total	13,392 m²	(144,092 ft²)

Standard laboratories are multiples of 3 m x 3.7 m (10 ft x 12 ft) bays. Steel, free-standing, Formica*-topped laboratory benches are arranged along the walls with peninsulas in large laboratories. Many of the laboratories have aluminum downdraft hoods, with round corner construction, coated with chemical resistant paint. The hoods have heavy stainless steel tray bottoms and steel bases capable of supporting 3 tons. Besides the hoods, many stainless steel gloveboxes are provided for work with moderate quantities of alpha emitters. The gloveboxes have individual high efficiency particulate air (HEPA) filters located at the exhaust port. Hoods exhaust through HEPA filters located in boxes in the exhaust ductwork system (stainless steel or polyvinyl chloride, depending on the service), then via the exhaust fans of the general ventilation system to the stack.

The 325-A High Level Radiochemistry Facility (HLRF) has three hot cells, shielded with 1.2-m (4 ft-thick high density concrete walls. The cells are 4.6 m (15 ft) high by 2.1 m (7 ft) deep inside dimensions; two are 1.8 m (6 ft) wide, and one is 4.6 m (15 ft) wide.

There is an underground vault for storage tanks (capacities: 1,040 L to 68,130 L [275 to 18,000 gal]) adjacent to the HLRF. Remote operation of the cell equipment is

*Trademark of Formica Corporation.

performed in a "front face" operating gallery; movement of materials in the cells takes place in a rear face gallery. The cells are ventilated by air drawn from the rear face gallery and exhausted through HEPA filters to the general ventilation exhaust. Figure 2-4 is a cut-a-way view of the 325-A High Level Radiochemistry Facility.

The 325-B Shielded Analytical Laboratory (SAL) has six compartments, each about 0.5 m (5.5 ft) square, enclosed in shield walls either of 66 cm (26-in) magnetite concrete or 30.5 cm (12-in) Meehanite iron. Four-inch lead shielding divides the compartments into three groups of two. The compartments are served by front face and rear face galleries as above. The cells are ventilated by air drawn in from the rear face, exhausted through two HEPA filter banks in series and an activated charcoal absorber, and finally released to a separate 13 m (42.5-ft) tall stack. There are three exhaust fans, two normally operating and one on standby.

Figure 2-5 shows the basement which underlies the main building and the 325-A and 325-B wings. The basement includes rooms numbered 2 through 98. Rooms 40 and 40 A, B, and C are in 325-A; rooms 23 and 32 are in 325-B.

The first floor layout is shown in Figure 2-6. The portion labeled 325-C is the central part of the building. Hot cells are shown in the East (325-A) and West (325-B) wings. The electrical machine shop and instrument shop, 325-D, is shown in the southwest corner of the building. The 325-C fluorine gas storage enclosure is located just outside the building in the southeast quadrant. First floor rooms are numbered 101 through 604.

The second floor plan is shown in Figure 2-7. Four rooms are located in the 325-A wing: 606, 607, 609 and 610. The second floor rooms, located in the central part of the building, are numbered 910 through 971. This floor also includes an equipment room, power operating room, and change room.

Also shown in Figure 2-7 is the third floor, which extends only above the 325-A wing. The top of the A-wing cells and the Aqueous Makeup (AMU) area, which is labeled room 611, are located on this floor.

2.3 FACILITY MISSIONS

Over the years, a wide variety of chemical and physical analyses have been performed in the 325 Building. A listing of some of the missions and techniques used over the years is presented below.

Original Missions. Initial building missions included production support and process improvement for the REDOX separations process, improvements for a uranium metal recovery process (especially in handling wastes and supernatants), and studies of separations waste treatment aimed at developing techniques to reduce activity levels in high level wastes. Additional early missions included production development for radioactive lanthanum, temporary technical support for the bismuth phosphate separations process, support studies for tritium production, and basic investigations of plutonium chemistry. The 325 Building was also used to support development of the PUREX, RECUPLEX, and PRF processes during its first decade of operation, 1953-1963 (Gerber 1992).

Isotope Campaigns. The high level radiochemistry addition (325-A) was completed in time to support work done in the 1960's to separate isotopes from high level waste. These isotopes were produced for medical use and for use in the space program. Methods employed to separate specific isotopes in the waste included ion exchange, carrier precipitation, and solvent extraction, among others. Strontium-90, cesium-137, curium-244, americium-241, and promethium-147 were the isotopes in highest demand. In fact, Hanford was the only supplier in the world of promethium-147, which was used in the development of the artificial heart.

Promethium-147, strontium-90, americium-241 and curium-244 were all purified in the A-cell (325-A wing), while the cesium and strontium separations process used in B-Plant encapsulation work was developed in the 325 Building's B-Cell (325-A wing). Strontium fluoride and cesium chloride encapsulation chemistry for the B Plant mission also was developed in B-Cell. In the same period, compatibility studies for strontium fluoride capsule development experiments in plutonium recovery from special irradiated neptunium-237/aluminum target material were performed in C-Cell (also 325-A wing) (Gerber 1992).

Waste Vitrification and Other Projects. From 1962-1964, A-Cell (325-A wing) was used to support waste solidification and vitrification tests, including calcining and glass melting. Studies that were part of a large vitrification project took place in the A, B, and C cells from 1977 to 1980. Other projects in this period included high level waste behavior and fuel dissolution tests performed in B-cell. At the same time, demonstrations of molten salt electrodeposition of uranium oxide and plutonium oxide were conducted in C-cell, as were solvent degradation tests used as part of FFTF development.

The vitrification mission was placed on standby by the DOE in 1980. Because budget authorizations did not provide for cell and equipment decontamination and removal, space in the A, B, and C cells in 325-A has been partially occupied with contaminated material ever since. Since 1980, the remaining available cell space has been used for materials characterization leach tests of waste glass and of spent nuclear fuel, post irradiation examination of the boron thermal shield from N Reactor, and characterization of neutralized cladding removal waste (along with the testing of a potential method of converting it to non-TRU waste). Other radiochemical work conducted in these cells has included characterization of double-shell tank slurry, tests of fuel iodine control and fuel uranium dissolution methods for N Reactor, and experiments in the recovery of strontium using antimonite acid (Gerber 1992).

Liquid Metal Fast Breeder Reactor Program. During the 1970's much of the work performed by Westinghouse Hanford in the 325 Building was done in support of the LMFBR Program, especially the FFTF. Activities under the LMFBR program included characterization studies of mixed-oxide fuel, fuel cladding, absorber, and sodium metal coolant.

2.4 FACILITY HISTORY

Over the past 40 years the 325 Building has been occupied by several different contractors working on a wide variety of projects. This has resulted in numerous changes to the physical plant. This section first discusses the physical changes, followed by a review of the activities performed in the 325 Building. Finally, there is a brief section outlining contractor occupancy and custody changes between 1953 and 1993.

2.4.1 Physical Changes

A review of an index of project documentation shows many changes to the building and its laboratories. Topics and dates are summarized below.

<u>Date</u>	<u>Contractor</u>	<u>Topic</u>
1951	-	Specifications for 325 Radiochemistry Building, Project C381.
1960	GE	Specifications for 325-B Shielded Analytical Lab Project CAH 866.
1960	-	352-A, High Level Radiochemistry Annex completed.
1970	BNWL	Modifications, rooms 411 and 415, 404, 701, 515, 416, 325-A basement, 54, 504, 506.
1970	WADCO	Modifications, rooms 971, 945, 947, 55, 94, 94A, 417, 419, 414, 52, 510, 22, 527, 520, 312.
1971	WADCO	Modifications, rooms 48, 101, 102, 117, 118, 55, 522, 325 basement, 972, 109, 504, 525.
1972	WADCO	Modifications, rooms 409, 972, sodium glove box, 605, 109, 422, 530A, 528, 409A, 401, 22, 316, 325, 326, 330, 421, 425, 700, 539, 504, 309, 529, 400, 206, 325B hot cell.
1973	WHC	Rm 313: remove old style filter box and replace, hood 1. Modifications, room 307, and fry pans A, B and C Cell in the high level radiochemistry facility.
1974	WHC	Modifications, rooms 505A, 94, 95, 96A, 97A, 316, 52, 56, 24, 54, 950, 22, 30, 318, 524, 313, 702, 12, 32, 24, 5.
1975	-	Major modifications to the shielded analytical complex in the 325-B Building.
1975	WHC	Hood/equipment relocation. Modifications, rooms 511, mezzanine, 524A, 52, 48, 12, 21, 21A, 401, 950.
1976	WHC	Modifications, rooms 971, storage cage partitions in basement, 40, 327A, 327B, 58, 50, 50A.
1977	-	Final exhaust ventilation HEPA filters, Hand dig vitrification project utilities.

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<u>Date</u>	<u>Contractor</u>	<u>Topic</u>
1977	WHC	Modifications, rooms 110, 603, 21A, 30, 524A, basement, Air 325 bldg, dock, 54, 327B, 501, 93.
1977	BNWL	Modifications room 422, upper C-Cell liner.
1978	WHC	Install mini hot cell in room 23.
1978	BNWL	325-A Security modifications. Modifications, room 119.
1979	WHC	Replace corroded HVAC ducts. Modifications, rooms 308, 110, 110A, 525, 970, 23, 102, 103, 48,
1979	BNWL	Modifications, room 504, add HVAC to 325-A, Remove 15 ton crane, replace with 30 ton crane.
1980	-	Install additional criticality howlers.
1980	WHC	Modifications, rooms 200, 209, 91, 312, 313, 504, kitchen, 58, 90, 326.
1981	WHC	Modifications, rooms 303, 23, (505, 517, 510, 506, and 601 joint with BNWL), 405A, 23B, men's change room, 30A, 400, 404A.
1982	-	Utility changes, temporary modification for high voltage power supply.
1982	WHC	Modifications, rooms 40, 50A, 23, 500, 50.
1983	-	Relocated radioactive liquid waste line.
1983	WHC	Modifications, rooms 209, 200, 306, 400, 110, 202, 200.
1984	WHC	Modifications, rooms 32, 202, 530A.
1985	WHC	Modifications, rooms 55A, 111A, 112, 103A, 416.
1986	WHC	Modifications, rooms 430, 91, 111A, 409, 303, 506, 422, 500, 524, (521, 525, PNL related), 504, 603.
1987	WHC	Modifications, rooms 520, 32.

2.4.2 Activity Changes

The 325 Building activities have changed considerable with time. As described in facility Safety Analysis Reports (McCormack 1969, Anderson and Hanthorn 1975 and 1977), operations can best be described by dividing the building into several working facilities. The following sections address changes in the operations in each facility over time. Many of the dates used in the following sections correspond to the dates that the source safety analysis documents were published.

The 325 Building houses laboratories and specialized facilities for activities ranging from work with nonradioactive materials to work with gram to kilogram quantities of fissionable materials and up to megacurie quantities of other radionuclides. The building is divided into several working facilities, which are addressed below.

General Purpose Chemical Laboratories

In 1969 the general purpose laboratories were located on the main floor and in the basement and were used for research, development and analytical operations requiring little or no radiation shielding. Most labs were equipped with hoods and many with gloveboxes. Studies of actinide elements, the chemistry of fission products and other radionuclides, nonradioactive organic and physical chemistry operations, and analytical services of all types were conducted in the general purpose laboratories.

In 1975-1977 the general purpose laboratories were located on the main floor but also included Room 52 in the basement. The chemical, radiochemical and microstructural laboratories consisted of 55 rooms with a combined area of approximately 1,860 m² (20,000 ft²). Installed facilities included radiochemistry hoods, gloveboxes for transuranic materials, inert atmosphere gloveboxes, and laminar flow hoods for the analysis of metallic sodium. These laboratories were required for characterization studies of fuel, absorber, sodium metal coolant, and other materials for quality assurance and for the evaluation of developmental tests.

Three laboratories, Rooms 52, 312 and 318 in the 325 Building, were used for the analysis of metallic sodium. Analytical samples normally contained between one and 100 g of sodium.

Room 52 is a 9.1 m x 9.1 m (30 ft x 30 ft) laboratory in the basement of the building. Sodium handling was carried out in a 0.9 m x 2.4 m (3 ft x 8 ft) inert atmosphere glovebox. No radioactive materials were permitted or handled in the room.

Rooms 312 and 318 are both standard 6.1 m x 7.3 m (20 ft x 24 ft) laboratories on the main floor of the building; each contained two inert atmosphere gloveboxes for the handling of sodium. Radioactive materials were not normally handled in these laboratories. Occasionally sodium samples that had been in contact with either activated corrosion products or fission products were received and analyzed. Maximum amounts of radioactive material were under 10 millicuries. When beta-gamma contaminated samples were handled, a temporary radiation zone was established, and a Radiation Work Permit prepared. Alpha-contaminated materials were not permitted in these laboratories.

Between 1975 and 1977, the description of sodium handling became more detailed. In 1975, the sodium inventory was limited to 100 grams or under in a single piece. In 1977, the sodium inventory was limited to less than 4.5 kg (10 lb) per lab and 100 grams or less in any single container, except for reservoirs of up to 3.6 kg (8 lbs) in inert atmosphere. In 1977 all other laboratories also had a limit on reagent alkali metals of .9 kg (2 lb) per lab with additional amounts requiring special evaluation.

These laboratories are currently performing the operations described in Section 2.5.

Shielded Analytical Laboratory (325-B Annex)

The 325-B Annex contains six interconnecting compartments (cells) inside thick shielding walls equipped with lead glass viewing windows. Operations are conducted using manipulators or other remote equipment.

In 1969, the 325-B cells were used for examining small amounts of radioactive materials and for preparing high-activity samples for analysis, as well as for carrying out several routine analytical determinations.

In 1975 and 1977, the cells continued to be used for analytical chemistry operations on small amounts of highly radioactive materials, such as irradiated mixed-oxide fuels and fuel cladding samples. Typical operations included analytical weighing, sample dissolution, sample dilution and aliquoting, emission spectrographic analysis, titrimetric analyses, solvent extraction, and ion exchange separations.

High Level Radiochemistry Facility (325-A Annex)

The 325-A Annex contains three interconnected multi-curie cells, which are identified as A, B, and C. The cells are heavily shielded and equipped with lead glass windows. Auxiliary to the cells are vaults containing tanks for radioactive solution storage; facilities for handling shielded, large volume shipping casks; and solution transfer facilities.

A-Cell is equipped with ion exchange columns and auxiliary equipment for the separation and purification of large quantities of various fission products. It was used routinely to produce multi-kilocurie quantities of promethium-147 but was also used for isolating and purifying americium and curium. Processing included the use of ion exchange resins and complexing agents.

B-Cell was used for miscellaneous, short term chemical studies involving small amounts of highly radioactive materials.

C-Cell is equipped for separating and purifying 100-g quantities of plutonium-238 and neptunium-237 from experimental irradiated fuel elements. Processing included the use of mercury-catalyzed nitric acid, caustic solutions, and ion exchange resins.

In 1978, A-Cell and C-Cell were cleaned out, renovated, and re-equipped to process light-water reactor fuel as part of the NWVP. The equipment included dissolvers, feed preparation tanks, a battery of four pulse columns, a concentrator, ion-exchange columns for the recovery of plutonium, and supporting tanks and instrumentation. The equipment extracted the fission product waste and transferred it to the 324 Building for conversion to borosilicate glass. The project was shut down in 1980, but no funds were provided for cleanup. Some unused equipment still remains. Space has been made in front of each window to conduct other research. Currently, that space is used for the tank sludge characterization program. B-Cell was not used during the NWVP program and currently contains a core extruder and analytical measuring equipment used for the sludge characterization program.

Shielded Glove Boxes

In 1969, Room 604 contained two shielded glove-boxes used for converting pure promethium-147 solution to the dry oxide in multicurie amounts and for conversion to promethium metal. Hundreds of grams of pure promethium oxide powder, averaging about 750 Ci/g, were stored in sealed stainless steel containers in these glove boxes.

Fissile Material Storage Room

Since 1969, Room 530 has been used for storing fissile material. Storage of material is controlled by a criticality safety specification.

Basement and Mezzanine

In 1969, the "Fuels and Materials Department Facility" occupied several thousand square feet of the 325 Building basement and mezzanine. It included storage cages for enriched uranium; laboratories for fuel element assembly, high temperature research, thorium preparation, uranium dioxide preparation, and nuclear poisons handling; a high temperature research facility; and a welding area and machine shop. Experimental fuels and fuel elements were fabricated in these laboratories, but more active alpha emitters, such as plutonium, were not allowed in the facility. High-temperature research studies were conducted occasionally upon encapsulated radioactive heat sources.

In 1975, the mezzanine area provided space for offices and a few laboratories equipped with special laboratory apparatus for nonradioactive work. The north end of the basement area contained several analytical laboratories. The south end of the basement contained a laboratory area, Room 30, wherein pressed and sintered UO_2 pellets were ground and finished to size. This work was done on UO_2 pellets with enrichments varying from normal to fully enriched. A maximum of about one kilogram of material could be processed in one day depending on enrichment. Some work was also done on the blending, pressing, and binding operations with normal or depleted UO_2 or with normal UO_2 with zirconia added.

Currently, the basement contains approximately 25 laboratories for low-level radioactive work. There is one miniature, all-metal hot cell in Room 23 of the basement. The basement also houses the primary high efficiency particulate air (HEPA) filters (for all for the building's hoods, gloveboxes, room exhaust vents, etc.), the exhaust ductwork for the building, the normal and standby electrical power switchgear and panels, the laboratory vacuum and air-sampling vacuum pumps, the backup air compressor, the sanitary and process water piping, and other required building services.

2.4.3 Custody Changes

The 325 Building has been operated by several contractors. From 1953 to 1960, the operator was General Electric (GE); later operators were Westinghouse Hanford and Battelle's Pacific Northwest Laboratories (PNL). Westinghouse Hanford Company has also been called

"HEDL" for Hanford Engineering Development Laboratory and "WADCO". Battelle Pacific Northwest Laboratories is also known as "BNWL" and has been both the operator of the building and a tenant. Custody changes are described below:

<u>Date</u>	<u>Contractor</u>
1953-1965	General Electric
1965	BNWL (Battelle)
1970	Joint occupation by WADCO (Westinghouse) & BNWL (Battelle). WADCO was the managing contractor. WADCO occupied 2880 m ² (31,000 ft ²) of the building; BNWL occupied 4560 m ² (49,000 ft ²).
1987	PNL (Battelle) assumed landlord responsibilities; WHC retained 41 rooms. WHC space includes:
	Rooms 941, 942, 943, 944, 945, 946, 36 (UO ₂ Cage) for Safeguards & Security;
	Room 108 for Quality Assurance;
	Room 522, 524A, 528, 529 & 530A for Waste Operations;
	Rooms 2, 3, 11, 12A, 12B, 12C, 13, 14, 15, 16, 17, 18, 19, 19A, 21, 21A, 226, 27, 28, 29, 43, 43A, 57, 58, 97, 97A, 105, 420, & Welding Development Laboratory for Engineering Development.

2.5 CURRENT OPERATIONS

Because the 325 Building is a research facility, the work conducted in the building is constantly changing according to programmatic needs. Typically, from 20 to 40 projects are being conducted simultaneously in the building. Work recently performed, currently underway, or planned includes process research, development and demonstration; analytical chemistry research and services; and treatment of radioactive, hazardous, or mixed hazardous wastes. This section describes typical work in the building, although the description is not intended to be comprehensive.

Work is divided among the two hot cell complexes, gloveboxes, fume hoods, and laboratory benches, depending on the radioactive or hazardous nature of the work. Projects frequently involve working in more than one of these locations, such as sample preparation or dilution in a hot cell or glovebox, followed by analytical measurements in a fume hood. Analytical services are provided for all projects in the 325 Building as well as services for outside customers.

General chemical laboratories are typically equipped with work space on laboratory benches and fume hoods and often include gloveboxes or large equipment such as

spectrometers. Some laboratories are devoted exclusively to housing specialized instruments such as spectrometers. These laboratories do not contain any fume hoods and have few or no laboratory benches. Laboratories also may be devoted exclusively or almost exclusively to housing gloveboxes. The arrangement of laboratories and equipment in laboratories is constantly changing as some projects are completed and others are started or as project needs change.

Some typical work in the 325 Building is briefly described below. Most of this work is in progress, and the projects selected for description represent a wide range of activities.

- Development and demonstrate the Catalyzed Electrochemical Plutonium Oxide Dissolution (CEPOD) process for processing plutonium-rich materials for plutonium recovery of recycle operations and for processing plutonium-lean scrap or waste to convert TRU waste to non-TRU waste.
- Characterize chemical, radiochemical, and physical properties of wastes from double-shell waste tanks with particular emphasis on waste stream suitability for processing at the Hanford Waste Vitrification Plant (HWVP). Similarly, characterize waste from single-shell tanks. Treat some of the wastes and evaluate the effects of the treatment.
- Provide a treatment service for hazardous waste or mixed (hazardous and radioactive) waste generated by PNL laboratory activities. Include grouting, neutralization, and distillation, and perhaps demonstrate new and emerging technologies for chemical waste treatment and destruction.
- Provide analytical chemistry support for fuels-related programs such as the Materials Characterization Center and tuff repository programs.
- Provide, on an as-requested basis, RCRA and *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) analyses of liquids and solids associated with the Hanford Site characterization and remediation effort and with plant operations.
- Analyze performance evaluation samples submitted by the EPA, the Environmental Monitoring Laboratory, and other organizations as a routine part of the laboratory quality control program.
- Develop flowsheets for processing selected Hanford wastes.
- Develop and test flowsheets for the removal of transuranics and other selected radionuclides from dissolved fuel from light-water reactors in support of a process being developed by Westinghouse Hanford.
- Determine the potential for rapid exothermic reactions between ferrocyanide and nitrate or nitrite in waste from single-shell tanks.
- Evaluate ion-exchange resins for the recovery of selected radionuclides from vitrification waste produced by the HWVP.

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- Evaluate the performance of a resorcinol/formaldehyde ion-exchange resin for removal of cesium-137 from Savannah River alkaline waste.
- Develop and demonstrate a process for dissolving highly radioactive europium oxide pellets in acetic acid, separating gadolinium-153 from the europium, and preparing the recovered gadolinium for shipment to Oak Ridge National Laboratory or return to the FFTF.
- Development and demonstrate a process for preparing waste sludges from West Valley Nuclear Services Company for vitrification feeds. Develop processes for secondary treatment of wash or supernatant liquids to reduce level of radioactivity to as low as reasonably achievable.
- Store natural or depleted uranium and thorium as a service for Westinghouse Hanford.
- Perform nonradioactive research work on waste volume reduction and compaction.
- Prepare samples for x-ray diffraction, scanning electron microscope, or Auger analysis; analyze samples. Include samples of oxidized and nonoxidized spent fuel from light-water reactors and fission product deposits from fuel rods.
- Prepare standard solutions of radionuclides from stock batches for use in research and development of analytical procedures and for quality control.
- Investigate tritium release from tritium-containing materials such as beryllium and lithium oxide. Examine releases by both carrier gas extraction and vacuum extraction.
- Perform chemical and physical experiments involving sodium and lithium metals. Provide chemical analyses of these materials including FFTF primary sodium.
- Prepare organic standards and investigate organic extractions. (Work may involve gallon quantities of solvents such as acetone, hexane, toluene, isooctane, carbon tetrachloride, freon 112, and methylene chloride).
- Perform autoclave tests up to and including 5,000 psi on rock samples with various waste environments to simulate geologic conditions pertinent to the Yucca Mountain repository project.
- Investigate oxidation kinetics of spent light-water reactor fuel.
- Study tritium permeation through reactor target rods.
- Separate and process medically usable radionuclides.

Figure 2-1. Location of the Hanford Site.

Figure 2-2. Hanford Site Map.

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Figure 2.3. Photograph of the 325 Building.

Figure 2-4. Building 325A High-Level Radiochemistry Facility.

Figure 2-5. 325 Building Basement Layout.
(not to scale)

Figure 2-6. 325 Building First Floor Layout.
(not to scale)

Figure 2-7. Layout of the 325 Building Second and Third Floors.

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3.0 WASTE GENERATION

The wastes generated at the 325 Building can be segregated into radiological and nonradiological wastes in gaseous, liquid, and solid forms.

3.1 GASEOUS WASTES

The 325 Building ventilation system was designed to assist in the control of radioactive contamination by maintaining pressure differentials between zones. Air flow is always from zones of lower contamination potential to zones of higher potential (Anderson and Hanthorn 1977). Gaseous and particulate wastes are exhausted through cell, hood, and stack filters. These wastes have included iodine-131 and -132, cerium-144, ruthenium-103 and -106, strontium-90, and yttrium-90.

All gloveboxes are equipped with small high efficiency particulate air (HEPA) filters near the glovebox, in series with the larger HEPA filter further downstream. The main stack and the 325-B Shielded Analytical Laboratory (SAL) stack are equipped with continuous, calibrated, alarming stack monitors that respond to alpha, particulate beta, and iodine-131 radiations. An alarming monitor, the same as the stack monitors, samples the exhaust from the 325-A cells. This monitor serves to give an advance warning of emissions from this megacurie facility (Anderson and Hanthorn 1977).

3.2 LIQUID WASTES

Currently, the liquid effluents generated by the 325 Building are handled by one of three drainage systems: the sanitary sewer, the retention process sewer, and the radioactive liquid waste system (RLWS).

The sanitary sewer handles liquid waste from drinking fountains, the lunchroom, lavatory areas, service, and other similar areas. This waste stream is essentially free of radioactivity and is discharged into the 300 Area sanitary sewer system.

Cooling water, sink wastes, floor drains, and laboratory chemical waste water systems that might accidentally contain radioactivity are discharged through the retention process sewer system. This sewer is routed through a diversion station in the 325 Building basement that is equipped with a radioactivity monitor. In the event that the stream contains radioactivity above a present level, the flow is diverted to the 300 Area radioactive liquid waste system. Until 1975, uncontaminated liquid chemical wastes were piped to the 300 Area process ponds.

The RLWS within the 325 Building consists of three sections. Radioactive liquid wastes from these sections exits the 325 Building at two locations to join the 300 Area RLWS. The waste is then routed to the 340 Building.

Specific routing of radioactive liquid wastes from the three sections of the 325 Building is outlined below.

<u>Section</u>	<u>Specific Source(s)</u>	<u>Waste Routing</u>
Central Portion Building (Bldg) 325	<ul style="list-style-type: none"> • Hood, Room 528 • Floor Drain (Plugged), Room 529 	To one of the two waste lines leaving Bldg 325, then to Bldg 340.
Bldg 325B (West Wing)	<ul style="list-style-type: none"> • cells and 2 sinks 	To 760-l holding tank in Room 32, then jetted to RLWS line to Bldg 340.
Bldg 325A (East Wing)	<ul style="list-style-type: none"> • cells • sinks and floor drains • cooling water from process tanks, a glovebox, and cells. 	<p>To Room 40A tanks (4 tanks ranging in size from 340 l to 400 l), then can be transferred to several other locations in 325A.</p> <p>To second RLWS line existing the building.</p> <p>To diverter station in Room 50. Valve diverting flow to RLWS vault tank (WT-1) is locked open. The vault tank is the central collection point for Annex 325A radioactive liquid waste. Transfer from WT-1 is done either by jetting to the RLWS line exiting Annex 325A or by vacuum transfer to a cask in the liquid transfer hood. Shielded casks can be used to transport waste to the 200 Area for disposal.</p>

3.3 SOLID WASTES

Historically, several types of dry wastes have been segregated and packaged at the 325 Building. These types are: trash, salvageable scrap, toxic nonradioactive waste, pyrophoric nonradioactive waste, low dose rate radioactive waste, high dose rate radioactive waste, and transuranic waste (Anderson and Hanthorn 1977).

The new 325 Waste Treatment Unit will provide storage (less than 90 days) and has applied for a permit for treatment of hazardous and radioactive mixed wastes. It will provide routine treatment of wastes, research and development, and new treatment processes. Space limitations do not allow extensive waste segregation using physical barriers, but wastes are administratively segregated into low-level, transuranic, and mixed wastes. Waste handled by the 325 Waste Treatment Unit are packaged and shipped to, Westinghouse Hanford the current waste-handling contractor for the Hanford Site.

3.4 SOLID WASTE GENERATING ACTIVITIES

Because the 325 Facility has supported so many different projects and missions, it is impossible to describe the solid wastes that each of them might have generated. Therefore, in lieu of describing specific projects, some of the analytical procedures commonly performed in the 1970's and 1980's are listed below with brief descriptions. More complete information on each can be found in MG-28, *Analytical Chemistry Laboratory Manual*, Vols. 2 and 3 (HEDL 1975a and 1975b).

- Sulfur by Combustion and Idometry

Sulfur is determined by igniting the sample between 1600 °C and 1700 °C in a stream of oxygen. The sulfur dioxide formed is swept from the combustion chamber into an acid solution containing potassium iodide and the blue iodine-starch complex. The sulfur dioxide, which reduces iodine, is automatically titrated with standard potassium iodate solution using a colorimetric end point monitor.

- Sulfur by Combustion and Turbidimetry

Sulfur is oxidized to sulfur trioxide by combustion of the sample mixed with vanadium pentoxide. The sulfur trioxide is swept from the combustion tube into a trap of dilute caustic, after which hydrogen peroxide is added to ensure that all sulfur is in the 6+ valence state. The sulfate is precipitated as barium sulfate and the resulting turbidity is measured spectrophotometrically.

- Tungsten by Spectrophotometry

Tungsten(VI) is reduced to tungsten(V) with titanium(III) and the tungsten(V) is extracted from a hot hydrochloric acid solution into a solution of dithiol in amyl acetate. The absorbance of the tungsten-dithiol complex is measured at 640 nm. Molybdenum interference is removed by a preliminary extraction as molybdenum(VI). If tungsten is present as oxide in the samples, it is not completely dissolved by acid digestion. Therefore, the sample solution is filtered and the residue is dissolved by fusion with potassium pyrosulfate.

- Water by Constant Voltage Coulometry

Water is released from the sample by heating. A carrier gas sweeps the water into an electrolytic cell containing phosphorus pentoxide to absorb the water. A potential applied across the cell causes the absorbed water to electrolyzed. The total current is integrated and displayed digitally as micrograms of water.

- Impurities by Emission Spectroscopy: Photographic Method

This spectrographic method is based upon the carrier-distillation technique using carriers of gallium oxide and sodium fluoride. The concentrations of 24 impurity elements are determined by visual comparison of selected-line densities from the sample and standards.

- **Impurities by Emission Spectroscopy: Direct Reader**

Impurity elements are determined by a direct reading emission spectrometer using the carrier distillation technique to suppress the complex spectra from uranium and plutonium. A carrier mixture of gallium oxide and strontium fluoride is used to determine 24 elements whose concentrations are printed out directly in $\mu\text{g/g}$ after computer calculation of the data supplied from the spectrometer.

- **Rare Earth by Emission Spectroscopy**

Samples are dissolved in a hydrofluoric-nitric acid mixture. Uranium and plutonium are separated from the rare earths by a tri-n-octylamine extraction into xylene, and the rare earths are determined by a copper-spark spectrographic analysis of the aqueous phase.

- **Impurities by Spark Source Mass Spectroscopy**

The sample material is vaporized, and the elements present are ionized by a high voltage rf spark. The ions formed are separated according to their mass to charge ratios. The exposure of a photographic plate to the ion beams produce lines that are characteristic of the elements producing the ions. The positions of the lines indicate the elements present, and the densities of the lines relate to concentrations. The impurity elements determined quantitatively are tungsten, tantalum, dysprosium, europium, gadolinium, and samarium. Other impurities are determined semiquantitatively.

- **Americium-241 by Anion Exchange and Alpha Analysis**

Americium is determined from a total alpha count and an alpha spectrometric analysis after separation from plutonium and uranium by anion exchange.

- **Americium-241 by Gamma Spectrometry**

Americium is determined by direct gamma spectrometric analysis of the dissolved sample using a Ge(Li) detector and multichannel analyzer. No separation of americium from plutonium or uranium is required. The 59.6-keV ^{241}Am gamma peak is corrected for minor plutonium gamma interference by making a simple leading edge correction.

- **Gas Content by Vacuum Outgassing**

The sample is heated by induction heating in a tungsten crucible at 1600 °C. The pressure and temperature of the evolved gas are measured at a known volume. From these data, the cm^3/g of gas at standard temperature and pressure is calculated. The apparatus is designed so that a sample of the gas can be taken for an analysis of composition.

- **Carbon and Sulfur by Combustion and Infrared Spectrometry**

Samples are ignited with a tungsten accelerator between 1600 °C and 1700 °C in a stream of oxygen. The carbon and sulfur, as their oxides, are swept from the furnace into an infrared detector. The oxides absorb a portion of the infrared radiation, and this absorption is used to measure the amount of those gases evolved from the sample simultaneously.

- **Mixed Uranium - Plutonium Oxide Fuel Sample Dissolution**

Mixed oxide and plutonium dioxide samples are dissolved in a hot solution of nitric and hydrofluoric acids. The fluoride concentration is reduced by a boil-down with nitric acid after which the solution is diluted to volume with 0.5M nitric acid. Uranium dioxide is dissolved in nitric acid.

- **Plutonium by Controlled Potential Coulometry**

Plutonium is determined by a coulometric titration in a hydrochloric acid electrolyte. A preliminary adjustment of valence states is made as follows: any trace of Pu(VI) that may be present is reduced to Pu(III) by electrolytically generated Fe(II) after which Fe(II) and Pu(III) are oxidized to Fe(III) and Pu(IV) at a platinum cathode by applying a potential of +0.900V (versus a saturated calomel electrode). Then the measurement is made by reducing the Pu(IV) to Pu(III) at +0.550V. The plutonium content of the sample is calculated from the integrated current required for the titration, which is displayed on a digital voltmeter as milligrams of plutonium.

- **Plutonium by Amperometric Titration**

A solid sample is dissolved either by fusion with sodium bisulfate or by heating in nitric acid with a trace of hydrofluoric acid. The fused sample is dissolved in sulfuric acid, after which the plutonium is oxidized to plutonium(IV) with excess silver(II) oxide, and the excess silver(II) is reduced by heating. The nitric acid dissolved sample and other plutonium nitrate solutions are fumed with sulfuric acid to remove the nitrate before the plutonium is oxidized. After the oxidation of plutonium and reduction of excess silver(II), the solution is adjusted to about 6M in sulfuric acid.

- **Uranium by Controlled Potential Coulometry**

Uranium is determined by a coulometric titration in which U(VI) is reduced to U(IV) at a mercury cathode using a potential of -0.300V (versus a saturated calomel electrode) in a sulfuric acid electrolyte. A pre-reduction at +0.080V eliminates interferences from more readily reduced substances. The integrated current of the titration is displayed on a digital voltmeter as milligrams of uranium, from which the uranium content of the sample is calculated.

- **Oxygen to Metal Ratio by Thermogravimetry**

Samples are weighed and then heated to constant weight at 800 to 900 °C in an atmosphere of hydrogen-helium saturated with water vapor at 0 °C. The O/M is calculated from the difference between the initial and final weights. Procedures for macroanalysis (≥ 0.5 -g samples) and microanalysis (≤ 100 -mg samples) are included in this method.

- **Isotopic Composition of Plutonium and Uranium by Mass Spectrometry**

The isotopic abundances of plutonium and uranium are determined by thermal ionization mass spectrometry. Purified portions of these elements are prepared using ion exchange chromatography. The separation of americium and uranium from plutonium is complete enough to permit the unbiased measurements of ^{241}Pu and ^{238}Pu . Ions are produced from a carbonized, single rhenium filament. An ion current measuring technique is used in the analysis.

- **Weight Loss Upon Ignition**

Weight loss is determined by measuring the change in weight of a sample when heated to constant weight at 950 °C in air.

- **Uranium by Potentiometric Titration**

Uranium is reduced to U(IV) by excess Fe(II) in strong phosphoric acid and sulfamic acid. Excess Fe(II) is selectively oxidized by nitric acid in the presence of Mo(VI) catalyst. The U(IV) is titrated using standard potassium dichromate solution to a potentiometric end point. Vanadium(IV) solution is added before the titration to sharpen the end point. About 90 percent of the dichromate titrant is added by weight and the remainder is added by volume from a digital buret.

- **Fluoride and Chloride Separation From Samples by Pyrohydrolysis**

Water vapor is passed over a sample heated at 1000 °C. The pyrohydrolytic reaction quantitatively released fluoride and chloride as hydrofluoric and hydrochloric acids, which volatilize and collect in a trap solution. The trap solution is analyzed for fluoride and chloride using Methods 40.2 and 40.3 or 40.4.

- **Fluoride by Ion Selective Electrode Measurement**

The solution obtained from pyrohydrolysis (Method 40.1) is analyzed for fluoride with a fluoride-selective electrode in an acetate buffered solution.

- **Chloride by Constant Current Coulometry**

The solution obtained from pyrohydrolysis (Method 40.1) is analyzed for chloride with an automatic chloride titrator, which coulometrically generates silver ion to form insoluble silver chloride. The end point is sensed amperometrically and the

generating current is stopped automatically at a preset increment of indicator current. Because the rate of generating silver ion is constant, the titration time is proportional to the amount of chloride precipitated.

- Chloride by Spectrophotometry

The solution obtained from pyrohydrolysis (Method 40.1) is analyzed for chloride using a spectrophotometric procedure in which the absorbance of a ferric thiocyanate complex is measured at 460 nm. The red-colored complex is formed from chloride, mercuric thiocyanate, and ferric ammonium sulfate by a reaction in which the chloride complexes mercury, releasing an equivalent amount of thiocyanate to react with iron.

- Carbon by Combustion and Gas Chromatography

Carbon, as carbon dioxide, is quantitatively released from powdered samples by heating at 1000 °C in a stream of pure oxygen. The oxygen carries the carbon dioxide to a trap where the carbon dioxide is isolated by adsorption on molecular sieve at 0 °C. Subsequently, the carbon dioxide is desorbed by flash heating the trap and is carried in helium to gas chromatograph for measurement.

- Nitride by Kjeldahl-Spectrophotometric Method

Samples are dissolved in an acid mixture to convert nitride nitrogen to ammonium salts. Ammonia is released quantitatively by steam distillation from a strongly basic solution and is collected in a dilute acid solution. The ammonia is measured spectrophotometrically using the color developed from the reaction between ammonia and Nessler reagent.

- Total Nitrogen by Fusion and Gas Chromatography

Powdered or small pieces of sample are fused at about 2600 °C in a graphite crucible. The nitrogen is released in its elemental form and it is measured by gas chromatography, which is based upon the differences in thermal conductivity of gases.

- Surface Area by a Modified BET (Brunauer, Emmett, and Teller) Method

The surface area is determined using a commercially available analyzer that measures the amount of nitrogen gas adsorbed as a monomolecular layer on the surface on a sample held at the temperature of liquid nitrogen. Total surface area in square meters is displayed digitally on the analyzer.

- Particle Size Distribution by Sedimentation and X-Ray Scattering

The sample material is dispersed ultrasonically and with stirring in a liquid. The particle size analyzer measures the settling rates of the suspended particles by determining the concentration of particles remaining in suspension at various

depths as a function of time. The data is automatically presented as a curve relating a cumulative percent distribution to the equivalent spherical diameters of the particles.

- **Density and Open Porosity by Mercury Displacement**

A mercury-intrusion porosimeter is used to immerse a sample in mercury and to force mercury into open pores of the sample at various pressures ranging up to 5,000 psi. Density is determined by measuring the amount of mercury displaced by the sample and porosity is determined by measuring the amount of mercury penetrating pores at various pressures.

- **Boron Carbide Sample Preparation**

Boron Carbide Pellet samples are crushed, sieved, and mixed to produce a fine, homogeneous powder for various analyses.

- **Total Boron by A Volumetric Method**

Powdered nuclear-grade boron carbide is mixed with sodium carbonate and this mixture is fused to decompose the boron carbide. The melt is dissolved in water, filtered to remove the insoluble residue, acidified, and heated to remove carbon dioxide. The boron as boric acid is titrated with standardized sodium hydroxide using the mannitoboric acid procedure.

- **Total Carbon by Combustion and Gravimetry**

The sample mixed with a flux material is burned in oxygen at a temperature not lower than 1400 °C. Traces of carbon monoxide are oxidized to carbon dioxide and traces of dust, sulfur dioxide, and moisture are removed prior to the gravimetric measurement of carbon dioxide.

- **Isotopic Composition by Mass Spectrometry**

Boron isotopic ratios are measured in boron carbide by thermal ionization mass spectrometry without prior chemical separation of boron. Boron is converted to sodium borate by fusion of the boron carbide with sodium carbonate directly on a tantalum filament. The loaded filament is transferred to the mass spectrometer where boron isotopic ratios are measured using the Na_2BO_2^+ ion.

- **Fluoride and Chloride Separation from Boron Carbide**

Water vapor is passed over a sample heated at about 1000 °C. The pyrohydrolytic reaction quantitatively releases fluoride and chloride as hydrofluoric and hydrochloric acids, which volatilize and collect in a trap solution. The trap solution is analyzed for fluoride and chloride using Methods 40.2 and 40.3.

- **Fluoride by Ion-Selective Electrode Measurement**

The solution obtained from pyrohydrolysis (Method 40.1) is analyzed for fluoride with a fluoride-selective electrode in an boric acid buffered solution.

- **Chloride by Constant Current Coulometry**

The solution obtained from pyrohydrolysis (Method 40.1) is analyzed for chloride with an automatic chloride titrator, which coulometrically generates silver ion to form insoluble silver chloride. The end point is sensed amperometrically and the generating current is stopped automatically at a preset increment of indicator current. Since the rate of generating silver ion is constant, the titration time is proportional to the amount of chloride precipitated.

- **Soluble Carbon by A Manometric Measurement**

The sample in powder form is treated with a solution of sodium dichromate in sulfuric acid at a temperature of 100 °C. The soluble carbon is oxidized to carbon dioxide, which is measured manometrically.

- **Soluble Boron by Extraction and Titration**

Soluble boron is extracted from two portions of sample by refluxing separately with hydrochloric and nitric acids. The method is based upon the assumption that hydrochloric acid extracts only boron oxide, and nitric acid extracts both boron oxide and elemental boron. Each extract is purified from hydrolyzable metals by precipitation, and the filtrates are analyzed for boron by titration with standardized sodium hydroxide using the mannitoboric acid procedure. This method is empirical; therefore, it is important that the apparatus and analysis conditions used are exactly as described in this method.

- **Total Nitrogen by Fusion and Gas Chromatography**

Powdered or small pieces of boron carbide are fused with nickel at about 2600 °C in a graphite crucible. The nitrogen is released in its elemental form and it is measured by gas chromatography, which is based upon the differences in thermal conductivity of gases.

- **Nitrogen by A Fusion - Spectrophotometric Method**

The sample is mixed with lithium hydroxide and fused to decompose the boron carbide. The nitride nitrogen is converted to ammonia, which is trapped in a hydrochloric acid solution. The ammonium ion is measured spectrophotometrically using the colored complex produced by Nessler reagent.

- **Total Oxygen by Inert Gas Fusion**

Powdered boron carbide is fused with iron at 2600 °C in a graphite crucible. Oxygen evolves as carbon monoxide, which is converted to carbon dioxide when

passed over heated rare earth oxide. The carbon dioxide is measured by thermal-conductivity gas chromatography. A water analysis is required to correct the oxygen results for any water absorbed by the powdered material.

- **Gas Content by Vacuum Outgassing**

The sample is heated at 1000 °C by induction heating in a tungsten crucible. The pressure and temperature of the evolved gas are measured while the gas occupies a known volume. From these data the cm³/g of gas at standard temperature and pressure (STP) is calculated. The apparatus is designed so that a sample of the gas can be taken for an analysis of composition.

- **Impurities by Direct Reading Emission Spectroscopy**

Impurity elements are determined by a direct reading emission spectrometer using a mixture of germanium oxide and graphite as a buffer. Concentrations of Al, Ca, Cr, Fe, Mg, Mn, No, Si, and Ti are printed out directly in µg/g after computer calculation of the data supplied from the spectrometer.

- **Titanium by Emission Spectrography**

Titanium is determined by emission spectrography using a mixture of germanium oxide and graphite as a buffer. This method is used when the Direct Reader Analysis for titanium exceeds 100 µg/g (Method 40.11).

- **Tungsten by Spectrophotometry**

Tungsten is reduced to tungsten(V) with titanium(III) and the tungsten is extracted from a hot hydrochloric acid solution into a solution of dithiol in amyl acetate. The absorbance of the tungsten-dithiol complex is measured at 640 nm. Molybdenum interference is removed by a preliminary extraction as molybdenum(IV).

- **Total Carbon by Combustion and Gas Chromatography**

The sample, mixed with an accelerator, is burned in oxygen at greater than 1600 °C. The CO₂ product is selectively adsorbed on molecular sieve. When the combustion is complete, the molecular sieve is heated and the desorbed CO₂ is measured by thermal conductance gas chromatography.

4.0 SOLID WASTE HANDLING PRACTICES AND PROCEDURES

Solid radioactive waste handling, packaging, and characterization at the Hanford Site progressed through four general phases:

1. pre - 1969
2. 1970 - 1972
3. 1973 - 1982
4. 1982 - present.

Before 1969, radioactive solid waste received very little attention as to characterization, packaging, sorting, or treating. Marginal records were maintained with emphasis on the Special Nuclear Materials (SNM) operating laws. As waste retrieval was not a factor for consideration, the radioactive waste burial containers were not chosen for their resistance to long-term corrosion, weathering, or degradation. The solid radioactive waste burial during this time period is not very definable with respect to today's intricate waste classification system. The tables and graphs in this report do not include pre-1970 data; however, packaging and handling information is provided for this time period.

The AEC directive establishing the basis for TRU waste and the requirement for 20 year retrievable storage was issued in 1970. Solid Waste Burial Records (SWBR) were kept for all containers, although the information on physical contents and hazardous constituents was limited.

During the next period, 1973 to 1979, the AEC further defined TRU waste as material contaminated with certain alpha-emitting radionuclides with half-lives greater than 20 years and activity greater than 10 nCi/g. Record keeping and waste packaging improved during this time period.

In the early 1980's, the ability to assay waste packages accurately was improved with the addition of several Segmented Gamma Scan Assay Systems (SGSAS). This improved the ability to characterize TRU waste.

Since 1982, the 100 nCi/g TRU limit has been in effect. With this change in the TRU requirements as well as improved recording, packaging, and sorting practices, waste classified as TRU waste under the previous requirements now may be categorized as low-level. Waste acceptance criteria were developed and improved at this time also. RCRA requirements and other more strict compliance criteria, especially for waste containing hazardous chemicals, have been applied to radioactive solid waste handling, packaging, characterization, and record keeping practices.

4.1 HISTORICAL WASTE PACKAGING AND HANDLING REQUIREMENTS AT HANFORD

Eleven historical waste packaging manuals were reviewed for information regarding packaging and labeling requirements for TRU waste in retrievable storage at the Hanford Site. These manuals covered requirements from 1974 through 1988.

Packaging requirements have changed over time and have become more stringent. Table 4-1 summarizes TRU storage requirements for the Hanford Site from 1974 through 1988. The columns in Table 4-1 are not symmetrical; when a definition or requirement is consistent between manuals, text is shared under several document number columns. A blank spot indicates that no requirements or definition are found in that manual. Definitions (i.e., hazardous and toxic materials, etc.) change from manual to manual and so require reference to each particular manual.

Some of the more significant changes that have occurred in the past twenty years with regard to the packaging, handling, and record keeping for radioactive wastes from the 325 Building follow:

1. The definition of TRU waste has changed since 1970, and the designation of waste packages as TRU has also changed. During the period from 1970 to 1973 TRU segregation was based on generator practice. From 1974 until 1982, TRU waste was segregated if the concentration of TRU was greater than 10 nCi/g. In 1982, the current 100 nCi/g definition for TRU waste was implemented by the DOE.
2. Because of the varied contents of the waste containers, chemical reactions can occur. Gases, including hydrogen, that can contribute to fire and/or explosion may accumulate. Since 1982, waste materials that generate H_2 , O_2 , or NO_x are prohibited unless drums have been permanently fitted with vent clips to allow continual release of gases or include catalyst packs to recombine any hydrogen that may be produced.
3. Criticality specifications limited the amount of TRU to less than 250 g per 55-gallon drum from 1975 through 1978 and to 200 g/drum after that time. Prior to 1975 the criticality limit on drums and cartons was 400 grams.
4. Individual container weights were not required prior to 1977; however, estimated weights for pre-1977 containers were added to the records in the R-SWIMS database during the data reentry program in the mid-1980's. Standard weights were given for each container type. All 55-gallon drums, for example, were given a value of 68 Kg (150 lbs).
5. Originally, waste burial records for TRU were not done for individual containers but for entire shipments. In 1982, TRU burial and storage records began to be based on an individual container basis. The entry of unique data for each waste container into the R-SWIMS database was not fully implemented until 1984. During the R-SWIMS reentry program, historical TRU records were converted to an individual basis so that today there is one SWITS record for each TRU container stored at Hanford.

The conversion from group data to individual container data required some assumptions about the containers in the group to be made. Chief among these assumptions was that an even distribution of radiological and hazardous constituents existed among the members of the group.

LLW records are still kept for multiple containers rather than for individual containers.

6. Information on the hazardous constituents of waste containers was not required prior to 1986. During the R-SWIMS reentry program, any available information from the SWBRs was added, however, this information is limited.
7. Physical descriptions of the waste contents were not required on the SWBR prior to 1978. SWITS records for waste buried prior to 1978 list the contents as "miscellaneous" in most cases. In more recent years, the physical contents description has become more detailed. Many of the records now include the weight and volume percentages of a given component in the waste container.
8. Between 1972 and 1978, combustible and noncombustible waste components were segregated. Although the SWITS database did not retain a data field for this information, it was added to the physical contents description field.
9. The most common TRU waste container used at the Hanford Site is the 55-gallon steel drum. U.S. Department of Transportation (DOT) 17C and 17H drums, with minimum wall thicknesses of 0.053 in. and 0.043 in., respectively, were both used. Prior to 1982 most of the drums were painted, so there is approximately 0.005 in. of paint on both the exterior and interior of the drums. In 1982, galvanized drums replaced the painted drums. Recycled 55-gallon drums were also permitted for the storage of TRU waste from 1973 to 1978.
10. Data for wastes generated prior to 1970 are not included in the SWITS database.

Over the years, solid radioactive wastes generated at the 325 Building have been handled in a variety of ways. A variety of containers, including "gunk catchers," "paint cans," "milk pails," "lard cans," and "potato chip cans," have been used to hold radioactive waste. These waste were stored at collection points in room 52A and in several basement rooms (rooms 32, 40A, 40B, 40C, and 50) prior to disposal at the various burial grounds designated for use by 300 Area buildings: 618-10, 300 North, Wye, and the 200 Area Burial Grounds.

Prior to 1970, radioactive dry wastes were segregated into low-level wastes and high-level wastes based on their activity. Low-level solid wastes from all potentially contaminated areas were sealed in plastic-lined cardboard cartons and buried. High-level solid wastes from the multicurie "hot" cells were sealed in leak-proof metal cans and transported to the burial grounds in shielded casks. Small quantities of high-level wastes, such as analytical samples and glovebox wastes, were encapsulated in concrete prior to burial. Before 1968 some contaminated, used resins from 325 Building ion-exchange columns were placed in 30-gallon paper drums and disposed aboveground west of the 300 Area west gates.

In 1970, the Hanford Site implemented the requirement to segregate TRU waste from LLW. During the mid-1970's dry solid wastes were segregated into seven categories at 325. They were as follows:

- Trash
- Salvageable scrap
- Toxic non-radioactive waste
- Pyrophoric nonradioactive waste
- Low dose rate radioactive waste
- High dose rate radioactive waste
- Transuranic waste.

Presently, radioactive wastes are administratively segregated into low-level, transuranic, and mixed wastes.

4.2 HISTORICAL WASTE PACKAGING AND HANDLING PROCEDURES FOR THE 325 BUILDING

4.2.1 Transuranic Waste

During the 1970 to 1987 time frame, TRU waste was generated by five to six separate glovebox lines. The waste was primarily contaminated laboratory supplies that was put into 5-quart paint cans. For a time, the paint cans were placed in a larger "potato chip" can, which were then stacked in a 55-gallon drum. This practice was abandoned because of the large bulk of waste the overpacking created.

The accumulation limit for 5-quart paint cans in an individual glovebox was four. Once this limit was reached, the cans had to be bagged out. It took an average of 15 paint cans to fill a 55-gallon drum, as the cans were generally arranged in three stacks of five cans each. In order to meet requirements for waste accumulation and holding times in the laboratory, several gloveboxes were bagged out at the same time so that drums could be filled as quickly as possible. Therefore, an individual 55-gallon drum generally will contain solid wastes from several gloveboxes.

Glovebox operators were responsible for the bagout of their respective gloveboxes after 1980 or so. Prior to that time, the Waste Management Group was responsible for waste collection and decontamination work.

Catalyst packs were placed on the drums beginning in the mid-1980's. If a drum was vented, it also had a catalyst pack.

Acid solutions containing uranium and plutonium, acid digestion wastes, and uranyl nitrate from the digestion of fuel pins were mixed with Portland Cement in a 5-quart paint can to effectively neutralize them. There was a special glovebox dedicated to this process. Beginning in the mid-1980's the procedure changed, and acid solutions had to be neutralized prior to mixing with the cement. Frequently used acid solutions included phosphoric acid and hydroxylamine hydrochloride.

Prior to about 1987, old gloveboxes were packaged in burial boxes intact. For a brief period of time, they were sent to the 231-Z Facility to be cut up into smaller pieces. The pieces were packaged in steel culverts, steel boxes, plywood boxes, and some of the smaller pieces were placed in 55-gallon drums.

In the mid-1980's time frame, mercury was packaged in culverts about 8 in. in diameter and 2.4 ft long. The culverts were then put into drums with approximately 6 in. of concrete on the top and the bottom. It was common to fill the space around the culverts with bagged poly bottles and other items. These drums are extremely heavy; facility personnel estimate that these drums weighed between 600 and 800 lb each.

Beginning in 1980 or so, solid waste containers were sent from 325 to 324 for nondestructive assay (NDA). The NDA instrument used was Segmented Gamma Scanner Assay System (SGSAS). These containers were then shipped out from 324 to the burial grounds. The SWBRs for these drums lists 324, not 325, as the generating facility. A significant number of containers were also staged at the 340 facility prior to shipping. These containers list 340, not 325, as the generating facility.

Waste volume fluctuated from year to year according to facility personnel. One truck could hold about 23 drums, so that many were accumulated prior to sending them to the 200 Area burial ground. Sometimes there were several shipments of TRU waste per year. The normal holding time for a drum in the 300 Area during the 1980's was less than a year except in unusual circumstances. Drums that exceeded this holding time were special case drums that, in most cases, had to be brought into compliance with new regulations.

A typical TRU waste drum would probably be made up of the following items:

- Plastic vials and bottles
- Broken glass
- Electrodes (perhaps containing Hg)
- Paper towels, kimwipes
- Neoprene gloves
- Old laboratory equipment (balances, Ph meters, etc.).

4.2.2 Low-Level Waste

Facility personnel indicated that there was a significant amount of low-level waste generated at Building 325 during the 1980's. It was not unusual for two truckloads of LLW to be shipped in a given week. Typical LLW drums contained housekeeping and room waste only. All maintenance waste was placed in burial boxes and were handled by JA Jones or Kaiser.

According to facility personnel, the nominal generation rate for drums from 325 since PNL assumed landlord responsibilities is 36 drums of compacted waste per year. (In 1990, there were 36 drums of compacted waste produced; in 1991, 35 drums of compacted waste were produced.)

4.3 HANDLING AND PACKAGING OF CAISSON WASTE FROM THE 325 HOT CELLS

4.3.1 Pre-1970 Handling and Packaging Procedures

Prior to 1966, wastes generated in the hot cells were collected in extruded aluminum cans with a riveted bail for a handle. These cans were referred to as "milk pails" and were approximately the size of an imperial gallon. Although liquids were placed into the pails, most solvents evaporated quickly due to the high flow rate through the hot cells. When the milk pails were full, within about two inches of the top, they were covered with a "gelatin" layer, since they had no lids of their own. These pails were then disposed of at the Wye Burial Ground.

During 1966 and 1967, solid waste disposal caissons and containers used for 300 Area disposal changed in two ways. A new type of caisson (sometimes called a "silo"), with its top opening angled at 45 degrees to give better radiation shielding to disposal workers, was designed and fabricated in Hanford's 1100 Area Shops. At the same time, the milk pail system was replaced by the paint can system. Radioactive wastes from operations buildings were collected in 1-gallon paint cans with metal lids fastened on by two sets of clips. Eight paint cans together fit into a new cylindrical casks with 6 inches of lead shielding surrounded by a stainless steel shell. Thus, more securely sealed and heavily shielded, solid wastes traveled to the Wye Burial Grounds.

4.3.2 Post-1970 Packaging and Handling Procedures

After 1970, caisson waste was sent to the 200 Areas Burial Grounds for retrievable storage in underground caisson TRU storage containers. Casks from the 325B Hot Cell Annex were lined with 2-in. lead shielding and held three 1-gallon buckets. The casks themselves were not disposed but were reused many times. The paint can system continued in use for many years and is still used to some extent today. Later the system was augmented by the use of 50 lb "lard cans." These 10-gallon containers are used for high-activity solid radioactive wastes generated in the 325 Building and in other 300 Area structures (Gerber 1992). A diagram of the underground caisson TRU storage container is shown in Figure 4-1.

Interviews with 325B Hot Cells Annex Personnel were conducted to gather additional details regarding the handling of caisson waste. Personnel indicated that unused fuels from the Hot Cells were reacted with nitric acid in glass beakers. The liquid was then allowed to evaporate into a solidified waste form resulting in a saltcake that was crushed along with the beaker and placed in 1-gallon buckets to be sent to the caissons for disposal. In addition to the fuel, articles used in the analytical work became grossly contaminated with fuel to a level high enough that they were put in the same can as the fuel and sent to the alpha caissons. Considerable effort was made to keep the buckets externally clean or to fix any contamination externally. On a few occasions the cask boat that was used for lowering the cans into the caisson was lost in the process. It is expected that some of these cask boats will be encountered during retrieval efforts.

Figure 4-1. Post-1970 Underground Caisson TRU Storage
(218-W-4B Burial Ground).

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Table 4-1. TRU Storage Requirements for the Hanford

NOTE: For the period of 1970 through April 1974, document numbers are unknown.

Doc # Effective Date	ARM-3032 4/74 - 4/77	ARM-3032, Rev. 1 4/77 - 7/78	ARM-3032 Rev. 1 Sup 1 8/78 - 12/78	ARM-3032 Rev. 1 Supp. 2 12/78 - 5/80	RHO-MA-222 5/80 - 6/82	
TRU Definition	Waste containing Pu and/or other transuranium nuclides in concentrations greater than 10 nCi/g.	Waste containing or suspect of containing Pu and/or other transuranium nuclides in concentrations greater than 10 nCi/g.			Waste containing or suspect of containing transuranium alpha-emitting radionuclides with half-lives greater than 100 years or 233 U in concentrations greater than 10 nCi/g.	Wa com em gre con
Prohibited wastes types and Packaging Requirements	Liquid wastes must be packaged with sufficient inert absorbent so that liquid will not flow if container is breached			No free liquids	No free liquids - except liquid organic wastes.	No wa
		Liquid organic waste-free or absorbed is prohibited (includes animal carcasses).	Liquid organic waste-free or absorbed is prohibited (includes all oils and animal carcasses).	Animal carcasses accepted if packaged per requirements. Liquid organic waste with flashpoint > 150°F accepted if properly labeled and packaged. Liquid organic waste with flashpoint < 150°F accepted with special approval.		An per org 15 an wi wi
		Flammable absorbed liquids prohibited from disposal in casks.	Damp or wet wastes with highly combustible or explosive liquids prohibited.	Flammable liquids free or absorbed with flashpoints below 150°F prohibited		
		Unreacted Alkali Metals prohibited.			Unreacted Alkali Metals prohibited.	Ur
				Explosives Prohibited	Explosives prohibited	Ex
				Pyrophorics prohibited	Pyrophorics prohibited	Py
			TRU waste packages shall be of a nature that no radioactive material escapes as a result of a breach of the container; pressurization of the container shall not occur and the container shall maintain its integrity for a period of 20 years. If a container is vented to prevent pressurization the vent shall equal or exceed a HEPA filter with regard to minimizing passage of radiation.		Materials that generate significant amounts of gas are prohibited.	V or pc pc
		Hazardous and toxic materials must be treated prior to burial.			Hazardous and toxic materials accepted on case by case basis.	H a-
		Exterior surfaces must be free from smearable contamination-fixation allowed.			Exterior surface must be free from smearable contamination.	E c-

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1 Site. (3 sheets)

RHO-MA-222 6/82 Revision 6/82 - 6/83	RHO-MA-222 7 Rev 6/83 - 3/84	RHO-MA-222 Rev. 1 3/84 - 7/84	RHO-MA-222, Rev. 2 7/84 - 8/85*
Waste containing or suspect of containing transuranium alpha-emitting radionuclides with half-lives greater than 100 years or 233 U in concentrations greater than 10 nCi/g.	Document Unavailable	Waste containing alpha-emitting radionuclides with atomic numbers greater than 82 and half-lives greater than 20 years or 226 Ra or 233 U in concentrations greater than 100 nCi/g.	
Free liquids - except liquid organic wastes		No free liquids - except liquid organic wastes	No free liquids
Animal carcasses accepted if packaged per requirements. Liquid organic waste with flashpoint > 150°F accepted if properly labeled and packaged. Liquid organic waste with flashpoint < 150°F accepted with special approval.		Animal carcasses accepted if packaged per requirements.	
		Sludges cannot contain free liquids.	
Reacted Alkali Metals prohibited.		Unreacted Alkali metals prohibited with exceptions.	
Explosives prohibited		Pyrophorics and explosives prohibited except metal fines.	Explosives prohibited.
Pyrophorics prohibited			Pyrophorics prohibited.
		Gas cylinders containing radioactive gases prohibited. Empty cylinders accepted if permanently vented.	Compressed gases prohibited.
Waste materials that generate H ₂ , O ₂ , NO _x are prohibited unless permanently vented or catalyst package in container.		Waste materials that generate H ₂ , O ₂ or NO _x are prohibited unless permanently vented or catalyst package in container.	Waste containers that could repressurize to greater than 7 psi within 25 years require venting through HEPA filters.
Hazardous and toxic materials accepted on case by case basis.		Hazardous and Toxic materials must be treated to meet the waste acceptance criteria for disposal.	
Exterior surfaces free from smearable contamination fixation allowed.		Exterior surfaces free from smearable contamination fixation allowed.	Removable surface contamination limits fixation is not acceptable.

Table 4-1. TRU Storage Requirements for the Hanford

NOTE: For the period of 1970 through April 1974, document numbers are unknown.

Doc # Effective Date	ARM-3032 4/74 - 4/77	ARM-3032, Rev. 1 4/77 - 7/78	ARM-3032 Rev. 1 Sup 1 8/78 - 12/78	ARM-3032 Rev. 1 Supp. 2 12/78 - 5/80	RHO-MA-222 5/80 - 6/82	
		Contamination that is easily airborne must be in an inner liner.			Loose contamination must be stabilized or contained so that the surface of the container remains free of detectable loose contamination.	Loose contamination must be stabilized or contained so that the surface of the container remains free of detectable loose contamination.
	Be requires double containment.				Double containment required for all TRU waste and for all waste accepted from offsite generators. Be and Hg required double containment.	Double containment required for all TRU waste and for all waste accepted from offsite generators. Be and Hg required double containment.
					"Liquid Organic waste must be packaged in a sealed liquid-tight container (5-10 gallon), overpackaged in 55 gallon drum with a rigid polyethylene liner and filled to the top with at least two times the absorbent required to absorb the volume of liquid in the containers.	"Liquid Organic waste must be packaged in a sealed liquid-tight container (5-10 gallon), overpackaged in 55 gallon drum with a rigid polyethylene liner and filled to the top with at least two times the absorbent required to absorb the volume of liquid in the containers.

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1 Site. (3 sheets)

RHO-MA-222 6/82 Revision 6/82 - 6/83	RHO-MA-222 ? Rev 6/83 - 3/84	RHO-MA-222 Rev. 1 3/84 - 7/84	RHO-MA-222, Rev. 2 7/84 - 8/85*
			Flammable solids (metal fines) must be mixed with chemically stable material to produce a solidified waste matrix (glass, concrete, etc.)
se contamination must be stabilized or contained so that the surface of the container remains free of detectable loose contamination.		Loose contamination must be stabilized or contained so that the surface of the container remains free of detectable loose contamination.	Powders, ashes and similar particulates must be immobilized in concrete, glass or similar solidified matrix if > 1 weight % of the matrix weight is particulates < 10 microns in diameter or if > 15 weight % is < 200 microns in diameter.
Double containment required for all TRU waste. Double containment is required for Cd and Hg. Be, Cd, and Hg must be packaged with at least 6" of concrete on all sides.		Double containment required for all TRU waste. Double containment is required for Cd and Hg. Be, Cd, and Hg must be packaged with at least 6" of concrete on all sides.	Double containment required for all TRU waste. Be, Cd, Hg and other class B poisons must be immobilized in concrete for burial.
Liquid Organic waste must be packaged unabsorbed in a sealed liquid-tight container (5-10 gallon), overpackaged in 55 gallon drum with rigid polyethylene liner and filled to the top with at least two times the absorbent required to absorb the volume of liquid in the containers.		"Liquid Organic waste must be packaged unabsorbed in a sealed liquid-tight container (5-10 gallon), overpackaged in 55 gallon drum with a rigid polyethylene liner and filled to the top with at least two times the absorbent required to absorb the volume of liquid in the containers.	Liquid organic waste must be solidified for storage or disposal. Exceptions are considered on a case by case basis.

Table 4-1. TRU Storage Requirements for the Hanford

NOTE: For the period of 1970 through April 1974, document numbers are unknown.

Doc # Effective Date	ARH-3032 4/74 - 4/77	ARH-3032, Rev. 1 4/77 - 7/78	ARH-3032 Rev. 1 Sup 1 8/78 - 12/78	ARH-3032 Rev. 1 Supp. 2 12/78 - 5/80	RHO-MA-222 5/80 - 6/82	
					Animal waste must be packaged in a 55 gallon drum with a minimum 4 mil. plastic liner, treated to suppress gas generation, and surrounded by sufficient absorbent to prevent free liquids two times amount of absorbent required to absorb any liquid present or that may result from the decay process.	An 55 mil gas two req or pro
Labeling Requirements	Waste packages must be suitably labeled so that containers can be identified by cross-reference to permanent records.				Waste packages must be suitably labeled so that containers can be identified by cross-reference to permanent records. Waste packages containing TRU must be labeled "transuranic" or "transuranic waste"	W lab ide pe
	Be must be labeled.	Be must be labeled.	Be must be labeled.	Be must be labeled.	DOT Class "B" Poisons must be labeled (Be & Hg).	Be
		Hazardous and toxic waste must be labeled.				De wi
					"Liquid Organics" must be labeled.	"L m lal
					"Animal Waste" must be labeled.	"A
					"Fissile Material" label and Type "E" tamper indicating seal required if contents include 1 or more grams. Drums containing Pu must have Pu quantity in grams posted on the side and lid.	"F cc Pu m-

*Includes RHO-MA-222, Rev. 3, 3A and 4. The changes made in these revisions are general and do not affect the packaging, storage or disposal requirements of TRU unstates effective date of WHC-EP-0062, Rev. 0.

Site. (3 sheets)

RHO-MA-222 6/82 Revision 6/82 - 6/83	RHO-MA-222 7 Rev 6/83 - 3/84	RHO-MA-222 Rev. 1 3/84 - 7/84	RHO-MA-222, Rev. 2 7/84 - 8/85*
Animal waste must be packaged in a 55 gallon drum with a minimum 4 mil. plastic liner, treated to suppress gas generation, and surrounded by two times amount of absorbent required to absorb any liquid present or that may result from the decay process.		Animal waste must be packaged in a 55 gallon drum with a minimum 4 mil. plastic liner, treated to suppress gas generation, and surrounded by two times amount of absorbent required to absorb any liquid present or that may result from the decay process.	
Waste packages must be suitably labeled so that containers can be identified by cross-reference to permanent records.		Waste packages must be suitably labeled so that containers can be identified by cross-reference to permanent records.	
Cd and Hg must be labeled.		Be, Cd and Hg must be labeled.	
DOT labels required for all classes of waste that apply to the package.		DOT labels and color coding required on all waste packages.	
"Liquid Organics" must be labeled and must have flashpoint range listed on label.		"Liquid Organics" must be labeled and must have flashpoint range listed on label.	
"Animal Waste" must be labeled.		"Animal Waste" must be labeled.	
"Fissile Material" label required if contents include 1 or more grams. Pu quantity must be labeled if 1 or more grams of Pu is in the container.		"Fissile Material" label required if contents include 1 or more grams. Pu quantity must be labeled if 1 or more grams of Pu is in the container.	

or reactive wastes specifically. The requirements listed under Rev. 2 of RHO-MA-222 are effective up to the

INTRODUCTION TO SECTIONS 5.0 THROUGH 8.0

Because the main 325 Radiochemistry Building was jointly occupied by Westinghouse Hanford and PNL throughout the 1970's and 1980's, the waste that was generated there was designated by the company producing it. In this report we have retained this separation; Section 5.0 contains information on waste designated as Westinghouse Hanford and Section 6.0 contains information on waste designated as PNL. It should be noted, however, that Westinghouse Hanford had the responsibility for the waste handling operations at 325 from 1970 until 1987, at which time PNL assumed this role. During the earlier period it is likely that some PNL waste was designated as Westinghouse Hanford waste. It is also possible that some Westinghouse Hanford waste was designated as PNL waste after 1987.

The 325 Building A and B annexes contain three and six "hot" cells, respectively. The activities performed in these hot cells were quite different from the activities performed in the analytical laboratories. The wastes generated were often designated more specifically as '325A' and '325B'. The 325A annex has been operated solely by PNL since the mid-1960's. The waste designated as being from 325A is discussed in Section 7.0. The 325B annex was operated by PNL until the middle of 1970, when Westinghouse Hanford took occupancy of the hot cells. Waste designated as being from 325B is discussed in Section 8.0. Please note that it is extremely likely that some wastes from both 325A and 325B were designated as 325.

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5.0 CHARACTERIZATION OF RETRIEVABLY STORED SOLID WASTE GENERATED AT 325 BY WESTINGHOUSE HANFORD

The information found in this section is based primarily on data from the Solid Waste Information and Tracking System (SWITS) database. This database, which incorporated the older R-SWIMS database, is used to track information on radioactive and other wastes stored or disposed at the Hanford Site. Transuranic solid waste packages have been tracked since 1970, however, changes in the requirements and regulations governing radioactive wastes have left their mark in the quantity and quality of the data contained in this database. Caveats are included in the text to alert the reader to changes that may affect the interpretation of the data provided.

Solid Waste Burial Records (SWBRs) are the original source of data found in the SWITS database and were used as a secondary source of information in this section. Between 1970 and 1980, the 325 Building was used as a collection point for all waste in the 300 Area. Although waste originated from other buildings in the 300 Area, it's not uncommon for the SWITS database to list the originating source as 325. Review of the original SWBRs clearly indicates a different facility as the originating source for some of the waste listed under 325. The majority of the tables and figures in this section are based on all waste listed in the SWITS database as 325 waste even though some of this waste did originate elsewhere. The summary, Tables 5-1 and 5-2, however, show the breakdown of waste designated as coming from 325 but known to have originated at other facilities.

Beginning in 1980 solid waste originating from 325 by Westinghouse Hanford was sent to 324 or 340 for interim storage and assay. Subsequently, waste containers from 325 were recorded in SWITS as originating from 324 or 340, although the original SWBRs clearly indicate the 325 Building as the originating source of the waste. These waste containers are included in the tables and figures in this section, and data obtained from SWBRs rather than SWITS is clearly labeled.

The bulk of the data provided in this section is limited to information about the TRU waste that was generated at 325 by Westinghouse Hanford; however, some general information on the non-TRU waste is included for completeness. The term non-TRU waste is used instead of LLW because a small percentage of the unsegregated waste is designated only as not TRU. Tables 5-3 and 5-4 present TRU and non-TRU waste generation summaries by container type and year. As the initial retrieval efforts and WRAP 1 will focus on 55-gal drums, these containers are considered separately from all other container types. Therefore, the term "other containers" in this report will refer to all container types except 55-gal drums. The term "drum" refers to 55-gal drums only, unless specified otherwise.

The original SWITS data that form the basis for most of the tables and figures in this section can be found in Appendix A. Each computer run is preceded by the query used to generate the data.

Because of the large number of figures and tables in this section, they are placed at the end of the chapter.

5.1 SUMMARY OF 325 WASTE GENERATION BY WESTINGHOUSE HANFORD

5.1.1 Waste Stored in 55-Gallon Steel Drums

The most common waste container for TRU waste stored at the Hanford Site is the 55-gal steel drum. The drums used are either DOT 17C or 17H drums made from carbon sheet steel with minimum thicknesses of 0.053 in. and 0.043 in., respectively. Prior to 1982 most of the drums were painted, so these drums have approximately 0.005 in. of paint on both the exterior and interior of the drums. In 1982, galvanized drums replaced painted drums. Recycled 55-gal drums were also permitted for the storage of TRU waste between 1973 and 1978.

The 1970 Immediate Action Directive (AEC 1970) stipulated that TRU wastes be packaged and stored as contamination-free packages for at least 20 years. The 20 year interim period was to allow time to study permanent disposal options for TRU contaminated wastes.

As more of the 55-gal drums reach and exceed the twenty year storage mark, more attention is being given to ascertaining the condition of these drums. A discussion of the previous studies of steel drum corrosion and degradation can be found in WHC-0225, Rev. 1 (Anderson et al. 1991) and WHC-SA-1450FP (Duncan et al. 1992).

Table 5-5 contains waste summary data for 55-gal drums of radioactive waste generated at 325 by Westinghouse Hanford between 1970 and 1992. The upper portion of this table presents the number, total weight, and total volume of TRU waste drums. The number of TRU mixed waste drums are also indicated. The same information for non-TRU waste follows. At the bottom of the table are the relative percentages of TRU and non-TRU wastes by container number, weight, and volume. Figures 5-1 through 5-6 present this information graphically.

5.1.1.1 Number of Drums. Between 1970 and 1992, 3,803 55-gal drums of radioactive waste were generated by Westinghouse Hanford at 325. This total includes 1,069 drums of non-TRU and 2,414 drums of TRU waste. The total number of radioactive mixed waste drums is 45 which are all non-TRU MW drums. Figure 5-1 provides a graph of the number of 55-gal drums of TRU and non-TRU generated by Westinghouse Hanford at 325 annually. The major features of this graph are directly related to historical events that took place at 325.

The Commercial Alpha Waste Program was developed in the early 1970's to study and implement an alpha waste reduction plan. Six tasks provided objectives for the treatment and disposal of alpha waste through waste segregation, waste product criterion and evaluation, and waste container criterion and evaluation. Results from the programs are seen in Figure 5-1, which indicates a general decline in TRU waste during the mid-1970's.

The large TRU peaks in 1978 and 1979 are probably due to expanded support of the Fast Flux Test Facility (FFTF) prior to its startup.

Figure 5-2 shows the relative percentage of TRU and non-TRU by year.

5.1.1.2 Weight. In the period between 1970 and 1990 approximately 186,999 kg of TRU waste and 138,092 kg of non-TRU waste generated by Westinghouse Hanford at 325 were stored in 55-gal drums. These numbers are estimates since container weights were not required for individual containers prior to 1977. During the R-SWIMS data reentry program in the mid-1980's, all pre-1977 containers were assigned standard weights. All 55-gal drums, for instance, were assigned a value of 68 kg (150 lbs). Since 1979, the average weight of all 325 drums generated by Westinghouse Hanford has been 89 kg. However, while the average weight of TRU drums from that period was 68 kg, the average weight of non-TRU drums was 143 kg, making these drums over 100% heavier than the TRU drums.

Figure 5-3 presents the total weight of both TRU and non-TRU radioactive wastes stored annually in 55-gal drums. The relative weight percentages for TRU and non-TRU drums generated annually by Westinghouse Hanford at 325 are shown in Figure 5-4.

The large TRU peak in 1979 is probably a result of the removal and replacement of corroded HVAC ducts. This and other TRU wastes in 1979 were stored and buried in 55-gal drum containers only.

5.1.1.3 Volume. The total volume of waste generated by Westinghouse Hanford at 325 and stored in 55-gal drums is 774 m³, of which 507 m³ is TRU and 267 m³ is non-TRU. Annual waste generation information is shown in Figure 5-5; the volume percentages of radioactive waste stored in 55-gal drums are provided in Figure 5-6. Since all 55-gal drums have a volume of 0.21 m³, the patterns shown in Figures 5-5 and 5-6 are the same as those described for Figures 5-1 and 5-2 (drum number), respectively. They are included here so that comparisons with later figures can be made (Figures 5-11 and 5-12).

5.1.2 Waste Stored in Containers Other Than 55-Gallon Steel Drums

Radioactive solid wastes have been stored or disposed of in a wide variety of containers other than 55-gal steel drums. Other container types used for solid waste generated at 325 by Westinghouse Hanford include the following:

- Burlap, cloth, paper or plastic bags
- Concrete boxes
- Concrete cylinders, casks
- Fiberboard/plastic boxes, cartons or cases
- Metal drums, barrels, or kegs (other than 55-gal drums)
- Metal boxes, cartons, and cases
- Fiberboard/plastic drums, barrels, kegs
- Wooden boxes, cartons, and cases.

Some items were disposed of or stored without additional packaging, such as dump trucks; gloveboxes; HEPA filters; miscellaneous scrap; trucks, flatbeds, compactors, loadluggers; self-contained equipment; portable tanks, and metal cylinder casks. These items are also included in the "Other Container" category.

Table 5-6 summarizes the waste data for containers of radioactive waste other than 55-gal drums that were generated at 325 by Westinghouse Hanford between 1970 and 1992. The upper portion of this table indicates the number, total weight and total volume of TRU waste stored in other containers. The number of other containers of TRU mixed waste is also provided. The same information for non-TRU waste follows. At the bottom of this table are the relative percentages of TRU and non-TRU wastes by container number, weight and volume. Figures 5-7 through 5-12 present these data graphically.

5.1.2.1 Number of Other Containers. Between 1970 and 1992, 19,887 other containers of radioactive waste were generated at 325 by Westinghouse Hanford. Of these containers, 97 hold TRU waste, while 19,790 contain non-TRU waste. For reference, during the same period of time a total of 3,483 55-gal drums of radioactive solid waste were generated at 325 by Westinghouse Hanford. Figure 5-7 is a graph of the number of other containers of TRU and non-TRU waste generated at 325 by Westinghouse Hanford by year.

The largest number of other containers containing TRU waste was generated in 1972, with 25 containers. This is the result of a large number of concrete boxes. The vast majority of other containers contain non-TRU waste. In the years 1970 to 1992, over 99% of the waste is non-TRU with fiberboard/plastic boxes, cartons, and cases accounting for over 91% of the non-TRU total.

Figure 5-8 presents the relative percentages of TRU and non-TRU containers other than 55-gal drums. Two things are apparent from this figure: no TRU waste was packaged in other containers from 1986 to 1992, almost all of the waste in other containers was non-TRU.

5.1.2.2 Weight. In the period between 1970 and 1992, approximately 1,142,956 kg of radioactive solid waste was generated at 325 by Westinghouse Hanford and placed in containers other than 55-gal drums. This total includes approximately 95,127 kg of TRU and 1,047,829 kg of non-TRU contaminated material. These weights are approximations because individual container weights were not required to be recorded for individual containers prior to 1977. During an update of the R-SWIMS database in the mid-1980's, all waste containers without recorded weights were assigned standard values. For example, all 2 ft³ boxes were given a standard weight of 5.5 kg (12 lb) and 5 gal lard cans were assigned a standard weight of 22.7 kg (50 lb).

Figure 5-9 depicts the weight of TRU and non-TRU waste stored in containers other than 55-gal drums on an annual basis. The most notable TRU peaks in 1972, 1974, and 1975 are due mainly to 16 concrete boxes, one 7 ft x 10 ft x 16 ft metal box, and one 1,250 ft³ metal box, respectively. Some of the weight represented by the large non-TRU peaks in 1976 and 1979 is a result of the disposal of trucks, flatbeds, compactors and/or loadluggers.

Figure 5-10 shows the percent contribution of TRU and non-TRU waste to the total annual weight of waste packaged in other containers. Because of the practice of storing TRU waste in drums when possible, proportionately less of the other container waste is TRU.

5.1.2.3 Volume. The volume of waste generated at 325 by Westinghouse Hanford and packaged in containers other than 55-gal drums during the period from 1970 through 1992

is 4,758 m³. Transuranic wastes account for 195 m³ of the total volume; non-TRU wastes account for 4,563 m³. Figure 5-11 shows annual volumes of TRU and non-TRU wastes generated at 325 by Westinghouse Hanford and packaged in containers other than 55-gal drums. Figure 5-12 shows the relative contribution of TRU and non-TRU wastes to the total volume of waste in other containers for each year.

5.1.3 Summary of Waste Generation Rates at Westinghouse Hanford 325 Between 1970 and 1992

5.1.3.1 Number of Waste Containers. Between 1970 and 1992, there were 23,370 containers of radioactive solid waste generated at 325 by Westinghouse Hanford. Fifty-five gallon drums account for 3,483 of the total number of containers. Containers of transuranics comprise only 11% of the total container numbers.

Figure 5-13 shows the total numbers of both TRU and non-TRU waste containers generated on an annual basis during this period. The difference in the amount of waste characterized as TRU and non-TRU from 1970 to 1992 is most evident in this graph. As mentioned previously, the Commercial Alpha Waste Program helped to reduce the amount of TRU waste during the mid-1970's. In addition, changes in the DOE (formerly AEC) regulations and disposal practices directly affected the proportion of the waste determined to be TRU and non-TRU. A significant portion of the waste stored as TRU prior to 1982 may be redesignated as LLW upon characterization.

5.1.3.2 Total Weight. Approximately 1,468,047 kg of radioactive solid waste was generated at 325 by Westinghouse Hanford between 1970 and 1992. Waste packaged in 55-gal drums accounts for about 22% of the total weight of waste from Westinghouse Hanford 325, with 78% of the total weight comprised of waste packaged in some other type of waste container.

Waste designated as TRU makes up 19% of the total weight while waste designated as non-TRU makes up the remainder. Figure 5-14 provides a graph of the total weight of TRU and non-TRU waste generated at 325 by Westinghouse Hanford on a yearly basis between 1970 and 1992.

The majority of the weight, 66%, of TRU waste is contained in 55-gal drums followed by metal boxes, cartons, cases with 44,203 kg or 16% of the TRU waste weight. Concrete boxes with 8% of the waste accounted for 23,354 kg of TRU waste.

5.1.3.3 Total Volume. In the period between 1970 and 1992, 5532 m³ of radioactive solid wastes were generated at 325 by Westinghouse Hanford. Only 14% of this volume is comprised of 55-gal drums; the remaining 86% of the volume is made up of other container types. Transuranic wastes account for 13% of the waste volume, while non-TRU wastes make up the remaining 87%. Figure 5-15 shows the total volume of TRU and non-TRU waste generated at 325 by Westinghouse Hanford on a yearly basis.

One interesting fact observable in this figure shows all TRU waste generated in 1973, 1979, 1984, and 1987 was disposed of in 55-gal drums only.

5.2 WASTE CONTAINERS

5.2.1 TRU Waste Containers

Table 5-3 provides a summary of the TRU waste generated annually at 325 by Westinghouse Hanford from 1970 to 1992 sorted by container type. The greatest number of containers are 55-gal drums, 2,414 by count. The percentages for all container types and the weight and volume of these containers are shown for each year in this table.

5.2.2 NON-TRU Waste Containers

Table 5-4 provides a summary of the non-TRU waste generated at 325 by Westinghouse Hanford from 1970 to 1992 by container type. Fiberboard/plastic boxes, cartons, and cases were the most common containers used accounting for more than 86% of the total non-TRU waste count. Significant numbers of metal drums, barrels, and kegs were also generated including 55-gal and other container sizes.

5.3 TRU WASTE STORAGE LOCATIONS

Table 5-7 provides the storage locations for TRU waste packaged in 55-gal drums by year. Storage locations for TRU waste packaged in other containers are shown in Table 5-8. In general 58% of the drums and 56% of other containers generated at 325 by Westinghouse Hanford are stored at burial ground 218-W-4B. A summary of 325 waste by PNL by storage location follows:

- 218-W-3A - Burial Ground 218-W-3A consists of 14 earthen-bottom, gravel filled trenches with waste emplaced from May 1970 to April 1988. Drums and other containers from 325 by Westinghouse Hanford were disposed here in the years between 1970 and 1978; they contain no hazardous constituents according to the SWITS database search.
- 218-W-4B - Burial Ground 218-W-4B, consisting of 14 trenches and 5 trenches, accepted retrievable waste through September of 1978. One thousand four hundred forty-five drums and other containers from 325 by Westinghouse Hanford were buried here from 1971 to 1978.
- 218-W-4C - Burial Ground 218-W-4C consists of six trenches with the first waste emplaced in March 1978. Seven-hundred-eighty-six 55-gal drum TRU waste was sent to this area from 1978 to 1987 with four other containers emplaced between 1980 and 1985.

5.4 PHYSICAL CONTENTS OF TRU WASTE CONTAINERS

The physical contents of 55-gal drums are shown in Tables 5-9 through 5-11. There is a separate table for each storage location. The top portion of each table indicates the

number of drums for which a given component is listed; the bottom part of the table indicates the percentage of the total drums from 325 by Westinghouse Hanford in that burial location that contain the listed constituent. The physical contents for TRU waste containers other than 55-gal drums can be found in Tables 5-12 through 5-14.

It should be noted that prior to 1978, physical contents were not required to be listed on the burial records. A great many of the contents on early records are listed only as "Miscellaneous".

5.5 RADIOLOGICAL DESCRIPTION OF SOLID WASTE AT 325 BY WESTINGHOUSE HANFORD

Table 5-15 shows the number of grams of transuranics contained in waste stored in 55-gal drums each year by storage location; Table 5-16 provides the same information for containers other than 55-gal drums. Figure 5-16 combines the information on these tables in a graph that shows the total amount of transuranics present in waste packages from Westinghouse Hanford 325 by year. The noticeable peak in the quantity of transuranics present in the 325 waste from the late 1970's reflects the high level of analytical support for the FFTF in these years.

5.6 RADIOACTIVE ISOTOPES PRESENT IN SOLID WASTE AT 325 BY WESTINGHOUSE HANFORD

The information on radioactive isotopes found in Table 5-17 and 5-18 was obtained from the SWITS database searches. Table 5-17 lists the isotopes found in 55-gal drums along with their half lives, quantity, and radioactive emission type. Table 5-18 contains this information for waste from 325 stored in containers other than 55-gal drums.

5.7 HAZARDOUS CONSTITUENTS OF SOLID WASTE GENERATED AT 325 BY WESTINGHOUSE HANFORD

This section provides a review of the data on the hazardous components known or suspected to be in the solid waste stream from Westinghouse Hanford at 325. Information was gathered from several sources, including: the SWITS database, SWBRs, personnel interviews, an internal report examining hazardous components of solid waste, *Inventory of Chemicals Used at Hanford Site Production Plants and Support Operations* (Klem 1990), and *Unstable and Reactive Chemicals in Transuranic Retrievable Waste at the Hanford Site* (Reddinger 1992).

5.7.1 Chemical Inventories

Tables 5-19 and 5-20 provide lists of chemicals used at the Westinghouse Hanford Company Development Laboratory from 1970 to 1976 and the 325 Building Analytical Laboratory from 1953 to 1976, respectively. These lists were developed by Klem (1990) to support waste characterization efforts for the single-shell tanks. Although most liquids from

the 325 Building did end up in the tanks, it may be possible to find small amounts of these chemicals in solid waste containers. These lists are based on chemical process flow sheets, essential materials consumption records, letters, reports, and other historical data.

The final two columns in both of the tables cited above contain information on the toxicity and hazards associated with each of the chemicals listed. The first of these columns lists the EPA toxicity category, which was determined using the *Registry of Toxic Effects of Chemical Substances Quarterly Issue* (NIOSH 1992) and the EPA *"Spill Table"* (EPA 1989). In cases where the two sources differed, the more recent source, the Registry of Toxic Effects, was used. Category X marks the most toxic chemicals, followed by Categories A, B, C, and D, listed in order of decreasing toxicity. The EPA *"Spill Table"* is incorporated by reference into the Washington State Administrative Code, Chapter 173-303, *Dangerous Waste Regulations*. The Registry of Toxic Effects is a quarterly update to the EPA *"Spill Table."* The final column lists the U.S. Department of Transportation (DOT) designation found in the DOT *Hazardous Materials Table* (49 CFR 172.101).

5.7.2 Solid Waste Information and Tracking System (SWITS)

The hazardous constituent field in the SWITS database was searched for all containers from Westinghouse Hanford Building 325 that contained radioactive mixed waste. The database search revealed no TRU containers from Westinghouse Hanford Building 325 with mixed waste.

5.7.3 Burial Records

The SWBR or SWSDR for a given container is the source of waste container information abstracted for the SWITS database. Often these records will have more detailed information on the hazardous components of a waste containers than is found in SWITS. Additional data can also be found on the supplementary forms often attached to the SWBR or SWSDR. These supplementary documents include Uniform Hazardous Waste Manifests, Contents Inventory Sheets, NRC 741 Forms, and Storage/Disposal Approval Records (SDARS).

A review of the Westinghouse Hanford 325 burial records for all TRU mixed waste containers was made. Table 5-21 contains a summary of the information obtained. Table 5-24 is a summary of the low-level mixed waste containers. The presence of asbestos-containing waste material was included in the summary tables despite the fact that it is not considered to be mixed waste. Lead shielding is also not considered to be waste at the current time.

5.7.4 Interviews with 325 Building Personnel

From the information gained in interviews with 325 Building personnel, a list of known or suspected components in the solid waste stream has been compiled. As much information as possible concerning the quantity, form, packaging, and relevant use of each of the

constituents was provided by the interviewees. It is important to note that the liquids below were typically disposed of in a nonliquid form, often absorbed by kitty litter, rags, cotton swabs, lab coats, or other absorbents.

Mercury (Hg)	Mercury was used in large quantities in the 325 laboratory. Mercury was used in diffusion pumps and up to 15 cm ³ was used as an electrode in coulometry cells. Although mercury was recycled whenever possible, both free and concreted mercury are expected to be found in the waste from 325. It is expected that the maximum amount of free mercury in a drum might exceed 15 cm ³ .
Boron Carbide	Boron carbide was used as a poison for the FFTF core.
Sodium Bisulfite	Sodium bisulfite was used by the pound at Building 325. It is believed most of this solution went to liquid waste; it is possible that there is some in the solid waste.
Zirconium (Zr)	There were small amounts of zirconium metal used in Building 325, so not much is expected to be in the waste from this facility. In the 1988 time frame there was some uranium-zirconium alloy work that was going on, but it was felt that most of the waste would have been liquid, and any waste of this type that was sent to solid waste would have been concreted first.
Asbestos	Asbestos sheet, approximately 5 ft by 3 ft, was used to line the gloveboxes because of the furnaces. In addition, asbestos was used in the gaskets. Since it was in the gloveboxes, any asbestos encountered may be corrosive due to absorbed acid. Not much of the asbestos disposed of at Building 325 was believed to be in friable form. If it was friable, it was wetted and sealed in 5 quart cans.
Nitric Acid	Nitric acid was used little in the processing of fuel. Most of the liquid waste was neutralized and mixed with Portland cement.
Potassium/Sodium Hydroxide	Potassium and sodium hydroxide was neutralized and concreted.
Propane Cylinders	One interviewee remembered three or four propane cylinders that were disposed of at Building 325. These cylinders were definitely empty and had their valves extracted prior to packaging.
Sodium Metal (Na)	All sodium waste was reacted prior to disposal.
Uranyl Nitrate	One respondent thought that there was a possibility of uranyl nitrate precipitate in the waste from Building 325, but added that it was usually grouted with cement.
Metal fines	No metal fines are expected to be in the drums from Building 325 according to facility personnel.

Aerosol cans	Unvented aerosol cans are potentially present in the drums from Building 325. Most commonly these cans would contain Windex ¹ or WD-40 ² .
Lead (Pb)	Lead shielding and bricks are expected.
Nitrated Rags	It is possible that rags and paper towels used to clean up nitric acid spills are present in the waste from Building 325. Facility personnel did not recall any effort being made to dry these items prior to disposal. After 1980, such items would have been neutralized and grouted prior to disposal.
Scintillation Liquids	Organic solvents commonly used in scintillation cocktails (toluene, xylene, etc.) were disposed of in scintillation vials. Vial contents were poured into absorbent, usually kitty litter, in a metal can. Conwed ³ fiber was used as an absorbent in the most recent years. The metal cans were usually one quart "ice cream" cans, which had a slip lid, although 5 quart and other size cans were sometimes used. When filled, the cans were placed in double lined bags. These bags, in turn, were packaged in 55-gal drums with more kitty litter. The amount of kitty litter was determined by assuming that the entire volume of the can was liquid. In the early 1980's an absorbent to liquid ration of 1:1 was required; later this ratio was changed to 2:1. Approximately five to eight cans were packed into each 55-gal drum.

¹Trademark of Drackett Company.

²Trademark of WD-40 Company.

³Trademark Conwed Plastics.

225, 6-91, WMC

Figure 5-1. 55-Gallon Drum Waste Count Generated by Westinghouse Hanford Building 325 Annually.

Figure 5-2. Percentage of Westinghouse Hanford Building 325 TRU/ Non-TRU 55-Gallon Drums.

2005-8-02 WHC

225, 5-03, WHC

Figure 5-3. Weight of 55-Gallon Drum Waste Generated by Westinghouse Hanford Building 325 Annually.

Legend

- Non-TRU 324/340
- TRU 324/340
- Non-TRU
- TRU

WHS, 6-04, WHIC

Figure 5-5. Volume of 55-Gallon Drum Waste Generated by Westinghouse Hanford Building 325 Annually.

55-Gallon Drums

Figure 5-6. Volume Percentage of Westinghouse Hanford Building 325 55-Gallon Drums.

Figure 5-7. Other Container Waste Count Generated by Westinghouse Hanford Building 325 Annually.

325 TRU/

Figure 5-8. Percentage of Westinghouse Hanford Building 325 TRU/Non-TRU Other Containers.

325, 1-08 WHC

Figure 5-9. Weight of Other Containers Generated by Westinghouse Hanford Building 325 Annually.

Figure 5-10. Weight Percentage of Other Containers Generated by Westinghouse Hanford Building 325 Annually.

288_5-10.WHC

Figure 5-11. Volume of Other Containers Generated by Westinghouse Hanford Building 325 Annually.

325, 5-12 WMC

Figure 5-12. Volume Percentage of Other Containers Generated by Westinghouse Hanford Building 325 Annually.

325, 5-13 WMC

Figure 5-13. Total Number of Waste Containers Generated by Westinghouse Hanford Building 325 Annually.

Figure 5-14. Total Weight of Waste Generated by Westinghouse Hanford Building 325 Annually.

325_5-14.WHC

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Figure 5-15. Total Volume of Waste Generated by Westinghouse Hanford Building 325 Annually.

325_5-16 WHC

Figure 5-16. Grams of TRU Waste Generated by Westinghouse Hanford Building 325 Annually.

Table 5-1. Transuranic Wastes Attributed to Westinghouse Hanford Building 325 but Originating at Other Facilities.

Year	Source	Container Number	Percent of Total	Weight (kg)	Weight Percent	Volume (m ³)	Volume Percent
1974	308	20 Drums	8%	1,360	8%	4.1	8%
	309	6 Others	26%	506	2 %	1.1	2%
	<i>Total</i>	<i>20 Drums 6 Others</i>	<i>8% 26%</i>	<i>1,360 —</i>	<i>8% —</i>	<i>4.1 1.1</i>	<i>8% 2%</i>
1975	No other sources listed						
1976	308	14 Drums	9%	779	7%	2.9	9%
	<i>Total</i>	<i>14 Drums</i>	<i>9%</i>	<i>779</i>	<i>7%</i>	<i>5.2</i>	<i>9%</i>
1977	308	20 Drums	14%	1,024	11%	4.2	14%
	<i>Total</i>	<i>20 Drums</i>	<i>14%</i>	<i>1,024</i>	<i>11%</i>	<i>4.2</i>	<i>14%</i>
1978	308	4 Drums 1 Other	1% 10%	202 1,998	5% 21%	0.8 4.6	1% 42%
	340	86 Drums 1 Other	28% 10%	22,378 5,996	52% 62%	17.8 5.2	28% 48%
	Babcock & Wilcox	62 Drums	20%	3427	8%	13.0	20%
	<i>Total</i>	<i>152 Drums 2 Other</i>	<i>49% 20%</i>	<i>26,007 7994</i>	<i>61% 83%</i>	<i>31.9 9.8</i>	<i>49% 90%</i>
1979	327	4 Drums	1%	1907	6%	0.8	1%
	Babcock & Wilcox	221 Drums	51%	14,261	49%	46.4	51%
	<i>Total</i>	<i>225 Drums</i>	<i>51%</i>	<i>16,528</i>	<i>56%</i>	<i>47.2</i>	<i>51%</i>
1980	Babcock & Wilcox	12 Drums	13%	627	10%	2.5	13%
	<i>Total</i>	<i>12 Drums</i>	<i>13%</i>	<i>627</i>	<i>10%</i>	<i>2.5</i>	<i>13%</i>

Table 5-2. Low-Level Wastes Attributed to Westinghouse Hanford Building 325 but Originating at Other Facilities.
(3 sheets)

Year	Source	Container Number	Percent of Total	Weight (kg)	Weight Percent	Volume (m ³)	Volume Percent
1971	327	54 Others	4%	1157	4%	7.3	4%
	<i>Total</i>	<i>54 Others</i>	<i>4%</i>	<i>1157</i>	<i>4%</i>	<i>7.3</i>	<i>4%</i>
1972	306	51 Others	4%	1792	3%	8.1	3%
	327	98 Others	8%	5333	9%	21.0	9%
	340	26 Others	2%	3534	6%	10.1	4%
	3706	40 Others	3%	508	1%	5.0	2%
	<i>Total</i>	<i>215 Others</i>	<i>17%</i>	<i>11167</i>	<i>18%</i>	<i>44.2</i>	<i>18%</i>
1973	306	9 Drums 1 Other	10% < 1%	846 2511	8% 4%	1.9 5.5	10% 2%
	308	24 Others	1%	3833	6%	10.0	3%
	340	13 Drums 4 Others	14% < 1%	4449 3836	40% 6%	7.3 2.7	37% 1%
	<i>Total</i>	<i>22 Drums 29 Others</i>	<i>24% 2%</i>	<i>5295 10180</i>	<i>47% 16%</i>	<i>9.2 18.2</i>	<i>46% 6%</i>
1974	306	41 Others	3%	2495	5%	8.0	3%
	308	50 Others	3%	636	1%	6.2	2%
	309	10 Others	1%	1240	3%	3.2	1%
	324	2 Others	< 1%	2237	5%	4.9	2%
	340	10 Drums 16 Others	15% 1%	2315 1545	15% 3%	2.1 4.7	7% 2%

Table 5-2. Low-Level Wastes Attributed to Westinghouse Hanford Building 325 but Originating at Other Facilities.
(3 sheets)

Year	Source	Container Number	Percent of Total	Weight (kg)	Weight Percent	Volume (m ³)	Volume Percent
1974 (cont)	3706	48 Others	3%	3966	8%	13.2	5%
	<i>Total</i>	<i>10 Drums</i> <i>167 Others</i>	<i>15%</i> <i>10%</i>	<i>2315</i> <i>12119</i>	<i>15%</i> <i>26%</i>	<i>2.1</i> <i>40.2</i>	<i>7%</i> <i>15%</i>
1975	324	37 Others	2%	470	<1%	4.7	1%
	327	11 Others	1%	2136	1%	4.7	1%
	340	1 Other	<1%	1889	1%	1.8	<1%
	3706	3 Others	<1%	13125	9%	28.9	5%
	3760	1 Other	<1%	4977	3%	11.0	2%
	<i>Total</i>	<i>53 Others</i>	<i>2%</i>	<i>22597</i>	<i>15%</i>	<i>51.1</i>	<i>9%</i>
1976	309	1 Other	<1%	2554	1%	2.1	<1%
	340	1 Drum 42 Others	1% 2%	94 852	<1% <1%	0.2 2.6	<1% <1%
	3706	1 Others	<1%	2314	1%	5.1	1%
	<i>Total</i>	<i>1 Drum</i> <i>45 Others</i>	<i>1%</i> <i>2%</i>	<i>94</i> <i>5720</i>	<i><1%</i> <i>3%</i>	<i>0.2</i> <i>9.8</i>	<i><1%</i> <i>2%</i>
1977	308	1 Other	<1%	2802	2%	6.3	1%
	North Bone Yard	1 Other	<1%	2059	2%	4.5	1%
	<i>Total</i>	<i>2 Others</i>	<i>4%</i>	<i>4861</i>	<i>4%</i>	<i>10.8</i>	<i>2%</i>
1978	306	2 Others	<1%	908	1%	5.6	1%
	324	3 Others	<1%	4881	3%	10.8	1%

Table 5-2. Low-Level Wastes Attributed to Westinghouse Hanford Building 325 but Originating at Other Facilities.
(3 sheets)

Year	Source	Container Number	Percent of Total	Weight (kg)	Weight Percent	Volume (m ³)	Volume Percent
1978 (cont)	3730	1 Drum 1 Other	1% <1%	227 454	1% <1%	0.2 0.4	1% <1%
	<i>Total</i>	<i>1 Drum 6 Others</i>	<i>1% <1%</i>	<i>227 6243</i>	<i>1% 4%</i>	<i>0.2 16.8</i>	<i>1% 2%</i>
1979	308	21 Others	1%	14982	10%	83.7	12%
	324	13 Others	<1%	7970	5%	59.1	8%
	327	8 Others	<1%	6538	5%	16.9	2%
	340	2 Others	<1%	14528	10%	15.1	2%
	<i>Total</i>	<i>44 Others</i>	<i>2%</i>	<i>44018</i>	<i>30%</i>	<i>174.8</i>	<i>24%</i>
1980	324	9 Others	3%	6211	36%	32.3	33%
	327	20 Drums 46 Others	27% 16%	3588 725	23% 4%	4.2 6.0	27% 6%
	<i>Total</i>	<i>20 Drums 55 Others</i>	<i>27% 8%</i>	<i>3588 6936</i>	<i>23% 40%</i>	<i>4.2 38.3</i>	<i>27% 39%</i>

Table 5-3. TRU Waste Generated at Building 325 Westinghouse Hanford by Container Type and Year. (4 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1970							
Metal Drums, Barrels, Kegs	30-gal	17	19.1	694	6.8	2.0	7.3
	55-gal	67	75.3	4,559	44.4	14.1	51.6
HEPA Filters	unknown	5	5.6	5,004	48.8	11.2	41.0
TOTALS		89		10,257		27.3	
1971							
Metal Drums, Barrels, Kegs	30-gal	1	0.4	41	0.3	0.1	0.2
	55-gal	238	99.2	16,194	97	50.0	97.8
Tanks, Portable	unknown	1	0.4	457	2.7	1.0	2.0
TOTALS		240		16,692		51.1	
1972							
Concrete Boxes	3x3x3	13	4.9	10,567	29.4	10.0	13.1
	4x4x4	3	1.1	4,300	11.9	5.4	7.1
Glove Boxes	unknown	2	0.8	3,048	8.5	6.8	8.9
Metal Boxes, Cartons, Cases	4x4x4	2	0.8	1,626	4.5	3.6	4.7
Metal Drums, Barrels, Kegs	55-gal	238	90.5	16,194	45.0	50.0	65.4
Miscellaneous Scrap	unknown	5	1.9	268	0.7	0.6	0.8
TOTALS		263		36,003		76.4	
1973							
Metal Drums, Barrels, Kegs	55-gal	217	100	14,765	100	45.6	100
TOTALS		217		14,765		45.6	
1974							
Glove Boxes	unknown	7	2.5	1,803	4.6	4.0	3.9
HEPA Filters	unknown	4	1.4	1,372	3.5	3.1	3.0
Metal Boxes, Cartons, Cases	5x5x5	1	0.4	1,588	4.0	3.5	3.4
	7x10x16	1	0.4	14,225	36.1	31.7	31.1
Metal Drums, Barrels, Kegs	55-gal	254	91.7	17,577	44.6	53.3	52.3
Self-Contained, Equipment	unknown	4	1.4	2,313	5.9	5.2	5.1

Table 5-3. TRU Waste Generated at Building 325 Westinghouse Hanford by Container Type and Year. (4 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Tanks, Portable	unknown	6	2.2	505	1.3	1.1	1.1
TOTALS		277		39,383		101.9	
1975							
Metal Boxes, Cartons, Cases	1,250 ft. ³	1	0.4	15,876	44.9	35.4	39.2
Metal Drums, Barrels, Kegs	55-gal	218	97.3	15,445	43.6	45.8	50.7
Wooden Boxes, Cartons, Cases	4x4x4	5	2.2	4,064	11.5	9.1	10.1
TOTALS		224		35,385		90.3	
1976							
Metal Boxes, Cartons, Cases	4x4x5	1	0.6	1,016	7.0	2.3	5.5
	4x5x9	1	0.6	2,286	15.8	5.1	12.2
Metal Drums, Barrels, Kegs	55-gal	162	98.2	11,022	76.2	34.0	81.3
	110-gal	1	0.6	136	0.9	0.4	1.0
TOTALS		165		14,460		41.8	
1977							
Concrete Boxes	3x3x3	1	0.7	796	4.9	0.8	1.8
Concrete Cylinders, Casks	7x12	1	0.7	5,869	36.3	13.1	30.3
Metal Drums, Barrels, Kegs	55-gal	140	98.6	9,521	58.8	29.4	67.9
TOTALS		142		16,186		43.3	
1978							
Concrete Boxes	3x3x3	9	2.8	7,691	14.7	6.3	8.4
Metal Drums, Barrels, Kegs	55-gal	307	96.9	42,781	81.5	64.5	85.6
Wooden Boxes, Cartons, Cases	3.17x5x10.3	1	0.3	1,996	3.8	4.6	6.1
TOTALS		317		52,468		75.4	
1979							
Metal Drums, Barrels, Kegs	55-gal	437	100	29,733	100	91.8	100
TOTALS		437		29,733		91.8	

Table 5-3. TRU Waste Generated at Building 325 Westinghouse Hanford by Container Type and Year. (4 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1980							
Metal Boxes, Cartons, Cases	4.2x6.2x15.6	1	1.1	2,495	28.7	11.5	37.6
Metal Drums, Barrels, Kegs	55-gal	91	98.9	6,192	71.3	19.1	62.4
TOTALS		92		8,687		30.6	
1981							
1982							
Metal Drums, Barrels, Kegs	** 55-gal	26	92.9	1,786	36.9	5.5	36.4
Metal Boxes, Cartons, Cases	** 12x6x7	2	7.1	3,049	63.1	9.6	63.6
TOTALS		28		4,835		15.1	
1983							
1984							
Metal Drums, Barrels, Kegs	** 55-gal	6	100	405	100	1.3	100
TOTALS		6		405		1.3	
1985							
Metal Boxes, Cartons, Cases	4x6x10	1	11.1	2,042	76.2	7.1	80.7
Metal Drums, Barrels, Kegs	** 55-gal	8	88.9	639	23.8	1.7	19.3
TOTALS		9		2,681		8.8	
1986							
1987							
Metal Drums, Barrels, Kegs	** 55-gal	5	100	186	100	1.1	100
TOTALS		5		186		1.1	
1988							
1989							

Table 5-3. TRU Waste Generated at Building 325 Westinghouse Hanford by Container Type and Year. (4 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1990							
1991							
1992							

*Unless otherwise noted, units of dimensions are in ft.
 **Solid Waste Burial Records for Building 325 WHC that were found with WHC Building 324 and 340 records.
 ***These containers hold mixed waste.

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1970							
Burlap, Cloth, Paper, or Plastic Bags	unknown	1	0.2	889	2.0	2.0	1.3
Concrete Boxes	2x3x6	2	0.3	3919	9.0	2.0	1.3
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	603	91.6	7658	17.5	76.8	48.7
HEPA Filter	unknown	10	1.5	1569	3.6	3.5	2.2
Metal Boxes, Cartons, Cases	4x5x6	6	0.9	4293	9.8	9.6	6.1
Metal Drums, Barrels, Kegs	55-gal	10	1.5	680	1.6	2.1	1.3
Miscellaneous Scrap	unknown	10	1.5	3295	7.6	14.1	8.9
Self-Contained, Equipment	unknown	2	0.3	1867	4.3	4.2	2.7
Trucks, Flatbeds, Compactor, Loadligger	unknown	3	0.5	610	1.4	1.4	0.9
Wooden Boxes, Cartons, Cases	4x4x7	3	0.5	4293	9.8	9.6	6.1
	4x4x9	2	0.3	3658	8.4	8.2	5.2
	4x5x7	5	0.8	8890	20.4	19.8	12.6
	4x5x8	1	0.2	2033	4.7	4.5	2.9
TOTALS		658		43654		157.8	
1971							
Burlap, Cloth, Paper, or Plastic Bags	unknown	6	0.5	44	0.2	1.5	0.8
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	34	2.8	185	0.7	2.1	1.2
	***unknown	18	1.5	229	0.8	2.3	1.3
	unknown	1128	91.1	14437	51.2	143.9	79.2
Glove Boxes	unknown	2	0.2	830	2.9	1.9	1.1
Metal Drums, Barrels, Kegs	*** 55-gal	3	0.2	204	0.7	0.6	0.3
	55-gal	32	2.6	2177	7.7	6.7	3.7
Miscellaneous Scrap	unknown	4	0.3	2559	9.1	5.7	3.1
Self-Contained Equipment	unknown	6	0.5	787	2.8	1.8	1.0

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Tanks, Portable	unknown	1	0.1	635	2.3	1.4	0.8
Trucks, Flatbeds, Compactor, Loadligger	unknown	4	0.3	6147	21.8	13.7	7.5
TOTALS		1238		28234		181.6	
1972							
Burlap, Cloth, Paper, or Plastic Bags	unknown	29	2.2	2286	3.5	7.1	2.8
Concrete Boxes	unknown	1	0.1	1887	2.9	1.8	0.7
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	3	0.2	22	0.1	0.1	0.1
	unknown	1174	89.0	16885	26.1	150.0	58.8
Metal Drums, Barrels, Kegs	55-gal	58	4.4	4156	6.4	12.3	4.8
Miscellaneous Scrap	*** unknown	10	0.8	2722	4.2	0.3	0.1
	unknown	17	1.3	216	0.3	1.9	0.7
Self-Contained Equipment	unknown	13	1.0	16480	25.4	36.7	14.4
Truck, Flatbeds, Compactor, Loadligger	unknown	13	1.0	18543	28.6	41.3	16.2
Wooden Boxes, Cartons, Cases	4x4x8	1	0.1	1626	2.5	3.6	1.4
TOTALS		1319		64803		255.1	
1973							
Dump Truck	unknown	1	0.1	1905	2.5	1.7	0.5
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	1549	91.9	19673	26.1	198.0	62.9
Glove Boxes	unknown	1	0.1	787	1.0	1.8	0.6
HEPA Filters	unknown	1	0.1	127	0.2	0.3	0.1
Metal Drums, Barrels, Kegs	30-gal	4	0.2	177	0.2	0.5	0.2
	55-gal	93	5.5	11189	14.9	19.8	6.3
Miscellaneous Scrap	unknown	18	1.1	14918	19.8	33.3	10.6
Self-Contained Equipment	unknown	4	0.2	610	0.8	1.5	0.5
Tanks, Portable	unknown	1	0.1	2159	2.9	4.9	1.6

**Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)**

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Trucks, Flatbeds, Compactor, Loadligger	unknown	14	0.8	23794	31.6	53.0	16.8
TOTALS		1686		75339		314.8	
1974							
Burlap, Cloth, Paper, or Plastic Bags	unknown	3	0.2	425	0.8	1.0	0.4
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	1566	92.0	19902	35.9	199.7	72.4
Glove Boxes	unknown	2	0.1	1054	1.9	2.3	0.8
Metal Drums, Barrels, Kegs	30-gal	23	1.3	939	1.7	2.8	1.0
	55-gal	67	3.9	8378	15.1	14.2	5.1
Miscellaneous Scrap	unknown	20	1.2	5720	10.3	13.4	4.9
Self-Contained Equipment	unknown	1	0.1	749	1.3	1.7	0.6
Trucks, Flatbeds, Compactor, Loadligger	unknown	20	1.2	18346	33.1	40.9	14.8
TOTALS		1702		55513		276.0	
1975							
Burlap, Cloth, Paper, or Plastic Bags	unknown	36	1.6	5760	3.4	13.4	2.3
Concrete Boxes	3x3x3	7	0.3	5575	3.3	5.3	0.9
	4x4x4	1	< 0.1	1887	1.1	1.8	0.3
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	6	0.3	41	< 0.1	0.8	0.1
	unknown	1967	86.0	24982	14.7	250.7	43.4
Fiberboard/Plastic Drums, Barrels, Kegs	unknown	1	< 0.1	572	0.3	1.3	0.2
Glove Boxes	unknown	1	< 0.1	12347	7.3	27.5	4.8
HEPA Filters	unknown	37	1.6	2159	1.3	6.9	1.2
Metal Cylinder, Casks	unknown	12	0.5	7876	4.6	17.6	3.0
Metal Drums, Barrels, Kegs	55-gal	143	6.3	15935	9.4	30.4	5.3
Miscellaneous Scrap	unknown	37	1.6	10422	6.1	23.1	4.0
Self-Contained Equipment	unknown	6	0.3	5332	3.1	13.1	2.3
Tanks, Portable	unknown	7	0.3	2185	1.3	4.9	0.9

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Trucks, Flatbeds, Compactor, Loadligger	unknown	8	0.3	24181	14.3	53.9	9.3
Wooden Boxes, Cartons, Cases	2x2x7	1	< 0.1	6400	3.8	14.3	2.5
	2x4x4	1	< 0.1	181	0.1	0.9	0.2
	3.3x3.3x3.3	1	< 0.1	470	0.3	1.1	0.2
	4x4x5	1	< 0.1	1016	0.6	2.3	0.4
	4x4x8	9	0.4	14631	8.6	32.6	5.6
	4x4x12	1	< 0.1	181	0.1	5.4	0.9
	4x8x10	1	< 0.1	4064	2.4	9.1	1.6
	4.5x5.6x24	1	< 0.1	7657	4.5	17.1	3.0
	4.5x5.6x8.7	1	< 0.1	2792	1.7	6.2	1.1
	5x11x12	1	< 0.1	4082	2.4	18.7	3.2
	5x5x28	1	< 0.1	8890	5.2	19.8	3.4
TOTALS		2288		169618		578.2	
1976							
Burlap, Cloth, Paper or Plastic Bags	unknown	13	0.5	768	0.4	1.7	0.3
Concrete Boxes	3x3x3	8	0.3	6368	3.1	6.1	1.0
	unknown	1	< 0.1	737	0.4	0.7	0.1
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	2274	85.1	28583	14.0	287.0	47.7
HEPA Filters	unknown	90	3.4	8479	4.2	17.8	3.0
Metal Boxes, Cartons, Cases	2x3x4	1	< 0.1	305	0.1	0.7	0.1
	3x3x4	2	0.1	914	0.5	2.0	0.3
	4x4x6	1	< 0.1	1219	0.6	2.7	0.5
	4x5x6	2	0.1	127	0.1	0.3	0.1
Metal Drums, Barrels, Kegs	110-gal	8	0.3	1502	0.7	3.4	0.6
	30-gal	1	< 0.1	41	< 0.01	0.1	< 0.1
	***55-gal	25	0.9	9072	4.5	5.3	0.9
	55-gal	134	5.0	13035	6.4	28.5	4.7

**Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)**

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Miscellaneous Scrap	unknown	33	1.2	20327	10.0	45.3	7.5
Self-Contained Equipment	unknown	41	1.5	2889	1.4	6.4	1.1
Tanks Portable	unknown	3	0.1	20297	10.0	45.3	7.5
Trucks, Flatbeds, Compactor, Loadlifter	unknown	18	0.7	50659	24.9	86.9	14.5
Wooden Boxes, Cartons, Cases	2x3x4	1	< 0.1	305	0.1	0.7	0.1
	3x3x3	1	< 0.1	343	0.2	0.8	0.1
	3x3x4	1	< 0.1	457	0.2	1.0	0.2
	4x4x6	1	< 0.1	12193	6.0	2.7	0.5
	4x4x8	12	0.5	19506	9.6	43.5	7.2
	4x6x10	1	< 0.1	3048	1.5	6.8	1.1
	4x6x8	1	< 0.1	2439	1.2	5.4	0.9
TOTALS		2673		203613		601.1	
1977							
Burlap, Cloth, Paper or Plastic Bags	unknown	13	0.5	3925	2.8	9.0	1.5
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	35	1.4	456	0.3	4.4	0.7
	*** unknown	55	2.2	699	0.5	7.0	1.2
	unknown	2031	80.1	235	0.2	260.5	44.5
Fiberboard/Plastic Drums, Barrels, Kegs	unknown	1	< 0.1	38	< 0.1	0.1	< 0.1
HEPA Filters	unknown	69	2.7	1170	0.8	9.4	1.6
Metal Boxes, Cartons, Cases	108 ft. ³	1	< 0.1	1372	1.0	3.1	0.5
	2x2x3	9	0.4	1300	0.9	2.9	0.5
	4x5x9	16	0.6	2784	2.0	6.2	1.1
	unknown	2	0.1	188	0.1	0.4	0.1
Metal Cylinder, Casks	*** unknown	2	0.1	1219	0.9	2.7	0.5
	unknown	2	0.1	91	0.1	0.2	< 0.1
Metal Drums, Barrels, Kegs	110-gal	2	0.1	272	0.2	0.9	0.1
	30-gal	9	0.4	349	0.3	2.0	0.3

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
	5-gal	2	0.1	48	< 0.1	0.1	< 0.1
	*** 55-gal	7	0.3	826	0.6	1.5	0.3
	55-gal	110	4.3	18782	13.3	23.4	4.0
Miscellaneous Scrap	unknown	57	2.3	6909	4.9	24.9	4.3
Self-Contained Equipment	*** unknown	12	0.5	5183	3.7	11.5	2.0
	unknown	18	0.7	6230	4.4	13.9	2.4
Tanks, Portable	*** unknown	1	< 0.1	800	0.6	1.8	0.3
	unknown	1	< 0.1	9525	6.7	21.2	3.6
Trucks, Flatbeds, Compactor, Loadligger	unknown	23	0.9	23305	16.5	53.7	9.2
Wooden Boxes, Cartons, Cases	0.7x0.7x6	1	< 0.1	68	0.1	0.2	< 0.1
	2x2x2	1	< 0.1	227	0.2	0.2	< 0.1
	2x2x3	5	0.2	699	0.5	1.6	0.3
	2x2x6	1	< 0.1	203	0.1	0.5	0.1
	2x4x4	1	< 0.1	406	0.3	0.9	0.1
	*** 3x3x3	2	0.1	394	0.3	0.9	0.1
	3x3x3	9	0.4	2172	1.5	4.8	0.8
	3x3x4	1	< 0.1	457	0.3	1.0	0.2
	*** 4x4x4	2	0.1	1603	1.1	3.6	0.6
	4x4x4	6	0.2	4876	3.5	10.9	1.9
	*** 4x4x6	2	0.1	2439	1.7	5.4	0.9
	*** 4x4x8	8	0.3	13004	9.2	29.0	4.9
	4x4x8	17	0.7	27010	19.1	61.6	10.5
	*** 4x6x6	1	< 0.1	1829	1.3	4.1	0.7
TOTALS		2535		141093		585.5	
1978							
Burlap, Cloth, Paper or Plastic Bags	unknown	7	0.2	290	0.2	0.9	0.1
Concrete Boxes	3x3x3	3	0.1	2241	1.3	2.2	0.3
Concrete Cylinders, Casks	7x12	2	0.1	1746	1.0	9.9	1.1

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	2919	85.2	40888	24.1	372.5	42.5
HEPA Filters	unknown	182	5.3	7024	4.1	22.5	2.6
Metal Boxes, Cartons, Cases	5x5x7	1	< 0.1	770	0.5	4.8	0.5
Metal Drums, Barrels, Kegs	110-gal	1	< 0.1	454	0.3	0.4	0.1
	30-gal	3	0.1	190	0.1	0.4	0.1
	5-gal	3	0.1	68	< 0.1	0.2	< 0.1
	1-gal	2	0.1	27	< 0.1	0.01	< 0.1
	*** 55-gal	6	0.2	1520	0.9	1.3	0.1
	55-gal	159	4.6	20450	12.1	33.8	3.9
Miscellaneous Scrap	unknown	52	1.5	14776	8.7	70.1	8.0
Self-Contained Equipment	unknown	17	0.5	4584	2.7	62.2	7.1
Trucks, Flatbeds, Compactor, Loadlifter	unknown	16	0.5	28683	16.9	121.6	13.9
Wooden Boxes, Cartons, Cases	1.7x1.8x4.9	1	< 0.1	159	0.1	0.4	0.1
	2x2x4	1	< 0.1	159	0.1	0.5	0.1
	3x4x5	1	< 0.1	762	0.5	1.7	0.2
	3x4x8	1	< 0.1	218	0.1	2.7	0.3
	3x5x5	2	0.1	748	0.4	4.3	0.5
	4x4x4	1	< 0.1	813	0.5	1.8	0.2
	4x4x8	25	0.7	35490	20.9	97.9	11.2
	4x6x6	1	< 0.1	653	0.4	4.1	0.5
	4x8x14	1	< 0.1	1016	0.6	12.7	1.5
	5x5x8	1	< 0.1	2540	1.5	5.7	0.7
	6x8x12	1	< 0.1	1306	0.8	16.3	1.9
	8x8x12	1	< 0.1	1588	0.9	21.8	2.5
	unknown	17	0.5	371	0.2	3.4	0.4
TOTALS		3427		169534		876.1	

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1979							
Burlap, Cloth, Paper or Plastic Bags	unknown	12	0.4	161	0.1	0.4	0.1
Concrete Boxes	3x3x3	7	0.2	7439	4.7	4.7	0.6
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	20	0.7	95	0.1	1.0	0.1
	*** unknown	14	0.5	178	0.1	1.8	0.2
	unknown	2397	82.3	30634	19.3	305.5	41.2
Fiberboard/Plastic Drums, Barrels, Kegs	unknown	1	< 0.1	41	< 0.1	0.2	< 0.1
Glove Boxes	unknown	1	< 0.1	186	0.1	0.9	0.1
HEPA Filters	*** unknown	10	0.3	752	0.5	1.4	0.2
	unknown	219	7.5	6188	3.9	26.4	3.6
Metal Boxes, Cartons, Cases	6x8x12	1	< 0.1	2041	1.3	16.3	2.2
Metal Drums, Barrels, Kegs	30-gal	2	0.1	77	0.1	0.3	< 0.1
	55-gal	113	3.9	13628	8.6	24.0	3.2
	5-gal	2	0.1	45	< 0.1	0.1	< 0.1
Miscellaneous Scrap	unknown	31	1.1	9032	5.7	22.2	3.0
Self-Contained Equipment	unknown	19	0.7	1879	1.2	3.9	0.5
Tanks, Portable	unknown	2	0.1	16	< 0.1	0.1	< 0.1
Trucks, Flatbeds, Compactor, Loadlifter	unknown	29	1.0	45369	28.6	181.7	24.5
Wooden Boxes, Cartons, Cases	2x2x8	1	< 0.1	406	0.3	0.9	0.1
	3x4x4	1	< 0.1	622	0.4	1.4	0.2
	3x4x8	1	< 0.1	363	0.2	2.7	0.4
	4x4x12	1	< 0.1	1045	0.7	5.4	0.7
	4x4x8	24	0.8	29374	18.5	87.0	11.7
	4x5x7	1	< 0.1	544	0.3	4.0	0.5
	6x8x14	2	0.1	6243	3.9	38.1	5.1
	6x8x8	1	< 0.1	2090	1.3	10.8	1.5
TOTALS		2912		158448		741.3	

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1980							
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	211	54.5	5459	11.4	40.9	30.6
HEPA Filters	unknown	54	14.0	918	1.9	7.1	5.3
Metal Boxes, Cartons, Cases	unknown	1	0.3	152	0.3	0.3	0.2
Metal Drums, Barrels, Kags	55-gal	74	19.1	15562	32.4	15.7	11.7
	** 55-gal	31	8.0	2108	4.4	6.5	4.9
Self-Contained Equipment	unknown	1	0.3	544	1.1	1.6	1.2
Wooden Boxes, Cartons, Cases	4x4x8	13	3.4	10197	21.2	47.1	25.2
	** 16x4x4	2	0.5	13119	27.3	14.6	10.9
TOTALS		387		48059		133.8	
1981							
Dump Truck	unknown	1	8.3	2204	22.2	1.5	3.8
Wooden Boxes, Cartons, Cases	** 4x4x8	3	25.0	1363	13.7	10.9	27.5
	4x4x8	6	50.0	5443	54.9	21.7	54.7
	** 5.5x6x3	2	16.7	908	9.2	5.6	14.1
TOTALS		12		9918		39.7	
1982							
1983							
Wooden Boxes, Cartons, Cases	** 8x4x4	11	78.6	13301	83.0	42.1	97.7
HEPA Concrete Boxes	** 2x2x3	3	21.4	2729	17.0	1.0	2.3
		14		16030		43.1	
1984							
1985							

Table 5-4. Non-TRU Waste Generated at Building 325 Westinghouse Hanford
by Container Type and Year. (10 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1986							
1987							
1988							
Metal Drums, Barrels, Kegs	*** 55-gal	2	40	767	42.1	0.8	15.7
	*** 55-gal	1	20	150	8.2	0.2	3.9
Wooden Boxes, Cartons, Cases	4x4x8	2	40	907	49.7	4.1	80.4
TOTALS		5		1824		5.1	
1989							
1990							
Metal Drums, Barrels, Kegs	*** 55-gal	3	100	240	100	0.6	100
TOTALS		3		240		0.6	
1991							
1992							

*Unless otherwise noted, units of dimensions are in ft.

**Solid Waste Burial Records for Building 325 WHC that were found with WHC Building 324 and 340 records.

***These containers hold mixed waste.

Table 5-5. Building 325 Westinghouse Hanford Waste Summary Data for 55-Gallon Drums.

55-Gallon	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
TRU Count	67	238	238	217	254	218	162	140	307	437	91	0	26*	0	6*	8*	0	5*	0	0	0	0	0
TRU Wt. (kg)	4559	16194	16194	14765	17577	15445	11022	9521	42781	29733	6192	0	1786	0	405*	639*	0	186*	0	0	0	0	0
TRU Vol. (m³)	14.1	50.0	50.0	45.6	53.3	45.8	34.0	29.4	64.5	91.8	19.1	0	5.5*	0	1.3*	1.7*	0	1.1*	0	0	0	0	0
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Count	10	35	58	93	67	143	159	117	165	113	31*/ 74	0	0	0	0	0	0	0	1	0	3	0	0
Non-TRU Wt. (kg)	680	2381	4156	11189	8378	15935	22107	19608	21970	13628	2108*/ 15562	0	0	0	0	0	0	0	150	0	240	0	0
Non-TRU Vol. (m³)	2.1	7.3	12.3	19.8	14.2	30.4	73.8	24.9	35.1	24.0	6.5*/ 15.7	0	0	0	0	0	0	0	0.2	0	0.6	0	0
Non-TRU MW Count	0	3	0	0	0	0	25	7	6	0	0	0	0	0	0	0	0	0	1	0	3	0	0
Percentage																							
%TRU Count	87%	87%	80%	70%	79%	60%	50%	54%	65%	79%	46%		100%		100%	100%		100%	0%		0%		
%Non-TRU Count	13%	13%	20%	30%	21%	40%	50%	46%	35%	21%	16%*/ 38%		0%		0%	0%		0%	100%		100%		
Wt% TRU	87%	87%	80%	57%	68%	49%	33%	33%	66%	68%	26%		100%		100%	100%		100%	0%		0%		
Wt% Non-TRU	13%	13%	20%	43%	32%	51%	67%	67%	34%	31%	9%*/ 65%		0%		0%	0%		0%	100%		100%		
Vol% TRU	87%	87%	80%	70%	79%	60%	32%	54%	65%	79%	46%		100%		100%	100%		100%	0%		0%		
Vol% Non-TRU	13%	13%	20%	30%	21%	40%	68%	46%	35%	21%	16%*/ 38%		0%		0%	0%		0%	100%		100%		
%MW Non-TRU by Count		9%					16%	6%	4%										100%		100%		

*Solid Waste Burial Records that were found under WHC Building 324 and 340 records.

Table 5-6. Building 325 Westinghouse Hanford Waste Summary Data for Containers Other Than 55-Gallon Drums.

Other Containers	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
TRU Count	22	2	25	0	23	6	3	2	10	0	1	0	2*	0	0	1	0	0	0	0	0	0	0
TRU Wt. (kg)	5688	498	19809	0	21806	19940	3438	6665	9687	0	2495	0	3049*	0	0	2042	0	0	0	0	0	0	0
TRU Vol. (m ³)	13.2	1.1	26.4	0	48.6	44.5	7.8	13.9	10.9	0	11.5	0	9.6*	0	0	7.1	0	0	0	0	0	0	0
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Count	648	1203	1261	1593	1635	2145	2514	2418	3262	2799	2*/ 280	5*/ 7	0	14*	0	0	0	0	4	0	0	0	0
Non-TRU Wt. (kg)	42974	25853	80647	64150	47135	153683	181506	121485	147564	144820	13119*/ 17270	2272*/ 7647	0	18030	0	0	0	0	1674	0	0	0	0
Non-TRU Vol. (m ³)	155.7	174.3	242.8	295.0	261.8	547.8	567.3	560.6	841.0	717.3	14.6*/ 97.0	16.5*/ 23.2	0	43.1*	0	0	0	0	4.9	0	0	0	0
Non-TRU MW Count	0	18	10	0	0	0	0	85	0	24	0	0	0	0	0	0	0	0	2	0	0	0	0
Percentage																							
%TRU Count	3%	< 1%	2%	0%	1%	< 1%	< 1%	< 1%	< 1%	0%	< 1%	0	100%*	0%*		100%			0%				
%Non-TRU Count	97%	100%	98%	100%	99%	100%	100%	100%	100%	100%	< 1%*/ 100%	42%*/ 58%	0%*	100%*		0%			100%				
Wt% TRU	12%	2%	25%	0%	32%	11%	2%	5%	6%	0%	7%	0%	100%*	0%*		100%			0%				
Wt% Non-TRU	88%	98%	75%	100%	68%	89%	98%	95%	94%	100%	40%*/ 53%	23%*/ 77%	0%	100%*		0%			100%				
Vol% TRU	8%	1%	10%	0%	16%	8%	1%	2%	1%	0%	9%	0%	100%*	0%*		100%			0%				
Vol% Non-TRU	92%	99%	90%	100%	84%	92%	99%	98%	99%	100%	12%*/ 79%	42%*/ 58%	0%*	100%*		0%			100%				
%MW Non-TRU		1%	1%					4%		1%												50%	

*Solid Waste Burial Records that were found under WHC Building 324 and 340 records.

Table 5-7. Building 325 Westinghouse Hanford TRU Waste in 55-Gallon Drums: Drum Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-3A	67	76							94														
218-W-4B		162	238	217	254	218	162	140															
218-W-4C									213	437	91		26*		6*	8*		5*					

*Solid Waste Burial Records that were found under WHC Building 324 and 340 records.

Table 5-8. Building 325 Westinghouse Hanford TRU Waste in Containers Other Than 55-Gallon Drums: Container Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-3A	22	2			2	6			7														
218-W-4B			25		21		3	2	3														
218-W-4C											1		2*			1							

*Solid Waste Burial Records that were found under WHC Building 324 and 340 records.

Table 5-9. Distribution and Percentage for Building 325 Westinghouse Hanford of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-3A.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other	67	76							1														
Percentage																							
Misc/Unknown/Other	100%	100%							1%														

Table 5-10. Distribution and Percentage for Building 325 Westinghouse Hanford of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-4B.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other	162	173	2			1	1	1	3														
Percentage																							
Misc/Unknown/Other	100%	73%	0.9%			0.5%	0.6%	2%															

Table 5-11. Distribution and Percentage for Building 325 Westinghouse Hanford of TRU 55-Gallon Drums Physical Contents by Storage Location - 218-W-4C. (2 sheets)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Absorbent/Kitty Litter/Vermiculite									29	11				3*	1*								
Ceramic																		1*					
Cloth/Rags, Nylon								1	88	23		17*											
Concrete									52	27		26*		1*	5*		4*						
Cotton/Kotex										53		26*											
Filters									83														
Glass									23	27		26*		1*	3*		1*						
Graphite																1*							
Metal/Iron/Galvanized/Sheet									29	91		26*		1*	8*		4*						
Miscellaneous/Unknown/Other								5	18														
Paint Cans															2*								
Paper/Cardboard								1	95	80		26*		2*	3*		2*						
Plastic/Polyurethane								1	94	80		26*		6*	8*		5*						
Rubber								1	7					1*									
Sample Cans														1*									
Stainless Steel															2*								
Wood/Lumber/Plywood									65	16		17*											
Percentage																							
Absorbent/Kitty Litter/Vermiculite									7%	12%				50%	13%								
Ceramic																	20%						

Table 5-11. Distribution and Percentage for Building 325 Westinghouse Hanford of TRU 55-Gallon Drums Physical Contents by Storage Location - 218-W-4C. (2 sheets)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Cloth/Rags, Nylon							0.3%	20%	25%				65%*										
Concrete								12%	30%				100%		17%	63%		80%					
Cotton/Kotex									58%				100%										
Filters								19%															
Glass								5%	30%				100%		17%	38%		20%					
Graphite																13%							
Metal/Iron/Galvanized/ Sheet								7%	100%				100%		17%	100%		80%					
Miscellaneous/Unknown/ Other							2%	4%															
Paint Cans															33%								
Paper/Cardboard							0.3%	22%	88%				100%		33%	38%		40%					
Plastic/Polyurethane							0.3%	22%	88%				100%		100%	100%		100%					
Rubber							0.3%	2%							17%								
Sample Cans															17%								
Stainless Steel															33%								
Wood/Lumber/Plywood								15%	18%				65%*										

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Table 5-12. Distribution and Percentage for Building 325 Westinghouse Hanford of TRU Containers Other Than 55-Gallon Drums Physical Contents by Storage Location - 218-W-3A.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other	22	2				5																	
Percentage																							
Misc/Unknown/Other	100%	100%				83%																	

Table 5-13. Distribution and Percentage for Building 325 Westinghouse Hanford of TRU Containers Other Than 55-Gallon Drums Physical Contents by Storage Location - 218-W-4B.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other			25		10			1															
Percentage																							
Misc/Unknown/Other			100%		43%			50%															

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Table 5-14. Distribution and Percentage for Building 325 Westinghouse Hanford of TRU Containers Other Than 55-Gallon Drums
Physical Contents by Storage Location - 218-W-4C.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Cloth/Rags/Nylon													2*										
Concrete													2*										
Cotton/Kotex													2*										
Glass											1		2*										
Metal/Iron/Galvanized/Sheet											1		2*			1							
Paper/Cardboard													2*										
Plastic/Polyurethane											1		2*										
Plexiglass											1												
Wood/Lumber/Plywood											1		2*										
Percentage																							
Cloth/Rags/Nylon													100%*										
Concrete													100%*										
Cotton/Kotex													100%*										
Glass											100 %		100%*										
Metal/Iron/Galvanized/Sheet											100 %		100%*			100%							
Paper/Cardboard													100%*										
Plastic/Polyurethane											100 %		100%*										
Plexiglass											100 %												
Wood/Lumber/Plywood											100 %		100%*										

Table 5-15. Building 325 Westinghouse Hanford TRU Waste in 55-Gallon Drums: Total Grams TRU by Storage Location.

55-Gallon Drums	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
218-W-3A	20.0	20.0							87.0														
218-W-4B		183.2	427.4	396.4	1167.3	1786.1	599.0	835.2															
218-W-4C									2493.2	4901.2	1179.5		106.8*	223.7*	212.5*			152.2*					
TOTALS	20.0	203.2	427.4	396.4	1167.3	1786.1	599.0	835.2	2586.2	4901.2	1179.5		106.8*	223.7*	212.5*			152.2*					

Table 5-16. Building 325 Westinghouse Hanford TRU Waste in Containers Other than 55-Gallon Drums: Total Grams by Storage Location.

Other Containers	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
218-W-3A	0.02				0.2	1.5			7.0														
218-W-4B			4.0		1.0		2.1	0.1	1.0														
218-W-4C																							
TOTALS	0.02		4.0		1.2	1.5	2.1	0.1	8.0														

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Table 5-17. Isotopes in 55-Gallon Drums for Westinghouse Hanford Building 325 (1970-1992).

Isotope	Half Life	Quantity (g)	Radiation
²⁴¹ Am	433Y	0.6	α, γ
²⁴⁵ Cm	8.5×10^3 Y	2.0	α, γ
²³⁷ Np	2.14×10^6 Y	20.7	α, γ
²³⁸ Pu	87.74Y	1.3	α, γ
²³² Th	1.41×10^{10} Y	33973	α, γ
²³³ U	1.592×10^5 Y	12.0	α, γ
Pu total	*	14059.09	*
U depleted	*	225019.14	*
U enriched	*	19009.19	*
U natural	*	561016.18	*

Y = Year

* = Varies according to isotope.

Table 5-18. Isotopes in Other Containers for Westinghouse Hanford Building 325 (1970-1992).

Isotope	Half Life	Quantity (g)	Radiation
Pu total	*	16.96g	*
U enriched	*	35.00g	*
U natural	*	32.00g	*

Table 5-19. Building 325: Chemicals Used at Westinghouse Hanford Company Development Laboratory (1970-1976). (3 sheets)

Compound Name	Formula	EPA Category	DOT Classification
Acetic Acid	$\text{CH}_3\text{CO}_2\text{H}$	D	corrosive
Acetone	$\text{CH}_3\text{C}_2\text{OH}_3$	D	flammable liquid
Aluminum	Al	D	flammable solid
Ammonia (Anhydrous)	NH_3	B	
Ammonium Oxalate	$(\text{NH}_4)_2\text{C}_2\text{O}_4 \cdot \text{H}_2\text{O}$		ORM-A ¹
Barium Nitrate	$\text{Ba}(\text{NO}_3)_2$	C	oxidizer
Beryllium	Be	X (1 # Dust)	Poison B
Boric Acid	H_3BO_3	B	
Calcium Carbonate	CaCO_3		
Calcium Chloride	CaCl_2	D	
Calcium Nitrate	$\text{Ca}(\text{NO}_3)_2$		oxidizer
Ceric Nitrate	$\text{Ce}(\text{NO}_3)_4$		
Cerous Nitrate	$\text{Ce}(\text{NO}_3)_3$	D	
Cesium	Cs		
Chromic Acid	H_2CrO_4	C	
Citric Acid	$\text{C}_3\text{H}_4\text{OH}(\text{COOH})_3$		
Diatomaceous Earth	SiO_2		
Ethanol	$\text{CH}_3\text{CH}_2\text{OH}$		combustible flammable liquid
Ferric Ammonium Sulfate	$\text{Fe}_3\text{NH}_4(\text{SO}_4)_2$		
Ferric Nitrate	$\text{Fe}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$	C	oxidizer
Ferric Sulfate	$\text{Fe}_2(\text{SO}_4)_3$		
Hydrazine	$\text{H}_2\text{NNH}_2 \cdot \text{H}_2\text{O}$	B	flammable liquid, poison/corrosive
Hydrochloric Acid	HCl	D	nonflammable gas, corrosive
Iodine	I_2		
Iron	Fe		
Isopropyl Alcohol	$\text{C}_3\text{H}_7\text{OH}$		Flammable liquid
Lanthanum-Neodymium Nitrate	$\text{La}(\text{NO}_3)_3 \cdot (\text{Nd})(\text{NO}_3)_3$		
Lead Nitrate	$\text{Pb}(\text{NO}_3)_2$		oxidizer
Magnesium Nitrate	$\text{Mg}(\text{NO}_3)_2$		
Mercuric Nitrate	$\text{Hg}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}$	A	oxidizer/poison
Methanol	CH_3OH	D	flammable liquid
Mineral Oil	Light Hydrocarbons		

Table B-19. Building 325: Chemicals Used at Westinghouse Hanford Company
Development Laboratory (1970-1976). (3 sheets)

Compound Name	Formula	EPA Category	DOT Classification
Molybdenum	Mo		
Nitric Acid	HNO ₃	C	oxidizer, corrosive
Nitrous Acid	HNO ₂		
Normal Paraffin Hydrocarbon	C ₁₀ H ₂₂ to C ₁₄ H ₃₀		
Phosphoric Acid	H ₃ PO ₄	D	corrosive
Phosphorous Pentoxide	P ₂ O ₅		corrosive
Portland Cement	Calcium Compounds		
Potassium Bicarbonate	KHCO ₃		
Potassium Carbonate	K ₂ CO ₃	D	
Potassium Dichromate	K ₂ Cr ₂ O ₇	ORM-A ¹	
Potassium Permanganate	KMnO ₄	D	oxidizer
Silver Nitrate	AgNO ₃	X	oxidizer
Sodium Bicarbonate	NaHCO ₃		
Sodium Bisulfate	NaHSO ₄ ·H ₂ O	ORM-B ²	
Sodium Carbonate	Na ₂ CO ₃	D	
Sodium Dichromate	Na ₂ Cr ₂ O ₇ ·H ₂ O		
Sodium Hydroxide	NaOH	C	corrosive
Sodium Hypochlorite	NaOCl	B	
Sodium Iodide	NaI		
Sodium Nitrate	NaNO ₃	D	oxidizer
Sodium Nitrite	NaNO ₂	C	oxidizer
Sodium Oxalate	Na ₂ C ₂ O ₄		
Sodium Phosphate	Na ₃ PO ₄		
Sodium Silicate	Na ₂ O·SiO ₂	D	
Sodium Sulfate	Na ₂ SO ₄		
Stainless Steel	FeNiCr		
Strontium Nitrate	Sr(NO ₃) ₂		
Sugar	C ₁₂ H ₂₂ O ₁₁		
Sulfuric Acid	H ₂ SO ₄	C	corrosive
Tetrasodium Ethylene Diamine-Tetraacetate (EDTA)	N ₂ C ₂ H ₄ (C ₂ H ₂ O ₂ Na) ₄		
Tide (Detergent) ³	Na ₃ PO ₄ , Na ₂ CO ₃ , Na Silicate		

Table 5-19. Building 325: Chemicals Used at Westinghouse Hanford Company Development Laboratory (1970-1976). (3 sheets)

Compound Name	Formula	EPA Category	DOT Classification
Tributyl Phosphate	$(C_4H_9)_3PO_4$	D	
Turco 4502 D ⁴	KOH, K_2CrO_4 , $KMnO_4$		
Turco 4518 ⁴	$HO_2CCO_{22}H+2H_2O$, Sodium Dodecyl Benene Sulfonate		
Urea	$CO(NH_2)_2$		
Vanadium	V		
Zinc Nitrate	$Zn(NO_3)_2$		
Zirconium	Zr		

¹Other regulated material with an anesthetic, irritating, noxious, toxic or other properties than can cause discomfort to persons in the event of leakage.

²Other regulated material capable of causing significant damage from leakage.

³Tradename - Proctor and Gamble.

⁴Tradename - Turco Products, Inc.

Table 5-20. Building 325: Chemicals Used at Analytical Laboratory (1953-1976).
(2 sheets)

Compound Name	Formula	EPA Category	DOT Classification
Acetone	$\text{CH}_3\text{C}_2\text{OH}_3$	D	flammable liquid
Aluminum Nitrate Nonahydrate	$\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$	D	oxidizer
Ammonia (Anhydrous)	NH_3	B	
Ammonium Hydroxide	NH_4OH	C	corrosive, ORM-A ¹
Ammonium Oxalate	$(\text{NH}_4)_2\text{C}_2\text{O}_4 \cdot \text{H}_2\text{O}$		ORM-A ¹
Bromocresol Purple	$\text{C}_7\text{H}_5\text{OHBr}$		
Calcium Carbonate	CaCO_3		
Calcium Chloride	CaCl_2	D	
Carbon Tetrachloride	CCl_4	D	ORM-A ¹
Ceric Sulfate	$\text{Ce}(\text{SO}_4)_2$	C	
Cesium Nitrate	CsNO_3	D	
Ethanol	$\text{C}_2\text{H}_5\text{OH}$		combustible, flammable liquid
Ferrous Ammonium Sulfate	$\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$		
Hydrazine	$\text{H}_2\text{NNH}_2 \cdot \text{H}_2\text{O}$	B	flammable liquid, poison/corrosive
Hydrochloric Acid	HCl	D	non-flammable gas, corrosive
Hydrofluoric Acid	HF	B	corrosive
Hydrogen Peroxide	H_2O_2	B	oxidizer
Hydroiodic Acid	HI		
Hydroxylamine Hydrochloride	$\text{NH}_2\text{OH} \cdot \text{HCl}$		
Iodine	I_2		
Iron	Fe		
Kerosene	$\text{C}_{10}\text{H}_{22}$ to $\text{C}_{16}\text{H}_{34}$		combustible
Magnesium Oxide	MgO		
Mercury	Hg	X	ORM-B ²
Mercuric Nitrate	$\text{Hg}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}$	A	oxidizer/poison
Methanol	CH_3OH	D	flammable liquid
Methyl Ethyl Ketone	$\text{CH}_3\text{COC}_2\text{H}_5$	D	flammable liquid
Methyl Isobutyl Ketone	$\text{CH}_3\text{COC}_4\text{H}_9$	D	
Methyl Lactic Acid	$\text{CH}_3\text{CH}(\text{OH})\text{CO}_2\text{CH}_3$		
Nitric Acid	HNO_3	C	oxidizer, corrosive
Nitrous Acid	HNO_2		
Oxalic Acid	$\text{HO}_2\text{CCO}_2\text{H} \cdot 2\text{H}_2\text{O}$		

Table 5-20. Building 325: Chemicals Used at Analytical Laboratory (1953-1976).
(2 sheets)

Compound Name	Formula	EPA Category	DOT Classification
Perchloric Acid	HClO ₄		
Periodic Acid	IO ₄		
Phosphoric Acid	H ₃ PO ₄	D	corrosive
Potassium Hydroxide	KOH	C	corrosive
Potassium Iodate	KIO ₃		
Potassium Permanganate	KMnO ₄	D	oxidizer
Silver Nitrate	AgNO ₃	X	oxidizer
Sodium Carbonate	Na ₂ CO ₃	D	
Sodium Hydroxide	NaOH	C	corrosive
Stainless Steel	FeNiCr		
Strontium Nitrate	Sr(NO ₃) ₂		
Sulfuric Acid	H ₂ SO ₄	C	corrosive
Tetrasodium Ethylene Diamine-Tetraacetate (EDTA)	N ₂ C ₂ H ₄ (C ₂ H ₂ O ₂ Na) ₄		
Tetraphenyl Boron	(C ₆ H ₅) ₄ B		
Thenoyltrifluoroacetone	(CH ₃) ₃ SCOCH ₂ COCF ₃		
Tide (Detergent) ³	Sodium silicate compounds		
Tributyl Phosphate	(C ₄ H ₉) ₃ PO ₄	D	
Trichloroethane	CH ₃ CCl ₃		ORM-A ¹
Tri-iso-octylamine	[(CH ₃) ₂ CH(CH ₂) ₆] ₃ N	D	
Tri-n-octylamine	[(CH ₃)(CH ₂) ₇] ₃ N		
Turco Alkaline (Rust Remover) ⁴	NaOH, Kerosene		
Turco Deseal Zit 2 ⁴	Methylene Chloride, Acetic Acid		
Turco Plaudit ⁴	No Hazardous Compounds		
Vanadium Pentoxide	V ₂ O ₅	C	
Xylene	C ₆ H ₄ (CH ₃) ₂	C	flammable liquid
Zirconyl Nitrate	ZrO(NO ₃) ₂		

¹Other regulated material with an anesthetic, irritating, noxious, toxic or other properties than can cause discomfort to persons in the event of leakage.

²Other regulated material capable of causing significant damage from leakage.

³Tradename - Proctor and Gamble.

⁴Tradename - Turco Products, Inc.

Table 5-21. Summary of Information from Solid Waste Storage Disposal Records (SWSDR) for TRU Wastes with Hazardous Contents from Building 325 Westinghouse Hanford. (2 sheets)

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (%)
02/15/79	WH-88-74	325-WHC-74-14-31	Uranyl stearate Uranyl bromate Uranyl nitrate (powder) Uranyl nitrate (solution)		0.005 0.007 0.0005 0.005	
05/16/79	WH-79-209	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-228	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-229	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-230	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-231	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-232	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-233	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-234	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-235	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-236	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-237	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-238	325-WHC-79-275	Asbestos			39*
05/16/79	WH-79-239	325-WHC-79-275	Asbestos			39*
10/13/82	WH-1519	340-WHC-83-2	Lead	D008		2

*Volume percents represent entire shipment, rather than individual containers.

Table 5-22. Summary of Information from Solid Waste Storage Disposal Records (SWSDR) for Low Level Wastes with Hazardous Contents from Building 325 Westinghouse Hanford.

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (%)
07/31/71		WAD-35-71-029	Lead (brick)			
04/07/72		WHC-325-23-72-013	Lead (brick)		2721	
10/05/76		325-WHC-760098	Lead			
05/10/77		325-WHC-77-054	Sodium			
08/31/77	WHC-77-163	325-WHC-77-099	Lead			
08/31/77	WHC-77-211	325-WHC-77-099	Lead			
10/05/77	WHC-77-272	325-WHC-77-112	Lead			
10/05/77	WHC-77-273	325-WHC-77-112	Lead			
02/13/78	WH-78-128	325-WHC-78-015	Lead (pig)			
06/05/79		325-WHC-79-75	Asbestos			4
08/15/88	325W-88-0003	325-WHC-89-01	Ammonium fluoride Potassium hydroxide Ammonium nitrate Ammonium fluoro-zirconate		3.0 18.0 3.0 7.5	2 12 2 5

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6.0 CHARACTERIZATION OF RETRIEVABLY STORED SOLID WASTE GENERATED AT BUILDING 325 BY PNL

The information found in this section is based primarily on data from the Solid Waste Information and Tracking System (SWITS) database. This database, which incorporated the older R-SWIMS database, is used to track information on radioactive and other wastes stored or disposed at the Hanford Site. Transuranic solid waste packages have been tracked since 1970, however, changes in the requirements and regulations governing radioactive wastes have left their mark in the quantity and quality of the data contained in this database. Caveats are included in the text to alert the reader to changes that may affect the interpretation of the data provided.

Solid Waste Burial Records (SWBR) are the source for the data in SWITS and were used as a secondary source of information in this section. Between 1970 and 1980, the 325 Building was used as a collection point for all waste in the 300 Area. Although waste originated from other buildings, the SWITS database recorded the originating source as Building 325. Review of the original SWBRs indicates a different 300 Area facility as the originating source for the waste. Tables 6-1 and 6-2 show the breakdown of waste designated as being produced by PNL at Building 325, but originating at other facilities.

Since 1980, solid waste originating from PNL at Building 325 was sent to Buildings 327 or 340 for interim storage and assay. Subsequently, these waste containers were recorded in SWITS as originating from Buildings 327 or 340 rather than from Building 325. Review of the SWBRs indicates the 325 Building as the originating source of the waste. Data taken from the burial records are incorporated in the tables and figures in this section and are clearly labeled.

The bulk of the data provided in this section is limited to information about the TRU waste that was generated at Building 325 by PNL; however, some general information on the non-TRU waste is included for completeness. The term non-TRU waste is used instead of LLW because a small percentage of the unsegregated waste is designated only as not TRU. Tables 6-3 and 6-4 present TRU and non-TRU waste generation summaries by container type and year. As the initial retrieval efforts and WRAP 1 will focus on 55-gal drums, these containers are considered separately from all other container types. Therefore, the term "other containers" in this report will refer to all container types except 55-gal drums. The term "drum" refers to 55-gal drums only, unless specified otherwise.

The original SWITS data that form the basis for most of the tables and figures in this section can be found in Appendix B. Each computer run is preceded by the query used to generate the data.

Because of the large number of figures and tables in this section, they are placed at the end of the chapter.

6.1 SUMMARY OF BUILDING 325 WASTE GENERATION BY PNL

6.1.1 Waste Stored in 55-Gallon Steel Drums

Table 6-5 contains waste summary data for 55-gal drums of radioactive waste generated at Building 325 by PNL between 1970 and 1992. The upper portion of this table presents the number, total weight, and total volume of TRU waste drums. The number of TRU mixed waste drums is also indicated. The same information for non-TRU waste follows. At the bottom of the table are the relative percentages of TRU and non-TRU wastes by container number, weight, and volume. Figures 6-1 through 6-6 present this information graphically.

6.1.1.1 Number of Drums. Between 1970 and 1992, 3,786 55-gal drums of radioactive waste were generated by PNL at Building 325. This total includes 2,069 drums of non-TRU and 1,717 drums of TRU waste. The total number of radioactive mixed waste drums is 46, which includes 43 non-TRU MW drums and 3 TRU MW drums. Figure 6-1 provides a graph of the number of 55-gal drums of TRU and non-TRU generated by PNL at Building 325 by year. The major features of this graph are directly related to historical events that took place at Building 325.

The Commercial Alpha Waste program was developed in the early 1970's to study and implement an alpha waste reduction plan. Six tasks provided objectives for the treatment and disposal of alpha waste through waste segregation, waste product criterion and evaluation, and waste container criterion and evaluation. Results from the program as seen in Figure 6-1 reveal a general decline in TRU waste from 1973 to 1978. At the same time, the number of non-TRU containers generally increased. This is depicted more clearly in Figure 6-2, which shows the relative percentages of TRU and non-TRU by year.

Note that, according to the database, 1988 was the only year that TRU waste was not generated; non-TRU waste filled 92 drums in that year.

6.1.1.2 Weight. In the period between 1970 and 1992 approximately 121,744 kg of TRU waste and 251,801 kg of non-TRU waste generated by PNL at Building 325 were stored in 55-gallon drums. These numbers are estimates since container weights were not required for individual containers prior to 1977. During the R-SWIMS data reentry program in the mid-1980's, all pre-1977 containers were assigned standard weights. All 55-gal drums, for instance, were assigned a value of 68 kg (150 lb). Since 1979, the average weight of all 325 drums generated by PNL has been 102 kg. However, while the average weight of TRU drums from that period was 79 kg, the average weight of non-TRU drums was 117 kg, making these drums over 48% heavier than the TRU drums. In addition, the average weight per drum of TRU waste increased yearly between 1985 and 1992.

Average Weight (kg)	1985	1986	1987	1988	1989	1990	1991	1992
	74	N/A	88	N/A	90	95	102	133

Figure 6-3 presents the total weight of both TRU and non-TRU radioactive wastes stored annually in 55-gal drums. The relative weight percentages for TRU and non-TRU drums generated annually by PNL at Building 325 are shown in Figure 6-4.

The large TRU peak in 1979 is probably due to the removal of a 15 ton crane. At that time, it was replaced with a 30 ton crane.

Two trends worth noting both started in the 1980's. First, according to the database, no non-TRU waste was generated between 1981 and 1987. Secondly, non-TRU waste started at a high in 1988 with 92 containers and generally declined over the next four years.

6.1.1.3 Volume. The total volume of waste generated by PNL at Building 325 and stored in 55-gal drums is 790 m³, of which 361 m³ is TRU and 429 m³ is non-TRU. Annual waste generation information is shown in Figure 6-5; the volume percentages of radioactive waste stored in 55-gal drums are provided in Figure 6-6. Since all 55-gal drums have a volume of 0.21 m³, the patterns shown in Figures 6-5 and 6-6 are the same as those described for Figures 6-1 and 6-2 (drum number), respectively. They are included here so that comparisons with later figures can be made (Figures 6-11 and 6-12).

6.1.2 Waste Stored in Containers Other Than 55-Gallon Steel Drums

Radioactive solid wastes have been stored or disposed of in a wide variety of containers other than 55-gal steel drums. Other container types used for solid waste generated at Building 325 by PNL include the following:

- Burlap, cloth, paper or plastic bags
- Concrete boxes
- Fiberboard/plastic boxes, cartons or cases
- Fiberboard/plastic drums, barrels or kegs
- Metal drums, barrels, or kegs (other than 55-gal drums)
- Metal boxes, cartons, and cases
- Fiberglass reinforced plywood boxes (FRP)
- Wooden boxes, cartons, and cases.

Some items were disposed of or stored without additional packaging, such as dump trucks; gloveboxes; HEPA filters; miscellaneous scrap; trucks, flatbeds, compactors, loadluggers; self-contained equipment; portable tanks, and metal cylinder casks. These items are also included in the "Other Container" category.

Table 6-6 summarizes the waste data for containers of radioactive waste other than 55-gal drums that were generated at Building 325 by PNL between 1970 and 1992. The upper portion of this table indicates the number, total weight and total volume of TRU waste stored in other containers. The number of other containers of TRU mixed waste also is provided. The same information for non-TRU waste follows. At the bottom of this table are the relative percentages of TRU and non-TRU wastes by container number, weight, and volume. Figures 6-7 through 6-12 present these data graphically.

6.1.2.1 Number of Other Containers. Between 1972 and 1992, 49,588 other containers of radioactive waste were generated at Building 325 by PNL. Of these containers, 379 hold TRU waste, while 49,209 contain non-TRU waste. For reference, during the same period of time a total of 3,786 55-gallon drums of radioactive solid waste were generated at Building 325 by PNL. Figure 6-7 is a graph of the number of other containers of TRU and non-TRU waste generated at Building 325 by PNL annually.

The largest number of other containers containing TRU waste was generated in 1970 with 361 containers. This is the result of an inordinately large number of fiberboard/plastic boxes, cartons, and cases. The vast majority of other containers contain non-TRU waste. In the years from 1970 to 1992, over 99% of the waste is non-TRU, with fiberboard/plastic boxes, cartons, and cases accounting for over 96% of the total.

Figure 6-8 presents the relative percentages of TRU and non-TRU containers other than 55-gallon drums. One thing is apparent from this figure: Almost all of the waste in other containers is non-TRU.

The probable explanation for the large TRU peak in 1970 is the decontamination and repair of a major exhaust stack. Additionally, 41 HEPA filters were disposed of as TRU waste.

6.1.2.2 Weight. In the period between 1970 and 1992, approximately 1,309,081 kg of radioactive solid waste was generated at 325 by PNL and placed in containers other than 55-gal drums. This total includes approximately 42,204 kg of TRU and 1,266,877 kg of non-TRU contaminated material. These weights are approximations because individual container weights were not required to be recorded for individual containers prior to 1977. During an update of the R-SWIMS database in the mid-1980's, all waste containers without recorded weights were assigned standard values. For example, all 2 cubic foot boxes were given a standard weight of 5.5 kg (12 lb) and 5 gallon lard cans were assigned a standard weight of 22.7 kg (50 lb).

Figure 6-9 depicts the weight of TRU and non-TRU waste stored in containers other than 55-gallon drums on an annual basis. The most notable features of this graph are the TRU waste peaks in 1970, 1974, 1978, 1982, and 1992. The large weight of waste disposed of in these years is the result of the shipment of several large containers to retrievable storage including three concrete boxes in 1974, one portable tank in 1978, one 6 ft x 6 ft x 7 ft metal box, carton, or case in 1982, and one 5.6 ft x 6.5 ft x 9.3 ft metal box, carton, or case in 1992. The WHC-MR-0388 report (Gerber 1992) also indicated that some contaminated soil was also removed from around the radioactive liquid waste system line 1970. These six containers account for over 73% of the TRU waste weight in other containers buried between 1970 and 1992. Fiberboard/plastic boxes, cartons, and cases account for 50% of the non-TRU waste weight. The removal of trucks, flatbeds, compactors, loadluggers in 1970 and dump trucks in 1974 contributed to the TRU waste peaks in 1970 and 1974.

Figure 6-10 shows the percent contribution of TRU and non-TRU waste to the total annual weight of waste packaged in other containers. Because of the practice of storing TRU waste in drums when possible, proportionately less of the other container waste is TRU.

6.1.2.3 Volume. The volume of waste generated at Building 325 by PNL and packaged in containers other than 55-gal drums during the period from 1970 through 1992 is 8,090 m³. Transuranic wastes account for 103 m³ of the total volume; non-TRU wastes account for 7,987 m³. Figure 6-11 shows annual volumes of TRU and non-TRU wastes generated at Building 325 by PNL and packaged in containers other than 55-gal drums. Figure 6-12 shows the relative contribution of TRU and non-TRU wastes to the total volume of waste in other containers for each year.

6.1.3 Summary of Waste Generation Rates at 325 Between 1970 and 1992 by PNL

6.1.3.1 Number of Waste Containers. Between 1970 and 1992, there were 53,374 containers of radioactive solid waste generated at Building 325 by PNL. Fifty-five gallon drums account for 3,786 of the total number of containers. Containers of transuranics comprise only 4% of the total container numbers.

Figure 6-13 shows the total numbers of both TRU and non-TRU waste containers generated on an annual basis during this period. The difference in the amount of waste characterized as TRU and non-TRU from 1970 to 1992 is most evident in this graph. As mentioned previously, the Commercial Alpha Waste Program helped to reduce the amount of alpha waste progressively throughout the 1970's. In addition, changes in the DOE (formerly AEC) regulations and disposal practices directly affected the proportion of the waste determined to be TRU and non-TRU. A significant portion of the waste stored as TRU prior to 1982 may be redesignated as LLW upon characterization at WRAP.

6.1.3.2 Total Weight. Approximately 1,682,626 kg of radioactive solid waste was generated at Building 325 by PNL between 1970 and 1992. Waste packaged in 55-gal drums accounts for about 22% of the total weight of waste from Building 325, with 78% of the total weight comprised of waste packaged in some other type of waste container.

Waste designated as TRU makes up 10% of the total weight while waste designated as non-TRU makes up the remainder. Figure 6-14 provides a graph of the total weight of TRU and non-TRU waste generated at 325 by PNL on a yearly basis between 1970 and 1992. This graph shows that as the number of containers declined in later years, the weight of waste also declined but not in the same proportion.

The majority of the weight, 74%, of TRU waste is contained in 55-gal drums followed by concrete boxes with 20,448 kg or 12% of the TRU waste weight.

6.1.3.3 Total Volume. In the period between 1970 and 1992, 8880 m³ of radioactive solid wastes were generated at Building 325 by PNL. Only 9% of this volume was comprised of 55-gal drums; the remaining 91% of the volume was made up of other container types. Transuranic wastes account for 5% of the waste volume, while non-TRU wastes make up the remaining 95%. Figure 6-15 shows the total volume of TRU and non-TRU waste generated at Building 325 by PNL on a yearly basis.

6.2 WASTE CONTAINERS

6.2.1 TRU Waste Containers

Table 6-3 provides a summary of the TRU waste generated annually at Building 325 by PNL from 1970 to 1992 sorted by container type. The greatest number of containers are 55-gal drums, 1,717 by count; however, there are also significant numbers of fiberboard/plastic boxes, cartons, and cases in 1970. The percentages for all container types and the weight and volume of these containers are shown for each year in this table.

6.2.2 Non-TRU Waste Containers

Table 6-4 provides a summary of the non-TRU waste generated by PNL Building 325 from 1970 to 1992 by container type. Fiberboard/plastic boxes, cartons, and cases were the most common containers used accounting for more than 92% of the total non-TRU waste count. Significant numbers of 55-gal drums - metal drums, barrels, and kegs were also generated. The greatest weight of non-TRU waste, 40%, is comprised of waste in fiberboard/plastic boxes, cartons, and cases.

6.3 TRU WASTE STORAGE LOCATIONS

Table 6-7 provides the storage locations for TRU waste packaged in 55-gallon drums by year. Storage locations for TRU waste packaged in other containers are shown in Table 6-8. In general, 69%, of the drums and 93% of other containers generated at Building 325 by PNL are stored at burial ground 218-W-4B. A summary of Building 325 waste generated by PNL by storage location follows:

- 218-W-3A - Burial Ground 218-W-3A consists of 14 earthen-bottom, gravel filled trenches, with waste emplaced from May 1970 to April 1988. Ninety-five drums and other containers from Building 325 by PNL were disposed here in the years between 1970 and 1975; they contain no hazardous constituents.
- 218-W-4B - Burial Ground 218-W-4B, consisting of 14 trenches and 5 caissons, accepted retrievable waste through September of 1978. One thousand-one hundred and ninety-two drums and other containers from Building 325 by PNL were buried here from 1970 to 1978.
- 218-W-4C - Burial Ground 218-W-4C consists of six trenches with the first waste emplaced in March 1978. Three-hundred thirty eight 55-gal drum TRU waste was sent to this area from 1978 to 1987 with one other container emplaced in 1982.
- 224T - 224T is an above-ground storage structure known as the Transuranic Storage and Assay Facility (TRUSAF). TRU waste in 55-gal drums from Building 325 by PNL were stored here from 1987 and 1992. Nine of the total 113 drums contained one or more of the following hazardous constituents: asbestos, mercury, lead, and nitric acid.

- 2403-WA - Storage location 2403-WA is part of the Central Waste Complex. Only five 55-gal drums of TRU waste were sent here for storage between 1991 and 1992.
- 2402-WE - Storage Location 2402-WE is part of the Central Waste Complex. One metal box, carton, or case measuring 5.6 ft x 6.5 ft x 9.3 ft was sent here for storage in 1992.

6.4 PHYSICAL CONTENTS OF TRU WASTE CONTAINERS

The physical contents of TRU 55-gal drums are shown in Tables 6-9 through 6-13. There is a separate table for each storage location. The top portion of each table indicates the number of drums for which a given component is listed; the bottom part of the table indicates the percentage of the total drums from Building 325 by PNL in that burial location that contain the listed constituent. The physical contents for TRU waste containers other than 55-gal drums can be found in Tables 6-14 through 6-17.

One of the most interesting components is in storage location 218-W-4C. In 1980, animal waste is recorded as present in 47% of the TRU drums that were listed as being shipped from PNL Building 325. It should be noted that this waste was not from any animal research taking place at PNL Building 325. Rats were known to be used in Building 331 for biological studies. In fact, during a recent review of the SWBRs for one record indicated "lots of rats" were present. These animal carcasses were generally packed in lime.

It should be noted that prior to 1978, physical contents were not required to be listed on the burial records. A great many of the contents on early records are listed only as "Miscellaneous".

During an interview with 325 Building personnel, it was indicated that there might be a potential problem with unvented aerosol cans. Aerosol cans of Windex¹ and WD-40² were disposed of and sent for burial from the 325 Building.

6.5 RADIOLOGICAL DESCRIPTION OF BUILDING 325 SOLID WASTE BY PNL

Table 6-18 shows the number of grams of transuranics contained in waste stored in 55-gal drums each year by storage location; Table 6-19 provides the same information for containers other than 55-gal drums. Figure 6-16 combines the information on these tables in a graph that shows the total amount of transuranics present in waste packages from PNL Building 325 by year.

¹Trademark of Drackett Company.

²Trademark of WD-40 Company.

6.6 RADIOACTIVE ISOTOPES PRESENT IN BUILDING 325 SOLID WASTE BY PNL

Tables 6-20 and 6-21 contain information on radioactive isotopes found in 55-gal drums and other containers, respectively.

The following isotopes are all referred to specifically in the Building 325 Safety Analysis Reports: ^{131}I , ^{89}Sr , ^{90}Sr , ^{103}Ru , and ^{238}U . Although these isotopes used in PNL processes and laboratories may or may not be present in the solid waste stream, they are mentioned here for completeness.

6.7 HAZARDOUS CONSTITUENTS OF SOLID WASTE GENERATED AT 325 BY PNL

This section provides a review of the data on the hazardous components known or suspected to be in the solid waste stream from Building 325 by PNL. Information was gathered from several sources, including: the Solid Waste Information Tracking System, Solid Waste Burial Records, personnel interviews, an internal report examining hazardous components of solid waste, *Inventory of Chemicals Used at Hanford Site Production Plants and Support Operations* (Klem 1990), and *Unstable and Reactive Chemicals in Transuranic Retrievable Waste at the Hanford Site* (Reddinger 1992).

6.7.1 Chemical Inventories

Table 6-22 provides a list of chemicals used at 325 by the PNL Development and Production Laboratory from 1955 to 1976. In addition, Table 5-20, discussed previously in Section 5.7.1, provides a list of chemicals used at the 325 Building Analytical Laboratory from 1953 to 1976. These lists were developed by Klem (1990) to support waste characterization efforts for the single-shell tanks. Though these lists characterize chemicals used in the Analytical Laboratory, they do not specify which of these chemicals were used by PNL and/or Westinghouse Hanford.

The final two columns in both of the tables cited above contain information on the toxicity and hazards associated with each of the chemicals listed. The first of these columns lists the EPA toxicity category, which was determined using the *Registry of Toxic Effects of Chemical Substances Quarterly Issue* (NIOSH 1992) and the EPA "Spill Table" (EPA 1989). In cases where the two sources differed, the more recent source, the Registry of Toxic Effects, was used. Category X marks the most toxic chemicals, followed by Categories A, B, C, and D, listed in order of decreasing toxicity. The EPA "Spill Table" is incorporated by reference into the Washington State Administrative Code, Chapter 173-303, *Dangerous Waste Regulations*. The Registry of Toxic Effects is a quarterly update to the EPA "Spill Table." The final column lists the U.S. Department of Transportation (DOT) designation found in the DOT *Hazardous Materials Table* (49 CFR 172.101).

6.7.2 Solid Waste Information and Tracking System (SWITS)

The information about the hazardous constituents of the solid waste generated by PNL at Building 325 can be found in Tables 6-23 and 6-24. According to the SWITS database, only 9 drums from Building 325 PNL contain mixed waste. The greatest percent of mixed waste was found in 1992 when 13% of all 55-gal drums generated at Building 325 by PNL contained mixed waste.

The hazardous constituent field in the SWITS database also was searched for containers from Building 325 generated by PNL. Table 6-25 lists the hazardous constituents of TRU 55-gal drums sorted by storage location and year. In addition, the percentage of PNL drums in the burial location that contain each constituent is indicated. There were no records found that listed PNL TRU containers other than 55-gal drums with mixed waste.

6.7.3 Burial Records

Table 6-25 contains a summary of the information obtained from a review of the PNL Building 325 burial records for all TRU mixed waste containers. Table 6-27 is a summary of the low-level mixed waste containers. The presence of asbestos-containing waste material was included in the summary tables despite the fact that it is not considered to be mixed waste. Lead shielding is also not considered to be waste at the current time.

6.7.4 Interviews with 325 Building Personnel

From the information gained in interviews with 325 Building personnel, a list of known or suspected components in the solid waste stream has been compiled. This list of components was discussed above and can be found in Section 5.7.4. As this list applies to the entire 325 Building Analytical Laboratory, it is expected that these constituents may be part of the PNL waste stream as well the Westinghouse Hanford waste stream.

Figure 6-1. 55-Gallon Drum Waste Count Generated at Building 325 by PNL Annually.

WHC-EP-0696

Figure 6-2. Percentage of Building 325 TRU/Non-TRU
55-Gallon Drums by PNL.

200-00-000

Figure 6-3. Weight of 55-Gallon Drum Waste Generated at Building 325 by PNL Annually.

200-40-003

Figure 6-4. Weight Percentage of Building 325 55-Gallon Drums by PNL.

200-04-003

Figure 6-5. Volume of 55-Gallon Drum Waste Generated at Building 325 by PNL Annually.

325-305.ch3

20-20-20

Figure 6-6. Volume Percentage of Building 325 55-Gallon Drums by PNL.

Figure 6-7. Other Container Waste Count Generated at Building 325 by PNL Annually.

200-07-003

Figure 6-8. Percentage of Building 325 TRU/Non-TRU Other Containers by PNL.

2025-06-03

Figure 6-9. Weight of Other Containers Generated at Building 325 by PNL Annually.

222-08-013

Figure 6-10. Weight Percentage of Other Containers Generated at Building 325 by PNL Annually.

225-10.043

Figure 6-11. Volume of Other Containers Generated at Building 325 by PNL Annually.

205-11.003

Figure 6-12. Volume Percentage of Other Containers Generated at Building 325 by PNL Annually.

222-12.203

88-11-203

Figure 6-13. Total Number of Waste Containers Generated at Building 325 by PNL Annually.

200-14-010

Figure 6-14. Total Weight of Waste Generated at Building 325 by PNL Annually.

Figure 6-15. Total Volume of Waste Generated at Building 325 by PNL Annually.

W/HC-EP-0696

Figure 6-16. Grams of TRU Waste Generated at Building 325 by PNL Annually.

Table 6-1. TRU Wastes Attributed to PNL Building 325 but Generated at Other Facilities.

Year	Source	Container Number	Percent of Total	Weight (kg)	Weight Percent	Volume (m ³)	Volume Percent
1970	308	7 Others	2%	286	3%	0.8	2%
	308	6 Drums	12%	408	12%	1.2	11%
	Total	7 Others 6 Drums	2% 12%	286 408	3% 12%	0.8 1.2	2% 11%
1974	325B	3 Others	100%	18634	100%	17.9	100%
	Total	3 Others	100%	18634	100%	17.9	100%
1976	3708	1 Other	100%	305	100%	0.7	100%
	Total	1 Other	100%	305	100%	0.7	100%
1979	303C	48 Drums	19%	1360	8%	10.0	19%
	324	36 Drums	14%	1814	11%	7.6	14%
	Total	84 Drums	34%	3174	19%	17.6	34%

Table 6-2. Low-Level Wastes Attributed to PNL Building 325 but Generated at Other Facilities. (2 sheets)

Year	Source	Container Number	Percent of Total	Weight (kg)	Weight Percent	Volume (m ³)	Volume Percent
1970	327	2 Others	<1%	366	<1%	0.8	<1%
	340	20 Others	2%	6843	4%	16.8	4%
	340	24 Drums	77%	4899	91%	5.1	78%
	Total	22 Others 24 Drums	2% 77%	7209 4899	5% 91%	17.6 5.1	4% 78%
1972	331	96 Others	4%	1219	3%	12.1	3%
	Total	96 Others	4%	1219	3%	12.1	3%
1973	340	11 Others	<1%	794	1%	2.8	<1%
	3706	33 Others	1%	419	1%	5.1	1%
	Total	44 Others	1%	1213	1%	7.9	1%
1974	306	2 Others	<1%	5265	3%	11.6	2%
	309	30 Others	1%	17450	10%	38.4	5%
	309	7 Drums	7%	658	7%	1.5	7%
	Total	32 Others 7 Drums	1% 7%	22715 658	13% 7%	50.0 1.5	6% 7%
1977	306	6 Drums	3%	805	3%	1.3	3%
	Total	6 Drums	3%	805	3%	1.3	3%
1978	306	19 Others	<1%	2721	2%	63.8	5%
	324	63 Drums	13%	3266	4%	13.1	14%

Table 6-2. Low-Level Wastes Attributed to PNL Building 325 but Generated at Other Facilities. (2 sheets)

Year	Source	Container Number	Percent of Total	Weight (kg)	Weight Percent	Volume (m ³)	Volume Percent
	Total	19 Others 63 Drums	<1% 13%	2721 3266	2% 4%	63.8 13.1	5% 14%
1979	306	7 Others	<1%	9044	10%	22.0	3%
	331	23 Others	<1%	292	<1%	2.9	<1%
	327	9 Others	<1%	114	<1%	1.1	<1%
	329	6 Others	<1%	76	<1%	0.8	<1%
	340	4 Others	<1%	51	<1%	0.5	<1%
	3720	2 Others	<1%	25	<1%	0.3	<1%
	3745	2 Others	<1%	25	<1%	0.3	<1%
	Total	53 Others	1%	9627	11%	27.9	3%
1980	306	21 Drums	42%	5410	67%	4.4	42%
	Total	21 Drums	42%	5410	67%	4.4	42%
1985	325A	4 Others	80%	8269	95%	35.4	89%
	Total	4 Others	80%	8269	95%	35.4	89%

Table 6-3. TRU Waste Generated at Building 325 by PNL by Container Type and Year.
(4 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1970							
Burlap, Cloth, Paper, or Plastic Bags	unknown	4	1.0	1242	10.0	2.6	4.2
Fiberboard/Plastic Boxes, Cartons, or Cases	unknown	315	76.5	4436	35.9	40.4	65.6
HEPA Filters	unknown	8	1.9	533	4.3	1.2	1.9
	5-gal	4	1.0	254	2.1	0.6	0.1
	30-gal	29	7.0	1184	9.6	3.4	5.5
Metal Drums, Barrels, Kegs	55-gal	51	12.4	3443	27.9	10.6	17.2
Trucks, Flatbeds, Compactor, Loadligger	unknown	1	0.2	1270	10.3	2.8	4.5
TOTALS		412		12362		61.6	
1971							
Metal Drums, Barrels, Kegs	55-gal	327	100	22249	100	68.7	100
TOTALS		327		22249		68.7	
1972							
Metal Drums, Barrels, Kegs	55-gal	548	100	37286	100	115.1	100
TOTALS		548		37286		115.1	
1973							
Metal Drums, Barrels, Kegs	55-gal	79	100	5634	100	16.6	100
TOTALS		79		5634		16.6	
1974							
Concrete Boxes	4x4x8	1	1.8	3774	17.0	3.6	12.5
	4x7x9	2	3.6	14860	67.0	14.3	49.7
Metal Drums, Barrels, Kegs	55-gal	52	94.5	3538	16.0	10.9	37.8
TOTAL		55		22172		28.8	

Table 6-3. TRU Waste Generated at Building 325 by PNL by Container Type and Year.
(4 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1975							
Concrete Boxes	3x3x3	1	0.8	1814	18.0	0.8	3.1
Metal Drums, Barrels, Kegs	55-gal	121	99.1	8259	82.0	25.4	96.9
TOTALS		122		10073		26.2	
1976							
Metal Boxes, Cartons, Cases	2x2x6	1	1.9	305	7.7	0.7	5.9
Metal Drums, Barrels, Kegs	55-gal	53	98.1	3658	92.3	11.1	94.1
TOTALS		54		3963		11.8	
1977							
Metal Drums, Barrels, Kegs	55-gal	33	100	2313	100	6.9	100
		33		2313		6.9	
1978							
Burlap, Cloth, Paper or Plastic Bags	unknown	1	2.0	114	1.7	0.3	1.2
Metal Drums, Barrels, Kegs	55-gal	40	78.4	2708	40.5	8.4	34.2
Miscellaneous Scrap	unknown	8	15.7	103	1.5	0.2	0.8
Self-Contained Equipment	unknown	1	2.0	13	0.2	0.03	0.1
Tanks, Portable	unknown	1	2.0	3742	56.0	15.6	63.6
TOTALS		51		6680		24.5	
1979							
Metal Drums, Barrels, Kegs	55-gal	250	100	17010	100	52.5	100
TOTALS		250		17010		52.5	
1980							
Metal Drums, Barrels, Kegs	55-gal	17	100	1157	100	3.6	100
TOTALS		17		1157		3.6	
1981							

Table 6-3. TRU Waste Generated at Building 325 by PNL by Container Type and Year.
(4 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1982							
Metal Boxes, Cartons, Cases	** 6x6x7	1	5	5455	82	7.1	65
Metal Drums, Barrels, Kegs	** 55-gal	18	95	1238	18	3.8	35
TOTALS		19		6693		10.9	
1983							
Metal Drums, Barrels, Kegs	** 55-gal	8	100	696	100	1.7	100
TOTALS		8		696		1.7	
1984							
1985							
Metal Drums, Barrels, Kegs	55-gal	3	100	221	100	0.6	100
TOTALS		3		221		0.6	
1986							
1987							
Metal Drums, Barrels, Kegs	55-gal	17	100	1494	100	3.5	100
TOTALS		17		1494		3.5	
1988							
1989							
Metal Drums, Barrels, Kegs	*** 55-gal	1	4.5	51	3.2	0.2	4.3
	55-gal	21	95.5	1829	96.8	4.4	95.7
TOTALS		22		1880		4.6	

**Table 6-3. TRU Waste Generated at Building 325 by PNL by Container Type and Year.
(4 sheets)**

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1990							
Metal Drums, Barrels, Kegs	***55-gal	1	3.2	136	4.7	0.2	3.1
	55-gal	30	96.8	2727	95.3	6.3	96.9
TOTALS		31		2863		6.5	
1991							
Metal Drums, Barrels, Kegs	*** 55-gal	1	6.7	52	3.7	0.2	6.5
	55-gal	14	93.3	1370	96.7	2.9	93.5
TOTALS		15		1422		3.1	
1992							
Metal Boxes, Cartons, Cases	5.6x6.5x9.3	1	2.8	3105	40.0	9.8	58.3
Metal Drums, Barrels, Kegs	55-gal	35	97.2	4665	60.0	7.0	41.7
TOTALS		36		7770		16.8	

*Unless otherwise noted, units of dimensions are in ft.

**Solid Waste Burial Records for PNL Building 325 that were found under PNL Buildings 327 and 340 records.

***Containers hold mixed waste.

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1970							
Fiberboard/Plastic Boxes, Cartons, Cases	*** unknown	7	0.6	89	0.1	0.9	0.2
	unknown	1071	92.3	13754	8.4	136.2	29.2
Glove Boxes	unknown	2	0.2	826	0.5	1.8	0.4
HEPA Filters	unknown	2	0.2	366	0.2	0.8	0.2
Metal Drums, Barrels, Kegs	30-gal	6	0.5	245	0.1	0.7	0.2
	*** 55-gal	1	0.1	68	< 0.1	0.2	< 0.1
	55-gal	30	2.6	5330	3.3	6.3	1.3
Miscellaneous Scrap	unknown	22	1.9	70361	42.9	156.9	33.6
Self-Contained Equipment	unknown	10	0.9	26866	16.4	59.9	12.8
Trucks, Flatbeds, Compactors, Loadluggers	unknown	4	0.3	40007	24.4	89.2	19.1
Wooden Boxes, Cartons, Cases	3x3x4	3	0.3	1829	1.1	4.1	0.9
	4x5x6	3	0.3	4445	2.7	9.9	2.1
TOTALS		1161		164186		466.9	
1971							
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	1116	98.7	14174	85.0	142.2	94.0
Metal Drums, Barrels, Kegs	55-gal	11	1.0	748	4.5	2.3	1.5
Wooden Boxes, Cartons, Cases	unknown	4	0.4	1760	10.5	6.7	4.4
TOTALS		1131		16682		151.2	
1972							
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	2624	93.8	33436	68.6	333.7	88.8
Metal Drums, Barrels, Kegs	55-gal	109	3.9	5218	10.7	18.7	5.0
Self-Contained, Equipment	unknown	1	< 0.1	38	0.1	1.0	0.3
Tanks, Portable	unknown	3	0.1	229	0.5	0.5	0.1
Trucks, Flatbeds, Compactor, Loadluggers	unknown	2	0.1	3601	7.4	8.0	2.1
Wooden Boxes, Cartons, Cases	4x4x8	2	0.1	3251	6.7	7.3	1.9

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m³)	Percent Volume
Wooden Boxes, Cartons, Cases (cont)	unknown	56	2.0	2991	6.1	6.7	1.8
TOTALS		2797		48764		375.9	
1972							
Burlap, Cloth, Paper or Plastic Bags	unknown	12	0.2	152	0.2	3.0	0.4
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	6374	98.2	80966	90.0	812.2	96.9
Metal Boxes, Cartons, Cases	2x2x3	1	< 0.1	152	0.2	0.3	< 0.1
Metal Drums, Barrels, Kegs	30-gal	1	< 0.1	41	0.1	0.1	< 0.1
	55-gal	97	1.5	7350	8.2	19.3	2.3
Self-Contained Equipment	unknown	2	< 0.1	616	0.7	1.4	0.2
Trucks, Flatbeds, Compactor, Loadlifter	unknown	1	< 0.1	667	0.7	1.5	0.2
TOTALS		6488		89944		837.8	
1974							
Dump Truck	unknown	16	0.3	76421	40.0	73.4	9.3
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	4672	96.4	59448	31.2	595.5	75.2
Metal Drums, Barrels, Kegs	30-gal	9	0.2	367	0.2	1.1	0.1
	55-gal	95	2.0	9189	4.8	20.6	2.6
Miscellaneous Scrap	unknown	3	0.1	1264	0.7	2.8	0.3
Self-Contained Equipment	unknown	1	< 0.1	64	< 0.1	0.1	< 0.1
Trucks, Flatbeds, Compactor, Loadlifter	unknown	2	< 0.1	5264	2.8	11.7	1.5
Wooden Boxes, Cartons, Cases	2x2x8	1	< 0.1	406	0.2	0.9	0.1
	2x2x9	1	< 0.1	457	0.2	1.0	0.1
	2x4x5	1	< 0.1	508	0.3	1.1	0.1
	2x4x8	13	0.3	10565	5.5	23.6	3.0
	4x4x4	14	0.3	11381	6.0	25.4	3.2
	4x4x5	1	< 0.1	1016	0.5	2.3	0.3
	4x4x8	4	0.1	6504	3.4	14.5	1.8
	5x6x7	1	< 0.1	2667	1.4	6.0	0.8

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Wooden Boxes, Cartons, Cases (cont)	unknown	14	0.3	5307	2.8	11.8	1.5
TOTALS		4848		190828		791.8	
1975							
Burlap, Cloth, Paper or Plastic Bags	unknown	7	0.2	781	1.0	1.7	0.3
Concrete Boxes	3x3x3	1	< 0.1	1814	2.3	0.8	0.2
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	3801	93.2	48262	59.9	484.2	88.6
HEPA Filters	unknown	23	0.6	978	1.2	2.2	0.4
Metal Boxes, Cartons, Cases	unknown	7	0.2	800	1.0	1.8	0.3
Metal Drums, Barrels, Kegs	30-gal	8	0.2	526	0.7	1.2	0.2
	55-gal	195	4.8	21491	26.7	41.4	7.6
Miscellaneous Scrap	unknown	21	0.5	2769	3.4	6.2	1.1
Self-Contained, Equipment	unknown	16	0.4	1854	2.3	4.4	0.8
Trucks, Flatbeds, Compactor, Loadligger	unknown	1	< 0.1	1270	1.6	2.8	0.5
TOTALS		4080		80545		546.7	
1976							
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	4141	94.3	53050	60.9	528.1	87.3
HEPA Filters	unknown	10	0.2	1715	2.0	3.8	0.6
Metal Boxes, Cartons, Cases	unknown	3	0.1	381	0.4	0.9	0.1
Metal Cylinder, Casks	unknown	1	< 0.1	254	0.3	0.6	0.1
Metal Drums, Barrels, Kegs	30-gal	3	0.1	122	0.1	0.4	0.1
	55-gal	220	5.0	20657	23.7	46.8	7.7
Miscellaneous Scrap	unknown	2	0.1	13	< 0.1	0.03	< 0.1
Self-Contained, Equipment	unknown	6	0.1	589	0.7	1.3	0.2
Trucks, Flatbeds, Compactor, Loadligger	unknown	2	0.1	3378	3.9	7.5	1.2
	1x2x3	1	< 0.1	76	0.1	0.2	< 0.1

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Wooden Boxes, Cartons, Cases	4x4x4	1	< 0.1	813	0.9	1.8	0.3
	4x4x8	2	0.1	3251	3.7	7.3	1.2
	6x6x6	1	< 0.1	2743	3.1	6.1	1.0
TOTALS		4393		87042		604.8	
1977							
Burlap, Cloth, Paper or Plastic Bags	unknown	86	0.9	4405	2.2	10.5	0.8
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	101	1.1	702	0.3	3.1	0.2
	unknown	8483	92.3	109287	54.5	1082.4	83.4
HEPA Filters	unknown	67	0.7	3834	1.9	11.2	0.9
Metal Boxes, Cartons, Cases	4x4x5	1	< 0.1	1016	0.5	2.3	0.2
	80.8 ft. ³	13	0.1	13372	6.7	29.8	2.3
Metal Drums, Barrels, Kegs	2-gal	5	0.1	91	0.1	0.1	< 0.1
	5-gal	78	0.9	2416	1.2	5.5	0.4
	30-gal	4	< 0.1	163	0.1	0.7	0.1
	55-gal	227	2.5	24405	12.2	48.3	3.7
Miscellaneous Scrap	*** unknown	1	< 0.1	236	0.1	0.2	< 0.1
	unknown	44	0.5	2095	1.0	7.3	0.6
Self-Contained, Equipment	unknown	8	0.1	1070	0.5	2.5	0.2
Tanks, Portable	unknown	1	< 0.1	2515	1.3	5.6	0.4
Wooden Boxes, Cartons, Cases	0.7x1x1.2	11	0.1	200	0.1	0.2	< 0.1
	*** 1x4x4	1	< 0.1	363	0.2	0.5	< 0.1
	1x4x4	1	< 0.1	305	0.2	0.7	0.1
	***	7	0.1	13	< 0.1	0.3	< 0.1
	1.5x1.5x0.7						
	2x2x2	1	< 0.1	140	0.1	0.3	< 0.1
	2x2x4	2	< 0.1	406	0.2	0.9	0.1
	3x3x3	13	0.1	2015	1.0	7.0	0.5
	3x3x4	1	< 0.1	457	0.2	1.0	0.1
	3x6x16	1	< 0.1	3658	1.8	8.2	0.6
	4x0.4x0.8	2	< 0.1	762	0.4	1.7	0.1

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Wooden Boxes, Cartons, Cases (cont)	4x1.5x1.5	1	< 0.1	114	0.1	0.3	< 0.1
	*** 4x4x4	1	< 0.1	1451	0.7	1.8	0.1
	4x4x4	9	0.1	6154	3.1	16.3	1.3
	4x4x6	1	< 0.1	1219	0.6	2.7	0.2
	4x4x7	7	0.1	2642	1.3	20.6	1.6
	4x4x8	3	< 0.1	4876	2.4	10.9	0.8
	4x7x8	1	< 0.1	2845	1.4	6.3	0.5
	4.5x5.6x8.7	1	< 0.1	826	0.4	1.8	0.1
	5x8x8	1	< 0.1	5897	2.9	5.7	0.4
	unknown	5	0.1	611	0.3	1.7	0.1
TOTALS		9189		200561		1298.4	
1978							
Burlap, Cloth, Paper or Plastic Bags	*** unknown	1	< 0.1	18	< 0.1	0.03	< 0.1
	unknown	94	1.0	2711	1.2	13.3	1.0
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	112	1.1	1311	0.6	4.0	0.3
	*** unknown	58	0.6	921	0.4	7.4	0.5
	unknown	8735	89.0	118363	51.2	1111.0	82.1
Fiberboard/Plastic Drums, Barrels, Kegs	unknown	1	< 0.1	41	< 0.1	0.2	< 0.1
Glove Boxes	unknown	4	< 0.1	782	0.3	22.9	1.7
HEPA Filters	unknown	143	1.5	5126	2.2	20.0	1.5
Metal Boxes, Cartons, Cases	unknown	1	< 0.1	816	0.4	8.2	0.6
Metal Drums, Barrels, Kegs	5-gal	70	0.7	1209	0.5	4.5	0.3
	30-gal	14	0.1	940	0.4	1.7	0.1
	*** 55-gal	1	< 0.1	454	0.2	0.2	< 0.1
	55-gal	476	4.9	85613	37.0	96.4	7.1
Miscellaneous Scrap	unknown	67	0.7	2610	1.1	37.2	2.7
Self-Contained, Equipment	unknown	26	0.3	1642	0.7	4.2	0.3
Wooden Boxes, Cartons, Cases	2x2x4	1	< 0.1	508	0.2	1.1	0.1
	2x4x4	1	< 0.1	406	0.2	0.9	0.1

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size ^a	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Wooden Boxes, Cartons, Cases (cont)	3x3x4	1	< 0.1	318	0.1	0.7	0.1
	3x4x5	1	< 0.1	762	0.3	1.7	0.1
	4x4x4	3	< 0.1	1539	0.7	5.4	0.4
	4x5x12	1	< 0.1	3048	1.3	6.8	0.5
	4x3x7	1	< 0.1	1778	0.8	4.0	0.3
	unknown	2	< 0.1	384	0.2	1.0	0.1
TOTALS		9814		231300		1352.8	
1978							
Burlap, Cloth, Paper or Plastic Bags	unknown	35	0.6	499	0.4	2.3	0.3
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	86	1.5	1554	1.3	5.7	0.6
	*** unknown	48	0.8	610	0.5	6.1	0.7
	unknown	5003	87.7	66170	56.1	644.6	71.4
Glove Boxes	unknown	4	0.1	3924	3.3	112.0	12.4
HEPA Filters	*** unknown	4	0.1	51	< 0.1	0.5	0.1
	unknown	118	2.1	2732	2.3	14.0	1.6
Metal Boxes, Cartons, Cases	4x4x6	3	0.1	1219	1.0	2.7	0.3
Metal Drums, Barrels, Kegs	55-gal	56	1.0	1270	1.0	2.7	0.3
	*** 55-gal	6	0.1	563	0.5	1.3	0.1
	55-gal	301	5.3	29436	25.0	64.2	7.1
Miscellaneous Scrap	unknown	28	0.5	936	0.8	12.3	1.4
Self-Contained, Equipment	unknown	4	0.1	1261	1.1	8.4	0.9
Wooden Boxes, Cartons, Cases	4x4x8	7	0.1	7598	6.4	25.4	2.8
	unknown	1	< 0.1	132	0.1	0.6	0.1
TOTALS		5704		117955		902.8	
1980							
Burlap, Cloth, Paper or Plastic Bags	unknown	2	0.4	102	0.7	0.2	0.3
Fiberboard/Plastic Boxes, Cartons, Cases	2 ft. ³	6	1.3	151	1.1	0.5	0.8
	unknown	411	86.0	5305	37.7	52.4	80.6

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
HEPA Filters	unknown	8	1.7	481	3.4	1.3	2.0
Metal Drums, Barrels, Kegs	55-gal	50	10.5	8029	57.0	10.6	16.3
Miscellaneous Scrap	unknown	1	0.2	22	0.2	0.04	0.1
TOTALS		478		14090		65.0	
1981							
1982							
Wooden Boxes, Cartons, Cases	** 8x4x4	1	100.0	909	100.0	3.6	100.0
TOTALS		1		909		3.6	
1983							
Fiberglass Reinforced Plywood Boxes	** 8x4x4	1	100.0	909	100.0	3.6	100.0
TOTALS		1		909		3.6	
1984							
Tanks, Portable	unknown	10	100.0	27215	100.0	4.0	100.0
TOTALS		10		27215		4.0	
1985							
Glove Boxes	unknown	1	20.0	431	5.0	3.7	9.3
Metal Boxes, Cartons, Cases	unknown	4	80.0	8269	95.0	35.9	90.7
TOTALS		5		8700		39.6	
1986							
1987							
Miscellaneous Scrap	unknown	46	92.0	3276	47.4	21.5	57.0
Wooden Boxes, Cartons, Cases	4x5x8	4	8.0	3629	52.6	16.2	43.0
TOTALS		50		6905		37.7	
1988							
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	314	45.7	5284	11.3	40.0	19.1
HEPA Filters	unknown	76	11.1	7279	15.6	38.1	18.2
Metal Boxes, Cartons, Cases	2x3x4	18	2.6	2041	4.4	10.2	4.9

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Metal Boxes, Cartons, Cases (cont)	2.5x2.5x4	18	2.6	2041	4.4	10.2	4.9
Metal Drums, Barrels, Kegs	*** 55-gal	3	0.4	211	0.5	0.6	0.3
	55-gal	89	13.0	6563	14.0	18.7	8.9
	** 5-gal	8	1.2	98	0.2	0.2	0.1
Miscellaneous Scrap	unknown	146	21.3	9616	20.6	29.8	14.2
Wooden Boxes, Cartons, Cases	4x4x8	15	2.2	13608	29.1	61.8	29.5
TOTALS		687		46746		209.6	
1989							
Fiberboard/Plastic Boxes, Cartons, Cases	unknown	75	27.5	1239	1.2	10.5	2.2
HEPA Filters	unknown	31	11.4	1259	1.2	9.8	2.1
Metal Drums, Barrels, Kegs	*** 55-gal	24	8.8	7138	6.9	5.0	1.1
	55-gal	35	12.8	3183	3.1	7.3	1.5
Wooden Boxes, Cartons, Cases	4x4x8	108	39.6	91036	87.7	439.6	93.1
TOTALS		273		103855		472.2	
1990							
Metal Drums, Barrels, Kegs	*** 8-gal	3	5.6	65	0.7	0.1	1.0
	*** 30-gal	3	5.6	105	1.1	0.4	3.8
	*** 55-gal	4	7.4	1364	15.4	0.8	7.5
	55-gal	44	81.5	7336	82.7	9.2	87.6
TOTALS		54		8870		10.5	
1991							
Metal Drums, Barrels, Kegs	*** 5-gal	2	2.4	25	0.1	0.04	< 0.1
	*** 20-gal	3	3.6	90	0.3	0.2	0.2
	*** 30-gal	1	1.2	39	0.1	0.1	0.1
	*** 55-gal	2	2.4	341	1.0	0.4	0.3
Metal Drums, Barrels, Kegs	55-gal	46	54.8	6841	19.4	9.6	7.2

Table 6-4. Non-TRU Waste Generated at Building 325 by PNL by Container Type and Year. (9 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
Wooden Boxes, Cartons, Cases	4x4x8	30	35.7	27932	79.2	122.4	92.2
TOTALS		84		35268		132.7	
1992							
Metal Drums, Barrels, Kegs	*** 55-gal	2	6.6	174	0.5	0.4	0.4
	55-gal	1	3.3	99	0.3	0.2	0.2
Wooden Boxes, Cartons, Cases	4x4x8	27	90.0	37136	99.2	108.0	99.5
TOTALS		30		37409		108.6	

*Unless otherwise noted, units of dimensions are in ft.

**Solid Waste Burial Records for PNL Building 325 that were found under PNL Buildings 327 and 340 records.

***Containers hold mixed waste.

Table 6-5. Building 325 Waste Summary Data for 55-Gallon Drums by PNL.

55 Gal. Drums	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
TRU Count	51	327	548	79	52	121	53	33	40	250	17	0	18*	8*	0	3	0	17	0	21	30	14	35
TRU Wt. (kg)	3443	22249	37286	5634	3538	8259	3658	2313	2708	17010	1157	0	1238*	696*	0	221	0	1494	0	1890	2983	1422	4885
TRU Vol. (m³)	10.6	68.7	115.1	16.6	10.9	25.4	11.1	6.9	8.4	52.5	3.6	0	3.8*	1.7*	0	0.6	0	3.5	0	4.8	6.5	3.1	7.0
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Non-TRU Count	31	11	109	97	95	195	220	227	477	307	50	0	0	0	0	0	0	0	92	59	48	48	3
Non-TRU Wt. (kg)	5398	748	5218	7350	9189	21491	20657	24405	88067	29999	8029	0	0	0	0	0	0	0	6774	10321	8700	7182	273
Non-TRU Vol. (m³)	6.5	2.3	18.7	19.3	20.6	41.4	46.8	48.3	96.6	65.5	10.6	0	0	0	0	0	0	0	18.3	12.3	10.0	10.0	0.6
Non-TRU MW Count	1	0	0	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	3	24	4	2	2
Percentage																							
% TRU Count	62%	97%	83%	45%	35%	38%	19%	13%	8%	45%	25%		100%*	100%*		100%		100%	0%	26%	38%	23%	82%
% Non-TRU Count	38%	3%	17%	55%	65%	62%	81%	87%	92%	55%	75%		0%*	0%*		0%		0%	100%	74%	62%	77%	8%
Wt% TRU	39%	97%	88%	43%	28%	28%	15%	9%	3%	36%	13%		100%*	100%*		100%		100%	0%	15%	25%	17%	94%
Wt% Non-TRU	61%	3%	12%	57%	72%	72%	85%	91%	97%	64%	87%		0%*	0%*		0%		0%	100%	85%	75%	83%	6%
Vol% TRU	62%	97%	86%	46%	35%	38%	19%	13%	8%	44%	25%		100%*	100%*		100%		100%	0%	27%	39%	24%	82%
Vol% Non-TRU	38%	3%	14%	54%	65%	62%	81%	87%	92%	55%	75%		0%*	0%*		0%		0%	100%	73%	61%	76%	8%
% MW TRU by Count																				5%	3%	7%	
% MW Non-TRU by Count	3%								< 1%	2%									3%	41%	8%	4%	67%

*Solid Waste Burial Records for PNL Building 325 that were found under PNL Buildings 327 and 340 records.

Table 6-6. Building 325 Waste Summary Data for Waste Containers Other Than 55-Gallon Drums by PNL.

Other Containers	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
TRU Count	361	0	0	0	3	1	1	0	11	0	0	0	1*	0	0	0	0	0	0	0	0	0	1
TRU Wt. (kg)	8919	0	0	0	18634	1814	305	0	3972	0	0	0	5455*	0	0	0	0	0	0	0	0	0	3105
TRU Vol. (m ³)	51.0	0	0	0	17.9	0.8	0.7	0	18.1	0	0	0	7.1*	0	0	0	0	0	0	0	0	0	9.8
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Count	1130	1120	2688	6391	4753	3885	4173	8982	9337	5397	428	0	1*	1*	10	5	0	50	8*/587	214	6	36	27
Non-TRU Wt. (kg)	158788	15934	43546	82594	181639	59054	66385	176156	145233	87956	8061	0	909*	909*	27215	8700	0	6905	98*/39888	93534	170	28086	37136
Non-TRU Vol. (m ³)	480.4	148.9	357.2	818.5	771.2	505.3	558.0	1250.1	1256.2	837.3	54.4	0	3.6*	3.6*	4.0	38.6	0	37.7	0.2*/190.1	459.9	0.5	122.7	108
Non-TRU MW Count	7	0	0	0	0	0	0	10	59	52	0	0	0	0	0	0	0	0	0	0	6	6	0
Percentage																							
%TRU Count	24%	0%	0%	0%	< 1%	< 1%	< 1%	0%	< 1%	0%	0%		50%	0%	0%	0%		0%	0%	0%	0%	0%	4%
%Non-TRU Count	76%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		50%	100%	100%	100%		100%	1%*/98%	100%	100%	100%	96%
Wt% TRU	5%	0%	0%	0%	9%	3%	< 1%	0%	3%	0%	0%		88%	0%	0%	0%		0%	0%	0%	0%	0%	8%
Wt% Non-TRU	95%	100%	100%	100%	91%	97%	100%	100%	97%	100%	100%		14%	100%	100%	100%		100%	0.2%*/100%	100%	100%	100%	92%
Vol% TRU	10%	0%	0%	0%	2%	< 1%	< 1%	0%	1%	0%	0%		66%	0%	0%	0%		0%	0%	0%	0%	0%	8%
Vol% Non-TRU	90%	100%	100%	100%	98%	100%	100%	100%	99%	100%	100%		34%	100%	100%	100%		100%	0.1%*/100%	100%	100%	100%	92%
%MW Non-TRU by Count	1%							< 1%	1%	1%											100%	17%	

*Solid Waste Burial Records for PNL Building 325 that were found under PNL Buildings 327 and 340 records.

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Table 6-7. Building 325 TRU Waste in 55-Gallon Drums by PNL: Drum Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-3A	35	22		14		1																	
218-W-4B	16	305	548	65	52	120	53	33															
218-W-4C									40	250	17		18*	8*		3		2					
224T																		15		22	31	13	32
2403-WA																						2	3

*Solid Waste Burial Records for PNL Building 325 that were found under PNL Buildings 327 and 340 records.

Table 6-8. Building 325 TRU Waste in Containers Other Than 55-Gallon Drums by PNL: Container Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-3A	23																						
218-W-4B	338			3	1	1			11														
218-W-4C													1*										
2402-WE																							1

*Solid Waste Burial Records for PNL Building 325 that were found under PNL Buildings 327 and 340 records.

Table 6-9. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-3A.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Animal Waste				7																			
Misc/Unknown/Other	35	22		7		1																	
Percentage																							
Animal Waste				50%																			
Misc/Unknown/Other	100%	100%		50%		100%																	

Table 6-10. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-4B.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Dirt/Soil/Diatomaceous Earth																							
Misc/Unknown/Other	8	305	548	65	52	120	53	33															
Percentage																							
Dirt/Soil/Diatomaceous Earth																							
Misc/Unknown/Other	50%	100%	100%	100%	100%	100%	100%	100%															

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Table 6-11. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-4C. (2 sheets)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Absorbent/Kitty Litter/Vermiculite																2		1					
Animal Waste										8													
Brick/Firebrick																		1					
Cement													2*										
Cloth/Rags/Nylon								1	22				6*			1		1					
Concrete													4*	8*									
Cotton/Kotex**										6													
Dirt/Soil/Diatomaceous Earth										6													
Floor Sweep																		1					
Glass										39	17		16*	8*		2		2					
Insulation/Non-Asbestos																		1					
Kotex													4*										
Lead																		1					
Metal/Iron/Galvanized/Sheet										162	17		18*	8*		3		1					
Misc/Unknown/Other								39	88														
Paper/Cardboard									1	162	17		18*	8*		3							
Plastic/Polyurethane									1	162	17		18*	8*		3		2					
Rubber									1	157						2		2					
Stainless Steel																		1					
Wood/Lumber/Plywood										5			6*										

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Table 6-11. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-4C. (2 sheets)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Percentage																							
Absorbent/Kitty Litter/Vermiculite																67%		50%					
Animal Waste											47%												
Brick/Firebrick																		50%					
Cement													11%*										
Cloth/Rags/Nylon								3%	9%				33%*			33%		50%					
Concrete													22%*	100%*									
Cotton/Kotex**										2%													
Dirt/Soil/Diatomaceous Earth										2%													
Floor Sweep																		50%					
Glass									16%	100%			89%*	100%*		67%		100%					
Insulation/Non-Asbestos																		50%					
Kotex													22%*										
Lead																		50%					
Metal/Iron/Galvanized/Sheet									65%	100%			100%*	100%*		100%		50%					
Misc/Unknown/Other								97%	35%														
Paper/Cardboard								3%	65%	100%			100%*	100%*		100%							
Plastic/Polyurethane								3%	65%	100%			100%*	100%*		100%		100%					
Rubber								3%	63%							67%		100%					
Stainless Steel																		50%					
Wood/Lumber/Plywood									2%				33%*										

*Solid Waste Burial Records for PNL Building 325 that were found under PNL Buildings 327 and 340 records.

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Table 6-12. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 224T. (3 sheets)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Absorbent/Kitty Litter/ Vermiculite																9		8	2		5		18
Asbestos																					1		4
Cement																							14
Ceramics																1		3			1		5
Charcoal																				3			
Cloth/Rags/Nylon																11		8	2		4		7
Conweb																						1	
Cotton/Kotex																			2				
Dirt/Soil/Diatomaceous Earth																1							
Equipment																			7				
Floor Sweeps																1		1	1		1		
Foam/Styrofoam																							1
Glass																12		13	7		5		14
Insulation/ Non-Asbestos																1				1			
Lead																			1	1			
Leather																				2			1
Liquid																					1		14
Metal/Iron/Galvanized Sheet																15		17	31		11		32
Misc/Unknown/Other																				1			
Oxides/Powders																				1			
Paper/Cardboard																9		11	7		2		15

Table 6-12. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 224T. (3 sheets)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Plastic/Polyurethane																		15	21	31	13	32	
Rubber																		8	13	11	10	17	
Salt Bath																		1					
Stainless Steel																			4				
Wood/Lumber/Plywood																			1	2		1	
Percentage																							
Absorbent/Kitty Litter/ Vermiculite																		60%	36%	6%	38%	56%	
Asbestos																					8%	13%	
Cement																						44%	
Ceramics																		7%	14%		8%	16%	
Charcoal																				10%			
Cloth/Rags/Nylon																		73%	36%	6%	31%	22%	
Conweb																					8%		
Cotton/Kotex																				9%			
Dirt/Soil/Diatomaceous Earth																		7%					
Equipment																				32%			
Floor Sweeps																		7%	5%	3%	8%		
Foam/Styrofoam																						3%	
Glass																		80%	59%	23%	38%	44%	
Insulation/ Non-Asbestos																		7%		31%			
Lead																				5%	3%		

Table 6-12. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 224T. (3 sheets)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Leather																				6%			3%
Liquid																						8%	44%
Metal/Iron/Galvanized Sheet																		100%	77%	100%	85%	100%	
Misc/Unknown/Other																				5%			
Oxides/Powders																				5%			
Paper/Cardboard																		60%	50%	23%	15%	47%	
Plastic/Polyurethane																		100%	95%	100%	100	100%	
Rubber																		53%	59%	35%	77%	53%	
Salt Bath																		7%					
Stainless Steel																				18%			
Wood/Lumber/Plywood																				5%	6%		3%

Table 6-13. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 2403-WA.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Absorbent/Kitty Litter/Vermiculite																							1
Charcoal																							1
Glass																					1	1	
Metal/Iron/Galvanized/Sheet																					2	3	
Plastic/Polyurethane																					2	3	
Rubber																					1	1	
Percentage																							
Absorbent/Kitty Litter/Vermiculite																							33%
Charcoal																							33%
Glass																					50%	33%	
Metal/Iron/Galvanized/Sheet																					100%	100%	
Plastic/Polyurethane																					100%	100%	
Rubber																					50%	33%	

Table 6-14. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents by Storage Location - 218-W-3A.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other	23																						
Percentage																							
Misc/Unknown/Other	100%																						

Table 6-15. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents by Storage Location - 218-W-4B.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other	338			3	1	1			11														
Percentage																							
Misc/Unknown/Other	100%			100%	100%	100%			100%														

Table 6-16. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents by Storage Location - 218-W-4C.

	70	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Metal											1*												
Percentage																							
Metal											100%*												

*Solid Waste Burial Records for PNL Building 325 that were found with PNL Buildings 327 and 340 records.

Table 6-17. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents by Storage Location - 2402-WE.

Distribution	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Cloth/Rags/Nylon																							1
Glass																							1
Metal/Iron/ Galvanized Sheet																							1
Paper/Cardboard																							1
Plastic/Polyurethane																							1
Rubber																							1
Wood/Lumber/Plywood																							1
Percentage																							
Cloth/Rags/Nylon																							100%
Glass																							100%
Metal/Iron/ Galvanized Sheet																							100%
Paper/Cardboard																							100%
Plastic/Polyurethane																							100%
Rubber																							100%
Wood/Lumber/Plywood																							100%

Table 6-18. Building 325 TRU Waste by PNL in 55-Gallon Drums: Total Grams TRU by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-4B	162.03	2.34	1.17	16.9	70.50	16.91	47.99																
218-W-3A	0.0	0.0		0.14	18.80																		
218-W-4C								52.01	464.62	5.40		18.76*	16.58*		7.21		32.94						
224T																	292.16		114.28	113.4	36.37	415.08	
2403-WA																					29.99	2.21	
TOTALS	0.0	162.03	2.34	1.31	16.90	89.10	16.91	47.99	52.01	464.62	5.40		18.76*	16.58*		7.21	325.10		114.28	113.4	66.36	417.29	

*Solid Waste Burial Records for PNL Building 325 that were found with PNL Buildings 327 and 340 records.

Table 6-19. Building 325 TRU Waste by PNL in Containers Other Than 55-Gallon Drums: Total Grams TRU by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-4B	60.00				4.00	0.0	1.00		11.99														
218-W-3A	0.0																						
2402-WE																							47.51
TOTALS	60.00				4.00	0.0	1.00		11.99														47.51

*Solid Waste Burial Records for PNL Building 325 that were found with PNL Buildings 327 and 340 records.

Table 6-20. Isotopes in 55-Gallon Drums.

Isotope	Half Life	Quantity (g)	Radiation
²⁴¹ Am	433Y	21.807523	α, γ
²⁴³ Am	7.37×10^3 Y	0.0510001	α, γ
¹³⁷ Ba	2.551M	0.07401	γ
¹⁴⁴ Ce	284D	0.000037	β, γ
²⁴³ Cm	28.5Y	0.001365	α, γ
²⁴⁴ Cm	18.11Y	1.378593	α, γ
²⁴⁵ Cm	8.5×10^3 Y	49.980000	α, γ
⁶⁰ Co	5.271Y	7.33×10^{-4}	β, γ
¹³⁴ Cs	2.062Y	0.000476	β, γ
¹³⁷ Cs	30.17Y	0.0741	β, γ
¹⁵² Eu	13Y	1.9×10^4	β, γ
¹⁵⁴ Eu	8.5Y	5.47×10^{-4}	β, γ
⁵⁴ Mn	312D	-----	γ
⁸⁶ Nb	35.0D	2×10^{-6}	β, γ
²³⁷ Np	2.14×10^6 Y	6.013921	α, γ
¹⁴⁷ Pm	2.6234Y	427.23	β, γ
²³⁸ Pu	87.74Y	0.480396	α, γ
²³⁹ Pu	2.41×10^4 Y	306.0857	α, γ
²⁴⁰ Pu	6.57×10^3 Y	36.8253	α, γ
²⁴¹ Pu	14.4Y	3.165925	β, α, γ
²⁴² Pu	3.76×10^5 Y	0.852415	α, γ
¹⁰⁶ Ru	367D	7.704×10^{-3} g	β
¹⁰⁶ Rh	29.8S	-----	β, γ
¹²⁵ Sb	2.7Y	0.000155	β, γ
¹²⁵ Te	58D	0.000155	γ
²²⁸ Th	1.913Y	5.38×10^{-4}	α, γ
²³² Th	1.41×10^{10} Y	24444	α, γ
⁹⁰ Zr	64.0D	2×10^{-6}	β, α
Pu total	*	1477.77	*
U depleted	*	334653.81	*
U enriched	*	10027.49	*
U natural	*	409169.27	*

Y = Years
D = Days
S = Seconds
H = Hours
M = Minutes.

Table 6-21. Isotopes in Other Containers than 55-Gallon Drums for 1970 - 1992.

Isotope	Half Life	Quantity (g)	Radiation
²⁴¹ Am	433Y	2.2	α, γ
¹⁴⁷ Pm	2.6234Y	8572.5	β
²³⁸ Pu	87.74Y	0.064	α, γ
²³⁹ Pu	2.41×10^4 Y	36.8	α, γ
²⁴⁰ Pu	6.57×10^3 Y	7.31	α, γ
²⁴¹ Pu	14.4Y	1.14	β
²⁴² Pu	3.76×10^5 Y	0.338	α, γ
²³³ U	1.592×10^5 Y	55.0	α, γ
Pu total	*	41.14	*
U depleted	*	11432.98	*
U enriched	*	175.00	*
U natural	*	1.00	*

Y = Years.

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Table 6-22. Chemicals Used at Building 325: Pacific Northwest Laboratory Development and Production Laboratory (1955-1976). (2 sheets)

Compound Name	Formula	EPA Category	DOT Classification
Aluminum Nitrate Nonahydrate	$\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$	D	oxidizer
Acetone	$\text{CH}_3\text{C}_2\text{OH}_3$	D	flammable liquid
Ammonium Hydroxide	NH_4OH	C	corrosive, ORM-A
Carbon Tetrachloride	CCl_4	D	ORM-A ¹
Cesium Nitrate	CsNO_3	D	
Copper Nitrate	$\text{Cu}(\text{NO}_3)_2$	D	oxidizer
Dowex 50 ³ (IX Resin)	Sulfonate Polystyrene Divinyl Benzene		
Ethanol	$\text{C}_2\text{H}_5\text{OH}$		combustible flammable liquid
Ferrous Sulfate	$\text{Fe}(\text{SO}_3\text{NH}_2)_2$		
Hydrazine	$\text{H}_2\text{HHN}_2 \cdot \text{H}_2\text{O}$	B	flammable liquid, Poison/Corrosive
Hydrochloric Acid	HCl	D	Non-Flammable gas, Corrosive
Hydrofluoric Acid	HF	B	corrosive
Hydroxylamine Nitrate	$\text{NH}_2\text{OHHNO}_3$		
Lanthanum Nitrate	$\text{La}(\text{NO}_3)_3$	D	
Methanol	CH_3OH	D	flammable liquid
Mercury	Hg	X	ORM-B ²
Nitric Acid	HNO_3	C	oxidizer, corrosive
Nitrilotriacetic Acid (NTA)	$\text{N}(\text{CH}_2\text{COOH})_3$	D	
Normal Paraffin Hydrocarbon	$\text{C}_{10}\text{H}_{22}$ to $\text{C}_{14}\text{H}_{30}$		
Oxalic Acid	$\text{HO}_2\text{CCO}_2\text{H} \cdot 2\text{H}_2\text{O}$		
Pentasodium Diethylene Triamine Pentaacetate (DTPA)	$\text{N}_3(\text{CH}_2)_4(\text{COONa})_5$		
Potassium Permanganate	KMnO_4	D	oxidizer
Platinum	Pt		
Sodium Dichromate	$\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$	B	oxidizer
Sodium Fluoride	NaF	C	ORM-B ² , corrosive
Sodium Hydroxide	NaOH	C	corrosive
Sodium Nitrate	NaNO_3	D	oxidizer
Sodium Phosphate	Na_3PO_4		
Sodium Sulfate	Na_2SO_4		
Strontium Nitrate	$\text{Sr}(\text{NO}_3)_2$		

**Table 6-22. Chemicals Used at Building 325: Pacific Northwest Laboratory
Development and Production Laboratory (1955-1976). (2 sheets)**

Compound Name	Formula	EPA Category	DOT Classification
Sulfuric Acid	H_2SO_4	C	corrosive
Tetrasodium Ethylene Diamine Tetraacetate (EDTA)	$N_2C_3H_4(C_2H_2O_2Na)_4$		
Tributyl Phosphate	$(C_4H_9)_3PO_4$	D	
Trisodium Hydroxyethyl Ethylene-Diamine Triacetate (HEDTA)	$N_2C_2H_4(C_2H_2O_2Na)_3(C_2H_4OH)$		
Turco (Fabrifilm) ⁴	Toluene, Butanol, Isopropanol, Acetone		
Turco 4502 D ⁴	KOH, K_2CrO_4 , $KMnO_4$		
Turco 4518 ⁴	$HO_2CCO_2H + 2H_2O$, Sodium Dodecyl Benzene Sulfonate		
Yttrium Nitrate	$Y(NO_3)_3$		
Zinc Nitrate	$Zn(NO_3)_2$		

¹Other regulated material with an anesthetic, irritating, noxious, toxic or other properties that can cause discomfort to persons in the event of leakage.

²Other regulated material capable of causing significant damage from leakage.

³Tradename - Dow Chemical.

⁴Tradename - Turco Products, Inc.

Table 6-23. Building 325 TRU 55-Gallon Drums Containing Hazardous Constituents by PNL: Drum Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
224T																				2	1	2	4

Table 6-24. Number and Percentage of Building 325 TRU 55-Gallon Drums Containing Hazardous Constituents by Storage Location - 224T.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Asbestos																					1	4	
Lead																				1	1		
Mercury																				1			
Nitric Acid																					1		
Percentage																							
Asbestos																					8%	13%	
Lead																				5%	3%		
Mercury																				5%			
Nitric Acid																					8%		

Table 6-25. Summary of Information from Solid Waste Storage Disposal Records (SWSDR) for TRU Wastes with Hazardous Contents from PNL at Building 325.

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (%)
02/13/87	PNL-186004	325-PNL-87-2	Lead (bricks)	D008	34.1	3

Table 6-26. Summary of Information from Solid Waste Storage Disposal Records (SWSDR) for LLW Wastes with Hazardous Contents from PNL at Building 325. (2 sheets)

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (%)
05/26/72		BNW-325-19-72-020	Lead	D008		
03/31/77		325-BNW-77-035	Lead (brick)	D008		
06/15/77		325-BNW-77-062	Lead (brick) Lead (sheet)	D008 D008	1361	
04/21/78		325-BNW-78-053	Lead (shielding)	D008		
05/04/79		325-PNL-79-46	Asbestos			2
05/18/79		325-PNL-79-48	Asbestos			6
05/25/79		325-PNL-79-51	Asbestos			3
06/05/79		325-PNL-79-54	Asbestos			2
06/05/79		325-PNL-79-53	Asbestos			4
06/26/79		325-PNL-79-60	Asbestos			2
05/10/88		325-PNL-88-12	Asbestos (tile)		4.3	14
05/18/80		325-PNL-88-13	Asbestos (tile)		2.0	10
05/24/88		325-PNL-88-15	Asbestos (tile)		4.3	19
10/28/88	PNL-88-028	325-PNL-89-1	Pseudocumene/ xylene mixture		8.18	23
10/28/88	PNL-88-035	325-PNL-89-2	Pseudocumene/ xylene mixture		8.18	23
10/28/88	PNL-88-039	325-PNL-89-3	Pseudocumene/ xylene mixture		8.18	23

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Table 6-26. Summary of Information from Solid Waste Storage Disposal Records (SWSDR) for LLW Wastes with Hazardous Contents from PNL at Building 325. (2 sheets)

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (%)
08/25/89	PNL-89-006	325-PNL-89-01	Cadmium Chromium Lead Mercury Silver Methylene chloride Acetone Xylene Toluene	D006 D007 D008 D009 D011 F001, F002 F003 F003 F005	0.00082 0.01470 0.02730 0.00297 0.01004 0.000001 0.00018 5.0 e ⁻⁷ 2.0 e ⁻⁷	
08/25/89	PNL-89-007	325-PNL-89-02	Lead	D008, WT01	295.5	100
08/25/89	PNL-89-012	325-PNL-89-03	Lead	D008, WT01	366.9	100
08/25/89	PNL-89-013	325-PNL-89-04	Lead	D008, WT01	422.3	100
08/25/89	PNL-89-011	325-PNL-89-05	Lead	D008, WT01	432.4	97.7
08/25/89	PNL-89-010	325-PNL-89-06	Lead	D008, WT01	438.7	97.8
08/25/89	PNL-89-008	325-PNL-89-07	Lead	D008, WT01	340.9	100

7.0 CHARACTERIZATION OF RETRIEVABLY STORED SOLID WASTE GENERATED BY 325A HOT CELLS ANNEX

The information found in this section is based primarily on data from the Solid Waste Information and Tracking System (SWITS) database. This database, which incorporated the older R-SWIMS database, is used to track information on radioactive and other wastes stored or disposed at the Hanford Site. Transuranic solid waste packages have been tracked since 1970, however, changes in the requirements and regulations governing radioactive wastes have left their mark in the quantity and quality of the data contained in this database. Caveats are included in the text to alert the reader to changes that may affect the interpretation of the data provided.

The bulk of the data provided is limited to information about the TRU waste that was generated at 325A, however, some general information on the non-TRU waste is included for completeness. The term non-TRU waste is used instead of LLW because a small percentage of the unsegregated waste is designated only as not TRU. Tables 7-1 and 7-2 present TRU and non-TRU waste generation summaries by container type and year. Since the initial retrieval efforts and WRAP 1 will focus on 55-gal drums, these containers are considered separately from all other container types. Therefore, the term "other containers" in this report will refer to all container types except 55-gal drums. The term "drum" refers to 55-gal drums only, unless specified otherwise.

The 325A Hot Cells Annex is composed of three cells - A, B, and C. During the past 25 years, the 325A Hot Cells Annex has been operated by PNL. This is waste that was not included in the previous section on PNL Building 325. Appendix C contains the original SWITS queries and computer runs for PNL 325A. Because of the large number of figures and tables, they are placed at the end of the chapter.

7.1 SUMMARY OF 325A WASTE GENERATION

7.1.1 Waste Stored in 55-Gallon Steel Drums

Table 7-3 contains waste summary data for 55-gal drums of radioactive waste generated at the 325A Annex between 1970 and 1992. The upper portion of this table presents the number, total weight, and total volume of TRU waste drums. The number of TRU mixed waste drums are also indicated. The same information for non-TRU waste follows. At the bottom of the table are the relative percentages of TRU and non-TRU wastes by container number, weight, and volume. Figures 7-1 through 7-6 present this information graphically.

7.1.1.1 Number of Drums. Between 1970 and 1979, fifty-four 55-gal drums of radioactive waste were generated at the 325A Annex. This total includes 39 drums of non-TRU and 15 drums of TRU waste. The total number of radioactive mixed waste drums is 15, all of which are non-TRU. Figure 7-1 provides a graph of the number of 55-gal drums of TRU and non-TRU wastes generated at the 325A Annex by PNL annually. The major features of this graph are directly related to historical events that took place at the 325A Annex.

The Nuclear Waste Vitrification Project (NWVP) peaked in 1978-1979. The large non-TRU container count in 1978 is probably a result of the processing of light water reactor fuel in cells A and C. This operation as well as modifications to A and C cells, were part of NWVP and generally contributed to the waste.

Other NWVP support operations in B and C cells between 1977 and 1979 contributed to the TRU and non-TRU waste generation. The B cell was involved with high-level waste behavior studies and light reactor fuel dissolution testing. The C cell's support of the FFTF by solvent degradation testing as well as molten salt electrode portion experiments probably contributed to the waste generated at 325A Hot Cell Annex (Gerber 1992).

Figure 7-2 presents the relative percentages for TRU and non-TRU drums generated annually at the 325A Annex.

7.1.1.2 Weight. In the period between 1970 and 1979 approximately 4,195 kg of TRU waste and 8,591 kg of non-TRU waste generated at the 325A Annex were stored in 55-gal drums. These numbers are estimates since container weights were not required for individual containers prior to 1977. During the R-SWIMS data reentry program in the mid-1980's, all pre-1977 containers were assigned standard weights. All 55-gal drums, for instance, were assigned a value of 68 kg (150 lbs). However, while the average weight of TRU drums from that period was 280 kg, the average weight of non-TRU drums was 296 kg, making these drums more than 16 kg heavier than the TRU drums.

Figure 7-3 presents the total weight of both TRU and non-TRU radioactive wastes stored annually in 55-gal drums. The relative weight percentages for TRU and non-TRU drums generated annually at the 325A Annex are shown in Figure 7-4.

7.1.1.3 Volume. The total volume of waste generated at the 325A Annex and stored in 55-gal drums between 1970 and 1992 is 11 m³, of which 3 m³ is TRU and 8 m³ is non-TRU. Annual waste generation information is shown in Figure 7-5; the volume percentages of radioactive waste stored in 55-gal drums are provided in Figure 7-6. Since all 55-gal drums have a volume of 0.21 m³, the patterns shown in Figures 7-5 and 7-6 are the same as those described for Figures 7-1 and 7-2 (drum number), respectively. They are included here so that comparisons with later figures (7-11 and 7-12) can be made.

7.1.2 Waste Stored in Containers Other Than 55-Gallon Steel Drums

Radioactive solid wastes have been stored or disposed of in a wide variety of containers other than 55-gal steel drums. Other container types used for solid waste generated at the 325A Annex include the following:

- Burlap, cloth, paper or plastic bags
- Metal drums, barrels, or kegs (other than 55-gal drums)
- Wooden boxes, cartons, and cases
- Metal cylinders, casks.

Some items were disposed of or stored without additional packaging, such as portable tanks; miscellaneous scrap; trucks, flatbeds, compactors, loadluggers; and self-contained equipment. These items are also included in the "Other Container" category.

Table 7-4 summarizes the waste data for containers of radioactive waste other than 55-gal drums that were generated at the 325A Annex between 1970 and 1992. The upper portion of this table indicates the number, total weight, and total volume of TRU waste stored in other containers. The number of other containers of TRU mixed waste is also provided. The same information for non-TRU waste follows. At the bottom of this table are the relative percentages of TRU and non-TRU wastes by container number, weight and volume. Figures 7-7 through 7-12 present these data graphically.

7.1.2.1 Number of Other Containers. Between 1970 and 1992, 341 other containers of radioactive waste were generated at 325A. Of these containers, 108 hold TRU waste, while 233 contain non-TRU waste. For reference, during the same period of time a total of fifty-four 55-gal drums of radioactive solid waste were generated at the 325A Annex. Figure 7-7 is a graph of the number of other containers of TRU and non-TRU waste generated at 325A by year. The largest number of other containers containing TRU waste was generated in 1971 with 38 containers. This is the result of an inordinately large number of 5-gal metal drums. Over 68% of the containers other than 55-gal drums generated at 325A contain non-TRU waste. The peaks in the number of non-TRU other contains in 1978 and 1979 probably result from NWVP support.

Figure 7-8 presents the relative percentages of TRU and non-TRU containers other than 55-gal drums generated at 325A by year. One thing apparent from this figure is that after 1975 almost all of the waste in other containers was non-TRU.

7.1.2.2 Weight. In the period between 1970 and 1992, approximately 121,113 kg of radioactive solid waste was generated at the 325A Annex and placed in containers other than 55-gal drums. This total includes approximately 31,517 kg of TRU and 89,596 kg of non-TRU contaminated material. These weights are approximations because individual container weights were not required to be recorded for individual containers prior to 1977. During an update of the R-SWIMS database in the mid-1980's, all waste containers without recorded weights were assigned standard values. For example, all 2 ft³ boxes were given a standard weight of 5.5 kg (12 lb) and 5-gal lard cans were assigned a standard weight of 22.7 kg (50 lb).

Figure 7-9 depicts the weight of TRU and non-TRU waste stored in containers other than 55-gal drums on an annual basis. The most notable feature of this graph is the TRU waste peak in 1975. The large weight of waste disposed of in this year is probably due to the shipment of 11 metal cylinders or casks to retrievable storage. Figure 7-10 shows the percent contribution of TRU and non-TRU waste to the total annual weight of waste packaged in other containers.

7.1.2.3 Volume. The volume of waste generated at the 325A Annex and packaged in containers other than 55-gal drums during the period from 1970 through 1992 is 305 m³. Transuranic wastes account for 69 m³ of the total volume; non-TRU wastes account for 236 m³. Figure 7-11 shows annual volumes of TRU and non-TRU wastes generated by the

325A Annex and packaged in containers other than 55-gal drums. Figure 7-12 shows the relative contribution of TRU and non-TRU wastes to the total volume of waste in other containers for each year.

7.1.3 Summary of Waste Generation Rates at the 325A Annex Between 1970 and 1992

7.1.3.1 Number of Waste Containers. Between 1970 and 1992 there were 395 containers of radioactive solid waste generated at the 325A Annex. Fifty-five gallon drums account for 14% of the total number of containers. Containers of transuranics comprise 31% of the total container numbers.

Figure 7-13 shows the total numbers of both TRU and non-TRU waste containers generated on an annual basis during this period. The difference in the amount of waste characterized as TRU and non-TRU from 1970 to 1992 is most evident in this graph. Changes in the DOE (formerly AEC) regulations and the 325A Annex disposal practices directly affected the proportion of the waste determined to be TRU and non-TRU. A significant portion of the waste stored as TRU prior to 1982 may be redesignated as LLW upon characterization at WRAP.

Notice that no waste was generated in 1974 unlike the early 1970's. The Hot Cells Isotope campaign, which included a ^{238}Pu recovery program, may account for the early 1970's waste. Large peaks in 1978-1979 are probably due to NWVP support.

The NWVP program was put on standby in 1980. During the rest of the 1980's, waste generated probably resulted from some of the several 325A Annex operations such as:

- Material characterization leach test of waste glass nuclear fuels
- Post irradiation examination of Boron shield from N Reactor
- Characterization of neutral cladding removal waste
- Method development to convert cladding to non-TRU waste
- Characterization of double-shell tank slurry
- Fuel iodine analysis
- Fuel uranium dissolution methods for N Reactor
- Recovery testing of Sr using antimonetic acid.

Memos dated from the early 1990's indicate a hot cell cleanout and HWVP radioactive testing. This may account for the waste in 1992.

7.1.3.2 Total Weight. Approximately 133,899 kg of radioactive solid waste was generated at the 325A Annex between 1970 and 1992. Waste packaged in 55-gal drums accounts for about 10% of the total weight of waste from the 325A Annex, with 90% of the total weight comprised of waste packaged in some other type of waste container.

Waste designated as TRU makes up 27% of the total weight while waste designated as non-TRU makes up the remainder. Figure 7-14 provides a graph of the total weight of TRU and non-TRU waste generated at the 325A Annex on a yearly basis between 1970 and 1992.

The large TRU weight peaks in 1975 and 1976 probably resulted from extended renovations to the 325A Annex prior to 1975, as well as a variety of operations in the 325A Annex during 1975. In 1975, A cell was involved in the separation and purification of fission products as well as ^{147}Pm production. Radiochemical studies were performed in B cell while C cell was used for separation and purification of ^{238}Pu and ^{237}Np from fuel elements. All of these operations contributed to TRU waste peaks in 1975-1976.

7.1.3.3 Total Volume. In the period between 1970 and 1992, 316 m³ of radioactive solid wastes were generated at the 325A Annex. Only 4% of this volume is comprised of 55-gal drums; the remaining 96% of the volume is made up of other container types. Transuranic wastes account for 23% of the waste volume, while non-TRU wastes make up the remaining 77%. Figure 7-15 shows the total volume of TRU and non-TRU waste generated at the 325A Annex on a yearly basis. The most notable feature of this graph is the peak in 1975. It is interesting to note that metal cylinders or casks account for 100% of the TRU waste volume for 1975. For the Non-TRU portion of the 1975 peak, metal cylinders or casks account for 50%.

7.2 WASTE CONTAINERS

7.2.1 TRU Waste Containers

Table 7-1 provides a summary of the TRU waste generated annually from 1970 to 1992 by the 325A Annex sorted by container type. The greatest number of containers are 55-gal metal drums, barrels, or kegs, 75% by count. Eight percent of the TRU waste is contained in 11 metal cylinders or casks of unknown container size, followed by 11% of the weight in 55-gal drums. The percentages for all container types and the weight and volume of these containers are shown for each year in this table.

7.2.2 Non-TRU Waste Containers

Table 7-2 provides a summary of the non-TRU waste generated by the 325A Annex from 1970 to 1992 by container type. Miscellaneous scrap was the most common type of waste generated. The greatest weight of non-TRU waste, 40%, is comprised of waste in wooden boxes, cartons, or cases although there are also large amounts of waste weight from trucks, flatbeds, compactors, or loadluggers.

7.3 TRU WASTE STORAGE LOCATIONS

Table 7-5 provides the storage locations for TRU waste packaged in 55-gal drums by year. In general, the bulk of the drums generated in one year are stored primarily in one

facility. Storage locations for TRU waste packaged in other containers are shown in Table 7-6. A summary of the 325A Annex waste by storage location follows:

- 218-W-3A - Burial Ground 218-W-3A consists of 14 earthen-bottom, gravel filled trenches with waste emplaced from May 1970 to April 1988. Drums and other containers from the 325A Annex were disposed here between 1975 and 1976 containing no hazardous constituents.
- 218-W-4B - Burial Ground 218-W-4B, consisting of 14 trenches, accepted retrievable waste through September of 1978. Drum and other container waste from the 325A Annex was buried here from 1970 to 1983.
- 218-W-4C - Burial Ground 218-W-4C consists of six trenches with the first waste emplaced in March 1978. Drum waste from the 325A Annex was sent to this area in 1979.

7.4 PHYSICAL CONTENTS OF TRU WASTE CONTAINERS

The physical contents of 55-gal drums are shown in Tables 7-7 through 7-8. There is a separate table for each storage location. The top portion of each table indicates the number of drums for which a given component is listed; the bottom part of the table indicates the percentage of the total drums from the 325A Annex in that burial location that contain the listed constituent. The physical contents for TRU waste containers other than 55-gal drums can be found in Tables 7-9 through 7-10.

Interviews with 325 Building personnel indicate possible unvented aerosols cans may be among the non-TRU waste containers. Aerosol cans may have contained Windex™ and WD-40™.

It should be noted that prior to 1978, physical contents were not required to be listed on the burial records. A great many of the contents on early records are listed only as "Miscellaneous."

7.5 RADIOLOGICAL DESCRIPTION OF THE 325A ANNEX SOLID WASTE

Table 7-11 shows the number of grams of transuranics contained in waste stored in 55-gal drums each year by storage location; Table 7-12 provides the same information for containers other than 55-gal drums. Figure 7-16 combines the information on these tables in a graph that shows the total amount of transuranics present in waste packages from the 325A Annex by year. It should be noted that not all SWITS records for TRU Waste containers list the number of grams of TRU, particularly in the early 1970's.

7.6 RADIOACTIVE ISOTOPES PRESENT IN THE 325A ANNEX SOLID WASTE

Information on radioactive isotopes was obtained from the SWITS database and from the 325A Annex Safety Analysis Report (Anderson and Hanthorn 1975). Isotopes known to be in the waste stream are presented in Table 7-13 for 55-gal drums and Table 7-14 for other containers. The present isotopes listed in the safety analysis report as being used in the 325A Annex processes and laboratories may or may not be in the solid waste stream. The following are isotopes suspected to be present in the 325A solid waste stream: ^{241}Am , ^{243}Am , ^{144}Ce , Cm , ^{131}I , ^{237}Np , ^{147}Pm , ^{238}Pu , and ^{239}Pu .

7.7 HAZARDOUS CONSTITUENTS OF SOLID WASTE GENERATED BY 325A HOT CELLS ANNEX

This section provides a review of the data on the hazardous components known or suspected to be in the solid waste stream from Westinghouse Hanford and PNL Westinghouse Hanford 325A Annex Hot Cells. Information was gathered from several sources, including: the Solid Waste Information Tracking System, Solid Waste Burial Records, personnel interviews, an internal report examining hazardous components of solid waste, *Inventory of Chemicals Used at Hanford Site Production Plants and Support Operations* (Klem 1990), and *Unstable and Reactive Chemicals in Transuranic Retrievable Waste at the Hanford Site* (Reddinger 1992).

7.7.1 Chemical Inventories

Table 5-20, discussed previously in Section 5.7.1, provides a list of chemicals used at the 325 Building Analytical Laboratory from 1953 to 1976. This list was developed by Klem (1990) to support waste characterization efforts for the single shell tanks. Though this list characterizes chemicals used in the Analytical Laboratory, it does not specify, if any, which of these chemicals originated in the 325A Hot Cells Annex.

7.7.2 Solid Waste Information and Tracking System (SWITS)

The hazardous constituent field in the SWITS database was searched for all containers from PNL 325 Hot Cells that contained radioactive mixed waste. This search indicated that no mixed waste containers from the 325A Hot Cells Annex were sent to the solid waste burial grounds.

7.7.3 Burial Records

A review of microfilmed burial records revealed hazardous constituents that were sent to the solid waste burial grounds from the Westinghouse Hanford and PNL 325A Hot Cells Annex. Table 7-15 contains a summary of the PNL 325A Annex TRU mixed waste containers and their hazardous contents. The PNL 325A low-level mixed waste containers are summarized in Table 7-16.

7.7.4 Interviews with 325 Building Personnel

From the information gained in interviews with 325 Building personnel, a list of known or suspected components in the solid waste stream has been compiled. This list of components can be found in Section 5.7.4. As this list applies to the entire 325 Building Analytical Laboratory, it is expected that some of the constituents may be present in the Hot Cells waste stream as well.

325A-01.ppt

Figure 7-1. 55-Gallon Drum Waste Count Generated by the 325A Annex Annually.

325A-02.ppt

Figure 7-2. Percentage of 325A Annex TRU/Non-TRU 55-Gallon Drums.

325A-03.m

Figure 7-3. Weight of 55-Gallon Drum Waste Generated by the 325A Annex Annually.

325A-04.pdf

Figure 7-4. Weight Percentage of 325A Annex 55-Gallon Drums.

Figure 7-5. Volume of 55-Gallon Drum Waste Generated by the 325A Annex Annually.

325A-06.ppt

325A-06.ppt

Figure 7-6. Volume Percentage of 325A Annex 55-Gallon Drums.

325A-07.PML

Figure 7-7. Other Container Waste Count Generated by the 325A Annex Annually.

Figure 7-8. Percentage of 325A Annex TRU/Non-TRU Other Containers.

Legend
□ Non-TRU
■ TRU

Figure 7-9. Weight of Other Containers Generated by the 325A Annex Annually.

325A-EP-0696

00000-18.pdf

Figure 7-10. Weight Percentage of Other Containers
Generated by the 325A Annex Annually.

Figure 7-11. Volume of Other Containers Generated by the 325A Annex Annually.

202502-11.dwg

2004-11-10

Figure 7-12. Volume Percentage of Other Containers
Generated by the 325A Annex Annually.

2024-12-24

Figure 7-13. Total Number of Waste Containers Generated by the 325A Annex Annually.

325A-14.pdf

Figure 7-14. Total Weight of Waste Generated by the 325A Annex Annually.

Figure 7-15. Total Volume of Waste Generated by the 325A Annex Annually.

2025-10-20

Figure 7-16. Grams of TRU Waste Generated by the 325A Annex Annually.

Table 7-1. TRU Waste Generated at the 325A Annex by Container Type and Year.
(2 sheets)

Container Type	Container Size ^a	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1970							
Metal Drums, Barrels, Kegs	5-gal	17	100%	180	100%	0.3	100%
TOTALS		17		180		0.3	
1971							
Metal Drums, Barrels, Kegs	5-gal	38	100%	379	100%	0.5	100%
TOTALS		38		379		0.5	100%
1972							
Metal Drums, Barrels, Kegs	5-gal	35	100%	359	100%	0.5	100%
TOTALS		35		359		0.5	100%
1973							
Metal Drums, Barrels, Kegs	5-gal	6	100%	100	100%	0.1	100%
TOTALS		6		100		0.1	
1974							
1975							
Metal Cylinder, Casks	unknown	11	100%	30481	100%	68.0	100%
TOTALS		11		30481		68.0	
1976							
Metal Drums, Barrels, Kegs	55-gal	10	100%	3855	100%	2.1	100%
TOTALS		10		3855		2.1	
1977							
1978							
1979							
Metal Drums, Barrels, Kegs	55-gal	5	100%	340	100%	1.1	100%
TOTALS		5		340		1.1	

Table 7-1. TRU Waste Generated at the 325A Annex by Container Type and Year.
(2 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1980							
1981							
1982							
1983							
Metal Drums, Barrels, Kegs	5-gal	1	100%	18	100%	< 0.1	100%
TOTALS		1		18		< 0.1	
1984							
1985							
1986							
1987							
1988							
1989							
1990							
1991							
1992							

*Unless otherwise noted, units of dimensions are in ft.
 **These containers hold mixed waste.

Table 7-2. Non-TRU Waste Generated at the 325A Annex by Container Type and Year.
(3 sheets)

Container Type	Container Size *	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1970							
1971							
1972							
1973							
1974							
1975							
Metal Cylinder, Casks	unknown	2	50.0%	5475	89.8%	12.2	89.7%
Miscellaneous Scrap	unknown	2	50.0%	622	10.2%	1.4	10.3%
TOTALS		4		6097		13.6	
1976							
1977							
Burlap, Cloth, Paper, or Plastic Bags	unknown	26	40.6%	4445	10.6%	9.9	11.6%
Metal Drums, Barrels, Kegs	110-gal	1	1.6%	188	0.4%	0.4	0.5%
	55-gal	10	15.6%	3016	7.2%	2.1	2.5%
Miscellaneous Scrap	unknown	1	1.6%	38	0.1%	0.9	1.1%
Tanks, Portable	unknown	6	9.4%	7760	18.4%	17.3	20.3%
Wooden, Boxes, Cartons, Cases	3x4x6	1	1.6%	914	2.2%	2.0	2.3%
	4x4x4	9	14.1%	7315	17.4%	16.3	19.1%
	4x4x8	10	15.6%	18407	43.7%	36.3	42.6%
TOTALS		64		42083		85.2	

Table 7-2. Non-TRU Waste Generated at the 325A Annex by Container Type and Year.
(3 sheets)

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m ³)	Percent Volume
1978							
Burlap, Cloth, Paper, or Plastic Bags	unknown	57	29.7%	2026	6.1%	21.1	21.4%
Metal Drums, Barrels, Kegs	5-gal	2	1.0%	68	0.2%	0.1	0.1%
	** 55-gal	15	7.8%	2478	7.4%	3.2	3.2%
	55-gal	14	7.3%	3097	9.3%	3.0	3.0%
Miscellaneous Scrap	** unknown	20	10.4%	771	2.3%	4.8	4.9%
	unknown	79	41.1%	2483	7.4%	6.4	6.5%
Trucks, Flatbeds, Compactor, Loadlifter	** unknown	3	1.6%	16209	48.6%	37.3	37.8%
	unknown	2	1.0%	6214	18.6%	22.7	23.0%
TOTALS		192		33346		98.6	
1979							
1980							
1981							
Wooden Boxes, Cartons, Cases	4x4x8	3	100%	3629	100%	11.3	100%
TOTALS		3		3629		11.3	
1982							
1983							
1984							
1985							
1986							

**Table 7-2. Non-TRU Waste Generated at the 325A Annex by Container Type and Year.
(3 sheets)**

Container Type	Container Size*	Container Number	% of Total	Total Container Weight (kg)	Percent Weight	Volume (m³)	Percent Volume
1987							
1988							
1989							
1990							
1991							
1992							
Wooden Boxes, Cartons, Cases	4x4.5x8	3	33.3%	4841	37.1%	12.0	33.3%
	8x4x4.5	6	66.7%	8191	62.9%	24.0	66.7%
TOTALS		9		13032		36.0	

*Unless otherwise noted, units of dimensions are in ft.

**These containers hold mixed waste.

Table 7-3. The 325A Annex Waste Summary Data for 55-Gallon Drums.

55 Gal. Drums	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
TRU Count	0	0	0	0	0	0	10	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
TRU Wt. (kg)	0	0	0	0	0	0	3855	0	0	340	0	0	0	0	0	0	0	0	0	0	0	0	0
TRU Vol. (m³)	0	0	0	0	0	0	2.1	0	0	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Count	0	0	0	0	0	0	0	10	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Wt. (kg)	0	0	0	0	0	0	0	3016	5575	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Vol. (m³)	0	0	0	0	0	0	0	2.1	6.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU MW Count	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage																							
%TRU Count							100%	0%	0%	100%													
%Non-TRU Count							0%	100%	100%	0%													
Wt% TRU							100%	0%	0%	100%													
Wt% Non-TRU							0%	100%	100%	0%													
Vol% TRU							100%	0%	0%	100%													
Vol% Non-TRU							0%	100%	100%	0%													
%MW Non-TRU by Count							52%																

7-30

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Table 7-4. The 325A Annex Waste Summary Data for Waste Containers Other Than 55-Gallon Drums.

Other Containers	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
TRU Count	17	38	35	6	0	11	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
TRU Wt. (kg)	180	379	359	100	0	30481	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0
TRU Vol. (m ³)	0.3	0.5	0.5	0.1	0	68.0	0	0	0	0	0	0	0	< 0.1	0	0	0	0	0	0	0	0	0
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Count	0	0	0	0	0	4	0	54	163	0	0	3	0	0	0	0	0	0	0	0	0	0	9
Non-TRU Wt. (kg)	0	0	0	0	0	6097	0	39067	27771	0	0	3629	0	0	0	0	0	0	0	0	0	0	13032
Non-TRU Vol. (m ³)	0	0	0	0	0	13.6	0	83.1	92.4	0	0	11.3	0	0	0	0	0	0	0	0	0	0	36.0
Non-TRU MW Count	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage																							
%TRU Count	100%	100%	100%	100%		73%		0%	0%			0%		100%									0%
%Non-TRU Count	0%	0%	0%	0%		27%		100%	100%			100%		0%									100%
Wt% TRU	100%	100%	100%	100%		83%		0%	0%			0%		100%									0%
Wt% Non-TRU	0%	0%	0%	0%		17%		100%	100%			100%		0%									100%
Vol% TRU	100%	100%	100%	100%		83%		0%	0%			0%		100%									0%
Vol% Non-TRU	0%	0%	0%	0%		17%		100%	100%			100%		0%									100%
%MW Non-TRU by Count									14%														

Table 7-5. The 325A Annex TRU Waste in 55-Gallon Drums: Drum Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-3A						10																	
218-W-4B																							
218-W-4C									5														

Table 7-6. The 325A Annex TRU Waste in Containers Other Than 55-Gallon Drums: Container Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-3A						11																	
218-W-4B	17	38	35	6									2										
218-W-4C																							

Table 7-7. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-3A.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other						10																	
Percentage																							
Misc/Unknown/Other						100%																	

Table 7-8. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location - 218-W-4C.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other										5													
Percentage																							
Misc/Unknown/Other										100%													

Table 7-9. Distribution and Percentage of TRU Containers Other than 55-Gallon Drums Physical Contents by Storage Location - 218-W-3A.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Misc/Unknown/Other																							
Percentage																							
Misc/Unknown/Other																							

**Table 7-10. Distribution and Percentage of TRU Containers Other than 55-Gallon Drums
Physical Contents by Storage Location - 218-W-4B.**

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Metal/Iron/ Galvanized Sheet														1									
Misc/Unknown/Other	17	38	35	6																			
Oxides/Powders														1									
Percentage																							
Metal/Iron/ Galvanized Sheet														50%									
Misc/Unknown/Other	100%	100%	100%	100%																			
Oxides/Powders														50%									

Table 7-11. The 325A Annex TRU Waste in 55-Gallon: Total Grams TRU by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
218-W-3A							1125.6																
218-W-4B																							
218-W-4C									5.0														
TOTALS							1125.6		5.0														

Table 7-12. The 325A Annex TRU Waste in Containers Other than 55-Gallon Drums: Total Grams TRU by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
218-W-3A						7.0																	
218-W-4B	0.2	0.4	< 0.1	0.0										17.0									
218-W-4C																							
TOTALS	0.2	0.4	< 0.1	0.0		7.0								17.0									

Table 7-13. Isotopes in 55-Gallon Drums for the 325A Annex for 1970-1992.

Isotope	Half-Life	Quantity (g)	Radiation
²³² Th	1.41. x 10 ¹⁰ Y	22600	α , γ
²³³ U	1.592 x 10 ⁵ Y	4.0	α , γ
Pu total	*	1126.0	*

Y = Years

* = Varies according to isotope.

Table 7-14. Isotopes in Other Containers for the 325A Annex for 1970-1992.

Isotope	Half-Life	Quantity (g)	Radiation
¹³⁷ Ba	2.551M	30.087	γ
¹³⁷ Cs	30.17Y	30.087	β , γ
¹²⁹ I	1.6 x 10 ⁷ Y	0.5	β , γ
²³⁷ Np	2.14 x 10 ⁶ Y	0.011	α , γ
¹⁰⁶ Rh	130M	1.01	β , γ
¹⁰⁶ Ru	367D	1.01	β
⁹⁰ Sr	28.8Y	8200	β
²³² Th	1.41. x 10 ¹⁰ Y	30.0	α , γ
²³³ U	1.592 x 10 ⁵ Y	17.0	α , γ
⁹⁰ Y	49.7M	30.0	α
Pu total	*	7.5948	*

Y = Years

D = Days

M = Minutes

* = Varies according to isotope.

Table 7-15. Summary of Information from Solid Waste Burial Records (SWBR) for TRU Wastes with Hazardous Contents from 325A Hot Cell Annex by PNL.

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (%)
08/11/70	325-70-008		Resin			
08/12/70	325-70-209		Resin			
10/16/70	325-70-216-038		Resin			
11/01/72	325-73-011	325-A-BNW-72-025	Resin			
02/14/73	325-73-025	325-A-BNW-73-008	Resin			
02/14/73	325-73-026	325-A-BNW-73-009	Resin			
02/15/73	325-73-027	325-A-BNW-73-010	Resin			
02/15/73	325-73-028	325-A-BNW-73-011	Resin			

Table 7-16. Summary of Information from Solid Waste Burial Records (SWBR) for Low-Level Wastes with Hazardous Contents from 325A Hot Cell Annex by PNL. (3 sheets)

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (%)
04/07/70	325-70-010		Resin			
04/05/71	325-71-336	BNW-325-A-71-016	Resin			
04/07/71	325-71-340	BNW-325-A-71-020	Resin			
04/08/71	325-71-343	BNW-325-A-71-023	Resin			
12/07/71	325-72-014	BNW-325-A-71-049	Resin			
04/20/72		BNW-325-A-72-022-006	Resin			
01/29/73	325-73-023	325-A-BNW-73-006	Resin			
01/31/73	325-73-024	325-A-BNW-73-007	Resin			
02/20/73	325-73-029	325-A-BNW-43-012	Resin			
03/15/73	325-73-037	325-A-BNW-73-020	Resin			
07/09/73	325-74-005	325-A-BNW-73-034	Resin			
07/09/73	325-74-006	325-A-BNW-73-035	Resin			
07/10/73	325-74-007	325-A-BNW-73-036	Resin			
07/24/73	325-74-016	325-A-BNW-73-045	Resin			
09/17/73	325-74-017	325-A-BNW-73-048	Resin			
10/09/73	325-74-024	325-A-BNW-73-054	Resin			
02/25/74	325-74-034	325-A-BNW-74-001	Resin			
03/06/74	325-74-039	325-A-BNW-74-006	Resin			

Table 7-16. Summary of Information from Solid Waste Burial Records (SWBR) for Low-Level Wastes with Hazardous Contents from 325A Hot Cell Annex by PNL. (3 sheets)

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (Y)
05/16/74	325-74-050	325-A-BNW-74-017	Resin			
05/17/74	325-74-051	325-A-BNW-74-018	Resin			
05/22/74	325-74-057	325-A-BNW-74-024	Resin			
07/18/74	325-75-013	325-A-BNW-74-042	Resin			
02/27/75	325-75-48	325-A-BNW-75-015	Resin			
03/05/75	325-75-049	325-A-BNW-75-016	Resin			
03/05/75	325-75-050	325-A-BNW-75-017	Resin			
03/07/75	325-75-054	325-A-BNW-75-021	Resin			
03/10/75	325-75-056	325-A-BNW-75-023	Resin			
03/11/75	325-75-058	325-A-BNW-75-025	Resin			
05/07/75	325-75-71	325-A-BNW-75-031	Resin			
05/07/75	325-75-72	325-A-BNW-75-032	Resin			
06/20/74	325-75-93	325-A-BNW-75-052	Resin			
06/23/75	325-75-94	325-A-BNW-75-053	Resin			
06/23/75	325-75-95	325-A-BNW-75-054	Resin			
04/02/76	325-76-050	325-A-BNW-76-028	Resin			
04/02/76	325-76-051	325-A-BNW-76-029	Resin			
01/17/77	325-77-018	325-A-BNW-77-001	Resin			

Table 7-16. Summary of Information from Solid Waste Burial Records (SWBR) for Low-Level Wastes with Hazardous Contents from 325A Hot Cell Annex by PNL. (3 sheets)

Date Accepted	Pin Number	Burial Record Number	Hazardous Constituents	Waste Codes	Weight (kg)	Volume (')
01/17/77	325-77-019	325-A-BNW-77-002	Resin			
01/19/77	325-77-020	325-A-BNW-77-003	Resin			
01/26/77	325-77-024	325-A-BNW-77-004	Resin			
01/21/77	325-77-021	325-A-BNW-77-003A	Resin			
01/21/77	325-77-022	325-A-BNW-77-003B	Resin			
06/15/77	325-77-029	325-BNW-77-062	Lead(sheets) Lead (bricks)		1361	
08/24/77	325-77-030	325-A-BNW-77-003	Lead			
05/25/78	325-78-004	325-A-BNW-78-004	Lead (scraps)			
08/11/78	325-78-006	325-A-BNW-78-06	Lead			
10/10/78	325-78-009	325-A-PNL-78-09	Welding lead			
05/25/79	325-79-012	325-A-PNL-79-11	Resin			
05/30/79	325-79-013	325-A-PNL-79-12	Resin			
06/20/79	325-79-025	325-A-PNL-79-24	Resin			

8.0 CHARACTERIZATION OF RETRIEVABLY STORED SOLID WASTE GENERATED BY 325B HOT CELLS ANNEX

The information found in this section is based primarily on data from the Solid Waste Information and Tracking System (SWITS) database. This database, which incorporated the older R-SWIMS database, is used to track information on radioactive and other wastes stored or disposed at the Hanford Site. Transuranic solid waste packages have been tracked since 1970. Changes in the requirements and regulations governing radioactive wastes have left their mark in the quantity and quality of the data contained in this database. Caveats are included in the text to alert the reader to changes that may affect the interpretation of the data provided.

The 325B west wing, with its six interconnecting hot cells, has been operated by both PNL and Westinghouse Hanford during the last 30 years. Custody was transferred from PNL to Westinghouse Hanford in 1970, and Westinghouse Hanford operated 325B until 1987 when custody of the facility was returned to PNL. Tables 8-1 through 8-5 present a summary of the TRU waste generated by Westinghouse Hanford between 1970 and 1985. Table 8-6 presents the TRU waste generation summary for PNL at the 325B Annex.

Appendix D contains the original SWITS queries and computer runs for the Westinghouse Hanford 325B Annex. Appendix E contains the original SWITS queries and computer runs for PNL 325B Annex. Since the only records retrieved for the PNL 325B Annex are from 1970, Westinghouse Hanford 325B data was used to generate a majority of the tables and figures in this section. Because of the large number of figures and tables, they are placed at the end of the chapter.

8.1 SUMMARY OF 325B WASTE GENERATION

A summary of the waste generated at the 325B Annex by Westinghouse Hanford can be found in Table 8-1. This is waste that was not included in Section 5.0 and 6.0, Westinghouse Hanford and PNL Building 325 waste, but was entered into the database as 325B Annex waste. This table is organized by container type and year.

8.1.1 Waste Stored in 55-Gallon Steel Drums

According to the SWITS database, no TRU waste was generated at the 325B Annex by Westinghouse Hanford or PNL and stored in 55-gal drums.

8.1.2 Waste Stored in Containers Other Than 55-Gallon Steel Drums

The only container type used to contain the solid waste generated at the 325B Annex was the 1-gal metal drum. Some items were disposed of and stored without additional packaging such as self-contained equipment. These items also are included in the "Other Container" category.

Table 8-2 summarizes the waste data for containers of radioactive waste other than 55-gal drums for Westinghouse Hanford that were generated at the 325B Annex between 1970 and 1992. This table indicates the number, total weight and total volume of TRU waste stored in other containers. Figures 8-1 through 8-3 present these data graphically.

8.1.2.1 Number of Other Containers. Between 1970 and 1985, 355 other containers of radioactive waste were generated at the 325B Annex by Westinghouse Hanford. These containers all contain TRU waste. Figure 8-1 is a graph of the number of other containers of TRU waste generated at the 325B Annex by Westinghouse Hanford annually. The largest number of other containers containing TRU waste was generated in 1971 with 80 containers. This is the result of an inordinately large number of 1-gal metal drums, barrels, or kegs. In 1970, twenty-five 1-gal containers of TRU waste was generated at the 325B Annex by PNL.

According to interviews with 325B personnel, the 325B Hot Cells Annex was mainly an analytical facility performing two operations using spent fuel. One operation was spent fuel burnup analyses which involved determining how long fuel had been in the reactor and how much fuel had been used. The second operation was hydrothermal testing. In this operation, spent fuel was received from the 324 Building, loaded into autoclaves, reacted, down loaded and disposed of or dried and disposed of. The hydrothermal testing work was part of the Basalt Waste Isolation Project during the mid-1980's. These two operations should account for a majority of waste generated at the 325B Annex.

8.1.2.2 Weight. In the period between 1970 and 1985, approximately 916 kg of radioactive solid waste was generated at the 325B Annex by Westinghouse Hanford and placed in containers other than 55-gal drums. Figure 8-2 depicts the weight of TRU stored in containers other than 55-gal drums on an annual basis. In 1970, an additional 75 kg of TRU waste was generated at the 325B Annex by PNL.

The weight totals are approximations because individual container weights were not required prior to 1977. During an update of the R-SWIMS database in the mid-1980's, all waste containers without recorded weights were assigned standard values. For 325B Hot Cells Annex data, 1-gal cans appear to have been given a standard weight of 2.6 kg for 1970 through 1972. The heaviest weight for a 1-gal can was recorded in 1977 as 4.3 kg compared to the average weight per container of 2.5 kg for 1970 to 1992.

8.1.2.3 Volume. The volume of waste generated at the 325B Annex by Westinghouse Hanford and packaged in containers other than 55-gal drums during the period from 1970 through 1985 is less than 2 m³. Transuranic wastes account for all of the total volume. Figure 8-3 shows annual volumes of TRU waste generated by the 325B Annex and packaged in containers other than 55-gal drums. In 1970, 0.1 m³ of TRU waste was generated at the 325B Annex by PNL.

The volume of TRU waste generated at 325B follows a pattern similar to the number of containers of TRU waste generated at 325B.

8.2 WASTE CONTAINERS

8.2.1 TRU Waste Containers

Table 8-1 provides a summary of the TRU waste generated annually at the 325B Annex by Westinghouse Hanford sorted by container type. The greatest number of containers are 1-gal metal cans, 91% by count for both PNL and Westinghouse Hanford.

In December 1975, the 325B facility had just resumed operations after extensive modifications. This could explain the lack of data for 1974 and 1975. The typical mid-1970's operations included analytical analysis of irradiated mixed oxides fuels and fuel cladding samples such as follows:

- Analytical weighing
- Sample dissolution
- Sample dilution
- Aliquoting
- Emission spectrographic analysis
- Titrimetric analysis
- Solvent extraction
- Ion exchange separations.

Fuel waste from the burnup analysis was solidified and disposed of as a salt cake in 1-gal buckets. Fuel waste from hydrothermal testing was disposed of in a powder form. Personnel from the 325B Annex indicated that there is a backlog of hydrothermal testing waste that was never disposed of.

8.2.2 Non-TRU Waste Containers

According to the SWITS database, the 325B Annex generated no non-TRU waste either under PNL or Westinghouse Hanford from 1970 to 1992.

8.3 TRU WASTE STORAGE LOCATIONS

Table 8-3 provides the storage location for TRU waste packaged in 1-gal containers by year. All the 325B Annex waste by Westinghouse Hanford or PNL is stored in the caissons in burial ground 218-W-4B.

8.4 PHYSICAL CONTENTS OF TRU WASTE CONTAINERS

The physical contents of the 1-gal containers are shown in Tables 8-4. The top portion of this table indicates the number of containers for which a given component is listed; the bottom part of the table indicates the percentage of the total drums generated at the

325B Annex in that burial location that contain the listed constituent. Some of the more interesting physical contents include fuel pins or rods in 1983, graphite in 1980, and rubber in 1983 and 1984.

It should be noted that prior to 1978, physical contents were not required to be listed on the burial records. A great many of the contents on early records are listed only as "Miscellaneous."

8.5 RADIOLOGICAL DESCRIPTION OF 325B SOLID WASTE

Table 8-5 shows the number of grams of transuranics contained in waste stored in 1-gal containers cans each year by Westinghouse Hanford. Figure 8-4 shows the total amount of transuranics present in waste packages from the 325B Annex by Westinghouse Hanford. It should be noted that not all SWITS records for TRU Waste containers list the number of grams of TRU, particularly in the early 1970's.

8.6 RADIOACTIVE ISOTOPES PRESENT IN 325B SOLID WASTE

Information on radioactive isotopes was obtained from the SWITS database and from the 325B Safety Analysis Report (SAR) Supplement (Anderson and Hanthorn 1975). Isotopes known to be in the waste stream are presented in Table 8-7.

8.7 HAZARDOUS CONSTITUENTS OF SOLID WASTE GENERATED BY 325B HOT CELLS ANNEX

This section provides a review of the data on the hazardous components known or suspected to be in the solid waste stream from Westinghouse Hanford and PNL 325B Annex Hot Cells. Information was gathered from several sources, which include the SWITS database, SWBRs, personnel interviews, an internal report examining hazardous components of solid waste, *Inventory of Chemicals Used at Hanford Site Production Plants and Support Operations* (Klem 1990), and *Unstable and Reactive Chemicals in Transuranic Retrievable Waste at the Hanford Site* (Reddinger 1992).

8.7.1 Chemical Inventories

Table 5-22, discussed previously in Section 5.7.1, provides a list of chemicals used at the 325 Building Analytical Laboratory from 1953 to 1976. This list was developed by Klem (1990) to support waste characterization efforts for the single shell tanks. Though this list characterizes chemicals used in the Analytical Laboratory, it does not specify which of these chemicals may have been used in the 325B Hot Cells Annex.

8.7.2 Solid Waste Information and Tracking System (SWITS)

The hazardous constituent field in the SWITS database was searched for all containers from Westinghouse Hanford and PNL 325B Hot Cells Annex that contained radioactive mixed waste. This search indicated that no mixed waste containers from the 325B Hot Cells Annex were sent to the caissons.

8.7.3 Burial Records

The SWBR or SWSDR for a given container is the source of waste container information abstracted for the SWITS database. Often these records will have more detailed information on the hazardous components of waste containers than is found in SWITS. Additional data can also be found on the supplementary forms often attached to the SWBR or SWSDR. These supplementary documents include Uniform Hazardous Waste Manifests, Contents Inventory Sheets, NRC 741 Forms, and Storage/Disposal Approval Records (SDARS).

A thorough search of these microfilmed records verifies the results of the SWITS database search, which indicated that no mixed waste containers from the Westinghouse Hanford and PNL 325B Hot Cells Annex were sent to the solid waste burial grounds.

8.7.4 Interviews with 325 Building Personnel

From the information gained in interviews with 325 Building personnel, a list of known or suspected hazardous components in the solid waste stream has been compiled. This list of components can be found in Section 5.7.4. As this list applies to the entire 325 Building Analytical Laboratory, it is expected that some of the constituents may be part of the Hot Cell waste stream from the 325B Annex as well.

Figure 8-1. Other Container Waste Count Generated by the Westinghouse Hanford 325B Annex Annually.

2000-10-00000

Figure 8-2. Weight of Other Containers Generated by the Westinghouse Hanford 325B Annex Annually.

325B-02.WHC

325B-03.WHC

Figure 8-3. Volume of Other Containers Generated by the Westinghouse Hanford 325B Annex Annually.

Figure 8-4. Grams of TRU Waste Generated by the Westinghouse Hanford 325B Annex Annually.

325B-01.WHC

Table 8-1. TRU Waste Generated at the Westinghouse Hanford 325B Annex by Container Type and Year. (3 sheets)

Container Type	Container Size	Container Number	% of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1970							
Metal Drums, Barrels, Kegs	1-gal	25	100%	65	100%	0.1	100%
TOTALS		25		65		0.1	
1971							
Metal Drums, Barrels, Kegs	1-gal	80	100%	208	100%	0.3	100%
TOTALS		80		208		0.3	100%
1972							
Metal Drums, Barrels, Kegs	1-gal	48	98.0%	125	96.9%	0.2	95.2%
Self-Contained, Equipment	unknown	1	2.0%	4	3.1%	< 0.1	4.8%
TOTALS		49		129		0.2	
1973							
Metal Drums, Barrels, Kegs	1-gal	55	100%	143	100%	0.2	100%
TOTALS		55		143		0.2	
1974							
1975							
1976							
Metal Drums, Barrels, Kegs	1-gal	11	100%	30	100%	< 0.1	100%
TOTALS		11		30		< 0.1	
1977							
Metal Drums, Barrels, Kegs	1-gal	19	100%	81	100%	0.1	100%
TOTALS		19		81		0.1	
1978							
Metal Drums, Barrels, Kegs	1-gal	22	100%	67	100%	0.1	100%
TOTALS		22		67		0.1	

Table 8-1. TRU Waste Generated at the Westinghouse Hanford 325B Annex by Container Type and Year. (3 sheets)

Container Type	Container Size	Container Number	% of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1979							
Metal Drums, Barrels, Kegs	1-gal	33	100%	78	100%	0.2	100%
TOTALS		33		78		0.2	
1980							
Metal Drums, Barrels, Kegs	1-gal	17	100%	34	100%	0.1	100%
TOTALS		17		34		0.1	
1981							
Metal Drums, Barrels, Kegs	1-gal	13	100%	21	100%	0.1	100%
TOTALS		13		21		0.1	
1982							
1983							
Metal Drums, Barrels, Kegs	1-gal	18	100%	35	100%	0.1	100%
TOTALS		18		35		0.1	
1984							
Metal Drums, Barrels, Kegs	1-gal	10	100%	20	100%	< 0.1	100%
TOTALS		10		20		< 0.1	
1985							
Metal Drums, Barrels, Kegs	1-gal	3	100%	5	100%	< 0.1	100%
TOTALS		3		5		< 0.1	
1986							
1987							
1988							

Table 8-1. TRU Waste Generated at the Westinghouse Hanford 325B Annex by Container Type and Year. (3 sheets)

Container Type	Container Size	Container Number	% of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1988							
1989							
1990							
1991							
1992							

Table 8-2. The 325B Annex Westinghouse Hanford Waste Summary Data for Waste Containers Other Than 55-Gallon Drums.

Other Containers	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
TRU Count	25	80	49	55	0	0	11	19	22	33	17	13	0	18	10	3	0	0	0	0	0	0	0
TRU Wt. (kg)	65	208	129	143	0	0	30	81	67	78	34	21	0	35	20	5	0	0	0	0	0	0	0
TRU Vol. (m ³)	0.1	0.3	0.2	0.2	0	0	< 0.1	0.1	0.1	0.2	0.1	0.1	0	0.1	< 0.1	< 0.1	0	0	0	0	0	0	0
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Wt. (kg)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU Vol. (m ³)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage																							
%TRU Count																							
%Non-TRU Count																							
Wt% TRU																							
Wt% Non-TRU																							
Vol% TRU																							
Vol% Non-TRU																							
%MW Non-TRU by Count																							

Table 8-3. The 325B Annex Westinghouse Hanford TRU Waste in Containers Other Than 55-Gallon Drums:
Container Count by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-4B	25	80	49	55			11	19	22	33	17	13		18	10	3							

Table 8-4. Distribution and Percentage of TRU Containers Other than 55-Gallon Drum Physical Contents by Storage Location - 218-W-4B.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Cloth/Rags/Nylon									31	11	2		16										
Cotton/Kotex																3							
Fuel/Pins or Rods													2										
Glass									31	17	11					3							
Graphite										2													
Metal/Iron/ Galvanized Sheet									31	15	10		18	10	3								
Misc/Unknown/ Other	25	80	49	55			11	19	22	2													
Paper/Cardboard										31	17	13		16	10								
Plastic/Polyurethane										31	17	13		16	10	3							
Rubber														14	2								
Wood/Lumber/ Plywood											2												
Percentage																							
Cloth/Rags/Nylon									94%	65%	15%		89%										
Cotton/Kotex																100%							
Fuel/Pins or Rods														11%									
Glass									94%	100%	85%					100%							
Graphite										13%													
Metal/Iron/ Galvanized Sheet									94%	88%	77%		100%	100%	100%								
Misc/Unknown/ Other	100%	100%	100%	100%			100%	100%	100%	6%													
Paper/Cardboard										94%	100%	100%		89%	100%								
Plastic/Polyurethane										94%	100%	100%		89%	100%	100%							
Rubber														78%	20%								
Wood/Lumber/ Plywood											12%												

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Table 8-5. The 325B Annex Westinghouse Hanford TRU Waste in Containers Other Than 55-Gallon Drums: Total Grams TRU by Storage Location.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
218-W-4B	0.5	8.8	29.6	51.7			18.1	22.8	52.3	59.0	57.3	52.4		41.4	46.2	2.7							
TOTALS	0.5	8.8	29.6	51.7			18.1	22.8	52.3	59.0	57.3	52.4		41.4	46.2	2.7							

**Table 8-6. Characterization of TRU Waste
from the PNL 325B Annex in 1 Gallon
Containers Stored at 218-W-4B.**

1970	
TRU Containers	25
TRU Wt. (kg)	75
TRU Volume (m ³)	0.1
TRU Grams	0.01

**Table 8-7. Isotopes in Other Containers for the 325B Annex from 1970
to 1992.**

Isotope	Half-Life	Quantity (g)	Radiation
²⁴¹ Cm	433Y	0.2	α , γ
²³⁷ Np	2.14x10 ⁶ Y	0.93	α , γ
²³² Th	1.41.x10 ¹⁰ Y	183.41	α , γ
²³³ U	1.592x10 ⁵ Y	3.64	α , γ
Pu total	*	0.005/438.0431	*
U depleted	*	0/1373.74	*
U enriched	*	5.0/4001.44	*
U natural	*	0/163.42	*

PNL/Westinghouse Hanford.

* = Varies according to isotopes

Y = Years.

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9.0 REFERENCES

- AEC, 1970, *Immediate Action Directive 0511-21*, U.S. Atomic Energy Commission, Washington, D.C.
- AEC, 1973, *Atomic Energy Commission Manual*, Chapter 0511, "Radioactive Waste Management," U.S. Atomic Energy Commission, Washington, D.C.
- Anderson, B. C., J. D. Anderson, J. A. Demiter, D. R. Duncan, L. A. Fort, D. C. McCann, and S. J. Stone, 1991, *Contact-Handled Transuranic Waste Characterization Based on Existing Records*, WHC-EP-0225, Revision 1, Westinghouse Hanford Company, Richland, Washington.
- Anderson, H. J., and H. E. Hanthorn, 1975, *Safety Analysis Report for the 325 Radiochemistry Building*, TC-299, Revision 1, Hanford Engineering Development Laboratory, Westinghouse Hanford Company, Richland, Washington.
- Anderson, H. J., and H. E. Hanthorn, 1977, *Safety Analysis Report for the 325 Radiochemistry Building*, TC-299, Revision 2, Hanford Engineering Development Laboratory, Westinghouse Hanford Company, Richland, Washington.
- DOE, 1980, *Radioactive Waste Management*, DOE Order 5820.2A, U.S. Department of Energy, Washington, D.C.
- DOE, 1982, *Management of Transuranic Material*, DOE Order 5820.1, U.S. Department of Energy, Washington, D.C.
- DOE, 1987, *Radioactive Waste: Byproducts Material Final Rule*, 10 CFR 962, Federal Register, 52 FR 159397-1592, U.S. Department of Energy, Washington, D.C.
- DOE, 1988, *Radioactive Waste Management*, DOE Order 5820.2A, U.S. Department of Energy, Washington, D.C.
- DOT, 1989, *Transportation*, Title 49, Code of Federal Regulations, Parts 100 to 199, U.S. Department of Transportation, Washington, D.C.
- Duncan, D. R., D. A. Burbank, B. C. Anderson, and J. A. Demiter, *Application of Service Examinations to Transuranic Waste Container Integrity at the Hanford Site*, WHC-SA-1450FP, Westinghouse Hanford Company, Richland, Washington, October 1992.
- Ecology, 1989, *Dangerous Waste Regulations*, Chapter 173-303, Washington Administrative Code, Washington State Department of Ecology, Olympia, Washington.
- EPA, 1976, *Resource Conservation and Recovery Act*, Public Law 94-580, 90 Stat. 2003, 42 USC 6901 et seq.
- EPA, 1989, *Spill Table*, 40 CFR 302.4, Environmental Protection Agency, Washington, D.C.

- EPA, 1990, *Licensing Requirements for Land Disposal of Radioactive Waste*, Title 10, Code of Federal Regulations, Part 61, U.S. Environmental Protection Agency, Washington, D.C.
- EPA, 1991, *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, Title 40, Code of Federal Regulations, Part 265, U.S. Environmental Protection Agency, Washington, D.C.
- Gerber, M. S., 1992, *Past Practices Technical Characterization Study - 300 Area - Hanford Site*, WHC-MR-0388, Westinghouse Hanford Company, Richland, Washington.
- HEDL, 1975a, *Analytical Chemistry Laboratory Manual*, MG-28, Volume 2: *Analytical Methods for Mixed Uranium-Plutonium Oxide Fuel*, Hanford Engineering Developmental Laboratory, Westinghouse Hanford Company, Richland, Washington.
- HEDL, 1975b, *Analytical Chemistry Laboratory Manual*, MG-28, Volume 3: *Analytical Methods for Boron Carbide Absorbers*, Hanford Engineering Developmental Laboratory, Westinghouse Hanford Company, Richland, Washington.
- Klem, M. J., 1990, *Inventory of Chemicals Used at Hanford Site Production Plants and Support Operations (1944-1980)*, WHC-ED-0172, Revision 1, Westinghouse Hanford Company, Richland, Washington.
- McCormack, C. G., 1969, *325 Building Safety Analysis Report*, BNWL-CC-1913, Battelle-Northwest, Richland, Washington. *Please note that this document is not publicly available due to its age.*
- NIOSH, 1992, *Registry of Toxic Effects of Chemical Substances Quarterly Issue*, July 1992 Microfiche edition, National Institute for Occupational Safety and Health, Cincinnati, Ohio.
- Reddinger, R.W., 1992, *Unstable and Reactive Chemicals in TRU Retrievable Waste at the Hanford Site - A Review of Available Data*, WHC-EP-0603, Westinghouse Hanford Company, Richland, Washington.
- U.S. Department of Interior, 1973, *Fire and Explosion Hazard Evaluation - Waste Storage Facility - AEC Hanford Operations - Richland, Washington*, United States Department of Interior, Mining Enforcement and Safety Administration, Health and Safety Technical Support, Washington, D.C.
- WHC, 1981, *Waste Management Manual*, MG-17, Rev. 17, Hanford Engineering Development Laboratory, Westinghouse Hanford Company, Richland, Washington.
- Willis, N.P., and Triner, 1991, *Hanford Site Radioactive Solid Waste Acceptance Criteria*, WHC-EP-0063-3, Westinghouse Hanford Company, Richland, Washington.
- WIPP, 1989, *TRU Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, WIPP-DOE-069, Revision 3, Westinghouse Electric Corporation, Carlsbad, New Mexico.

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APPENDIX A

**DATA ON BUILDING 325 WASTE GENERATION BY WESTINGHOUSE HANFORD
FROM THE SOLID WASTE INFORMATION TRACKING SYSTEM**

The information found in this appendix is from the Solid Waste Information and Tracking System (SWITS) database. This database incorporates the older R-SWIMS database and is used to track information on radioactive and other wastes stored or disposed at the Hanford Site.

Each SWITS data run in this appendix is preceded by the query used to generate the data. A brief explanation of the run and any additional information needed to understand the data presented is also included.

The bulk of the data provided is limited to information about TRU waste generated at Building 325 by Westinghouse Hanford; however, some general information on the non-TRU waste is included for completeness. The term non-TRU is used, instead of LLW, because a small percentage of the waste has been designated only as not TRU. It is believed that most, if not all, of the non-TRU waste is LLW.

The data runs in this appendix are further segregated by waste container type. Since initial retrieval efforts and WRAP 1 will focus on 55-gal drums, these container types are considered separately.

Some general information about SWITS database and the codes used follows. Please note the disclaimer found on the next page.

DON'T SAY IT --- Write It !

Date:

To: *Judy Pattmeyer*

From: Solid Waste Engineering Data Management Group
N3-11 6-4394/6-4020

Re: SWITS DATA REQUEST

Attached for your information and use is the data which you requested. This data represents best available information regarding wastes currently in storage at the Hanford Site. I trust the information will be suitable to your needs.

Requests for information from the Solid Waste Information and Tracking System (SWITS) are normally relatively limited in scope, requesting specific data fields or summary data. The responses to these requests undergo review during data collection, summary and response preparation.

The response to this request represents a simple reproduction of the SWITS Database. Transmittal of this information is made with the following disclaimers:

- 1) The information contained in this transmittal is raw data, and represents information provided to Solid Waste Engineering (SWE) on burial records or other documents. This data has not been validated.
- 2) The information contained in this transmittal is subject to change without notice. Continual update of SWITS information and improvement of the software system make it impossible to ensure consistency of this data with the database after transmittal.
- 3) This information is current as of 12/11/92.

If I can be of further assistance to you, do not hesitate to call me.

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SWIR401

Solid Waste Information and Tracking System

05/01/92

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Primary Waste Type Code Table

Primary Waste Type Code	Primary Waste Type Description	Ship Time	Rad
AH	HAZ, ADMIN HOLD	89	N
CM	MORATORIUM CONTROLLED	89	N
H	HAZARDOUS	89	N
HP	HAZARDOUS WASTE PCB	29	N
M	MIXED	89	Y
MP	MIXED PCB	29	Y
N	NON-REGULATED		N
P	PCB	29	N
R	RADIOACTIVE		Y
RP	RADIOACTIVE PCB	29	Y
U	UNKNOWN		N

Secondary Waste Type Code Table

Secondary Waste Type Code	Secondary Waste Group	Secondary Waste Type Description
1A	TRU	TRANSURANIC (NOT PROCESSED THROUGH TRUSAF)
1B	TRU	TRANSURANIC CLASSIFIED
1C	TRU	TRANSURANIC WIPP CERTIFIED
1D	TRU	TRANSURANIC WIPP UNCERTIFIED
1E	TRU	TRANSURANIC SPECIAL CASE
1F	TRU	TRANSURANIC CAISSONS
2A	LLW	LOW-LEVEL NON-INDUSTRIAL
2B	LLW	LOW-LEVEL NON-INDUSTRIAL CLASSIFIED
2F	LLW	LOW-LEVEL CAISSONS
2L	LLW	LOW-LEVEL NON-INDUSTRIAL (ASSAYED FROM TRU)
3A	LLW	LOW-LEVEL INDUSTRIAL
3L	LLW	LOW-LEVEL INDUSTRIAL (ASSAYED FROM TRU)
4A	HLW	HIGH LEVEL WASTE (SPENT FUEL)
UA	USG	UNSEGREGATED NON-TRANSURANIC DRY WASTE
UB	USG	UNSEGREGATED NON-TRANSURANIC INDUSTRIAL
UC	USG	UNSEGREGATED CAISSONS (REMOTE HANDLED)
UF	USG	UNSEGREGATED TRANSURANIC/LOW-LEVEL (TUNNELS PUREX)
UG	USG	UNSEGREGATED TRANSURANIC DRY WASTE
UJ	USG	UNSEGREGATED TRANSURANIC INDUSTRIAL

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APPENDIX A.1

**CONTAINER NUMBER AND WEIGHT OF TRU WASTE IN
55-GALLON DRUMS BY WASTE TYPE**

This data run gives an overall look at the waste types, container numbers and total weight (in kilograms) of the radioactive wastes generated at Building 325 by Westinghouse Hanford on a yearly basis. These data are for wastes stored in 55-gal drums only. The meanings of primary and secondary waste codes can be found in the introductory materials for this appendix.

The data in the average weight column should be taken cautiously, especially for LLW codes. Concern is warranted because LLW records are still done on a batch basis. This means that one weight datum may be the composite weight for a group of drums. The computer program used simply divided the sum of all weight values by the number of values used to compute the total weight, not the actual number of containers that the value represents.

From 1970 until 1978 individual container weights were not required for TRU drums. During the data re-entry program in the mid-1980's standard weights were assigned for all container types; 55-gal drums were given a standard weight of 68 kg. This is why the average weight/drum for TRU is so consistent during this period.

```

set linesize 170
set pagesize 45
newpage 0
spool pot2.srep
title center '325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(con_cntr_vol) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Type"
col sum(rdet_rswims_count) format 999999 heading "Count"
col avg(con_gross_wgt) format 99999.99 heading "Avg|Weight"
col sum(con_gross_wgt) format 999999.99 heading "Sum|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Sum|Vol"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Vol"
col cntyp_descr format a30 heading "Container Description"
col con_size_descr format a25 heading "Container Size"
select substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       sum(rdet_rswims_count),
       sum(con_gross_wgt),
       avg(con_gross_wgt),
       sum(con_cntr_vol),
       avg(con_cntr_vol)
from radwaste, cntype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON' and con_cntyp_cd = cntyp_cd
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       rdet_swtyp_cd
;
spool off

```

325 WHC

Date	Container Description	Container Size	Pri Wast Type	Sec Wast Type	Count	Sum Weight	Avg Weight	Sum Vol	Avg Vol
1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	3	204.12	204.12	.64	.64

sum					3	204.12		.64	
1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	25	9071.80	9071.80	5.31	5.31

sum					25	9071.80		5.31	
1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	7	825.99	275.33	1.49	.50

sum					7	825.99		1.49	
1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	6	1519.53	1519.53	1.27	1.27

sum					6	1519.53		1.27	
1988	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	1	149.68	149.68	.21	.21

sum					1	149.68		.21	
1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	3	239.94	79.98	.63	.21

sum					3	239.94		.63	
1970	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	67	4558.68	68.04	14.07	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	10	680.39	226.80	2.12	.71

sum					77	5239.07		16.19	
1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	238	16193.52	68.04	49.98	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	32	2177.26	197.93	6.74	.61

sum					270	18370.78		56.72	
1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	238	16193.52	68.04	49.99	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	58	4156.25	296.88	12.27	.88

sum					296	20349.77		62.26	
1973	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	217	14764.68	68.04	45.57	.21

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Date	Container Description	Container Size	Pri Wast Type	Sec Wast Type	Count	Sum Weight	Avg Weight	Sum Vol	Avg Vol
1973	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	93	11189.18	508.60	19.75	.90

sum					310	25953.86		65.32	
1974	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	254	17576.99	69.20	53.34	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	67	8378.27	492.84	14.23	.84

sum					321	25955.26		67.57	
1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218	15445.05	70.85	45.78	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	143	15935.07	408.59	30.37	.78

sum					361	31380.12		76.15	
1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	162	11022.48	68.04	34.02	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	134	13035.27	449.49	28.45	.98

sum					296	24057.75		62.47	
1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	140	9521.06	68.01	29.40	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	110	18782.24	569.16	23.36	.71

sum					250	28303.30		52.76	
1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	307	42781.36	139.35	64.47	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	159	20449.69	454.44	33.76	.75

sum					466	63231.05		98.23	
1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	437	29733.48	68.04	91.77	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	113	13628.11	412.97	24.00	.73

sum					550	43361.59		115.77	
1980	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	91	6191.64	68.04	19.11	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	74	15561.78	2223.11	15.72	2.25

sum					165	21753.42		34.83	

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APPENDIX A.2

**BUILDING 325 WESTINGHOUSE HANFORD TRU WASTE CONTAINERS
SORTED BY CONTAINER DESCRIPTION, SIZE, YEAR,
AND PRIMARY WASTE TYPE**

This subappendix provides information on Building 325 Westinghouse Hanford TRU waste containers, weight, volume, and primary waste type stored at various TRU waste storage facilities on the Hanford Site. The data provides the TRU waste generation from the Building 325 Westinghouse Hanford Facility by year.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot3.srep
title center 'TRU WASTE- 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_de format a4 heading "Sec|Wast|Type"
col sum(con_gross_wgt) format 999999.99 heading "Weight"
col sum(rdet_rswims_count) format 99999 heading "Count"
col avg(con_gross_wgt) format 999999.99 heading "Avg|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Volume"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Volume"
col cntyp_descr format a55 heading "Container Discription"
col con_size_descr format a45 heading "Container Size"
col con_locn_facil_id format a8 heading "Facility"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    con_locn_facil_id
;
spool off

```


Container Discription	Container Size	Date	Pri	Facility	Count	Weight	Avg	Volume	Avg
			Wast						
CONCRETE BOXES	3*3*3	1972	R	218W48	13	10566.79	812.83	9.95	.77

		SUM			13	10566.79		9.95	
CONCRETE BOXES	3*3*3	1977	R	218W48	1	796.05	796.05	.77	.77

		SUM			1	796.05		.77	
CONCRETE BOXES	3*3*3	1978	R	218W3A	7	7200.77	1028.68	4.75	.68
CONCRETE BOXES	3*3*3		R	218W48	2	489.88	244.94	1.53	.77

		SUM			9	7690.65		6.28	
CONCRETE BOXES	4*4*4	1972	R	218W48	3	4300.02	1433.34	5.44	1.81

		SUM			3	4300.02		5.44	
CONCRETE CYLINDERS, CASKS	7*12	1977	R	218W48	1	5869.45	5869.45	13.08	13.08

		SUM			1	5869.45		13.08	
GLOVE BOXES	UNKNOWN	1972	R	218W48	2	3048.12	1524.06	6.80	3.40

		SUM			2	3048.12		6.80	
GLOVE BOXES	UNKNOWN	1974	R	218W48	7	1803.04	257.58	4.02	.57

		SUM			7	1803.04		4.02	
HEPA FILTERS	UNKNOWN	1970	R	218W3A	5	5004.01	1000.80	11.16	2.23

		SUM			5	5004.01		11.16	
HEPA FILTERS	UNKNOWN	1974	R	218W48	4	1371.64	342.91	3.06	.77

		SUM			4	1371.64		3.06	
METAL BOXES, CARTONS, CASES	1250 CU FT	1975	R	218W3A	1	15875.65	15875.65	35.40	35.40

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Container Discription	Container Size	Pri Wast		Date	Type	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		sum					1	15875.65		35.40	
METAL BOXFS, CARTONS, CASES	4*4*4	1972	R			218W4B	2	1625.66	812.83	3.62	1.81

		sum					2	1625.66		3.62	
METAL BOXES, CARTONS, CASES	4*4*5	1976	R			218W4B	1	1016.04	1016.04	2.27	2.27
METAL BOXES, CARTONS, CASES	4*5*9		R			218W4B	1	2286.09	2286.09	5.10	5.10

		sum					2	3302.13		7.36	
METAL BOXES, CARTONS, CASES	4*6*10	1985	R			218W4C	1	2042.06	2042.06	7.07	7.07

		sum					1	2042.06		7.07	
METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	1980	R			218W4C	1	2494.75	2494.75	11.50	11.50

		sum					1	2494.75		11.50	
METAL BOXES, CARTONS, CASES	5*5*5	1974	R			218W3A	1	1587.57	1587.57	3.54	3.54
METAL BOXES, CARTONS, CASES	7*10*16		R			218W3A	1	14224.58	14224.58	31.72	31.72

		sum					2	15812.15		35.26	
METAL DRUMS, BARRELS, KEGS	110 GALLON	1976	R			218W4B	1	136.08	136.08	.42	.42

		sum					1	136.08		.42	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1970	R			218W3A	17	693.94	40.82	1.97	.12

		sum					17	693.94		1.97	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1971	R			218W3A	1	40.32		.12	.12

		sum					1	40.32		.12	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R			218W3A	67	4558.68		14.07	.21

		sum					67	4558.68		14.07	

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Container Discription	Container Size	Pri Wast Date Type Facility	Count	Weight	Avg Weight	Volume	Avg Volume
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R 218W3A	76	5171.04	68.04	15.96	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R 218W4B	162	11022.48	68.04	34.02	.21

		sum	238	16193.52		49.98	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R 218W4B	238	16193.52	68.04	49.99	.21

		sum	238	16193.52		49.99	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R 218W4B	217	14764.68	68.04	45.57	.21

		sum	217	14764.68		45.57	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R 218W4B	254	17576.99	69.20	53.34	.21

		sum	254	17576.99		53.34	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R 218W4B	218	15445.05	70.85	45.78	.21

		sum	218	15445.05		45.78	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R 218W4B	162	11022.48	68.04	34.02	.21

		sum	162	11022.48		34.02	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R 218W4B	140	9521.06	68.01	29.40	.21

		sum	140	9521.06		29.40	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R 218W3A	94	28473.94	302.91	19.74	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R 218W4C	213	14307.42	67.17	44.73	.21

		sum	307	42781.36		64.47	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R 218W4C	437	29733.48	68.04	91.77	.21

		sum	437	29733.48		91.77	

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Container Discription	Container Size	Pri Wast		Count	Weight	Avg		Avg
		Date	Type Facility			Weight	Volume	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R	218W4C	91	6191.64	68.04	19.11	.21
		****		-----	-----	-----	-----	-----
		SUM		91	6191.64		19.11	
MISCELLANEOUS SCRAP	UNKNOWN	1972 R	218W4B	5	267.60	53.52	.60	.12
		****		-----	-----	-----	-----	-----
		SUM		5	267.60		.60	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1974 R	218W4B	4	2313.32	578.33	5.15	1.29
		****		-----	-----	-----	-----	-----
		SUM		4	2313.32		5.15	
TANKS, PORTABLE	UNKNOWN	1971 R	218W3A	1	457.22	457.22	1.02	1.02
		****		-----	-----	-----	-----	-----
		SUM		1	457.22		1.02	
TANKS, PORTABLE	UNKNOWN	1974 R	218W4B	6	505.14	84.19	1.12	.19
		****		-----	-----	-----	-----	-----
		SUM		6	505.14		1.12	
WOODEN BOXES, CARTONS, CASES	3.17*5*10.3	1978 R	218W4B	1	1995.80	1995.80	4.64	4.64
		****		-----	-----	-----	-----	-----
		SUM		1	1995.80		4.64	
WOODEN BOXES, CARTONS, CASES	4*4*4	1975 R	218W3A	5	4064.15	812.83	9.06	1.81
		****		-----	-----	-----	-----	-----
		SUM		5	4064.15		9.06	

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APPENDIX A.3

**BUILDING 325 WESTINGHOUSE HANFORD NON-TRU WASTE CONTAINERS
SORTED BY CONTAINER DESCRIPTION, SIZE, YEAR,
AND PRIMARY WASTE TYPE**

This subappendix provides information on Building 325 Westinghouse Hanford non-TRU waste containers, weight, volume, and primary waste type stored at various waste storage facilities on the Hanford Site. The data provides the non-TRU waste generation from the Building 325 Westinghouse Hanford Facility by year.

```

set linesize 175
set pagesize 45
set newpage 0
spool pot3a.srep
title center 'NON-TRU WASTE- 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Type"
col sum(con_gross_wgt) format 999999.99 heading "Weight"
col sum(rdet_rswims_count) format 99999 heading "Count"
col avg(con_gross_wgt) format 999999.99 heading "Avg|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Volume"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Volume"
col cntyp_descr format a55 heading "Container Discription"
col con_size_descr format a45 heading "Container Size"
col con_locn_facil_id format a8 heading "Facility"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Code"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and rdet_swtyp_cd in ('2A','2B','2L','3A','3L','UA','UB') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id
;
spool off

```


Container Discription	Container Size	Date	Pri	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
			Wast	Wast						
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1970	R	2A	218W3A	1	889.04	889.04	1.98	1.98

		SUM				1	889.04		1.98	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1971	R	2A	218W4B	6	88.90	44.45	1.54	.77

		SUM				6	88.90		1.54	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1972	R	2A	218W3A	29	2286.09	457.22	7.09	1.42

		SUM				29	2286.09		7.09	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1974	R	2A	218W3A	3	425.47	212.74	.95	.47

		SUM				3	425.47		.95	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1975	R	2A	218W3A	36	5759.68	639.96	13.42	1.49

		SUM				36	5759.68		13.42	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1976	R	2A	218W3A	13	768.39	192.10	1.71	.43

		SUM				13	768.39		1.71	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1977	R	2A	218W3A	13	3925.37	654.23	8.96	1.49

		SUM				13	3925.37		8.96	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1978	R	2A	218W3A	7	290.29	72.57	.91	.23

		SUM				7	290.29		.91	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1979	R	2A	218W3A	12	160.58	53.53	.43	.14

		SUM				12	160.58		.43	
CONCRETE BOXES	2*3*6	1970	R	2A	218W3A	2	3919.02	3919.02	2.04	2.04

		SUM				2	3919.02		2.04	

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NON-TRU WASTE- 325 WHC

WHC-EP-0696

Pri Sec
Wast Mast

Container Discription	Container Size	Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
CONCRETE BOXES	3*3*3	1975 R	2A	218	USA	7	5574.62	5574.62	5.35	5.35

		Sum				7	5574.62		5.35	
CONCRETE BOXES	3*3*3	1976 R	2A	218	USA	8	6368.40	6368.40	6.12	6.12

		Sum				8	6368.40		6.12	
CONCRETE BOXES	3*3*3	1978 R	2A	218	USA	3	2240.73	2240.73	2.17	2.17

		Sum				3	2240.73		2.17	
CONCRETE BOXES	3*3*3	1979 R	2A	218	USA	7	7438.88	7438.88	4.73	4.73

		Sum				7	7438.88		4.73	
CONCRETE BOXES	4*4*4	1975 R	2A	218	USA	1	1886.93	1886.93	1.81	1.81

		Sum				1	1886.93		1.81	
CONCRETE BOXES	UNKNOWN	1972 R	2A	218	USA	1	1886.93	1886.93	1.81	1.81

		Sum				1	1886.93		1.81	
CONCRETE BOXES	UNKNOWN	1976 R	2A	218	USA	1	737.08	737.08	.71	.71

		Sum				1	737.08		.71	
CONCRETE CYLINDERS, CASKS	7*12	1978 R	2A	218	USA	2	1746.32	1746.32	9.91	9.91

		Sum				2	1746.32		9.91	
DUMP TRUCK	UNKNOWN	1973 R	2A	218	USA	1	1905.08	1905.08	1.70	1.70

		Sum				1	1905.08		1.70	
DUMP TRUCK	UNKNOWN	1981 R	2A	218	USA	1	2204.45	2204.45	1.53	1.53

		Sum				1	2204.45		1.53	

Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg Weight	Volume	Avg Volume
		Date	Type	Code Facility					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1971	R	2A 218W3A	34	185.06	185.06	2.12	2.12

		SUM			34	185.06		2.12	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1972	R	2A 218W3A	3	21.77	21.77	.10	.10

		SUM			3	21.77		.10	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1975	R	2A 218W3A	6	40.82	40.82	.75	.75

		SUM			6	40.82		.75	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1977	R	2A 218W3A	35	455.86	151.95	4.36	1.45

		SUM			35	455.86		4.36	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1979	R	2A 218W3A	20	94.81	31.60	.96	.32

		SUM			20	94.81		.96	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970	R	2A 218W3A	603	7658.39	156.29	76.84	1.57

		SUM			603	7658.39		76.84	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1971	M	2A 218W48	18	228.61	228.61	2.29	2.29
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		R	2A 218W3A	544	6909.10	300.40	69.32	3.01
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		R	2A 218W48	584	7527.80	358.47	74.59	3.55

		SUM			1146	14665.51		146.20	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972	R	2A 218W3A	1174	16885.35	337.71	149.97	3.00

		SUM			1174	16885.35		149.97	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1973	R	2A 218W3A	1549	19673.16	258.86	197.95	2.60

		SUM			1549	19673.16		197.95	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1974	R	2A 218W3A	1566	19901.68	234.14	199.68	2.35

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Container Discription	Container Size	Pri Sec			Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast										
					SUM				1566	19901.68		199.68	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN				1975	R	2A	218W3A	1967	24981.95	247.35	250.65	2.48

					SUM				1967	24981.95		250.65	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN				1976	R	2A	218W3A	2274	28582.50	294.66	286.98	2.96

					SUM				2274	28582.50		286.98	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN				1977	H	2A	218W3A	55	698.53	349.27	7.01	3.50
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN					R	2A	218W3A	2031	25863.94	235.13	260.51	2.37

					SUM				2086	26562.47		267.52	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN				1978	R	2A	218W3A	2919	40887.91	312.12	372.54	2.84

					SUM				2919	40887.91		372.54	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN				1979	H	2A	218W3A	14	177.81	177.81	1.78	1.78
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN					R	2A	218W3A	2397	30633.66	297.41	305.45	2.97

					SUM				2411	30811.47		307.23	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN				1980	R	2A	218W3A	207	2737.87	248.90	26.38	2.40
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN					R	3A	218W3A	4	2721.54	2721.54	14.50	14.50

					SUM				211	5459.41		40.87	
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN				1975	R	2A	218W3A	1	571.52	571.52	1.27	1.27

					SUM				1	571.52		1.27	
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN				1977	R	2A	218W3A	1	38.10	38.10	.09	.09

					SUM				1	38.10		.09	
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN				1979	R	2A	218W3A	1	40.82	40.82	.18	.18

					SUM				1	40.82		.18	

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
GLOVE BOXES	UNKNOWN	1971 R	2A	218M3A	2	829.61	414.81	1.85	.92
		****			-----	-----	-----	-----	
		SUM			2	829.61		1.85	
GLOVE BOXES	UNKNOWN	1973 R	2A	218M3A	1	787.43	787.43	1.76	1.76
		****			-----	-----	-----	-----	
		SUM			1	787.43		1.76	
GLOVE BOXES	UNKNOWN	1974 R	2A	218M3A	2	1054.14	527.07	2.35	1.18
		****			-----	-----	-----	-----	
		SUM			2	1054.14		2.35	
GLOVE BOXES	UNKNOWN	1975 R	2A	218M3A	1	12346.72	12346.72	27.52	27.52
		****			-----	-----	-----	-----	
		SUM			1	12346.72		27.52	
GLOVE BOXES	UNKNOWN	1979 R	2A	218M3A	1	186.43	186.43	.89	.89
		****			-----	-----	-----	-----	
		SUM			1	186.43		.89	
HEPA FILTERS	UNKNOWN	1970 R	2A	218M3A	10	1568.51	1568.51	3.50	3.50
		****			-----	-----	-----	-----	
		SUM			10	1568.51		3.50	
HEPA FILTERS	UNKNOWN	1973 R	2A	218M3A	1	127.01	127.01	.28	.28
		****			-----	-----	-----	-----	
		SUM			1	127.01		.28	
HEPA FILTERS	UNKNOWN	1975 R	2A	218M3A	37	2159.09	539.77	6.85	1.71
		****			-----	-----	-----	-----	
		SUM			37	2159.09		6.85	
HEPA FILTERS	UNKNOWN	1976 R	2A	218M3A	90	8479.41	1059.93	17.79	2.22
		****			-----	-----	-----	-----	
		SUM			90	8479.41		17.79	
HEPA FILTERS	UNKNOWN	1977 R	2A	218M3A	69	1169.81	129.98	9.39	1.04
		****			-----	-----	-----	-----	
		SUM			69	1169.81		9.39	

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Container Discription	Container Size	Pri Sec		Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast						
Date	Type	Code							
HEPA FILTERS	UNKNOWN	1978 R	2A	218W3A	182	7024.26	219.51	22.55	.70

		SUM			182	7024.26		22.55	
HEPA FILTERS	UNKNOWN	1979 M	2A	218W3A	10	752.05	752.05	1.42	1.42
HEPA FILTERS	UNKNOWN		R	218W3A	219	6188.33	247.53	26.36	1.05

		SUM			229	6940.38		27.78	
HEPA FILTERS	UNKNOWN	1980 R	2A	218W3A	54	917.62	183.52	7.11	1.42

		SUM			54	917.62		7.11	
METAL BOXES, CARTONS, CASES	108 CU FT	1977 R	2A	218W3A	1	1371.66	1371.66	3.06	3.06
METAL BOXES, CARTONS, CASES	2*2*3		R	218W3A	9	1299.99	1299.99	2.91	2.91

		SUM			10	2671.65		5.96	
METAL BOXES, CARTONS, CASES	2*3*4	1976 R	2A	218W3A	1	304.81	304.81	.68	.68
METAL BOXES, CARTONS, CASES	3*3*4		R	218W3A	2	914.44	914.44	2.04	2.04
METAL BOXES, CARTONS, CASES	4*4*6		R	218W3A	1	1219.25	1219.25	2.72	2.72

		SUM			4	2438.50		5.44	
METAL BOXES, CARTONS, CASES	4*5*6	1970 R	2A	218W3A	6	4292.78	4292.78	9.57	9.57

		SUM			6	4292.78		9.57	
METAL BOXES, CARTONS, CASES	4*5*6	1976 R	2A	218W3A	2	127.01	127.01	.28	.28

		SUM			2	127.01		.28	
METAL BOXES, CARTONS, CASES	4*5*9	1977 R	2A	218W3A	16	2784.14	2784.14	6.21	6.21

		SUM			16	2784.14		6.21	
METAL BOXES, CARTONS, CASES	5*5*7	1978 R	2A	218W3A	1	770.20	770.20	4.81	4.81

		SUM			1	770.20		4.81	

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
METAL BOXES, CARTONS, CASES	6*8*12	1979	R	2A 218W3A	1	2041.16	2041.16	16.31	16.31

		SUM			1	2041.16		16.31	
METAL BOXES, CARTONS, CASES	UNKNOWN	1977	R	2A 218W3A	2	187.79	187.79	.43	.43

		SUM			2	187.79		.43	
METAL BOXES, CARTONS, CASES	UNKNOWN	1980	R	2A 218W3A	1	152.41	152.41	.34	.34

		SUM			1	152.41		.34	
METAL CYLINDER, CASKS	UNKNOWN	1975	R	2A 218W3A	12	7876.14	3938.07	17.56	8.78

		SUM			12	7876.14		17.56	
METAL CYLINDER, CASKS	UNKNOWN	1977	M	2A 218W3A	2	1219.25	1219.25	2.72	2.72
METAL CYLINDER, CASKS	UNKNOWN		R	2A 218W3A	2	90.72	45.36	.16	.08

		SUM			4	1309.97		2.87	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1978	R	2A 218W3A	2	27.22	27.22	.01	.01

		SUM			2	27.22		.01	
METAL DRUMS, BARRELS, KEGS	110 GALLON	1976	R	2A 218W3A	8	1502.30	751.15	3.40	1.70

		SUM			8	1502.30		3.40	
METAL DRUMS, BARRELS, KEGS	110 GALLON	1977	R	2A 218W3A	2	272.15	272.15	.85	.85

		SUM			2	272.15		.85	
METAL DRUMS, BARRELS, KEGS	110 GALLON	1978	R	2A 218W3A	1	453.59	453.59	.41	.41

		SUM			1	453.59		.41	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1973	R	2A 218W3A	4	176.90	176.90	.46	.46

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AIM

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Inches

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
		sum			4	176.90		.46	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1974 R	2A	218W3A	23	938.93	469.47	2.75	1.37

		sum			23	938.93		2.75	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1976 R	2A	218W3A	1	40.82	40.82	.12	.12

		sum			1	40.82		.12	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1977 R	2A	218W3A	9	349.26	116.42	2.04	.68

		sum			9	349.26		2.04	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1978 R	2A	218W3A	3	190.05	63.35	.38	.13

		sum			3	190.05		.38	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1979 R	2A	218W3A	2	76.65	38.33	.27	.13

		sum			2	76.65		.27	
METAL DRUMS, BARRELS, KEGS	5 GALLON	1977 R	2A	218W3A	2	48.08	24.04	.09	.04

		sum			2	48.08		.09	
METAL DRUMS, BARRELS, KEGS	5 GALLON	1978 R	2A	218W3A	3	68.04	68.04	.16	.16

		sum			3	68.04		.16	
METAL DRUMS, BARRELS, KEGS	5 GALLON	1979 R	2A	218W3A	2	45.36	45.36	.06	.06

		sum			2	45.36		.06	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970 R	2A	218W3A	10	680.39	226.80	2.12	.71

		sum			10	680.39		2.12	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 M	2A	218W4B	3	204.12	204.12	.64	.64
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W3A	18	1224.71	204.12	3.78	.63

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg Weight	Volume	Avg Volume
		Date	Type	Code Facility					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R	2A	218W4B	14	952.55	190.51	2.97	.59

		SUM			35	2381.38		7.38	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R	2A	218W3A	58	4156.25	296.88	12.27	.88

		SUM			58	4156.25		12.27	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R	2A	218W3A	93	11189.18	508.60	19.75	.90

		SUM			93	11189.18		19.75	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R	2A	218W3A	67	8378.27	492.84	14.23	.84

		SUM			67	8378.27		14.23	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R	2A	218W3A	143	15935.07	408.59	30.37	.78

		SUM			143	15935.07		30.37	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 M	2A	218W3A	25	9071.80	9071.80	5.31	5.31
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W3A	134	13035.27	449.49	28.45	.98

		SUM			159	22107.07		33.75	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 M	2A	218W3A	7	825.99	275.33	1.49	.50
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W3A	110	18782.24	569.16	23.36	.71

		SUM			117	19608.23		24.84	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 M	2A	218W3A	6	1519.53	1519.53	1.27	1.27
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W3A	159	20449.69	454.44	33.76	.75

		SUM			165	21969.22		35.04	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R	2A	218W3A	113	13628.11	412.97	24.00	.73

		SUM			113	13628.11		24.00	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R	2A	218W3A	74	15561.78	2223.11	15.72	2.25

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A.3-12

Container Description	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	

		sum			74	15561.78		15.72	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M	2A 2402W	1	149.68	149.68	.21	.21

		sum			1	149.68		.21	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	M	2A FS6	3	239.94	79.98	.63	.21

		sum			3	239.94		.63	
METAL DRUMS, BARRELS, KEGS	85 GALLON	1988	M	2A 2402WC	2	766.56	383.28	.81	.41

		sum			2	766.56		.81	
MISCELLANEOUS SCRAP	UNKNOWN	1970	R	2A 218W3A	10	3294.87	823.72	14.05	3.51

		sum			10	3294.87		14.05	
MISCELLANEOUS SCRAP	UNKNOWN	1971	R	2A 218W3A	4	2559.15	639.79	5.71	1.43

		sum			4	2559.15		5.71	
MISCELLANEOUS SCRAP	UNKNOWN	1972	M	2A 218W3A	10	2721.54	2721.54	.28	.28
MISCELLANEOUS SCRAP	UNKNOWN		R	2A 218W3A	17	215.91	215.91	1.91	1.91

		sum			27	2937.45		2.19	
MISCELLANEOUS SCRAP	UNKNOWN	1973	R	2A 218W3A	18	14918.11	2131.16	33.26	4.75

		sum			18	14918.11		33.26	
MISCELLANEOUS SCRAP	UNKNOWN	1974	R	2A 218W3A	20	5719.77	817.11	13.41	1.92

		sum			20	5719.77		13.41	
MISCELLANEOUS SCRAP	UNKNOWN	1975	R	2A 218W3A	37	10421.68	801.67	23.13	1.78

		sum			37	10421.68		23.13	

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Container Discription	Container Size	Date	Pri	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
			Wast	Wast						
MISCELLANEOUS SCRAP	UNKNOWN	1976 R	2A	218W3A	33	20327.19	1451.94	45.32	3.24	

		sum			33	20327.19		45.32		
MISCELLANEOUS SCRAP	UNKNOWN	1977 R	2A	218W3A	57	6909.07	300.39	24.87	1.08	

		sum			57	6909.07		24.87		
MISCELLANEOUS SCRAP	UNKNOWN	1978 R	2A	218W3A	52	14776.15	547.26	70.11	2.60	

		sum			52	14776.15		70.11		
MISCELLANEOUS SCRAP	UNKNOWN	1979 R	2A	218W3A	31	9032.36	531.32	22.21	1.31	

		sum			31	9032.36		22.21		
A.3-14 SELF CONTAINED, EQUIPMENT	UNKNOWN	1970 R	2A	218W3A	2	1866.98	933.49	4.16	2.08	

		sum			2	1866.98		4.16		
SELF CONTAINED, EQUIPMENT	UNKNOWN	1971 R	2A	218W3A	6	787.43	393.72	1.76	.88	

		sum			6	787.43		1.76		
SELF CONTAINED, EQUIPMENT	UNKNOWN	1972 R	2A	218W3A	13	16459.87	8229.94	36.70	18.35	

		sum			13	16459.87		36.70		
SELF CONTAINED, EQUIPMENT	UNKNOWN	1973 R	2A	218W3A	4	610.08	305.04	1.49	.74	

		sum			4	610.08		1.49		
SELF CONTAINED, EQUIPMENT	UNKNOWN	1974 R	2A	218W3A	1	749.33	749.33	1.67	1.67	

		sum			1	749.33		1.67		
SELF CONTAINED, EQUIPMENT	UNKNOWN	1975 R	2A	218W3A	6	5332.40	1333.10	13.08	3.27	

		sum			6	5332.40		13.08		

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Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg		Avg
		Wast	Wast							Weight	Volume	Volume
SELF CONTAINED, EQUIPMENT	UNKNOWN	1976	R	2A	218W3A	41	2889.36	412.77	6.44	.92		

		sum				41	2889.36		6.44			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1977	M	2A	218W3A	12	5182.71	1727.57	11.55	3.85		
SELF CONTAINED, EQUIPMENT	UNKNOWN		R	2A	218W3A	18	6229.60	519.13	13.93	1.16		

		sum				30	11412.31		25.49			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1978	R	2A	218W3A	17	4583.53	1145.88	62.19	15.55		

		sum				17	4583.53		62.19			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1979	R	2A	218W3A	19	1879.23	187.92	3.91	.39		

		sum				19	1879.23		3.91			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1980	R	2A	218W3A	1	544.31	544.31	1.59	1.59		

		sum				1	544.31		1.59			
TANKS, PORTABLE	UNKNOWN	1971	R	2A	218W4B	1	635.03	635.03	1.42	1.42		

		sum				1	635.03		1.42			
TANKS, PORTABLE	UNKNOWN	1973	R	2A	218W3A	1	2159.09	2159.09	4.81	4.81		

		sum				1	2159.09		4.81			
TANKS, PORTABLE	UNKNOWN	1975	R	2A	218W3A	7	2184.50	728.17	4.87	1.62		

		sum				7	2184.50		4.87			
TANKS, PORTABLE	UNKNOWN	1976	R	2A	218W3A	3	20297.25	6765.75	45.25	15.08		

		sum				3	20297.25		45.25			
TANKS, PORTABLE	UNKNOWN	1977	M	2A	218W3A	1	800.13	800.13	1.78	1.78		
TANKS, PORTABLE	UNKNOWN		R	2A	218W3A	1	9525.39	9525.39	21.24	21.24		

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
		sum			2	10325.52		23.02	
TANKS, PORTABLE	UNKNOWN	1979 R	2A	218W3A	2	15.88	15.88	.06	.06

		sum			2	15.88		.06	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970 R	2A	218W3A	3	609.62	304.81	1.36	.68

		sum			3	609.62		1.36	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1971 R	2A	218W3A	4	6147.05	1536.76	13.71	3.43

		sum			4	6147.05		13.71	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1972 R	2A	218W3A	13	18542.76	2060.31	41.34	4.59

		sum			13	18542.76		41.34	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1973 R	2A	218W3A	14	23794.43	1699.60	53.05	3.79

		sum			14	23794.43		53.05	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1974 R	2A	218W3A	20	18345.90	1310.42	40.91	2.92

		sum			20	18345.90		40.91	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1975 R	2A	218W3A	8	24180.89	3022.61	53.92	6.74

		sum			8	24180.89		53.92	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1976 R	2A	218W3A	18	50659.20	2814.40	86.93	4.83

		sum			18	50659.20		86.93	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1977 R	2A	218W3A	23	23305.46	3329.35	53.65	7.66

		sum			23	23305.46		53.65	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1978 R	2A	218W3A	16	28682.76	2048.77	121.63	8.69

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A.3-16

Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	Volume
		sum			16	28682.76		121.63	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1979 R	2A	218W3A	29	45368.54	2160.41	181.68	8.65

		sum			29	45368.54		181.68	
WOODEN BOXES, CARTONS, CASES	0.7*0.7*6	1977 R	2A	218W3A	1	67.58	67.58	.16	.16

		sum			1	67.58		.16	
WOODEN BOXES, CARTONS, CASES	1.7*1.8*4.9	1978 R	2A	218W3A	1	159.21	159.21	.44	.44

		sum			1	159.21		.44	
WOODEN BOXES, CARTONS, CASES	2*2*2	1977 R	2A	218W3A	1	226.80	226.80	.23	.23
WOODEN BOXES, CARTONS, CASES	2*2*3	R	2A	218W3A	5	698.52	349.26	1.56	.78

		sum			6	925.32		1.78	
WOODEN BOXES, CARTONS, CASES	2*2*4	1978 R	2A	218W3A	1	159.21	159.21	.45	.45

		sum			1	159.21		.45	
WOODEN BOXES, CARTONS, CASES	2*2*6	1977 R	2A	218W3A	1	202.75	202.75	.45	.45

		sum			1	202.75		.45	
WOODEN BOXES, CARTONS, CASES	2*2*7	1975 R	2A	218W3A	1	6400.15	6400.15	14.27	14.27

		sum			1	6400.15		14.27	
WOODEN BOXES, CARTONS, CASES	2*2*8	1979 R	2A	218W3A	1	406.42	406.42	.91	.91

		sum			1	406.42		.91	
WOODEN BOXES, CARTONS, CASES	2*3*4	1976 R	2A	218W3A	1	304.81	304.81	.68	.68

		sum			1	304.81		.68	
WOODEN BOXES, CARTONS, CASES	2*4*4	1975 R	2A	218W3A	1	181.44	181.44	.91	.91

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A.3-17

Container Discription	Container Size	Date	Pri	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
			Wast	Wast						

		sum				1	181.44		.91	
WOODEN BOXES, CARTONS, CASES	2*4*4	1977	R	2A	218W3A	1	406.42	406.42	.91	.91

		sum				1	406.42		.91	
WOODEN BOXES, CARTONS, CASES	3*3*3	1976	R	2A	218W3A	1	342.91	342.91	.77	.77

		sum				1	342.91		.77	
WOODEN BOXES, CARTONS, CASES	3*3*3	1977	M	2A	218W3A	2	393.72	196.86	.88	.44
WOODEN BOXES, CARTONS, CASES	3*3*3		R	2A	218W3A	9	2171.79	1085.90	4.84	2.42

		sum				11	2565.51		5.72	
WOODEN BOXES, CARTONS, CASES	3*3*4	1976	R	2A	218W3A	1	457.22	457.22	1.02	1.02

		sum				1	457.22		1.02	
WOODEN BOXES, CARTONS, CASES	3*3*4	1977	R	2A	218W3A	1	457.22	457.22	1.02	1.02

		sum				1	457.22		1.02	
WOODEN BOXES, CARTONS, CASES	3*4*4	1979	R	2A	218W3A	1	622.33	622.33	1.39	1.39

		sum				1	622.33		1.39	
WOODEN BOXES, CARTONS, CASES	3*4*5	1978	R	2A	218W3A	1	762.03	762.03	1.70	1.70
WOODEN BOXES, CARTONS, CASES	3*4*8		R	2A	218W3A	1	217.72	217.72	2.72	2.72

		sum				2	979.75		4.42	
WOODEN BOXES, CARTONS, CASES	3*4*8	1979	R	2A	218W3A	1	362.87	362.87	2.72	2.72

		sum				1	362.87		2.72	
WOODEN BOXES, CARTONS, CASES	3*5*5	1978	R	2A	218W3A	2	748.42	748.42	4.25	4.25

		sum				2	748.42		4.25	

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A.3-18

Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
WOODEN BOXES, CARTONS, CASES	3.3*3.3*3.3	1975	R	2A 218W3A	1	470.37	470.37	1.05	1.05
WOODEN BOXES, CARTONS, CASES	4*4*12		R	2A 218W3A	1	181.44	181.44	5.44	5.44

		sum			2	651.81		6.49	
WOODEN BOXES, CARTONS, CASES	4*4*12	1979	R	3A 218W3A	1	1045.07	1045.07	5.44	5.44

		sum			1	1045.07		5.44	
WOODEN BOXES, CARTONS, CASES	4*4*4	1977	M	2A 218W3A	2	1602.98	801.49	3.62	1.81
WOODEN BOXES, CARTONS, CASES	4*4*4		R	2A 218W3A	6	4876.09	4876.09	10.87	10.87

		sum			8	6479.07		14.50	
WOODEN BOXES, CARTONS, CASES	4*4*4	1978	R	2A 218W3A	1	812.83	812.83	1.81	1.81

		sum			1	812.83		1.81	
WOODEN BOXES, CARTONS, CASES	4*4*5	1975	R	2A 218W3A	1	1016.04	1016.04	2.27	2.27

		sum			1	1016.04		2.27	
WOODEN BOXES, CARTONS, CASES	4*4*6	1976	R	2A 218W3A	1	12192.50	12192.50	2.72	2.72

		sum			1	12192.50		2.72	
WOODEN BOXES, CARTONS, CASES	4*4*6	1977	M	2A 218W3A	2	2438.50	2438.50	5.44	5.44

		sum			2	2438.50		5.44	
WOODEN BOXES, CARTONS, CASES	4*4*7	1970	R	2A 218W3A	3	4292.78	4292.78	9.57	9.57

		sum			3	4292.78		9.57	
WOODEN BOXES, CARTONS, CASES	4*4*8	1972	R	2A 218W3A	1	1625.67	1625.67	3.63	3.63

		sum			1	1625.67		3.63	
WOODEN BOXES, CARTONS, CASES	4*4*8	1975	R	2A 218W3A	9	14631.00	2438.50	32.62	5.44

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Container Discription	Container Size	Date	Pri	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
			Wast	Wast						

			SUM			9	14631.00		32.62	
WOODEN BOXES, CARTONS, CASES	4*4*8	1976 R	2A	218W3A		12	19506.18	4876.55	43.50	10.87

			SUM			12	19506.18		43.50	
WOODEN BOXES, CARTONS, CASES	4*4*8	1977 H	2A	218W3A		8	13003.52	6501.76	29.00	14.50
WOODEN BOXES, CARTONS, CASES	4*4*8	R	2A	218W3A		17	27010.37	4501.73	61.62	10.27

			SUM			25	40013.89		90.62	
WOODEN BOXES, CARTONS, CASES	4*4*8	1978 R	2A	218W3A		25	35489.80	3943.31	97.86	10.87

			SUM			25	35489.80		97.86	
WOODEN BOXES, CARTONS, CASES	4*4*8	1979 R	2A	218W3A		22	28013.72	4001.96	79.74	11.39
WOODEN BOXES, CARTONS, CASES	4*4*8	R	3A	218W3A		2	1360.77	1360.77	7.25	7.25

			SUM			24	29374.49		86.99	
WOODEN BOXES, CARTONS, CASES	4*4*8	1980 R	3A	218W3A		13	10196.70	3398.90	47.12	15.71

			SUM			13	10196.70		47.12	
WOODEN BOXES, CARTONS, CASES	4*4*8	1981 R	3A	218W3AE		6	5443.08	5443.08	21.75	21.75

			SUM			6	5443.08		21.75	
WOODEN BOXES, CARTONS, CASES	4*4*8	1988 R	3A	218W5		2	907.18	907.18	4.08	4.08

			SUM			2	907.18		4.08	
WOODEN BOXES, CARTONS, CASES	4*4*9	1970 R	2A	218W3A		2	3657.75	3657.75	8.16	8.16
WOODEN BOXES, CARTONS, CASES	4*5*7	R	2A	218W3A		5	8890.36	8890.36	19.82	19.82

			SUM			7	12548.11		27.98	
WOODEN BOXES, CARTONS, CASES	4*5*7	1979 R	2A	218W3A		1	544.31	544.31	3.96	3.96

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg Weight	Volume	Avg Volume
		Date	Type	Code Facility					
		sum			1	544.31		3.96	
WOODEN BOXES, CARTONS, CASES	4*5*8	1970 R	2A	218W3A	1	2032.08	2032.08	4.53	4.53

		sum			1	2032.08		4.53	
WOODEN BOXES, CARTONS, CASES	4*6*10	1976 R	2A	218W3A	1	3048.12	3048.12	6.80	6.80

		sum			1	3048.12		6.80	
WOODEN BOXES, CARTONS, CASES	4*6*6	1977 M	2A	218W3A	1	1828.87	1828.87	4.08	4.08

		sum			1	1828.87		4.08	
WOODEN BOXES, CARTONS, CASES	4*6*6	1978 R	2A	218W3A	1	653.17	653.17	4.08	4.08

		sum			1	653.17		4.08	
WOODEN BOXES, CARTONS, CASES	4*6*8	1976 R	2A	218W3A	1	2438.50	2438.50	5.44	5.44

		sum			1	2438.50		5.44	
WOODEN BOXES, CARTONS, CASES	4*8*10	1975 R	2A	218W3A	1	4064.17	4064.17	9.06	9.06

		sum			1	4064.17		9.06	
WOODEN BOXES, CARTONS, CASES	4*8*14	1978 R	2A	218W3A	1	1016.04	1016.04	12.69	12.69

		sum			1	1016.04		12.69	
WOODEN BOXES, CARTONS, CASES	4.5*5.6*24	1975 R	2A	218W3A	1	7656.60	7656.60	17.08	17.08
WOODEN BOXES, CARTONS, CASES	4.5*5.6*8.7	R	2A	218W3A	1	2792.30	2792.30	6.23	6.23
WOODEN BOXES, CARTONS, CASES	5*11*12	R	2A	218W3A	1	4082.31	4082.31	18.69	18.69
WOODEN BOXES, CARTONS, CASES	5*5*28	R	2A	218W3A	1	8890.36	8890.36	19.82	19.82

		sum			4	23421.57		61.82	
WOODEN BOXES, CARTONS, CASES	5*5*8	1978 R	2A	218W3A	1	2540.10	2540.10	5.66	5.66
WOODEN BOXES, CARTONS, CASES	6*8*12	R	2A	218W3A	1	1306.34	1306.34	16.31	16.31

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Container Discription	Container Size	Pri Date	Sec Wast	Wast Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		SUM				2	3846.44		21.97	
WOODEN BOXES, CARTONS, CASES	6*8*14	1979 R	3A	218W3A		2	6243.21	3121.61	38.06	19.03
WOODEN BOXES, CARTONS, CASES	6*8*8	R	3A	218W3A		1	2090.14	2090.14	10.87	10.87

		SUM				3	8333.35		48.93	
WOODEN BOXES, CARTONS, CASES	8*8*12	1978 R	2A	218W3A		1	1587.57	1587.57	21.75	21.75
WOODEN BOXES, CARTONS, CASES	UNKNOWN	R	2A	218W3A		17	370.59	92.65	3.40	.85

		SUM				18	1958.16		25.15	

207 rows selected.

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APPENDIX A.4

**RADIOLOGICAL DATA FOR TRU WASTE CONTAINERS
SORTED BY DATE, PRIMARY WASTE TYPE, AND
STORAGE FACILITY**

This subappendix summarizes the radiological data for all TRU waste containers generated at Building 325 Westinghouse Hanford. Specifically, this computer run provides the total grams of TRU elements in a given container type in a given year. In addition, the average gram loading for a given container type in a given year has been calculated.

In 1991 and 1992 the number of curies (Ci) of alpha radiation was included on the SWBRs. Since the Building 325 Westinghouse Hanford waste generation data is all from 1970 to 1988, these columns contain blank entries. The "Max Dose" column contains the highest value recorded for a given container in a given year, in mrem/hr.

Additional information about the isotopes present in Building 325 Westinghouse Hanford waste containers can be found in subappendices A.9 and A.10.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot4.srep
tttitle center 'TRU Waste 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(rdet_rswims_count) on report
compute sum of sum(rad_qty) on dt
compute sum of avg(rad_qty) on dt
compute sum of sum(rad_alpha_ci) on dt
compute sum of avg(rad_alpha_ci) on dt
compute sum of max(rdet_bg_dose_rate) on dt
col dt                format a4                heading "Date"
col cntyp_descr       format a45                heading "Container Description"
col con_size_descr    format a20                heading "Container Size"
col con_pwtyp_cd       format a4                heading "Pri|Wast|Type"
col con_locn_facil_id format a8                heading "Location"
col sum(rdet_rswims_count) format 999999        heading "Count"
col sum(rad_qty)       format 999999.99         heading "Total|TRU (g)"
col avg(rad_qty)        format 99999.99         heading "Avg|TRU (g)"
col sum(rad_alpha_ci)   format 999999.99        heading "Total|Alpha (ci)"
col avg(rad_alpha_ci)   format 999999.99        heading "Avg|Alpha (ci)"
col max(rdet_bg_dose_rate) format 999999.99     heading "Max|Alpha (ci)"
select cntyp_descr,
       con_size_descr,
       substr(to_char(con_tsd_accept_dt, 'YYYY'),1, 4)dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count),
       sum(rad_qty),
       avg(rad_qty),
       sum(rad_alpha_ci),
       avg(rad_alpha_ci),
       max(rdet_bg_dose_rate)
from radwaste, contype, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325' and
rad_iso_num in (1,21,22,26,41,52,87,97,98,100,104,105,111,146,147) and
rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UF','UG','UJ') and
con_cntyp_cd = cntyp_cd(+) and con_pkg_id = rad_pkg_id(+)
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr(to_char(con_tsd_accept_dt, 'YYYY'), 1, 4),
       con_locn_facil_id
;
spool off
tttitle off

```


Container Description	Container Size	Pri Waste Date Type Location	Count	Total TRU (g)	Avg TRU (g)	Total Alpha (ci)	Avg Alpha (ci)	Max Alpha (ci)
CONCRETE BOXES	3*3*3	1972 R 218W4B	13	1.00	.08			1000.00

		sum	13	1.00	.08	.00	.00	1000.00
CONCRETE BOXES	3*3*3	1977 R 218W4B	1	.10	.10			50.00

		sum	1	.10	.10	.00	.00	50.00
CONCRETE BOXES	3*3*3	1978 R 218W3A	7	7.00	1.00			80.00
CONCRETE BOXES	3*3*3	R 218W4B	2	.00	.00			15.00

		sum	9	7.00	1.00	.00	.00	95.00
CONCRETE BOXES	4*4*4	1972 R 218W4B	3	1.20	.40			2625.00

		sum	3	1.20	.40	.00	.00	2625.00
CONCRETE CYLINDERS, CASKS	7*12	1977 R 218W4B	1	.00	.00			6.00

		sum	1	.00	.00	.00	.00	6.00
GLOVE BOXES	UNKNOWN	1972 R 218W4B	2	1.00	.50			1.00

		sum	2	1.00	.50	.00	.00	1.00
GLOVE BOXES	UNKNOWN	1974 R 218W4B	7	.04	.01			50.00

		sum	7	.04	.01	.00	.00	50.00
HEPA FILTERS	UNKNOWN	1970 R 218W3A	5	.01	.00			500.00

		sum	5	.01	.00	.00	.00	500.00
HEPA FILTERS	UNKNOWN	1974 R 218W4B	4	.00	.00			100.00

		sum	4	.00	.00	.00	.00	100.00
METAL BOXES, CARTONS, CASES	1250 CU FT	1975 R 218W3A	1	1.00	1.00			2.00

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Container Description	Container Size	Pri Wast		Location	Count	Total	Avg	Total	Avg	Max
		Date	Type			TRU (g)	TRU (g)	Alpha (ci)	Alpha (ci)	Alpha (ci)
		sum			1	1.00	1.00	.00	.00	2.00
METAL BOXES, CARTONS, CASES	4*4*4	1972	R	218W4B	2	.80	.40			2625.00

		sum			2	.80	.40	.00	.00	2625.00
METAL BOXES, CARTONS, CASES	4*4*5	1976	R	218W4B	1	1.00	1.00			5.00
METAL BOXES, CARTONS, CASES	4*5*9		R	218W4B	1	1.00	1.00			5.00

		sum			2	2.00	2.00	.00	.00	10.00
METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	1980	R	218W4C	1	.00	.00			6.00

		sum			1	.00	.00	.00	.00	6.00
METAL BOXES, CARTONS, CASES	5*5*5	1974	R	218W3A	1	.10	.10			5.00
METAL BOXES, CARTONS, CASES	7*10*16		R	218W3A	1	.10	.10			5.00

		sum			2	.20	.20	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	110 GALLON	1976	R	218W4B	1	.10	.10			25.00

		sum			1	.10	.10	.00	.00	25.00
METAL DRUMS, BARRELS, KEGS	30 GALLON	1970	R	218W3A	17	.01	.00			10.00

		sum			17	.01	.00	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	30 GALLON	1971	R	218W3A	1	.00	.00			10.00

		sum			1	.00	.00	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R	218W3A	67	20.01	.30			20.00

		sum			67	20.01	.30	.00	.00	20.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971	R	218W3A	76	20.01	.26			50.00
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	218W4B	163	183.22	1.12			10.00

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		TRU Waste 325 WHC								
Container Description	Container Size	Pri	Wast	Location	Count	Total	Avg	Total	Avg	Max
		Date	Type			TRU (g)	TRU (g)	Alpha (ci)	Alpha (ci)	Alpha (ci)
			sum		239	203.23	1.39	.00	.00	60.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972	R	218W4B	239	427.41	1.79			25.00

		sum			239	427.41	1.79	.00	.00	25.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R	218W4B	217	396.38	1.83			40.00

		sum			217	396.38	1.83	.00	.00	40.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974	R	218W4B	254	1167.35	4.60			100.00

		sum			254	1167.35	4.60	.00	.00	100.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975	R	218W4B	218	1786.10	8.19			1.00

		sum			218	1786.10	8.19	.00	.00	1.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976	R	218W4B	162	599.01	3.70			1.43

		sum			162	599.01	3.70	.00	.00	1.43
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977	R	218W4B	141	835.18	5.92			800.00

		sum			141	835.18	5.92	.00	.00	800.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978	R	218W3A	94	87.00	.93			6.00
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	218W4C	215	2493.22	11.60			13.00

		sum			309	2580.22	12.52	.00	.00	19.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R	218W4C	438	4901.22	11.19			10.00

		sum			438	4901.22	11.19	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1980	R	218W4C	91	1179.55	12.96			6.00

		sum			91	1179.55	12.96	.00	.00	6.00

TRU Waste 325 WHC

Page: 4

Container Description	Container Size	Pri		Date	Type	Location	Count	Total	Avg	Total	Avg	Max
		Waste						TRU (g)	TRU (g)	Alpha (ci)	Alpha (ci)	Alpha (ci)
MISCELLANEOUS SCRAP	UNKNOWN	1972	R	218W4B			5	.00	.00			1.00

		sum					5	.00	.00	.00	.00	1.00
SELF CONTAINED, EQUIPMENT	UNKNOWN	1974	R	218W4B			4	.40	.10			1.00

		sum					4	.40	.10	.00	.00	1.00
TANKS, PORTABLE	UNKNOWN	1971	R	218W3A			1	.00	.00			50.00

		sum					1	.00	.00	.00	.00	50.00
TANKS, PORTABLE	UNKNOWN	1974	R	218W4B			6	.60	.10			1.00

		sum					6	.60	.10	.00	.00	1.00
WOODEN BOXES, CARTONS, CASES	3.17*5*10.3	1978	R	218W4B			1	1.00	1.00			6.00

		sum					1	1.00	1.00	.00	.00	6.00
WOODEN BOXES, CARTONS, CASES	4*4*4	1975	R	218W3A			5	.50	.10			10.00

		sum					5	.50	.10	.00	.00	10.00

39 rows selected.

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APPENDIX A.5

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325 WESTINGHOUSE HANFORD
55-GALLON DRUMS CONTAINING TRU WASTE
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the 55-gal drums of TRU waste generated by Building 325 Westinghouse Hanford. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix A contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot5.srep
title center 'TRU WASTE- 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40      heading "Physical Description"
col cntyp_descr              format a55      heading "Container Discription"
col con_size_descr           format a45      heading "Container Size"
col dt                       format a4       heading "Date"
col con_pwtyp_cd             format a4       heading "Pri|Wast|Type"
col con_locn_facil_id        format a8      heading "Facility"
col sum(rdet_rswims_count)    format 999999  heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```


Physical Description	Container Discription	Container Size	Pri Wast		Count
			Date	Type Facility	
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1970 R	218W3A	67
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R		76
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R		1

			sum		144
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R	218W4B	162
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R		173
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R		2
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R		1
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R		1
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R		3

			sum		342
▷ ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R	218W4C	29
▷ ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		11
▷ CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R		1
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		88
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		23
CONCRETE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		52
CONCRETE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		27
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		53
FILTERS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		83
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		23
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		27
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		29
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		91
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R		5
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		18
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R		1
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		95
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		80
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R		1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		94
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		80
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R		1
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		7
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		65
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R		16

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Physical Description	Container Discription	Container Size	Pri Wast Date Type Facility Count

			sum 1000

34 rows selected.

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APPENDIX A.6

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325 WESTINGHOUSE HANFORD
TRU WASTE CONTAINERS OTHER THAN 55-GALLON DRUMS
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the TRU waste containers other than 55-gal drums generated at Building 325 Westinghouse Hanford. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix A contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot6.srep
title center 'TRU WASTE - 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40          heading "Physical Description"
col con_size_descr           format a47          heading "Container Description"
col cntyp_descr              format a45          heading "Container Size"
col dt                       format a4          heading "Date"
col con_pwtyp_cd             format a4          heading "Pri|Wast|Type"
col con_locn_facil_id        format a8          heading "Facility"
col sum(rdet_rswims_count)    format 999999      heading "Count"
col rdet_swtyp_cd            format a4          heading "Sec|Wast|Type"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
rdet_swtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

Physical Description	Container Size	Container Description	Date	Pri	Sec	Wast	Wast	Facility	Count
MISCELLANEOUS/UNKNOWN/OTHER	HEPA FILTERS	UNKNOWN	1970	R	1A		218W3A		5
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	30 GALLON	1970	R	1A				17
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	30 GALLON	1971	R	1A				1
MISCELLANEOUS/UNKNOWN/OTHER	TANKS, PORTABLE	UNKNOWN	1971	R	1A				1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	4*4*4	1975	R	1A				5

SUM									29
MISCELLANEOUS/UNKNOWN/OTHER	CONCRETE BOXES	3*3*3	1972	R	1A		218W4B		13
MISCELLANEOUS/UNKNOWN/OTHER	CONCRETE BOXES	4*4*4	1972	R	1A				3
MISCELLANEOUS/UNKNOWN/OTHER	GLOVE BOXES	UNKNOWN	1972	R	1A				2
MISCELLANEOUS/UNKNOWN/OTHER	METAL BOXES, CARTONS, CASES	4*4*4	1972	R	1A				2
MISCELLANEOUS/UNKNOWN/OTHER	MISCELLANEOUS SCRAP	UNKNOWN	1972	R	1A				5
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1974	R	1A				4
MISCELLANEOUS/UNKNOWN/OTHER	TANKS, PORTABLE	UNKNOWN	1974	R	1A				6
MISCELLANEOUS/UNKNOWN/OTHER	CONCRETE BOXES	3*3*3	1977	R	1A				1

SUM									36
GLASS	METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	1980	R	1A		218W4C		1
METAL/IRON/GALVANIZED/SHEET	METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	1980	R	1A				1
METAL/IRON/GALVANIZED/SHEET	METAL BOXES, CARTONS, CASES	4*6*10	1985	R	1A				1
PLASTIC/POLYURATHANE	METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	1980	R	1A				1
PLEXIGLASS	METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	1980	R	1A				1
WOOD/LUMBER/PLYWOOD	METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	1980	R	1A				1

SUM									6

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19 rows selected.

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APPENDIX A.7

**HAZARDOUS CONSTITUENTS OF 55-GALLON
DRUMS CONTAINING TRU WASTE**

The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). In this subappendix the hazardous contents of 55-gal drums generated at Building 325 Westinghouse Hanford are sorted by storage facility.

Information concerning the hazardous constituents of waste containers was not required prior to 1986. During the R-SWIMS data reentry program in the mid-1980's an attempt was made to add any available information on the hazardous materials present, however, this information was limited.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot7.srep
title center 'TRU Waste - 325 WHC ' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text          format a40          heading "Hazardous"
col con_size_descr         format a45          heading "Container Description"
col cntyp_descr            format a40          heading "Container Size"
col dt                     format a4           heading "Date"
col con_pwtyp_cd           format a4           heading "Pri|Wast|Type"
col con_locn_facil_id      format a8          heading "Facility"
col sum(rdet_rswims_count) format 999999      heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

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APPENDIX A.8

**HAZARDOUS CONSTITUENTS OF TRU WASTE CONTAINERS
OTHER THAN 55-GALLON DRUMS**

The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). No hazardous constituents are listed in containers other than 55-gal drums generated at Building 325 Westinghouse Hanford; therefore this run did not reveal any hazardous information.

```

set linesize 170
set pagesize 45
newpage 0
spool pot8.srep
title center 'TRU Waste - 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text          format a40          heading "Hazardous"
col con_size_descr         format a45          heading "Container Description"
col cntyp_descr            format a40          heading "Container Size"
col dt                     format a4           heading "Date"
col con_pwtyp_cd           format a4           heading "Pri|Wast|Type"
col con_locn_facil_id      format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999      heading "Count"
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       rdet_rswims_count
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A', '1B', '1C', '1D', '1E', '1F', 'UG', 'UF', 'UJ') and
cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
con_size_descr,
rdet_rswims_count
;
spool off

```

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```
col con_pwtyp_cd          format a4          heading "Pri|Wast|Type"
col con_locn_facil_id     format a8          heading "Facility"
col sum(rdet_rswims_count) format 999999     heading "Count"
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       rdet_rswims_count
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
"pot8.sql" 37 lines, 1182 characters
```

SQL> @pot8

no rows selected

SQL> ! llpr pot8.srep

°VT100° 80 COL° °7 BIT MODE°

APPENDIX A.9

**ISOTOPES LISTED IN 55-GALLON DRUMS
CONTAINING TRU WASTES**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325 Westinghouse Hanford stored in 55-gal drums. The isotope field in SWITS contains several of the following types of information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted)
- Plutonium-239 fissile gram equivalents (Pu239 FSL GR equiv)
- Total - alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste drums with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot9.srep
title center 'TRU Waste 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name          format a30          heading "Isotope"
col sum(rad_qty)      format 999999.999999 heading "Rad Qty"
col iso_unit          heading a4          heading "Unit"
col dt                format a4           heading "Date"
col cntyp_descr       format a40          heading "Container Size"
col con_size_descr    format a45          heading "Container Description"
col con_pwtyp_cd      format a4           heading "Pri|Wast|Type"
col con_locn_facil_id format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999 heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A', '1B', '1C', '1E', '1F', 'UG', 'UF', 'UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       cntyp_descr,
       con_size_descr,
       rdet_rswims_count
;
spool off

```

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
AM-241	.600000	GM 1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
	-----	****						-----
	.600000	sum						1
CM-245	2.000000	GM 1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	1
	-----	****						-----
	2.000000	sum						1
NP-237	20.700000	GM 1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
PM-147		CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
	-----	****						-----
	20.700000	sum						2
PU	20.013700	GM 1970	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	67
	-----	****						-----
	20.013700	sum						67
PU	20.012110	GM 1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	76
PU	182.315300	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	162
	-----	****						-----
	202.327410	sum						238
PU	406.711000	GM 1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	238
	-----	****						-----
	406.711000	sum						238
PU	396.381600	GM 1973	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	217
	-----	****						-----
	396.381600	sum						217
PU	1167.351400	GM 1974	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	254
	-----	****						-----
	1167.351400	sum						254
PU	1786.104500	GM 1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	218
	-----	****						-----
	1786.104500	sum						218
PU	599.012700	GM 1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	162
	-----	****						-----

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Isotope	Rad Qty Un Date			Container Size	Container Description	Pri	Sec	Facility	Count
						Wast	Wast		
		Type	Type			Type	Type		
A.9-5	599.012700	sum							162
	834.578100	GM	1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	140
	834.578100	sum							140
A.9-5	87.000700	GM	1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	94
	2479.222900	GM		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	212
	2566.223600	sum							306
A.9-5	4900.822700	GM	1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	437
	4900.822700	sum							437
	1179.553200	GM	1980	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	91
A.9-5	1179.553200	sum							91
	.900000	GM	1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
	.900000	sum							1
A.9-5	.400000	GM	1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	1
	.400000	sum							1
	2054.000000	GM	1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	13
A.9-5	834.600000	GM		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
	2888.600000	sum							14
A.9-5	15060.000000	GM	1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	10
	15060.000000	sum							10
	10000.000000	GM	1973	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
A.9-5	10000.000000	sum							1

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
TH-232	4144.000000	GM 1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	4
	-----	****						-----
	4144.000000	sum						4
TH-232	1874.500000	GM 1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	6
	-----	****						-----
	1874.560000	sum						6
TH-232	7.000000	GM 1980	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	1
	-----	****						-----
	7.000000	sum						1
TOTAL BETA/GAMMA	.279000	CI 1970	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	67
	-----	****						-----
	.279000	sum						67
TOTAL BETA/GAMMA	18.350000	CI 1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	76
TOTAL BETA/GAMMA	.662000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	162
	-----	****						-----
	19.012000	sum						238
TOTAL BETA/GAMMA	7.624400	CI 1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	238
	-----	****						-----
	7.624400	sum						238
TOTAL BETA/GAMMA	2.890000	CI 1973	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	217
	-----	****						-----
	2.890000	sum						217
TOTAL BETA/GAMMA	1.225000	CI 1974	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	189
	-----	****						-----
	1.225000	sum						189
TOTAL BETA/GAMMA	.350000	CI 1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	218
	-----	****						-----
	.350000	sum						218
TOTAL BETA/GAMMA	.522000	CI 1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	162
	-----	****						-----
	.522000	sum						162

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type	Sec Waste Type	Facility	Count
TOTAL BETA/GAMMA	1.676500	CI 1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	140
	-----	****						-----
	1.676500	sum						140
TOTAL BETA/GAMMA	4.039000	CI 1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	94
TOTAL BETA/GAMMA	11.408000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	213
	-----	****						-----
	15.447000	sum						307
TOTAL BETA/GAMMA	2.226000	CI 1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	437
	-----	****						-----
	2.226000	sum						437
TOTAL BETA/GAMMA	10.840000	CI 1980	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	91
	-----	****						-----
	10.840000	sum						91
	12.000000	GM 1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	2
	-----	****						-----
	12.000000	sum						2
URANIUM-DEPLETED	6938.000000	GM 1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	1
URANIUM-DEPLETED	9571.000000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
	-----	****						-----
	16509.000000	sum						2
URANIUM-DEPLETED	75000.000000	GM 1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	5
	-----	****						-----
	75000.000000	sum						5
URANIUM-DEPLETED	79.600000	GM 1974	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	2
	-----	****						-----
	79.600000	sum						2
URANIUM-DEPLETED	480.870000	GM 1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	39
	-----	****						-----
	480.870000	sum						39
URANIUM-DEPLETED	4406.000000	GM 1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1

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Isotope	Rad	Qty	Un	Date	Container	Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
	-----	4406.000000	****	sum							1
URANIUM-DEPLETED	653.040000	GM	1977	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4B		27
	-----	653.040000	****	sum							27
URANIUM-DEPLETED	6178.000000	GM	1978	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4C		4
	-----	6178.000000	****	sum							4
URANIUM-DEPLETED	121708.630000	GM	1979	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4C		8
	-----	121708.630000	****	sum							8
URANIUM-DEPLETED	4.000000	GM	1980	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4C		1
	-----	4.000000	****	sum							1
URANIUM-ENRICHED	6682.000000	GM	1971	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4B		11
	-----	6682.000000	****	sum							11
URANIUM-ENRICHED	907.060000	GM	1972	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4B		39
	-----	907.060000	****	sum							39
URANIUM-ENRICHED	5505.000000	GM	1973	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4B		2
	-----	5505.000000	****	sum							2
URANIUM-ENRICHED	665.600000	GM	1974	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4B		7
	-----	665.600000	****	sum							7
URANIUM-ENRICHED	213.016000	GM	1975	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4B		41
	-----	213.016000	****	sum							41
URANIUM-ENRICHED	335.992000	GM	1976	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A	218W4B		17

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
	335.992000	**** sum						17
URANIUM-ENRICHED	1407.955000	GM 1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	40
	1407.955000	**** sum						40
URANIUM-ENRICHED	1116.950000	GM 1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	48
	1116.950000	**** sum						48
URANIUM-ENRICHED	1862.680000	GM 1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	19
	1862.680000	**** sum						19
URANIUM-ENRICHED	313.000000	GM 1980	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	3
	313.000000	**** sum						3
URANIUM-NATURAL	148898.000000	GM 1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	12
URANIUM-NATURAL	5814.000000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	3
	154712.000000	**** sum						15
URANIUM-NATURAL	345513.500000	GM 1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	15
	345513.500000	**** sum						15
URANIUM-NATURAL	204.800000	GM 1974	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	2
	204.800000	**** sum						2
URANIUM-NATURAL	31707.000000	GM 1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	39
	31707.000000	**** sum						39
URANIUM-NATURAL	123.047000	GM 1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	12
	123.047000	**** sum						12

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
URANIUM-NATURAL	2380.264000	GM 1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48	57
	-----	****						-----
	2380.264000	sum						57
URANIUM-NATURAL	9942.520000	GM 1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	57
	-----	****						-----
	9942.520000	sum						57
URANIUM-NATURAL	15613.370000	GM 1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	17
	-----	****						-----
	15613.370000	sum						17
URANIUM-NATURAL	819.680000	GM 1980	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	8
	-----	****						-----
	819.680000	sum						8

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APPENDIX A.10

**ISOTOPES LISTED IN TRU CONTAINERS
OTHER THAN 55-GALLON DRUMS**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325 Westinghouse Hanford stored in containers other than 55-gal drums. The isotope field in SWITS contains several of the following types of information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted)
- Plutonium-239 equivalent curies (PE-CI)
- Total-alpha
- Total beta/gamma
- PE-CI (plutonium equivalent curies)

This computer run contains the isotope field listing along with the number of TRU waste containers with that listing. The run is sorted by storage facility and year.

```

set linesize 170
pagesize 45
set newpage 0
spool pot10.srep
title center 'TRU Waste 325 WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name                format a30      heading "Isotope"
col sum(rad_qty)            format 9999.99999 heading "Rad Qty"
col iso_unit                heading a4      heading "Unit"
col dt                      format a4      heading "Date"
col cntyp_descr             format a45      heading "Container Size"
col con_size_descr          format a45      heading "Container Description"
col con_pwtyp_cd            format a4      heading "Pri|Wast|Type"
col con_locn_facil_id       format a8      heading "Facility"
col sum(rdet_rswims_count)  format 999999   heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
       m radwaste, cntype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       con_pwtyp_cd,
       con_locn_facil_id,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       cntyp_descr,
       con_size_descr
;
spool off

```

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type Facility	Count
PU	.008400	GM	1970 HEPA FILTERS	UNKNOWN	R 218W3A	5
PU	.010100	GM	METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218W3A	17
	-----	****				-----
	.018500	SUM				22
PU	.000100	GM	1971 METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218W3A	1
PU	.000100	GM	TANKS, PORTABLE	UNKNOWN	R 218W3A	1
	-----	****				-----
	.000200	SUM				2
PU	.100000	GM	1974 METAL BOXES, CARTONS, CASES	5*5*5	R 218W3A	1
PU	.100000	GM	METAL BOXES, CARTONS, CASES	7*10*16	R 218W3A	1
	-----	****				-----
	.200000	SUM				2
PU	1.000000	GM	1975 METAL BOXES, CARTONS, CASES	1250 CU FT	R 218W3A	1
PU	.500000	GM	WOODEN BOXES, CARTONS, CASES	4*4*4	R 218W3A	5
	-----	****				-----
	1.500000	SUM				6
PU	7.000000	GM	1978 CONCRETE BOXES	3*3*3	R 218W3A	7
	-----	****				-----
	7.000000	SUM				7
PU	1.001000	GM	1972 CONCRETE BOXES	3*3*3	R 218W48	13
PU	1.200000	GM	CONCRETE BOXES	4*4*4	R 218W48	3
PU	1.000000	GM	GLOVE BOXES	UNKNOWN	R 218W48	2
PU	.800000	GM	METAL BOXES, CARTONS, CASES	4*4*4	R 218W48	2
PU	.000500	GM	MISCELLANEOUS SCRAP	UNKNOWN	R 218W48	5
	-----	****				-----
	4.001500	SUM				25
PU	.040300	GM	1974 GLOVE BOXES	UNKNOWN	R 218W48	7
PU	.000400	GM	HEPA FILTERS	UNKNOWN	R 218W48	4
PU	.400000	GM	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W48	4
PU	.600000	GM	TANKS, PORTABLE	UNKNOWN	R 218W48	6
	-----	****				-----
	1.040700	SUM				21
PU	1.000000	GM	1976 METAL BOXES, CARTONS, CASES	4*4*5	R 218W48	1

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type Facility	Count
PU	1.000000	GM 1976	METAL BOXES, CARTONS, CASES	4*5*9	R 218W48	1
PU	.100000	GM	METAL DRUMS, BARRELS, KEGS	110 GALLON	R 218W48	1
	-----	****				-----
	2.100000	sum				3
PU	.100000	GM 1977	CONCRETE BOXES	3*3*3	R 218W48	1
PU	.000100	GM	CONCRETE CYLINDERS, CASKS	7*12	R 218W48	1
	-----	****				-----
	.100100	sum				2
PU	.000200	GM 1978	CONCRETE BOXES	3*3*3	R 218W48	2
PU	1.000000	GM	WOODEN BOXES, CARTONS, CASES	3.17*5*10.3	R 218W48	1
	-----	****				-----
	1.000200	sum				3
PU	.000100	GM 1980	METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	R 218W4C	1
	-----	****				-----
	.000100	sum				1
TOTAL BETA/GAMMA	.370000	CI 1970	HEPA FILTERS	UNKNOWN	R 218W3A	5
TOTAL BETA/GAMMA	.053000	CI	METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218W3A	17
	-----	****				-----
	.423000	sum				22
TOTAL BETA/GAMMA	.005000	CI 1971	METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218W3A	1
TOTAL BETA/GAMMA	3.000000	CI	TANKS, PORTABLE	UNKNOWN	R 218W3A	1
	-----	****				-----
	3.005000	sum				2
TOTAL BETA/GAMMA	.100000	CI 1974	METAL BOXES, CARTONS, CASES	5*5*5	R 218W3A	1
TOTAL BETA/GAMMA	.100000	CI	METAL BOXES, CARTONS, CASES	7*10*16	R 218W3A	1
	-----	****				-----
	.200000	sum				2
TOTAL BETA/GAMMA	.100000	CI 1975	WOODEN BOXES, CARTONS, CASES	4*4*4	R 218W3A	5
	-----	****				-----
	.100000	sum				5
TOTAL BETA/GAMMA	4.860000	CI 1978	CONCRETE BOXES	3*3*3	R 218W3A	7
	-----	****				-----

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
	4.860000	sum				7
TOTAL BETA/GAMMA	104.000000	CI 1972	CONCRETE BOXES	3*3*3	R 218W4B	13
TOTAL BETA/GAMMA	63.000000	CI	CONCRETE BOXES	4*4*4	R 218W4B	3
TOTAL BETA/GAMMA	.002000	CI	GLOVE BOXES	UNKNOWN	R 218W4B	2
TOTAL BETA/GAMMA	42.000000	CI	METAL BOXES, CARTONS, CASES	4*4*4	R 218W4B	2
TOTAL BETA/GAMMA	.005000	CI	MISCELLANEOUS SCRAP	UNKNOWN	R 218W4B	5
	-----	****				-----
	209.007000	sum				25
TOTAL BETA/GAMMA	1.820000	CI 1974	GLOVE BOXES	UNKNOWN	R 218W4B	7
TOTAL BETA/GAMMA	.400000	CI	HEPA FILTERS	UNKNOWN	R 218W4B	4
TOTAL BETA/GAMMA	.040000	CI	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W4B	4
TOTAL BETA/GAMMA	.060000	CI	TANKS, PORTABLE	UNKNOWN	R 218W4B	6
	-----	****				-----
	2.320000	sum				21
TOTAL BETA/GAMMA	.005000	CI 1976	METAL BOXES, CARTONS, CASES	4*4*5	R 218W4B	1
TOTAL BETA/GAMMA	.005000	CI	METAL BOXES, CARTONS, CASES	4*5*9	R 218W4B	1
	-----	****				-----
	.010000	sum				2
TOTAL BETA/GAMMA	.500000	CI 1977	CONCRETE BOXES	3*3*3	R 218W4B	1
TOTAL BETA/GAMMA	.060000	CI	CONCRETE CYLINDERS, CASKS	7*12	R 218W4B	1
	-----	****				-----
	.560000	sum				2
TOTAL BETA/GAMMA	.300000	CI 1978	CONCRETE BOXES	3*3*3	R 218W4B	2
TOTAL BETA/GAMMA	.060000	CI	WOODEN BOXES, CARTONS, CASES	3.17*5*10.3	R 218W4B	1
	-----	****				-----
	.360000	sum				3
TOTAL BETA/GAMMA	.060000	CI 1980	METAL BOXES, CARTONS, CASES	4.2*6.2*15.6	R 218W4C	1
	-----	****				-----
	.060000	sum				1
URANIUM-ENRICHED	14.000000	GM 1974	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W4B	4
URANIUM-ENRICHED	21.000000	GM	TANKS, PORTABLE	UNKNOWN	R 218W4B	6
URANIUM-NATURAL	12.400000	GM	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W4B	4
URANIUM-NATURAL	18.600000	GM	TANKS, PORTABLE	UNKNOWN	R 218W4B	6

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Isotope	Rad	Qty	Un	Date	Container	Size	Container Description	Pri Waste Type	Facility	Count
	-----		****							-----
	66.000000		sum							20
URANIUM-NATURAL	1.000000	GM	1978	WOODEN BOXES, CARTONS, CASES			3.17*5*10.3	R	218W48	1
	-----		****							-----
	1.000000		sum							1

55 rows selected.

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APPENDIX B

**DATA ON BUILDING 325 WASTE GENERATION BY PNL FROM THE
SOLID WASTE INFORMATION TRACKING SYSTEM**

The information found in this appendix is from the Solid Waste Information and Tracking System (SWITS) database. This database incorporates the older R-SWIMS database and is used to track information on radioactive and other wastes stored or disposed at the Hanford Site.

Each SWITS data run in this appendix is preceded by the query used to generate the data. A brief explanation of the run and any additional information needed to understand the data presented is also included.

The bulk of the data provided is limited to information about TRU waste generated at Building 325 by PNL; however, some general information on the non-TRU waste is included for completeness. The term non-TRU is used, instead of LLW, because a small percentage of the waste has been designated only as not TRU. It is believed that most, if not all, of the non-TRU waste is LLW.

The data runs in this appendix are further segregated by waste container type. Since initial retrieval efforts and WRAP 1 will focus on 55-gal drums, these container types are considered separately.

Some general information about SWITS database and the codes used follows. Please note the disclaimer found on the next page.

DON'T SAY IT --- Write It !

Date:

To: *Judy Pattmeyer*

From: Solid Waste Engineering Data Management Group
N3-11 6-4394/6-4020

Re: SWITS DATA REQUEST

Attached for your information and use is the data which you requested. This data represents best available information regarding wastes currently in storage at the Hanford Site. I trust the information will be suitable to your needs.

Requests for information from the Solid Waste Information and Tracking System (SWITS) are normally relatively limited in scope, requesting specific data fields or summary data. The responses to these requests undergo review during data collection, summary and response preparation.

The response to this request represents a simple reproduction of the SWITS Database. Transmittal of this information is made with the following disclaimers:

- 1) The information contained in this transmittal is raw data, and represents information provided to Solid Waste Engineering (SWE) on burial records or other documents. This data has not been validated.
- 2) The information contained in this transmittal is subject to change without notice. Continual update of SWITS information and improvement of the software system make it impossible to ensure consistency of this data with the database after transmittal.
- 3) This information is current as of 12/11/92.

If I can be of further assistance to you, do not hesitate to call me.

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Solid Waste Information and Tracking System

05/01/92

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Primary Waste Type Code Table

Primary Waste Type Code	Primary Waste Type Description	Ship Time	Rad
AH	HAZ, ADMIN HOLD	89	N
CM	MORATORIUM CONTROLLED	89	N
H	HAZARDOUS	89	N
HP	HAZARDOUS WASTE PCB	29	N
M	MIXED	89	Y
MP	MIXED PCB	29	Y
N	NON-REGULATED		N
P	PCB	29	N
R	RADIOACTIVE		Y
RP	RADIOACTIVE PCB	29	Y
U	UNKNOWN		N

Secondary Waste Type Code Table

Secondary Waste Type Code	Secondary Waste Group	Secondary Waste Type Description
1A	TRU	TRANSURANIC (NOT PROCESSED THROUGH TRUSAF)
1B	TRU	TRANSURANIC CLASSIFIED
1C	TRU	TRANSURANIC WIPP CERTIFIED
1D	TRU	TRANSURANIC WIPP UNCERTIFIED
1E	TRU	TRANSURANIC SPECIAL CASE
1F	TRU	TRANSURANIC CAISSONS
2A	LLW	LOW-LEVEL NON-INDUSTRIAL
2B	LLW	LOW-LEVEL NON-INDUSTRIAL CLASSIFIED
2F	LLW	LOW-LEVEL CAISSONS
2L	LLW	LOW-LEVEL NON-INDUSTRIAL (ASSAYED FROM TRU)
3A	LLW	LOW-LEVEL INDUSTRIAL
3L	LLW	LOW-LEVEL INDUSTRIAL (ASSAYED FROM TRU)
4A	HLW	HIGH LEVEL WASTE (SPENT FUEL)
UA	USG	UNSEGREGATED NON-TRANSURANIC DRY WASTE
UB	USG	UNSEGREGATED NON-TRANSURANIC INDUSTRIAL
UC	USG	UNSEGREGATED CAISSONS (REMOTE HANDLED)
UF	USG	UNSEGREGATED TRANSURANIC/LOW-LEVEL (TUNNELS PUREX)
UG	USG	UNSEGREGATED TRANSURANIC DRY WASTE
UJ	USG	UNSEGREGATED TRANSURANIC INDUSTRIAL

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APPENDIX B.1

**CONTAINER NUMBER AND WEIGHT OF TRU WASTE IN
55-GALLON DRUMS BY WASTE TYPE**

This data run gives an overall look at the waste types, container numbers and total weight (in kilograms) of the radioactive wastes generated at Building 325 PNL on a yearly basis. These data are for wastes stored in 55-gal drums only. The meanings of primary and secondary waste codes can be found in the introductory materials for this appendix.

The data in the average weight column should be taken cautiously, especially for LLW codes. Concern is warranted because LLW records are still done on a batch basis. This means that one weight datum may be the composite weight for a group of drums. The computer program used simply divided the sum of all weight values by the number of values used to compute the total weight, not the actual number of containers that that value represents.

From 1970 until 1978 individual container weights were not required for TRU drums. During the data reentry program in the mid-1980's standard weights were assigned for all container types; 55-gal drums were given a standard weight of 68 kg. This is why the average weight/drum for TRU is so consistent during this period.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot2.srep
title center '325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(con_cntr_vol) on dt
col dt                                format a4          heading "Date"
col con_pwtyp_cd                      format a4          heading "Pri|Wast|Type"
col rdet_swtyp_cd                     format a4          heading "Sec|Wast|Type"
col sum(rdet_rswims_count)            format 999999      heading "Count"
col avg(con_gross_wgt)                format 99999.99    heading "Avg|Weight"
col sum(con_gross_wgt)                format 9999999.99    heading "Sum|Weight"
col sum(con_cntr_vol)                 format 99999.99    heading "Sum|Vol"
col avg(con_cntr_vol)                 format 99999.99    heading "Avg|Vol"
col cntyp_descr                       format a30         heading "Container Description"
col con_size_descr                    format a25         heading "Container Size"
select substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       sum(rdet_rswims_count),
       sum(con_gross_wgt),
       avg(con_gross_wgt),
       sum(con_cntr_vol),
       avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON' and con_cntyp_cd = cntyp_cd
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       rdet_swtyp_cd
;
spool off

```

325 PNL

Date	Container Description	Container Size	Pri Wast Type	Sec Wast Type	Count	Sum Weight	Avg Weight	Sum Vol	Avg Vol
1970	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	1	68.04	68.04	.21	.21

SUM					1	68.04		.21	
1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	1	453.59	453.59	.21	.21

SUM					1	453.59		.21	
1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	6	563.36	563.36	1.27	1.27

SUM					6	563.36		1.27	
1988	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	3	210.92	70.31	.63	.21

SUM					3	210.92		.63	
1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	1	61.10	61.10	.21	.21
1-4	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	24	7138.56	297.44	5.04	.21

SUM					25	7199.66		5.25	
1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	1	136.39	136.39	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	4	1363.48	340.87	.84	.21

SUM					5	1499.87		1.05	
1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	1	52.27	52.27	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	2	340.73	170.37	.42	.21

SUM					3	393.00		.63	
1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	2	173.40	86.70	.41	.21

SUM					2	173.40		.41	
1969	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	UG	115	10797.73	415.30	24.26	.93

SUM					115	10797.73		24.26	
1970	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	35	2354.18	67.26	7.26	.21

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Date	Container Description	Container Size	Pri Wast Type	Sec Wast Type	Count	Sum Weight	Avg Weight	Sum Vol	Avg Vol
1970	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	3	204.12	204.12	.63	.63
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	UA	27	5125.57	1281.39	5.69	1.42
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	UG	16	1088.62	544.31	3.35	1.68

sum					81	8772.49		16.93	
1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	327	22249.08	68.04	68.67	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	11	748.43	187.11	2.33	.58

sum					338	22997.51		71.00	
1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	548	37285.92	68.04	115.08	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	109	5218.11	372.72	18.68	1.33

sum					657	42504.03		133.76	
1973	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	79	5633.66	71.31	16.60	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	97	7349.94	204.17	19.32	.54

sum					176	12983.60		35.93	
1974	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	52	3538.08	68.04	10.92	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	95	9188.80	224.12	20.61	.50

sum					147	12726.88		31.53	
1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	121	8258.69	68.25	25.41	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	195	21490.65	335.79	41.41	.65

sum					316	29749.34		66.82	
1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	53	3657.82	69.02	11.13	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	220	20656.53	350.11	46.82	.79

sum					273	24314.35		57.95	
1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	33	2313.36	70.10	6.94	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	227	24405.42	259.63	48.32	.51

sum					260	26718.78		55.25	

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Date	Container Description	Container Size	Pri Wast Type	Sec Wast Type	Count	Sum Weight	Avg Weight	Sum Vol	Avg Vol
1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	40	2707.99	67.70	8.40	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	476	85612.85	847.65	96.35	.95

sum					516	88320.84		104.75	
1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	250	17010.00	68.04	52.50	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	301	29435.73	319.95	64.18	.70

sum					551	46445.73		116.67	
1980	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	17	1156.68	68.04	3.57	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	29	2617.67	436.28	6.15	1.02
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A	21	5411.33	5411.33	4.46	4.46

sum					67	9185.68		14.18	
1985	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	3	220.99	73.66	.63	.21

sum					3	220.99		.63	
1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	17	1493.66	87.86	3.57	.21

sum					17	1493.66		3.57	
1988	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	89	6563.43	437.56	18.66	1.24

sum					89	6563.43		18.66	
1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	21	1828.52	87.07	4.41	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	31	2896.25	93.43	6.51	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A	4	285.77	71.44	.84	.21

sum					56	5010.54		11.76	
1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	30	2727.16	90.91	6.30	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	5	295.46	59.09	1.05	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A	39	7040.40	180.52	8.19	.21

sum					74	10063.02		15.54	

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Date	Container Description	Container Size	Pri Wast Type	Sec Wast Type	Count	Sum Weight	Avg Weight	Sum Vol	Avg Vol
1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	14	1370.20	97.87	2.94	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	8	467.80	58.48	1.68	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2L	3	350.64	116.88	.63	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A	35	6022.59	172.07	7.32	.21

sum					60	8211.23		12.57	
1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	35	4665.38	137.22	7.00	.20
	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	1	98.90	98.90	.21	.21

sum					36	4764.28		7.21	

52 rows selected.

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APPENDIX B.2

**BUILDING 325 PNL TRU WASTE CONTAINERS SORTED BY CONTAINER DESCRIPTION,
SIZE, YEAR, AND PRIMARY WASTE TYPE**

This subappendix provides information on Building 325 PNL TRU waste containers, weight, volume, and primary waste type stored at various TRU waste storage facilities on the Hanford Site. The data provides the TRU waste generation from the Building 325 PNL Facility by year.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot3.srep
title center 'TRU WASTE - 325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt                                format a4          heading "Date"
col con_pwtyp_cd                      format a4          heading "Pri|Wast|Type"
col rdet_swtyp_cd                     format a4          heading "Sec|Wast|Type"
col sum(con_gross_wgt)                format 999999.99   heading "Weight"
col sum(rdet_rswims_count)            format 99999      heading "Count"
col avg(con_gross_wgt)                format 999999.99   heading "Avg|Weight"
col sum(con_cntr_vol)                 format 99999.99   heading "Volume"
col avg(con_cntr_vol)                 format 99999.99   heading "Avg|Volume"
col cntyp_descr                       format a55        heading "Container Discription"
col con_size_descr                    format a45        heading "Container Size"
col con_locn_facil_id                 format a8        heading "Facility"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, cntype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    con_locn_facil_id
;
spool off

```

Container Discription	Container Size	Pri	Date	Type	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast								
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN		1970	R	218W48	4	1242.38	1242.38	2.59	2.59

			SUM			4	1242.38			
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN		1978	R	218W48	1	114.30	114.30	.26	.26

			SUM			1	114.30			
CONCRETE BOXES	3*3*3		1975	R	218W48	1	1814.36	1814.36	.77	.77

			SUM			1	1814.36			
CONCRETE BOXES	4*4*8		1974	R	218W48	1	3773.87	3773.87	3.63	3.63
CONCRETE BOXES	4*7*9			R	218W48	2	14859.60	7429.80	14.27	7.14

			SUM			3	18633.47			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT		1969	R	218W48	6	32.66	16.33	.20	.10
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN			R	218W48	2017	26950.51	414.62	257.71	3.96

			SUM			2023	26983.17			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		1970	R	218W48	315	4436.11	403.28	40.42	3.67

			SUM			315	4436.11			
HEPA FILTERS	UNKNOWN		1969	R	218W48	27	1892.37	630.79	4.20	1.40

			SUM			27	1892.37			
HEPA FILTERS	UNKNOWN		1970	R	218W48	8	533.42	266.71	1.19	.59

			SUM			8	533.42			
METAL BOXES, CARTONS, CASES	2*2*6		1976	R	218W48	1	304.81	304.81	.68	.68

			SUM			1	304.81			
METAL BOXES, CARTONS, CASES	5.6*6.5*9.3		1992	R	2402WE	1	3105.00	3105.00	9.80	9.80

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Container Description	Container Size	Pri Wast		Date	Type	Facility	Count	Weight	Avg Weight	Volume	Avg Volume

		SUM					1	3105.00			
METAL DRUMS, BARRELS, KEGS	30 GALLON	1969	R	218W48			5	204.12	204.12	.58	.58

		SUM					5	204.12			
METAL DRUMS, BARRELS, KEGS	30 GALLON	1970	R	218W3A			23	938.86	40.82	2.67	.12
METAL DRUMS, BARRELS, KEGS	30 GALLON		R	218W48			6	244.94	244.94	.70	.70
METAL DRUMS, BARRELS, KEGS	5 GALLON		R	218W48			4	254.01	254.01	.57	.57

		SUM					33	1437.81			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1969	R	218W48			115	10797.73	415.30	24.26	.93

		SUM					115	10797.73			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R	218W3A			35	2354.18	67.26	7.26	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	218W48			16	1088.62	544.31	3.35	1.68

		SUM					51	3442.80			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971	R	218W3A			22	1496.88	68.04	4.62	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	218W48			305	20752.20	68.04	64.05	.21

		SUM					327	22249.08			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972	R	218W48			548	37285.92	68.04	115.08	.21

		SUM					548	37285.92			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R	218W3A			14	1211.06	86.50	2.95	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	218W48			65	4422.60	68.04	13.65	.21

		SUM					79	5633.66			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974	R	218W48			52	3538.08	68.04	10.92	.21

		SUM					52	3538.08			

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Container Discription	Container Size	Pri Wast Date Type Facility	Count	Weight	Avg Weight	Volume	Avg Volume
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R 218M3A	1	93.89	93.89	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R 218M4B	120	8164.80	68.04	25.20	.21

		SUM	121	8258.69			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R 218M4B	53	3657.82	69.02	11.13	.21

		SUM	53	3657.82			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R 218M4B	33	2313.36	70.10	6.94	.21

		SUM	33	2313.36			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R 218M4C	40	2707.99	67.70	8.40	.21

		SUM	40	2707.99			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R 218M4C	250	17010.00	68.04	52.50	.21

		SUM	250	17010.00			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R 218M4C	17	1156.68	68.04	3.57	.21

		SUM	17	1156.68			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R 218M4C	3	220.99	73.66	.63	.21

		SUM	3	220.99			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R 218M4C	2	239.00	119.50	.42	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R 224T	15	1254.66	83.64	3.15	.21

		SUM	17	1493.66			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M 224T	1	61.10	61.10	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R 224T	21	1828.52	87.07	4.41	.21

		SUM	22	1889.62			

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Container Discription	Container Size	Date	Type	Facility	Count	Weight	Pri		Avg	Volume
							Wast	Weight		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	M	224T	1	136.39			136.39	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	224T	30	2727.16			90.91	6.30

		SUM			31	2863.55				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	M	224T	1	52.27			52.27	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	224T	12	1134.32			94.53	2.52
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2403UA	2	235.88			117.94	.42

		SUM			15	1422.47				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	R	224T	32	4334.58			135.46	6.40
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2403UA	3	444.40			148.13	.60

		SUM			35	4778.98				
MISCELLANEOUS SCRAP	UNKNOWN	1969	R	218UA8	23	4102.28			1367.43	9.15
		****								3.05
		SUM			23	4102.28				
MISCELLANEOUS SCRAP	UNKNOWN	1978	R	218UA8	8	102.96			12.87	.23
		****								.03
		SUM			8	102.96				
SELF CONTAINED, EQUIPMENT	UNKNOWN	1969	R	218UA8	27	4264.20			473.80	9.50
		****								1.06
		SUM			27	4264.20				
SELF CONTAINED, EQUIPMENT	UNKNOWN	1978	R	218UA8	1	12.70			12.70	.03
TANKS, PORTABLE	UNKNOWN		R	218UA8	1	3742.12			3742.12	15.57
		****								15.57
		SUM			2	3754.82				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969	M	218UA8	1	2781.41			2781.41	6.20
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	218UA8	16	50069.09			4172.42	114.62
		****								9.55
		SUM			17	52850.50				

Container Discription	Container Size	Pri Wast Date Type Facility	Count	Weight	Avg Weight	Volume	Avg Volume
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970 R 218U48	1	1270.05	1270.05	2.83	2.83

		SUM	1	1270.05			
WOODEN BOXES, CARTONS, CASES	1*3*3	1969 R 218U48	1	114.30	114.30	.26	.26
WOODEN BOXES, CARTONS, CASES	2*2*4	R 218U48	1	203.21	203.21	.45	.45
WOODEN BOXES, CARTONS, CASES	2*4*10	R 218U48	1	1016.04	1016.04	2.27	2.27
WOODEN BOXES, CARTONS, CASES	3*3*3	R 218U48	1	400.07	400.07	.89	.89
WOODEN BOXES, CARTONS, CASES	4*5*6	R 218U48	1	1524.06	1524.06	3.40	3.40
WOODEN BOXES, CARTONS, CASES	UNKNOWN	R 218U48	10	4076.87	815.37	9.12	1.82

		SUM	15	7334.55			

58 rows selected.

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APPENDIX B.3

**BUILDING 325 PNL NON-TRU WASTE CONTAINERS SORTED BY
CONTAINER DESCRIPTION, SIZE, YEAR,
AND PRIMARY WASTE TYPE**

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This subappendix provides information on Building 325 PNL non-TRU waste containers, weight, volume, and primary waste type stored at various waste storage facilities on the Hanford Site. The data provides the non-TRU waste generation from the Building 325 PNL Facility by year.

```

set linesize 175
set pagesize 45
set newpage 0
spool pot3a.srep
title center 'NON-TRU WASTE- 325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Type"
col sum(con_gross_wgt) format 999999.99 heading "Weight"
col sum(rdet_rswims_count) format 99999 heading "Count"
col avg(con_gross_wgt) format 999999.99 heading "Avg|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Volume"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Volume"
col cntyp_descr format a55 heading "Container Discription"
col con_size_descr format a45 heading "Container Size"
col con_locn_facil_id format a8 heading "Facility"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Code"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and rdet_swtyp_cd in ('2A','2B','2L','3A','3L','UA','UB') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id
;
spool off

```

Container Discription	Container Size	Pri Sec		Facility	Count	Weight	Avg		Avg
		Wast	Wast				Weight	Volume	
Date	Type	Code							Volume
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1973 R	2A	218W3A	12	152.41	76.21	2.97	1.49

		SUM			12	152.41		2.97	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1975 R	2A	218W3A	7	781.08	260.36	1.74	.58

		SUM			7	781.08		1.74	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1977 R	2A	218W3A	86	4405.26	231.86	10.49	.55

		SUM			86	4405.26		10.49	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1978 H	2A	218W3A	1	18.14	18.14	.03	.03
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN		R	2A	94	2711.12	142.69	13.30	.70

		SUM			95	2729.26		13.32	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1979 R	2A	218W3A	35	498.95	55.44	2.25	.25

		SUM			35	498.95		2.25	
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1980 R	2A	218W3A	2	101.60	50.80	.23	.11

		SUM			2	101.60		.23	
CONCRETE BOXES	3*3*3	1975 R	2A	218W3A	1	1814.36	1814.36	.77	.77

		SUM			1	1814.36		.77	
DUMP TRUCK	UNKNOWN	1974 R	2A	218W3A	16	7642	75.30	73.39	4.59

		SUM			16	7642		73.39	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1977 R	2A	218W3A	101	701.72	57.72	3.10	.39

		SUM			101	701.72		3.10	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1978 R	2A	218W3A	112	1311.33	57.01	4.02	.17

		SUM			112	1311.33		4.02	

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1979 R	2A	218W3A	86	1554.43	43.18	5.73	.16

		SUM			86	1554.43		5.73	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1980 R	2A	218W3A	6	150.59	37.65	.51	.13

		SUM			6	150.59		.51	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 M	2A	218W3A	7	88.90	88.90	.89	.89
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	2A	218W3A	722	9169.74	132.89	92.00	1.33
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	UA	218W3A	349	4584.43	382.04	44.23	3.69

		SUM			1078	13843.07		137.12	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1971 R	2A	218W3A	537	6820.18	324.77	68.43	3.26
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	2A	218W4B	579	7353.59	408.53	73.78	4.10

		SUM			1116	14173.77		142.21	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972 R	2A	218W3A	2624	33435.95	522.44	333.72	5.21

		SUM			2624	33435.95		333.72	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1973 R	2A	218W3A	6374	80965.82	710.23	812.21	7.12

		SUM			6374	80965.82		812.21	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1974 R	2A	218W3A	4672	59448.44	612.87	595.51	6.14

		SUM			4672	59448.44		595.51	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1975 R	2A	218W3A	3801	48262.00	473.16	484.22	4.75

		SUM			3801	48262.00		484.22	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1976 R	2A	218W3A	4141	53049.62	530.50	528.10	5.28

		SUM			4141	53049.62		528.10	

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Container Discription	Container Size	Pri Sec		Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast						
Date	Type	Code							
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1977	R	2A 218M3A	8483	109287.12	803.58	1082.35	7.96

		SUM			8483	109287.12		1082.35	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1978	M	2A 218M3A	58	920.79	920.79	7.39	7.39
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		R	2A 218M3A	8735	118363.40	799.75	1111.02	7.51

		SUM			8793	119284.19		1118.41	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1979	M	2A 218M3A	48	609.62	609.62	6.12	6.12
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		R	2A 218M3A	5003	66170.14	607.07	644.62	5.91

		SUM			5051	66779.76		650.74	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1980	R	2A 218M3A	411	5305.18	530.52	52.37	5.24

		SUM			411	5305.18		52.37	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1988	R	2A 218M5	314	5284.32	220.18	40.00	1.67

		SUM			314	5284.32		40.00	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1989	R	2A 218M5	75	1238.79	16.52	10.48	.14

		SUM			75	1238.79		10.48	
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1978	R	2A 218M3A	1	40.82	40.82	.18	.18

		SUM			1	40.82		.18	
GLOVE BOXES	UNKNOWN	1970	R	2A 218M3A	2	825.53	825.53	1.84	1.84

		SUM			2	825.53		1.84	
GLOVE BOXES	UNKNOWN	1978	R	2A 218M3A	4	781.99	391.00	22.88	11.44

		SUM			4	781.99		22.88	
GLOVE BOXES	UNKNOWN	1979	R	2A 218M3A	4	3923.56	1961.78	111.99	56.00

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Container Discription	Container Size	Pri Sec Wast Wast			Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
									4	3923.56		111.99	
					1985	R	3A	218W3AE	1	430.91	430.91	3.68	3.68

					SUM				1	430.91		3.68	
GLOVE BOXES	UNKNOWN												
					1970	R	UA	218W3A	2	365.59	365.59	.82	.82

					SUM				2	365.59		.82	
HEPA FILTERS	UNKNOWN												
					1975	R	2A	218W3A	23	977.94	325.98	2.18	.73

					SUM				23	977.94		2.18	
HEPA FILTERS	UNKNOWN												
					1976	R	2A	218W3A	10	1714.57	857.29	3.82	1.91

					SUM				10	1714.57		3.82	
HEPA FILTERS	UNKNOWN												
					1977	R	2A	218W3A	67	3833.75	273.84	11.21	.80

					SUM				67	3833.75		11.21	
HEPA FILTERS	UNKNOWN												
					1978	R	2A	218W3A	143	5126.02	176.76	20.04	.69

					SUM				143	5126.02		20.04	
HEPA FILTERS	UNKNOWN												
					1979	M	2A	218W3A	4	50.80	50.80	.45	.45
						R	2A	218W3A	118	2731.50	101.17	13.97	.52

					SUM				122	2782.30		14.42	
HEPA FILTERS	UNKNOWN												
					1980	R	2A	218W3A	8	480.81	120.20	1.25	.31

					SUM				8	480.81		1.25	
HEPA FILTERS	UNKNOWN												
					1988	R	2A	218W5	76	7278.77	661.71	38.08	3.46

					SUM				76	7278.77		38.08	
HEPA FILTERS	UNKNOWN												
					1989	R	2A	218W3A	14	564.86	40.35	4.44	.32

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Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg		Avg
		Wast	Wast							Weight	Volume	Volume
HEPA FILTERS	UNKNOWN	1989	R	2A	218M5			17	693.94	40.82	5.39	.32

		SUM						31	1258.80		9.83	
METAL BOXES, CARTONS, CASES	2*2*3	1973	R	2A	218M3A			1	152.41	152.41	.34	.34

		SUM						1	152.41		.34	
METAL BOXES, CARTONS, CASES	2*3*4	1988	R	2A	218M5			18	2041.16	2041.16	10.19	10.19
METAL BOXES, CARTONS, CASES	2.5*2.5*4		R	2A	218M5			18	2041.16	2041.16	10.19	10.19

		SUM						36	4082.32		20.39	
METAL BOXES, CARTONS, CASES	4*4*5	1977	R	2A	218M3A			1	1016.04	1016.04	2.27	2.27

		SUM						1	1016.04		2.27	
METAL BOXES, CARTONS, CASES	4*4*6	1979	R	2A	218M3A			3	1219.25	1219.25	2.72	2.72

		SUM						3	1219.25		2.72	
METAL BOXES, CARTONS, CASES	80.8 CU FT	1977	R	2A	218M3A			13	13371.83	13371.83	29.79	29.79

		SUM						13	13371.83		29.79	
METAL BOXES, CARTONS, CASES	UNKNOWN	1975	R	2A	218M3A			7	800.13	800.13	1.78	1.78

		SUM						7	800.13		1.78	
METAL BOXES, CARTONS, CASES	UNKNOWN	1976	R	2A	218M3A			3	381.02	381.02	.85	.85

		SUM						3	381.02		.85	
METAL BOXES, CARTONS, CASES	UNKNOWN	1978	R	2A	218M3A			1	816.46	816.46	8.16	8.16

		SUM						1	816.46		8.16	
METAL BOXES, CARTONS, CASES	UNKNOWN	1985	R	3A	218M3AE			4	8268.94	2067.24	35.88	8.97

		SUM						4	8268.94		35.88	

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Container Discription	Container Size	Pri	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast						
Date	Type	Code							
<hr/>									
METAL CYLINDER, CASKS	UNKNOWN	1976 R	2A	218W3A	1	254.01	254.01	.57	.57

		SUM			1	254.01		.57	
METAL DRUMS, BARRELS, KEGS	2 GALLON	1977 R	2A	218W3A	5	90.72	90.72	.14	.14

		SUM			5	90.72		.14	
METAL DRUMS, BARRELS, KEGS	20 GALLON	1991 H	2A	2402W	1	34.32	34.32	.08	.08
METAL DRUMS, BARRELS, KEGS	20 GALLON		H	2A	2402WG	1	23.85	.08	.08
METAL DRUMS, BARRELS, KEGS	20 GALLON		H	2A	FS6	1	32.00	.08	.08

		SUM			3	90.17		.24	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1970 R	UA	218W3A	6	244.94	244.94	.70	.70

		SUM			6	244.94		.70	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1973 R	2A	218W3A	1	40.82	40.82	.13	.13

		SUM			1	40.82		.13	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1974 R	2A	218W3A	9	367.41	122.47	1.12	.37

		SUM			9	367.41		1.12	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1975 R	2A	218W3A	8	526.17	175.39	1.20	.40

		SUM			8	526.17		1.20	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1976 R	2A	218W3A	3	122.47	61.24	.35	.17

		SUM			3	122.47		.35	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1977 R	2A	218W3A	4	163.29	54.43	.65	.22

		SUM			4	163.29		.65	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1978 R	2A	218W3A	14	940.29	188.06	1.67	.33

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Container Discription	Container Size	Pri	Sec	Date	Type	Code	Facility	Count	Weight	Avg	Volume	Avg
		Wast	Wast							Weight		Volume

		SUM						14	940.29		1.67	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1990	M	2A	2401W			1	38.60	38.60	.14	.14
METAL DRUMS, BARRELS, KEGS	30 GALLON		M	2A	FS6			2	65.90	32.95	.28	.14

		SUM						3	104.50		.42	
METAL DRUMS, BARRELS, KEGS	30 GALLON	1991	M	2A	FS5			1	39.46	39.46	.14	.14

		SUM						1	39.46		.14	
METAL DRUMS, BARRELS, KEGS	5 GALLON	1977	R	2A	218W3A			78	2416.29	127.17	5.48	.29

		SUM						78	2416.29		5.48	
METAL DRUMS, BARRELS, KEGS	5 GALLON	1978	R	2A	218W3A			70	1209.27	75.58	4.52	.28

		SUM						70	1209.27		4.52	
METAL DRUMS, BARRELS, KEGS	5 GALLON	1979	R	2A	218W3A			56	1270.07	141.12	2.73	.30

		SUM						56	1270.07		2.73	
METAL DRUMS, BARRELS, KEGS	5 GALLON	1991	M	2A	2402W			1	13.05	13.05	.02	.02
METAL DRUMS, BARRELS, KEGS	5 GALLON		M	2A	2402WE			1	11.70	11.70	.02	.02

		SUM						2	24.75		.04	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	M	2A	218W3A			1	68.04	68.04	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	218W3A			3	204.12	204.12	.63	.63
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UA	218W3A			27	5125.57	1281.39	5.69	1.42

		SUM						31	5397.73		6.53	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971	R	2A	218W3A			4	272.16	136.08	.84	.42
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	218W4B			7	476.27	238.14	1.49	.74

		SUM						11	748.43		2.33	

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B.3-10

Container Discription	Container Size	Pri Sec			Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast	Facility					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R	2A	218W3A	109	5218.11	372.72	18.68	1.33

		SUM			109	5218.11		18.68	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R	2A	218W3A	97	7349.94	204.17	19.32	.54

		SUM			97	7349.94		19.32	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R	2A	218W3A	95	9188.80	224.12	20.61	.50

		SUM			95	9188.80		20.61	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R	2A	218W3A	195	21490.65	335.79	41.41	.65

		SUM			195	21490.65		41.41	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R	2A	218W3A	220	20656.53	350.11	46.82	.79

		SUM			220	20656.53		46.82	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R	2A	218W3A	227	24405.42	259.63	48.32	.51

		SUM			227	24405.42		48.32	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 H	2A	218W3A	1	453.59	453.59	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	476	85612.85	847.65	96.35	.95

		SUM			477	86066.44		96.56	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 H	2A	218W3A	6	563.36	563.36	1.27	1.27
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	301	29435.73	319.95	64.18	.70

		SUM			307	29999.09		65.45	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R	2A	218W3A	29	2617.67	436.28	6.15	1.02
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A	21	5411.33	5411.33	4.46	4.46

		SUM			50	8029.00		10.61	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 H	2A	2401W	3	210.92	70.31	.63	.21

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Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast									
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R	2A	218M5			89	6563.43	437.56	18.66	1.24

		SUM						92	6774.35		19.29	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989	M	2A	2401W			1	117.93	117.93	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		M	2A	2402W			22	6907.23	313.97	4.62	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		M	2A	FS5			1	113.40	113.40	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	218M3A			3	208.66	69.55	.63	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	218M5			28	2687.59	95.99	5.88	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A	218M5			4	285.77	71.44	.84	.21

		SUM						59	10320.58		12.39	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	M	2A	2402W			1	490.78	490.78	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		M	2A	2403WA			1	663.60	663.60	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		M	2A	FS6			2	209.10	104.55	.42	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	218M3A			5	295.46	59.09	1.05	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A	218M5			39	7040.40	180.52	8.19	.21

		SUM						48	8699.34		10.08	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	M	2A	2402WE			1	281.73	281.73	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		M	2A	FS5			1	59.00	59.00	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	218M5			8	467.80	58.48	1.68	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2L	218M4C			3	350.64	116.88	.63	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A	218M5			35	6022.59	172.07	7.32	.21

		SUM						48	7181.76		10.05	
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	M	2A	2401W			1	113.50	113.50	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		M	2A	2402WE			1	59.90	59.90	.20	.20
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A	2401W			1	98.90	98.90	.21	.21

		SUM						3	272.30		.62	
METAL DRUMS, BARRELS, KEGS	8 GALLON	1990	M	2A	2402MB			3	65.00	21.67	.09	.03

		SUM						3	65.00		.09	
MISCELLANEOUS SCRAP	UNKNOWN	1970	R	2A	218M3A			2	6858.28	3429.14	15.29	7.65

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B.3-12

Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg Weight	Volume	Avg Volume
		Date	Type	Code Facility					
MISCELLANEOUS SCRAP	UNKNOWN	1970	R	UA 218M3A	20	63502.60	31751.30	141.59	70.79

		SUM			22	70360.88		156.88	
MISCELLANEOUS SCRAP	UNKNOWN	1974	R	2A 218M3A	3	1263.70	421.23	2.82	.94

		SUM			3	1263.70		2.82	
MISCELLANEOUS SCRAP	UNKNOWN	1975	R	2A 218M3A	21	2768.71	692.18	6.17	1.54

		SUM			21	2768.71		6.17	
MISCELLANEOUS SCRAP	UNKNOWN	1976	R	2A 218M3A	2	12.70	12.70	.03	.03

		SUM			2	12.70		.03	
MISCELLANEOUS SCRAP	UNKNOWN	1977	M	2A 218M3A	1	235.87	235.87	.23	.23
MISCELLANEOUS SCRAP	UNKNOWN		R	2A 218M3A	44	2095.12	130.95	7.26	.45

		SUM			45	2330.99		7.49	
MISCELLANEOUS SCRAP	UNKNOWN	1978	R	2A 218M3A	67	2609.94	153.53	37.18	2.19

		SUM			67	2609.94		37.18	
MISCELLANEOUS SCRAP	UNKNOWN	1979	R	2A 218M3A	28	935.76	93.58	12.32	1.23

		SUM			28	935.76		12.32	
MISCELLANEOUS SCRAP	UNKNOWN	1980	R	2A 218M3A	1	21.77	21.77	.04	.04

		SUM			1	21.77		.04	
MISCELLANEOUS SCRAP	UNKNOWN	1987	R	2A 218M5	46	3275.83	655.17	21.46	4.29

		SUM			46	3275.83		21.46	
MISCELLANEOUS SCRAP	UNKNOWN	1988	R	2A 218M5	146	9616.12	1068.46	29.79	3.31

		SUM			146	9616.12		29.79	

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1970 R	2A	218USA	4	21235.27	10617.64	47.35	23.67
SELF CONTAINED, EQUIPMENT	UNKNOWN	R	UA	218USA	6	5630.87	2815.44	12.56	6.28
		****			-----	-----	-----	-----	
		SUM			10	26866.14		59.91	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1972 R	2A	218USA	1	38.10	38.10	1.02	1.02
		****			-----	-----	-----	-----	
		SUM			1	38.10		1.02	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1973 R	2A	218USA	2	615.97	307.99	1.37	.69
		****			-----	-----	-----	-----	
		SUM			2	1231.94		1.37	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1974 R	2A	218USA	1	63.50	63.50	.14	.14
		****			-----	-----	-----	-----	
		SUM			1	63.50		.14	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1975 R	2A	218USA	16	1854.28	264.90	4.36	.62
		****			-----	-----	-----	-----	
		SUM			16	1854.28		4.36	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1976 R	2A	218USA	6	589.20	147.30	1.32	.33
		****			-----	-----	-----	-----	
		SUM			6	589.20		1.32	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1977 R	2A	218USA	8	1070.02	152.86	2.46	.35
		****			-----	-----	-----	-----	
		SUM			8	1070.02		2.46	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1978 R	2A	218USA	26	1641.99	149.27	4.16	.38
		****			-----	-----	-----	-----	
		SUM			26	1641.99		4.16	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1979 R	2A	218USA	4	1260.98	420.33	8.38	2.79
		****			-----	-----	-----	-----	
		SUM			4	1260.98		8.38	
TANKS, PORTABLE	UNKNOWN	1972 R	2A	218USA	3	228.61	228.61	.51	.51
		****			-----	-----	-----	-----	

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B.3-14

Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast									
		SUM						3	228.61		.51	
TANKS, PORTABLE	UNKNOWN	1977	R	2A	218	UA	3A	1	2514.70	2514.70	5.61	5.61

		SUM						1	2514.70		5.61	
TANKS, PORTABLE	UNKNOWN	1984	R	2A	218	UA	3A	10	27215.40	27215.40	3.96	3.96

		SUM						10	27215.40		3.96	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970	R	2A	218	UA	3A	2	6350.26	6350.26	14.16	14.16
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R			UA	218	2	33656.38	16828.19	75.04	37.52

		SUM						4	40006.64		89.20	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1972	R	2A	218	UA	3A	2	3600.60	1800.30	8.03	4.01

		SUM						2	3600.60		8.03	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1973	R	2A	218	UA	3A	1	666.78	666.78	1.49	1.49

		SUM						1	666.78		1.49	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1974	R	2A	218	UA	3A	2	5264.37	2632.19	11.74	5.87

		SUM						2	5264.37		11.74	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1975	R	2A	218	UA	3A	1	1270.05	1270.05	2.83	2.83

		SUM						1	1270.05		2.83	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1976	R	2A	218	UA	3A	2	3378.33	1689.17	7.53	3.77

		SUM						2	3378.33		7.53	
WOODEN BOXES, CARTONS, CASES	0.7*1*1.2	1977	R	2A	218	UA	3A	11	199.58	199.58	.24	.24

		SUM						11	199.58		.24	
WOODEN BOXES, CARTONS, CASES	1*2*3	1976	R	2A	218	UA	3A	1	76.20	76.20	.17	.17

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Container Discription	Container Size	Date	Pri	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
			Wast	Wast						

		SUM				1	76.20		.17	
WOODEN BOXES, CARTONS, CASES	1*4*4	1977	M	2A	218M3A	1	362.87	362.87	.45	.45
WOODEN BOXES, CARTONS, CASES	1*4*4		R	2A	218M3A	1	304.81	304.81	.68	.68
WOODEN BOXES, CARTONS, CASES	1.5*1.5*0.7		M	2A	218M3A	7	13.15	13.15	.30	.30
WOODEN BOXES, CARTONS, CASES	2*2*2		R	2A	218M3A	1	139.71	139.71	.31	.31
WOODEN BOXES, CARTONS, CASES	2*2*4		R	2A	218M3A	2	406.42	406.42	.91	.91

		SUM				12	1226.96		2.65	
WOODEN BOXES, CARTONS, CASES	2*2*4	1978	R	2A	218M3A	1	508.02	508.02	1.13	1.13

		SUM				1	508.02		1.13	
WOODEN BOXES, CARTONS, CASES	2*2*8	1974	R	2A	218M3A	1	406.42	406.42	.91	.91
WOODEN BOXES, CARTONS, CASES	2*2*9		R	2A	218M3A	1	457.22	457.22	1.02	1.02

		SUM				2	863.64		1.93	
WOODEN BOXES, CARTONS, CASES	2*4*4	1978	R	2A	218M3A	1	406.42	406.42	.91	.91

		SUM				1	406.42		.91	
WOODEN BOXES, CARTONS, CASES	2*4*5	1974	R	2A	218M3A	1	508.02	508.02	1.13	1.13
WOODEN BOXES, CARTONS, CASES	2*4*8		R	2A	218M3A	13	10565.02	3521.67	23.56	7.85

		SUM				14	11073.04		24.69	
WOODEN BOXES, CARTONS, CASES	3*3*3	1977	R	2A	218M3A	13	2014.85	402.97	6.98	1.40
WOODEN BOXES, CARTONS, CASES	3*3*4		R	2A	218M3A	1	457.22	457.22	1.02	1.02

		SUM				14	2472.07		8.00	
WOODEN BOXES, CARTONS, CASES	3*3*4	1978	R	2A	218M3A	1	317.51	317.51	.68	.68

		SUM				1	317.51		.68	
WOODEN BOXES, CARTONS, CASES	3*4*4	1970	R	2A	218M3A	3	1828.87	1828.87	4.08	4.08

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Container Discription	Container Size	Pri Sec Wast Wast			Count	Weight	Avg		Avg
		Date	Type	Code Facility			Weight	Volume	
		SUM			3	1828.87		4.08	
WOODEN BOXES, CARTONS, CASES	3*4*5	1978 R	2A	218M3A	1	762.03	762.03	1.70	1.70

		SUM			1	762.03		1.70	
WOODEN BOXES, CARTONS, CASES	3*6*16	1977 R	2A	218M3A	1	3657.75	3657.75	8.16	8.16
WOODEN BOXES, CARTONS, CASES	4*0.4*0.8	R	2A	218M3A	2	762.03	762.03	1.70	1.70
WOODEN BOXES, CARTONS, CASES	4*1.5*1.5	R	2A	218M3A	1	114.30	114.30	.26	.26

		SUM			4	4534.08		10.11	
WOODEN BOXES, CARTONS, CASES	4*4*4	1974 R	2A	218M3A	14	11380.57	11380.57	25.37	25.37

		SUM			14	11380.57		25.37	
B.3-17 WOODEN BOXES, CARTONS, CASES	4*4*4	1976 R	2A	218M3A	1	812.83	812.83	1.81	1.81

		SUM			1	812.83		1.81	
WOODEN BOXES, CARTONS, CASES	4*4*4	1977 M	2A	218M3A	1	1451.49	1451.49	1.81	1.81
WOODEN BOXES, CARTONS, CASES	4*4*4	R	2A	218M3A	9	6154.31	1230.86	16.31	3.26

		SUM			10	7605.80		18.12	
WOODEN BOXES, CARTONS, CASES	4*4*4	1978 R	2A	218M3A	3	1538.57	769.29	5.44	2.72

		SUM			3	1538.57		5.44	
WOODEN BOXES, CARTONS, CASES	4*4*5	1974 R	2A	218M3A	1	1016.04	1016.04	2.27	2.27

		SUM			1	1016.04		2.27	
WOODEN BOXES, CARTONS, CASES	4*4*6	1977 R	2A	218M3A	1	1219.25	1219.25	2.72	2.72
WOODEN BOXES, CARTONS, CASES	4*4*7	R	2A	218M3A	7	2641.71	2641.71	20.62	20.62

		SUM			8	3860.96		23.33	
WOODEN BOXES, CARTONS, CASES	4*4*8	1972 R	2A	218M3A	2	3251.34	1625.67	7.25	3.63

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AIM

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Centimeter

Inches

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BY APPLIED IMAGE, INC.

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Container Discription	Container Size	Pri Sec		Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast						
Date	Type	Code							
sum					2	3251.34		7.25	
WOODEN BOXES, CARTONS, CASES	4*4*8	1974 R	2A	218W3A	4	6504.48	6504.48	14.50	14.50

sum					4	6504.48		14.50	
WOODEN BOXES, CARTONS, CASES	4*4*8	1976 R	2A	218W3A	2	3251.34	1625.67	7.25	3.63

sum					2	3251.34		7.25	
WOODEN BOXES, CARTONS, CASES	4*4*8	1977 R	2A	218W3A	3	4876.09	4876.09	10.87	10.87

sum					3	4876.09		10.87	
WOODEN BOXES, CARTONS, CASES	4*4*8	1979 R	2A	218W3A	5	6236.86	3118.43	18.12	9.06
WOODEN BOXES, CARTONS, CASES	4*4*8	R	3A	218W3A	2	1360.77	1360.77	7.25	7.25

sum					7	7597.63		25.37	
WOODEN BOXES, CARTONS, CASES	4*4*8	1988 R	3A	218W5	15	13607.70	1133.98	61.76	5.15

sum					15	13607.70		61.76	
WOODEN BOXES, CARTONS, CASES	4*4*8	1989 R	3A	218W5	108	91035.54	842.92	439.64	4.07

sum					108	91035.54		439.64	
WOODEN BOXES, CARTONS, CASES	4*4*8	1991 R	2A	218W5	5	4477.39	895.48	20.40	4.08
WOODEN BOXES, CARTONS, CASES	4*4*8	R	3A	218W5	25	23454.75	938.19	102.00	4.08

sum					30	27932.14		122.40	
WOODEN BOXES, CARTONS, CASES	4*4*8	1992 R	2A	218W5	1	1136.40	1136.40	4.00	4.00
WOODEN BOXES, CARTONS, CASES	4*4*8	R	3A	218W5	26	36000.00	1384.62	104.00	4.00

sum					27	37136.40		108.00	
WOODEN BOXES, CARTONS, CASES	4*5*12	1978 R	2A	218W3A	1	3048.12	3048.12	6.80	6.80

sum					1	3048.12		6.80	

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Container Discription	Container Size	Pri	Sec	Date	Type	Code	Facility	Count	Weight	Avg	Volume	Avg
		Wast	Wast							Weight		Volume
WOODEN BOXES, CARTONS, CASES	4*5*6	1970	R	2A	218W3A			3	4445.18	4445.18	9.91	9.91

		sum						3	4445.18		9.91	
WOODEN BOXES, CARTONS, CASES	4*5*7	1978	R	2A	218W3A			1	1778.07	1778.07	3.96	3.96

		sum						1	1778.07		3.96	
WOODEN BOXES, CARTONS, CASES	4*5*8	1987	R	3A	218W5			4	3628.72	907.18	16.20	4.05

		sum						4	3628.72		16.20	
WOODEN BOXES, CARTONS, CASES	4*7*8	1977	R	2A	218W3A			1	2844.92	2844.92	6.34	6.34
WOODEN BOXES, CARTONS, CASES	4.5*5.6*8.7		R	2A	218W3A			1	825.53	825.53	1.84	1.84
WOODEN BOXES, CARTONS, CASES	5*5*8		R	2A	218W3A			1	5896.67	5896.67	5.66	5.66

		sum						3	9567.12		13.85	
WOODEN BOXES, CARTONS, CASES	5*6*7	1974	R	2A	218W3A			1	2667.11	2667.11	5.95	5.95

		sum						1	2667.11		5.95	
WOODEN BOXES, CARTONS, CASES	6*6*6	1976	R	2A	218W3A			1	2743.31	2743.31	6.12	6.12

		sum						1	2743.31		6.12	
WOODEN BOXES, CARTONS, CASES	UNKNOWN	1971	R	2A	218W48			4	1759.93	879.97	6.66	3.33

		sum						4	1759.93		6.66	
WOODEN BOXES, CARTONS, CASES	UNKNOWN	1972	R	2A	218W3A			56	2990.97	1495.49	6.67	3.33

		sum						56	2990.97		6.67	
WOODEN BOXES, CARTONS, CASES	UNKNOWN	1974	R	2A	218W3A			14	5307.00	5307.00	11.84	11.84

		sum						14	5307.00		11.84	
WOODEN BOXES, CARTONS, CASES	UNKNOWN	1977	R	2A	218W3A			5	610.54	203.51	1.67	.56

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Container Discription	Container Size	Pri Date	Sec Wast Type	Wast Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume

		SUM				5	610.54		1.67	
WOODEN BOXES, CARTONS, CASES	UNKNOWN	1978	R	2A	218W3A	2	384.20	192.10	.99	.50

		SUM				2	384.20		.99	
WOODEN BOXES, CARTONS, CASES	UNKNOWN	1979	R	2A	218W3A	1	131.99	131.99	.62	.62

		SUM				1	131.99		.62	

204 rows selected.

B.3-20

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APPENDIX B.4

**RADIOLOGICAL DATA FOR TRU WASTE CONTAINERS
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix summarizes the radiological data for all TRU waste containers generated at Building 325 PNL. Specifically, this computer run provides the total grams of TRU elements in a given container type in a given year. In addition, the average gram loading for a given container type in a given year has been calculated.

In 1991 and 1992 the number of curies (Ci) of alpha radiation was included on the SWBRs. Since the Building 325 PNL waste generation data is all from 1970 to 1988, these columns contain blank entries. The "Max Dose" column contains the highest value recorded for a given container in a given year, in mrem/hr.

Additional information about the isotopes present in Building 325 PNL waste containers can be found in subappendices B.9 and B.10.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot4.srep
tttitle center 'TRU Waste 325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(rdet_rswims_count) on report
compute sum of sum(rad_qty) on dt
compute sum of avg(rad_qty) on dt
compute sum of sum(rad_alpha_ci) on dt
compute sum of avg(rad_alpha_ci) on dt
compute sum of max(rdet_bg_dose_rate) on dt
col dt                format a4                heading "Date"
col cntyp_descr        format a45                heading "Container Description"
col con_size_descr     format a20                heading "Container Size"
col con_pwtyp_cd       format a4                heading "Pri|Wast|Type"
col con_locn_facil_id  format a8                heading "Location"
col sum(rdet_rswims_count) format 999999          heading "Count"
col sum(rad_qty)        format 999999.99          heading "Total|TRU (g)"
col avg(rad_qty)        format 99999.99           heading "Avg|TRU (g)"
col sum(rad_alpha_ci)   format 999999.99          heading "Total|Alpha (ci)"
col avg(rad_alpha_ci)   format 999999.99          heading "Avg|Alpha (ci)"
col max(rdet_bg_dose_rate) format 999999.99       heading "Max|Alpha (ci)"
select cntyp_descr,
       con_size_descr,
       substr(to_char(con_tsd_accept_dt, 'YYYY'),1, 4)dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count),
       sum(rad_qty),
       avg(rad_qty),
       sum(rad_alpha_ci),
       avg(rad_alpha_ci),
       max(rdet_bg_dose_rate)
from radwaste, contype, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325' and
rad_iso_num in (1,21,22,26,41,52,87,97,98,100,104,105,111,146,147) and
rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UF','UG','UJ') and
con_cntyp_cd = cntyp_cd(+) and con_pkg_id = rad_pkg_id(+)
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr(to_char(con_tsd_accept_dt, 'YYYY'), 1, 4),
       con_locn_facil_id
;
spool off
tttitle off

```


TRU Waste 325 PNL

Page: 1

Container Description	Container Size	Pri Wast		Count	Total	Avg	Total	Avg	Max
		Date	Type		TRU (g)	TRU (g)	Alpha (ci)	Alpha (ci)	Alpha (ci)
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1978	R	218W4B	1	1.09	1.09		6.00

		sum		1	1.09	1.09	.00	.00	6.00
CONCRETE BOXES	3*3*3	1975	R	218W4B	1	.00	.00		10.00

		sum		1	.00	.00	.00	.00	10.00
CONCRETE BOXES	4*4*8	1974	R	218W4B	1	1.00	1.00		100.00
CONCRETE BOXES	4*7*9		R	218W4B	2	3.00	1.50		100.00

		sum		3	4.00	2.50	.00	.00	200.00
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969	R	218W4B	33	19.05	19.05		10.00

		sum		33	19.05	19.05	.00	.00	10.00
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970	R	218W4B	66	60.00	30.00		

		sum		66	60.00	30.00	.00	.00	.00
METAL BOXES, CARTONS, CASES	2*2*6	1976	R	218W4B	1	1.00	1.00		1.00

		sum		1	1.00	1.00	.00	.00	1.00
METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992	R	2402WE	5	47.51	9.50	12.58	2.52
		****							2.50
		sum		5	47.51	9.50	12.58	2.52	2.50
METAL DRUMS, BARRELS, KEGS	30 GALLON	1970	R	218W3A	23	.00	.00		10.00

		sum		23	.00	.00	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989	M	224T	1	.10	.10		.50

		sum		1	.10	.10	.00	.00	.50
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	M	224T	1	.23	.23		.50

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Container Description	Container Size	Pri Wast		Count	Total TRU (g)	Avg TRU (g)	Total Alpha (ci)	Avg Alpha (ci)	Max Alpha (ci)
		Date	Type Location						
		sum		1	.23	.23	.00	.00	.50
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	224T	3	.02	.01			3.00

		sum		3	.02	.01	.00	.00	3.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1969 R	218W4B	1	.95	.95			10.00

		sum		1	.95	.95	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970 R	218W3A	35	.00	.00			10.00

		sum		35	.00	.00	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R	218W3A	22	.00	.00			10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON		R 218W4B	305	162.03	.53			11.00

		sum		327	162.03	.53	.00	.00	21.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R	218W4B	548	2.34	.00			25.00

		sum		548	2.34	.00	.00	.00	25.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R	218W3A	14	.14	.01			1.00
METAL DRUMS, BARRELS, KEGS	55 GALLON		R 218W4B	65	1.17	.02			200.00

		sum		79	1.31	.03	.00	.00	201.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R	218W4B	52	16.90	.33			17.00

		sum		52	16.90	.33	.00	.00	17.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R	218W3A	1	18.60	18.60			6.00
METAL DRUMS, BARRELS, KEGS	55 GALLON		R 218W4B	121	70.50	.58			5.00

		sum		122	89.10	19.18	.00	.00	11.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R	218W4B	53	16.91	.32			5.00

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Container Description	Container Size	Pri Waste Date Type Location	Count	Total TRU (g)	Avg TRU (g)	Total Alpha (ci)	Avg Alpha (ci)	Max Alpha (ci)
		sum	53	16.91	.32	.00	.00	5.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R 218W4B	33	47.99	1.45			117.00

		sum	33	47.99	1.45	.00	.00	117.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R 218W4C	40	52.01	1.30			6.00

		sum	40	52.01	1.30	.00	.00	6.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R 218W4C	253	464.62	1.84			2.00

		sum	253	464.62	1.84	.00	.00	2.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R 218W4C	17	5.40	.32			6.00

		sum	17	5.40	.32	.00	.00	6.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R 218W4C	4	7.21	1.80			35.00

		sum	4	7.21	1.80	.00	.00	35.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R 218W4C	2	32.94	16.47			7.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	R 224T	19	292.16	15.38			120.00

		sum	21	325.10	31.85	.00	.00	127.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R 224T	22	114.18	5.19			85.00

		sum	22	114.18	5.19	.00	.00	85.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R 224T	69	113.17	1.64			50.00

		sum	69	113.17	1.64	.00	.00	50.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R 224T	27	36.35	1.35			3.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	R 2403WA	5	29.99	6.00			7.00

		sum	32	66.34	7.34	.00	.00	10.00

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Container Description	Container Size	Pri		Count	Total TRU (g)	Avg TRU (g)	Total Alpha (ci)	Avg Alpha (ci)	Max Alpha (ci)
		Date	Waste Type Location						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R	224T	154	415.08	2.70	160.52	1.04	70.00
METAL DRUMS, BARRELS, KEGS	55 GALLON		R 2403WA	16	2.21	.14	1.01	.06	.50

		sum		170	417.29	2.83	161.54	1.11	70.50
MISCELLANEOUS SCRAP	UNKNOWN	1978 R	218W4B	8	8.72	1.09			6.00
SELF CONTAINED, EQUIPMENT	UNKNOWN		R 218W4B	1	1.09	1.09			6.00
TANKS, PORTABLE	UNKNOWN		R 218W4B	1	1.09	1.09			6.00

		sum		10	10.90	3.27	.00	.00	18.00
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 M	218W4B	1	.10	.10			

		sum		1	.10	.10	.00	.00	.00

B.4-7
40 rows selected.

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APPENDIX B.5

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325 PNL
55-GALLON DRUMS CONTAINING TRU WASTE
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the 55-gal drums of TRU waste generated by Building 325 PNL. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix B contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot5.srep
tttitle center 'TRU WASTE - 325 PNL ' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40          heading "Physical Description"
col cntyp_descr              format a55          heading "Container Discription"
col con_size_descr           format a45          heading "Container Size"
col dt                       format a4          heading "Date"
col con_pwtyp_cd             format a4          heading "Pri|Wast|Type"
col con_locn_facil_id        format a8          heading "Facility"
col sum(rdet_rswims_count)    format 999999      heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id(+)
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```


Physical Description	Container Discription	Container Size	Pri Wast			Count
			Date	Type	Facility	
ANIMAL WASTE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R	218W3A	7
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R		35
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1971	R		22
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R		7
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1975	R		1

					SUM	72
DIRT/SOIL/DIATOMACEOUS EARTH	METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R	218W4B	8
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1969	R		115
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1971	R		305
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972	R		524
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R		8
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972	R		24
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R		65
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1974	R		52
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1975	R		120
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1976	R		53
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1977	R		33

					SUM	1307
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R	218W4C	2
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
ANIMAL WASTE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980	R		8
BRICK/FIREBRICK	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978	R		1
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R		22
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		1
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R		6
DIRT/SOIL/DIATOMACEOUS EARTH	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R		6
FLOOR SWEEPS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R		39
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980	R		17
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		2
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		2
INSULATION NON-ASBESTOS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R		162

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Physical Description	Container Discription	Container Size	Pri Wast		Date Type Facility	Count
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R	218W4C		17
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R			3
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			1
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R			1
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R			6
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R			1
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R			162
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R			17
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R			3
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R			1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R			162
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R			17
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R			3
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			2
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R			1
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R			157
W RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R			2
W RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			2
W STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			1
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R			5
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R			38
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R			82
***** -----						
SUM						958
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 H	224T		1
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			9
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			8
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R			2
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			4
ABSORBENT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			18
ASBESTOS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			1
ASBESTOS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			4
CEMENT	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			14
CERAMICS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			1
CERAMICS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			3
CERAMICS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			1
CERAMICS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			5
CHARCOAL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R			3
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			11

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Physical Description	Container Discription	Container Size	Pri Wast		Count
			Date	Type Facility	
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R	224T	8
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R		2
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R		4
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		7
CONWEB PADS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M		1
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		2
DIRT/SOIL/DIATOMACEOUS EARTH	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R		1
EQUIPMENT	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		7
FLOOR SWEEPS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R		1
FLOOR SWEEPS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		1
FLOOR SWEEPS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R		1
FLOOR SWEEPS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R		1
FOAM/STYROFOAM	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M		1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M		1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R		12
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		12
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R		7
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R		4
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		14
INSULATION NON-ASBESTOS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R		1
INSULATION NON-ASBESTOS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R		1
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M		1
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M		1
LEATHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R		2
LEATHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		1
LIQUID	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M		1
LIQUID	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		14
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R		15
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		17
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R		30
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R		11
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		32
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		1
OXIDES/POWDERS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		1
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R		9
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		11
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R		7
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R		2

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Physical Description	Container Discription	Container Size	Date	Pri Wast Type	Facility	Count
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		224T	15
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M			1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M			1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M			1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			15
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			20
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R			30
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			12
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			32
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			8
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			13
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R			11
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			10
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			17
SALT BATH	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R			1
STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			4
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			1
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R			2
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			1
*****						527
SUM						527
ABSORBENT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R		2403WA	1
CHARCOAL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			2
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			3
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			2
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			3
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R			1
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R			1
*****						16
SUM						16

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140 rows selected.

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APPENDIX B.6

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325 PNL
TRU WASTE CONTAINERS OTHER THAN
55-GALLON DRUMS SORTED BY DATE,
PRIMARY WASTE TYPE, AND
STORAGE FACILITY**

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This subappendix describes the physical contents of the TRU waste containers other than 55-gal drums generated at Building 325 by PNL. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix B contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot6.srep
title center 'TRU WASTE - 325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40          heading "Physical Description"
col con_size_descr           format a47          heading "Container Description"
col cntyp_descr              format a45          heading "Container Size"
col dt                       format a4          heading "Date"
col con_pwtyp_cd             format a4          heading "Pri|Wast|Type"
col con_locn_facil_id        format a8          heading "Facility"
col sum(rdet_rswims_count)    format 999999      heading "Count"
col rdet_swtyp_cd            format a4          heading "Sec|Wast|Type"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, cntype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id(+)
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
rdet_swtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```


Physical Description	Container Size	Container Description	Pri Sec		Facility	Count
			Date	Type		
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	30 GALLON	1970 R	1A	218W3A	23

					sum	23
METAL/IRON/GALVANIZED/SHEET	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969 R	UG	218W48	27
METAL/IRON/GALVANIZED/SHEET	SELF CONTAINED, EQUIPMENT	UNKNOWN	1969 R	UG		2
METAL/IRON/GALVANIZED/SHEET	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R	UG		2
MISCELLANEOUS/UNKNOWN/OTHER	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 M	UG		1
MISCELLANEOUS/UNKNOWN/OTHER	BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1978 R	1A		1
MISCELLANEOUS/UNKNOWN/OTHER	MISCELLANEOUS SCRAP	UNKNOWN	1978 R	1A		8
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1978 R	1A		1
MISCELLANEOUS/UNKNOWN/OTHER	TANKS, PORTABLE	UNKNOWN	1978 R	1A		1
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1969 R	UG		6
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969 R	UG		2017
MISCELLANEOUS/UNKNOWN/OTHER	HEPA FILTERS	UNKNOWN	1969 R	UG		27
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	30 GALLON	1969 R	UG		5
MISCELLANEOUS/UNKNOWN/OTHER	MISCELLANEOUS SCRAP	UNKNOWN	1969 R	UG		23
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1969 R	UG		27
MISCELLANEOUS/UNKNOWN/OTHER	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R	UG		14
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	1*3*3	1969 R	UG		1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	2*2*4	1969 R	UG		1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	2*4*10	1969 R	UG		1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	3*3*3	1969 R	UG		1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	4*5*6	1969 R	UG		1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	UNKNOWN	1969 R	UG		10
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 R	UG		30
MISCELLANEOUS/UNKNOWN/OTHER	HEPA FILTERS	UNKNOWN	1970 R	UG		4
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	5 GALLON	1970 R	UG		4
PAPER/CARDBOARD	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R	UG		1
RUBBER	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R	UG		1
WOOD/LUMBER/PLYWOOD	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R	UG		1
	CONCRETE BOXES	4*4*8	1974 R	1A		1
	CONCRETE BOXES	4*7*9	1974 R	1A		2
	CONCRETE BOXES	3*3*3	1975 R	1A		1
	METAL BOXES, CARTONS, CASES	2*2*6	1976 R	1A		1
	BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1970 R	UG		4
	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 R	UG		285
	HEPA FILTERS	UNKNOWN	1970 R	UG		4
	METAL DRUMS, BARRELS, KEGS	30 GALLON	1970 R	UG		6
	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970 R	UG		1

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Physical Description	Container Size	Container Description	Date	Pri	Sec	Facility	Count
				Wast	Wast		
						*****	-----
						sum	2523
CLOTH/RAGS/NYLON	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992 R	1A	2402WE		1
GLASS	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992 R	1A			1
METAL/IRON/GALVANIZED/SHEET	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992 R	1A			1
PAPER/CARDBOARD	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992 R	1A			1
PLASTIC/POLYURATHANE	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992 R	1A			1
RUBBER	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992 R	1A			1
WOOD/LUMBER/PLYWOOD	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	1992 R	1A			1
						*****	-----
						sum	7

44 rows selected.

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APPENDIX B.7

**HAZARDOUS CONSTITUENTS OF 55-GALLON
DRUMS CONTAINING TRU WASTE**

The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). In this subappendix the hazardous contents of 55-gal drums generated at Building 325 PNL are sorted by storage facility.

Information concerning the hazardous constituents of waste containers was not required prior to 1986. During the R-SWIMS data reentry program in the mid-1980's an attempt was made to add any available information on the hazardous materials present, however, this information was limited.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot7.srep
title center 'TRU Waste - 325 PNL ' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text                format a40          heading "Hazardous"
col con_size_descr              format a45          heading "Container Description"
col cntyp_descr                 format a40          heading "Container Size"
col dt                          format a4           heading "Date"
col con_pwtyp_cd                format a4           heading "Pri|Wast|Type"
col con_locn_facil_id           format a8           heading "Facility"
col sum(rdet_rswims_count)       format 999999      heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

Hazardous	Date	Container Size	Container Description	Pri Wast Type	Facility	Count
ASBESTOS	1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	224T	1
ASBESTOS	1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R		4
LEAD	1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M		1
LEAD	1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M		1
MERCURY	1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M		1
NITRIC ACID	1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M		1
***** -----						
sum						9

6 rows selected.

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APPENDIX B.8

**HAZARDOUS CONSTITUENTS OF TRU WASTE CONTAINERS
OTHER THAN 55-GALLON DRUMS**

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The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). No hazardous constituents are listed in containers other than 55-gal drums generated at Building 325 PNL; therefore this run did not reveal any hazardous information.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot8.srep
title center 'TRU Waste - 325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text                format a40      heading "Hazardous"
col con_size_descr              format a45      heading "Container Description"
col cntyp_descr                 format a40      heading "Container Size"
col dt                          format a4       heading "Date"
col con_pwtyp_cd                format a4       heading "Pri|Wast|Type"
col con_locn_facil_id           format a8       heading "Facility"
col sum(rdet_rswims_count)      format 999999   heading "Count"
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       rdet_rswims_count
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
       cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
con_size_descr,
rdet_rswims_count
;
spool off

```

Hazardous	Date	Container Size	Container Description	Pri Wast Type	Facility	RDET_RSWMIS_COUNT
BERYLLIUM	1969	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	M	218W48	1

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APPENDIX B.9

**ISOTOPES LISTED IN 55-GALLON DRUMS
CONTAINING TRU WASTES**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325 PNL stored in 55-gal drums. The isotope field in SWITS contains several of the following types of information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted)
- Plutonium-239 fissile gram equivalents (Pu239 FSL GR equiv)
- Total - alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste drums with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot9.srep
title center 'TRU Waste - 325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name                format a30          heading "Isotope"
col sum(rad_qty)            format 999999.999999 heading "Rad Qty"
col iso_unit                heading a4          heading "Unit"
col dt                      format a4           heading "Date"
col cntyp_descr             format a40          heading "Container Size"
col con_size_descr         format a45          heading "Container Description"
col con_pwtyp_cd           format a4           heading "Pri|Wast|Type"
col con_locn_facil_id      format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999       heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, cntype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       cntyp_descr,
       con_size_descr,
       rdet_rswims_count
;
spool off

```

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
AM-241	2.200000	GM 1992	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	R 2402ME	1
PE-CI	.000000	CI	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	R 2402ME	1
	****					-----
	SUM					2
PM-147	8572.500000	CI 1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218U48	33
PU	.100000	GM	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	M 218U48	1
	****					-----
	SUM					34
PU	.002300	GM 1970	METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218U3A	23
	****					-----
	SUM					23
PU	19.050000	GM 1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218U48	33
	****					-----
	SUM					33
PU	5.000000	GM 1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218U48	33
	****					-----
	SUM					33
PU	1.000000	GM 1974	CONCRETE BOXES	4*4*8	R 218U48	1
PU	3.000000	GM	CONCRETE BOXES	4*7*9	R 218U48	2
	****					-----
	SUM					3
PU	.000100	GM 1975	CONCRETE BOXES	3*3*3	R 218U48	1
	****					-----
	SUM					1
PU	1.000000	GM 1976	METAL BOXES, CARTONS, CASES	2*2*6	R 218U48	1
	****					-----
	SUM					1
PU	1.090000	GM 1978	BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	R 218U48	1
PU	8.720000	GM	MISCELLANEOUS SCRAP	UNKNOWN	R 218U48	8
PU	1.090000	GM	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218U48	1
PU	1.090000	GM	TANKS, PORTABLE	UNKNOWN	R 218U48	1
	****					-----

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Isotope	Rad	Qty	Un	Date	Container	Size	Container Description	Pri West Type Facility	Count
					SUM				11
PU-238	.064000	GM	1992		METAL BOXES, CARTONS, CASES		5.6*6.5*9.3	R 2402ME	1
PU-239	36.800000	GM			METAL BOXES, CARTONS, CASES		5.6*6.5*9.3	R 2402ME	1
PU-240	7.310000	GM			METAL BOXES, CARTONS, CASES		5.6*6.5*9.3	R 2402ME	1
PU-241	1.140000	GM			METAL BOXES, CARTONS, CASES		5.6*6.5*9.3	R 2402ME	1
PU-242	.338000	GM			METAL BOXES, CARTONS, CASES		5.6*6.5*9.3	R 2402ME	1
					****				-----
					SUM				5
TOTAL BETA/GAMMA	4.000000	CI	1969		TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER		UNKNOWN	M 218W4B	1
					****				-----
					SUM				1
TOTAL BETA/GAMMA	.115000	CI	1970		METAL DRUMS, BARRELS, KEGS		30 GALLON	R 218W3A	23
					****				-----
					SUM				23
TOTAL BETA/GAMMA	.002352	CI	1969		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES		2 CU FT	R 218W4B	6
TOTAL BETA/GAMMA	8580.863171	CI			FIBERBOARD/PLASTIC BOXES, CARTONS, CASES		UNKNOWN	R 218W4B	2017
TOTAL BETA/GAMMA	1.600000	CI			HEPA FILTERS		UNKNOWN	R 218W4B	27
TOTAL BETA/GAMMA	.007975	CI			METAL DRUMS, BARRELS, KEGS		30 GALLON	R 218W4B	5
TOTAL BETA/GAMMA	.331199	CI			MISCELLANEOUS SCRAP		UNKNOWN	R 218W4B	23
TOTAL BETA/GAMMA	.321308	CI			SELF CONTAINED, EQUIPMENT		UNKNOWN	R 218W4B	27
TOTAL BETA/GAMMA	1.432535	CI			TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER		UNKNOWN	R 218W4B	16
TOTAL BETA/GAMMA	.018710	CI			WOODEN BOXES, CARTONS, CASES		1*3*3	R 218W4B	1
TOTAL BETA/GAMMA	.033265	CI			WOODEN BOXES, CARTONS, CASES		2*2*4	R 218W4B	1
TOTAL BETA/GAMMA	.041665	CI			WOODEN BOXES, CARTONS, CASES		2*4*10	R 218W4B	1
TOTAL BETA/GAMMA	.007780	CI			WOODEN BOXES, CARTONS, CASES		3*3*3	R 218W4B	1
TOTAL BETA/GAMMA	.036365	CI			WOODEN BOXES, CARTONS, CASES		4*5*6	R 218W4B	1
TOTAL BETA/GAMMA	.149785	CI			WOODEN BOXES, CARTONS, CASES		UNKNOWN	R 218W4B	10
					****				-----
					SUM				2136
TOTAL BETA/GAMMA	.022825	CI	1970		BURLAP, CLOTH, PAPER OR PLASTIC BAGS		UNKNOWN	R 218W4B	4
TOTAL BETA/GAMMA	.441885	CI			FIBERBOARD/PLASTIC BOXES, CARTONS, CASES		UNKNOWN	R 218W4B	282
TOTAL BETA/GAMMA	.031450	CI			HEPA FILTERS		UNKNOWN	R 218W4B	8
TOTAL BETA/GAMMA	.014040	CI			METAL DRUMS, BARRELS, KEGS		30 GALLON	R 218W4B	6
TOTAL BETA/GAMMA	.025000	CI			METAL DRUMS, BARRELS, KEGS		5 GALLON	R 218W4B	4
TOTAL BETA/GAMMA	.050000	CI			TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER		UNKNOWN	R 218W4B	1

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type Facility	Count
	****					-----
	SUM					305
TOTAL BETA/GAMMA	3.000000	CI 1974	CONCRETE BOXES	4*4*8	R 218W48	1
TOTAL BETA/GAMMA	6.000000	CI	CONCRETE BOXES	4*7*9	R 218W48	2
	****					-----
	SUM					3
TOTAL BETA/GAMMA	.007000	CI 1975	CONCRETE BOXES	3*3*3	R 218W48	1
	****					-----
	SUM					1
TOTAL BETA/GAMMA	.010000	CI 1976	METAL BOXES, CARTONS, CASES	2*2*6	R 218W48	1
	****					-----
	SUM					1
B.9-6 TOTAL BETA/GAMMA	.001000	CI 1978	BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	R 218W48	1
TOTAL BETA/GAMMA	.008000	CI	MISCELLANEOUS SCRAP	UNKNOWN	R 218W48	8
TOTAL BETA/GAMMA	.001000	CI	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W48	1
TOTAL BETA/GAMMA	.001000	CI	TANKS, PORTABLE	UNKNOWN	R 218W48	1
	****					-----
	SUM					11
TOTAL BETA/GAMMA	.002500	CI 1992	METAL BOXES, CARTONS, CASES	5.6*6.5*9.3	R 2402WE	1
	****					-----
	SUM					1
U-233	55.000000	GM 1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218W48	33
	****					-----
	SUM					33
URANIUM-DEPLETED	10593.018600	GM 1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218W48	24
URANIUM-DEPLETED	39.965180	GM	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W48	4
	****					-----
	SUM					28
URANIUM-DEPLETED	800.000000	GM 1975	CONCRETE BOXES	3*3*3	R 218W48	1
	****					-----
	SUM					1

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
URANIUM-ENRICHED	95.000000	GM	1970 FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218W48	33
		****				-----
		SUM				33
URANIUM-ENRICHED	80.000000	GM	1975 CONCRETE BOXES	3*3*3	R 218W48	1
		****				-----
		SUM				1
URANIUM-NATURAL	1.000000	GM	1969 TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	M 218W48	1
		****				-----
		SUM				1

57 rows selected.

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APPENDIX B.10

**ISOTOPES LISTED IN TRU CONTAINERS
OTHER THAN 55-GALLON DRUMS**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325 PNL stored in containers other than 55-gal drums. The isotope field in SWITS contains several of the following types of information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted)
- Plutonium-239 equivalent curies (PE-Ci)
- Total-alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste containers with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot10.srep
tttitle center 'TRU Waste - 325 PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name          format a30          heading "Isotope"
col sum(rad_qty)      format 999999.999999 heading "Rad Qty"
col iso_unit          heading a4          heading "Unit"
col dt                format a4          heading "Date"
col cntyp_descr       format a45          heading "Container Size"
col con_size_descr    format a45          heading "Container Description"
col con_pwtyp_cd      format a4          heading "Pri|Wast|Type"
col con_locn_facil_id format a8          heading "Facility"
col sum(rdet_rswims_count) format 999999 heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, cntype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       con_pwtyp_cd,
       con_locn_facil_id,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       cntyp_descr,
       con_size_descr
;
spool off

```

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
AM-241	8.500000	GM 1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	3
	****							3
	SUM							
AM-241	.100000	GM 1985	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C	1
	****							1
	SUM							
AM-241	7.730000	GM 1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	5
	****							5
	SUM							
AM-241	1.337573	GM 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	23
	****							23
	SUM							
AM-241	.001000	GM 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
AM-241	.441880	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
AM-241	.060820	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403WA	2
	****							15
	SUM							
AM-241	3.394450	GM 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	31
AM-241	.241800	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403WA	3
	****							34
	SUM							
AM-243	.050000	GM 1985	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C	1
	****							1
	SUM							
AM-243	.000001	GM 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
	****							1
	SUM							
CE-144 -- PR-144	.000037	CI 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	2
	****							2
	SUM							
CM-243	.000000	GM 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	3

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast	Sec Wast	Facility	Count
	****							-----
	SUM							3
CM-243	.001365	GM	1992 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	9
CM-243	.000000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403WA	1
	****							-----
	SUM							10
CM-244	.009410	GM	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	2
	****							-----
	SUM							2
CM-244	.000083	GM	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
	****							-----
	SUM							1
CM-244	1.369100	GM	1992 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	4
	****							-----
	SUM							4
CM-245	49.980000	GM	1989 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
CO-60	.000693	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	3
	****							-----
	SUM							4
CO-60	.000002	CI	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	7
	****							-----
	SUM							7
CO-60	.000038	CI	1992 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	5
CS-134	.000476	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	14
	****							-----
	SUM							19
CS-137 -- BA-137M	.000205	CI	1989 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	4
	****							-----
	SUM							4
CS-137 -- BA-137M	.000053	CI	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
	****							-----

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast	Sec Wast	Facility	Count
			SUM					12
CS-137 -- BA-137M	.000100	CI 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
CS-137 -- BA-137M	.001780	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403WA	1
	****							-----
			SUM					2
CS-137 -- BA-137M	.071869	CI 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	27
CS-137 -- BA-137M	.000003	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403WA	2
EU-152	.000190	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	3
	****							-----
			SUM					32
EU-154	.000001	CI 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	4
	****							-----
			SUM					4
EU-154	.000020	CI 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
	****							-----
			SUM					1
EU-154	.000526	CI 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	12
	****							-----
			SUM					12
MN-54	.000000	CI 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
NP-237	.103266	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	11
	****							-----
			SUM					12
NP-237	2.010380	GM 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	3
NP-237	2.000000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403WA	1
	****							-----
			SUM					4
NP-237	1.900275	GM 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	10
	****							-----
			SUM					10
PE-CI	.000000	CI 1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C	2

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Sec	Facility	Count
					Wast Type	Wast Type		
PE-CI	.000000	CI	1987 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
	****							-----
	SUM							3
PE-CI	.000000	CI	1989 METAL DRUMS, BARRELS, KEGS	55 GALLON	H	1D	224T	1
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	21
	****							-----
	SUM							22
PE-CI	.000000	CI	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	H	1D	224T	1
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	30
	****							-----
	SUM							31
PE-CI	.000000	CI	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	H	1D	224T	1
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403UA	2
	****							-----
	SUM							15
PM-147	427.230000	CI	1969 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	UG	218U48	1
PU	.949400	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	UG	218U48	1
	****							-----
	SUM							2
PU	.003500	GM	1970 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218U3A	35
	****							-----
	SUM							35
PU	.002200	GM	1971 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218U3A	22
PU	162.030100	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218U48	305
	****							-----
	SUM							327
PU	2.338200	GM	1972 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218U48	548
	****							-----
	SUM							548
PU	.140000	GM	1973 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218U3A	14
PU	1.173400	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218U48	65

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Sec	Facility	Count
					Wast	Wast		
					Type	Type		
PU	.100000	GM 1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
PU	64.200000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	21
	****							-----
	SUM							22
PU	.234000	GM 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
PU	111.723120	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	30
	****							-----
	SUM							31
PII	.016500	GM 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
PU	33.895918	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
PU	27.926400	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403MA	2
	****							-----
	SUM							15
B.10-9 3PU	64.420000	GM 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	5
	****							-----
	SUM							5
PU-238	.300000	GM 1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218M4B	1
	****							-----
	SUM							1
PU-238	.178863	GM 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	25
PU-238	.001533	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403MA	3
PU-239	304.368700	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	25
PU-239	1.717000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403MA	3
PU-240	36.590240	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	25
PU-240	.232900	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403MA	3
PU-241	3.153580	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	25
PU-241	.012345	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403MA	3
PU-242	.849767	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	25
PU-242	.002648	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403MA	2
	****							-----
	SUM							139
PU239 FSL GR EQUIV	.000000	GM 1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218M4C	2
PU239 FSL GR EQUIV	.000000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1

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Isotope	Rad	Qty	Un	Date	Container Size	Container Description	Pri Wast	Sec Wast	Facility	Count
				****						-----
				SUM						3
PU239 FSL GR EQUIV	.000000	GM	1989		METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
PU239 FSL GR EQUIV	.000000	GM			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	21
				****						-----
				SUM						22
PU239 FSL GR EQUIV	.000000	GM	1990		METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
PU239 FSL GR EQUIV	.000000	GM			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	30
				****						-----
				SUM						31
PU239 FSL GR EQUIV	.000000	GM	1991		METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
PU239 FSL GR EQUIV	.000000	GM			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
PU239 FSL GR EQUIV	.000000	GM			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403MA	2
				****						-----
				SUM						15
RU-106 -- RH-106	.000004	CI	1990		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
				****						-----
				SUM						1
RU-106 -- RH-106	.007700	CI	1991		METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
				****						-----
				SUM						1
SB-125	.000155	CI	1992		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	1
TE-125M	.000155	CI			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	1
				****						-----
				SUM						2
TH-228	.000520	GM	1990		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
				****						-----
				SUM						12
TH-228	.000018	GM	1992		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	5
				****						-----
				SUM						5

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Isotope	Rad	Qty	Un	Date	Container	Size	Container Description	Pri	Sec	Facility	Count
								Wast	Wast		
								Type	Type		
TH-232	9344.000000	GM	1971	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A	218W48	2	
	****									2	
	SUM										
TH-232	15000.000000	GM	1972	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A	218W48	1	
	****									1	
	SUM										
TH-232	100.000000	GM	1992	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1C	224T	2	
	****									2	
	SUM										
TOTAL BETA/GAMMA	427.234631	CI	1969	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	4	
TOTAL BETA/GAMMA	.077185	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	6	
TOTAL BETA/GAMMA	.047100	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	6	
TOTAL BETA/GAMMA	.040785	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	20	
TOTAL BETA/GAMMA	.201025	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	30	
TOTAL BETA/GAMMA	.013635	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	6	
TOTAL BETA/GAMMA	.028620	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	7	
TOTAL BETA/GAMMA	.522050	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	16	
TOTAL BETA/GAMMA	.023440	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	9	
TOTAL BETA/GAMMA	.171500	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	11	
	****									115	
	SUM										
TOTAL BETA/GAMMA	.181000	CI	1970	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A	218W3A	35	
TOTAL BETA/GAMMA	.064800	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	UG	218W48	16	
	****									51	
	SUM										
TOTAL BETA/GAMMA	.094000	CI	1971	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A	218W3A	22	
TOTAL BETA/GAMMA	.773000	CI		METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A	218W48	305	
	****									327	
	SUM										
TOTAL BETA/GAMMA	4.016100	CI	1972	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A	218W48	540	
	****									540	
	SUM										
TOTAL BETA/GAMMA	.014000	CI	1973	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A	218W3A	14	

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Isotope	Rad	Qty	Un	Date	Container	Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
TOTAL BETA/GAMMA	1.326000	CI	1973		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48		55
	****										-----
	SUM										69
TOTAL BETA/GAMMA	2.288000	CI	1974		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48		50
	****										-----
	SUM										50
TOTAL BETA/GAMMA	.060000	CI	1975		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A		1
TOTAL BETA/GAMMA	.721000	CI			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48		120
	****										-----
	SUM										121
TOTAL BETA/GAMMA	.486000	CI	1976		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48		53
	****										-----
	SUM										53
TOTAL BETA/GAMMA	3.874000	CI	1977		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W48		32
	****										-----
	SUM										32
TOTAL BETA/GAMMA	.522000	CI	1978		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C		40
	****										-----
	SUM										40
TOTAL BETA/GAMMA	2.251000	CI	1979		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C		250
	****										-----
	SUM										250
TOTAL BETA/GAMMA	1.020000	CI	1980		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C		17
	****										-----
	SUM										17
TOTAL BETA/GAMMA	.150000	CI	1985		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C		3
	****										-----
	SUM										3
TOTAL BETA/GAMMA	.100000	CI	1987		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C		2
TOTAL BETA/GAMMA	.005000	CI			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		1
	****										-----

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Sec	Facility	Count
					Wast	Wast		
			SUM					3
TOTAL BETA/GAMMA	.000500	CI 1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
TOTAL BETA/GAMMA	2.903091	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	21
	****							-----
			SUM					22
TOTAL BETA/GAMMA	.000500	CI 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
TOTAL BETA/GAMMA	.101419	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	30
	****							-----
			SUM					31
TOTAL BETA/GAMMA	.015620	CI 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
TOTAL BETA/GAMMA	.014700	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
TOTAL BETA/GAMMA	.004060	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403WA	2
	****							-----
			SUM					15
TOTAL BETA/GAMMA	.158522	CI 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	32
TOTAL BETA/GAMMA	.000057	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	2403WA	3
	****							-----
			SUM					35
TOTAL-ALPHA	.000000	CI 1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C	2
TOTAL-ALPHA	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
	****							-----
			SUM					3
TOTAL-ALPHA	.000000	CI 1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
TOTAL-ALPHA	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	21
	****							-----
			SUM					22
TOTAL-ALPHA	.000000	CI 1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
TOTAL-ALPHA	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	30
	****							-----
			SUM					31
TOTAL-ALPHA	.000000	CI 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T	1
TOTAL-ALPHA	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
TOTAL-ALPHA	.000000	CI 1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	2403WA	2
		****						-----
		SUM						15
URANIUM-DEPLETED	3501.014000	GM 1969	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	UG	218W4B	8
		****						-----
		SUM						8
URANIUM-DEPLETED	303000.000000	GM 1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	3
		****						-----
		SUM						3
URANIUM-DEPLETED	.300000	GM 1975	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
		****						-----
		SUM						1
URANIUM-DEPLETED	23000.000000	GM 1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
		****						-----
		SUM						1
URANIUM-DEPLETED	455.000000	GM 1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	1
		****						-----
		SUM						1
URANIUM-DEPLETED	3400.000000	GM 1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
		****						-----
		SUM						1
URANIUM-DEPLETED	1297.500000	GM 1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	5
		****						-----
		SUM						5
URANIUM-ENRICHED	1821.500000	GM 1971	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	4
		****						-----
		SUM						4
URANIUM-ENRICHED	194.000000	GM 1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	2
		****						-----
		SUM						2

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Isotope	Rad	Qty	Un	Date	Container Size	Container Description	Pri Wast	Sec Wast	Facility	Count
URANIUM-ENRICHED	2466.000000	GM	1975		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	1
URANIUM-ENRICHED	44.000000	GM			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	1
			****							-----
			SUM							2
URANIUM-ENRICHED	3530.200000	GM	1977		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	5
			****							-----
			SUM							5
URANIUM-ENRICHED	698.980000	GM	1979		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	7
			****							-----
			SUM							7
URANIUM-ENRICHED	1273.010000	GM	1992		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	10
			****							-----
			SUM							10
URANIUM-NATURAL	.006000	GM	1970		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	2
			****							-----
			SUM							2
URANIUM-NATURAL	38.600000	GM	1971		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	2
			****							-----
			SUM							2
URANIUM-NATURAL	402000.000000	GM	1972		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4B	8
			****							-----
			SUM							8
URANIUM-NATURAL	1.000000	GM	1978		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	1
			****							-----
			SUM							1
URANIUM-NATURAL	6260.000000	GM	1980		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	4
			****							-----
			SUM							4
URANIUM-NATURAL	200.000000	GM	1989		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	1
			****							-----
			SUM							1

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Isotope	Rad Qty Un Date Container Size	Container Description	Pri Sec			Count
			Wast	Wast	Facility	
Type	Type		Type	Type		

URANIUM-NATURAL	669.664000 GM 1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T	12
	****					-----
	SUM					12
ZR-95 -- NB-95M	.000002 CI 1992 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T	1
	****					-----
	SUM					1

171 rows selected.

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APPENDIX C

**DATA ON BUILDING 325A WASTE GENERATION BY PNL FROM
THE SOLID WASTE INFORMATION TRACKING SYSTEM**

The information found in this appendix is from the SWITS database. This database incorporates the older R-SWIMS database and is used to track information on radioactive and other wastes stored or disposed at the Hanford Site.

Each SWITS data run in this appendix is preceded by the query used to generate the data. A brief explanation of the run and any additional information needed to understand the data presented is also included.

The bulk of the data provided is limited to information about TRU waste generated at Building 325A by PNL; however, some general information on the non-TRU waste is included for completeness. The term non-TRU is used, instead of LLW, because a small percentage of the waste has been designated only as not TRU. It is believed that most, if not all, of the non-TRU waste is LLW.

The data runs in this appendix are further segregated by waste container type. Since initial retrieval efforts and WRAP 1 will focus on 55-gallon drums, these container types are considered separately.

Some general information about SWITS database and the codes used follows. Please note the disclaimer found on the next page.

DON'T SAY IT --- Write It !

Date:

To: *Judy Pattmeyer*

From: Solid Waste Engineering Data Management Group
N3-11 6-4394/6-4020

Re: SWITS DATA REQUEST

Attached for your information and use is the data which you requested. This data represents best available information regarding wastes currently in storage at the Hanford Site. I trust the information will be suitable to your needs.

Requests for information from the Solid Waste Information and Tracking System (SWITS) are normally relatively limited in scope, requesting specific data fields or summary data. The responses to these requests undergo review during data collection, summary and response preparation.

The response to this request represents a simple reproduction of the SWITS Database. Transmittal of this information is made with the following disclaimers:

- 1) The information contained in this transmittal is raw data, and represents information provided to Solid Waste Engineering (SWE) on burial records or other documents. This data has not been validated.
- 2) The information contained in this transmittal is subject to change without notice. Continual update of SWITS information and improvement of the software system make it impossible to ensure consistency of this data with the database after transmittal.
- 3) This information is current as of 12/11/92.

If I can be of further assistance to you, do not hesitate to call me.

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SWIR401

Solid Waste Information and Tracking System

05/01/92

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Primary Waste Type Code Table

Primary Waste Type Code	Primary Waste Type Description	Ship Time	Rad
AH	HAZ, ADMIN HOLD	89	N
CM	MORATORIUM CONTROLLED	89	N
H	HAZARDOUS	89	N
HP	HAZARDOUS WASTE PCB	29	N
M	MIXED	89	Y
MP	MIXED PCB	29	Y
N	NON-REGULATED		N
P	PCB	29	N
R	RADIOACTIVE		Y
RP	RADIOACTIVE PCB	29	Y
U	UNKNOWN		N

Secondary Waste Type Code Table

Secondary Waste Type Code	Secondary Waste Group	Secondary Waste Type Description
1A	TRU	TRANSURANIC (NOT PROCESSED THROUGH TRUSAF)
1B	TRU	TRANSURANIC CLASSIFIED
1C	TRU	TRANSURANIC WIPP CERTIFIED
1D	TRU	TRANSURANIC WIPP UNCERTIFIED
1E	TRU	TRANSURANIC SPECIAL CASE
1F	TRU	TRANSURANIC CAISSONS
2A	LLW	LOW-LEVEL NON-INDUSTRIAL
2B	LLW	LOW-LEVEL NON-INDUSTRIAL CLASSIFIED
2F	LLW	LOW-LEVEL CAISSONS
2L	LLW	LOW-LEVEL NON-INDUSTRIAL (ASSAYED FROM TRU)
3A	LLW	LOW-LEVEL INDUSTRIAL
3L	LLW	LOW-LEVEL INDUSTRIAL (ASSAYED FROM TRU)
4A	HLW	HIGH LEVEL WASTE (SPENT FUEL)
UA	USG	UNSEGREGATED NON-TRANSURANIC DRY WASTE
UB	USG	UNSEGREGATED NON-TRANSURANIC INDUSTRIAL
UC	USG	UNSEGREGATED CAISSONS (REMOTE HANDLED)
UF	USG	UNSEGREGATED TRANSURANIC/LOW-LEVEL (TUNNELS PUREX)
UG	USG	UNSEGREGATED TRANSURANIC DRY WASTE
UJ	USG	UNSEGREGATED TRANSURANIC INDUSTRIAL

APPENDIX C.1

**CONTAINER NUMBER AND WEIGHT OF TRU WASTE IN
55-GALLON DRUMS BY WASTE TYPE**

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This data run gives an overall look at the waste types, container numbers and total weight (in kilograms) of the radioactive wastes generated at Building 325A-PNL on a yearly basis. These data are for wastes stored in 55-gallon drums only. The meanings of primary and secondary waste codes can be found in the introductory materials for this appendix.

The data in the average weight column should be taken cautiously, especially for LLW codes. Concern is warranted because LLW records are still done on a batch basis. This means that one weight datum may be the composite weight for a group of drums. The computer program used simply divided the sum of all weight values by the number of values used to compute the total weight, not the actual number of containers that that value represents.

From 1970 until 1978 individual container weights were not required for TRU drums. During the data re-entry program in the mid-1980's standard weights were assigned for all container types; 55-gallon drums were given a standard weight of 68 kg. This is why the average weight/drum for TRU is so consistent during this period.

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```

set linesize 170
set pagesize 45
set newpage 0
spool pot2.srep
title center '325A PNL ' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(con_cntr_vol) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Type"
col sum(rdet_rswims_count) format 999999 heading "Count"
col avg(con_gross_wgt) format 99999.99 heading "Avg|Weight"
col sum(con_gross_wgt) format 999999.99 heading "Sum|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Sum|Vol"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Vol"
col cntyp_descr format a30 heading "Container Description"
col con_size_descr format a25 heading "Container Size"
select substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       sum(rdet_rswims_count),
       sum(con_gross_wgt),
       avg(con_gross_wgt),
       sum(con_cntr_vol),
       avg(con_cntr_vol)
from radwaste, cntype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and con_size_descr = '55 GALLON' and con_cntyp_cd = cntyp_cd
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       rdet_swtyp_cd

spool off

```

Date	Container Description	Container Size	Pri Wast Type	Sec Wast Type	Count	Sum Weight	Avg Weight	Sum Vol	Avg Vol
1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	15	2477.97	825.99	3.19	1.06

sum					15	2477.97		3.19	
1976	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	10	3855.50	385.55	2.10	.21

sum					10	3855.50		2.10	
1977	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	10	3016.37	1508.19	2.12	1.06

sum					10	3016.37		2.12	
1978	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	14	3097.11	3097.11	2.97	2.97

sum					14	3097.11		2.97	
1979	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	5	340.20	68.04	1.05	.21

sum					5	340.20		1.05	

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APPENDIX C.2

**BUILDING 325A-PNL TRU WASTE CONTAINERS SORTED BY
CONTAINER DESCRIPTION, SIZE, YEAR,
AND PRIMARY WASTE TYPE**

This subappendix provides information on Building 325A-PNL TRU waste containers, weight, volume, and primary waste type stored at various TRU waste storage facilities on the Hanford Site. The data provides the TRU waste generation from the Building 325A-PNL Facility by year.

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```

set linesize 170
set pagesize 44
set newpage 0
spool pot3.srep
title center 'TRU WASTE- 325A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_de format a4 heading "Sec|Wast|Type"
col sum(con_gross_wgt) format 999999.99 heading "Weight"
col sum(rdet_rswims_count) format 99999 heading "Count"
col avg(con_gross_wgt) format 999999.99 heading "Avg|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Volume"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Volume"
col cntyp_descr format a55 heading "Container Discription"
col con_size_descr format a45 heading "Container Size"
col con_locn_facil_id format a8 heading "Facility"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    con_locn_facil_id

spool off

```


Container Discription	Container Size	Pri Wast		Date	Type	Facility	Count	Weight	Avg		Avg
									Weight	Volume	Volume
METAL CYLINDER, CASKS	UNKNOWN	1975	R	218W3A	11	30481.24	2771.02	67.96	6.18		

		sum			11	30481.24		67.96			
METAL DRUMS, BARRELS, KEGS	5 GALLON	1970	R	218W4B	17	179.64	19.96	.25	.03		

		sum			17	179.64		.25			
METAL DRUMS, BARRELS, KEGS	5 GALLON	1971	R	218W4B	38	379.24	19.96	.53	.03		

		sum			38	379.24		.53			
METAL DRUMS, BARRELS, KEGS	5 GALLON	1972	R	218W4B	35	359.28	19.96	.50	.03		

		sum			35	359.28		.50			
METAL DRUMS, BARRELS, KEGS	5 GALLON	1973	R	218W4B	6	99.80	19.96	.14	.03		

		sum			6	99.80		.14			
METAL DRUMS, BARRELS, KEGS	5 GALLON	1983	R	218W4B	1	18.14	18.14	.04	.04		

		sum			1	18.14		.04			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976	R	218W3A	10	3855.50	385.55	2.10	.21		

		sum			10	3855.50		2.10			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	k	218W4C	5	340.20	68.04	1.05	.21		

		sum			5	340.20		1.05			
WOODEN BOXES, CARTONS, CASES	1.5*1.5*10	1969	R	218W4B	1	200.03	200.03	.45	.45		
WOODEN BOXES, CARTONS, CASES	2*2*3		R	218W4B	2	338.83	338.83	.76	.76		
WOODEN BOXES, CARTONS, CASES	3*3*3		R	218W4B	2	781.09	390.55	1.74	.87		
WOODEN BOXES, CARTONS, CASES	3*3*4		R	218W4B	2	914.44	914.44	2.04	2.04		

		sum			7	2234.39		4.98			

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APPENDIX C.3

**BUILDING 325A-PNL NON-TRU WASTE CONTAINERS SORTED
BY CONTAINER DESCRIPTION, SIZE, YEAR,
AND PRIMARY WASTE TYPE**

This subappendix provides information on PNL Building 325A non-TRU waste containers, weight, volume, and primary waste type stored at various waste storage facilities on the Hanford Site. The data provides the non-TRU waste generation from the PNL Building 325A Facility by year.

```

set linesize 175
set pagesize 45
set newpage 0
spool pot3a.srep
title center 'NON-TRU WASTE- 325A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt                                format a4          heading "Date"
col con_pwtyp_cd                      format a4          heading "Pri|Wast|Type"
col rdet_swtyp_cd                     format a4          heading "Sec|Wast|Type"
col sum(con_gross_wgt)                format 999999.99      heading "Weight"
col sum(rdet_rswims_count)            format 99999          heading "Count"
col avg(con_gross_wgt)                format 999999.99      heading "Avg|Weight"
col sum(con_cntr_vol)                 format 99999.99       heading "Volume"
col avg(con_cntr_vol)                 format 99999.99       heading "Avg|Volume"
col cntyp_descr                       format a55          heading "Container Discription"
col con_size_descr                    format a45          heading "Container Size"
col con_locn_facil_id                 format a8          heading "Facility"
col rdet_swtyp_cd                     format a4          heading "Sec|Wast|Code"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and rdet_swtyp_cd in ('2A','2B','2L','3A','3L','UA','UB') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id
;
spool off

```

Container Discription	Container Size	Date	Pri	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
			Wast	Wast						
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1977 R	2A	218W3A	26	4445.18	4445.18	9.91	9.91	

		sum			26	4445.18		9.91		
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1978 R	2A	218W3A	57	2026.19	1013.10	21.15	10.58	

		sum			57	2026.19		21.15		
METAL CYLINDER, CASKS	UNKNOWN	1975 R	2A	218W3A	2	5474.83	5474.83	12.21	12.21	

		sum			2	5474.83		12.21		
METAL DRUMS, BARRELS, KEGS	110 GALLON	1977 R	2A	218W3A	1	187.79	187.79	.42	.42	

		sum			1	187.79		.42		
METAL DRUMS, BARRELS, KEGS	5 GALLON	1978 R	2A	218W3A	2	68.04	68.04	.09	.09	

		sum			2	68.04		.09		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R	2A	218W3A	10	3016.37	1508.19	2.12	1.06	

		sum			10	3016.37		2.12		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 M	2A	218W3A	15	2477.97	825.99	3.19	1.06	
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W3A	14	3097.11	3097.11	2.97	2.97	

		sum			29	5575.08		6.16		
MISCELLANEOUS SCRAP	UNKNOWN	1975 R	2A	218W3A	2	622.33	622.33	1.39	1.39	

		sum			2	622.33		1.39		
MISCELLANEOUS SCRAP	UNKNOWN	1977 R	2A	218W3A	1	38.10	38.10	.91	.91	

		sum			1	38.10		.91		
MISCELLANEOUS SCRAP	UNKNOWN	1978 M	2A	218W3A	20	771.10	771.10	4.81	4.81	
MISCELLANEOUS SCRAP	UNKNOWN	R	2A	218W3A	79	2483.40	1241.70	6.37	3.19	

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Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast									
								99	3254.50		11.19	
				1977	R	2A	218W3A	6	7760.02	3880.01	17.30	8.65

				sum				6	7760.02		17.30	
TANKS, PORTABLE	UNKNOWN											
				1978	M	2A	218W3A	3	16209.03	8104.52	37.31	18.65
					R	2A	218W3A	2	6214.19	3107.10	22.65	11.33

				sum				5	22423.22		59.96	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN											
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN											
				1977	R	2A	218W3A	1	914.44	914.44	2.04	2.04
WOODEN BOXES, CARTONS, CASES	3*4*6				R	2A	218W3A	9	7314.59	2438.20	16.31	5.44
WOODEN BOXES, CARTONS, CASES	4*4*4				R	2A	218W3A	10	18406.68	9203.34	36.25	18.12
WOODEN BOXES, CARTONS, CASES	4*4*8			****								
				sum				20	26635.71		54.60	
				1981	R	3A	218W3A	3	3628.72	1814.36	11.13	5.56

				sum				3	3628.72		11.13	
				1992	R	3A	218W5	3	4840.90	1613.63	12.00	4.00
WOODEN BOXES, CARTONS, CASES	4*4.5*8				R	3A	218W5	6	8191.40	1365.23	24.00	4.00
WOODEN BOXES, CARTONS, CASES	8*4*4.5			****								
				sum				9	13032.30		36.00	

21 rows selected.

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APPENDIX C.4

**RADIOLOGICAL DATA FOR TRU WASTE CONTAINERS
SORTED BY DATE, PRIMARY WASTE TYPE, AND
STORAGE FACILITY**

WHC-EP-0696

This subappendix summarizes the radiological data for all TRU waste containers generated at Building 325A-PNL. Specifically, this computer run provides the total grams of TRU elements in a given container type in a given year. In addition, the average gram loading for a given container type in a given year has been calculated.

In 1991 and 1992 the number of curies (Ci) of alpha radiation was included on the SWBRs. Since the Building 325A-PNL waste generation data is all from 1970 to 1988, these columns contain blank entries. The "Max Dose" column contains the highest value recorded for a given container in a given year, in mrem/hr.

Additional information about the isotopes present in Building 325A-PNL waste containers can be found in sub-appendices C.9 and C.10.

```

linesize 170
pagesize 44
set newpage 0
spool pot4.srep
tttitle center 'TRU Waste 325A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(rdet_rswims_count) on report
compute sum of sum(rad_qty) on dt
compute sum of avg(rad_qty) on dt
compute sum of sum(rad_alpha_ci) on dt
compute sum of avg(rad_alpha_ci) on dt
compute sum of max(rdet_bg_dose_rate) on dt
col dt format a4 heading "Date"
col cntyp_descr format a45 heading "Container Description"
col con_size_descr format a20 heading "Container Size"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col con_locn_facil_id format a8 heading "Location"
col sum(rdet_rswims_count) format 999999 heading "Count"
col sum(rad_qty) format 999999.99 heading "Total|TRU (g)"
col avg(rad_qty) format 99999.99 heading "Avg|TRU (g)"
col sum(rad_alpha_ci) format 999999.99 heading "Total|Alpha (ci)"
col avg(rad_alpha_ci) format 999999.99 heading "Avg|Alpha (ci)"
col max(rdet_bg_dose_rate) format 999999.99 heading "Max|Alpha (ci)"
select cntyp_descr,
       con_size_descr,
       substr(to_char(con_tsd_accept_dt, 'YYYY'),1, 4)dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count),
       sum(rad_qty),
       avg(rad_qty),
       sum(rad_alpha_ci),
       avg(rad_alpha_ci),
       max(rdet_bg_dose_rate)
from radwaste, contype, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A' and
rad_iso_num in (1,21,22,26,41,52,87,97,98,100,104,105,111,146,147) and
rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UF','UG','UJ') and
con_cntyp_cd = cntyp_cd(+) and con_pkg_id = rad_pkg_id(+)
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr(to_char(con_tsd_accept_dt, 'YYYY'), 1, 4),
       con_locn_facil_id
;
spool off
tttitle off

```

TRU Waste 325A PNL

Page: 1

Container Description	Container Size	Pri		Count	Total TRU (g)	Avg TRU (g)	Total Alpha (ci)	Avg Alpha (ci)	Max Alpha (ci)
		Date	Waste Type Location						
METAL CYLINDER, CASKS	UNKNOWN	1975 R	218W3A	11	7.02	.64			3000.00

		sum		11	7.02	.64	.00	.00	3000.00
METAL DRUMS, BARRELS, KEGS	5 GALLON	1970 R	218W4B	17	.16	.02			20.00

		sum		17	.16	.02	.00	.00	20.00
METAL DRUMS, BARRELS, KEGS	5 GALLON	1971 R	218W4B	42	.37	.02			30.00

		sum		42	.37	.02	.00	.00	30.00
METAL DRUMS, BARRELS, KEGS	5 GALLON	1972 R	218W4B	35	.03	.00			100.00

		sum		35	.03	.00	.00	.00	100.00
METAL DRUMS, BARRELS, KEGS	5 GALLON	1973 R	218W4B	6	.00	.00			5.00

		sum		6	.00	.00	.00	.00	5.00
METAL DRUMS, BARRELS, KEGS	5 GALLON	1983 R	218W4B	2	17.00	8.50			5.00

		sum		2	17.00	8.50	.00	.00	5.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R	218W3A	11	1125.60	102.33			10.00

		sum		11	1125.60	102.33	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R	218W4C	5	5.00	1.00			1.00

		sum		5	5.00	1.00	.00	.00	1.00
WOODEN BOXES, CARTONS, CASES	1.5*1.5*10	1969 R	218W4B	1	.00	.00			
WOODEN BOXES, CARTONS, CASES	2*2*3	R	218W4B	2	.00	.00			4000.00
WOODEN BOXES, CARTONS, CASES	3*3*3	R	218W4B	2	.01	.00			4000.00
WOODEN BOXES, CARTONS, CASES	3*3*4	R	218W4B	2	.01	.01			4000.00

		sum		7	.02	.02	.00	.00	12000.00

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APPENDIX C.5

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325A-PNL
55-GALLON DRUMS CONTAINING TRU WASTE
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

WHC-EP-0696

This subappendix describes the physical contents of the 55-gallon drums of TRU waste generated by Building 325A-PNL. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix C contains a table of waste codes and their meanings.

WHC-EP-0696

```

set linesize 170
set pagesize 45
set newpage 0
spool pot5.srep
title center 'TRU WASTE - 325A PNL ' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40          heading "Physical Description"
col cntyp_descr              format a55           heading "Container Discription"
col con_size_descr           format a45           heading "Container Size"
col dt                       format a4           heading "Date"
col con_pwtyp_cd             format a4           heading "Pri|Wast|Type"
col con_locn_facil_id        format a8           heading "Facility"
col sum(rdet_rswims_count)    format 999999       heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id(+)
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

Physical Description	Container Discription	Container Size	Pri Wast		Count
			Date	Type Facility	
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1976	R 218W3A	10
				*****	-----
				sum	10
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R 218W4C	4
			1979	R	1
				*****	-----
				sum	5

C.5-4

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APPENDIX C.6

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325A-PNL TRU
WASTE CONTAINERS OTHER THAN 55-GALLON DRUMS
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the TRU waste containers other than 55-gallon drums generated at Building 325A-PNL. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix C contains a table of waste codes and their meanings.

WHC-EP-0696

```

set linesize 170
set pagesize 45
set newpage 0
spool pot6.srep          325A
title center 'TRU WASTE - 235A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40          heading "Physical Description"
col con_size_descr          format a47          heading "Container Description"
col cntyp_descr             format a45          heading "Container Size"
col dt                      format a4           heading "Date"
col con_pwtyp_cd            format a4           heading "Pri|Wast|Type"
col con_locn_facil_id       format a8           heading "Facility"
col sum(rdet_rswims_count)   format 999999      heading "Count"
col rdet_swtyp_cd           format a4           heading "Sec|Wast|Type"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id(+)
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
rdet_swtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

Physical Description	Container Size	Container Description	Date	Pri Wast	Sec Wast	Facility	Count
MISCELLANEOUS/UNKNOWN/OTHER	METAL CYLINDER, CASKS	UNKNOWN	1975	R	1A	218W3A	8
	METAL CYLINDER, CASKS	UNKNOWN	1975	R	1A		3

						sum	11
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	5 GALLON	1983	R	1F	218W4B	1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	1.5*1.5*10	1969	R	UG		1
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	2*2*3	1969	R	UG		2
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	3*3*3	1969	R	UG		2
MISCELLANEOUS/UNKNOWN/OTHER	WOODEN BOXES, CARTONS, CASES	3*3*4	1969	R	UG		2
OXIDES/POWDERS	METAL DRUMS, BARRELS, KEGS	5 GALLON	1983	R	1F		1
	METAL DRUMS, BARRELS, KEGS	5 GALLON	1970	R	1F		17
	METAL DRUMS, BARRELS, KEGS	5 GALLON	1971	R	1F		38
	METAL DRUMS, BARRELS, KEGS	5 GALLON	1972	R	1F		35
	METAL DRUMS, BARRELS, KEGS	5 GALLON	1973	R	1F		6

						sum	105

C.6-4

12 rows selected.

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APPENDIX C.7

**HAZARDOUS CONSTITUENTS OF 55-GALLON
DRUMS CONTAINING TRU WASTE**

The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). In this subappendix the hazardous contents of 55-gallon drums generated at Building 325A-PNL are sorted by storage facility.

Information concerning the hazardous constituents of waste containers was not required prior to 1986. During the R-SWIMS data reentry program in the mid-1980's an attempt was made to add any available information on the hazardous materials present, however, this information was limited.

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```

set linesize 170
set pagesize 45
set newpage 0
spool pot7.srep
title center 'TRU Waste 325A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text          format a40          heading "Hazardous"
col con_size_descr         format a45          heading "Container Description"
col cntyp_descr            format a40          heading "Container Size"
col dt                     format a4           heading "Date"
col con_pwtyp_cd           format a4           heading "Pri|Wast|Type"
col con_locn_facil_id      format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999      heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

```

haz_comp_text,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
        cntyp_descr,
        con_size_descr

```

```

;
spool off

```

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```

"pot7.sql" 37 lines, 1220 characters

SQL> @pot7

no rows selected

SQL>

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°VT220° 80 COL° °7 BIT MODE°

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APPENDIX C.8

**HAZARDOUS CONSTITUENTS OF TRU WASTE CONTAINERS
OTHER THAN 55-GALLON DRUMS**

WHC-EP-0696

The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). No hazardous constituents are listed in containers other than 55-gallon drums generated at Building 325A-PNL; therefore this run did not reveal any hazardous information.

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```

set linesize 170
set pagesize 45
newpage 0
spool pot8.srep
title center 'TRU Waste 325A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text          format a40          heading "Hazardous"
col con_size_descr         format a45          heading "Container Description"
col cntyp_descr            format a40          heading "Container Size"
col dt                     format a4           heading "Date"
col con_pwtyp_cd           format a4           heading "Pri|Wast|Type"
col con_locn_facil_id      format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999      heading "Count"
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       rdet_rswims_count
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
order by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
con_size_descr,
rdet_rswims_count
;
spool off

```

```

haz_comp_text,
con_pwtyp_cd,
      cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
      con_size_descr,
      rdet_rswims_count

```

```

;
spool off

```

```

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```

"pot8.sql" 37 lines, 1177 characters

SQL> @pot8

no rows selected

SQL>

° ° ° °

°VT220° 80 COL° °7 BIT MODE°

APPENDIX C.9

**ISOTOPES LISTED IN 55-GALLON DRUMS
CONTAINING TRU WASTES**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325A-PNL stored in 55-gallon drums. The isotope field in SWITS contains several types of the following information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted.)
- Plutonium-239 fissile gram equivalents (Pu239 FSL GR equiv).
- Total - alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste drums with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot9.srep
title center 'TRU Waste 325A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name          format a30          heading "Isotope"
col sum(rad_qty)      format 999999.999999 heading "Rad Qty"
col iso_unit          heading a4          heading "Unit"
col dt                format a4           heading "Date"
col cntyp_descr       format a40          heading "Container Size"
col con_size_descr    format a45          heading "Container Description"
col con_pwtyp_cd      format a4           heading "Pri|Wast|Type"
col con_locn_facil_id format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999 heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, cntype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       cntyp_descr,
       con_size_descr,
       rdet_rswims_count
;
spool off

```


Isotope	Rad	Qty	Un	Date	Container Size	Container Description	Pri Wast Type	Sec Wast Type	Facility	Count
PU	1121.600000	GM	1976		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	10
	-----		****							-----
	1121.600000	sum								10
PU	5.000000	GM	1979		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	5
	-----		****							-----
	5.000000	sum								5
TH-232	22600.000000	GM	1976		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	10
TOTAL BETA/GAMMA	.070000	CI			METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	10
	-----		****							-----
	22600.070000	sum								20
TOTAL BETA/GAMMA	.005000	CI	1979		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C	5
	-----		****							-----
	.005000	sum								5
U-233	4.000000	GM	1976		METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W3A	1
	-----		****							-----
	4.000000	sum								1

6 rows selected.

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APPENDIX C.10

**ISOTOPES LISTED IN TRU CONTAINERS
OTHER THAN 55-GALLON DRUMS**

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This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325A-PNL stored in containers other than 55-gallon drums. The isotope field in SWITS contains several types of the following information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted)
- Plutonium-239 equivalent curies (PE-Ci)
- Total-alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste containers with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot10.srep
title center 'TRU Waste 325A PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name          format a30          heading "Isotope"
col sum(rad_qty)       format 999999.999999 heading "Rad Qty"
col iso_unit           heading a4          heading "Unit"
col dt                format a4           heading "Date"
col cntyp_descr        format a45         heading "Container Size"
col con_size_descr     format a45         heading "Container Description"
col con_pwtyp_cd       format a4          heading "Pri|Wast|Type"
col con_locn_facil_id  format a8          heading "Facility"
col sum(rdet_rswims_count) format 999999 heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
       radwaste, contype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325A'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       con_pwtyp_cd,
       con_locn_facil_id,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       cntyp_descr,
       con_size_descr
;
spool off

```

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
CS-137 BA-137M	.087000	CI 1970	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	1
	-----	****				
	.087000	sum				1
CS-137 -- BA-137M	30.000000	CI 1971	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	6
	-----	****				
	30.000000	sum				6
I-129	.103750	CI 1969	WOODEN BOXES, CARTONS, CASES	2*2*3	R 218W4B	2
I-129	.116550	CI	WOODEN BOXES, CARTONS, CASES	3*3*3	R 218W4B	1
I-129	.279700	CI	WOODEN BOXES, CARTONS, CASES	3*3*4	R 218W4B	2
	-----	****				
	.500000	sum				5
NP-237	.011000	GM 1971	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	4
	-----	****				
	.011000	sum				4
PU	7.019000	GM 1975	METAL CYLINDER, CASKS	UNKNOWN	R 218W3A	11
	-----	****				
	7.019000	sum				11
PU	.003340	GM 1969	WOODEN BOXES, CARTONS, CASES	1.5*1.5*10	R 218W4B	1
PU	.002075	GM	WOODEN BOXES, CARTONS, CASES	2*2*3	R 218W4B	2
PU	.008991	GM	WOODEN BOXES, CARTONS, CASES	3*3*3	R 218W4B	2
PU	.005594	GM	WOODEN BOXES, CARTONS, CASES	3*3*4	R 218W4B	2
	-----	****				
	.020000	sum				7
PU	.160000	GM 1970	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	17
	-----	****				
	.160000	sum				17
PU	.361000	GM 1971	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	38
	-----	****				
	.361000	sum				38
PU	.033300	GM 1972	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	35
	-----	****				
	.033300	sum				35

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
PU	.000500	GM 1973	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	6
	-----	****				-----
	.000500	sum				6
PU	.000100	GM 1983	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	1
	-----	****				-----
	.000100	sum				1
RU-106 -- RH-106	1.010000	CI 1971	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	4
SR-90 - Y90	30.000000	CI	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	6
	-----	****				-----
	31.010000	sum				10
TH-232	8200.000000	GM 1983	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	1
	-----	****				-----
	8200.000000	sum				1
TOTAL BETA/GAMMA	41.130000	CI 1975	METAL CYLINDER, CASKS	UNKNOWN	R 218W3A	11
	-----	****				-----
	41.130000	sum				11
TOTAL BETA/GAMMA	.016700	CI 1969	WOODEN BOXES, CARTONS, CASES	1.5*1.5*10	R 218W4B	1
TOTAL BETA/GAMMA	.103750	CI	WOODEN BOXES, CARTONS, CASES	2*2*3	R 218W4B	2
TOTAL BETA/GAMMA	.149850	CI	WOODEN BOXES, CARTONS, CASES	3*3*3	R 218W4B	2
TOTAL BETA/GAMMA	.279700	CI	WOODEN BOXES, CARTONS, CASES	3*3*4	R 218W4B	2
	-----	****				-----
	.550000	sum				7
TOTAL BETA/GAMMA	720.174000	CI 1970	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	17
	-----	****				-----
	720.174000	sum				17
TOTAL BETA/GAMMA	800.006200	CI 1971	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	38
	-----	****				-----
	800.006200	sum				38
TOTAL BETA/GAMMA	.141500	CI 1972	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W4B	33
	-----	****				-----
	.141500	sum				33

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
TOTAL BETA/GAMMA	.010000	CI 1973	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W48	6
	-----	****				-----
	.010000	sum				6
TOTAL BETA/GAMMA	.161500	CI 1983	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W48	1
U-233	17.000000	GM	METAL DRUMS, BARRELS, KEGS	5 GALLON	R 218W48	1
	-----	****				-----
	17.161500	sum				2

30 rows selected.

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APPENDIX D

**DATA ON BUILDING 325B WASTE GENERATION BY WESTINGHOUSE HANFORD
FROM THE SOLID WASTE INFORMATION TRACKING SYSTEM**

The information found in this appendix is from the SWITS database. This database incorporates the older R-SWIMS database and is used to track information on radioactive and other wastes stored or disposed at the Hanford Site.

Each SWITS data run in this appendix is preceded by the query used to generate the data. A brief explanation of the run and any additional information needed to understand the data presented is also included.

The bulk of the data provided is limited to information about TRU waste generated at Building 325B-Westinghouse Hanford; however, some general information on the non-TRU waste is included for completeness. The term non-TRU is used, instead of LLW, because a small percentage of the waste has been designated only as not TRU. It is believed that most, if not all, of the non-TRU waste is LLW.

The data runs in this appendix are further segregated by waste container type. Since initial retrieval efforts and WRAP 1 will focus on 55-gallon drums, these container types are considered separately.

Some general information about SWITS database and the codes used follows. Please note the disclaimer found on the next page.

DON'T SAY IT --- Write It !

Date:

To: *Judy Pattmeyer*

From: Solid Waste Engineering Data Management Group
N3-11 6-4394/6-4020

Re: SWITS DATA REQUEST

Attached for your information and use is the data which you requested. This data represents best available information regarding wastes currently in storage at the Hanford Site. I trust the information will be suitable to your needs.

Requests for information from the Solid Waste Information and Tracking System (SWITS) are normally relatively limited in scope, requesting specific data fields or summary data. The responses to these requests undergo review during data collection, summary and response preparation.

The response to this request represents a simple reproduction of the SWITS Database. Transmittal of this information is made with the following disclaimers:

- 1) The information contained in this transmittal is raw data, and represents information provided to Solid Waste Engineering (SWE) on burial records or other documents. This data has not been validated.
- 2) The information contained in this transmittal is subject to change without notice. Continual update of SWITS information and improvement of the software system make it impossible to ensure consistency of this data with the database after transmittal.
- 3) This information is current as of 12/11/92.

If I can be of further assistance to you, do not hesitate to call me.

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Solid Waste Information and Tracking System

05/01/92

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Page: 1

Primary Waste Type Code Table

Primary Waste Type Code	Primary Waste Type Description	Ship Time	Rad
AH	HAZ, ADMIN HOLD	89	N
CM	MORATORIUM CONTROLLED	89	N
H	HAZARDOUS	89	N
HP	HAZARDOUS WASTE PCB	29	N
M	MIXED	89	Y
MP	MIXED PCB	29	Y
N	NON-REGULATED		N
P	PCB	29	N
R	RADIOACTIVE		Y
RP	RADIOACTIVE PCB	29	Y
U	UNKNOWN		N

Secondary Waste Type Code Table

Secondary Waste Type Code	Secondary Waste Group	Secondary Waste Type Description
1A	TRU	TRANSURANIC (NOT PROCESSED THROUGH TRUSAF)
1B	TRU	TRANSURANIC CLASSIFIED
1C	TRU	TRANSURANIC WIPP CERTIFIED
1D	TRU	TRANSURANIC WIPP UNCERTIFIED
1E	TRU	TRANSURANIC SPECIAL CASE
1F	TRU	TRANSURANIC CAISSONS
2A	LLW	LOW-LEVEL NON-INDUSTRIAL
2B	LLW	LOW-LEVEL NON-INDUSTRIAL CLASSIFIED
2F	LLW	LOW-LEVEL CAISSONS
2L	LLW	LOW-LEVEL NON-INDUSTRIAL (ASSAYED FROM TRU)
3A	LLW	LOW-LEVEL INDUSTRIAL
3L	LLW	LOW-LEVEL INDUSTRIAL (ASSAYED FROM TRU)
4A	HLW	HIGH LEVEL WASTE (SPENT FUEL)
UA	USG	UNSEGREGATED NON-TRANSURANIC DRY WASTE
UB	USG	UNSEGREGATED NON-TRANSURANIC INDUSTRIAL
UC	USG	UNSEGREGATED CAISSONS (REMOTE HANDLED)
UF	USG	UNSEGREGATED TRANSURANIC/LOW-LEVEL (TUNNELS PUREX)
UG	USG	UNSEGREGATED TRANSURANIC DRY WASTE
UJ	USG	UNSEGREGATED TRANSURANIC INDUSTRIAL

APPENDIX D.1

**CONTAINER NUMBER AND WEIGHT OF TRU WASTE IN
55-GALLON DRUMS BY WASTE TYPE**

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This data run gives an overall look at the waste types, container numbers and total weight (in kilograms) of the radioactive wastes generated at Building 325B-Westinghouse Hanford on a yearly basis. These data are for wastes stored in 55-gallon drums only. The meanings of primary and secondary waste codes can be found in the introductory materials for this appendix.

The data in the average weight column should be taken cautiously, especially for LLW codes. Concern is warranted because LLW records are still done on a batch basis. This means that one weight datum may be the composite weight for a group of drums. The computer program used simply divided the sum of all weight values by the number of values used to compute the total weight, not the actual number of containers that that value represents.

From 1970 until 1978 individual container weights were not required for TRU drums. During the data reentry program in the mid-1980's standard weights were assigned for all container types; 55-gallon drums were given a standard weight of 68 kg. This is why the average weight/drum for TRU is so consistent during this period.

```

set linesize 170
set pagesize 45
spool newpage 0
spool pot2.srep
title center '325B WHC ' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(con_cntr_vol) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Type"
col sum(rdet_rswims_count) format 999999 heading "Count"
col avg(con_gross_wgt) format 99999.99 heading "Avg|Weight"
col sum(con_gross_wgt) format 9999999.99 heading "Sum|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Sum|Vol"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Vol"
col cntyp_descr format a30 heading "Container Description"
col con_size_descr format a25 heading "Container Size"
select substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       sum(rdet_rswims_count),
       sum(con_gross_wgt),
       avg(con_gross_wgt),
       sum(con_cntr_vol),
       avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON' and con_cntyp_cd = cntyp_cd
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       rdet_swtyp_cd
;
spool off

```


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```
      con_pwtyp_cd,  
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),  
      rdet_swtyp_cd
```

```
;  
spool off
```

```
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"pot2.sql" 42 lines, 1394 characters

SQL> @pot2

no rows selected

SQL>

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APPENDIX D.2

**BUILDING 325B-WESTINGHOUSE HANFORD TRU WASTE CONTAINERS
SORTED BY CONTAINER DESCRIPTION, SIZE,
YEAR, AND PRIMARY WASTE TYPE**

This subappendix provides information on Building 325B-Westinghouse Hanford TRU waste containers, weight, volume, and primary waste type stored at various TRU waste storage facilities on the Hanford Site. The data provides the TRU waste generation from the Building 325B-Westinghouse Hanford Facility by year.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot3.srep
tttitle center 'TRU WASTE- 325B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt                                format a4           heading "Date"
col con_pwtyp_cd                      format a4           heading "Pri|Wast|Type"
col rdet_swtyp_de                     format a4           heading "Sec|Wast|Type"
col sum(con_gross_wgt)                format 999999.99      heading "Weight"
col sum(rdet_rswims_count)            format 99999          heading "Count"
col avg(con_gross_wgt)                format 999999.99      heading "Avg|Weight"
col sum(con_cntr_vol)                 format 99999.99      heading "Volume"
col avg(con_cntr_vol)                 format 99999.99      heading "Avg|Volume"
col cntyp_descr                       format a55          heading "Container Discription"
col con_size_descr                    format a45           heading "Container Size"
col con_locn_facil_id                 format a8           heading "Facility"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    con_locn_facil_id
;
spool off

```

Container Discription	Container Size	Pri Wast Date Type Facility	Count	Weight	Avg Weight	Volume	Avg Volume
METAL DRUMS, BARRELS, KEGS	1 GALLON	1970 R 218W4B	25	64.85	12.97	.09	.02

		SUM	25	64.85		.09	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1971 R 218W4B	80	207.52	12.97	.29	.02

		SUM	80	207.52		.29	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1972 R 218W4B	48	124.51	12.45	.17	.02

		SUM	48	124.51		.17	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1973 R 218W4B	55	142.67	12.97	.20	.02

		SUM	55	142.67		.20	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1976 R 218W4B	11	29.73	7.43	.04	.01

		SUM	11	29.73		.04	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1977 R 218W4B	19	81.33	16.27	.08	.02

		SUM	19	81.33		.08	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1978 R 218W4B	22	67.41	13.48	.10	.02

		SUM	22	67.41		.10	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1979 R 218W4B	33	78.04	7.80	.16	.02

		SUM	33	78.04		.16	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R 218W4B	17	33.58	4.20	.08	.01

		SUM	17	33.58		.08	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1981 R 218W4B	13	21.32	3.55	.06	.01

		SUM	13	21.32		.06	

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Container Discription	Container Size	Pri		Date	Type	Facility	Count	Weight	Avg		Volume
		Wast							Weight	Volume	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1983	R			218W4B	18	34.93	4.37	.08	.01
		****					-----	-----	-----	-----	
		sum					18	34.93		.08	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1984	R			218W4B	10	19.51	4.88	.04	.01
		****					-----	-----	-----	-----	
		sum					10	19.51		.04	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1985	R			218W4B	3	4.50	4.50	.01	.01
		****					-----	-----	-----	-----	
		sum					3	4.50		.01	
SELF CONTAINED, EQUIPMENT	UNKNOWN	1972	R			218W4B	1	4.19	4.19	.01	.01
		****					-----	-----	-----	-----	
		sum					1	4.19		.01	

D.2-5 14 rows selected.

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APPENDIX D.3

**BUILDING 325B-WESTINGHOUSE HANFORD NON-TRU WASTE CONTAINERS
SORTED BY CONTAINER DESCRIPTION, SIZE,
YEAR, AND PRIMARY WASTE TYPE**

This subappendix provides information on Building 325B-Westinghouse Hanford non-TRU waste containers, weight, volume, and primary waste type stored at various waste storage facilities on the Hanford Site. The data provides the non-TRU waste generation from the Building 325B-Westinghouse Hanford Facility by year.

```

set linesize 175
set pagesize 45
newpage 0
spool pot3a.srep
title center 'NON-TRU WASTE- 325B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt                                format a4          heading "Date"
col con_pwtyp_cd                      format a4          heading "Pri|Wast|Type"
col rdet_swtyp_cd                     format a4          heading "Sec|Wast|Type"
col sum(con_gross_wgt)                format 999999.99      heading "Weight"
col sum(rdet_rswims_count)            format 99999          heading "Count"
col avg(con_gross_wgt)                format 999999.99      heading "Avg|Weight"
col sum(con_cntr_vol)                 format 99999.99      heading "Volume"
col avg(con_cntr_vol)                 format 99999.99      heading "Avg|Volume"
col cntyp_descr                       format a55         heading "Container Discription"
col con_size_descr                    format a45         heading "Container Size"
col con_locn_facil_id                 format a8         heading "Facility"
col rdet_swtyp_cd                     format a4          heading "Sec|Wast|Code"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and rdet_swtyp_cd in ('2A','2B','2L','3A','3L','UA','UB') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id
;
spool off

```

```
group by cntyp_descr,
        con_size_descr,
        substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
        con_pwtyp_cd,
        rdet_swtyp_cd,
        con_locn_facil_id
```

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;
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spool off
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```
"pot3a.sql" 48 lines, 1538 characters
```

```
SQL> @pot3a
```

```
no rows selected
```

```
SQL>
```

```
  . . . .
```

```
      'VT220' 80 COL'  '7 BIT MODE'
```

APPENDIX D.4

**RADIOLOGICAL DATA FOR TRU WASTE CONTAINERS
SORTED BY DATE, PRIMARY WASTE TYPE, AND
STORAGE FACILITY**

This subappendix summarizes the radiological data for all TRU waste containers generated at Building 325B-Westinghouse Hanford. Specifically, this computer run provides the total grams of TRU elements in a given container type in a given year. In addition, the average gram loading for a given container type in a given year has been calculated.

In 1991 and 1992 the number of curies (Ci) of alpha radiation was included on the SWBRs. Since the Building 325B-Westinghouse Hanford waste generation data is all from 1970 to 1988, these columns contain blank entries. The "Max Dose" column contains the highest value recorded for a given container in a given year, in mrem/hr.

Additional information about the isotopes present in Building 325B-Westinghouse Hanford waste containers can be found in sub-appendices D.9 and D.10.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot4.srep
title center 'TRU Waste 325B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(rdet_rswims_count) on report
compute sum of sum(rad_qty) on dt
compute sum of avg(rad_qty) on dt
compute sum of sum(rad_alpha_ci) on dt
compute sum of avg(rad_alpha_ci) on dt
compute sum of max(rdet_bg_dose_rate) on dt
col dt                format a4                heading "Date"
col cntyp_descr        format a45                heading "Container Description"
col con_size_descr     format a20                heading "Container Size"
col con_pwtyp_cd       format a4                heading "Pri|Wast|Type"
col con_locn_facil_id  format a8                heading "Location"
col sum(rdet_rswims_count) format 999999        heading "Count"
col sum(rad_qty)        format 999999.99        heading "Total|TRU (g)"
col avg(rad_qty)        format 99999.99         heading "Avg|TRU (g)"
col sum(rad_alpha_ci)   format 999999.99        heading "Total|Alpha (ci)"
col avg(rad_alpha_ci)   format 999999.99        heading "Avg|Alpha (ci)"
col max(rdet_bg_dose_rate) format 999999.99     heading "Max|Alpha (ci)"
select cntyp_descr,
       con_size_descr,
       substr(to_char(con_tsd_accept_dt, 'YYYY'),1, 4)dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count),
       sum(rad_qty),
       avg(rad_qty),
       sum(rad_alpha_ci),
       avg(rad_alpha_ci),
       max(rdet_bg_dose_rate)
from radwaste, contype, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B' and
rad_iso_num in (1,21,22,26,41,52,87,97,98,100,104,105,111,146,147) and
rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UF','UG','UJ') and
con_cntyp_cd = cntyp_cd(+) and con_pkg_id = rad_pkg_id(+)
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr(to_char(con_tsd_accept_dt, 'YYYY'), 1, 4),
       con_locn_facil_id
;
spool off
title off

```

Container Description	Container Size	Pri Waste		Count	Total TRU (g)	Avg TRU (g)	Total Alpha (ci)	Avg Alpha (ci)	Max Alpha (ci)
		Date	Type Location						
METAL DRUMS, BARRELS, KEGS	1 GALLON	1970	R 218W48	25	.50	.10			10.00

		SUM		25	.50	.10	.00	.00	10.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1971	R 218W48	80	8.80	.55			

		SUM		80	8.80	.55	.00	.00	.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1972	R 218W48	48	28.45	2.85			20.00

		SUM		48	28.45	2.85	.00	.00	20.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1973	R 218W48	55	51.75	4.70			35.00

		SUM		55	51.75	4.70	.00	.00	35.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1976	R 218W48	11	18.10	4.53			350.00

		SUM		11	18.10	4.53	.00	.00	350.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1977	R 218W48	19	22.80	4.56			400.00

		SUM		19	22.80	4.56	.00	.00	400.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1978	R 218W48	25	52.26	8.71			20.00

		SUM		25	52.26	8.71	.00	.00	20.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1979	R 218W48	33	58.97	5.90			1000.00

		SUM		33	58.97	5.90	.00	.00	1000.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1980	R 218W48	17	57.33	7.17			220.00

		SUM		17	57.33	7.17	.00	.00	220.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1981	R 218W48	13	52.40	8.73			450.00

		SUM		13	52.40	8.73	.00	.00	450.00

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Container Description	Container Size	Pri		Count	Total TRU (g)	Avg TRU (g)	Total Alpha (ci)	Avg Alpha (ci)	Max Alpha (ci)
		Date	Waste Type Location						
METAL DRUMS, BARRELS, KEGS	1 GALLON	1983	R 218W48	21	41.42	4.60			150.00

		SUM		21	41.42	4.60	.00	.00	150.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1984	R 218W48	10	46.23	11.56			20.00

		SUM		10	46.23	11.56	.00	.00	20.00
METAL DRUMS, BARRELS, KEGS	1 GALLON	1985	R 218W48	9	2.75	.92			100.00

		SUM		9	2.75	.92	.00	.00	100.00
SELF CONTAINED, EQUIPMENT	UNKNOWN	1972	R 218W48	1	1.05	1.05			

		SUM		1	1.05	1.05	.00	.00	.00

D.4-5 14 rows selected.

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APPENDIX D.5

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325B-WESTINGHOUSE
HANFORD 55-GALLON DRUMS CONTAINING TRU WASTE
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the 55-gallon drums of TRU waste generated by Building 325B-Westinghouse Hanford. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix D contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot5.srep
title center 'TRU WASTE- 325B-WHC' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40      heading "Physical Description"
col cntyp_descr              format a55      heading "Container Discription"
col con_size_descr           format a45      heading "Container Size"
col dt                       format a4       heading "Date"
col con_pwtyp_cd             format a4       heading "Pri|Wast|Type"
col con_locn_facil_id        format a8       heading "Facility"
col sum(rdet_rswims_count)    format 999999  heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
phys_comp_descr is null and
cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

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```
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
        cntyp_descr,
        con_size_descr
```

```

;
spool off
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```

"pot5.sql" 38 lines, 1269 characters

SQL> @pot5

no rows selected

SQL>

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°VT220° 80 COL° °7 BIT MODE°

APPENDIX D.6

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325B-WESTINGHOUSE
HANFORD TRU WASTE CONTAINERS OTHER THAN 55-GALLON DRUMS
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the TRU waste containers other than 55-gallon drums generated at Building 325B-Westinghouse Hanford. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix D contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot6.srep          325B
tttitle center 'TRU WASTE - 235B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40          heading "Physical Description"
col con_size_descr           format a47          heading "Container Description"
col cntyp_descr              format a45          heading "Container Size"
col dt                       format a4           heading "Date"
col con_pwtyp_cd             format a4           heading "Pri|Wast|Type"
col con_locn_facil_id        format a8           heading "Facility"
col sum(rdet_rswims_count)    format 999999      heading "Count"
col rdet_swtyp_cd            format a4           heading "Sec|Wast|Type"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A', '1B', '1C', '1D', '1E', '1F', 'UG', 'UF', 'UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id(+)
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
rdet_swtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```


Physical Description	Container Size	Container Description	Pri Sec		Date	Type	Type	Facility	Count
			Wast	Wast					
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	1 GALLON	1979 R	1F	218W48				31
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R	1F					11
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	1 GALLON	1981 R	1F					2
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	1 GALLON	1983 R	1F					16
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	1 GALLON	1985 R	1F					3
FUEL/PINS OR RODS	METAL DRUMS, BARRELS, KEGS	1 GALLON	1983 R	1F					2
GLASS	METAL DRUMS, BARRELS, KEGS	1 GALLON	1979 R	1F					31
GLASS	METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R	1F					17
GLASS	METAL DRUMS, BARRELS, KEGS	1 GALLON	1981 R	1F					11
GLASS	METAL DRUMS, BARRELS, KEGS	1 GALLON	1985 R	1F					3
GRAPHITE	METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R	1F					2
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	1 GALLON	1979 R	1F					31
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R	1F					15
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	1 GALLON	1981 R	1F					10
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	1 GALLON	1983 R	1F					18
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	1 GALLON	1984 R	1F					10
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	1 GALLON	1985 R	1F					3
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	1 GALLON	1972 R	1F					3
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1972 R	1F					1
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	1 GALLON	1979 R	1F					31
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R	1F					17
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	1 GALLON	1981 R	1F					13
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	1 GALLON	1983 R	1F					16
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	1 GALLON	1984 R	1F					10
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	1 GALLON	1979 R	1F					31
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R	1F					17
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	1 GALLON	1981 R	1F					13
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	1 GALLON	1983 R	1F					16
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	1 GALLON	1984 R	1F					10
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	1 GALLON	1985 R	1F					3
RUBBER	METAL DRUMS, BARRELS, KEGS	1 GALLON	1983 R	1F					14
RUBBER	METAL DRUMS, BARRELS, KEGS	1 GALLON	1984 R	1F					2
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	1 GALLON	1980 R	1F					2
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1970 R	1F					25
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1971 R	1F					80
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1972 R	1F					45
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1973 R	1F					55
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1976 R	1F					11
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1977 R	1F					19
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1978 R	1F					22

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Physical Description	Container Size	Container Description	Pri Sec		Date	Type	Type	Facility	Count
			Wast	Wast					
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1979	R	1F	218W48			2

								SUM	674

41 rows selected.

D.6-5

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APPENDIX D.7

**HAZARDOUS CONSTITUENTS OF 55-GALLON
DRUMS CONTAINING TRU WASTE**

The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). In this subappendix the hazardous contents of 55-gallon drums generated at Building 325B-Westinghouse Hanford are sorted by storage facility.

Information concerning the hazardous constituents of waste containers was not required prior to 1986. During the R-SWIMS data reentry program in the mid-1980's an attempt was made to add any available information on the hazardous materials present, however, this information was limited.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot7.srep
title center 'TRU Waste 325B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text          format a40          heading "Hazardous"
col con_size_descr         format a45          heading "Container Description"
col cntyp_descr            format a40          heading "Container Size"
col dt                     format a4           heading "Date"
col con_pwtyp_cd           format a4           heading "Pri|Wast|Type"
col con_locn_facil_id      format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999      heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
order by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

```

haz_comp_text,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
        cntyp_descr,
        con_size_descr

```

```

;
spool off

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```

"pot7.sql" 37 lines, 1220 characters

SQL> @pot7

no rows selected

SQL>

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'VT220' 80 COL' '7 BIT MODE'

WHC-EP-0696

APPENDIX D.8

**HAZARDOUS CONSTITUENTS OF TRU WASTE CONTAINERS
OTHER THAN 55-GALLON DRUMS**

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The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). No hazardous constituents are listed in containers other than 55-gallon drums generated at Building 325B-Westinghouse Hanford; therefore this run did not reveal any hazardous information.

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```

set linesize 170
set pagesize 45
set newpage 0
spool pot8.srep
title center 'TRU Waste 325B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text          format a40          heading "Hazardous"
col con_size_descr         format a45          heading "Container Description"
col cntyp_descr            format a40          heading "Container Size"
col dt                     format a4           heading "Date"
col con_pwtyp_cd           format a4           heading "Pri|Wast|Type"
col con_locn_facil_id      format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999      heading "Count"
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       rdet_rswims_count
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
       cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
con_size_descr,
rdet_rswims_count
;
spool off

```

```

haz_comp_text,
con_pwtyp_cd,
    cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
    con_size_descr,
    rdet_rswims_count

```

```

;
spool off

```

```

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```

"pot8.sql" 37 lines, 1177 characters

SQL> @pot8

no rows selected

SQL>

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•VT220• 80 COL• •7 BIT MODE•

APPENDIX D.9

**ISOTOPES LISTED IN 55-GALLON DRUMS
CONTAINING TRU WASTES**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325B-Westinghouse Hanford stored in 55-gallon drums. The isotope field in SWITS contains several types of the following information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted.)
- Plutonium-239 fissile gram equivalents (Pu239 FSL GR equiv).
- Total - alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste drums with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
spool newpage 0
spool pot9.srep
title center 'TRU Waste 325B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name          format a30          heading "Isotope"
col sum(rad_qty)       format 999999.999999 heading "Rad Qty"
col iso_unit          heading a4          heading "Unit"
col dt                format a4          heading "Date"
col cntyp_descr       format a40          heading "Container Size"
col con_size_descr    format a45          heading "Container Description"
col con_pwtyp_cd      format a4          heading "Pri|Wast|Type"
col con_locn_facil_id format a8          heading "Facility"
col sum(rdet_rswims_count) format 999999 heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, cntype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       cntyp_descr,
       con_size_descr,
       rdet_rswims_count
;
spool off

```

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```
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
         iso_unit,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
        con_pwtyp_cd,
        rdet_swtyp_cd,
con_locn_facil_id,
        cntyp_descr,
        con_size_descr,
        rdet_rswims_count
```

```

;
spool off
```

```
~
~
~
~
~
```

"pot9.sql" 46 lines, 1458 characters

SQL> @pot9

no rows selected

SQL>

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°VT220° 80 COL° °7 BIT MODE°

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APPENDIX D.10

**ISOTOPES LISTED IN TRU CONTAINERS
OTHER THAN 55-GALLON DRUMS**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325B-Westinghouse Hanford stored in containers other than 55-gallon drums. The isotope field in SWITS contains several types of the following information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted)
- Plutonium-239 equivalent curies (PE-Ci)
- Total-alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste containers with that listing. The run is sorted by storage facility and year.

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```

set linesize 170
set pagesize 45
set newpage 0
spool pot10.srep
title center 'TRU Waste 325B WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name                format a30          heading "Isotope"
col sum(rad_qty)             format 999999.999999 heading "Rad Qty"
col iso_unit                 heading a4          heading "Unit"
col dt                       format a4          heading "Date"
col cntyp_descr              format a45         heading "Container Size"
col con_size_descr           format a45         heading "Container Description"
col con_pwtyp_cd             format a4          heading "Pri|Wast|Type"
col con_locn_facil_id        format a8          heading "Facility"
col sum(rdet_rswims_count)    format 999999     heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
       in radwaste, contype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '325B'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       con_pwtyp_cd,
       con_locn_facil_id,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       cntyp_descr,
       con_size_descr
;
spool off

```

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
AM-241	.200000	GM 1985	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
NP-237	.930000	GM	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
	-----	****				-----
	1.130000	sum				6
PU	.500000	GM 1970	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	25
	-----	****				-----
	.500000	sum				25
PU	8.800000	GM 1971	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	80
	-----	****				-----
	8.800000	sum				80
PU	28.450000	GM 1972	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	48
PU	1.050000	GM	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W48	1
	-----	****				-----
	29.500000	sum				49
PU	51.750000	GM 1973	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	55
	-----	****				-----
	51.750000	sum				55
PU	18.100000	GM 1976	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	11
	-----	****				-----
	18.100000	sum				11
PU	22.800000	GM 1977	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	19
	-----	****				-----
	22.800000	sum				19
PU	48.662000	GM 1978	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	22
	-----	****				-----
	48.662000	sum				22
PU	58.970300	GM 1979	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	33
	-----	****				-----
	58.970300	sum				33
PU	57.330400	GM 1980	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	17
	-----	****				-----

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
	57.330400	sum				17
PU	52.400300	GM 1981	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	13
	-----	****				-----
	52.400300	sum				13
PU	41.380100	GM 1983	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	18
	-----	****				-----
	41.380100	sum				18
PU	46.230000	GM 1984	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	10
	-----	****				-----
	46.230000	sum				10
PU	1.620000	GM 1985	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
	-----	****				-----
	1.620000	sum				3
TH-232	1.350000	GM 1978	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	5
	-----	****				-----
	1.350000	sum				5
TH-232	1.350000	GM 1979	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	2
	-----	****				-----
	1.350000	sum				2
TH-232	20.970000	GM 1980	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	2
	-----	****				-----
	20.970000	sum				2
TH-232	51.140000	GM 1983	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	5
	-----	****				-----
	51.140000	sum				5
TH-232	108.600000	GM 1984	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	2
	-----	****				-----
	108.600000	sum				2
TOTAL BETA/GAMMA	50.000000	CI 1970	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	25
	-----	****				-----

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
	50.000000	SUM				25
TOTAL BETA/GAMMA	850.000000	CI 1971	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	80
	850.000000	SUM				80
TOTAL BETA/GAMMA	203.000000	CI 1972	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	48
TOTAL BETA/GAMMA	7.000000	CI	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W48	1
	210.000000	SUM				49
TOTAL BETA/GAMMA	155.000000	CI 1973	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	55
	155.000000	SUM				55
TOTAL BETA/GAMMA	30.001000	CI 1976	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	11
	30.001000	SUM				11
TOTAL BETA/GAMMA	50.000000	CI 1977	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	19
	50.000000	SUM				19
TOTAL BETA/GAMMA	80.100000	CI 1978	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	7
	80.100000	SUM				7
TOTAL BETA/GAMMA	6150.000000	CI 1979	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	33
	6150.000000	SUM				33
TOTAL BETA/GAMMA	40.000000	CI 1980	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	17
	40.000000	SUM				17
TOTAL BETA/GAMMA	75.402000	CI 1981	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	13
	75.402000	SUM				13
TOTAL BETA/GAMMA	.220000	CI 1983	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	18

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
	-----	****				-----
	.220000	sum				18
TOTAL BETA/GAMMA	.200000	CI 1984	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	10
	-----	****				-----
	.200000	sum				10
TOTAL BETA/GAMMA	.050000	CI 1985	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
	-----	****				-----
	.050000	sum				3
U-233	3.600000	GM 1978	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
	-----	****				-----
	3.600000	sum				3
U-233	.040000	GM 1983	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
	-----	****				-----
	.040000	sum				3
URANIUM-DEPLETED	4.000000	GM 1970	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	20
	-----	****				-----
	4.000000	sum				20
URANIUM-DEPLETED	40.350000	GM 1978	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	8
	-----	****				-----
	40.350000	sum				8
URANIUM-DEPLETED	270.950000	GM 1979	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	7
	-----	****				-----
	270.950000	sum				7
URANIUM-DEPLETED	55.990000	GM 1980	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	7
	-----	****				-----
	55.990000	sum				7
URANIUM-DEPLETED	11.960000	GM 1981	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	2
	-----	****				-----
	11.960000	sum				2
URANIUM-DEPLETED	739.140000	GM 1983	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	14

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type Facility	Count
	739.140000	**** sum				14
URANIUM-DEPLETED	248.830000	GM 1984	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	10
	248.830000	**** sum				10
URANIUM-DEPLETED	2.520000	GM 1985	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
	2.520000	**** sum				3
URANIUM-ENRICHED	88.000000	GM 1971	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	80
	88.000000	**** sum				80
URANIUM-ENRICHED	97.150000	GM 1972	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	48
URANIUM-ENRICHED	3.850000	GM	SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218W48	1
	101.000000	**** sum				49
URANIUM-ENRICHED	127.000000	GM 1973	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	35
	127.000000	**** sum				35
URANIUM-ENRICHED	39.350000	GM 1976	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	11
	39.350000	**** sum				11
URANIUM-ENRICHED	68.200000	GM 1977	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	19
	68.200000	**** sum				19
URANIUM-ENRICHED	81.700000	GM 1978	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	18
	81.700000	**** sum				18
URANIUM-ENRICHED	849.660000	GM 1979	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	24
	849.660000	**** sum				24

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type Facility	Count
URANIUM-ENRICHED	287.840000	GM	1980 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	9
	-----	****				-----
	287.840000	sum				9
URANIUM-ENRICHED	120.760000	GM	1981 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	7
	-----	****				-----
	120.760000	sum				7
URANIUM-ENRICHED	1418.750000	GM	1983 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	18
	-----	****				-----
	1418.750000	sum				18
URANIUM-ENRICHED	405.480000	GM	1984 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	8
	-----	****				-----
	405.480000	sum				8
URANIUM-ENRICHED	501.700000	GM	1985 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	3
	-----	****				-----
	501.700000	sum				3
URANIUM-NATURAL	1.000000	GM	1970 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	5
	-----	****				-----
	1.000000	sum				5
URANIUM-NATURAL	17.300000	GM	1973 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	20
	-----	****				-----
	17.300000	sum				20
URANIUM-NATURAL	54.450000	GM	1978 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	17
	-----	****				-----
	54.450000	sum				17
URANIUM-NATURAL	29.110000	GM	1979 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	7
	-----	****				-----
	29.110000	sum				7
URANIUM-NATURAL	26.580000	GM	1980 METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	7
	-----	****				-----
	26.580000	sum				7

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type Facility	Count
URANIUM-NATURAL	5.250000	GM 1981	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	2
	-----	****				-----
	5.250000	sum				2
URANIUM-NATURAL	21.580000	GM 1983	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	11
	-----	****				-----
	21.580000	sum				11
URANIUM-NATURAL	9.150000	GM 1984	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W48	10
	-----	****				-----
	9.150000	sum				10

66 rows selected.

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APPENDIX E

**DATA ON BUILDING 325B WASTE GENERATION BY PNL FROM THE
SOLID WASTE INFORMATION TRACKING SYSTEM**

The information found in this appendix is from the SWITS database. This database incorporates the older R-SWIMS database and is used to track information on radioactive and other wastes stored or disposed at the Hanford Site.

Each SWITS data run in this appendix is preceded by the query used to generate the data. A brief explanation of the run and any additional information needed to understand the data presented is also included.

The bulk of the data provided is limited to information about TRU waste generated at Building 325B by PNL; however, some general information on the non-TRU waste is included for completeness. The term non-TRU is used, instead of LLW, because a small percentage of the waste has been designated only as not TRU. It is believed that most, if not all, of the non-TRU waste is LLW.

The data runs in this appendix are further segregated by waste container type. Since initial retrieval efforts and WRAP 1 will focus on 55-gallon drums, these container types are considered separately.

Some general information about SWITS database and the codes used follows. Please note the disclaimer found on the next page.

DON'T SAY IT --- Write It !

Date:

To: *Judy Pattmeyer*

From: Solid Waste Engineering Data Management Group
N3-11 6-4394/6-4020

Re: SWITS DATA REQUEST

Attached for your information and use is the data which you requested. This data represents best available information regarding wastes currently in storage at the Hanford Site. I trust the information will be suitable to your needs.

Requests for information from the Solid Waste Information and Tracking System (SWITS) are normally relatively limited in scope, requesting specific data fields or summary data. The responses to these requests undergo review during data collection, summary and response preparation.

The response to this request represents a simple reproduction of the SWITS Database. Transmittal of this information is made with the following disclaimers:

- 1) The information contained in this transmittal is raw data, and represents information provided to Solid Waste Engineering (SWE) on burial records or other documents. This data has not been validated.
- 2) The information contained in this transmittal is subject to change without notice. Continual update of SWITS information and improvement of the software system make it impossible to ensure consistency of this data with the database after transmittal.
- 3) This information is current as of 12/11/92.

If I can be of further assistance to you, do not hesitate to call me.

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Primary Waste Type Code Table

Primary Waste Type Code	Primary Waste Type Description	Ship Time	Rad
AH	HAZ, ADMIN HOLD	89	N
CM	MORATORIUM CONTROLLED	89	N
H	HAZARDOUS	89	N
HP	HAZARDOUS WASTE PCB	29	N
M	MIXED	89	Y
MP	MIXED PCB	29	Y
N	NON-REGULATED		N
P	PCB	29	N
R	RADIOACTIVE		Y
RP	RADIOACTIVE PCB	29	Y
U	UNKNOWN		N

Secondary Waste Type Code Table

Secondary Waste Type Code	Secondary Waste Group	Secondary Waste Type Description
1A	TRU	TRANSURANIC (NOT PROCESSED THROUGH TRUSAF)
1B	TRU	TRANSURANIC CLASSIFIED
1C	TRU	TRANSURANIC WIPP CERTIFIED
1D	TRU	TRANSURANIC WIPP UNCERTIFIED
1E	TRU	TRANSURANIC SPECIAL CASE
1F	TRU	TRANSURANIC CAISSONS
2A	LLW	LOW-LEVEL NON-INDUSTRIAL
2B	LLW	LOW-LEVEL NON-INDUSTRIAL CLASSIFIED
2F	LLW	LOW-LEVEL CAISSONS
2L	LLW	LOW-LEVEL NON-INDUSTRIAL (ASSAYED FROM TRU)
3A	LLW	LOW-LEVEL INDUSTRIAL
3L	LLW	LOW-LEVEL INDUSTRIAL (ASSAYED FROM TRU)
4A	HLW	HIGH LEVEL WASTE (SPENT FUEL)
UA	USG	UNSEGREGATED NON-TRANSURANIC DRY WASTE
UB	USG	UNSEGREGATED NON-TRANSURANIC INDUSTRIAL
UC	USG	UNSEGREGATED CAISSONS (REMOTE HANDLED)
UF	USG	UNSEGREGATED TRANSURANIC/LOW-LEVEL (TUNNELS PUREX)
UG	USG	UNSEGREGATED TRANSURANIC DRY WASTE
UJ	USG	UNSEGREGATED TRANSURANIC INDUSTRIAL

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APPENDIX E.1

**CONTAINER NUMBER AND WEIGHT OF TRU WASTE IN
55-GALLON DRUMS BY WASTE TYPE**

This data run gives an overall look at the waste types, container numbers and total weight (in kilograms) of the radioactive wastes generated at Building 325B-PNL on a yearly basis. These data are for wastes stored in 55-gallon drums only. The meanings of primary and secondary waste codes can be found in the introductory materials for this appendix.

The data in the average weight column should be taken cautiously, especially for LLW codes. Concern is warranted because LLW records are still done on a batch basis. This means that one weight datum may be the composite weight for a group of drums. The computer program used simply divided the sum of all weight values by the number of values used to compute the total weight, not the actual number of containers that that value represents.

From 1970 until 1978 individual container weights were not required for TRU drums. During the data reentry program in the mid-1980's standard weights were assigned for all container types; 55-gallon drums were given a standard weight of 68 kg. This is why the average weight/drum for TRU is so consistent during this period.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot2.srep
title center '325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(con_cntr_vol) on dt
col dt format a4 heading "Date"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col rdet_swtyp_cd format a4 heading "Sec|Wast|Type"
col sum(rdet_rswims_count) format 999999 heading "Count"
col avg(con_gross_wgt) format 99999.99 heading "Avg|Weight"
col sum(con_gross_wgt) format 999999.99 heading "Sum|Weight"
col sum(con_cntr_vol) format 99999.99 heading "Sum|Vol"
col avg(con_cntr_vol) format 99999.99 heading "Avg|Vol"
col cntyp_descr format a30 heading "Container Description"
col con_size_descr format a25 heading "Container Size"
select substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       sum(rdet_rswims_count),
       sum(con_gross_wgt),
       avg(con_gross_wgt),
       sum(con_cntr_vol),
       avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON' and con_cntyp_cd = cntyp_cd
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       rdet_swtyp_cd
;
spool off

```

```

con_size_descr,
con_pwtyp_cd,
rdet_swtyp_cd,
sum(rdet_rswims_count),
sum(con_gross_wgt),
avg(con_gross_wgt),
sum(con_cntr_vol),
avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON' and con_cntyp_cd = cntyp_cd
group by cntyp_descr,
"pot2.sql" 42 lines, 1393 characters

```

```

SQL> ^[:
unknown command "" - rest of line ignored.

```

```

SQL>
SQL> @pot2

```

```

no rows selected

```

```

SQL>
. . .
      'VT220' 80 COL'  '7 BIT MODE'

```

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APPENDIX E.2

**BUILDING 325B-PNL TRU WASTE CONTAINERS SORTED BY
CONTAINER DESCRIPTION, SIZE, YEAR,
AND PRIMARY WASTE TYPE**

WHC-EP-0696

This subappendix provides information on Building 325B-PNL TRU waste containers, weight, volume, and primary waste type stored at various TRU waste storage facilities on the Hanford Site. The data provides the TRU waste generation from the Building 325B-PNL Facility by year.

```

● linesize 170
● pagesize 44
set newpage 0
spool pot3.srep
tttitle center 'TRU WASTE- 325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt                                format a4          heading "Date"
col con_pwtyp_cd                      format a4          heading "Pri|Wast|Type"
col rdet_swtyp_de                     format a4          heading "Sec|Wast|Type"
col sum(con_gross_wgt)                format 999999.99    heading "Weight"
col sum(rdet_rswims_count)            format 99999       heading "Count"
col avg(con_gross_wgt)                format 999999.99    heading "Avg|Weight"
col sum(con_cntr_vol)                 format 99999.99    heading "Volume"
col avg(con_cntr_vol)                 format 99999.99    heading "Avg|Volume"
col cntyp_descr                       format a55         heading "Container Discription"
col con_size_descr                    format a45         heading "Container Size"
col con_locn_facil_id                 format a8          heading "Facility"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, cntype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    con_locn_facil_id
;
spool off

```

Container Discription	Container Size	Pri Wast			Count	Weight	Avg		Avg
		Date	Type	Facility			Weight	Volume	
METAL DRUMS, BARRELS, KEGS	1 GALLON	1970	R	218W4B	25	74.85	14.97	.11	.02

		sum			25	74.85		.11	

E.2-4

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WHC-EP-0696

APPENDIX E.3

**BUILDING 325B-PNL NON-TRU WASTE CONTAINERS SORTED BY
CONTAINER DESCRIPTION, SIZE, YEAR,
AND PRIMARY WASTE TYPE**

This subappendix provides information on Building 325B-PNL non-TRU waste containers, weight, volume, and primary waste type stored at various waste storage facilities on the Hanford Site. The data provides the non-TRU waste generation from the Building 325B-PNL Facility by year.

WHC-EP-0696

```

set linesize 175
set pagesize 45
set newpage 0
spool pot3a.srep
title center 'NON-TRU WASTE- 325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(con_gross_wgt) on dt
compute sum of sum(rdet_rswims_count) on dt
col dt                                format a4           heading "Date"
col con_pwtyp_cd                      format a4           heading "Pri|Wast|Type"
col rdet_swtyp_cd                     format a4           heading "Sec|Wast|Type"
col sum(con_gross_wgt)                format 999999.99      heading "Weight"
col sum(rdet_rswims_count)            format 99999          heading "Count"
col avg(con_gross_wgt)                format 999999.99      heading "Avg|Weight"
col sum(con_cntr_vol)                 format 99999.99      heading "Volume"
col avg(con_cntr_vol)                 format 99999.99      heading "Avg|Volume"
col cntyp_descr                       format a55          heading "Container Discription"
col con_size_descr                    format a45           heading "Container Size"
col con_locn_facil_id                 format a8           heading "Facility"
col rdet_swtyp_cd                     format a4           heading "Sec|Wast|Code"
select
    cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id,
    sum(rdet_rswims_count),
    sum(con_gross_wgt),
    avg(con_gross_wgt),
    sum(con_cntr_vol),
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and rdet_swtyp_cd in ('2A','2B','2L','3A','3L','UA','UB') and
con_cntyp_cd = cntyp_cd
group by cntyp_descr,
    con_size_descr,
    substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) ,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    con_locn_facil_id
;
spool off

```

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col rdet_swtyp_cd format a4 heading "Sec|Wast|Code"
select

 cntyp_descr,
 con_size_descr,
 substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
 con_pwtyp_cd,
 rdet_swtyp_cd,
 con_locn_facil_id,
 sum(rdet_rswims_count),
 sum(con_gross_wgt),
 avg(con_gross_wgt),
 sum(con_cntr_vol),
 avg(con_cntr_vol)

from radwaste, contype
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
"pot3a.sql" 48 lines, 1538 characters

SQL> @pot3a

no rows selected

SQL>

'VT220' 80 COL' '7 BIT MODE'

APPENDIX E.4

**RADIOLOGICAL DATA FOR TRU WASTE CONTAINERS
SORTED BY DATE, PRIMARY WASTE TYPE, AND
STORAGE FACILITY**

WHC-EP-0696

This subappendix summarizes the radiological data for all TRU waste containers generated at Building 325B-PNL. Specifically, this computer run provides the total grams of TRU elements in a given container type in a given year. In addition, the average gram loading for a given container type in a given year has been calculated.

In 1991 and 1992 the number of curies (Ci) of alpha radiation was included on the SWBRs. Since the Building 325B-PNL waste generation data is all from 1970 to 1988, these columns contain blank entries. The "Max Dose" column contains the highest value recorded for a given container in a given year, in mrem/hr.

Additional information about the isotopes present in Building 325B-PNL waste containers can be found in subappendices E.9 and E.10.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot4.srep
tttitle center 'TRU Waste 325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rdet_rswims_count) on dt
compute sum of sum(rdet_rswims_count) on report
compute sum of sum(rad_qty) on dt
compute sum of avg(rad_qty) on dt
compute sum of sum(rad_alpha_ci) on dt
compute sum of avg(rad_alpha_ci) on dt
compute sum of max(rdet_bg_dose_rate) on dt
col dt format a4 heading "Date"
col cntyp_descr format a45 heading "Container Description"
col con_size_descr format a20 heading "Container Size"
col con_pwtyp_cd format a4 heading "Pri|Wast|Type"
col con_locn_facil_id format a8 heading "Location"
col sum(rdet_rswims_count) format 999999 heading "Count"
col sum(rad_qty) format 999999.99 heading "Total|TRU (g)"
col avg(rad_qty) format 99999.99 heading "Avg|TRU (g)"
col sum(rad_alpha_ci) format 999999.99 heading "Total|Alpha (ci)"
col avg(rad_alpha_ci) format 999999.99 heading "Avg|Alpha (ci)"
col max(rdet_bg_dose_rate) format 999999.99 heading "Max|Alpha (ci)"
select cntyp_descr,
       con_size_descr,
       substr(to_char(con_tsd_accept_dt, 'YYYY'),1, 4)dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count),
       sum(rad_qty),
       avg(rad_qty),
       sum(rad_alpha_ci),
       avg(rad_alpha_ci),
       max(rdet_bg_dose_rate)
from radwaste, contype, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B' and
rad_iso_num in (1,21,22,26,41,52,87,97,98,100,104,105,111,146,147) and
rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UF','UG','UJ') and
con_cntyp_cd = cntyp_cd(+) and con_pkg_id = rad_pkg_id(+)
group by cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       substr(to_char(con_tsd_accept_dt, 'YYYY'), 1, 4),
       con_locn_facil_id
;
spool off
tttitle off

```

TRU Waste 3258 PNL

Page: 1

Container Description	Container Size	Pri		Count	Total	Avg	Total	Avg	Max
		Waste	Location						
		Date	Type		TRU (g)	TRU (g)	Alpha (ci)	Alpha (ci)	Alpha (ci)
METAL DRUMS, BARRELS, KEGS	1 GALLON	1970	R	25	.01	.00			1.00

		sum		25	.01	.00	.00	.00	1.00

E:4.4

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APPENDIX E.5

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325B-PNL
55-GALLON DRUMS CONTAINING TRU WASTE
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the 55-gallon drums of TRU waste generated by Building 325B-PNL. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date, and primary waste type. The introduction to Appendix E contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot5.srep
title c ter 'TRU WASTE- 325B PNL ' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_comp_descr          format a40          heading "Physical Description"
col cntyp_descr              format a55           heading "Container Discription"
col con_size_descr           format a45           heading "Container Size"
col dt                       format a4            heading "Date"
col con_pwtyp_cd              format a4           heading "Pri|Wast|Type"
col con_locn_facil_id         format a8           heading "Facility"
col sum(rdet_rswims_count)    format 999999       heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
phys_comp_descr is null and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

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WHC-EP-0696

```
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
        cntyp_descr,
        con_size_descr
```

```
;
spool off
```

```
~
~
~
~
~
~
~
~
```

"pot5.sql" 38 lines, 1269 characters

SQL> @pot5

no rows selected

SQL>

```

?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?      ?
      VT220 80 COL 7 BIT MODE
```

APPENDIX E.6

**PHYSICAL CONTENTS DESCRIPTION FOR BUILDING 325B-PNL TRU
WASTE CONTAINERS OTHER THAN 55-GALLON DRUMS
SORTED BY DATE, PRIMARY WASTE TYPE,
AND STORAGE FACILITY**

This subappendix describes the physical contents of the TRU waste containers other than 55-gallon drums generated at Building 325B-PNL. Prior to 1978, physical contents were not required on the burial records, so a great many of the early records list the contents of the drum as "Miscellaneous."

The printout for this computer run sorts the contents data by storage facility, date and primary waste type. The introduction to Appendix E contains a table of waste codes and their meanings.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot6.srep          325B
title center 'TRU WASTE - 235B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col phys_ccmp_descr          format a40          heading "Physical Description"
col con_size_descr          format a47          heading "Container Description"
col cntyp_descr             format a45          heading "Container Size"
col dt                      format a4           heading "Date"
col con_pwtyp_cd            format a4           heading "Pri|Wast|Type"
col con_locn_facil_id       format a8           heading "Facility"
col sum(rdet_rswims_count)   format 999999      heading "Count"
col rdet_swtyp_cd           format a4           heading "Sec|Wast|Type"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select phys_comp_descr,
       cntyp_descr,
       con_size_descr,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, physcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1D','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = phys_pkg_id(+)
group by con_locn_facil_id,
phys_comp_descr,
con_pwtyp_cd,
rdet_swtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
spool off

```


Physical Description	Container Size	Container Description	Pri Sec		Date	Type	Type	Facility	Count
			Wast	Wast					
	METAL DRUMS, BARRELS, KEGS	1 GALLON	1970	R	1F	218W4B		25	
						*****	-----		
						SUM		25	

E.6-4

W/H-C-EP-0696

APPENDIX E.7

**HAZARDOUS CONSTITUENTS OF 55-GALLON
DRUMS CONTAINING TRU WASTE**

The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). In this sub-appendix the hazardous contents of 55-gallon drums generated at Building 325B-PNL are sorted by storage facility.

Information concerning the hazardous constituents of waste containers was not required prior to 1986. During the R-SWIMS data reentry program in the mid-1980's an attempt was made to add any available information on the hazardous materials present, however, this information was limited.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot7.srep
title center 'TRU Waste 325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text          format a40          heading "Hazardous"
col con_size_descr        format a45          heading "Container Description"
col cntyp_descr           format a40          heading "Container Size"
col dt                    format a4           heading "Date"
col con_pwtyp_cd          format a4           heading "Pri|Wast|Type"
col con_locn_facil_id     format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999      heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A', '1B', '1C', '1E', '1F', 'UG', 'UF', 'UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
cntyp_descr,
con_size_descr
;
spool off

```

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```
col con_locn_facil_id          format a8          heading "Facility"
col sum(rdet_rswims_count)     format 999999      heading "Count"
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
"pot7.sql" 37 lines, 1220 characters
```

SQL> @pot7

no rows selected

```
SQL>
      . . . . .
      'VT220' 80 COL'  '7 BIT MODE'
```

APPENDIX E.8

**HAZARDOUS CONSTITUENTS OF TRU WASTE CONTAINERS
OTHER THAN 55-GALLON DRUMS**

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The presence of hazardous constituents in a radioactive waste drum designates the waste as "Mixed" (primary waste code "M"). No hazardous constituents are listed in containers other than 55-gallon drums generated at Building 325B-PNL; therefore this run did not reveal any hazardous information.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot8.srep
title center 'TRU Waste 325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on con_locn_facil_id skip 1
col haz_comp_text                format a40      heading "Hazardous"
col con_size_descr              format a45      heading "Container Description"
col cntyp_descr                 format a40      heading "Container Size"
col dt                          format a4       heading "Date"
col con_pwtyp_cd                format a4       heading "Pri|Wast|Type"
col con_locn_facil_id           format a8       heading "Facility"
col sum(rdet_rswims_count)      format 999999   heading "Count"
select haz_comp_text,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       rdet_rswims_count
from radwaste, contype, chemcomp
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = haz_pkg_id
group by con_locn_facil_id,
haz_comp_text,
con_pwtyp_cd,
       cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
con_size_descr,
rdet_rswims_count
;
spool off

```



```

1az_comp_text,
con_pwtyp_cd,
      cntyp_descr,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
      con_size_descr,
      rdet_rswims_count
;

```

spool off

"pot8.sql" 37 lines, 1177 characters

SQL> @pot8

no rows selected

SQL>

• • • •

•VT220• 80 COL• •7 BIT MODE•

APPENDIX E.9

**ISOTOPES LISTED IN 55-GALLON DRUMS
CONTAINING TRU WASTES**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325B-PNL stored in 55-gallon drums. The isotope field in SWITS contains several types of the following information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted.)
- Plutonium-239 fissile gram equivalents (Pu239 FSL GR equiv).
- Total - alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste drums with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot9.srep
title center 'TRU Waste 325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name          format a30          heading "Isotope"
col sum(rad_qty)       format 999999.999999 heading "Rad Qty"
col iso_unit           heading a4          heading "Unit"
col dt                format a4           heading "Date"
col cntyp_descr        format a40         heading "Container Size"
col con_size_descr     format a45         heading "Container Description"
col con_pwtyp_cd       format a4          heading "Pri|Wast|Type"
col con_locn_facil_id  format a8          heading "Facility"
col sum(rdet_rswims_count) format 999999 heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, cntype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       con_pwtyp_cd,
       rdet_swtyp_cd,
       con_locn_facil_id,
       cntyp_descr,
       con_size_descr,
       rdet_rswims_count
;
spool off

```

```

con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr = '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
        iso_unit,
substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
        con_pwtyp_cd,
        rdet_swtyp_cd,
con_locn_facil_id,
        cntyp_descr,
        con_size_descr,
        rdet_rswims_count
;
spool off
~
"pot9.sql" 46 lines, 1458 characters

SQL> @pot9

10 rows selected

SQL>
    . . .

```

°VT220° 80 COL° °7 BIT MODE°

APPENDIX E.10

**ISOTOPES LISTED IN TRU CONTAINERS
OTHER THAN 55-GALLON DRUMS**

This subappendix contains a listing of the SWITS isotope information for TRU waste from Building 325B-PNL stored in containers other than 55-gallon drums. The isotope field in SWITS contains several types of the following information:

- Specific isotope (e.g., Am-241, Np-237, U-233, Pu-238)
- Generic isotope listings (e.g., Pu, uranium-enriched, uranium-depleted)
- Plutonium-239 equivalent curies (PE-Ci)
- Total-alpha
- Total beta/gamma
- PE-Ci (plutonium equivalent curies).

This computer run contains the isotope field listing along with the number of TRU waste containers with that listing. The run is sorted by storage facility and year.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot10.srep
title center 'TRU Waste 325B PNL' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
compute sum of sum(rad_qty) on con_locn_facil_id
compute sum of sum(rdet_rswims_count) on con_locn_facil_id
col iso_name          format a30          heading "Isotope"
col sum(rad_qty)      format 999999.999999 heading "Rad Qty"
col iso_unit          heading a4          heading "Unit"
col dt                format a4           heading "Date"
col cntyp_descr       format a45          heading "Container Size"
col con_size_descr    format a45          heading "Container Description"
col con_pwtyp_cd       format a4          heading "Pri|Wast|Type"
col con_locn_facil_id format a8           heading "Facility"
col sum(rdet_rswims_count) format 999999 heading "Count"
select iso_name,
       sum(rad_qty),
       iso_unit,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4) dt,
       cntyp_descr,
       con_size_descr,
       con_pwtyp_cd,
       con_locn_facil_id,
       sum(rdet_rswims_count)
from radwaste, cntype, isotope, isoqty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'PNL' and
con_srce_facil_id = '325B'
and con_size_descr <> '55 GALLON'
and rdet_swtyp_cd in ('1A','1B','1C','1E','1F','UG','UF','UJ') and
con_cntyp_cd = cntyp_cd and con_pkg_id = rad_pkg_id and rad_iso_num = iso_num
group by iso_name,
       iso_unit,
       con_pwtyp_cd,
       con_locn_facil_id,
       substr (to_char(con_tsd_accept_dt, 'YYYY'),1, 4),
       cntyp_descr,
       con_size_descr
;
spool off

```


Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Wast Type Facility	Count
PU	.005000	GM 1970	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W4B	25
TOTAL BETA/GAMMA	70.001000	CI	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W4B	25
URANIUM-ENRICHED	5.000000	GM	METAL DRUMS, BARRELS, KEGS	1 GALLON	R 218W4B	25
	-----	****				-----
	75.006000	SUM				75

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