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Characterization of Past and Present Solid Waste Streams from the Plutonium-Uranium Extraction Plant

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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 7% of the transuranic waste to be retrieved for shipment to the Waste Isolation Pilot Plant has been generated at the Plutonium-Uranium Extraction (PUREX) Plant.

The purpose of this report is to characterize the radioactive solid wastes generated by PUREX using process knowledge, existing records, and oral history interviews. The PUREX Plant is currently operated by the Westinghouse Hanford Company for the U.S. Department of Energy and is now in standby status while being prepared for permanent shutdown.

The PUREX Plant is a collection of facilities that has been used primarily to separate plutonium for nuclear weapons from spent fuel that had been irradiated in the Hanford Site's defense reactors. Originally designed to reprocess aluminum-clad uranium fuel, the plant was modified to reprocess zirconium alloy clad fuel elements from the Hanford Site's N Reactor. PUREX has provided plutonium for research reactor development, safety programs, and defense. In addition, the PUREX was used to recover slightly enriched uranium for recycling into fuel for use in reactors that generate electricity and plutonium. Section 2.0 provides further details of the PUREX's physical plant and its operations.

The PUREX Plant functions that generate solid waste are as follows:

- Processing operations
- Laboratory analyses
- Supporting activities.

The types and estimated quantities of waste resulting from these activities are discussed in detail in Section 3.0.

All solid wastes originating at PUREX 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 PUREX. Current and historical handling and packaging procedures for radioactive wastes at the PUREX Plant are provided in Section 4.0.

Information on the radioactive wastes generated at the PUREX Plant can be found in a number of existing documents and databases. The most important of these are the Solid Waste Information and Tracking System database and Solid Waste Burial Records. Facility personnel also provided excellent information about past waste generation and the procedures used to handle that waste. Section 5.0 was compiled using these sources to characterize the radioactive wastes, especially TRU wastes, generated at the PUREX Plant.

Between 1970 and 1992, 42,322 containers of radioactive solid waste were generated at the PUREX Plant. These containers represent over 4.3 million kg (9.5 million lb) of waste occupying 15,039 m³ (531,094.4 ft³) of space. Section 5.0 provides an in-depth look at this waste including 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

202-A	Plutonium-Uranium Extraction (PUREX) Facility
202-AL	PUREX Analytical Laboratory
AEC	U.S. Atomic Energy Commission (now DOE)
AFAN	ammonium fluoride-ammonium nitrate
ANN	aluminum nitrate
CFR	<i>Code of Federal Regulations</i>
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DVB	divinyl benzene
ECMP	east crane maintenance platform
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FFTF	Fast Flux Test Facility
FP	fission product
FRP	fiberglass reinforced polyester
FSAR	final safety analysis report
FY	fiscal year
HEPA	high-efficiency particulate air (filter)
HMS	Hanford Meteorological Station
IAD	immediate action directive
LLW	low-level waste
MFP	mixed fission products
MW	mixed waste
NPH	normal paraffin hydrocarbon
NRC	U.S. Nuclear Regulatory Commission
ORM	other regulated material
P&O	pipe and operations
PFP	Plutonium Finishing Plant
PCB	polychlorinated biphenyls
PNL	Pacific Northwest Laboratory
PR	product recovery
PUREX	Plutonium-Uranium Extraction (Plant)
PUREX-AL	PUREX-Analytical Laboratory
R-SWIMS	Richland Solid Waste Information Management Systems
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
REDOX	reduction oxidation
RHO	Rockwell Hanford Operations
SAR	safety analysis report
SDAR	Storage/Disposal Approval Record
SNM	special nuclear material

LIST OF TERMS (cont.)

SWBR	Solid Waste Burial Record
SWITS	Solid Waste Information and Tracking System
SWSDR	Solid Waste Storage and Disposal Record
SR	State Route
TBP	tributylphosphate
TK	tank
TRU	transuranic
TRUSAF	Transuranic Storage and Assay Facility
UNH	uranyl nitrate hexahydrate
UO ₃	Uranium Trioxide (Plant)
WHC	Westinghouse Hanford Company
WIPP	Waste Isolation Pilot Plant
WRAP	Waste Receiving and Processing Facility

CHARACTERIZATION OF PAST AND PRESENT SOLID WASTE STREAMS FROM THE PLUTONIUM- URANIUM EXTRACTION PLANT

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to characterize, as far as possible, the solid waste generated by the Plutonium-Uranium Extraction (PUREX) Facility and PUREX Analytical Laboratory (PUREX-AL) since their construction in 1956. Solid waste, as defined in this document, is any containerized or self-contained material that has been declared waste. The objective is to describe characteristics of solid wastes that are or will be managed by the Restoration and Upgrades Program; gaseous or liquid effluents are discussed only at a summary level. This characterization is of particular interest in the planning of transuranic (TRU) waste retrieval operations, including the Waste Receiving and Processing (WRAP) Facility, since PUREX has generated approximately 7.2% 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 Area 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 [IAD] 0511-21* [AEC 1970]). TRU radionuclides are those with an atomic number > 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 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 > 20 years and activity > 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 by DOE Order 5820.1, *Management of Transuranic Material* (DOE 1982).

In addition to radioactive materials, Hanford Site 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.

At 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 by-product 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 the Hanford Site (EPA 1987).

During the next two decades the TRU waste now stored in the burial trenches and storage facilities is to be retrieved and processed at the WRAP Facility and shipped to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, for final disposal. Over 7% of the total volume of TRU waste to be retrieved for shipment to WIPP has been generated by PUREX and PUREX-AL.

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 sections discussing information from each source.

Documents that describe PUREX processes, including the *Plutonium Uranium Extraction Plant Final Safety Analysis Report* (PUREX FSAR) (Manry and Prosk 1985), the *200 Areas Fact Book* (RHO 1985), the current *PUREX Technical Manual — Chemical Processing* (WHC 1989), and the first *PUREX Technical Manual* (HAPO 1955) were used to determine the solid wastes that may have been generated at PUREX during its 35-year history.

Documents that describe PUREX waste packaging and handling procedures include the *Hanford Site Radioactive Solid Waste Acceptance Criteria* (Willis and Triner 1991).

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

Characterization data were 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 East and West Areas since 1970. Data in the 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 (e.g., shipment manifests and U.S. Nuclear Regulatory Commission [NRC] 741 Forms).

Hazardous waste components were determined using information from the SWITS database, SWBRs, SWSDRs, and personnel interviews. Additional information was obtained from *Inventory of Chemicals Used at Hanford Site Production Plants and Support Operations (1944-80)* (Klem 1990), *Reactive and Unstable Chemicals in Transuranic Retrievable Waste at the Hanford Site - A Review of Available Data* (Reddinger 1992), and *Solid Waste Stream Hazardous and Dangerous Components Study* (Olson 1992).

1.4 SCOPE

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

Section 2.0 provides a brief, physical description of the PUREX Plant and the operations that occur there. A short history of the significant occurrences and changes at PUREX follows this description.

Section 3.0 identifies the solid waste streams that are a result of PUREX processes, laboratory analyses, and support 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 practices and packaging procedures used in PUREX Process Facilities and in the PUREX-AL. Historical changes in waste handling, packaging, and recordkeeping are also reviewed in this section.

Section 5.0 contains the results of a search for actual waste container data. This section describes what is known about the physical, radiological, and hazardous characteristics of the radioactive solid waste from PUREX.

Section 6.0 lists the references used in the compilation of this report.

Appendix A contains the PUREX process flowsheets (Manry and Prosk 1985).

Appendix B contains a history of the PUREX Plant, which was reprinted from the *PUREX Final Safety Analysis Report* (Manry and Prosk 1985).

Appendix C contains the original SWITS data runs that form the basis for most of the tables and figures found in Section 5.0.

Appendix D comprises individual SWITS records for the heaviest (high mass) containers generated by PUREX.

Appendix E comprises individual SWITS records for the TRU waste containers with the heaviest gram loadings.

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2.0 DESCRIPTION OF THE PLUTONIUM-URANIUM EXTRACTION PLANT

The mission of the PUREX Plant was to reprocess irradiated fuels from the Hanford Site reactors. Initially, the PUREX Plant was to reprocess aluminum-clad uranium metal fuel to recover weapons-grade plutonium and depleted uranium. The PUREX Plant and process have since been modified to reprocess zirconium alloy (Zircaloy) clad fuel from N Reactor to recover fuels-grade plutonium, slightly enriched uranium, and neptunium.

The purpose of this section is to describe the facility and to summarize the process history, so that solid waste generating activities can be compared to facility status.

2.1 LOCATION

The PUREX Plant is a complex of several buildings and support facilities located within a fenced and controlled or limited area in the southeast corner of the 200 East Area. The 200 East Area is located in the center of the Hanford Site (Figure 2-1). The Hanford Site, which occupies 147,715.5 ha (365,000 acres) of arid steppe, is located in the southeastern part of Washington State, approximately 72.4 km (45 miles) north of the Oregon border (Figure 2-2).

2.2 PHYSICAL PLANT

The PUREX Plant may be the largest nuclear fuels reprocessing plant in the world; the main process building is the size of $3\frac{3}{4}$ football fields (306.3 m [1,005 ft] long). Figure 2-3 is a photograph of the PUREX facility.

2.2.1 202-A Building

Fuels reprocessing was conducted in the 202-A Building. Built of reinforced concrete, its approximate dimensions are: 306.3 m (1,005 ft) long, 36.3 m (119 ft) wide (at its maximum), and 30.5 m (100 ft) high, with approximately 12.2 m (40 ft) of this height below the grade elevation of 222.8 m (731 ft). It consists of three main structural components: (1) canyon, (2) galleries, and (3) service annex.

2.2.1.1 Canyon. The canyon is a thick-walled, heavily shielded, concrete structure that houses the equipment used for radioactive processing. The canyon area proper is 306.3 m (1,005 ft) long, 9.3 m (30.5 ft) wide, and 31.7 m (104 ft) high. A single row of 12 process cells is contained within the canyon. The functions of these 12 cells, as well as the equipment they contain, are described in Table 2-1. At the east end of the canyon is a basin where irradiated fuel would have been stored. A railroad tunnel, running north and south on the west side of the storage basin, brought casks containing fuel into the canyon.

The east crane maintenance platform (ECMP) is located in an extension that was added to the existing 202-A Building in 1957. The extension is 21.6 m (71 ft) 7.6 cm (3 in.) high, 11 m (36 ft) wide, and 2 m (6 ft 6 in.) deep and is a reinforced concrete and steel-beamed structure. Three interior, 7.6-cm- (3-in.-) thick steel plate shielding doors separate the canyon from the ECMP. Below the 222.8-m (731-ft) elevation, 25.4 cm (10 in.) of concrete of the original building separate the ECMP from the canyon. The roof is made up of coal-tar pitch, roofing felt, mineral-surfaced roofing, plastic roofing, cement, and roofing gravel. This addition served as the containment vessel when the canyon shielding doors were opened.

2.2.1.2 Gallery Levels. A 1.8-m- (6-ft-) thick concrete wall separates the cells from the galleries. The storage, sample, pipe and operations, and crane cab galleries parallel the north wall of the canyon and are located at different levels, one above the other. The wall above the cells is 1.2-m (4-ft) thick and forms a shielded cabway (crane cab gallery) for the two 40-ton master gantry cranes. Located on rails above the master crane level is a 40-ton slave crane. Platforms for crane maintenance are located at the east and west ends of the crane cab level.

The pipe and operations gallery, located below the crane cab gallery, contains instrument transmitter racks, electrical motor controls, steam and cooling water supply lines, and the piping and associated valves used for transferring nonradioactive solutions. Since most of the valves were controlled from the control panels, only a few operations were required in the gallery. There are also several batch chemical addition tanks located on this level.

The next level down is the sample gallery, which contains the remote samplers used for obtaining process solution sampled from the cell equipment. A shielded pipe chase behind the remote sampler boxes contains headers for recovered nitric acid, organic solvent, sampler drains, and sampler lines to and from cell equipment.

The storage gallery area, the level beneath the sample gallery, was used primarily for storage of dry chemicals and spare equipment. A 5-ton capacity elevator serves the storage and pipe and operations galleries, as well as the four floors of the Aqueous Makeup Facility.

At the west end of the storage gallery is a separate area containing the deactivated Neptunium Purification and Loadout Facility (in Q cell), the plutonium product handling and removal room, and the Plutonium Oxide Production Facility (in N cell).

2.2.1.3 Service Annex. The Service Annex is adjacent to and north of the gallery section and consists of two separate areas. The larger, main area (the west annex) houses the maintenance shops, offices, lunchroom, locker room, radiation zone entry lobby, ventilation air and supply room, a switch gear room, compressor room, central control room, and the Aqueous Makeup Facility. The smaller laboratory area (the east annex) contains the analytical laboratory, the headend control room, and a switch gear room.

2.2.2 U and R Cells

External to the 202-A Building are the U and R cells, located on the north side of the structure. The U cell is located just east of the headend control room and contains recovered nitric acid storage tanks and laboratory waste tanks. The R cell is located at the northwest corner of the 202-A Building and contains process equipment for cleanup of process solvent. The R cell facility, also designated as the "cold" solvent building (276-A), houses equipment that was used to wash the organic waste stream from the final uranium cycle and prepare it for reuse.

2.2.3 Auxiliary Facilities

Descriptions of the PUREX Plant auxiliary facilities follow.

203-A Tank Farm — A pump house and concrete pad, enclosed and sectionalized with concrete dikes containing four 100,000-gal tanks that were used for receipt, storage, and tank trailer loading of uranyl nitrate hexahydrate (UNH). A small UNH concentration tank and a waste receiver tank are also included.

205-A Facility — A transite (a composite of asbestos imbedded in a cementitious matrix) building housing the (deactivated) silica gel beds (formerly used for uranium product treatment) and a concrete tank pad enclosed by a concrete dike. Contained within the building are storage tanks that were used to receive and store recovered nitric acid shipped from the Uranium Trioxide (UO₃) Plant in the 200 West Area.

206-A Facility — A concrete structure adjacent to U cell containing a vacuum fractionator and associated equipment that were used for concentrating nitric acid recovered from PUREX and UO₃ Plants.

211-A Facility — A steel and transite pump house and associated tank farm for receipt, storage, and transfer of bulk process chemicals. The process water demineralizer units are also located in the pump house.

2714-A Building — A steel warehouse for receipt, storage, and transfer of process chemicals that were received in less than bulk quantities.

212-A Building — A steel building that was used for load-in and load-out of liquid wastes.

213-A Building — A steel building used for temporary storage of contaminated dry waste.

218-E-14 and 218-E-15 Tunnels — Two earth-covered tunnels extending southward from the east end of the 202-A Building used for storage of large, contaminated equipment on railcars.

Failed process equipment and other items that are too large, too bulky, and too radioactive for immediate removal from the PUREX canyon are placed on railcars and stored in the PUREX burial tunnels. Only tunnel 2 is currently in use; tunnel 1 was filled to capacity in 1964 and was closed at that time.

Burial tunnel 1, constructed in 1956, is made of creosote-treated Douglas fir timbers placed side by side and is 152 m (500 ft) long by 5.8 m (19 ft) wide by 6.7 m (22 ft) high. The entire tunnel is covered with mineral roofing, a layer of tar, and 2.4 m (8 ft) of fill dirt. An analysis of the structural integrity of the timbers, performed in 1980, found the strength of the beams to be within the standards for new wood (RHO 1980). A 1973 study concluded that no danger of explosion exists within tunnel 1 and that the possibility of fire is extremely remote (DOI 1973). Despite this finding, an effort was made to create an inert atmosphere by isolating the tunnel and filling it with carbon dioxide. Diffusion of the carbon dioxide through the gravel bed rendered this effort unsuccessful. The duct for burial tunnel 1 is blanked, and the door to this tunnel has been sealed so that the air in the tunnel is stagnant.

A typical sectional view of PUREX burial tunnel 2 is shown in Figure 2-4. Burial tunnel 2, constructed in 1964, is 514.5 m (1,688 ft) long by 6.7 m (22 ft) high by 10.4 m (34 ft) wide. The roof is made of corrugated steel, and cement arches that are placed at regular intervals along the tunnel roof to add strength. There is an overburden of 2.4 m (8 ft) of fill dirt covering the tunnel roof.

Both tunnels have water-filled doors that serve as radiation shields. These doors can be drained and raised to allow access to the tunnels. Both tunnels slope downward to prevent the railcars from accidentally rolling out of the tunnels. The maximum capacity of burial tunnels 1 and 2 is 8 and 35 railcars, respectively.

Table 2-2 contains a list of the contents of burial tunnel 1. Figure 2-5 contains a description of the railcars in PUREX burial tunnel 2 and a list of their contents.

291-A Facilities — The canyon exhaust air filtration and discharge facilities. These facilities include two below-grade concrete filter cells and an unused, third filter cell, four parallel exhaust fans, and a 61-m- (200-ft-) high concrete stack.

292-A Building — A wood structure adjacent to the east side of the 61-m (200-ft) stack, housing stack monitoring, sampling, and flush equipment.

293-A Building — A two-level concrete structure containing absorption towers used to remove oxides of nitrogen and residual radioiodine from dissolver offgas.

294-A Facility — A small steel building above grade and three filter cells below grade. It is located north of the 293-A Building and provided secondary filtration of dissolver gas.

2.3 GENERAL PUREX PROCESS

The PUREX process was designed for the individual separation of uranium, plutonium, neptunium, and fission products present in irradiated fuel elements. The constituents were separated and purified using a solvent extraction process using an organic phase tributylphosphate (TBP) dissolved in a normal paraffin hydrocarbon (NPH) and a nitric acid aqueous phase. The separation and purification were accomplished by controlling the relative phase distribution of the desired constituents between the organic and aqueous phases.

2.3.1 PUREX Products.

During the operating life of the PUREX Plant, the following products were produced:

- Weapons-grade plutonium
- Fuel-grade plutonium
- Depleted uranium
- Slightly enriched uranium
- Neptunium-237
- Thorium.

2.3.1.1 Plutonium Products. The initial plutonium product was in the form of a plutonium nitrate — nitric acid solution containing approximately 350 g of plutonium per liter and approximately 7 M of nitric acid per liter. The plutonium nitrate-nitric acid product was loaded into product recovery (PR) cans and transported to the Plutonium Finishing Plant for conversion to metal or oxide. In the 1977–81 timeframe, a plutonium nitrate to oxide conversion process was installed in N cell. The conversion process was employed to produce plutonium oxide. The plutonium products were used in weapons production or in the breeder reactor program, based on the isotopic content of the plutonium involved.

2.3.1.2 Uranium Products. The uranium product was recovered in the form of a uranyl nitrate solution containing approximately 4.2 lb of uranium per gallon with a nitric acid concentration of <0.1 lb of nitric acid per gallon. The plutonium content was <10 parts per billion parts of uranium. The ^{235}U content ranged from depleted to a slight enrichment of 2.1%. The uranium product solution was shipped to the 244-U Building, located in the 200 West Area, for calcination to UO_3 . The oxide product was subsequently shipped offsite for future use as a nuclear fuel product.

2.3.1.3 Neptunium Product. The ^{237}Np product was produced in the form of a nitrate-nitric acid solution with a neptunium concentration of approximately 40 g of neptunium per liter and a nitric acid concentration of <0.3 M of nitric acid. Initially, the neptunium nitrate solution was shipped to the Savannah River Plant for use in the production of ^{238}Pu oxide. Later, a nitrate to oxide conversion process was designed to produce neptunium oxide. This conversion process was never used.

2.3.1.4 Thorium Product. A thorium process flowsheet was developed in 1965. The flowsheet was modified after a PUREX Plant process test and used for thorium processing campaigns in 1966 and 1970.

2.3.2 PUREX Processing Units

The overall PUREX Plant process consisted of seven fundamental processing units that interfaced with each other. The following is a list of those processing units:

- Feed preparation
- Solvent extraction separation and purification
- Solvent treatment
- Backcycle waste system
- Acid recovery
- Waste treatment
- Offgas treatment.

An eighth processing unit was added to N cell to convert the plutonium nitrate product solution to a plutonium oxide product. The following section briefly describes the PUREX process as it was conducted in the 1970's and 1980's. This period is of most interest in this report as it allows characterization of the TRU solid wastes to be retrieved for WRAP.

2.3.2.1 Feed Preparation. In the original feed preparation process for aluminum-clad fuel, the fuel elements were declad with a sodium hydroxide solution, containing sodium nitrate to suppress formation of hydrogen gas. After rinsing the bare metal fuel elements, two or more dissolution cuts were taken with nitric acid. The number of dissolution cuts depended on the total metal inventory remaining in the dissolver. The individual cuts or batches of the resulting uranyl nitrate solution were then transferred to feed storage tanks. The feed was clarified by batch centrifugation. After clarification, the dissolved metal solution was chemically adjusted to ensure reasonably uniform nitric acid and uranyl nitrate concentrations and then was used as feed for the solvent extraction system.

The PUREX facility was later modified to handle the reprocessing of fuel elements from N Reactor, which consisted of uranium metal with a Zircaloy cladding. In this process, properly aged N Reactor fuel elements in the canisters were charged (dumped) to dissolvers. To remove the Zircaloy cladding from the fuel elements, the zirflex process was used. This process employed a boiling solution of ammonium fluoride and ammonium nitrate to dissolve the cladding. Potassium hydroxide was then used to convert uranium and plutonium fluoride compounds to hydrated oxides (metathesis). The cladding waste, metathesis waste, and rinse solutions were then centrifuged to remove solid uranium and plutonium compounds. These compounds were metathesized (if required) and/or dissolved in nitric acid. The resulting acid solution was then blended with the reprocessing feed.

2.3.2.2 Solvent Extraction Separation and Purification. Pulsed solvent extraction columns were employed in the PUREX process to effect the decontamination necessary to produce acceptable products. A number of cycles made up the total solvent extraction process.

Codecontamination Cycle (No Neptunium Recovery) — In this cycle, the uranium and plutonium were extracted into an organic solvent to separate them from the bulk of the fission products, the americium, the neptunium, and the curium that remained in the aqueous stream. The organic solvent used was a 30 vol% TBP extractant in hydrocarbon diluent. The aqueous waste stream was concentrated, partially denitrated, made alkaline, and stored in underground storage tanks.

Partition Cycle (No Neptunium Recovery) — The uranium-plutonium organic solvent stream was then contacted in a partitioning column with an aqueous countercurrent stream containing a chemical reducing agent. This caused the plutonium to transfer into the aqueous phase and enter the stream leaving the bottom of the column. This aqueous product solution entered the scrub column where it was scrubbed with fresh organic solvent to remove residual uranium. It was then routed to the second plutonium cycle. The bulk of the uranium remained in the organic solvent stream that flowed out the top of the partitioning column.

The exiting organic stream was then fed to another column in which the uranium was stripped countercurrently from the organic phase into a dilute aqueous nitric acid stream. The stripped organic solvent was treated in the organic recovery system and was reused in the process.

The exiting aqueous uranium product stream was fed to the tower of a steam-heated concentrator, where it was concentrated by a factor of 7 to 8. The concentrator was designed and operated to remove, by steam-stripping, entrained organic solvent that might have entered with the product stream. This prevented accumulation of an organic phase in the concentrator and reduced the possibility of formation of potentially explosive "red oil," a complex of nitrated degraded solvent with uranium or other heavy metals. The process condensate stream was recycled as makeup water for various solvent extraction streams.

Second and Third Plutonium Cycles — The plutonium stream was processed through a second extraction and stripping cycle for continued purification from uranium, fission products, and other metallic impurities. A third plutonium cycle further reduced the fission products and other metallic impurities to complete the purification of the plutonium product.

The product stream was also steam-stripped to remove residual organic solvent and to reduce the probability of the red oil formation. The product stream was then concentrated to product-level concentration and transferred to storage tanks where it was sampled, analyzed, and held. The product could then be converted into plutonium oxide or transported to the Plutonium Finishing Plant for conversion to metal or oxide.

The overhead process condensates from the stripper and concentrator, normally containing only trace amounts of plutonium, were routed to the third plutonium cycle feed tank for rework and recovery.

Plutonium Oxide Production — The plutonium nitrate solution was converted to plutonium oxide by precipitating the plutonium as oxalate, which was then calcined to produce oxide. The plutonium oxide then went to a blender, where it was thoroughly

mixed and sampled. If the sample analyses indicated that the plutonium oxide met product specifications, it was transferred to the canning operation; if not, it was returned for recycling through the second stage calciner or the plutonium oxide rework (dissolution) facility. The final product was chemically and radiolytically stable.

Can-filling operations were remotely controlled. The empty cans were weighed, and then filled, the slip-lid was placed on the can, and the filled can was weighed. The can lid was then tape sealed. After tape sealing, the can was bagged out and placed into a second can, which was sealed by a commercial can-sealing machine. The can assembly was sent by conveyor to a final canning location where the assembly was loaded into a third can. The third can was then labeled, sealed, and the can assembly placed into a shipping container for transfer to storage.

Final Uranium Cycle — The concentrated uranium product solution from the partition cycle was adjusted and became feed for the final uranium cycle. This cycle provided final decontamination from plutonium and fission products and consisted of extraction into the organic phase followed by stripping back into the aqueous phase. The uranium product solution was steam stripped to remove residual organic solution, concentrated, transferred to the 203-A Building for interim storage, and then shipped to the UO_3 Plant.

The final uranium concentration step included essentially the same elements as described previously for the partition cycle uranium stream, except that the relatively uncontaminated process condensate was sent to an underground crib for final disposal instead of being recycled within the process.

The aqueous waste contained a small percentage of the uranium, plus the residual plutonium and fission products. It was routed to the backcycle waste concentrator and subsequently fed, along with the virgin feed metal solution, to the codecontamination cycle.

Neptunium Recovery — With adequate preparations, the PUREX Plant could be modified to produce a neptunium product. When neptunium recovery was not employed, most of the neptunium was in the codecontamination cycle aqueous waste stream, where it was rejected with the fission products and americium.

The aqueous waste stream from both the uranium and plutonium cycles contained neptunium. These streams were collected in the backcycle waste system and concentrated for recycle back to the codecontamination cycle to minimize losses of associated uranium, plutonium, and nitric acid. If neptunium recovery was required, a portion of the concentrated backcycle waste stream was used as feed for the neptunium recovery cycle; in the continuous extraction-stripping cycle neptunium, accumulated as other nuclides (e.g., plutonium, uranium, and fission products), was removed and returned to the backcycle waste system. This operation continued until the neptunium concentration reached the desired level, after which the neptunium cycle was isolated and operated on total neptunium recycle until the concentrations of plutonium, uranium, and fission products were low enough for neptunium product transfer to the final purification system.

In the final purification system, neptunium was loaded on an ion exchange resin that would then be washed to remove residual fission products and plutonium, and would then be eluted from the resin. The neptunium was then retained in a storage tank or packaged for eventual shipment offsite. The remaining effluent stream and the wash were either retained in tankage or routed to the backcycle waste system.

2.3.2.3 Solvent Treatment. The organic solvent was washed after use to remove impurities, chemicals, and radiolytic degradation products that would interfere with proper process operation. Two separate solvent treatment systems were used. The first processed all the solvent except that from the final uranium cycle, which was processed separately in the second system.

2.3.2.4 Backcycle Waste System. The backcycle waste system accumulated product-bearing aqueous waste streams from the uranium and plutonium cycles following the partition cycle and then concentrated and recycled this material to the solvent extraction process. This provided recovery of products routed from the individual product purification cycles by re-extraction in the codecontamination cycle. The backcycle waste system also provided the nitric acid needed for the efficient extraction operation of this cycle.

The overhead condensate from the waste concentrator was routed to the first-cycle uranium concentrator, where the condensate was re-evaporated along with the principal uranium product stream.

2.3.2.5 Acid Recovery. Nitric acid was one of the principal chemicals used in the PUREX process. In addition to being used to dissolve irradiated fuels, it was also used as the "salting" agent in the solvent extraction cycles to help force the transfer of plutonium and uranium from the aqueous phase into the organic extractant. Because of the large volume used, nitric acid was recovered and reused.

A major recovery source of nitric acid was the aqueous high-acid waste from the solvent extraction cycles. Most of the acid was recovered by evaporation in the high-level waste concentrator. Further treatment of the concentrated waste by sugar denitration reduced acid levels and produced oxides of nitrogen. These oxides of nitrogen were partially converted to acid in the acid absorber, which treated the vapor from the high-level waste concentrator. The resulting dilute nitric acid stream was fed to the acid fractionator along with the acid streams that were returned from the dissolver offgas facility and from the UO_3 Plant.

2.3.2.6 Waste Treatment. Aqueous waste from the codecontamination cycle contained essentially all of the fission products that entered the PUREX process except the radioactive gases, a fraction of the halogens, and part of the tritium. This acid waste was routed to the high-level waste feed tank where it was diluted to enhance acid recovery before entering the waste concentrator.

The concentrated waste, partially deacidified by boiling acid overhead, overflowed continuously from the concentrator to a waste receiver tank. After the concentrated waste had been sampled, analyzed, and confirmed for transfer, it was partially denitrated by the addition of a sugar solution. The gases produced, principally carbon dioxide and

oxides of nitrogen, were routed back to the vapor tower of the concentrator and then to the acid absorber where the oxides of nitrogen were partially recovered as nitric acid.

The concentrated, denitrated waste was made alkaline and transferred from the PUREX Plant to underground storage in the tank farms.

2.3.2.7 Offgas Treatment. The offgas from the decladding step contained hydrogen and ammonia, both kept well below their lower explosive limit concentrations by water scrubbing or dilution with the large flow of process air through the system. (The presence of the nitrate ion inhibits hydrogen formation in the dissolvers.) The decladding offgas was water vapor scrubbed to remove ammonia. It was then passed through steam and electric heaters, a silver reactor (for the removal of radioiodine), two fiberglass filters in series, and out the main ventilation stack to the atmosphere. The ammonia-bearing offgas stream from the ammonia removal system was scrubbed with water, filtered, and then discharged to the atmosphere via a separate stack. The ammonia scrubber water containing some radionuclides was concentrated and sent to underground storage tanks. The concentrator condensate was sent to a crib.

The offgas from the dissolving step was passed through steam and electric heaters, a silver reactor (for the removal of radioiodine), the in-cell fiberglass filter, the secondary fiberglass filter, and into the backup facility. In the backup facility, much of the remaining iodine and oxides of nitrogen were removed from the offgas by two acid absorbers in series. The offgas was then discharged through the main ventilation stack to the atmosphere. The dilute nitric acid produced in the absorbers was recycled to the PUREX acid recovery system where it was concentrated and recycled to the process.

A fourth stage of high-efficiency particulate air (HEPA) filters was installed in the main exhaust plenum of the PUREX Plant. The HEPA filter banks were installed downstream from the fiberglass filters. The design, installation, and activation (placed in service) occurred in the 1983-86 timeframe.

Before the fourth filter stage installation, plutonium releases to the atmosphere were borderline. The fourth stage of HEPA filters reduced the plutonium releases to acceptable levels.

2.3.3 Process Flowsheet Modifications

Modifications have been made to the PUREX flowsheet as information became available to increase capacity, decrease operating costs, reduce waste losses, and improve product purity. Major flowsheet modifications fell into six categories: (1) optimization of the original flowsheet within the objectives of the original plant mission, (2) modifications for neptunium recovery, (3) modifications for thorium processing, (4) modifications for increased processing flexibility (primarily in the headend), (5) modifications for reduced environmental releases, and (6) modification for plutonium oxide production.

Appendix A contains the PUREX Operational Flow Diagram. It is reprinted from the PUREX FSAR (Manry and Prosk 1985).

2.3.4 Process Flow Diagram

A simplified flow diagram of the PUREX process, employing a block diagram to illustrate processing unit interfaces, is shown in Figure 2-6, "PUREX Plant Simplified Flow Diagram." This flow diagram is reprinted from the PUREX FSAR (Manry and Prosk 1985) and describes the PUREX process as it was conducted during the middle to late 1980's.

2.4 FACILITY HISTORY

The AEC authorized the design and construction of the PUREX Plant in 1952. The PUREX process was an improvement over the reduction oxidation (REDOX) process because it employed a recoverable salting agent, resulting in a significant reduction in unit costs and waste generation. The PUREX Plant became operational in 1956 and operated continuously until its shutdown in September 1972. The shutdown was caused by the closure of eight of the nine materials production reactors located at the Hanford Site.

The PUREX Plant was in a "wet standby" condition from 1972 to 1978. During this standby period, major plant equipment was operated periodically to ensure its operability and its availability for a mission assignment. The plant's extraction columns, associated tankage, pumps, column pulsers, jets, and other mechanical equipment were operated on a regular basis. Equipment that failed was either replaced or upgraded accordingly; if the equipment was not replaced or upgraded, the identified failures were formally documented for future replacement action.

From 1978 to 1983, the PUREX Plant underwent considerable upgrading and replacement to prepare for the restart of operations. Cold startup tests were carried out to establish the plant's readiness to commence irradiated fuels processing. In November 1983, the PUREX Plant resumed operations to reprocess the inventory of stored N Reactor fuel to provide plutonium for nuclear weapons programs, research, reactor development, and other ancillary safety programs. In addition to plutonium production, the PUREX Plant provided slightly enriched uranium for reactor fuel.

Operations were terminated in December 1989 to readdress safety requirements. The plant was operated from February 1990 until March 1990 to stabilize the plant for an extended shutdown period while a new environmental impact statement (EIS) was being prepared.

In February 1991, PUREX Plant operations were terminated by the DOE. The plant has been in a standby cleanout mode in preparation for deactivation. An official deactivation notice was issued in December 1992.

Originally, the PUREX Plant was designed to reprocess aluminum-clad uranium metal fuel to recover weapons-grade plutonium and depleted uranium. The headend of the plant was modified and upgraded to reprocess zirconium-alloy- (Zircaloy-) clad fuel from N Reactor to recover fuels-grade plutonium, slightly enriched uranium, and ^{237}Np . The recovery of fuels-grade plutonium from N Reactor required a plutonium oxide end product. Consequently, N cell was modified to accept a plutonium oxide conversion facility. Over the life of the PUREX Plant (1956-90), significant improvements, upgrades, and

processing enhancements were made to increase production rates, provide for more diverse reprocessing capability, provide higher quality products, decrease environmental releases, and improve the safety of the overall operation.

During the operating life of the PUREX Plant (1956-90), there were many major and minor upgrades to the processing facilities and systems. These upgrades improved operational efficiencies, enhanced safety, improved environmental emission control, instituted waste minimization efforts, and expanded the reprocessing versatility and capability. The construction upgrade and modification projects that would have influenced the generation rates for TRU solid waste and/or LLW are listed chronologically in Table 2-3.

Radioactive solid wastes generated by significant events other than capital projects are listed in Table 2-4. Appendix B contains a more complete history of the PUREX Plant. This history is reprinted from the PUREX FSAR (Manry and Prosk 1985).

2.5 CURRENT STATUS

The DOE recently (December 1992) announced plans to permanently shut down the PUREX Plant. It was temporarily shut down in March 1990 for what was intended to be a year's worth of upgrades. Once the upgrade work was complete, plans had called for processing 2,100 metric tons of spent fuel from Hanford Site's N Reactor.

Currently, no schedule has been set for readying the plant for decommissioning. The plant still contains approximately 1,135,620 L (300,000 gal) of acid and organic solutions, residual radioactive contamination, and other hazardous materials. The fiscal year (FY) 1993 budget includes \$46.8 million for maintaining the plant and preparing it for permanent shutdown.

Figure 2-1. Map of the Hanford Site Area.

FFTF = Fast Flux Test Facility
 HMS = Hanford Meteorology Station
 I = Interstate
 PFP = Plutonium Finishing Plant
 PNL = Pacific Northwest Laboratory
 PUREX = Plutonium-Uranium Extraction (Plant)
 SR = State Route

39301054.4

Figure 2-2. Location of the Hanford Site in Washington State.

39305033.1

Figure 2-3. PUREX Plant — 200 East Area.

Figure 2-4. Burial Tunnel 2 (218-E-15).

RCP8008-105

Figure 2-5. PUREX Burial Tunnel 2 (218-E-15). (2 sheets)

Purex # two Burial Tunnel is located at the southeast end of the Purex building and is an extension of the railroad tunnel. The storage area is approximately 1688 feet long, 22 feet high and 34 feet wide. The tracks have a one percent down-grade toward the south end of the tunnel. The capacity of the Burial Tunnel is 38 -40 modified railroad cars, 40-42 feet long. The Tunnel contains 15 cars as of 5/13/88.

position

1. E-F6 #1 (2WW WASTE) CONCENTRATOR, TK F15-2, ONE TUBE BUNDLE AND AGITATOR MOTORS. BURIED IN TUNNEL ON 12/12/67 ON CAR 61439. 2,400 CU. FT., 700 CURIES.

2. E-F6 #5 (E-H4 3WB) CONCENTRATOR, TWO TUBE BUNDLES BURIED IN TUNNEL ON 3/26/69 ON CAR MILW 60883. 2,400 CU. FT., 500 CURIES.

3. E-F6 #6 (2WW WASTE) CONCENTRATOR, TWO TUBE BUNDLES FAILED BURIED IN TUNNEL ON 3/19/70 ON CAR 3612. 2,400 CU. FT., 700 CURIES.

4. CELL PACKAGE IN A SEALED STEEL BOX (H2-66012) BURIED IN TUNNEL ON 12/30/70 ON CAR MILW 60033. 2,400 CU. FT., 500 GRMS PU.

5. F2 SILVER REACTOR, F6 DEMISTER, VESSEL VENT LINE STEEL CAT-WALK AND GUARD RAILS. BURIED IN TUNNEL ON 2/26/71 ON GONDOLA CAR 4610. 2,400 CU. FT., 20 CURIES.

6. MODIFIED A3-1 TOWER, SCRUBBER, LID AND VAPOR LINE BURIED IN TUNNEL ON 12/12/71 ON GONDOLA CAR 4611. 2,400 CU. FT., 10 CURIES.

7. A3 DISSOLVER BURIED IN TUNNEL ON 12/22/71 ON NINE FT. SHORTENED CAR B58. 2,400 CU. FT., 50 CURIES.

8. A1W1 FUEL ENDS IN STEEL LINER BOX AND NPR FUEL HANDLING EQUIPT. USED WITH THE SUSPECTED CANISTERS, ON CAR 19808 BURIED IN TUNNEL ON 8/29/72. 800 CU. FT., 17,500 CURIES.

9. C3 DISSOLVER BURIED IN TUNNEL ON 9/30/72 ON CAR 19811. 1590 CU. FT., 50 CURIES.

10. E-H4 (3WB) CONCENTRATOR, #61 TUBE BUNDLE, PROTOTYPE COOLING COIL AND A F-F1 FILTER TANK. BURIED IN TUNNEL 8/30/83 ON CAR CDX-1. 2,400 CU. FT., 500 CURIES.

11. A3 DISSOLVER (VESSEL #10 AND HEATER (VESSEL #6) BURIED IN TUNNEL ON 1/18/86 ON CAR 3613. 3,960 CU. FT., 0.81 CURIES

202A-WHC-86-01

12. WHITE BOX (H2-58456) CONTAINING EIGHT TUBE BUNDLES #S 57, 60, 62, 64, 67, 68, 74, AND 76. PULSER #5 AND OLD HEATER. DISS LID OLD STYLE DUMPING TRUNNIONS(9). BURIED IN TUNNEL ON 1/20/86 ON CAR 3611. 5,438 CU. FT., 540 CURIES

202A-WHC-86-02

13. J5 TANK (VESSEL #30), F1 COND (VESSEL #13) AND F12-B CELL BLK. OLD FOUR-WAY DUMPER, DISS YOKE AND FLANGE PLATE. BURIED IN TUNNEL ON 1/21/86 ON CAR 19806. 2,500 CU. FT., 90 CURIES

202A-WHC-86-03

Figure 2-5. PUREX Burial Tunnel 2 (218-E-15). (2 sheets)

POSITION

14.

L-1 PULSER, 2-COLUMN CARTRIDGES, 1-JUMPER CUTTER, 3-JUMPER ALIGNMENT TOOLS, 9-EXTERIOR DUMPING TRUNNIONS, 10-PUMPS, 3-AGITATORS, 4-TUBE BUNDLES, 2-VENT JUMPERS AND 7-YOKES. BURIED IN TUNNEL ON 11/18/87 ON CAR PX-10 (10A-19380) & RACK H2-96629. 50 TONS, 3,600 CU. FT., 33.750 CURIE (REF: LETTER 12110-88-074).

15.

SILVER REACTOR, E-F2 STEAM HEATER AND BURIAL LINER(H2-65095) FULL OF CUT UP JUMPERS BURIED IN TUNNEL ON 5/13/88 ON CAR PX-9 (10A-19809) & S/R CRADLE SK-GLR-11-2-87. 20 TONS, 2,775 CU. FT., 240 CURIES (REF: LETTER 12110-88-074).

UNH = Uranyl Nitrate Hydroxide

Table 2-1. PUREX Cell Functions and Equipment.

Cell	Function	Equipment
A,B,C	Metal dissolution	Dissolvers, dissolver towers, scrubbers, heaters, silver reactors, process tanks, jets, and filters
D	Metal solution storage	Metal solution storage tanks, metathesis solution storage, coating, waste receiver, pumps, jets, samples, and agitators
E	Feed preparation and cladding waste treatment	Centrifuges, catch tank, coating waste tank, rework tank, feed makeup tank, recovered product tank, scrubber, pump, jets, agitators, and samplers
F	Waste treatment and process ventilation	Nitric acid absorber, condensers, pumps, tanks, samplers, concentrators, jets, and agitators
G	Solvent treatment system	Pulse column and generator, tanks, decanter, turbomixer, pumps, jet, agitators, and samplers
H	First decontamination system	Tanks, concentrator, condenser, pumps, samplers, jets, pulse columns, and pulse generators
J	Partition system/no recovery	Tanks, concentrator, condenser, pumps, samplers, jets, pulse columns, and pulse generators
K	Uranium decontamination and concentration system	Pulse columns, tanks, pulse generators, concentrators, condensers, pumps, jets, and agitators
L	Plutonium decontamination and concentration system	Pulse columns, tanks, pulse generators, concentrators, condensers, pumps, jets, agitators, and stripper/condenser
M	Equipment decontamination and storage/plutonium nitrate storage	Tanks, pumps, hood, and samplers

Table 2-2. Contents of Burial Tunnel 1.

Storage date	Item
June 1960	HA column and miscellaneous box
July 1960	E-F11 concentrator
December 1960	Miscellaneous jumpers, two-tube bundles, and an E4 centrifuge
January 1961	E-H4 concentrator
April 1961	E-F6 concentrator
February 1962	E-F11 concentrator
January 1965	E-F6 concentrator

Table 2-3. Radioactive Solid Waste Generation by Capital Projects.

Date or project	Equipment modification	Probable solid waste generation
April 1957	Installed titanium tube bundle in the plutonium concentrator	Spent equipment disposal. Maintenance generated wastes/TRU waste
January 1958	N cell plutonium anion exchange system installed	Process wastes — ion exchange resin discarded as TRU waste
August to October 1962	Installed neptunium recovery and purification equipment	Neptunium previously discarded to tank farm. Neptunium recovery generates TRU process waste and housekeeping and maintenance generated TRU waste
February 1967	Installed UNH rework concentration and reflux system in the 203 Area (TK-P6)	Maintenance activities generated LLW
July 1968	Replaced N cell resin "pusher" with "puller", which was unsuccessful	Maintenance activities and equipment discard generated TRU waste
January 1971	Replaced L cell package with third plutonium cycle	Maintenance activities and equipment discard generated TRU waste slightly contaminated with FP and uranium
B-175 (1977-78)	Installation of the plutonium oxide conversion facility	Maintenance activities, equipment, process operations and housekeeping generated TRU wastes
1978	Rework of off-specification plutonium oxide	Maintenance activities, equipment, process operations, and housekeeping generated TRU wastes
B-379	Addition of HEPA filters and control instruments to the white room filtration system to divert airflow in the event of a leak in the P&O gallery	Filter changes generate TRU and LLW
B-410	Installation of plutonium nitrate lag storage tank	Maintenance installation generates TRU and LLW

FP = Fission product.
 HEPA = High-efficiency particulate air (filter).
 LLW = Low-level waste.
 P&O = Pipe and operations.
 TK = Tank.
 TRU = Transuranic.
 UNH = Uranyl nitrate hexahydrate.

Table 2-4. Radioactive Solid Waste Generation by Significant Events.

Date	Equipment modification	Probable solid waste generation
2/23/58	Fire in hot shop (oil or acid soaked rags) — minor loss of contamination control in hot shop	TRU and LLW generated by cleanup
1/10/60	PR can pressurization (lacked vent hole in gasket). One small loss of contamination control in the PR room	TRU and LLW generated by cleanup
3/3/62	51,481 L (13,600 gal) of water on floor in K cell. Loss of contamination control in the PR room	TRU and LLW generated by cleanup. May have FP present
9/23/66	PR can tipped over on PR elevator — minor loss of contamination control to the PR elevator area	TRU and LLW generated by cleanup
5/10/68	UNH truck leaked from PUREX to UO ₃ Plant — minor uranium contamination	LLW generated by cleanup

FP = Fission product.

LLW = Low-level waste.

PR = Product recovery.

PUREX = Plutonium-Uranium Extraction (Facility).

TRU = Transuranic.

UNH = Uranyl nitrate hexahydrate.

UO₃ = Uranium trioxide.

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3.0 WASTE GENERATION

The wastes generated by PUREX Plant operations can be segregated into radiological or nonradiological wastes in gaseous, liquid, and solid forms.

3.1 RADIOLOGICAL WASTES

The radioactive wastes generated have been classified into five categories based on the waste's potential radioactivity levels, methods of handling, and disposal procedures. These categories are as follows:

1. Gaseous
2. Low-level liquid
3. High-level liquid
4. Miscellaneous solids
5. Failed equipment.

The focus and intent of this document is to characterize wastes in categories 4 and 5. Gaseous and liquid wastes are covered at a summary level only.

3.1.1 Gaseous Radioactive Wastes

The typical discharge of gaseous waste from the PUREX Plant is illustrated in Figure 3-1, "Principal Gaseous Waste Discharge Points from the PUREX Plant" (Manry and Prosk 1985). The gaseous discharge points were filtered to remove entrained particulates as indicated in Figure 3-1. The HEPA and deep-bed fiberglass filters were used extensively. Changeout of these filtering systems generated solid radioactive waste according to the exhaust stream that was filtered.

3.1.2 Liquid Radioactive Waste

Much attention was given to liquid waste generation to reduce the quantity of radioactive effluent streams or to eliminate these streams entirely. Consequently, significant recycle processes were incorporated into the PUREX flowsheet over the operational life of the plant. The liquid effluents generated by the PUREX Plant can be characterized as follows:

- Liquids essentially free of radioactive contamination, which were discharged to artificial ponds
- Slightly contaminated liquid wastes, which were discharged to underground trenches (cribs)
- Liquid wastes containing mixed fission products, which were neutralized at the PUREX Plant and routed to underground storage tanks.

The generation rate of liquid wastes far exceeded the generation levels of solid and gaseous wastes.

A general summary of the liquid and gaseous effluent discharges from the PUREX Plant is provided in Figure 3-2, "PUREX Plant Input-Output Diagram — Operating N Reactor Fuels" (Manry and Prosk 1985). A similar presentation addressing the liquid effluent streams leaving the PUREX Plant is shown in Figure 3-3 (Manry and Prosk 1985).

The accommodation of the liquid effluent streams generated some solid wastes in the form of failed equipment, unplanned sludge accumulations, and miscellaneous industrial maintenance wastes, which may or may not have been contaminated with radioactivity.

3.1.3 Solid Radioactive Wastes

Solid wastes generated at the PUREX Plant are segregated by their radioactivity levels listed in the following categories:

- Solid, nonradioactive wastes that contain no mixed fission products (MFPs) or TRU nuclides as determined by beta-gamma readings of $< 200 \text{ dpm}/100 \text{ cm}^2$ (15.5 in^2) and alpha readings of $< 20,000 \text{ dpm}/100 \text{ cm}^2$ (15.5 in^2), respectively
- Solid, LLWs that have beta-gamma readings $> 200 \text{ dpm}/100 \text{ cm}^2$ (15.5 in^2) and alpha readings of $< 20,000 \text{ dpm}/100 \text{ cm}^2$ (15.5 in^2), respectively
- Solid, TRU wastes that contain or are suspected to contain TRU nuclides in the amount of 100 nCi/g of waste (nominally = or $> 20,000 \text{ dpm}/100 \text{ cm}^2$ [15.5 in^2]) or more.

3.2 NONRADIOLOGICAL WASTES

Normally, cooling water and liquid effluents to the chemical sewer were below radiological detection limits. If radioactivity was discovered, the respective effluent was diverted to the diversion retention basin. The other major nonradioactive liquid effluent stream was the sanitary waste effluent, which was directed to the tile field. Any inadvertent contamination of the tile field would have developed into a major decontamination and decommissioning (D&D) effort, generating a significant level of solid waste.

Solid, nonradioactive wastes primarily consisted of ordinary trash originating outside of contaminated areas.

3.3 SOLID WASTE GENERATORS

PUREX Plant functions that generated solid waste were processing operations, laboratory analyses, and supporting activities. The published PUREX and Plutonium Oxide Production flowsheets do not address solid waste generation in any detail. However, an internal memo issued by the PUREX Regulatory Compliance Group (Ellis 1991) addresses solid waste generation at the PUREX Plant based on recent past operations (from 1987 to present). The internal memo divided the solid waste generated into the following categories:

1. Nonregulated waste
2. Low-level waste
3. Mixed waste
4. TRU and TRU mixed waste
5. Hazardous waste.

Flowsheets were developed for these five waste categories and are provided in Figures 3-4 through 3-8. These flowsheets apply only to waste generated during PUREX operations that took place in the late 1980's. The flowsheets indicate yearly generation quantities for each category of solid waste. Waste characterization is also addressed, and the anticipated radionuclide distribution has been included. These flowsheets are an excellent solid waste synopsis. However, other solid waste streams are not addressed, such as the failed equipment items placed in the PUREX burial tunnels.

3.3.1 Failed Equipment

Large-size failed equipment (e.g., large process equipment pieces, such as dissolvers, towers, vessels, and concentrators) was loaded on old railcars and stored in the PUREX burial tunnels. Intermediate-size failed equipment (e.g., tube bundles, process jumpers, and pumps) was placed in sealable, noncombustible, retrievable boxes. These boxes were either stored on old railcars in the PUREX burial tunnels or placed in concrete burial boxes and "buried" in a designated radiation burial ground in trenches covered by at least 2.4 m (8 ft) of earth fill for radiation shielding. The failed equipment items stored in the burial tunnels fit in either the LLW or the low-level mixed waste (LLMW) categories, depending on the presence of hazardous contaminants.

The total plutonium content of each equipment item placed on a railcar was restricted to 250 g (8.8 oz), the same limit that was imposed upon items placed in a burial box. Construction materials capable of sustaining combustion were kept to a minimum on both the railcar and the equipment containment envelope (if one was provided).

3.3.2 Solid TRU Waste Generation

Solid TRU waste was generated by process operations in the following plant locations:

- L cell — Solvent extraction equipment to perform the third plutonium purification cycle
- M cell — Plutonium nitrate storage and equipment decontamination facilities
- N cell — Originally used for plutonium product purification by ion exchange. The ion exchange unit was replaced by the third plutonium cycle located in L cell. A plutonium nitrate solution to oxide conversion process was then installed in N cell
- Q cell — Neptunium purification facility
- PR room — Product removal room that was used for filling plutonium nitrate shipping containers (PR cans or FL-10-1 containers). Also a sampling point for plutonium nitrate before it entered N cell for oxide production.

In addition, solid TRU waste was generated by support maintenance activities in the hot shop and M cell.

Solid TRU waste was also generated by the analytical laboratory in the form of contaminated apparatus, equipment, waste rags, paper, cardboard, rubber gloves, etc. The TRU waste elements included curium, neptunium, plutonium, and americium.

3.3.3 Types of TRU Waste Generated

Solid TRU waste was generated by plutonium-based processes, such as the third plutonium purification cycle, the plutonium nitrate solution load-out to PR cans, and the plutonium nitrate to oxide conversion process in N cell. This TRU waste falls into the following five groups of materials:

- Spent and failed equipment and tools
- Housekeeping items such as rags, plastic bottles, wipes, and cardboard containers; and glovebox maintenance materials such as HEPA prefilters, glovebox gloves, cutout plastic bags, and other miscellaneous items
- Ventilation HEPA filters
- Demolition and major equipment removal, such as gloveboxes, tanks, and piping

- Processing items, such as Fulflo* filters, drum filter cloth, contaminated lubricant, and other miscellaneous metal items.

3.3.4 Types of Low-Level Waste

The majority of PUREX LLW was generated by room activities, rather than by glovebox activities as in the case of TRU waste generation. For this reason, LLW is also referred to as room waste, while TRU waste is called glovebox waste.

The types of LLW generated by PUREX operations include plastics, rubber surgeon's gloves, cardboard containers, paper, miscellaneous metal items, and contaminated clothing. Maintenance equipment with low levels of radioactive contamination were often able to be disposed of as LLW. When possible, equipment was sometimes sent to other site operations for reuse, rather than for disposal.

*Fulflo is a trademark of Ruthman Pump and Engineering, Incorporated.

Figure 3-1. Principal Gaseous Waste Discharge Points from the PUREX Plant.

RCP8105-213C

Figure 3-2. PUREX Plant Input-Output Diagram — Operating N Reactor Fuels.

Figure 3-3. Liquid Effluent Streams Leaving the PUREX Plant.

RCP8105-214B

PUREX = Plutonium-Uranium Extraction

Figure 3-4. Nonregulated Waste Flowsheet.

Figure 3-5. Low-Level Waste Flowsheet.

WASTE THAT CONTAINS RADIOACTIVITY THAT IS NOT CLASSIFIED AS HIGH LEVEL WASTE, TRANSURANIC WASTE, SPENT NUCLEAR FUEL, OR BYPRODUCT MATERIAL AS DEFINED IN DOE ORDERS 5820.2A (DOE 1988) AND 5400.3 (DOE 1989). LLW HAS CONCENTRATIONS OF TRANSURANIC RADIONUCLIDES LESS THAN OR EQUAL TO 100 nCi/g OF WASTE MATRIX.

WASTE CHARACTERISTICS

PHYSICAL OPERATIONS

- 30% PAPER
- 34% PLASTIC
- 8% RUBBER
- 7% GLASS
- 15% METAL
- 8% ABSORBENT
- 7% METAL
- 3% RUBBER
- 5% CLOTH
- 35% PAPER
- 30% PLASTIC
- 10% VEGETATION/SOIL
- 10% CONSTRUCTION MATERIALS (WOOD, CONCRETE, GLASS, ASBESTOS)

RADIONUCLIDE DISTRIBUTION (CURIE Z)

⁹⁰ Sr	4.56%	¹³⁷ Cs	5.28%
⁹¹ Y	4.56%	^{137m} Ba	5.00%
⁹¹ Zr	<1%	¹¹⁴ Ce	26.29%*
⁹¹ Tc	<1%	¹¹⁴ Pr	26.29%*
¹⁰⁶ Ru	6.34%	¹¹⁴ Pm	12.34%*
¹⁰⁶ Rh	6.34%	¹³⁵ Sm	<1%
¹⁰⁷ Pd	<1%	¹³⁷ La	2.48x10 ⁻² %
¹³⁷ I	<1%	¹⁴ C	6.18x10 ⁻³ %
¹³⁷ Cs	<1%		

NOTES: 1) PHYSICAL CHARACTERISTICS ARE ESTIMATES DETERMINED FROM PAST SHIPPING DOCUMENTATION.

2) RADIONUCLIDE DISTRIBUTIONS ARE ENGINEERING ESTIMATES BASED ON ORIGIN II TABLE DATA WITH REGARDS TO MARK IV 6% ²³⁵U FUEL. THE RADIONUCLIDES LISTED ARE THOSE WHICH CONTRIBUTE 1% OR MORE TO THE TOTAL CURIES OR THE TOTAL MASS. RADIONUCLIDES ²³⁵U AND ²³⁸U ARE SPECIFICALLY REQUIRED TO BE REPORTED PER "GUIDANCE DOCUMENT FOR IMPLEMENTATION OF DOE ORDER 5820.2A CHAPTER III. MANAGEMENT OF LOW-LEVEL RADIOACTIVE WASTE."

3) WASTE IS PACKAGED ACCORDING TO 49 CFR AND/OR SARP.

Figure 3-6. Mixed Waste Flowsheet.

Figure 3-7. TRU and TRU Mixed Waste Flowsheet.

WASTE CONTAMINATED WITH ALPHA-EMITTING TRANSURANIC RADIONUCLIDES WITH HALF-LIVES GREATER THAN 20 YEARS AND IN CONCENTRATIONS GREATER THAN 100 nCi/g OF THE WASTE MATRIX. THE TRANSURANIC RADIONUCLIDES ARE RADIONUCLIDES HAVING AN ATOMIC NUMBER GREATER THAN 92. TRU-NW IS TRU WASTE THAT ALSO CONTAINS DANGEROUS WASTE AS DEFINED BY 40 CFR (PART 261) AND WAC 173-070 THROUGH 173-103.

SECTION 1 (1) THE LISTED BACKGROUND DISTRIBUTION IS AN EXAMPLE BASED ON VEGETATION RESULTS.

- 2) TRU WASTES ARE CURRENTLY BEING SENT TO TRUSAF AND STORED UNTIL WIPP BEGINS ACCEPTING WASTE
- 3) TRU WASTES ARE MOVED TO THE SAME LOCATION AS THE TRU-MW, BUT NOT WITHIN THE 490 DAY ACCUMULATION AREA.
- 4) WASTE IS PACKAGED ACCORDING TO 49 CFR, SARP, AND/OR WIPP-WAC CRITERIA.

Figure 3-8. Hazardous Waste Flowsheet.

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4.0 SOLID WASTE HANDLING PRACTICES AND PACKAGING PROCEDURES

Solid radioactive waste handling, treatment, sorting, packaging, characterization, and recordkeeping at the PUREX Plant progressed through four general phases of time. They are as follows:

1. 1956-70
2. 1971-80
3. 1981-87
4. 1988-92.

During the first period (1956-70) radioactive solid waste received very little attention as to characterization, packaging, sorting, or treatment in general. Marginal records were maintained, with emphasis on the special nuclear material (SNM) operating laws. Since 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 buried during this time period is not very definable with respect to today's intricate waste classification system.

In the second phase (1971-80) the TRU waste concept was developed and refined with the additional requirement for retrievability in 20 years. Consequently, better records were kept and packaging and characterization improved. The SWBRs were kept for all containers, although the information on physical contents and hazardous constituents was limited.

During the third phase (1980-87) WIPP and low-level waste acceptance criteria were developed, tremendously improving the solid radioactive waste records, packaging, and sorting. Also at this time, entries on SWBRs began to be made on a per container basis, instead of a per shipment basis, improving the ability to characterize and categorize the wastes for retrieval.

In the final period of PUREX operation (1987-92) RCRA requirements and other more strict compliance criteria were applied to radioactive solid waste handling, packaging, characterization, and recordkeeping practices.

Retrieving the waste generated in phase 1 will require particular caution because of poor waste definition, uncertain packaging contents, and untested containers. Retrieving solid wastes generated in phase 2 will be less difficult, accordingly. Phase 3 waste characterization should be very definable except for the hazardous and toxic waste constituents. Retrieval and processing phase 4 generated waste should be relatively straightforward because of the excellent records, characterization, and waste acceptance criteria.

4.1 HISTORICAL WASTE HANDLING AND PACKAGING

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 cover requirements from 1974 through 1988. Before 1974, waste handling and packaging were based on individual generator practice.

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 definitions are found in that manual. Definitions (e.g., hazardous and toxic materials) change from manual to manual and require reference to each particular manual.

Changes in labeling and packaging requirements have had an effect on the SWITS data (much of the data in Chapter 5 was taken from SWITS). A summary of the impacts of changing regulations and practices concerning the information stored in SWITS is presented in Table 4-2.

Some of the more significant changes that have occurred in the past 20 years with regard to the packaging, handling, and recordkeeping for radioactive wastes from PUREX are as follows.

- Although the disposition of liquid and gaseous waste streams is discussed in great detail in the early *PUREX Technical Manual* (HAPO 1955), solid wastes are only briefly mentioned. Dry wastes from the analytical laboratory, such as absorbent tissues, wood, and metal parts, were placed into quart cardboard containers. These containers were then placed in larger cardboard cartons. When the radioactivity level of the contents of the carton was deemed to create a radiation hazard, the carton was sealed and moved to the 200 East Area burial ground.
- 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 > 10 nCi/g. In 1982, the current 100 nCi/g definition for TRU waste was implemented by the DOE.
- Because of the varied contents of the waste containers, chemical reactions can occur. Gases may accumulate, including hydrogen, which can contribute to fire and/or explosion. Since 1982, waste materials that generate hydrogen, oxygen, or NO_x are prohibited unless drums have been permanently fitted with vent clips to allow continual release of gases and include catalyst packs to recombine any hydrogen that may be produced.

- Criticality specifications limited the amount of TRU to < 250 g (8.8 oz) per 55-gal drum from 1975 to 1978 and to 200 g (7.1 oz) per drum after that time. Before 1975 there were no criticality limits.
- Individual container weights were not required before 1977; however, estimated weights for pre-1977 containers were added to the records in the R-SWIMS database during the data re-entry program in the mid-1980's. Standard weights were given for each container type. All 55-gal drums, for example, were given a value of 68 kg (150 lb).
- Originally, waste burial records for TRU were not done for individual containers, but rather 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 re-entry program, historical TRU records were converted to an individual container basis so that today there is one SWITS record for each TRU container stored at the Hanford Site.
 - The conversion from group data to individual container data required some assumptions to be made about the containers in the group. Chief among these assumptions was that an even distribution of radiological and hazardous constituents existed among the members of the group.
 - Low-level waste records are still kept for multiple containers rather than for individual containers.
- Information on the hazardous constituents of waste containers was not required before 1986. During the R-SWIMS re-entry program, any available information from the SWBRs was added. However, this information is limited.
- Physical descriptions of the waste contents were not required on the SWBR before 1978. In most cases, SWITS records for waste buried before 1978 list the contents as "Miscellaneous". In more recent years the physical contents description has become more detailed. Many of the records now include the weight and volume percentage of a given component in the waste container.
- 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.
- The most common TRU waste container used at the Hanford Site is the 55-gal steel drum. U.S. Department of Transportation (DOT) 17C or 17H drums produced from sheets with minimum wall thicknesses of 0.13 cm (0.053 in.) and 0.012 cm (0.043 in.), respectively, were both used. Before 1982 most of the drums were painted, so there is approximately 0.013 cm (0.005 in.) of paint on both the exterior and interior of the drums. In 1982, galvanized drums replaced the painted drums. Recycled 55-gal drums were also permitted for the storage of TRU waste from 1973 to 1978.

4.2 CURRENT WASTE HANDLING AND PACKAGING

The PUREX Plant currently is shut down and awaiting D&D; there is no process waste being generated. This section describes PUREX waste handling and packaging procedures as they were conducted in the most recent periods of process operations.

There were three categories for the classification of solid waste generated at the PUREX Plant. They are as follows:

- Nonradioactive waste
- Non-TRU waste
- TRU waste, including large, canyon solid waste items.

In addition, waste may be contaminated with hazardous constituents. Radioactive waste with hazardous components is further referred to as mixed waste.

Solid, nonradioactive wastes are waste material, equipment, or property that contain no MFPs or TRU nuclides as determined by alpha-beta readings < 200 dpm/100 cm² and alpha measures of $< 20,000$ dpm/100 cm².

The vast majority of non-TRU waste generated at PUREX is LLW. The term non-TRU is used in this report to specifically include all radioactive waste categorized as "not transuranic". Solid LLW has > 200 dpm/100 cm² beta-gamma contamination and $< 20,000$ dpm/100 cm² alpha contamination. Solid LLW primarily consists of failed or unusable tools, cleaning rags, plastics, and laboratory equipment contaminated above control limits.

Solid TRU wastes contain alpha-emitting nuclides with half-lives > 20 years. Between the years 1972 and 1982, TRU waste was defined as waste that contained or was suspected of containing > 10 nCi/g TRU. In 1982, the TRU segregation limit was raised to > 100 nCi/g.

All solid wastes originating at PUREX were packaged for onsite/offsite storage or disposal. Waste container design was intended to safely contain the waste during temporary storage at PUREX and during transportation to storage or disposal units. The waste packages must also meet the criteria of the storage/disposal unit. For TRU wastes, these criteria are the *TRU Waste Acceptance/Certification Criteria for the WIPP* (WIPP 1989) and WHC-EP-0063-3 (Willis and Triner 1991). For LLWs these criteria are those established by the LLW burial grounds (Willis and Triner 1991). Hazardous and mixed waste must also meet regulatory standards established by Ecology and DOT.

This section describes the equipment and procedures used for packaging radioactive solid wastes generated at PUREX. The description is most applicable to the latter years of PUREX waste generation. Additional information can be found in the PUREX FSAR (Manry and Prosk 1985) and in Solid Waste Acceptance Criteria (Willis and Triner 1991).

4.2.1 Equipment and System Description

The collection and packaging procedures for nonradioactive and solid radioactive wastes generated by both the PUREX process and by the analytical laboratory are discussed in this section.

4.2.1.1 Nonradioactive Wastes. Solid, nonradioactive wastes were collected in trash cans, plastic bags, cardboard boxes, etc., which were then emptied into dumpsters. The waste was compacted to one-third the original volume and buried in the Hanford Site Central Sanitary Landfill.

Noncontaminated asbestos waste was double-bagged, wetted, and labeled before being placed in a separate dumpster designated "Asbestos Only".

4.2.1.2 Solid Radioactive Wastes. Solid radioactive waste consisted primarily of failed or unusable equipment and other contaminated materials (e.g., tools, cleaning rags, plastic, paper, and laboratory equipment). The procedures for collection and packaging of solid, radioactive waste from PUREX were broken down by waste type (e.g., non-TRU, TRU, and large canyon) and are discussed.

Up until 1990, solid, low-level radioactive wastes of small bulk were collected and placed in fiberboard boxes or drums before burial. The fiberboard boxes were restricted to a maximum gross weight of 29 kg (63.9 lb) of dry waste. Since 1990, cardboard burial containers are no longer allowed. The two types of drums that were used for packaging, shipment, and burial of radioactive waste were DOT type 17C or 17H steel 55-gal drums. The exterior surfaces of the drums were either painted or galvanized in accordance with Westinghouse Hanford Company (WHC) specifications. The LLW drums were indicated with black paint and a black dome (49 *Code of Federal Regulations* [CFR] 178.118 [DOT 1989]).

The TRU wastes generated at PUREX that were of small bulk and relatively low levels of activity were packaged in DOT approved 55-gal drums. Drums were painted with the following distinct colors to identify waste types.

- Black drums with silver domes contain combustible waste with <0.5 g (0.02 oz) of TRU nuclide in each drum.
- Black drums with yellow domes contain combustible waste with >0.5 g (0.02 oz) of TRU nuclide in each drum.
- Red drums with red domes contain noncombustible TRU.

These wastes were segregated by waste classification and then shipped to either a TRU asphalt pad and dry waste trench or a TRU industrial and special waste trench.

All TRU waste drums were assayed when they reached the Transuranic Storage and Assay Facility (TRUSAF). If a LLW drum assayed at <100 nCi/g, it was sent to the burial grounds; if the LLW drum assayed at >100 nCi/g, it was sent back to the plant to be

repackaged as TRU waste. If a TRU drum assayed at < 100 nCi/g, it was sent back to the plant to be repackaged as LLW.

Items too large, too bulky or too radioactive to be removed from the plant in the immediate future were put on old railroad flatcars and moved into the PUREX equipment burial tunnel 2 (218-E-15) for indefinite-term storage.

Because of the high radiation levels, the packaging of failed process equipment from the canyon was done remotely using the canyon cranes. The failed processing equipment was transported from the canyon to the railroad tunnel where it was placed on flatcars or inside precast concrete boxes, depending on the type of disposal. Flatcars were pushed into the burial tunnel by a small, remotely operated locomotive colloquially known as "Little Toot".

Large waste items from the canyon for immediate disposal were put in wood, concrete, or metal boxes, and buried in the 200 East Area Burial Ground. Smaller process equipment items or other highly radioactive wastes were collected in large carbon steel containers that, when full, were placed in a concrete container with a lid and buried in the 200 East Area Burial Ground.

4.2.1.3 Laboratory Solid Wastes. The collection and packaging of laboratory solid wastes were the same as those mentioned for nonradioactive and radioactive wastes with the following exceptions.

- Radioactive and chemically hazardous (mixed) waste from the laboratory was typically low flash point material, which was put into glass or plastic bottles and then packed in absorbent material contained in a 55-gal steel drum. The drum remained in the laboratory until it was full. When full it was placed in a 90-day storage area before being shipped to the Central Waste Complex.
- Radioactive (but not mixed) waste was segregated by activity level.
- Waste with activity > 10 mrem/h, but < 100 mrem/h, was put in a 55-gal steel drum.
- Waste with activity > 100 mrem/h is put in concrete lined steel drums. When full, these drums were buried in the 200 West Burial Ground.
- Nonradioactive, but chemically hazardous, wastes from the laboratory were typically reagents in low flash point solvents that had exceeded normal shelf life. After 90-day storage, this waste was sent to the 616 Building, where it could then be shipped offsite.
- Nonradioactive, nonhazardous waste includes items, such as packaging material and lunchroom waste, which were disposed of at the central landfill.

4.2.2 Operating Procedures

4.2.2.1 Monitoring of Solid Waste. Solid waste effluents (excluding those that were highly radioactive and handled remotely) were monitored with beta-gamma and alpha instruments to determine their radiation level. The plutonium content of TRU drums was measured before shipment to determine whether the waste was to be sent to retrievable storage or reprocessed for plutonium reclamation.

4.2.2.2 Solid Waste Disposal Process Safety and Criticality Prevention. The following safety precautions were observed when handling radioactive solid wastes.

- Only the specified waste type was placed into a particular container.
- Materials soaked with acid or oxidizing agent were rinsed thoroughly several times, wrung dry, and placed in a plastic bag, which was closed with tape before disposal.
- Incompatible materials (oxidizing and reducing agents) were not placed in the same containers.
- Each container was lined with plastic to protect it against corrosive wastes.
- No free liquids or sorbed organic liquids were allowed in solid waste containers. Sufficient absorbent was placed within the container to absorb spillage of residual, free liquid.
- Items with contamination that could easily become airborne were contained within a package before being placed in a waste container.
- Operators wore a full-face mask while compacting radioactive waste.
- Waste drums were limited to a 500-mrem/h (non-TRU) and a 200 mrem/h (TRU) dose rate at contact.
- Waste containers were stored away from heat sources.
- Portable fire extinguishers or installed sprinkling systems were available in waste carton storage and loading areas.

In addition, the following items were prohibited from waste drums:

- Chemically incompatible materials in any waste container (in accordance with 40 CFR 265.313 [EPA 1989a])
- Explosives (in accordance with 10 CFR 61.56 [EPA 1990])
- Pyrophorics (in accordance with 10 CFR 61.56 [EPA 1990])
- Gas cylinders (including aerosol cans) not permanently vented

- Chelating compounds (prohibited from disposal only; they may be included in future treatment on a case-by-case basis (DOE Order 5820.2A [DOE 1988]))
- Liquids, except as packaged in accordance with WHC-EP-0063-3 (Willis and Triner 1991) (in accordance with 40 CFR 265.314 [EPA 1989a] and 10 CFR 61.56 [EPA 1990]).

The following criticality prevention specifications apply to miscellaneous scrap wastes in TRU waste containers.

- No waste containers that contain > 200 g (7.0 oz) of plutonium were transported to the 20-year retrievable storage sites.
- Wastes that contained only small quantities of plutonium contaminated materials (e.g., wiping rags used for decontamination, rubber gloves, and nonabsorbent material) were handled, stored, and transported in a container limited as follows:

Container	Mass limit		Array limit (l x w x h)
	(g)	(oz)	
55-gal drum	200	7.0	∞ x ∞ x 2
	250	8.8	∞ x ∞ x 1

Normally, TRU waste, 55-gal drums with a 200-g (7.0-oz) limit, was sent to the 20-year retrievable storage sites.

Miscellaneous failed equipment was handled as follows.

- Burial boxes must measure at least 0.8 m (2.5 ft) in every dimension.
- Any hydrogenous material (other than the hydrogenous material used in the construction of the equipment) was segregated physically from the equipment pieces and contained < 15 g (0.53 oz) of fissile material.
- Only those materials known to contain < 15 g (0.53 oz) of plutonium were added to burial boxes containing failed tube bundles that may have contained plutonium.
- The total mass of plutonium, ^{233}U , ^{235}U , and ^{238}Pu contained in a burial box was limited to 1,000 g (35.3 oz) per box, with any piece of individual equipment containing < 350 g (12.3 oz).

- The total plutonium content of equipment placed on a railcar to enter the burial tunnel was restricted to 1,000 g (35.3 oz), the same limit imposed upon a burial box.

4.2.3 Administrative Procedures

The specifications of administrative procedures for the handling and packaging of solid waste are contained in the *Hanford Site Radioactive Solid Waste Acceptance Criteria* (Willis and Triner 1991).

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Document number				
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 Sup. 2 12/78 - 5/80	RHO-MA-222 5/80 - 6/82
TRU defi				
Waste containing plutonium and/or other TRU nuclides in concentrations greater than 10 nCi/g.	Waste containing or suspected of containing plutonium and/or other TRU nuclides in concentrations greater than 10 nCi/g.			Waste containing or transuranium alpha- greater than 100 ye- than 10 nCi/g.
Prohibited wastes types and				
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 — ex-
	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 ac- requirements. Liqui- > 150 °F accepted i- Liquid organic waste- with special approve-	
	Flammable absorbed liquids prohibited from disposal in caissons.	Damp or wet wastes with highly combustible or explosive liquids prohibited.	Flammable liquids fr- below 150 °F prohibi-	
Unreacted alkali metals prohibited.				
			Explosives proi-	
			Pyrophorics pro	
		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 gene- significant amounts gas are prohibited.	

Table 4-1. TRU Storage Requirements
for the Hanford Site. (4 sheets)

Revisions and dates				
	RHO-MA-222 6/82 Revision 6/82 - 6/83	RHO-MA-222 Rev. 1 6/83 - 3/84	RHO-MA-222 Rev. 2* 7/84 - 8/85*	RHO-MA-222 Rev. 2 7/84 - 8/85*
Classification				
Suspected of containing alpha-emitting radionuclides with half-lives greater than 20 years or ²³³ U in concentrations greater than 100 nCi/g.		Document unavailable.	Waste containing alpha-emitting radionuclides with atomic numbers greater than 92 and half-lives greater than 20 years or ²²⁶ Ra or ²³³ U in concentrations greater than 100 nCi/g.	
Packaging requirements				
Not for liquid organic wastes.			No free liquids — except liquid organic wastes.	No free liquids.
Not for organic waste with flash point properly labeled and packaged. with flash point <150 °F accepted			Animal carcasses accepted if packaged per requirements.	
Not for solids or absorbed with flash points greater than 150 °F.			Sludges cannot contain free liquids.	
			Unreacted alkali metals prohibited with exceptions.	
Not for oxidizing.			Pyrophorics and explosives prohibited except metal fines.	Explosives prohibited.
Not for corrosive.				Pyrophorics prohibited.
			Gas cylinders containing radioactive gases prohibited. Empty cylinders accepted if permanently vented.	Compressed gases prohibited.
Not for waste materials that generate H ₂ , O ₂ , or 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.

Document num				
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 Sup. 2 12/78 - 5/80	RHO-MA-22 5/80 - 6/82
Prohibited wastes types and p				
	Hazardous and toxic materials must be treated prior to burial.			Hazardous and toxic basis.
	Exterior surfaces must be free from smearable contamination-fixation allowed.			Exterior surface must be free from smearable contamination.
	Contamination that is easily airborne must be in an inner liner.			Loose contamination that the surface of detectable loose contamination.
Beryllium requires double containment.				Double containment required for all TRU and for all waste accepted from off-site generators. Beryllium and mercury require double containment.

Table 4-1. TRU Storage Requirements
for the Hanford Site. (4 sheets)

Document numbers and dates				
D-MA-222 8/80 - 8/82	RHO-MA-222 8/82 Revision 8/82 - 8/83	RHO-MA-222 Rev. 1 8/83 - 3/84	RHO-MA-222 Rev. 2* 7/84 - 8/85*	RHO-MA-222 Rev. 2 7/84 - 8/85*
Storage and packaging requirements (cont.)				
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 surface must be free from smearable contamination.	Exterior surfaces free from smearable contamination; fixation allowed.		Exterior surfaces free from smearable contamination; fixation allowed.	Removable surface contamination limits; fixation is not acceptable.
				Flammable solids (metal fines) must be mixed with chemically stable material to produce a solidified waste matrix (glass, concrete, etc.)
Surface contamination must be stabilized or contained so surface of the container remains free of 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 wt% of the matrix weight is particulates < 10 microns in diameter or if > 15 wt% is < 200 microns in diameter.
Double containment required for all TRU waste from offsite. Beryllium and mercury must be packaged with at least 6 in. of concrete on all sides.	Double containment required for all TRU waste. Double containment is required for cadmium and mercury. Beryllium, cadmium, and mercury must be packaged with at least 6 in. of concrete on all sides.		Double containment required for all TRU waste. Double containment is required for cadmium and mercury. Beryllium, cadmium, and mercury must be packaged with at least 6 in. of concrete on all sides.	Double containment required for all TRU waste. Beryllium, cadmium, mercury and other class B poisons must be immobilized in concrete for burial.

				Document number
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 Sup. 2 12/78 - 5/80	RHO-MA-2 5/80 - 6/8
Prohibited wastes types and				
				Animal waste must be packaged in a 55-gallon drum with a minimum 4-mil. plastic liner to suppress gas generation and surrounded by sufficient absorbent to prevent leaks. Liquids must be packaged in two times the volume of absorbent required to absorb any liquid or that may result from the decay process.
				Liquid Organic waste must be packaged in a sealed liquid-tight container (5-10 gallon) overpackaged in a drum with a rigid polyethylene liner filled to the top with absorbent material at least two times the volume of liquid in the container.
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 waste".
Beryllium must be labeled.				DOT Class "B" Poisons must be labeled (B and mercury).
	Hazardous and toxic waste must be labeled.			

Table 4-1. TRU Storage Requirements
for the Hanford Site. (4 sheets)

References and dates				
2	RHO-MA-222 6/82 Revision 6/82 - 6/83	RHO-MA-222 Rev. 1 6/83 - 3/84	RHO-MA-222 Rev. 2* 7/84 - 8/85*	RHO-MA-222 Rev. 2 7/84 - 8/85*
Packaging requirements (cont.)				
Animal waste must be packaged in a 55-gal 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-gal 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.	
Liquid organic waste must be packaged unabsorbed in a sealed liquid-tight container (5-10 gal), overpackaged in 55-gal 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 unabsorbed in a sealed liquid-tight container (5-10 gal), overpackaged in 55-gal 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.
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.	
Beryllium, cadmium, and mercury must be labeled.			Beryllium, cadmium, and mercury 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.	

				Document number
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 Sup. 2 12/78 - 5/80	RHO-MA-222 5/80 - 6/82
				Labeling requirements
				"Liquid organics" must be labeled.
				Animal waste must be labeled.
				"Fissile Material" label and Type "E" tamper-indicating seal required if contents include 100 more grams. Drums containing plutonium must have plutonium quantity in grams labeled on the side and lid.

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

*Includes RHO-MA-222, Rev. 3, 3A, and 4. The changes made in these revisions are general and do not affect requirements listed under Rev. 2 of RHO-MA-222 are effective up to the effective date of WHC-EP-0082, Rev. 0.

DOT = U.S. Department of Transportation.

HEPA = High-efficiency particulate air (filter).

TRU = Transuranic.

Table 4-1. TRU Storage Requirements
for the Hanford Site. (4 sheets)

Revisions and dates				
	RHO-MA-222 6/82 Revision 6/82 - 6/83	RHO-MA-222 Rev. 1 6/83 - 3/84	RHO-MA-222 Rev. 2* 7/84 - 8/85*	RHO-MA-222 Rev. 2 7/84 - 8/85*
Requirements (cont.)				
Must be	Liquid organics must be labeled and must have flash point range listed on label.		Liquid organics must be labeled and must have flash point range listed on label.	
Must be labeled.			Animal waste must be labeled.	
Label required if fissile material is present	Fissile material label required if contents include 1 or more grams. Plutonium quantity must be labeled if 1 or more grams of plutonium is in the container.		Fissile material label required if contents include 1 or more grams. Plutonium quantity must be labeled if 1 or more grams of plutonium is in the container.	

the packaging, storage, or disposal requirements of TRU unstable or reactive wastes specifically. The

Table 4-2. Major Changes Affecting the Richland Solid Waste Information Management System and Solid Waste Information Tracking System Databases, 1970 to Present. (2 sheets)

Solid Waste Information Tracking System Database																							
1970	1971	1972	1973	1974	1975	1977	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	
TRU segregation based on generator practice				10 nCi/g TRU segregation limit								100 nCi/g TRU segregation limit											
TRU Burial and Storage Records based on a per shipment basis												TRU Burial and Storage Records based on individual containers											
LLW Burial and Storage Records based on a per shipment basis																							
TRU waste form based on a per shipment basis												TRU waste form description on an individual container basis											
Fissile content of each container required																							
Recycled drums used										Galvanized drums used													
Criticality to specification to 250 g of TRU					Criticality specification limit drums up to 200 g of TRU																		
Standard weights/continued on R-SWIMS					Container weight on storage record																		
					Liquid organics banned from disposal; retrievable storage initiated																		
					Vent clips installed on all but Z-9 drums																		
					Tampers-indicating seal on individual containers																		
												Mixed waste information on individual containers											
												Waste type (paper, cloth, etc.) entered											

Table 4-2. Major Changes Affecting the Richland Solid Waste Information Management System and Solid Waste Information Tracking System Databases, 1970 to Present. (2 sheets)

1970	1971	1972	1973	1974	1975	1977	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
		Segregation of combustible and noncombustible waste																				
												TRUSAF completed, allowing separation of TRU and LLW										

LLW = Low-level waste.

R-SWIMS = Richland Solid Waste Information Management System.

TRU = Transuranic.

TRUSAF = Transuranic Storage and Assay Facility.

5.0 CHARACTERIZATION OF RETRIEVABLY STORED SOLID WASTE GENERATED BY PUREX

The information found in this section is based primarily on data from the SWITS database. This database, which incorporated the older R-SWIMS database, is used to track information on radioactive and other wastes stored or disposed of at the Hanford Site. Radioactive solid waste packages, designated as TRU, have been tracked since 1970. In the intervening years, changes in the requirements and regulations governing radioactive wastes have left their mark in the quantity and quality of the data tracked 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 PUREX; however, some general information on the non-TRU waste is included for completeness. Tables 5-1 and 5-2 present TRU and non-TRU waste generation summaries, by container type and year. The data for the TRU wastes are further segregated in this report by container type. 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 combined, except 55-gal drums. The term "drum" refers to 55-gal drums only.

One seeming anomaly between the data in this report and SWITS data in other waste characterization reports is the difference in container numbers in 1970. The secondary waste codes (see Appendix C for a definition of all codes) searched in SWITS to generate the data in this report were not limited to TRU and LLW codes, but also included unsegregated wastes. The unsegregated waste all appears from 1969 to 1971 and is a feature specifically of the SWITS database. Since this waste was generated before the AEC directive was published in April 1970 (AEC 1970), it was not segregated by the waste generator. During the R-SWIMS data re-entry program in the mid-1980's, an attempt was made to classify the pre-April 1970 waste as TRU based on known amounts of TRU in each storage area. Most of the waste was classified as "unsegregated TRU" because of the conservative nature of the procedures used, although some waste was classified as "unsegregated non-TRU". For this reason, the SWITS database contains TRU and non-TRU waste data for waste generated before the AEC directive defining TRU waste.

The original SWITS data that form the basis for most of the tables and figures in this section can be found in Appendix C. Each computer run is preceded by the query used to generate the data. In addition to general PUREX runs, several separate runs were made for 202-A and 202-AL. After review of these runs, it was determined that the waste generation information in SWITS for 202-AL was not significantly different from the larger volume of waste data from 202-A. For this reason, all tables and graphs combine information from 202-A and 202-AL.

5.1 SUMMARY OF PUREX WASTE GENERATION

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 produced from sheet with minimum wall thicknesses of 0.134 cm (0.053 in.) and 0.109 cm (0.043 in.), respectively. Before 1982, most of the drums were painted, so these drums have approximately 0.013 cm (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 IAD (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 20-year storage mark, more attention has been 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-EP-0225, Rev. 1 (Anderson, et al. 1991).

Table 5-3 contains waste summary data for 55-gal drums of radioactive waste generated at PUREX between 1970 and 1992. The upper portion of this table indicates the number, total weight, and total volume of TRU waste drums. 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, 7,101 55-gal drums of radioactive waste were generated at PUREX. This total includes 3,096 drums of non-TRU waste and 4,005 drums of TRU waste. The total number of radioactive mixed waste drums is 327, which includes 142 non-TRU mixed waste drums and 185 TRU mixed waste drums. Figure 5-1 provides a graph of the number of 55-gal drums of TRU and LLW generated at PUREX by year.

The major features of this graph are related directly to historical changes in operational status that took place at PUREX. The high level of waste generation through 1972 corresponds to the continuation of PUREX process operations from 1956 until 1972. From 1972 until 1983, PUREX was in standby; this resulted in relatively small quantities of waste being generated. Restart in 1983 and operation until standby in 1990 led to an increase in waste generation. The increase in 1982 is probably a result of refitting and maintenance in preparation for restart the following year. The temporary standby in March of 1990 was for the purpose of refitting and updating equipment; the large amount of waste generated for 1990 is probably a result of this.

A secondary trend shown in Figure 5-1 is the gradual decrease in the ratio of TRU to non-TRU waste drums. This trend is shown more clearly in Figure 5-2, which shows the relative percentages of TRU and non-TRU waste drums by year. There are several reasons for this trend.

- During the period from 1970 to 1973, segregation of TRU wastes was based on generator practice, rather than on concentration limits.
- From 1974 to 1982, TRU waste was defined as waste with a concentration of > 10 nCi/g.
- In 1982, the current definition of > 100 nCi/g was implemented by the DOE.
- In 1985, the TRUSAF was completed. With TRUSAF there was the ability to assay packaged waste accurately, and, as a result, the amount of waste designated as TRU declined dramatically during 1986 and all subsequent years.

5.1.1.2 Weight. In the period between 1970 and 1992, approximately 268,215 kg (591,302.9 lb) of TRU waste and 304,437 kg (671,157.4 lb) of non-TRU waste were generated at PUREX and stored in 55-gal drums. These numbers are estimates since container weights were not required for individual containers before 1977. During the R-SWIMS data re-entry 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 1978 the mean weight for PUREX 55-gal drums is 64 kg (141 lb). A discussion of the results of a search of the SWITS database for the heaviest drums generated at PUREX can be found in Section 5.4. (The search is summarized in Table 5-21, and the SWITS records are contained in Appendix D.)

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 at PUREX are shown in Figure 5-4. These figures show, once again, the dip in the amount of waste designated as TRU after TRUSAF began operations.

5.1.1.3 Volume. The total volume of TRU waste generated at PUREX and stored in 55-gal drums is 841 m³; the total volume of non-TRU radioactive waste is 646 m³. Figure 5-5 depicts the annual volume of TRU and non-TRU waste generated between 1970 and 1991 and stored in 55-gal drums. The annual volume percentages of the total amount of radioactive waste stored in 55-gal drums is 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 Figures 5-11 and 5-12 can be made.

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. In this discussion these containers will be referred to as "other containers". Container types used for solid waste generated at PUREX include the following:

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

In addition, some items such as dump trucks; gloveboxes; HEPA filters; miscellaneous scrap; trucks, flatbeds, compactors, or loadluggers; and self-contained equipment were disposed of or stored without additional packaging. These items are also included in the "other containers" category.

Table 5-4 summarizes the waste data for containers of radioactive waste other than 55-gal drums that were generated at PUREX 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, 35,224 other containers of radioactive waste were generated at PUREX. Of these containers, 1,495 hold TRU waste, while 33,729 contain non-TRU waste. For reference — during the same period of time a total of 7,101 55-gal drums of radioactive solid waste were generated at PUREX. Figure 5-7 is a graph of the number of other containers of TRU and non-TRU wastes generated at PUREX by year.

The largest number of other containers containing TRU waste was generated in 1970, with 1,388 containers. This large number is the result of an inordinately large number of fiberboard/plastic boxes, cartons, and cases. With this packaging anomaly explained, the other container waste count reflects the patterns discussed previously for 55-gal drums.

In years other than 1970, the TRU waste data are overly compressed due to the scale of non-TRU waste container numbers. In the period from 1982 to 1989, when the greatest numbers of containers were generated, typically over 90% of the non-TRU waste containers were fiberboard/plastic boxes, cartons, and cases.

Figure 5-8 presents the relative percentages of TRU and non-TRU waste containers other than 55-gal drums. Again it is evident that the non-TRU waste container numbers swamp the relative numbers of TRU waste.

5.1.2.2 Weight. In the period between 1970 and 1992, approximately 3,757,778 kg (8,284,343 lb) of radioactive solid waste was generated at PUREX and placed in containers other than 55-gal drums. This total weight includes approximately 868,266 kg (1,914,166.6 lb) of TRU and 2,889,512 kg (6,370,176.3 lb) of non-TRU contaminated material. These weights are approximations because individual container weights were not required to be recorded for individual containers before 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 (12.1 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. This graph shows the peaks in waste generation in 1970-72 and 1983-90 associated with PUREX operation.

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, and storing non-TRU waste in other containers, proportionately less of the other container waste is TRU.

It is also evident in these two figures that, while non-TRU waste containers account for an overwhelming majority of the other container numbers, TRU waste containers contribute 23% of the total weight of other containers. This difference is explained by the fact that while non-TRU waste was generally packaged in a large number of relatively small containers, TRU waste was packaged in larger units, in many cases with container weights well over 1,000 kg (2,204.59 lb). The heaviest containers other than 55-gal drums are discussed in greater detail in Section 5.4. (See Table 5-19 for a summary of the data for these containers.)

5.1.2.3 Volume. The volume of waste generated at PUREX and packaged in containers, other than 55-gal drums, during the period from 1970 through 1992 is 13,573 m³ (479,323.37 ft³). TRU wastes account for 1,174 m³ (41,459.19 ft³) of the total volume; non-TRU wastes account for 12,399 m³ (437,864.18 ft³).

Figure 5-11 shows annual volumes of TRU and non-TRU wastes generated by PUREX 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. The volume of waste parallels the PUREX operational campaigns and reflects the practice of packaging non-TRU waste in other containers. Also evident is the reduction in volume of waste characterized as TRU as the definition of TRU changed and TRUSAF became operational.

5.1.3 Summary of Waste Generation Rates at PUREX Between 1970 and 1992

5.1.3.1 Number of Waste Containers. Between 1970 and 1992, there were 42,325 containers of radioactive solid waste generated at PUREX. 55-gal drums account for 17% of this total; other containers account for the remaining 83%. A majority of the non-TRU waste is packaged in fiberboard/plastic boxes, cartons, and cases. Section 5.2 describes the container types used in greater detail.

Overall, waste designated as TRU is stored in about 13% of the containers generated between 1970 and 1992. Non-TRU waste, mostly LLW, can be found in 87% of the containers. Figure 5-13 shows the total numbers of both TRU and non-TRU waste containers generated at PUREX on an annual basis between 1970 and 1992.

It should be remembered that several changes (discussed in Section 4.2) between 1970 and 1992 resulted in more waste being designated as non-TRU and less waste being designated as TRU in recent years. This trend is clearly seen in Figure 5-13. This graph shows a clear difference in the amount of waste characterized as TRU during the two periods of PUREX operation. Before 1973, a much larger quantity of waste was stored as TRU than during the operating period from 1983 through 1990. A significant portion of the waste stored as TRU may be redesignated as LLW upon characterization at the WRAP.

5.1.3.2 Total Weight. Over 4.3 million kg of radioactive solid waste were generated at PUREX between 1970 and 1992. Waste packaged in 55-gal drums accounts for about 13% of the total weight of waste from PUREX, with 87% of the total weight is composed of waste packaged in some other type of waste container.

Waste designated as TRU comprises 26% 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 PUREX on a yearly basis between 1970 and 1992. This graph shows that while the weight of waste did not change dramatically from the first operating period to the second. The portion characterized as TRU was considerably smaller in the second period.

5.1.3.3 Total Volume. In the 22-year period between 1970 and 1992, 15,060 m³ (531,835.99 ft³) of radioactive solid wastes were generated at PUREX. Only 10% of this volume is in 55-gal drums; the remaining 90% of the volume is in other container types, ranging from cardboard boxes to self-contained equipment. Section 5.2 discusses the other container types and their respective volumetric capacities.

As was seen when looking at the total number and weight of containers, waste designated as TRU accounts for a relatively small portion (13%) of the total waste volume and non-TRU waste accounts for the remainder. Figure 5-15 shows the total volume of TRU and non-TRU waste generated at PUREX between 1970 and 1992 on a yearly basis.

5.2 WASTE CONTAINERS

5.2.1 TRU Waste Containers

Table 5-1 provides a summary of the TRU waste generated annually at PUREX from 1970 to 1992 and is sorted by container type. The greatest number of containers are 55-gal drums; however, the majority of the weight of waste is composed of self-contained equipment. The percentages for all container types and the weight of these containers are shown for each year in this table.

5.2.2 Non-TRU Waste Containers

Table 5-2 provides a summary of the non-TRU waste generated by PUREX from 1970 to 1992 by container type. Fiberboard/plastic boxes, cartons, and cases were the most common containers used, in many years accounting for more than 90% of the total non-TRU waste count. Significant numbers of metal drums, barrels, and kegs; burlap, cloth, paper, or plastic bags; self-contained equipment; and HEPA filters were also generated. The greatest weight of non-TRU waste (39%) is stored in concrete boxes, although there are also large amounts stored in fiberboard/plastic boxes; metal drums, barrels, and kegs; trucks, flatbeds, compactors, and loadluggers; self-contained equipment; and dump trucks. By weight, non-TRU waste exceeded TRU waste by a factor of three.

5.3 TRU WASTE STORAGE LOCATIONS

Table 5-5 provides the storage locations for TRU waste packaged in 55-gal drums by year. In general, the bulk of the drums generated in any given year are stored in one or two facilities. Storage locations for TRU waste packaged in other containers are shown in Table 5-6. A summary of PUREX TRU waste storage, by storage location, follows:

- **218-E-12B** — Burial Ground 218-E-12B is the only burial ground with stored, TRU waste located in the 200 East Area. Waste was emplaced in this area from May 1970 to December 1973, with waste received from PUREX between 1970 and 1972. The database search disclosed 33 fiberboard/plastic boxes of mixed waste, all containing lead.
- **218-E-15** — This is a railroad burial tunnel located at the PUREX site. It is used to store failed equipment too large, too bulky, or too contaminated for removal. This tunnel contains 13 waste packages of self-contained equipment, emplaced during the PUREX Plant's operational periods (1970-72 and 1983-88). One of the failed equipment items from 1970 is recorded as containing 500 g (17.64 oz) of TRU waste (see Appendix C.5). Because of the large size and heavy radioactive contamination of the items stored in 218-E-15, recovery is likely to present unique difficulties. Burial tunnel 218-E-14 also contains PUREX waste, but, because of the time period of waste emplacement, it is not included in the SWITS database.

- **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. Only two PUREX TRU waste containers were placed here between 1977 and 1978. Neither container is listed as containing mixed waste.
- **218-W-4B** — Burial Ground 218-W-4B, consisting of 14 trenches, accepted waste from August 1970 through September 1978. TRU waste from PUREX in 55-gal drums and other containers was buried here from 1972 to 1978. No record of hazardous material was made during the burial time.
- **218-W-4C** — Burial Ground 218-W-4C consists of six trenches. The first waste was emplaced in March 1978. PUREX TRU waste in drums had been sent to this area from 1978 to 1988, with other TRU waste containers emplaced from 1981 to 1985. Waste containers recorded as having hazardous constituents were buried from 1984 through 1987. The SWITS database listed contaminants as lead, nitric acid, and sodium hydroxide.
- **224-T** — The TRUSAF is used to store TRU waste certified for transfer to the WIPP. 55-gal drum waste from PUREX has been stored at this site from 1986 to the present, with mixed waste drums emplaced during this entire time period. The primary hazardous contaminants are lead, mercury, nitric acid, sodium hydroxide, and heavy metals. In addition, there is one other waste container from 1989, which does not contain mixed waste.
- **2401-W, 2402-W, 2402-WB, and 2403-WA** — These buildings are located at the Hanford Central Waste Complex in the 200 West Area. There is one nonmixed TRU waste drum from 1988 and one other TRU waste container from 1989 that is contaminated with lead.
- **FS8** — This is a low flashpoint storage module, which contains nondrum containers of TRU mixed waste from PUREX, all from 1992.

5.4 PHYSICAL CONTENTS OF TRU WASTE CONTAINERS

The physical contents for 55-gal drums of TRU waste are shown in Tables 5-7 through 5-12; the physical contents for TRU waste containers other than 55-gal drums can be found in Tables 5-13 through 5-20. 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 portion of the table indicates the percentage of the total drums which that number represents. It should be noted that before 1978, physical contents were not required to be listed on the burial records, so a great many of the contents on early records are listed only as "Miscellaneous".

A database search was conducted for the TRU waste drums and other containers from 202-A with weights over 130 kg (286.6 lb) and 350 kg (771.6 lb), respectively. The SWITS records for these waste containers are contained in Appendixes D.1 and D.2, and the data are summarized in Tables 5-21 and 5-22. Before 1978 information was recorded on a per shipment basis, thus all of the drums revealed in this search are from after this

time. All of the heavy drums are stored at TRUSAF, and all contain mixed waste components. While lead did not comprise a majority of the container weight, it was a listed contaminant in all drums.

The 10 containers with a gross weight over 350 kg (771.6 lb) are all FRP boxes or metal cases and drums. While hazardous contaminants are not present, several of the containers do contain high levels of TRU waste.

5.5 RADIOLOGICAL DESCRIPTION OF PUREX SOLID WASTE

Table 5-23 shows the number of TRU grams stored in 55-gal drums each year by storage location; Table 5-24 provides the same information for TRU containers other than 55-gal drums. Figure 5-16 combines the information on these tables in a graph that shows the total grams of TRU present in waste packages from PUREX 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.

The most striking observation about the TRU gram loading in containers from PUREX is the high levels of TRU waste from 1984 to 1989. This time corresponds to a majority of the operating period that lasted from 1983 to 1990. Virtually all of the TRU waste from this time is in 55-gal drums, and is stored at 218-W-4C and at TRUSAF. Given the number of waste drums generated by PUREX, the average gram loading per drum for these years reaches or exceeds 50 g (1.76 oz) of TRU waste per drum.

A database search was conducted for drums from 202-A and 202-AL with TRU gram loadings greater than 175 g (6.17 oz) and 10 g (0.35 oz), respectively. The SWITS records for these waste containers are contained in Appendixes E.1 and E.2, and the data are summarized in Tables 5-25 and 5-26. The drums from 202-A are spread over the entire production run time and, therefore, probably represent routinely generated drums with abnormally high gram loading. All of the drums for 202-AL were disposed of on the same date, July 13, 1989 and show lead and sodium hydroxide contamination. These heavily gram loaded drums probably represent an anomaly, such as a spill or another random occurrence.

High dose rates are also a concern in waste retrieval. A number of the waste packages in 218-E-12B and 218-E-15 have dose rates well in excess of the 200 mrem/h limit for contact handled waste. This waste is primarily from the period 1970-72 and will require consideration in planning retrieval efforts.

5.6 HAZARDOUS CONSTITUENTS OF SOLID WASTE GENERATED BY PUREX

This section provides a review of the data on the hazardous components found in the SWITS database and on the original burial records. In addition, an inventory of the chemicals known to be used at PUREX and information from personnel interviews are

included in this section. Because information on the nonradioactive, hazardous chemicals in waste containers was not required on burial records before 1987, information before that date is limited.

5.6.1 Chemical Inventories

Tables 5-27 through 5-29 provide several lists of chemicals used at PUREX and at the PUREX Analytical Laboratories between 1949 and 1991. These lists were developed by Klem (1990) to support waste characterization efforts for the single-shell tanks. Although most liquid wastes from PUREX did end up in the tanks, it may be possible to find small amounts of these chemicals in solid waste containers. Because of the inherent health and safety risks of chemicals and chemical combinations, wherever data suggested the possible existence of a hazardous material in the waste stream, that chemical or compound was included in the table. These lists are based on chemical process flowsheets, essential material consumption records, letters, reports, and other historical data.

The final two columns in Tables 5-27 through 5-29 contain information on the toxicity and hazards associated with each of the chemicals listed. The first of these columns lists the EPA toxicity category, if designated, which was determined using the EPA "Spill Table" (EPA 1989b). 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* (Ecology 1989). The final column lists the DOT designation (found in the DOT *Hazardous Materials Table* [DOT 1989]), and comments.

Additional data on the use and form of many of the chemicals used at PUREX are presented below. The information given comes from the *PUREX Technical Manual* (WHC 1989).

- **Aluminum Nitrate (ANN)** — Used in uranium metal dissolver solution as a complexant for fluoride ions, ANN was received as a 1.68 *M* liquid.
- **Ammonium Fluoride-Ammonium Nitrate (AFAN)** — Used in the coating removal process to dissolve Zircaloy jackets, it was received in tank trucks as an alkaline solution in a concentration of 11.2 *M* ammonium fluoride and 1.1 *M* ammonium nitrate.
- **Cadmium Nitrate** — Used as a jet motive fluid in the plutonium product handling process. It was received as a 50 wt% solution.
- **Ferrous Sulfamate** — The function of the ferrous ion is to reduce plutonium to a nearly inextractable +3 valence. This compound was received as a green viscous 2.9 *M* solution, in 163.3-kg (360-lb) containers.
- **Hydrazine** — Used in variety of ion exchange columns, this material was received as an 11.3 *M* nonflammable solution.

- **Hydroxylamine Nitrate** — A reducing agent, this material was used as purchased: 2.05 *M* solution.
- **Nitric Acid** — Fresh nitric acid was received in tank trucks or railcars. For flexibility of choice and to guard against shortages, many nitric acid streams were piped so that fresh or recovered nitric acid could be used. Detailed routing is covered in the process flow diagrams found in Appendix A.
- **Oxalic Acid** — Used as a flush solution and in N cell to precipitate plutonium, this material was received in crystalline form in 136-kg (300-lb) fiber drums.
- **Potassium Hydroxide** — Used in the coating removal process to convert uranium tetrafluoride solids to hydrous uranium dioxide, and for neutralizing the process condensate effluent stream. This compound was received as 45 wt% by railcar.
- **Normal Paraffin Hydrocarbon (NPH)** — An organic diluent used in fresh organic makeup, it was a very pure mixture of n-dodecane to n-pentadecane. Received by railcar, NPH was used in Solvent System 2 and in C and R cells.
- **Potassium Permanganate** — Used with sodium carbonate in organic treatment systems, this material was received at PUREX in 45.36-kg (100-lb) metal drums.
- **Sodium Fluoride** — Used as part of the neptunium purification process, sodium fluoride was received as a finely pulverized white powder.
- **Silver Nitrate** — A silver nitrate solution was used to regenerate the silver reactors. It was received at PUREX as a white crystalline salt in 29.57-kg (62.5-lb) containers.
- **Sodium Nitrite** — A powerful oxidizing agent used to oxidize neptunium and plutonium to an extractable +6 and +4 valence, respectively. Sodium nitrite was received in a pelletized form.
- **Sugar (sucrose)** — Used to prevent ruthenium volatilization during waste concentration and for denitration of 1 WW (high-level waste) steam. Received in anhydrous form.
- **Sulfamic Acid** — A reductant reacting with nitrite ions to protect ferrous ions, this material was received as a solid.
- **Sulfuric Acid** — Used to regenerate a water demineralizer, sulfuric acid was purchased as a 93 wt% solution.
- **Tributylphosphate (TBP)** — Used in combination with normal paraffin hydrocarbon, TBP was received by rail in tank cars at 25 vol% mixed in NPH diluent.

5.6.2 Solid Waste Information and Tracking System

Information about hazardous constituents of the solid waste from PUREX is limited in the years before 1987 due to the recording and tracking practices of the time. According to the SWITS database, only 30 drums from PUREX are designated as mixed waste before 1986, accounting for less than one percent of the total drum count. In that same era, only 57 other containers were designated as mixed waste, all from 1969 and 1970 and containing lead. Since 1986, 297 PUREX drums have been listed as radioactive mixed waste, including 165 TRU drums and 132 non-TRU drums. TRU mixed waste drums account for 52% of the TRU drums from PUREX since 1986. During this same time, 23 other containers have been designated as mixed waste. This includes four of the TRU other containers, or 44% of that total. Mixed waste accounts for 7% and 1% of the non-TRU total drums and other containers since 1986, respectively.

Tables 5-30 and 5-31 present the number of TRU mixed waste drums and other containers, respectively, by year and storage location. The contents of the mixed waste containers in each storage location shown in Tables 5-32 through 5-38.

5.6.3 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 container 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). Tables 5-39, 5-40, and 5-41 contain a summary of the information obtained from the burial records.

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.

5.6.4 Interviews with PUREX Personnel

From the information gained in interviews with PUREX 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 in the following list were typically disposed of in a nonliquid form, often absorbed by kitty litter, rags, cotton swabs, lab coats, or other absorbents.

- **Asbestos** — PUREX personnel indicated that asbestos was part of the solid waste burial. Friable and nonfriable forms of asbestos were wetted, wrapped in plastic, and stored in 1.22- by 1.22- by 2.44-m (4- by 4- by 8-ft) burial

boxes. In later years, the burial boxes were replaced by 55-gal drums as storage containers. One respondent estimated the amount of disposed asbestos to be 11.32 to 16.99 m³/yr (400 to 600 ft³/yr).

- **Cadmium** — Traces of cadmium in solid form were disposed of to solid waste burial sites on a very infrequent basis. The cadmium was placed in a sealed can and then put into a 55-gal drum.
- **Cadmium Nitrate** — Cadmium nitrate was used as a nuclear poison in conjunction with highly concentrated plutonium nitrate solutions.
- **Hydrogen Peroxide** — PUREX personnel indicated that hydrogen peroxide was probably soaked up on cotton swabs or rags. Traces may also have remained in reagent bottles. The rags and bottles were plastic-wrapped, placed in a can with a lid or in an ice cream carton, and then put in a nonzoned radiation box.
- **Mercury** — Minute amounts of mercury were sent to solid waste burial as a result of broken manometers. The mercury was single wrapped in plastic before disposal. Less than 1,500 mL (50.72 fl oz) of mercury would have been lost in this manner each year.

One respondent explained that while slight amounts of mercury were used in certain procedures in the cells, none of that mercury was included in the waste stream.

- **Nitric Acid** — PUREX personnel estimated that a considerable amount of nitric acid was part of the waste stream. The nitric acid was primarily soaked up by rags or on process equipment. The rags were decontaminated, packed wet, and single wrapped in plastic. They were placed in a lard can or an ice cream carton and then put in 55-gal drums. The equipment that had nitric acid on or in it was double wrapped and packed in the same way.
- **Potassium Hydroxide** — PUREX personnel indicated that small amounts of potassium hydroxide may have leaked and been disposed of as solid waste.
- **Potassium Permanganate** — One drum from PUREX, from late 1987 or early 1988, contains a can of potassium permanganate that was only partially used.
- **Sodium Hydroxide** — The estimated amount of sodium hydroxide in solid waste burial varied from small to large amounts. The sodium hydroxide was soaked up with rags or was on process equipment. The rags and equipment were single wrapped in plastic, packed in cans, and put in 55-gal drums.
- **Uranyl Nitrate** — Small amounts of uranyl nitrate were soaked in rags or were in or on process equipment. The rags and equipment were double wrapped in plastic before disposal.

Figure 5-1. 55-Gallon Drum Waste Count Generated by PUREX Annually.

Figure 5-2. Percentage of PUREX TRU/Non-TRU 55-Gallon Drums.

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Figure 5-3. Weight of 55-Gallon Drum Waste Generated by PUREX Annually.

Figure 5-4. Weight Percentage of PUREX TRU/Non-TRU 55-Gallon Drums.

Figure 5-5. Volume of 55-Gallon Drum Waste Generated by PUREX Annually.

Figure 5-6. Volume Percentage of PUREX 55-Gallon Drums.

Figure 5-7. Other Containers Waste Count Generated by PUREX Annually.

Figure 5-8. Percentage of Other Containers Generated by PUREX Annually.

Figure 5-9. Weight of Other Containers Generated by PUREX Annually.

Figure 5-10. Weight Percentage of Other Containers Generated by PUREX Annually.

Figure 5-11. Volume of Other Containers Generated by PUREX Annually.

Figure 5-12. Percent Volume of Other Containers Generated by PUREX Annually.

Figure 5-13. Total Number of Waste Containers Generated by PUREX Annually.

Figure 5-14. Total Weight of Waste Generated by PUREX Annually.

Figure 5-15. Total Volume of Waste Generated by PUREX Annually.

Figure 5-16. Grams of TRU in Waste Generated by PUREX Annually.

Table 5-1. TRU Waste Generated at PUREX by Container Type and Year.
(5 sheets)

Container Type	Container Size	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1970							
Fiberboard/Plastic Boxes, Cartons, or Cases	2 ft ³	8	0.4%	44	<0.1%		
	2 ft ³	356	16.1%	1933	0.8%		
	unknown [*]	20	0.9%	254	0.1%		
	unknown	968	43.7%	12295	5.2%		
Fiberboard/Plastic Drums, Barrels, or Kegs	unknown	3	0.1%	122	0.1%		
HEPA Filters	unknown	4	0.2%	3283	1.4%		
Metal Drums, Barrels, or Kegs	55 gal	828	37.4%	55385	23.3%	173.9	
Miscellaneous Scrap	unknown	1	<0.1%	76	<0.1%	0.2	
Self-Contained Equipment	unknown [*]	5	0.2%	254	0.1%		
	unknown	11	0.5%	159440	67.1%		
Trucks, Flatbeds,	unknown	12	0.5%	4647	2.0%		
TOTAL		2216		237733			
1971							
Fiberboard/Plastic Boxes, Cartons, or Cases	unknown	14	1.1%	178	0.1%	1.8	0.4%
Metal Boxes, Cartons, or Cases	2.5x2.5x4 ft	18	1.4%	5715	1.7%	12.7	2.6%
	3x3x4 ft	1	0.1%	457	0.1%	1	0.2%
	unknown	1	0.1%	318	0.1%	0.7	0.1%
	3x3x4 ft	4	0.3%	1829	0.6%	4.1	0.8%
Metal Drums, Barrels, or Kegs	30 gal	2	0.2%	82	<0.1%	0.2	0.0%
	55 gal	1282	96.7%	87227	26.4%	269.2	54.5%
Self-Contained Equipment	unknown	4	0.3%	234875	71.0%	204.1	41.3%
TOTAL		1326		330681		493.8	

Table 5-1. TRU Waste Generated at PUREX by Container Type and Year.
(5 sheets)

Container Type	Container Size	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1972							
Fiberboard/Plastic Boxes, Cartons, or Cases	unknown	4	0.5%	51	<0.1%	0.5	0.2%
HEPA Filters	unknown	8	0.9%	2217	1.6%	4.9	1.9%
Metal Boxes, Cartons, or Cases	2.5x2.5x4 ft	7	0.8%	2223	1.6%	5	1.9%
	3x4x7 ft	1	0.1%	1067	0.8%	2.4	0.9%
Metal Drums, Barrels, or Kegs	30 gal	3	0.3%	122	0.1%	0.4	0.2%
	55 gal	843	97.1%	57358	40.3%	177.1	68.6%
Self-Contained Equipment	unknown	2	0.2%	79151	55.7%	67.7	26.2%
TOTAL		868		142189		258	
1973							
Metal Drums, Barrels, or Kegs	55 gal	119	100.0%	8097	100.0%	25	100.0%
TOTAL		119		8097		25	
1974							
Metal Boxes, Cartons, or Cases	4.3x2.6x2.6 ft	3	3.6%	1116	16.8%	2.5	12.8%
Metal Drums, Barrels, or Kegs	55 gal	81	96.4%	5511	83.2%	17	87.2%
TOTAL		84		6627		19.5	
1975							
HEPA Filters	unknown	8	18.6%	2032	46.0%	4.5	37.8%
Metal Drums, Barrels, or Kegs	55 gal	35	81.4%	2381	54.0%	7.4	62.2%
TOTAL		43		4413		11.9	
1976							
Metal Drums, Barrels or Kegs	55 gal	3	100.0%	204	100.0%	0.6	100.0%
TOTAL		3		204		0.6	

Table 5-1. TRU Waste Generated at PUREX by Container Type and Year.
(5 sheets)

Container Type	Container Size	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1977							
Fiberglass Reinforced Polyester Boxes	8x10x16 ft	1	20.0%	7212	96.4%	36.2	97.8%
Metal Drums, Barrels, or Kegs	55 gal	4	80.0%	272	3.6%	0.8	2.2%
TOTAL		5		7484		37.0	
1978							
Fiberglass Reinforced Polyester Boxes	8x10x16 ft	1	0.1%	9979	79.7%	36.2	84.6%
Metal Boxes, Cartons, or Cases	unknown	6	0.3%	1524	12.2%	3.4	7.9%
Metal Drums, Barrels, or Kegs	55 gal	15	0.8%	1021	8.2%	3.2	7.5%
TOTAL		22		12524		42.8	
1979							
Metal Drums, Barrels, or Kegs	55 gal	72	100.0%	4899	100.0%	15.1	100.0%
TOTAL		72		4899		15.1	
1980							
TOTAL		0		0		0.0	
1981							
Fiberglass Reinforced Polyester Boxes	9x10.7x16 ft	3	100.0%	23133	100.0%	130.4	100.0%
TOTAL		3		23133		130.4	
1982							
Metal Drums, Barrels, or Kegs	55 gal	227	100.0%	13744	100.0%	47.7	100.0%
TOTAL		227		13744		47.7	
1983							
Metal Drums, Barrels, or Kegs	55 gal	10	90.9%	656	0.8%	2.1	3.0%
Self-Contained Equipment	unknown	1	9.1%	79469	99.2%	68	97.0%
TOTAL		11		80125		70.1	

Table 5-1. TRU Waste Generated at PUREX by Container Type and Year.
(5 sheets)

Container Type	Container Size	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1984							
Metal Boxes, Carton, or Cases	unknown	2	2.4%	4070	42.9%	14.3	45.4%
Metal Drums, Barrels, or Kegs	55 gal'	1	1.2%	74	0.8%	0.2	0.6%
	55 gal	81	96.4%	5337	56.3%	17	54.0%
TOTAL		84		9481		31.5	
1985							
Metal Boxes, Cartons, or Cases	6x6x7 ft	3	3.3%	7097	38.8%	21.9	40.3%
	unknown	1	1.1%	6350	34.7%	14.3	26.3%
Metal Drums, Barrels, or Kegs	55 gal'	19	21.1%	1315	7.2%	4.0	7.4%
	55 gal	67	74.7%	3528	19.3%	14.1	26.0%
TOTAL		90		18290		54.3	
1986							
Metal Drums, Barrels, or Kegs	55 gal'	36	41.4%	2438	1.5%	7.6	2.1%
	55 gal	48	55.2%	2378	1.5%	10.1	2.8%
Self-Contained Equipment	unknown	3	3.4%	158757	97.1%	336.9	95.0%
TOTAL		87		163573		354.6	
1987							
Metal Drums, Barrels, or Kegs	55 gal'	56	60.9%	3994	9.5%	11.8	8.9%
	55 gal	35	38.0%	1630	3.9%	7.4	5.6%
Self-Contained Equipment	unknown	1	1.1%	36287	86.6%	113.3	85.5%
TOTAL		92		41911		132.5	
1988							
Metal Drums, Barrels, or Keg	55 gal'	35	71.4%	2878	13.2%	7.4	8.3%
	55 gal	13	26.5%	711	3.3%	2.7	3.0%
Self-Contained Equipment	unknown	1	2.0%	18144	83.5%	78.6	88.6%
TOTAL		49		21733		88.7	

Table 5-1. TRU Waste Generated at PUREX by Container Type and Year.
(5 sheets)

Container Type	Container Size	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1989							
Metal Boxes, Cartons, or Cases	6x6x7 ft ³	1	2.6%	2159	43.4%	7.1	47.0%
Metal Drums, Barrels, or Kegs	55 gal ¹	21	53.8%	1965	39.5%	4.4	29.1%
	55 gal	17	43.6%	852	17.1%	3.6	23.8%
TOTAL		39		4976		15.1	
1990							
Metal Drums, Barrels, or Kegs	55 gal ¹	7	28.0%	668	40.1%	1.5	28.3%
	55 gal	18	72.0%	997	59.9%	3.8	71.7%
TOTAL		25		1665		5.3	
1991							
Metal Drums, Barrels, or Kegs	55 gal ¹	7	28.0%	787	37.6%	1.5	28.3%
	55 gal	18	72.0%	1307	62.4%	3.8	71.7%
TOTAL		25		2094		5.3	
1992							
Metal Drums, Barrels, or Kegs	55 gal ¹	3	30.0%	277	30.6%	0.6	23.1%
	55 gal	4	40.0%	324	35.8%	0.8	30.8%
	85 gal ¹	3	30.0%	304	33.6%	1.2	46.2%
TOTAL		10		905		2.6	

¹Mixed waste containers.

HEPA = High-efficiency particulate air (filter).

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1970						
Concrete Boxes	3	1.2%	119748	91.2%	151	79.1%
Fiberboard/Plastic Boxes Cartons, and Cases	135	51.9%	1613	1.2%	16.3	8.5%
55-Gal Metal Drums, Barrels, and Kegs	12	4.6%	408	0.3%	2.5	1.3%
Miscellaneous Scrap	110	42.3%	9525	7.3%	21.2	11.1%
TOTAL	260		131294		191	
1971						
Concrete Boxes	4	8.2%	90537	99.2%	201.8	97.7%
Fiberboard/Plastic Boxes Cartons, and Cases	38	77.6%	309	0.3%	3.3	1.6%
55-Gal Metal Drums, Barrels, and Kegs	6	12.5%	408	0.4%	1.3	0.6%
Other Metal Drums, Barrels, and Kegs	1	2.0%	41	0.1%	0.1	0.1%
TOTAL	49		91295		206.5	
1972						
Concrete Boxes	7	1.4%	158439	81.2%	353.2	78.3%
Fiberboard/Plastic Boxes Cartons, and Cases	343	69.7%	4013	2.1%	40.6	9.0%
Fiberboard/Plastic Drums, Barrels, and Kegs	6	1.2%	245	0.1%	0.9	0.2%
HEPA Filters	28	5.7%	2845	1.5%	6.3	1.4%
55-Gal Metal Drums, Barrels, and Kegs	10	2.0%	939	0.5%	2.1	0.5%
Other Metal Drums, Barrels, and Kegs	84	17.1%	3319	1.7%	9.7	2.1%
Self-Contained Equipment	1	0.2%	305	0.2%	0.7	0.2%
Trucks, Flatbeds, Compactors, Loadluggers	7	1.4%	24340	12.5%	36.3	8.0%
Wooden Boxes, Cartons, and Cases	6	1.2%	610	0.3%	1.4	0.3%
TOTAL	492		195055		451.2	

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1973						
Burlap, Cloth, Paper, or Plastic Bags	2	0.7%	25	0.4%	0.3	0.8%
Fiberboard/Plastic Boxes Cartons, and Cases	237	79.8%	2988	49.4%	30	77.5%
55-Gal Metal Drums, Barrels, and Kegs	4	1.3%	376	6.2%	0.8	2.1%
Other Metal Drums, Barrels, and Kegs	48	16.2%	1959	32.4%	5.6	14.5%
Self-Contained Equipment	5	1.7%	64	1.1%	0.6	1.6%
Trucks, Flatbeds, Compactors, Loadluggers	1	0.3%	635	10.5%	1.4	3.6%
TOTAL	297		6047		38.7	
1974						
Concrete Boxes	1	1.2%	22634	84.6%	50.5	76.5%
Fiberboard/Plastic Boxes Cartons, and Cases	67	81.7%	800	3.0%	8.1	12.3%
HEPA Filters	4	4.9%	229	0.9%	0.5	0.8%
55-Gal Metal Drums, Barrels, and Kegs	8	9.8%	751	2.8%	1.7	2.6%
Trucks, Flatbeds, Compactors, Loadluggers	1	1.2%	1433	5.4%	3.2	4.8%
Wooden Boxes, Cartons, and Cases	1	1.2%	914	3.4%	2	3.0%
TOTAL	82		26761		66	
1975						
Fiberboard/Plastic Boxes Cartons, and Cases	96	66.2%	1169	19.6%	11.8	52.0%
Metal Boxes, Cartons, and Cases	2	1.4%	188	3.2%	0.4	1.8%
55-Gal Metal Drums, Barrels, and Kegs	29	20.0%	2723	45.7%	6.1	26.9%
Miscellaneous Scrap	4	2.8%	629	10.6%	1.4	6.2%
Self-Contained Equipment	2	1.4%	25	0.4%	0.3	1.3%
Wooden Boxes, Cartons, and Cases	12	8.3%	1219	20.5%	2.7	11.9%
TOTAL	145		5953		22.7	

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1976						
Burlap, Cloth, Paper, or Plastic Bags	1	0.7%	13	0.7%	0.1	0.6%
Fiberboard/Plastic Boxes Cartons, and Cases	135	99.3%	1729	99.3%	16.6	99.4%
TOTAL	136		1742		16.7	
1977						
Burlap, Cloth, Paper, or Plastic Bags	2	0.5%	171	1.2%	0.4	0.6%
Fiberboard/Plastic Boxes Cartons, and Cases	391	91.6%	4682	33.3%	47.2	69.2%
Fiberboard/Plastic Drums, Barrels, and Kegs	1	0.2%	41	0.3%	0.1	0.1%
55-Gal Metal Drums, Barrels, and Kegs	28	6.6%	2629	18.7%	5.9	8.7%
Other Metal Drums, Barrels, and Kegs	1	3.0%	41	0.3%	0.1	0.1%
Trucks, Flatbeds, Compactors, Loadluggers	4	0.9%	6517	46.3%	14.5	21.3%
TOTAL	427		14081		68.2	
1978						
Burlap, Cloth, Paper, or Plastic Bags	10	0.015	918	5.5%	17.9	16.2%
Fiberboard/Plastic Boxes Cartons, and Cases	583	86.9%	7353	44.3%	71.9	65.1%
Fiberboard/Plastic Drums, Barrels, and Kegs	1	0.1%	41	0.2%	0.2	0.2%
Gloveboxes	1	0.1%	363	2.2%	2.6	2.4%
55-Gal Metal Drums, Barrels and Kegs	21	3.1%	1925	11.6%	4.4	4.0%
Other Metal Drums, Barrels, Self-Contained Equipment	52	7.7%	1257	7.6%	2.8	2.5%
	1	0.1%	1222	7.4%	2.7	2.4%
Trucks, Flatbeds, Compactors, Loadluggers	2	0.3%	3531	21.3%	7.9	7.2%
TOTAL	671		16610		110.4	

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1979						
Burlap, Cloth, Paper, or Plastic Bags	6	2.3%	1034	2.6%	4.5	4.6%
Concrete Boxes	1	0.4%	30844	77.5%	43	43.7%
Fiberboard/Plastic Boxes Cartons, and Cases	186	72.7%	2383	6.0%	23.5	23.9%
Metal Boxes, Cartons, and Cases	1	0.4%	136	0.3%	0.5	0.5%
55-Gal Metal Drums, Barrels, and Kegs	54	21.1%	3999	10.1%	7.4	7.5%
Other Metal Drums, Barrels, and Kegs	5	2.0%	204	0.5%	0.6	0.6%
Trucks, Flatbeds, Compactors, Loadluggers	3	1.2%	1179	3.0%	18.8	19.1%
TOTAL	256		39779		98.3	
1980						
Burlap, Cloth, Paper, or Plastic Bags	12	9.2%	333	0.8%	2.3	2.8%
Concrete Boxes	1	0.8%	33203	79.7%	53.5	64.6%
Fiberboard/Plastic Boxes Cartons, and Cases	93	71.5%	1284	3.1%	11.6	14.0%
HEPA Filters	4	3.1%	113	0.3%	0.3	0.4%
55-Gal Metal Drums, Barrels, and Kegs	8	6.2%	751	1.8%	1.7	2.1%
Self-Contained Equipment	9	6.9%	1451	3.5%	4.5	5.4%
Trucks, Flatbeds, Compactors, Loadluggers	3	2.3%	4536	10.9%	8.9	10.7%
TOTAL	130		41671		82.8	
1981						
Fiberboard/Plastic Boxes Cartons, and Cases	357	74.5%	4344	20.5%	45.2	35.0%
55-Gal Metal Drums, Barrels, and Kegs	97	20.3%	10046	47.4%	20.3	15.7%
Other Metal Drums, Barrels, and Kegs	17	3.5%	531	2.5%	2.1	1.6%
Miscellaneous Scrap	1	0.2%	214	1.0%	1.3	1.0%
Self-Contained Equipment	3	0.6%	327	1.5%	4.3	3.3%

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
Trucks, Flatbeds, Compactors, Loadluggers	2	0.4%	1814	8.6%	42.5	32.9%
Wooden Boxes, Cartons, and Cases	2	0.4%	3912	18.5%	13.6	10.5%
TOTAL	479		21188		129.3	
1982						
Burlap, Cloth, Paper, or Plastic Bags	1	0.1%	15	<0.1%	0.2	0.1%
Concrete Boxes	2	0.1%	60781	68.4%	85	26.7%
Fiberboard/Plastic Boxes Cartons, and Cases	1391	90.9%	20559	23.1%	177.2	55.6%
HEPA Filters	50	3.3%	520	0.6%	4.3	1.3%
Metal Drums, Barrels, and Kegs	79	5.2%	3768	4.2%	16.6	5.2%
Other Metal Drums, Barrels, and Kegs	1	0.1%	57	0.1%	0.1	0.0%
Self-Contained Equipment	6	0.4%	1089	1.2%	10.9	3.4%
Trucks, Flatbeds, Compactors, Loadluggers	2	0.1%	2041	2.3%	24.6	7.7%
TOTAL	1631		88815		318.7	
1983						
Burlap, Cloth, Paper, or Plastic Bags	11	0.3%	1003	0.5%	6.3	1.0%
Concrete Boxes	4	0.1%	119748	65.6%	170.1	26.3%
Fiberboard/Plastic Boxes Cartons, and Cases	2943	91.5%	40372	22.1%	375	58.0%
HEPA Filters	72	2.2%	1111	0.6%	10.2	1.6%
Metal Drums, Barrels, and Kegs	111	3.5%	12375	6.8%	23.3	3.6%
Other Metal Drums, Barrels, and Kegs	1	0.0%	68	0.0%	0.1	0.0%
Miscellaneous Scrap	2	0.1%	1814	1.0%	1.7	0.3%
Self-Contained Equipment	8	0.2%	521	0.3%	3.2	0.5%
Trucks, Flatbeds, Compactors, Loadluggers	4	0.1%	3447	1.9%	33.7	5.2%

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
Wooden Boxes, Cartons, and Cases	59	1.8%	2131	1.2%	22.9	3.5%
TOTAL	3215		182590		646.5	
1984						
Burlap, Cloth, Paper, or Plastic Bags	23	0.5%	2442	1.2%	15	1.8%
Concrete Boxes	3	0.1%	97522	46.4%	113	13.2%
Fiberboard/Plastic Boxes Cartons, and Cases	4418	93.7%	57613	27.4%	566	66.2%
HEPA Filters	21	0.4%	180	0.1%	3.5	0.4%
55-Gal Metal Drums, Barrels, and Kegs	234	5.0%	30690	14.6%	49.1	5.7%
Miscellaneous Scrap	1	<0.1%	286	0.1%	1.1	0.1%
Self-Contained Equipment	4	0.1%	3629	1.7%	50.1	5.9%
Trucks, Flatbeds, Compactors, Loadluggers	11	0.2%	17962	8.5%	56.7	6.6%
TOTAL	4715		210324		854.5	
1985						
Concrete Boxes	5	0.1%	164200	29.2%	286.5	16.6%
Dump Trucks	30	0.5%	132709	23.6%	181.2	10.5%
Fiberboard/Plastic Boxes Cartons, and Cases	5703	90.7%	72611	12.9%	734.6	42.7%
HEPA Filters	8	0.1%	73	<0.1%	0.9	0.1%
55-Gal Metal Drums, Barrels, and Kegs	489	7.8%	66864	11.9%	102.6	6.0%
Miscellaneous Scrap	2	<0.1%	6350	1.1%	20.3	1.2%
Trucks, Flatbeds, Compactors, Loadluggers	49	0.8%	119487	21.2%	395.2	23.0%
TOTAL	6286		562294		1721.3	
1986						
Burlap, Cloth, Paper, or Plastic Bags	35	0.7%	4692	1.2%	34.2	1.7%
Concrete Boxes	6	0.1%	163292	42.2%	455.6	23.0%
Dump Trucks	23	0.5%	43170	11.2%	283.4	14.3%
Fiberboard/Plastic Boxes Cartons, and Cases	4599	90.4%	64891	16.8%	587.9	29.6%

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
HEPA Filters	99	1.9%	1088	0.3%	14.7	0.7%
55-Gal Metal Drums, Barrels, and Kegs	267	5.3%	28782	7.4%	56	2.8%
Miscellaneous Scrap	10	0.2%	2214	0.6%	20.6	1.0%
Self-Contained Equipment	1	<0.1%	1814	0.5%	14.5	0.7%
Trucks, Flatbeds, Compactors, Loadluggers	45	0.9%	76759	19.8%	517.2	26.1%
TOTAL	5085		386712		1984.1	
1987						
Burlap, Cloth, Paper, or Plastic Bags	110	2.2%	4026	1.5%	33.7	2.1%
Concrete Boxes	2	<0.1%	69626	26.6%	149.1	9.1%
Dump Trucks	27	0.5%	60656	23.2%	326.1	20.0%
Fiberboard/Plastic Boxes, Cartons, and Cases	4463	90.8%	56075	21.4%	596.6	36.5%
HEPA Filters	26	0.5%	522	0.2%	5.5	0.3%
Metal Drums, Barrels, and Kegs	192	3.9%	18923	7.2%	40.2	2.5%
Other Metal Drums, Barrels, and Kegs	12	0.2%	1701	0.6%	4.8	0.3%
Self-Contained Equipment	43	0.9%	4672	1.8%	41	2.5%
Trucks, Flatbeds, Compactors, Loadluggers	39	0.8%	45692	17.4%	436.9	26.7%
TOTAL	4914		261893		1633.9	
1988						
Burlap, Cloth, Paper, or Plastic Bags	94	2.4%	6155	2.3%	47.1	3.6%
Concrete Boxes	3	0.1%	101151	37.5%	223.8	17.2%
Dump Trucks	7	0.2%	21772	8.1%	89.3	6.9%
Fiberboard/Plastic Boxes, Cartons, and Cases	3502	88.1%	48898	18.1%	446.1	34.3%
HEPA Filters	32	0.8%	875	0.3%	6.2	0.5%
Metal Boxes, Cartons, and Cases	1	<0.1%	5443	2.0%	34.4	2.6%
Metal Drums, Barrels, and Kegs	267	6.7%	31038	11.5%	55.9	4.3%

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
Other Metal Drums, Barrels, and Kegs	5	0.1%	612	0.2%	2	0.2%
Miscellaneous Scrap	16	0.4%	3175	1.2%	21	1.6%
Self-Contained Equipment	8	0.2%	4627	1.7%	28.5	2.2%
Trucks, Flatbeds, Compactors, Loadluggers	41	1.0%	46166	17.1%	347.7	26.7%
TOTAL	3976		269912		1302	
1989						
Burlap, Cloth, Paper, or Plastic Bags	25	1.1%	427	0.5%	4.8	0.9%
Fiberboard/Plastic Boxes Cartons, and Cases	2018	90.5%	27351	31.8%	256.5	49.8%
HEPA Filters	17	0.8%	347	0.4%	2.9	0.6%
55-Gal Metal Drums, Barrels, and Kegs	86	3.9%	14476	16.9%	18.1	3.5%
Other Metal Drums, Barrels, and Kegs	1	<0.1%	35	<0.1%	0.2	<0.1%
Self-Contained Equipment	46	2.1%	1629	1.9%	24.9	4.8%
Trucks, Flatbeds, Compactors, Loadluggers	17	0.8%	26657	31.0%	112.8	21.9%
Wooden Boxes, Cartons, and Cases	19	0.9%	14969	17.4%	94.7	18.4%
TOTAL	2229		85891		514.9	
1990						
55-Gal Metal Drums, Barrels, and Kegs	867	88.7%	61133	20.0%	182.1	13.5%
Other Metal Drums, Barrels, and Kegs	23	2.4%	2233	0.7%	6.3	0.5%
Self-Contained Equipment	19	1.9%	194843	63.7%	792.4	58.8%
Trucks, Flatbeds, Compactors, Loadluggers	14	1.4%	6042	2.0%	142	10.5%
Wooden Boxes, Cartons, and Cases	55	5.6%	41825	13.7%	224.4	16.7%
TOTAL	978		306076		1347.2	

Table 5-2. Non-TRU Waste Generated at PUREX by Container Type and Year. (9 sheets)

Container Type	Container Number	Percent of Total	Total Container Weight	Percent Weight	Volume	Percent Volume
1991						
Fiberboard/Plastic Boxes, Cartons, and Cases	1	0.3%	1495	0.5%	4	0.3%
55-Gal Metal Drums, Barrels, and Kegs	158	42.0%	10724	3.4%	24.8	2.1%
Other Metal Drums, Barrels, and Kegs	4	1.1%	125	<0.1%	0.4	<0.1%
Self-Contained Equipment	42	11.2%	69410	52.6%	312.9	51.1%
Tanks, Portable	1	0.3%	3176	1.0%	28.0	1.7%
Trucks, Flatbeds, Compactors, Loadluggers	8	2.1%	1500	0.6%	75	6.2%
Wooden Boxes, Cartons, and Cases	163	43.4%	133736	42.8%	654.4	40.4%
TOTAL	376		216990		1071.5	
1992						
55-Gal Metal Drums, Barrels, and Kegs	168	80.4%	9751	24.3%	35.3	17.7%
Wooden Boxes, Cartons, and Cases	41	19.6%	30308	75.7%	164	82.3%
TOTAL	209		40059		199.3	

HEPA = High-efficiency particulate air (filter).

Table 5-3. PUREX 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	828	1282	843	119	81	35	3	4	15	72	0	0	227	10	82	86	84	81	48	38	25	26	7
TRU Wt. (kg)	55385	87227	57358	8087	5511	2381	204	272	1021	4898	0	0	13744	658	5411	4843	4816	5624	3589	2817	1885	2084	801
TRU Vol. (m ³)	174	289	177	25	17	7.4	0.6	0.8	3.2	15	0	0	48	2.1	17	18.1	18	19	10	8	5.3	5.3	1.5
TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	19	35	52	35	21	7	7	3
Non-TRU Count	12	8	10	4	8	29	0	28	21	54	8	87	79	111	234	489	207	192	267	86	867	158	185
Non-TRU Wt. (kg)	408	408	939	378	751	2723	0	2828	1925	3988	751	10045	3768	12375	30690	68564	28783	18922	31038	14475	61133	10724	9751
Non-TRU Vol. (m ³)	2.5	1.3	2.1	0.8	1.7	6.1	0	5.9	4.4	7.4	1.7	20	17	23	49	103	59	40	56	18	182	33	35.3
Non-TRU MW Count	0	0	0	0	0	0	0	0	0	1	0	0	8	0	0	0	0	2	8	28	54	22	22
Percentage																							
% TRU by Count	99%	100%	99%	97%	91%	55%	100%	13%	42%	57%	0%	0%	74%	8%	26%	15%	24%	32%	15%	31%	3%	14%	4%
% Non-TRU by Count	1%	0%	1%	3%	9%	45%	0%	88%	58%	43%	100%	100%	26%	92%	74%	85%	76%	68%	85%	99%	97%	86%	96%
Wt% TRU	99%	100%	98%	96%	88%	47%	100%	9%	35%	55%	0%	0%	78%	5%	15%	7%	14%	23%	10%	18%	3%	16%	6%
Wt% Non-TRU	1%	0%	2%	4%	12%	53%	0%	91%	65%	45%	100%	100%	22%	95%	85%	93%	86%	77%	90%	84%	97%	84%	94%
Vol% TRU	99%	100%	99%	97%	91%	55%	100%	12%	42%	67%	0%	0%	74%	8%	26%	15%	24%	32%	15%	31%	3%	14%	4%
Vol% Non-TRU	1%	0%	1%	3%	9%	45%	0%	88%	58%	33%	100%	100%	26%	92%	74%	85%	76%	68%	85%	99%	97%	86%	96%
% of TRU Drums that are MW by Count	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	N/A	N/A	0%	0%	1%	22%	43%	62%	73%	55%	28%	25%	43%
% of Non-TRU Drums that MW by Count	0%	0%	0%	0%	0%	0%	N/A	0%	0%	2%	0%	0%	11%	0%	0%	0%	0%	1%	3%	33%	6%	14%	13%

MW = Mixed waste.
TRU = Transuranic.

Table 5-4. PUREX 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	1388	44	26	0	3	8	0	1	7	0	0	3	0	1	2	4	3	1	1	1	0	0	3
TRU Wt. (kg)	182348	243454	84831	0	1116	2032	0	7212	11503	0	0	23133	0	78489	4070	13447	158757	38287	18144	2159	0	0	304
TRU Vol. (m ³)	N/A	224.6	81	0	2.5	4.5	0	36.2	39.6	0	0	130.4	0	68	14.3	36.2	336.9	113.3	78.6	7.1	0	0	1.2
TRU MW Count	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
Non-TRU Count	248	43	482	283	74	116	136	389	850	202	122	382	1452	3104	4481	5797	4818	4722	3708	2143	111	218	41
Non-TRU Wt. (kg)	130888	80887	184116	5671	26010	3230	1742	11462	14885	35780	40920	11142	85047	170215	178634	485430	357830	242870	238874	71415	244843	301852	30308
Non-TRU Vol. (m ³)	188.5	205.2	449.1	37.9	84.3	16.6	16.7	82.3	106	80.9	81.1	109	302.1	823.2	806.4	1618.7	1928.1	1593.7	1246.1	486.8	1185.1	1587.7	184
Non-TRU MW Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	1	10	4	0
Percentages																							
% TRU by Count	95%	51%	5%	0%	4%	8%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
% Non-TRU by Count	15%	49%	95%	100%	96%	94%	100%	100%	99%	100%	100%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%
Wt% TRU	58%	73%	30%	0%	4%	35%	0%	38%	44%	0%	0%	97%	0%	32%	2%	3%	31%	13%	7%	3%	0%	0%	1%
Wt% Non-TRU	42%	27%	70%	100%	96%	81%	100%	61%	56%	100%	100%	33%	100%	68%	98%	97%	69%	87%	93%	97%	100%	100%	89%
Vol% TRU	N/A	52%	16%	0%	4%	21%	0%	37%	27%	0%	0%	54%	0%	10%	2%	2%	15%	7%	6%	1%	0%	0%	1%
Vol% Non-TRU	N/A	48%	85%	100%	96%	79%	100%	63%	73%	100%	100%	46%	100%	90%	98%	98%	85%	93%	94%	99%	100%	100%	99%
% of TRU Containers that are TRU	2%	0%	0%	N/A	0%	0%	N/A	0%	0%	0%	N/A	N/A	N/A	0%	0%	0%	0%	0%	0%	100%	N/A	N/A	100%
MW by Count																							
% of Non-TRU Containers that are TRU	0%	0%	0%	0%	0%	0%	N/A	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	2%	0%
MW by Count																							

MW = Mixed waste.

TRU = Transuronic.

Table 5-5. PUREX 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
218-E-12B	828	1282	766																				
218-E-15																							
218-W-3A																							
218-W-4B		77	119	81	35	3	4	5															
218-W-4C							10	72	227	10	82	86	29	6	4								
224-T													55	85	42	38	24	25	7				
2401-W																			1				
2402-W																			1				
2403-WA																			1				
FS8																							

Table 5-6. PUREX 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
218-E-12B	1386	41	23																				
218-E-15	2	3	2						1							3	1	1					
218-W-3A								1	1														
218-W-4B					3	8																	
218-W-4C												3			2	4							
224-T																				1			
2401-W																							
2402-WB																					1		
FS8																						2	

Table 5-7. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location — 218-E-12B.

	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	828	1282	766																				
Percentage																							
Misc/Unknown/Other	100%	100%	100%																				

Table 5-8. 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																							
Misc/Unknown/Other			77	119	81	35	3	4	5														
Percentage																							
Misc/Unknown/Other			100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 5-9. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location — 218-W-4C. (2 sheets)

Distribution	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Absorbent/Kitty Litter/Vermiculite																3	3						
Aluminum																9							
Cloth/Rags/Nylon						2							182	2	56	22	12	3	4				
Concrete																1							
Copper Metal																1	9						
Cotton/Kotex																4	13						
Filters																							
Floor Tile												11											
Glass												37			12	55	10	1					
Lead															1	19	3						
Leather																1							
Metal/Iron/Galvanized/Sheet													57	8	34	72	26	2	4				
Misc/Unknown/Other						8	72																
Paper/Cardboard					2								195	2	32	62	15	6	4				
Plastic/Polyurethane					2								195	2	69	85	27	6	4				
Rubber						2										59	47	10	1				
Stainless Steel																13	28	16	4				
Teflon*																2							
Wood/Lumber/Plywood																1	13	3	2				

Table 5-9. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location — 218-W-4C. (2 sheets)

Percentage	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Absorbent/Kitty Litter/Vermiculite																3%	10%						
Aluminum																10%							
Cloth/Rags/Nylon									20%					80%	20%	68%	26%	41%	50%	100%			
Concrete																1%							
Copper Metal																1%	10%						
Cotton/Kotex																5%	15%						
Filters																			10%				
Floor Tile													5%										
Glass													16%			15%	64%	34%	17%				
Lead																1%	22%	10%					
Leather																				1%			
Metal/Iron/Galvanized/Sheet																25%	80%	41%	84%	69%	33%	100%	
Misc./Unknown/Other									80%	100%													
Paper/Cardboard									20%					86%	20%	39%	72%	52%	100%	100%			
Plastic/Polyurethane									20%					86%	20%	84%	99%	93%	100%	100%			
Rubber									20%							72%	55%	34%	17%				
Stainless Steel																16%	33%	55%	67%				
Teflon																				2%			
Wood/Lumber/Plywood																1%	15%	10%	33%				

* Teflon is a trademark of E.I. duPont de Nemours and Company.

Table 5-10. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location — 224-T. (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																							
Absorbant/Kitty Litter/Vermiculite																3			9	25	7		
Aluminum																	1						
Brick/Firebrick																	1						
Chemicals																							
Cloth/Rags/Nylon																34	70	39	12	10	24	7	
Copper Metal																10							
Cork																2			1				
Cotton/Kotex*																			6				
Equipment																			1				
Filters																			1				
Glass																24	30	17	20	15	7	5	
Hazardous Constituents																			2				
Lead																12	24	28	19	7	6	3	
Leather																	1			2			
Metal/Iron/Galvanized/Sheet																46	72	35	37	19	13	4	
Miscellaneous/Unknown/Other																7							
Paper/Cardboard																32	30	10	19	14	10	1	
Plastic/Polyurethane																55	78	42	38	23	25	7	
Rubber																40	73	33	16	20	17	6	
Stainless Steel																33	30	32					
Wood/Lumber/Plywood																6	23	11	4	3	4	2	

Table 5-10. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location — 224-T. (2 sheets)

Percentage	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Absorbant/Kitty Litter/Vermiculite																	5%				38%	100%	100%
Aluminum																		1%					
Brick/Firebrick																							
Chemicals																				3%	8%		
Cloth/Rags/Nylon																	62%	82%	93%	32%	42%	96%	100%
Copper Metal																	12%						
Cork																	2%				4%		
Cotton/Kotex																					25%		
Equipment																					4%		
Filters																							
Glass																	44%	35%	40%	53%	63%	28%	71%
Hazardous Constituents																							
Lead																	22%	28%	67%	50%	29%	24%	43%
Leather																		1%				8%	
Metal/Iron/ Galvanized/Sheet																	84%	85%	83%	97%	79%	52%	57%
Miscellaneous/Unknown/ Other																							
Paper/Cardboard																	58%	35%	24%	50%	58%	40%	14%
Plastic/ Polyurethane																	100%	92%	100%	100%	96%	100%	100%
Rubber																	73%	86%	79%	42%	83%	68%	86%
Stainless Steel																							
Wood/Lumber/Plywood																	60%	35%	76%				
																	11%	27%	26%	11%	13%	16%	29%

*Kotex is a trademark of the Kotex Corporation.

Table 5-11. 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																							
Cloth/Rags/Nylon																							
Glass																			1				
Metal/Iron/ Galvanized/Sheet																		1					
Paper/Cardboard																					1		
Plastic/ Polyurethane																		1				1	
Rubber																						1	
Percentage																							
Cloth/Rags/Nylon																		100%					
Glass																					100%		
Metal/Iron/ Galvanized/Sheet																		100%					
Paper/Cardboard																						100%	
Plastic/ Polyurethane																		100%					
Rubber																						100%	

Table 5-12. Distribution and Percentage of TRU 55-Gallon Drum Physical Contents by Storage Location — 2402-W.

	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																							
Lead																							
Paper/Cardboard																							
Plastic/Polyurethane																							
Rubber																							
Stainless Steel																							
Percentage																							
Cloth/Rags/Nylon																							
Lead																							
Paper/Cardboard																							
Plastic/Polyurethane																							
Rubber																							
Stainless Steel																							

Table 5-13. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents
by Storage Location -- 218-E-12B.

	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	1386	41	23																				
Percentage																							
Misc/Unknown/Other	100%	100%	100%																				

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Table 5-14. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents
by Storage Location -- 218-E-15.

	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						1				1	
Misc/Unknown/Other	2	3	2													3							
Percentage																							
Metal/Iron/ Galvanized/Sheet														100%				100%		100%		100%	
Misc/Unknown/Other	100%	100%	100%															100%					

Table 5-15. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents
by Storage Location — 218-W-2A.

	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								1	1														
Percentage																							
Misc/Unknown/Other								100%	100%														

Table 5-16. 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					3	8			6														
Percentage																							
Misc/Unknown/Other					100%	100%			100%														100%

Table 5-17. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents
by Storage Location -- 218-W-4C.

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/Regs/Nylon												1				3							
Glass																1							
Metal/Iron/ Galvanized/Sheet												3			2	3							
Paper/Cardboard																1							
Plastic/ Polyurethane																4							
Plexiglas *												3											
Stainless Steel																1							
Wood/Lumber/Plywood															1	2							
Percentage																							
Cloth/Regs/Nylon												33%				75%							
Glass																25%							
Metal/Iron/ Galvanized/Sheet												100%			100%	75%							
Paper/Cardboard															50%								
Plastic/ Polyurethane																100%							
Plexiglas												100%											
Stainless Steel																25%							
Wood/Lumber/Plywood															50%	50%							

* Plexiglas is a trademark of Rohm and Haas Company.

Table 5-18. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents
by Storage Location -- 2401-W.

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

Table 5-19. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents
by Storage Location — 2402-WB.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Conweb Pads																							1
Glass																							1
Hazardous Constituents																							1
Metal/Iron/ Galvanized/Sheet																							1
Plastic/ Polyurethane																							1
Percentage																							
Conweb Pads																							100%
Glass																							100%
Hazardous Constituents																							100%
Metal/Iron/ Galvanized/Sheet																							100%
Plastic/ Polyurethane																							100%

Table 5-20. Distribution and Percentage of TRU Containers Other Than 55-Gallon Drum Physical Contents
by Storage Location — FS8.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Conweb Pads																						2	
Glass																						2	
Hazardous Constituents																						2	
Metal/Iron/ Galvanized/Sheet																						2	
Plastic/ Polyurethane																						2	
Percentage																							
Conweb Pads																						100%	
Glass																						100%	
Hazardous Constituents																						100%	
Metal/Iron/ Galvanized/Sheet																						100%	
Plastic/ Polyurethane																						100%	

Table 5-21. 202-A 55-Gallon Drums with Gross Weights Over 130 Kilograms.

Date	Container Identification	Storage Location	Drum Weight (kg)	Grams of TRU	Principal Physical Contents	Hazardous Components
06/01/87	RHA87016	224-T	136	37.0	Rubber, stainless steel	Lead, nitric acid, sodium hydroxide
06/01/88	RHA087061	224-T	150	32.0	Plastic/polyurethane	Lead, sodium hydroxide
10/17/91	RHA-90-010	224-T	136	14.0	Lead, rubber	Lead
05/09/91	RHA-90-022	224-T	136	8.0	Lead, rubber	Lead

TRU = Transuranic.

Table 5-22. 202-A Containers Other Than 55-Gallon Drums with Gross Weights Over 350 Kilograms.

Date	Container Identification	Type Code	Container Weight (kg)	Storage Location	Container Volume (m ³)	Grams of TRU	Principal Physical Contents	Hazardous Components
02/10/71	202A-71-01985	DM	457	218-E-12B	1.0		Misc/unknown/other	
06/19/72	202A-72-0269S	CM	1067	218-E-12B	2.4	1.0E-04	Misc/unknown/other	
03/01/74	A-74-011	CM	372	218-W-4B	0.8		Not listed	
10/31/77	202A77-01	CA	7212	218-W-3A	36.2	168.0	Not listed	
08/16/78	A037816F1	CA	9979	218-W-3A	36.2	1.0	Misc/unknown/other	
01/02/81	202A7804	CA	6713	218-W-4C	43.4	36.0	Metal/iron/galvanized/sheet, Plexiglas*	
01/02/81	202A7805	CA	8437	218-W-4C	43.4	150.0	Metal/iron/galvanized/sheet	
01/02/81	202A7807	CA	7983	218-W-4C	43.4	22.0	Metal/iron/galvanized/sheet, Plexiglas	
03/07/85	SB83121.B	CM	6350	218-W-4C	14.3	481.0	Stainless steel	
08/17/89	RHA-SB-84-06	CM	2159	240I-W	7.1	22.0	Metal/iron/galvanized sheet lead	

CA = Fiberglass Reinforced Polyester Boxes.

CM = Metal Boxes, Cartons, and Cases.

DM = Metal Drums, Barrels, and Kegs.

TRU = Transuranic.

*Plexiglas is a trademark of Rohm and Haas Company.

Table 5-23. PUREX TRU Waste 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
218-E-12B																							
218-W-4B	93	30	1	11	93	0	0	0	0	0													
218-W-4C								20	27				92	109	2747	4211	1860	317	228				
224-T																	2615	4346	3117	1399	520	746	241
2402-W																			14				
Total TRU in Drums	93	30	15	11	93	0	0	0	20	27			92	109	2747	4211	4275	4663	3357	1399	520	746	241

TRU = Transuranic.

Table 5-24. PUREX 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-E-12B	111	0	29																				
218-E-15	500																						
218-W-3A								168	1														
218-W-4B					3	0			3														
218-W-4C												208				120	590						
2401-W																				22			
FS8																						4	
Total TRU in Other Containers	611	0	29		3	0		168	4			208				120	590			22		4	

TRU = Transuranic.

Table 5-25. 55-Gallon Drum Waste from 202-A Containing Greater than 175 Grams TRU.

Disposal Date	Container Identification	Storage Location	Weight (kg)	Grams of TRU	Principal Physical Contents	Hazardous Components
7/11/84	A-84-040	218-W-4C	65	184.2	Rubber	
11/16/85	A84066	218-W-4C	47	200.0	Metal/iron/galvanized/sheet, rubber	
2/19/88	RHA87-060	224-T	86	175.0	Plastic/polyurethane, rubber	Lead
6/01/88	RHA-87045	224-T	108	175.0	Plastic/polyurethane	Lead, sodium hydroxide
5/31/90	RHA-90-006	224-T	82	180.0	Rubber, plastic/polyurethane	Lead, sodium hydroxide
5/09/91	RHA-90-012	224-T	97	180.0	Metal/iron/galvanized/sheet, plastic/polyurethane	

TRU = Transuranic.

Table 5-26. 55-Gallon Drums from 202-AL Containing Greater than 10 Grams TRU.

Disposal Date	Container Identification	Storage Location	Weight (kg)	Grams of TRU	Principal Physical Contents	Hazardous Components
7/13/89	RHA-85-299	224-T	48	12.0	Plastic/polyurethane, paper/cardboard	
7/13/89	RHA-89-004	224-T	120	98.0	Plastic/polyurethane	Lead
7/13/89	RHA-89-005	224-T	113	36.0	Plastic/polyurethane	Lead, sodium hydroxide
7/13/89	RHA-89-006	224-T	141	22.0	Plastic/polyurethane	Lead
7/13/89	RHA-89-007	224-T	109	88.0	Plastic/polyurethane	Lead, sodium hydroxide
7/13/89	RHA-89-008	224-T	118	64.0	Plastic/polyurethane	Lead, sodium hydroxide
7/20/89	RHA-88-109	224-T	46	13.0	Plastic/polyurethane, paper/cardboard	

TRU = Transuranic.

Table 5-27. PUREX Plant (202-A Plant) — Fuel Reprocessing
(200 East Area) (1955-72). (3 sheets)

Compound Name	Formula	EPA Category	DOT Classification/Comments
Aluminum	Al		Fuel element constituent, flammable solid
Aluminum nitrate nonahydrate	$\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$	D	Oxidizer
Aluminum nitrate (mono basic)	$\text{Al}(\text{OH})(\text{NO}_3)_2$		Oxidizer
Ammonium fluoride	NH_4F	B	ORM-B
Ammonium nitrate	NH_4NO_3	D	Oxidizer
Beryllium	Be	A	Fuel element constituent, poison B
Cadmium	Cd	A	
Cadmium nitrate	$\text{Cd}(\text{NO}_3)_2$	C	
Calcium	Ca		
Chlorofluorophosphate	$\text{Ca}_3(\text{PO}_4)_2 \cdot \text{CaClF}$		
Copper	Cu	D	
Dibutyl butyl phosphonate	$\text{CH}_3(\text{CH}_2)_3\text{PO}_3$ $[\text{CH}_3(\text{CH}_2)_3]_2$		
Dow Anti-Foam B ¹	Silicon emulsion		
Dowex 21 K ² /Amberlite XE-270 ³ (IX Resin)	Polystyrene DVB with trimethyl ammonia		Product name
Ferric nitrate	$\text{Fe}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$	C	Oxidizer
Ferrous sulfamate	$\text{Fe}(\text{SO}_3\text{NH}_2)_2$		
Formaldehyde (solution)	CH_2O	B	ORM-A
Hexone	$\text{CH}_3\text{COCH}_2\text{CH}(\text{CH}_3)_2$		Flammable liquid
Hydrazine	$\text{H}_2\text{NNH}_2 \cdot \text{H}_2\text{O}$	X	Flammable, Corrosive, Poison
Hydroxylamine nitrate	$\text{NH}_2\text{OHHNO}_3$		
Ionac A-580 ⁴ /Permutit SK ⁵ (IX Resin)	Polyvinyl puridine with methyl groups		Product name
Iron	Fe		Fuel element constituent
Kerosine	Petroleum hydrocarbon mix	D	
Mercuric nitrate	$\text{Hg}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}$	A	Oxidizer

Table 5-27. PUREX Plant (202-A Plant) — Fuel Reprocessing
(200 East Area) (1955-72). (3 sheets)

Compound Name	Formula	EPA Category	DOT Classification/Comments
Nitric acid	HNO_3	C	Oxidizer, corrosive
Normal paraffin hydrocarbon	$\text{C}_{10}\text{H}_{22}$ to $\text{C}_{14}\text{H}_{30}$		
Oxalic acid	$\text{HO}_2\text{CCO}_2\text{H} \cdot 2\text{H}_2\text{O}$		
Phosphoric acid	H_3PO_4	D	Corrosive
Potassium fluoride	KF		ORM-B, corrosive
Potassium hydroxide	KOH	C	Corrosive
Potassium permanganate	KMnO_4	B	Oxidizer
Shell E-2342 ⁶	Naphthalene and paraffins		Product name
Silicon	Si	D	Fuel element constituent
Silver nitrate	AgNO_3	X	Oxidizer
Sodium carbonate	Na_2CO_3	D	
Sodium fluoride	NaF	C	ORM-B, corrosive
Sodium hydroxide	NaOH	C	Corrosive
Sodium nitrate	NaNO_3	D	Oxidizer
Sodium nitrite	NaNO_2	B	Oxidizer
Sodium thiosulfate	$\text{Na}_2\text{S}_2\text{O}_3$		
Soltrol-170 ⁷	$\text{C}_{10}\text{H}_{22}$ to $\text{C}_{18}\text{H}_{34}$		Product name
Sugar	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$		
Sulfamic acid	$\text{NH}_2\text{SO}_3\text{H}$	C	
Sulfuric acid	H_2SO_4	C	Corrosive
Tartaric acid	$\text{C}_2\text{H}_2(\text{OHCOOH})_2$		
Tributyl phosphate	$(\text{C}_4\text{H}_9)_3\text{PO}_4$	D	
Trichloroethane	CH_3CHCl_3		Equipment degreasing, ORM-A

Table 5-27. PUREX Plant (202-A Plant) — Fuel Reprocessing
(200 East Area) (1955-72). (3 sheets)

Compound Name	Formula	EPA Category	DOT Classification/Comments
Tri-n-Codecylamine	$[\text{CH}_3(\text{CH}_2)_{11}]_3\text{N}$		
Zirconium	Zr		Fuel element constituent, flammable solid.

DOT = U.S. Department of Transportation.

DVB = Divinyl benzene.

EPA = U.S. Environmental Protection Agency.

ORM = Other regulated materials.

¹Dow Anti-Foam B is a trademark of Dow Corning Corporation.

²Dowex 21 K is a trademark of Dow Chemical Company.

³Amberlite XE-270 is a trademark of Amberlite Plastics.

⁴Ionac is a trademark of Sybron Chemical Industries.

⁵Permutit SK is a trademark of Permutit Company, Incorporated.

⁶Shell E-2342 is a trademark of the Shell Oil Company.

⁷Soltrol-170 is a trademark of the Phillips Chemical Company.

Table 5-28. PUREX Plant (A Plant) — Analytical Laboratory
(200 East Area) (1955-72). (2 sheets)

Compound Name	Formula	EPA Category	DOT Classification/Comments
Acetone	$\text{CH}_3\text{C}_2\text{OH}_3$	D	Flammable liquid
Carbon tetrachloride	CCl_4	A	ORM-A
Ceric sulfate	$\text{Ce}(\text{SO}_4)_2$	C	
Ceric fluoride	CeF_4		
Ferrous sulfate	FeSO_4	C	
Hydrobromic acid	HBr		Nonflammable gas, corrosive
Hydrochloric acid	HCl	D	Nonflammable gas, corrosive
Hydrogen peroxide	H_2O_2		Oxidizer, corrosive
Hydroxylamine hydrochloride	$\text{NH}_2\text{OH}\cdot\text{HCl}$		
Isopropyl alcohol	$\text{C}_3\text{H}_7\text{OH}$		Flammable liquid
Lanthanum fluoride	LaF_3		
Lanthanum hydroxide	$\text{La}(\text{OH})_3$		
Lanthanum nitrate	$\text{La}(\text{NO}_3)_3$	D	
Magnesium	Mg		
Nitric acid	HNO_3	C	Oxidizer, corrosive
Periodic acid	HIO_4		
Phosphorous pentoxide	P_2O_5		Corrosive
Potassium oxalate	$\text{K}_2\text{C}_2\text{O}_4$		
Potassium permanganate	KMnO_4	B	Oxidizer
Silver nitrate	AgNO_3	X	Oxidizer
Sodium bisulfate	$\text{NaHSO}_4 \cdot \text{H}_2\text{O}$		ORM-B
Sodium bromate	NaBrO_3		
Sodium carbonate	Na_2CO_3		
Sodium fluoride	NaF	C	ORM-B, oxidizer
Sodium hydroxide	NaOH	C	Corrosive
Sodium nitrate	NaNO_3	D	Oxidizer

Table 5-28. PUREX Plant (A Plant) — Analytical Laboratory
(200 East Area) (1955-72). (2 sheets)

Compound Name	Formula	EPA Category	DOT Classification/Comments
Sulfuric acid	H_2SO_4	C	Corrosive
Thenoyltrifluoroacetone	$(CH)_3SCOCH_2COCF_3$		
Zirconyl phosphate	$ZrOPO_4$		

DOT = U.S. Department of Transportation.
EPA = U.S. Environmental Protection Agency.
ORM = Other regulated material.

Table 5-29. PUREX Plant (A Plant) — Fission Product Recovery
(200 East Area) (1960-66).

Compound Name	Formula	EPA Category	DOT Classification/Comments
Acetic acid	$\text{CH}_3\text{CO}_2\text{H}$	D	Corrosive
Ferric nitrate	$\text{Fe}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$	C	Oxidizer
Hydroxyacetic acid	CH_3OCOOH		
Lead nitrate	$\text{Pb}(\text{NO}_3)_2$	B	Oxidizer
Nickel nitrate	$\text{Ni}(\text{NO}_3)_2$	B	
Nitric acid	HNO_3	C	Oxidizer, corrosive
Oxalic acid	$\text{HO}_2\text{CCO}_2\text{H} \cdot 2\text{H}_2\text{O}$		
Silver nitrate	AgNO_3	X	Oxidizer
Sodium carbonate	Na_2CO_3	D	Oxidizer
Sodium ferrocyanide	$\text{Na}_4\text{Fe}(\text{CN})_6$		
Sodium hydroxide	NaOH	C	Corrosive
Sodium nitrate	NaNO_3	D	Oxidizer
Sodium sulfate	Na_2SO_4		
Tartaric acid	$\text{C}_2\text{H}_2(\text{OHCOOH})_2$		

DOT = U.S. Department of Transportation.

EPA = U.S. Environmental Protection Agency.

Table 5-30. PUREX TRU Mixed 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
218-E-12B																							
218-E-15																							
218-W-3A																							
218-W-4B																							
218-W-4C																							
224-T																							
2401-W																							
2402-W																							
FS8																							

Table 5-31. PUREX TRU Mixed 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
218-E-12B																							
218-E-15																							
218-W-3A																							
218-W-4B																							
218-W-4C																							
224-T																							
2401-W																							
2402-W																							
FS8																							

Table 5-32. Number and Percentage of PUREX TRU 55-Gallon Drums Containing Hazardous Constituents
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																							
Lead															1	18	3	1					
Nitric Acid																1	4	2					
Sodium Hydroxide																		2					
Percentage																							
Lead															1%	21%	10%	17%					
Nitric Acid																1%	14%	33%					
Sodium Hydroxide																		33%					

Table 5-33. Number and Percentage of PUREX TRU 55-Gallon Drums Containing Hazardous Constituents
by Storage Location — 224-T.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Barium																					2		
Cadmium																					1	2	
Calcium																					1		
Chlorofluorophosphate																							
Caustic																1							
Copper																	6						
Lead																26	51	29	21	7	6	3	
Mercury																					1	2	
Nitric Acid																28	50						
Sodium Hydroxide																7	50	28	13	4			
Percentage																							
Barium																					29%		
Cadmium																					4%	29%	
Calcium																					4%		
Chlorofluorophosphate																							
Caustic																2%							
Copper																	7%						
Lead																47%	80%	69%	55%	29%	24%	43%	
Mercury																					4%	29%	
Nitric Acid																	51%	59%					
Sodium Hydroxide																	13%	59%	67%	34%	17%		

Table 5-34. Number and Percentage of PUREX TRU 55-Gallon Drums Containing Hazardous Constituents
by Storage Location — 2402-W.

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

Table 5-35. Number and Percentage of PUREX TRU Other Containers Containing Hazardous Constituents
by Storage Location — 218-E-12B.

BY STORAGE LOCATION - Z 105-125.																								
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																								
Lead	33																							
Percentage																								
Lead	2%																							

Table 5-36. Number and Percentage of PUREX TRU Other Containers Containing Hazardous Constituents by Storage Location — 2401-W.

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																								
Lead																								1
Percentage																								
Lead																								100%

Table 5-37. Number and Percentage of PUREX TRU Other Containers Containing Hazardous Constituents by Storage Location — 2402-WB.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Carbon																							1
Tetrachloride																							1
Kerosene																							1
Tributyl Phosphate																							1
Percentage																							
Carbon																							100%
Tetrachloride																							100%
Kerosene																							100%
Tributyl Phosphate																							100%

Table 5-38. Number and Percentage of PUREX TRU Other Containers Containing Hazardous Constituents
by Storage Location — FS8.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Distribution																							
Chloroform																						1	
Cyclohexane																						1	
Hexone																						1	
Kerosine																						1	
Thenoyl																						1	
Trifluoroacetone																						1	
Tributyl Phosphate																							
Triisooctylamine																						1	
Trioctylphosphine Oxide																						1	
Xylene																						1	
Percentage																							
Chloroform																						50%	
Cyclohexane																						50%	
Hexone																						50%	
Kerosine																						50%	
Thenoyl																						50%	
Trifluoroacetone																						50%	
Tributyl Phosphate																							
Triisooctylamine																						50%	
Trioctylphosphine Oxide																						50%	
Xylene																						50%	

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APPENDIX A

PUREX OPERATIONAL FLOW DIAGRAM

This appendix has been reproduced from Appendix C of the *PUREX Final Safety Analysis Report*, WHC-SD-HS-SAR-001, Rev. 3 (Manry and Prosk 1985).

WHC-EP-0646
(from Manry and Prosk 1985)

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PUREX OPERATIONAL FLOW DIAGRAM

The objectives of a preliminary hazards analysis (PHA) are to identify potential hazardous conditions inherent within the system and to determine the significance of potential accidents that might arise.

The first step in a PHA is to identify potentially hazardous elements or components within the system. This process is facilitated by an organized approach to examining system components, engineering experience and the exercise of engineering judgment.

This first step was initiated by the development of a system model which allowed organized system/component evaluation, e.g., a process description, drawn as a Plutonium Uranium Extraction Plant (PUREX) operational flow diagram. The purpose of this flow diagram was to allow methodical analysis of the accident potential of the PUREX process steps. This flow diagram is presented in Figures C-1 through C-19. Figure C-1 is the flow diagram for the overall process. Figures C-2 through C-19 are each amplifications of the blocks in Figure C-1. The notation is such that the leading digit refers to the major process category and subsequent digits further identify the specific operations. Chemicals associated with the process steps are indicated above the steps in Figures C-2 through C-19.

The second step in the preparation of the PHA was the identification of those events that could transform specific hazardous conditions into potential accidents. Then the seriousness of the potential accident was assessed to determine the adequacy of plant control features. This was accomplished in the PUREX PHA in a series of round table discussions involving several senior Rockwell Hanford Operations personnel. Each section of the flow diagram was evaluated by the group for potential accidents by examining for energy sources such as flammable solvents, steam, hydrogen, radiation, etc.; the presence of adequate safety systems such as High Efficiency Particulate Air filters, engineered and administrative barriers; and potential consequences.

The format of this PHA followed closely that used in previous analyses, including a PHA done by Pacific Northwest Laboratories⁽⁹⁻¹⁾ and an unissued probabilistic risk assessment performed by Science Applications, Inc. Both of these studies were reviewed by Rockwell and incorporated in the final PHA as appropriate.

Each block in the operational flow diagram with accident potential was selected for more careful consideration in the PHA presented in Chapter 9.0. The number in the extreme left column of the PHA identifies the process block in this appendix from which the potential hazard was identified.

WHC-EP-0646
(from Manry and Prosk 1985)

FIGURE C-1. PUREX Process Overview.

RCP8201-114

FIGURE C-2. Fuel Receipt and Charging.

FIGURE C-3. Fuel Decladding and Dissolution. (Page 1 of 2)

RCP8201-116A

FIGURE C-4. Fuel Decladding and Dissolution. (Page 2 of 2)

FIGURE C-5. Dissolver Offgas Treatment.

RCP8201-118

FIGURE C-6. NH₃ Offgas Treatment.

WHC-EP-0646
(from Manry and Prosk 1985)

RCP8201-119

FIGURE C-7. Acid Recovery System.

RCP8201-120

FIGURE C-8. Backcycle Waste Concentrator.

FIGURE C-9. Decontamination and Partitioning Cycle.

FIGURE C-10. Final Plutonium Cycle.

RCP8201-123

FIGURE C-11. #1 Organic Recovery System.

RCP8201-125

FIGURE C-12. Final Uranium Cycle.

RCF8201-124

FIGURE C-13. Second Neptunium Cycle.

RCP8201-126A

FIGURE C-14. Organic Recovery System 2.

FIGURE C-15. Condenser Vessel Vent Offgas Treatment.

RCP8201-128A

FIGURE C-16. Final Neptunium Cycle.

RCP8201-129A

FIGURE C-17. Waste Concentration and Treatment.

RCF6201-1308

FIGURE C-18. Oxide Conversion.

RCP8203-49C

FIGURE C-19. Oxide Conversion Rework.

APPENDIX B

HISTORY OF PUREX PLANT

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HISTORY OF PUREX PLANT

This appendix presents a thorough discussion of the history of the Plutonium-Uranium Reduction Extraction (PUREX) Plant.

The PUREX Plant was committed to radioactive service in 1956 as a major producer of weapons-grade plutonium from irradiated uranium metal reactor elements. When it was shut down in 1972, the plant was a major facility of the then U.S. Atomic Energy Commission (AEC) effort to supply spent fuel separation capability to a variety of programs. Eight phases are discernible in the history of the facility (roughly 1954 to the present):

- A 2-yr building period
- A 4-mo testing period
- Startup
- Refinement
- Increasing versatility
- Standby
- Upgrading
- Startup.

Efforts to refine and improve flowsheets and processes preceded radioactive operation and continue to the present. Multipurpose use of the plant became a defined objective by 1960, and by the time the plant was placed on standby, it was processing entirely different materials from those originally processed and will continue in this manner for future operations.

PLANT MISSION

Originally, the PUREX Plant reprocessed irradiated, aluminum-clad, reactor fuel elements, employing a wet chemical process to separate fission products (FP) from the uranium and plutonium. This process resulted in uranium nitrate and plutonium nitrate, with both chemicals emerging in a highly purified state. The uranium nitrate was subsequently converted to uranium oxide (UO_3) and shipped offsite for enrichment and reuse as reactor fuel. The plutonium nitrate was further processed onsite and was eventually used in weapons fabrication.

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The fuel elements involved in the original process were low-burnup elements in the 250-700 Mwd/t range. These elements could be handled at the PUREX Plant following short cooling periods (90 to 120 d) and yielded small amounts of plutonium (a few grams per tonne). With this fuel, plant capacity was far in excess of the original design basis.

Table B-1 lists other materials processed by the PUREX Plant with the respective dates the various feed stocks were introduced. With minor exceptions, all of the processed materials were irradiated in Hanford Site reactors.

TABLE B-1. Fuels Reprocessed at the PUREX Plant.

Time period	Fuel
January 1956	"72" metal (natural U) Al-clad, low Pu g/t (weapons grade)
August 1958	First Np recovery
October to December 1960	Began recovery of FP, ⁹⁰ Sr, and ¹³⁷ Cs
August 1962	"72" metal (natural) Al-clad, moderate Pu g/t (fuels grade)
November 1965	"72" metal (natural) Al-clad, moderate Pu g/t (fuels grade); SEFOR ^a campaign(s)
February 1966	"95" metal (enriched) eventually both weapons
January 1965, May 1966, September 1970	Al-clad thoria target elements; oxide powder in 1965 and 1966; compressed wafers in 1970
June/July 1967	Zircaloy-clad "95" (enriched) metal and "1.25" (spike)--both from N Reactor
February 1968	Al-clad natural U from older Hanford Site reactors and Zircaloy-clad 210 (2.1% ²³⁵ U) "Coproduct" from N Reactor
February 1969	PRTR ^b , Zircaloy-clad PuO ₂ (initially less than 1% Pu), UO ₂ (1970--0.5, 1.0, 2.0, 4.0)
January and June 1972	Mixed oxide scrap (PuO ₂ ·UO ₂) in mild-steel cans; Zircaloy-clad mixed oxide
May 1982	Pu-Al and U-Al alloy (PRTR and Phoenix Reactors)

^aSoutheast Fast Oxide Reactor.

^bPlutonium recycle test reactor.

Representative plant performance is shown in Table B-2, giving the relative purity of products obtained.

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TABLE B-2. Historical PUREX Plant Performance.

Process	1956 ^a	1959 ^b	1967	1971
Separation ratios				
U from Pu ^c	10 ⁷	10 ⁷	10 ⁷	10 ⁷
Pu from U ^d	4 x 10 ⁴	4 x 10 ⁴	6 x 10 ⁵	6 x 10
Plutonium decontamination				
FP from Pu	10 ^{7e}	10 ⁸	10 ⁸	10 ⁸
First-cycle decontamination factor	3.5 x 10 ^{5f}	2 x 10 ⁴	5 x 10 ³	2 x 10 ³
Second-cycle decontamination factor	30	2 x 10 ³	2 x 10 ³	1 x 10 ³
Anion exchange	-	3	10	-
Third-cycle decontamination factor	-	-	-	50
Uranium decontamination				
FP from U	10 ⁶	5 x 10 ⁶	10 ⁷	10 ⁷
First-cycle decontamination factor	4.5 x 10 ^{5f}	2 x 10 ⁴	3 x 10 ³	2 x 10 ³
Second-cycle decontamination factor	13	5 x 10 ²	1.5 x 10 ³	5 x 10 ³
Silica gel	(4 to 10) ^g	-	2	-
Acid recovery				
Dissolving	-	85%	-	85%
Solvent extraction	65%	95%	-	95%
Sugar denitration	-	-	-	75%
Pu/U recovery	98%	99.9%	-	-
Solvent recovery	99%	99.7%	-	99.8%

^aHW-31000.(1)

^bHW-60116.(2)

^cPu/U in feed divided by Pu/U in product.

^dU/Pu in feed divided by U/Pu in product.

^ePu reworked at Z Plant.

^fBased on codecontamination and partition cycles.

^gInitial decontamination factors were not as good as planned; ZrNb was the primary problem.

PLANT FLOWSHEET EVOLUTION

Modifications have been made to the PUREX flowsheet as information became available to increase capacity, decrease operating costs, reduce waste losses, and improve product purity. Major flowsheet modifications fall into six categories: (1) optimization of the original flowsheet within the objectives of the original plant mission, (2) modifications for neptunium recovery, (3) modifications for thorium processing, (4) modifications for increased processing flexibility (primarily in the headend), (5) modifications for reduced environmental releases, and (6) modification for plutonium oxide production.

The following discussion is confined to the actual, documented flowsheets. A large number of process tests were performed over the years, but not all of the tests resulted in flowsheet modifications.

Brief discussions of PUREX-type flowsheets (of which there are innumerable variants) appear in Chapters IV and VI of the PUREX Technical Manual and Chapter IV of the Reactor Handbook, Vol. II.^(3,4) The development of the PUREX process was a major AEC activity involving efforts at Oak Ridge National Laboratory (ORNL), Knolls Atomic Power Laboratory, and the Hanford Site. The Hanford Site PUREX Plant flowsheet was demonstrated on a hot pilot plant scale at ORNL and in cold pilot plant work at Hanford in the 300 Area. Cold run operability tests in the plant itself were performed on what was then designated the HW 3 flowsheet. An increased capacity flowsheet (HW 4) was developed prior to hot startup, but was never used. The HW 3 flowsheet was modified, based on operational experience during cold run testing, and reissued as the PUREX Plant flowsheet (PPF) I. This flowsheet was, in turn, replaced within 6 mo of hot startup by PPF II. The changes were made primarily to improve ^{95}Zr -Nb decontamination. Conversion of the solvent extraction system from a three-cycle to a two-cycle scheme, with separate concentration and reuse of second-cycle aqueous waste streams, was accomplished and documented. With some modifications, the PUREX Plant two-cycle flowsheet was used throughout the remaining uranium-plutonium production campaigns. Updated versions were issued in 1968 for aluminum-clad fuels and in 1972 for Zircaloy-clad fuels. The current flowsheet, including the "Zirflex" process for decladding and dissolution of Zircaloy-clad N Reactor fuel, was updated in 1977. The latest flowsheet incorporated the processing of 6%, 9%, and 12% ^{240}Pu material, eliminated the recovery of neptunium and added the production of plutonium oxide (see Figure 6-1).⁽⁵⁾

A thorium process flowsheet was developed in 1965, modified after a PUREX Plant process test, and used for thorium processing campaigns in 1966 and 1970.

FEED PREPARATION PROCESSES

In the original feed preparation process for aluminum-clad fuel, the fuel elements were declad with a sodium hydroxide solution, containing sodium nitrate to suppress formation of hydrogen gas. After rinsing the

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bare metal fuel elements, two or more dissolution cuts were taken with nitric acid, the number depending on the total metal inventory remaining in the dissolver. The individual cuts or batches of the resulting uranyl nitrate solution were then transferred to feed storage tanks. The feed was clarified by batch centrifugation. After clarification, the dissolved metal solution was chemically adjusted to assure reasonably uniform nitric acid and uranyl nitrate concentrations and then used as feed for the solvent extraction system.

Feed clarification was discontinued in March 1959. Rinsing between coating removal and nitric acid dissolution, coupled with various jetleg-length changes and allowance for solids settling, eliminated the need for centrifugation. In 1963, chemical adjustment of the feed was discontinued after demonstrated uniformity of dissolved metal solution.

The Zirflex process for chemically decladding and dissolving Zircaloy-clad uranium metal fuel elements was developed to permit reprocessing of Zircaloy-clad fuels in the existing Hanford Site production fuel reprocessing plants. The Hanford reprocessing facilities do not possess mechanical means (i.e., chop, shear, or extrude) for breaching the fuel cladding.

The Zirflex process consists of the following steps:

1. Dissolution of the Zircaloy by a mixture of ammonium fluoride-ammonium nitrate (AFAN) solution
2. Methathesis of uranium and plutonium tetrafluorides to uranium and plutonium dioxides with potassium hydroxide
3. Centrifugation of cladding waste solutions, spent metathesis solutions, and various rinses for recovery of product prior to discharge of the cladding waste to underground storage
4. Dissolution of the uranium metal with nitric acid in one or more cuts (with aluminum nitrate added to complex residual fluoride)
5. Dissolution of the cake removed from the centrifuge in nitric acid-aluminum nitrate for eventual incorporation in the solvent extraction feed.

The only significant modification to the original process was to make up an AFAN solution of the desired concentration and add the amount to the dissolver prior to charging, rather than adding a concentrated AFAN solution to boiling dissolver water. This modification was necessary to provide sufficient nitrate ion concentration in solution at the start of the decladding reaction to suppress hydrogen evolution.

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Dissolver offgas treatment for the decladding process consists of ammonia removal in the downdraft condenser and water scrubber, deentrainment, offgas heating, iodine removal by passage through a packed tower containing silver nitrate-coated Beryl saddles, filtration, and discharge via the 200-ft stack. Offgas treatment for the uranium dissolution process consists of condensate recycle to the dissolver, deentrainment, offgas heating, passage through a packed tower containing silver nitrate-coated Beryl saddles for iodine removal, filtration, and additional nitric acid and iodine removal in the backup facility.

The backup nitric acid recovery system was originally installed as a dual purpose unit: the first column performing additional nitric acid absorption, the second operating as a caustic scrubber for radioiodine removal. The iodine removal in the first tower proved satisfactory. This, coupled with no measurable decline in efficiency, resulted in elimination of the caustic scrub for iodine removal in favor of additional acid recovery. As a result of increased cooling time of the fuel (to at least 180 d), radioiodine (^{131}I) levels declined to the point where operation of the silver reactors was no longer required. These were last regenerated in April 1968.

The chronology of the feed preparation processes is given in Table B-3.

SOLVENT EXTRACTION AND PRODUCT HANDLING, 1956-72

The basic startup flowsheet was a three-cycle system employing a codecontamination cycle; a partition cycle consisting of an extraction column, partition column, a scrub column ancillary to the partition column, and a uranium stripping column; and separate, final decontamination cycles consisting of extraction and strip columns for the plutonium and uranium streams. The breakdown is shown in Table B-4.

With the exception of the aqueous plutonium stream from the partition column, each aqueous product stream exiting from a cycle was concentrated. All extraction column losses were actual; however, high product content waste was generally recycled.

The basic operating features of this flowsheet were as follows:

- Rigid control of uranium saturation in the HA, 1A, and 2D Columns
- Uranium-plutonium separation by plutonium reduction to the inextractable III valence using ferrous ion (as ferrous sulfamate with sulfamic acid as a holding reductant) in the 1BX and 2DF streams, and an oxidizing step prior to the second plutonium cycle.

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TABLE B-3. Feed Preparation Headend Chronology.

Time period	Feed preparation
March 1956	Switch from batch nitric acid addition to continuous acid addition during cut to eliminate ^{131}I surge
September 1957	Backup offgas treatment facility on-line for improved acid recovery and ^{131}I removal
June 1958	T-XB switched from caustic to acid scrubber
June 1958	Prototype silver reactor installed as temporary replacement for original
June 1958	NH_3 scrubber installed
March 1960	Discontinued feed centrifugation (free centrifuges and E cell tankage for FP recovery)
October 1963	Discontinued feed adjustment
August 1965	Thoria process test. The A3 annular dissolver installed (testing continued through September)
January 1966	B3 annular dissolver installed
January 1966	216-A-36-A crib out of service, distributor extended (became 36-8), a consequence of (1) solution carry-over during dissolution into the NH_3 scrubber catch tank and (2) contamination of NH_3 scrubber waste with dissolver solution via the downdraft condenser and piping. The problem noted with the A3 dissolver was solved on the B3 and subsequent dissolver vessels by raising the elevation of the dissolver vent connection on the dissolver and by installing isolation valves between the dissolver and NH_3 waste tank. In addition, routine condenser and scrubber flushing at the conclusion of the fuel dissolution step was begun. ⁽⁶⁾
September 1966	Thoria campaign; C3 annular dissolver installed
January 1967	First test of Zirflex process
February 1968	First use of dissolver insert to reduce annulus (for nuclear criticality prevention) during coproduct processing
December 1969	Eliminated continuous AFAN solution
December 1970	Thoria campaign
January 1971	Leaks were found in all three dissolver cells. Operation was resumed with a new B3 dissolver and the A3 dissolver coil discharge routed to a backup concentrator.
September 1971	New C3 dissolver installed
December 1971	Plate coil on an old B3 dissolver--refurbished assembly installed on A3 dissolver

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TABLE B-4. System Breakdown.

Flowsheet designation	Canyon position ^a	Cycle ^b	Product	Function
HA	(H2)	1	CO	Extraction/scrub
HC	(H3)	1	CO	Strip
1A	(J2)	2	CO	Extraction/scrub
1BX	(J6)	2	CO	Partition
1BS	(J4)	2	Pu	Scrub
1C	(J7)	2	U	Strip
2A	(L1)	3	Pu	Extraction/scrub
2B	(L2)	3	Pu	Strip
2D	(K2)	3	U	Extraction/scrub
2E	(K3)	3	U	Strip

^aFor example, the H2 position is the second equipment position in H cell.

^bCarbon dioxide means uranium and plutonium as a coproduct.

The following modifications were made during the first year of hot operation for improved ⁹⁵Zr-Nb decontamination performance:

- C-type columns were changed from organic continuous to aqueous continuous operation (this minimized carryover of interfacial materials containing high FP activity)
- Uranium feed concentration to the HA column was increased and control of the uranium saturation of the organic phase was tightened
- Feed acidities to the HA, 1A, 2D, and 2A columns were decreased
- HA column temperature was reduced
- 1BX stream acidity was decreased
- Treatment of uranium product with silica gel for additional Zr-Nb decontamination factor was initiated.

Final three-cycle operation improvements consisted of:

- Conversion of 2D column to organic continuous operation and installation of a scrub section cartridge of improved design

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- Treatment of plutonium product in a new, semicontinuous, anion-exchange system (installed in a portion of the regulated shop and designated as N cell)
- Improvements to the solvent treatment flowsheet.

Two-cycle operation was tested in the plant in March 1958 and the following equipment modifications were made in June:

- Bottom-interface HA column installed
- The HC column became a scrub column associated with the HA column
- The 1A column was removed
- The backcycle waste system was established using the HCP concentrator (E-H4) to evaporate aqueous waste streams from the 2D and 2A columns and N cell for recycle to the HA column
- TK-F10 was used to combine waste streams.

The installation of backcycle capability, in turn, permitted tighter (higher) saturation in the 2A and 2D columns with concomitant improvements in product quality.

Subsequent major flowsheet changes through the 1972 plant shutdown were:

- Neptunium recovery on a campaign basis using existing columns (this capability resulted because neptunium accumulates in the backcycle waste system)
- Installation of neptunium recovery equipment (another solvent extraction system plus ion exchange product treatment)
- Installation of improved scrub section cartridges and larger diameter columns
- Installation of a third plutonium solvent extraction cycle to replace the anion exchange system to provide increased reliability, capacity, and safety.

Two continuing programs that merit more detailed attention are: (1) improvements in solvent* and solvent treatment and (2) alternate reductants for partitioning.

*The term solvent, as used in this discussion, refers to the mixture of tributyl phosphate (TBP), the actual process solvent, and inert hydrocarbon diluent.

Most of the problems associated with FP decontamination in the PUREX solvent extraction process were attributable to solvent deterioration resulting from radiation exposure. This was one reason for placing column interfaces at the opposite end of the columns from the product stream exit. Gross quantities of FP tended to accumulate at the interface in an interface layer consisting of degraded solvent. Consequently, any entrainment or column upset could result in contamination of the stream exiting the disengaging section containing the interface.

The solvent diluent used had a profound effect on solvent quality. The original diluent was a kerosene-type mixture of saturated and unsaturated hydrocarbons which was, in essence, a specific distillation cut (Shell Spray Base E 2342). In September 1961, this was changed to Soltrol-170, a mixture of highly branched aliphatic hydrocarbons with properties similar to Shell Spray Base. Some initial improvement was noted, but this dissipated after a relatively short time. In February 1966, a switch was made to a normal paraffin hydrocarbon (NPH) mixture (containing m-decane tetradecane). Evaluation of contrasting run periods proved straight chain hydrocarbon superiority in terms of process performance.

Improved solvent treatment processes evolved as well. Initially, aqueous sodium carbonate washing was performed in the 10 and 20 pulse columns, followed by centrifugation to remove entrained aqueous carbonate and solids. Shortly after startup, carbonate washing on a batch basis was started in the 10F pump tank (TK-G1). However, activity in solvent treatment system 1 continued to be a problem. A nitric acid scrub was then used in the 10 column (in place of carbonate) with marked improvement in both 10 column stability and solvent quality. In late 1957, KMnO_4 was added to the aqueous wash in TK-G1, a turbo-mixer was installed in receiver TK-G7, and centrifugation of the 10 column product was discontinued. A caustic wash was used with the turbo-mixer. Later, the same changes were made to solvent treatment system 2, the only exception being no turbo-mixer installation in R cell.

Due to declining FP activity in the plant feed (longer cooled reactor fuel), improved FP decontamination in the first cycle as a result of fluoride complexing of $^{95}\text{Zr-Nb}$ during processing of N Reactor fuel (Zirflex Tonic effect), and the stability of the NPH, it was found prior to shutdown that the turbo-mixer operation was not needed. The usage of KMnO_4 was reduced by 60% by lowering the concentration in the wash solution by 33% and eliminating the use of a more concentrated KMnO_4 add stream to the system 1 wash solution. Further reductions in the Na_2CO_3 - KMnO_4 usage were made by reusing more of the system 2 wash solution in system 1.

The search for an alternate to ferrous sulfamate as a plutonium reductant was motivated primarily by the waste management program. The iron and sulfates contribute to the total bulk of nonvolatile salt in the waste and adversely affected the waste fractionization effort in B Plant.

Plant tests have been performed with the following:

- Ferrous nitrate stabilized with hydrazine
- Uranium IV stabilized with hydrazine
- Hydroxylamine nitrate (HN)--stabilized with hydrazine
- HN in conjunction with lesser amounts of ferrous ion.

The HN stabilized with hydrazine is used in the 2D column feed and 2B column strip. The neptunium recovery system requires some ferrous ion and holding reductant due to the high nitric acid concentration and the radiolytically produced nitrite in the backcycle. The uranium IV, while demonstrated in the 1BX stream on a test basis, is not readily available for use. The tests with HN in the 1BX stream were successful, but proved too costly. The FeSA-SA system is preferred for nuclear criticality prevention. All other reducing systems require more administrative and engineered safeguards.

Solvent extraction chronology is shown in Table B-5.

WASTE TREATMENT

The waste treatment system at hot startup consisted of two cycles. A primary, high-level, waste concentrator (E-F11) evaporated the waste stream from the first extraction column. A second concentrator (E-F6) received aqueous waste streams from subsequent cycle extraction columns and the condensate from the E-F11-2 and vessel vent system condensers. The overheads from E-F6 were routed through an acid absorber-fractionator (T-F5). Two functions were performed by this system: nitric acid removal and recovery for recycle and waste volume reduction. Minimizing radioactivity in the concentrator overheads and recovering nitric acid were the primary justifications for double distillation of the HAW (HW column waste).

It was recognized during the final plant construction phase that an atmospheric acid absorber-fractionator would limit plant operating rates and have a short service life. An ancillary vacuum fractionator package was, therefore, procured and placed in operation in 1957.

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TABLE B-5. Solvent Extraction Chronology. (Sheet 1 of 2)

Time period	Solvent extraction
April to May 1955	Extended scrub portions of HA and 1A columns based on hot semiworks test experience. This required chipping 5 ft of concrete out of the cell floor at the H2 and J2 positions
April 1956	Batch washing in TK-G1 of system 1 solvent initiated
During 1956	C-type columns converted to aqueous-continuous (top interface) operation
November 1956	2D column converted to organic-continuous (bottom interface) operation
May 1957	Semicontinuous anion exchange treatment of Pu product stream (2BP) initiated. Sulfuric acid added to 2BX to permit reduced 2BX flow
December 1957	HA column converted to organic-continuous (bottom interface) operation. Began continuous KMnO ₄ solvent washing
March 1958	First test of two-cycle flowsheet, bypassing HC and 1A columns. Converted 10 column to dilute acid scrub
June 1958	First attempt to recover Np (campaign basis from 1WW). Implemented two-cycle system
February 1960	Solvent quality deteriorated to the point where it had to be discarded and replaced with fresh solvent
September 1961	Switched from Shell Spray Base diluent to Soltrol-170
October 1962	Began Np recovery on a continuous basis
January 1965	Process test of modified Thorex solvent extraction flowsheet successful
February 1966	Switched from Soltrol-170 to NPH diluent
May 1966	Performed Th campaign
July 1967	First N Reactor fuels processing campaign, "tonic" effect (enhanced ⁹⁵ Zr-Nb decontamination factor) noted; (attributed to F ⁻ in November 1969). Ferrous nitrate/hydrazine tested in 1BX
September 1969	Replaced sulfamic acid with hydrazine (1BX)
October 1969	1UD recycle (to 1CX)
January 1970	Deliberate butting of HAF with fluoride for decontamination factor enhancement

TABLE B-5. Solvent Extraction Chronology. (Sheet 2 of 2)

Time period	Solvent extraction
April 1970	Tested U(IV) as alternate 1BX reductant
May 1970	Tested HN in 2DIS
July to December 1970	Performed second Th campaign
April 1971	Third Pu cycle installed
August 1971	HAO stream eliminated for improved Np recovery. Use of TK-J2 eliminated. Second- and third-cycle organic waste streams routed directly to 1BXF tank (TK-J3)

The most significant change in the waste treatment system consisted of conversion to a single cycle. This change became feasible after converting to the two-cycle solvent extraction system with backcycle waste concentration, reducing the volume to be concentrated in the waste treatment system. In addition, sodium nitrite was added to suppress ruthenium volatilization into the overheads of concentrator E-F6 and a prototype demister was installed in the E-F6 offgas, markedly reducing activity in the overheads.

Another concern was volume reduction of high-level waste due to the high cost of underground storage tanks. Efforts toward this end involved reduction of nonvolatile components (previously discussed in the flowsheet section), increased concentration of high-level waste (eventual four-fold concentrator bottoms flow reduction), and denitration of the high-level waste. The process required alkalization of the waste with sodium hydroxide prior to storage in the underground, carbon steel waste tanks. After extensive laboratory study, equipment for a process utilizing formaldehyde to destroy nitric acid in the waste stream (1WW) without adding nonvolatile constituents to reduce sodium hydroxide additions was installed and briefly used in the plant. The reaction proved quite violent, causing excessive entrainment of 1WW in the gaseous products, resulting in high activity in the recovered acid. Sugar (sucrose) was tested as an alternative, proving eminently suitable, and was used after October 1963.

Two other topics merit discussion: intermediate-level waste disposal and plant rework of high-level-waste-containing product. Sump wastes and drainage from miscellaneous contaminated areas (i.e., sampler cave drains) are collected in TK-F18. This material may generally be disposed of to either nonboiling or boiling waste storage. If reworked due to high product content, it is processed through TK-F8.

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The TK-F8 proved very beneficial to the PUREX process. It is a standard tank equipped with a large steam coil and a condenser with capability to reflux by condensate return to F8 or concentrate by condensate disposal to TK-F7. Most material to be reworked contains some solvent. During prolonged refluxing, the solvent is degraded to nonvolatile phosphates, with the majority of the organic destroyed. Small batches of this rework material may then be blended with feed going to the first extraction column. The F18 and F8 operations have remained essentially unchanged throughout the history of the plant.

High-level waste without associated solvent may be reworked directly without F8 reflux. It has been found that F6 bottoms may be reworked with only occasional process upset, that partially sugar denitrated 1WW cannot be reworked without serious process upset, and that post-sugar/post-high-temperature digestion 1WW can be reworked with some beneficial effects on first-cycle decontamination.

High-level waste treatment and acid recovery chronology are shown in Table B-6.

TABLE B-6. High-Level Waste Treatment and Acid Recovery Chronology.

Time period	High-level waste treatment and acid recovery
February 1957	Vacuum fractionator on-line
September 1958	Tested anion exchange for product recovery from concentrated first-cycle waste
September 1962	E-F11 (evaporator) shut down; single evaporation cycle waste treatment initiated
August 1963	Test denitration of 1WW using formaldehyde
September 1963	Successful sugar denitration of PUREX 1WW
November 1966	First $\text{SO}_4^{=}$ -free 1WW campaign
November 1967	First condensate recycle system, F5 condensate used as reflux (acid absorber distillate)
March 1971	E-F11 used to concentrate sump material and coil condensate and cooling water

MAJOR EQUIPMENT CHANGES, 1954 to 1972

A chronology of equipment changes is given in Table B-7. Equipment changes preceded plant construction. One of the earliest, significant decisions concerning plant equipment involved redesign of the first-generation concentrator to provide removable steam tube bundles. Based on laboratory information and offsite experience, the tube bundle failure rate due to corrosion was expected (and subsequently found) to be considerably more frequent than originally believed.

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TABLE B-7. Chronology of Major Equipment Changes,
1956 to 1972. (Sheet 1 of 2)

Time period	Major equipment changes
Mid-1954	Removable tube bundles on all concentrators
April to May 1955	Went to longer scrub sections on HA and 1A columns. Required deepening cells
November 1955	Pumps placed in E6 to H1, E5 to E6 (jet dilution too great)
May 1956	Unidiameter 1A column installed, replacing L cell package (went to single stripper and a concentrator)
November 1956	T-K2 (2D) bottom interface column with "Zebra" (both stainless steel and plastic plates) scrub cartridge installed
April 1957	Ti tube bundle installed in the Pu product concentrator
November 1957	Bottom interface Zebra scrub cartridge HA installed
January 1958	N Cell Pu anion exchange system installed
February 1958	Replaced silver reactor
March 1958	G7 turbo-mixer installed
June 1958	HC and 1A columns removed; HS column and TK-J2 installed
December 1958	Second 40-ton crane installed
June 1960	Installed new HS, 1C, and 2E column
February 1961	Replaced 2A column (which was a packed column) with one with a cartridge
August 1961	Replaced concentrator tube bundle steam traps on trap pits south of 202-A with in-cell, diaphragm-operated valves
August to October 1962	Installed Np recovery and purification equipment
August 1965	Installed first annular dissolver ⁽³⁾ . Floor in cell rebuilt. New silver reactor (two beds) installed in A cell
January 1966	Second annular dissolver installed with modified vent in B cell; some concrete along one wall removed
April 1966	Installed new N6 and N7 vessels (Ta-lined and all Ti, respectively)
September 1966	C3 annular dissolver installed

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TABLE B-7. Chronology of Major Equipment Changes,
1956 to 1972. (Sheet 2 of 2)

Time period	Major equipment changes
February 1967	UNH rework concentration and reflux system installed in 203 area (TK-P6)
March 1967	Installed: geometrically favorable 2AF tank (TK-J5), improved N6 demister, greater capacity J4 cartridge (in hot spare column)
May 1967	Two-bed silver reactor in C cell; Zirflex decladding waste treatment system in E cell
June 1967	Unidiameter HA column installed. Also, new specially designed tanks installed in F7 position
April 1968	First use of Cd as neutron poison during rework Pu transfers (L11 to E6) (in solvent extraction)
June 1968	Bypassed HS column, codecontamination cycle decontamination factor dropped by factor of two to three, but was acceptable
July 1968	Replaced N cell resin "pusher" with "puller" and was unsuccessful
June 1969	E-F6 leaked and was replaced. First sectionalized concentrator installation
July 1969	Replaced barometric condenser for the acid fractionator with shell-and-tube unit
November 1969	Installed IUD recycle system
July 1970	Installed sectionalized concentrators in F11 and H4 positions for Th campaign
December 1970 to January 1971	Replaced L cell package with third Pu cycle
January 1971	All three dissolver coils leaked
March 1971	Replaced B3 dissolver
September 1971	Installed new C3 dissolver
December 1971	Installed dissolver with plate coil in A3 position

This basic concentrator was succeeded in the 1960s by the sectionalized concentrator which provided a common reboiler compatible with two differing towers: one tower designed for simple evaporation and acid boiloff service, the other for organic stripping (uranium) service. The first sectionalized concentrator to be installed replaced an acid concentrator.

The chronology cited covers most of the major equipment changes at PUREX. In general, the reasons for the changes were:

- Equipment failure with attendant modifications intended to preclude future failures
- Inadequate equipment performance and, generally, increased capacity desired
- Desired improvements in process performance.

SIGNIFICANT EVENTS, 1956 to 1972

The chronology shown in Table B-8 is a record of significant events occurring from 1956 to 1972.

PUREX PLANT PROJECTS

Table B-9 shows all past projects at PUREX resulting in actual equipment and facility changes.

The nature of the projects changed with time. Initially, most projects were directed toward process refinement. Gradually, emphasis shifted toward increased production. The third phase was directed toward increased plant versatility and safety. A fourth phase was directed toward upgrading the facility to meet more restrictive requirements for environmental discharges and conduct of operations.

FIRE PROTECTION SPRINKLER PROJECTS

Fire protection facilities were originally provided only in the process cells and the laboratory area. The process cells were provided with a manually operated, water-fog, fire protection system and Fireye photoelectric detectors, and the laboratory area was provided with a fire detection system. In 1967, an automatic sprinkler system was installed in the laboratory area and provided a laboratory storage area equipped with an automatic sprinkler system (Project IAP-605). In 1968, supervised automatic sprinkler systems were installed in the following areas (Project IAP-615): west end of first floor service area up to and including the main entrance lobby and airlock on the east; west transformer substation, dock storage

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(from Manry and Prosk 1985)

area; regulated and hot shops, including airlock; N cell airlock; and the east end of the storage gallery. This project also provided fire detectors in the west switchgear and cable rooms, and the existing paint storage area fire detectors in the 2714-A building were connected to the PUREX alarm circuit. In 1974, the light-water, aqueous, film-forming-foam sprinkler system was installed in process cells G, H, J, K, and R and TK-R1A under Projects HCP-678 and B-115. The dissolver down tanks were seismically upgraded to assure structural survival in the event of an earthquake under Project B-336.

TABLE B-8. Chronology of Significant Events. (Sheet 1 of 3)

Time period	Event
February 20, 1956	Blowback of contamination from L package-pressurized stripper to force overflow with a manometer ⁽⁷⁾
April 7, 1956	Partition failure due to NO ₂ recycle
June 2, 1956	First U product met specifications
February 13, 1958	Silver reactor explosion ⁽⁸⁾ (returned to service August 28, 1958)
February 23, 1958	Fire in hot shop (oil or acid soaked rags); minor loss of contamination control in the hot shop area
March 24, 1959	Seepage from A sump in F cell into storage gallery roped off and covered with blocks for shielding; rebuilt cell floor
January 10, 1960	PR can pressurization (lacked vent hole in gasket). One small loss of contamination control in the PR area
February 25, 1960	Fire in N cell (welding)
April 3, 1961	30,000 gal of 57% HNO ₃ drained to chemical sewer due to error in valving
April 20, 1961	1,335 lb of depleted U drained to crib due to valve leak
January 1962	F11 tube bundle; changeout resulted in major loss of contamination control in the canyon area
March 3, 1962	13,600 gal of water on floor in K cell. Loss of contamination control in the PR room
June 3, 1963	Caustic added to uncovered Al-clad fuel produced H ₂ explosion. No significant equipment damage
August 1963	Charge of insufficiently aged fuel to C3. Dissolver idled for 2 mo

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(from Manry and Prosk 1985)

TABLE B-8. Chronology of Significant Events. (Sheet 2 of 3)

Time period	Event
April 9 to 19, 1964	Main exhaust filter differential pressure increased rapidly to 14 in. WG due to pluggage by ammonium nitrate. New exhaust filter installed
June 14, 1964	TK-F15 coil leaked; approximately 10,000 Ci discharged to pond. Routings changed so that discharges of most coils exposed to high-activity solutions are to steam condensate crib
February 1966	A-36-A crib overloaded with radionuclides (new dissolver); switched to 216-A-36-B
September 23, 1966	PR can tipped over on PR elevator; minor loss of contamination control to the PR elevator area
May 10, 1968	UNH truck leaked from PUREX to UO ₃ ; minor U contamination
May 15, 1968	Overflowed cask in 212-A; no loss of contamination control in the 212-A facility
December 1969	Dumped a bucket of Zircaloy-clad N Reactor fuel on floor; fuel elements retrieved
May 1970	Approximately 14,000 Ci discharged to 216-A-36-B crib due to leaking valve in scrubber drain to catch tank
August to December 1970	Stack emission during Th processing ⁽⁹⁾ primarily due to Ru volatilization
January 3, 1971	First dissolver coil leak (C3) discovered
March 1971	All three dissolver coils subsequently found to leak
April 8 to 22, 1971	Pu polymer found in third Pu cycle due to omission of HNO ₃ to 3BP during startup operability testing
October 1971	Spilled a canister of N Reactor fuel on B cell floor; picked some up, covered rest with water (water leaked out expansion joint and contaminated the storage gallery)
December 4, 1971	KOH inadvertently added to C3 dissolver. As a result, Pu was precipitated as a Pu polymer. U feed solution reacidified with HNO ₃ , digested at an elevated temperature for an extended time, and processed as normal feed
January 1972	High PR stack Pu emissions (L9 sampler pressurized tank)

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(from Manry and Prosk 1985)

TABLE B-8. Chronology of Significant Events. (Sheet 3 of 3)

Time period	Event
February 23, 1972	Greater than 500 g Pu accumulated in F11 ⁽¹⁰⁾
April 3, 1972	Transferred excessive Pu to TK-D4 ⁽¹¹⁾ (exceeded total Pu limit specifications)
April 11, 1972	Sugar denitrated a waste batch with greater than 811 g of Pu ⁽¹²⁾
June 26 to July 17, 1972	14 of 19 charges exceeded criticality prevention limits for spike fuel due to change in canister load size. One deliberate excessive charge also made ⁽¹³⁾

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(from Manry and Prosk 1985)

TABLE B-9. PUREX Projects. (Sheet 1 of 5)

	Project	Description
CA-513-A	PUREX facility	Design and construction of PUREX separations plant with appurtenant tank farm and required outside facilities to process production metal fuel
CA-513-C	Three-column prototype with concentrator	Built in 300 Area to test large-size pulse columns and concentration step in the PUREX process
CA-513-E	PUREX Plant modifications	Addition of a spare 40-ton crane, and conversion to 2-cycle process
CG-598	Vacuum fractionator	Auxiliary structure to PUREX, enclosing vacuum acid fractionator and associated equipment
CG-647	Backup (radioiodine) removal	293-A facility
CG-683	Reroute PUREX cooling water to new pond	216-A-271 diversion box to pond 216-A-25 retention basin
CG-686	In-line monitoring instruments, REDOX and PUREX	Provide equipment for in-line monitoring. PUREX installation and modifications of gamma and alpha monitors and an automatic air cutoff. Iodine--A, B, C, and F 293-A. Gamma--G5, H3, J5A, and K3. Alpha--L1, L8, and 2BP
CG-742	HA column replacement--PUREX	Provide an HA column of new design to replace the existing column. The new column to be designed for a 4.0 capacity. The project includes burial of the old column and additional instrumentation and piping
CG-766	Additional ventilation for PUREX P&O gallery	Provide additional ventilation facilities, including a new blower, new ductwork, associated controls, and other minor equipment
CAC-140	PUREX ventilation filter replacement	Provide replacement for PUREX ventilation exhaust filter
CAC-152	PUREX analytical laboratory additions	Provide alteration and an addition to existing facilities
CAC-895	Reliability improvements 3.6 capacity factor, PUREX	D3/D4, demineralizer anion column, formaldehyde (TK-40)

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(from Manry and Prosk 1985)

TABLE B-9. PUREX Projects: (Sheet 2 of 5)

	Project	Description
CAC-964	New burial tunnel	Construction of new tunnel for retrievable storage of failed equipment
CGC-124	Increased processing flexibility--provide facilities for processing of natural, E metal, D metal, N Reactor fuel elements, and PRTR fuel elements	New J5, F7/F26, sump modifications for nuclear safety
CGC-172	Pu concentration and storage facilities--L cell--PUREX	Provide modifications to the existing L cell package. New L11, safe for ²³³ U
CGC-773	Interim waste crib--PUREX	Provide a new crib with associated piping and equipment for 200 East Area for disposing of condensate from PUREX boiling wastes
CGC-821	Project birch--PUREX Np	Provide in-canyon and gallery facilities in the PUREX Plant for recovery and decontamination of Np as a nitrate salt in aqueous solution from the PUREX waste streams
CGC-854	Conversion of PUREX anion exchange prototype to a manufacturing unit--N cell	Provision of a control room enclosure, access air lock and concrete radiation shielding wall, new improved feed pump system, and associated work to convert the facility to a manufacturing unit
CGC-873	FP loadout facility--PUREX	Provide an FP loadout facility on the south side of the PUREX building for transferring material from existing in-canyon vessels to suitable shipping containers (212-A Building)
CGC-891	PUREX 216-A-6 replacement (process condensate)	216-A-10 crib
CGC-929	NPR fuels processing annular dissolvers	Provide separation facilities for processing fuels from the new production reactor
CA-930	Secondary containment of dissolver offgases	Provide backup filters for each dissolver system in PUREX and REDOX facilities

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(from Manry and Prosk 1985)

TABLE B-9. PUREX Projects. (Sheet 3 of 5)

	Project	Description
IAP-600	PUREX 203-A UNH rework storage facility	TK-P6 installation in 203-A
IAP-601	Coproduct demonstration processing facilities, 200 Area	Coproduct insert
IAP-606	PUREX process condensate crib, 216-A-38	Replace A-10
IAP-608	PUREX D cell in-line sample station	D5 cave and canyon recirculation system
IAP-610	PUREX steam condensate crib, 216-A-37-1	A-30 replacement
IAP-615	Fire protection facilities, PUREX	Hot shop, regulated shop, service, and storage gallery
ICE-628	Third plutonium solvent extraction cycle, PUREX	Replace existing stripper concentrator with a third SX cycle, stripper-concentrator, and associated tanks
HCP-677	PUREX condensate bypass and pump system, 200 East Area	A pump tank and new run of piping (including a section over the railroad tunnel)
HCP-678	Improved fire protection, PUREX	Upgraded in-plant protection system
HCP-685	PUREX NH ₃ scrubber, Waste Concentration Facilities	F11 receives NH ₃ scrubber wastes
B-107	PUREX condensate recycle	Recycle AAD and AFD with excess to TK-F10, 3WD combination with 1UD
B-112	Waste management effluent control	Second-stage filtration--PR stack; filtration of R cell and U cell exhaust; upgrade sampling capability, retention basin for cooling water. Install third PUREX filter
B-115	Additional fire protection, PUREX Plant	J, K, L, and R cells on fire-foam system. New sprinkler system in ventilation tunnel
B-128	PUREX waste routing to 214-A-102 and -103 tanks	New waste routing
B-129	Piping from PUREX 241-AX-151 Encasement to 241-A valve pits	Route alkalinized and dilute wastes to 242-A system

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TABLE B-9. PUREX Projects. (Sheet 4 of 5)

	Project	Description
B-132	PUREX NH ₃ offgas system	Ties E cell scrubber offgas to F11
B-151	PUREX safeguards	Guardhouse and vehicle inspection equipment
B-153	PUREX Plant fire protection	Upgrades portions of facility to national fire safety codes
B-172 B-172A	Hanford plant security inspections, 200 Areas	Tie-in PUREX alarm systems with central computer, improve communications network. New perimeter fence
B-175	Plutonium oxide conversion facility	Provides facility in N cell to convert Pu nitrate to PuO ₂ product
B-175A	PuO ₂ rework	Provides batch equipment to dissolve off-specification PuO ₂ and other recoverable material for rework in the PUREX process
B-188	NH ₃ scrubber waste sampling system	Adds sampling system to NH ₃ scrubber waste discharge for environmental monitoring
B-189	Primary stack systems	Adds sampler monitor and flow totalizing systems to the primary PUREX stack (216-A-1)
B-190	Chemical sewer systems	Adds monitor and flow diversion systems for effluent control
B-191	PR room stack systems	Adds sampling, monitoring, and flow totalizing systems for effluent monitoring
B-196	Pollution abatement	Adds H ₂ O ₂ injection system to reduce NO _x emissions from the primary ventilation stack (291-A-1)
B-201	PUREX safeguards improvements	Building perimeter fencing, lighting, intrusion detection
B-203	Process condensate systems	Adds improved sampling, monitoring, and flow totalizing capability to the process condensate waste discharge
B-205	PUREX P&O gallery services upgrade	New cable trays and cable separation in P&O gallery
B-220	Waste transfer facilities, 200 Areas	Additional PUREX acid waste and neutralized high-level waste lines routed to PUREX

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TABLE B-9. PUREX Projects. (Sheet 5 of 5)

	Project	Description
B-254	UNH storage area effluents	Adds collection, sampling, and selective disposal routing for environmental control
B-268	Pond 216-B-3 expansion	Expands pond 216-B-3 to receive increased flow of cooling water from PUREX
B-280	Additional waste lines 202-A to 244-AR	Install PUREX high-level waste lines
B-281	Additional waste lines 202-A to 241-AW	Install PUREX high-level waste lines
B-311	HVAC centralized control	Adds control room instruments for centralized control of ventilation systems 1 and 2
B-313	PUREX perimeter intrusion detection system addition	Provides a second intrusion detection and alarm system for PUREX
B-336	PUREX seismic upgrade	Reinforces dissolver drown tanks to assure structural survival in the event of an earthquake. Adds backup light water foam fire protection system for Cells H and J
B-346	HVAC pressure zone	Provides airlocks to segregate 202-A facility into four distinct pressure zones and provides the differential pressure sensors/alarms to monitor those pressure zones
B-379	White room filtration system	Adds HEPA filters and control instruments to divert airflow in the event of a leak in the P&O gallery
B-382	PUREX backup generators	Adds motor-generator sets and electrical switchgear to provide backup power
B-410	Lag storage tank	Adds additional tank for Pu nitrate storage

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(from Manry and Prosk 1985)

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11. ARHCO, Criticality Specification Violation - Exceeding 10,000 grams Plutonium Limit in TK-D4, ARH-2466, Atlantic Richfield Hanford Company, Richland, Washington (April 25, 1972).
12. ARHCO, Sugar Denitration of Zirflex High-Level Waste, ARH-2340, Rev. 1, Table B-7, Atlantic Richfield Hanford Company, Richland, Washington (April 25, 1972).
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APPENDIX C

**PUREX WASTE GENERATION DATA FROM THE SOLID
WASTE INFORMATION TRACKING SYSTEM**

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**PUREX WASTE GENERATION DATA FROM THE SOLID
WASTE INFORMATION TRACKING SYSTEM**

The information found in this appendix is from the Solid Waste Information Tracking System (SWITS) database. This database incorporates the older Richland — Solid Waste Information Management System (R-SWIMS) database and is used to track information on radioactive and other wastes stored or disposed of 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 transuranic (TRU) waste generated at the Plutonium-Uranium Extraction (PUREX) Plant; however, some general information on the non-TRU waste is included for completeness. The term non-TRU is used in lieu of low-level waste (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 Waste Retrieval and Processing Plant (WRAP) 1 will focus on 55-gal drums, these container types are considered separately. There are also runs separating 202-A from 202-AL waste.

Some general information about the 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 12/1/92.

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

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

SWIR402

Solid Waste Information and Tracking System

05/01/92

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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 — SORTED BY WASTE TYPE**

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**CONTAINER NUMBER AND WEIGHT OF TRU WASTE IN
55-GALLON DRUMS — SORTED 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 the Plutonium-Uranium Extraction (PUREX) Plant 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 studied cautiously, especially for low-level waste (LLW) codes. Concern is warranted because LLW records are still done on a batch basis. This means that one weight or volume datum may be the composite for a group of drums. The computer program simply divided the sum of all values by the number of values used to compute the total, not the actual number of containers which that value represents.

From 1970 until 1978 individual container weights were not required for transuranic (TRU) waste 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 (149.9 lb). This is why the average weight per drum for TRU is so consistent during this period.

```

set linesize 160
set pagesize 44
set newpage 0
spool judy2.srep
title '202A/202AL'
btitle left 'pot2.sql'
break on dt skip 1
compute sum of sum(con_gross_wgt) on cntyp_descr
compute sum of sum(rdet_rswims_count) on cntyp_descr
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 99999999.99      heading "Weight"
col sum(rdet_rswims_count) format 999999      heading "Count"
col avg(con_gross_wgt) format 99999.99        heading "Avg|Weight"
col con_cntr_vol      format 9999.99          heading "Volume"
col avg(con_cntr_vol) format 9999.99          heading "Avg|Volume"
col cntry_descr       format a30              heading "Container Description"
col con_size_descr    format a20              heading "Container Size"
select
    cntyp_descr,
    con_size_descr,
    substr(to_char(con_tsd_accept_dt, 'YYYY'), 1, 4) dt,
    con_pwtyp_cd,
    rdet_swtyp_cd,
    sum(con_gross_wgt),
    sum(rdet_rswims_count),
    avg(con_gross_wgt),
    con_cntr_vol,
    avg(con_cntr_vol)
from radwaste, contype
where con_tsd_accept_dt between '01-jan-70' and '17-jun-92' and
con_size_descr = '55 GALLON' and con_srce_facil_id in ('202A', '202AL') 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,
    con_cntr_vol
;
spool off

```

Tue Aug 11

202A/202AL

Date CNTYP_DESCR	Container Size	Prf	Sec	West	Type	Weight	Count	Avg	Weight	Volume	Avg	Volume
1979 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A			93.89	1		93.89	.21		.21

SUM						93.89	1					
1982 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A			326.58	9		326.58	1.89		1.89

SUM						326.58	9					
1984 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D			73.98	1		73.98	.21		.21

SUM						73.98	1					
1985 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D			1315.09	19		69.22	.21		.21

SUM						1315.09	19					
1986 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C			2121.90	31		68.45	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D			316.01	5		63.20	.21		.21

SUM						2437.91	36					
1987 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C			2681.06	39		68.75	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D			1313.05	17		77.24	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A			408.23	2		204.12	.21		.21

SUM						4402.34	58					
1988 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C			155.03	3		51.68	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D			2722.94	32		85.09	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A			544.32	8		68.04	.21		.21

SUM						3422.29	43					
1989 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C			90.99	1		90.99	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C			115.66	2		57.83	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D			221.08	3		73.69	.21		.21

pot2.sql

Tue Aug 11

202A/202AL

Date	CNTP_DESCR	Container	Size	Pri	Sec	West	East	Type	Weight	Count	Avg	Weight	Volume	Avg	Volume
1989	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	1D			M	1537.21	15		102.48	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	2A			M	4271.48	28		152.55	.21		.21

sum									6236.42	49					
1990	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	1C			M	185.92	2		92.96	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	1D			M	481.99	5		96.40	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	2A			M	7502.41	54		138.93	.21		.21

sum									8170.32	61					
1991	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	1C			M	61.01	1		61.01	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	1D			M	725.98	6		121.00	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	2A			M	2512.87	22		114.22	.21		.21

sum									3299.86	29					
1992	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	1A			M	277.00	3		92.33	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	2A			M	1570.63	14		112.19	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	M	2A			M		3					

sum									1847.63	20					
1970	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A			R	54295.92	798		68.04	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			R	408.23	12		408.23	2.52		2.52
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	UG			R	136.08	2		136.08	.42		.42
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	UG			R	952.54	28		952.54	5.87		5.87

sum									55792.77	840					
1971	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A			R	87227.28	1282		68.04	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			R	68.04	1		68.04	.21		.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			R	136.08	2		136.08	.42		.42
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			R	204.12	3		204.12	.63		.63

sum									87635.52	1288					
	pot2.sql														

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Date CNTYP_DESCR	Container Size	Pri Sec		Weight	Count	Avg	
		Wast	Type			Weight	Volume
1972 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	57357.72	843	68.04	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	938.93	10	938.93	2.10

sum				58296.65	853		
1973 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	8096.76	119	68.04	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	93.89	1	93.89	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	281.68	3	281.68	.63

sum				8472.33	123		
1974 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	5511.24	81	68.04	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	187.78	2	93.89	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	187.79	2	187.79	.42
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	375.57	4	375.57	.84

sum				6262.38	89		
1975 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	2381.40	35	68.04	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	93.89	1	93.89	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	187.79	2	187.79	.42
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	281.68	3	281.68	.63
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	375.57	4	375.57	.84
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	657.25	7	657.25	1.47
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	1126.72	12	1126.72	2.52

sum				5104.30	64		
1976 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	204.12	3	68.04	.21

sum				204.12	3		
1977 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	272.16	4	68.04	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	281.67	3	93.89	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	187.79	2	187.79	.42
pot2.sqi							

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Date	CNTYP_DESCR	Container	Size	Pri Sec		Type	Type	Weight	Count	Avg Weight	Volume	Avg Volume
				West	East							
1977	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			281.68	3	281.68	.63	.63
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			375.57	4	375.57	.84	.84
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			469.47	5	469.47	1.05	1.05
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1032.82	11	1032.82	2.31	2.31

sum								2901.16	32			
1978	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A			1020.60	15	68.04	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			141.52	2	70.76	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			93.89	1	93.89	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			375.57	4	375.57	.84	.84
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1314.50	14	657.25	1.47	1.47

sum								2946.08	36			
1979	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A			4898.88	72	68.04	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			187.78	2	93.89	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			563.37	6	187.79	.42	.42
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			375.58	23	187.79	.43	.43
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			563.36	6	281.68	.63	.63
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			281.68	3	281.68	.64	.64
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			375.57	4	375.57	.84	.84
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1088.62	4	1088.62	.85	.85
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			469.47	5	469.47	1.06	1.06

sum								8804.31	125			
1980	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			375.58	4	187.79	.43	.43
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			375.57	4	375.57	.84	.84

sum								751.15	8			
1981	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			187.78	2	93.89	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			316.61	2	316.61	.42	.42
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			903.55	9	301.18	.63	.63
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			375.57	4	375.57	.84	.84

pot2.sql

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Date	CNTYP_DESCR	Container	Size	Pri	Sec	West	West	Type	Weight	Count	Avg	Weight	Volume	Avg	Volume
1981	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				127.01	10	127.01	2.10	2.10	2.10	2.10
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				1126.72	12	1126.72	2.52	2.52	2.52	2.52
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				3265.85	24	3265.85	5.03	5.03	5.03	5.03
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				3742.12	34	3742.12	7.13	7.13	7.13	7.13

sum									10045.21	97					
1982	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A				13744.38	227	60.55	.21	.21	.21	.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				281.67	3	93.89	.21	.21	.21	.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				420.48	6	140.16	.42	.42	.42	.42
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				45.36	2	45.36	.43	.43	.43	.43
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				589.67	12	196.56	.84	.84	.84	.84
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				938.94	10	469.47	1.05	1.05	1.05	1.05
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				204.12	6	204.12	1.26	1.26	1.26	1.26
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				281.23	7	281.23	1.47	1.47	1.47	1.47
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				340.19	10	340.19	2.10	2.10	2.10	2.10
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				340.19	14	340.19	2.93	2.93	2.93	2.93

sum									17186.23	297					
1983	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A				115.22	2	57.61	.21	.21	.21	.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1D				540.64	8	67.58	.21	.21	.21	.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				456.76	5	91.35	.21	.21	.21	.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				1428.81	8	357.20	.42	.42	.42	.42
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				2154.57	12	538.64	.63	.63	.63	.63
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				2086.52	16	521.63	.84	.84	.84	.84
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				170.10	5	170.10	1.05	1.05	1.05	1.05
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				2267.95	10	2267.95	2.10	2.10	2.10	2.10
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				635.03	20	635.03	4.19	4.19	4.19	4.19
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				3175.13	35	3175.13	7.33	7.33	7.33	7.33

sum									13030.73	121					
1984	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1A				2191.79	30	73.06	.21	.21	.21	.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1D				3145.03	51	61.67	.21	.21	.21	.21
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A				562.45	7	80.35	.21	.21	.21	.21

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Date	CNTYP_DESCR	Container	Size	Pri Sec		Wast	Type	Weight	Count	Avg Weight	Volume	Avg Volume
				Type	Wast							
1984	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1807.10	18	200.79	.42	.42
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			930.77	12	232.69	.63	.63
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2712.48	24	452.08	.84	.84
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			771.10	5	771.10	1.05	1.05
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1678.28	6	1678.28	1.26	1.26
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			8931.64	49	1275.95	1.47	1.47
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2086.51	8	2086.51	1.70	1.70
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2789.58	9	2789.58	1.89	1.89
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2131.87	10	2131.87	2.10	2.10
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1360.77	10	1360.77	2.12	2.12
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1746.32	22	873.16	2.31	2.31
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2160.44	39	720.15	2.72	2.72
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1020.58	15	1020.58	3.14	3.14

sum								36026.71	315			
1985	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1D			3527.97	67	52.66	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			147.42	2	73.71	.21	.21
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			136.08	2	136.08	.42	.42
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1349.44	9	449.81	.63	.63
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			104.33	3	104.33	.64	.64
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			176.90	4	176.90	.84	.84
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			181.44	4	181.44	.85	.85
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2267.95	5	2267.95	1.05	1.05
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2449.39	6	2449.39	1.26	1.26
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			4127.67	28	1031.92	1.47	1.47
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2267.95	7	2267.95	1.49	1.49
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			8209.98	24	2736.66	1.68	1.68
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2041.16	8	2041.16	1.70	1.70
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			8935.74	54	1489.29	1.89	1.89
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			6577.07	30	2192.36	2.10	2.10
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2267.95	11	2267.95	2.34	2.34
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			8731.60	36	2910.53	2.52	2.52
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			3401.93	14	3401.93	2.93	2.93
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			1247.37	22	1247.37	4.61	4.61
	METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			2041.16	27	2041.16	5.66	5.66

pot2.sql

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Date	CHYP_DESCR	Container	Size	Pri	Sec	Wast	Type	Weight	Count	Avg	Weight	Volume	Avg	Volume
1985	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			4309.11	60	2154.56	6.29	6.29		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			789.25	58	789.25	12.15	12.15		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			5102.89	75	5102.89	15.72	15.72		

sum								70391.75	556					
1986	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1C			1128.90	24	47.04	.21	.21		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1D			1249.05	24	52.04	.21	.21		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			90.72	2	45.36	.21	.21		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			408.24	8	102.06	.42	.42		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			158.76	3	158.76	.63	.63		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			589.67	8	294.84	.84	.84		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			226.80	5	226.80	1.05	1.05		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			884.49	18	294.83	1.26	1.26		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			714.40	7	714.40	1.47	1.47		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			2131.87	16	1065.94	1.68	1.68		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			1984.46	20	992.23	2.10	2.10		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			1791.68	11	1791.68	2.29	2.29		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			2301.97	22	1150.99	2.31	2.31		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			1079.54	24	539.77	2.52	2.52		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			2109.19	13	2109.19	2.72	2.72		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			3061.73	13	3061.73	2.72	2.72		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			2177.23	14	2177.23	2.93	2.93		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			2313.31	15	2313.31	3.14	3.14		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			3175.13	18	3175.13	3.77	3.77		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			952.54	21	952.54	4.40	4.40		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			2630.82	29	2630.82	6.08	6.08		

sum								31160.50	315					
1987	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1C			1236.49	24	51.52	.21	.21		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	1D			393.37	11	35.76	.21	.21		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			90.72	1	90.72	.21	.21		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			204.12	3	204.12	.63	.63		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			1587.57	10	793.79	1.05	1.05		
	METAL DRUMS, BARRELS, KEGS	55	GALLON	R	2A			601.01	7	601.01	1.47	1.47		

pot2.sql

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Date CNTYP_DESCR	Container Size	Pri	Sec	Wast				Avg			
				Type	Type	Weight	Count	Weight	Volume	Volume	Volume
1987 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			907.18	9	907.18	1.91	1.91	1.91
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			374.21	11	374.21	2.31	2.31	2.31
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			2721.54	24	1360.77	2.52	2.52	2.52
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			2347.33	14	2347.33	2.93	2.93	2.93
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			852.75	15	852.75	3.14	3.14	3.14
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			1156.65	17	1156.65	3.56	3.56	3.56
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			816.46	18	816.46	3.77	3.77	3.77
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			2267.95	19	2267.95	3.98	3.98	3.98
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			1814.36	20	1814.36	4.19	4.19	4.19
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			2721.54	21	2721.54	4.40	4.40	4.40
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3L			50.98	1	50.98	.21	.21	.21

SUM						20144.23	225				
1988 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C			346.95	7	49.56	.21	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D			364.01	6	60.67	.21	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			1973.15	13	151.78	.21	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			90.72	2	90.72	.42	.42	.42
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			272.15	3	272.15	.63	.63	.63
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			544.31	8	544.31	1.68	1.68	1.68
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			1179.33	13	1179.33	2.72	2.72	2.72
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			1088.62	16	1088.62	3.35	3.35	3.35
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			4127.67	34	2063.84	3.56	3.56	3.56
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			1496.85	19	1496.85	3.98	3.98	3.98
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			2143.21	42	1071.61	4.40	4.40	4.40
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			598.74	22	598.74	4.61	4.61	4.61
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			14696.32	81	14696.32	16.97	16.97	16.97
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A			2177.24	4	544.31	.21	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3L			106.01	2	53.01	.21	.21	.21

SUM						31205.28	272				
1989 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C			851.84	17	50.11	.21	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A			2396.84	41	58.46	.21	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A			7807.39	17	459.26	.21	.21	.21

pot2.sql											

Tue Aug 11

202A/202AL

Date CNTYP_DESCR	Container	Size	Pri Sec		Type	Type	Weight	Count	Avg	Weight	Volume	Avg	Volume
			Wast	Wast									
sum							11056.07	75					
1990 METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1C			422.98	8		52.87	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1D			574.00	10		57.40	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			6761.19	158		42.79	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A			46869.62	655		71.56	.21		.21

sum							54627.79	831					
1991 METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1C			354.02	5		70.80	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1D			63.00	1		63.00	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1D			889.96	12		74.16	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A			345.45	4		86.36	.20		.20
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A			7816.38	131		59.67	.21		.21

sum							9468.81	153					
1992 METAL DRUMS, BARRELS, KEGS	55 GALLON		R	1A			324.00	4		81.00	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	2A			127.95	2		63.98	.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON		R	3A			2557.00	49		52.18	.21		.21

sum							3008.95	55					
1991 METAL DRUMS, BARRELS, KEGS	55 GALLON		RP	2A			49.00	1		49.00	.21		.21

sum							49.00	1					

pot2.sql

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APPENDIX C.2

202-A TRU WASTE CONTAINERS

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202-A TRU WASTE CONTAINERS

This subappendix provides information on 202-A transuranic (TRU) waste including container type, weight, volume, and primary waste type stored at various TRU waste storage type facilities on the Hanford Site. The data provide the TRU waste generation from 202-A by year; data on waste from 202-AL are included in the next subappendix.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot3.srep
tttitle center 'TRU WASTE - 202A 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 = '202A'
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

```

TRU WASTE - 202A WHC

Container Description	Container Size	Date	Type	Facility	Count	Weight	Avg	
							Weight	Volume
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1969	R	218E128	1	63.50	63.50	.14
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R		218E128	669	3641.41	34.68	41.83

		SUM			670	3704.91		
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970	M	218E128	8	43.54	43.54	.50
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R		218E128	305	1654.68	39.40	19.62

		SUM			313	1698.22		
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969	M	218E128	23	292.11	292.11	2.93
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R		218E128	1471	18502.78	134.08	1.35

		SUM			1494	18794.89		
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970	M	218E128	20	254.01	254.01	2.83
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R		218E128	687	8725.30	212.81	2.14

		SUM			707	8979.31		
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1971	R	218E128	12	152.40	12.70	1.52

		SUM			12	152.40		
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972	R	218E128	2	25.40	12.70	.25

		SUM			2	25.40		
FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	1977	R	218A3A	1	7212.08	7212.08	36.25

		SUM			1	7212.08		
FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	1978	R	218A3A	1	9978.98	9978.98	36.25

		SUM			1	9978.98		
FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981	R	218A4C	3	23133.08	7711.03	130.40

		SUM			3	23133.08		43.47

TRU WASTE - 202A WHC

Container Description	Container Size	Date	Type	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1969 R		218E128	1	40.82	40.82	.18	.18

		SUM			1	40.82			
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS HEPA FILTERS	UNKNOWN UNKNOWN	1970 R		218E128	3	122.46	40.82	.53	.18
		R		218E128	4	3283.09	1094.36	7.32	2.44

HEPA FILTERS	UNKNOWN	SUM			7	3405.55			
		1972 R		218E128	8	2217.12	277.14	4.94	.62

HEPA FILTERS	UNKNOWN	SUM			8	2217.12			
		1975 R		218E128	8	2032.08	254.01	4.53	.57

METAL BOXES, CARTONS, CASES	2.5*2.5*4	SUM			8	2032.08			
		1971 R		218E128	18	5715.18	317.51	12.74	.71

METAL BOXES, CARTONS, CASES	2.5*2.5*4	SUM			18	5715.18			
		1972 R		218E128	7	2222.57	317.51	4.96	.71

METAL BOXES, CARTONS, CASES	3*3*4	SUM			7	2222.57			
		1971 R		218E128	1	457.22	457.22	1.02	1.02

METAL BOXES, CARTONS, CASES	3*4*7	SUM			1	457.22			
		1972 R		218E128	1	1066.84	1066.84	2.38	2.38

METAL BOXES, CARTONS, CASES	4.3*2.6*2.6	SUM			1	1066.84			
		1974 R		218E128	3	1115.82	371.94	2.49	.83

METAL BOXES, CARTONS, CASES	6*6*7	SUM			3	1115.82			
		1985 R		218E128	3	7097.33	2365.78	21.90	7.30

TRU WASTE - 202A WHC

Container Discription	Container Size	Date	Type	Facility	Count	Weight	Avg	
							Weight	Volume
		1989 M	2401W	1	2159.09	2159.09	7.14	7.14
METAL BOXES, CARTONS, CASES	6*6*7	1971 R	218E128	1	317.51	317.51	.71	.71
METAL BOXES, CARTONS, CASES	UNKNOWN	1978 R	218W48	6	1524.06	254.01	3.40	.57
METAL BOXES, CARTONS, CASES	UNKNOWN	1984 R	218W4C	2	4069.61	2034.81	14.27	7.14
METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	218W4C	1	6350.26	6350.26	14.27	14.27
METAL DRUMS, BARRELS, KEYS	3*3*4	1971 R	218E128	4	1828.88	457.22	4.08	1.02
METAL DRUMS, BARRELS, KEYS	55 GALLON	1969 R	218E128	7	657.24	164.31	1.47	.37
METAL DRUMS, BARRELS, KEYS	55 GALLON	1970 R	218E128	412	27079.90	70.52	86.51	.23
METAL DRUMS, BARRELS, KEYS	55 GALLON	1971 R	218E128	711	48376.44	68.04	149.31	.21

TRU WASTE - 202A WHC

Container Description	Container Size	Date	Type	Facility	Count	Weight	Avg	
							Weight	Volume
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972	R	218E128	367	24970.68	68.04	77.07
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		218W48	39	2653.56	68.04	8.19

		SUM			406	27624.24		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R	218W48	94	6395.76	68.04	19.74

		SUM			94	6395.76		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974	R	218W48	68	4626.72	68.04	14.28

		SUM			68	4626.72		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975	R	218W48	31	2109.24	68.04	6.51

		SUM			31	2109.24		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978	R	218W4C	10	680.40	68.04	2.10

		SUM			10	680.40		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R	218W4C	66	4490.64	68.04	13.86

		SUM			66	4490.64		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1982	R	218W4C	227	13744.38	60.55	47.67

		SUM			227	13744.38		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1983	R	218W4C	10	655.86	65.59	2.10

		SUM			10	655.86		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M	218W4C	1	73.98	73.98	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		218W4C	81	5336.82	65.89	17.01

		SUM			82	5410.80		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M	218W4C	19	1315.09	69.22	3.99

Container Description	Container Size	Pri		Date	Type	Facility	Count	Weight	Avg	
		Wast	Vol						Weight	Volume
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R	218WAC	67	3527.97	52.66	14.07	.21		

		sum		86	4843.06					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	218WAC	5	316.01	63.20	1.05	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	224T	31	2121.90	68.45	6.51	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	218WAC	24	1249.05	52.04	5.04	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	224T	24	1128.90	47.04	5.04	.21		

		sum		84	4815.86					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	218WAC	2	105.01	52.51	.42	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	224T	54	3889.10	72.02	11.34	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	218WAC	4	192.00	48.00	.84	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	224T	31	1437.86	46.38	6.51	.21		

		sum		91	5623.97					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	224T	34	2801.95	82.41	7.14	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2402M	1	76.02	76.02	.21	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	218WAC	4	246.03	61.51	.84	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	224T	8	398.93	49.87	1.68	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2403WA	1	66.00	66.00	.21	.21		

		sum		48	3588.93					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	224T	16	1363.94	85.25	3.35	.21		

		sum		16	1363.94					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	224T	7	667.91	95.42	1.47	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	224T	17	942.96	55.47	3.57	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2403WA	1	54.02	54.02	.21	.21		

		sum		25	1664.89					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	224T	7	786.99	112.43	1.47	.21		
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	224T	18	1306.98	72.61	3.78	.21		

TRU WASTE - 202A WHC

Container Description	Container Size	Date	Type	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Sum			25	2093.97			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 M		224T	3	277.00	92.33	.62	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		224T	4	324.00	81.00	.83	.21
METAL DRUMS, BARRELS, KEGS	85 GALLON	M		240248	1	96.80	96.80	.40	.40
METAL DRUMS, BARRELS, KEGS	85 GALLON	M		F88	2	207.30	103.65	.81	.40

		Sum			10	905.10			
MISCELLANEOUS SCRAP	UNKNOWN	1969 R		218E128	5	971.59	323.86	2.17	.72

		Sum			5	971.59			
MISCELLANEOUS SCRAP	UNKNOWN	1970 R		218E128	1	76.20	76.20	.17	.17

		Sum			1	76.20			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1969 M		218E128	1	114.30	114.30	.26	.26
SELF CONTAINED, EQUIPMENT	UNKNOWN	R		218E128	16	339.28	84.82	1.46	.36
SELF CONTAINED, EQUIPMENT	UNKNOWN	R		218E15	1	79468.97	79468.97	67.96	67.96

		Sum			18	79922.55			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1970 M		218E128	5	254.01	254.01	.57	.57
SELF CONTAINED, EQUIPMENT	UNKNOWN	R		218E128	7	381.02	63.50	1.19	.20
SELF CONTAINED, EQUIPMENT	UNKNOWN	R		218E15	2	158937.94	79468.97	135.92	67.96

		Sum			14	159572.97			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1971 R		218E15	3	238406.91	79468.97	203.88	67.96

		Sum			3	238406.91			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1972 R		218E15	2	79151.46	39575.73	67.68	33.84

		Sum			2	79151.46			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1983 R		218E15	1	79468.97	79468.97	67.96	67.96

TRU WASTE - 202A WHC					Page: 7	
Container Discription	Container Size	Date	Type	Facility	Pri	
					Wast	
					Count	Avg
					Weight	Volume
					Weight	Volume
		SUM			1	79488.97
SELF CONTAINED, EQUIPMENT	UNKNOWN	1986 R		218E15	3	158756.50
		****				52918.83
		SUM			3	158756.50
SELF CONTAINED, EQUIPMENT	UNKNOWN	1987 R		218E15	1	36287.20
		****				36287.20
		SUM			1	36287.20
SELF CONTAINED, EQUIPMENT	UNKNOWN	1988 R		218E15	1	18143.60
		****				18143.60
		SUM			1	18143.60
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R		218E12B	5	1802.56
		****				360.51
		SUM			5	1802.56
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970 R		218E12B	1	508.02
		****				508.02
		SUM			1	508.02

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APPENDIX C.3

202-AL TRU WASTE CONTAINERS

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202-AL TRU WASTE CONTAINERS

This subappendix provides information on 202-AL transuranic (TRU) waste including container type, weight, volume, and primary waste type stored at various TRU waste storage facilities on the Hanford Site. The data provide the TRU waste generation from 202-AL by year; data on waste from 202-A are included in the previous subappendix.

```

set linesize 170
set pagesize 44
set newpage 0
spool pot3.srep
title center 'TRU WASTE - 202AL 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"
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 = 'WHC' and
con_srce_facil_id = '202AL'
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

```

TRU WASTE - 202AL UHC

Container Discription	Container Size	Pri			Wast			Avg	Volume
		Date	Type	Facility	Count	Weight	Weight		
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1969 R		210E128	99	538.86	8.83	6.17	.10

		SUM			99	538.86			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970 R		210E128	51	277.57	12.62	3.18	.14

		SUM			51	277.57			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969 R		210E128	765	9715.61	74.74	97.49	.75

		SUM			765	9715.61			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 R		210E128	281	3568.75	75.93	35.80	.76

		SUM			281	3568.75			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1971 R		210E128	2	25.40	12.70	.25	.13

		SUM			2	25.40			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972 R		210E128	2	25.40	12.70	.25	.13

		SUM			2	25.40			
HEPA FILTERS	UNKNOWN	1969 R		210E128	5	63.50	63.50	.64	.64

		SUM			5	63.50			
METAL DRUMS, BARRELS, KEGS	30 GALLON	1971 R		210E128	2	81.64	40.82	.23	.12

		SUM			2	81.64			
METAL DRUMS, BARRELS, KEGS	30 GALLON	1972 R		210E128	3	122.46	40.82	.35	.12

		SUM			3	122.46			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970 R		210E128	416	28304.64	68.04	87.36	.21

		SUM			416	28304.64			

TRU WASTE - 202AL WHC

Container Description	Container Size	Pri		Date	Type	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Ust								
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R	218E128	571	38950.84	68.04	119.91	.21			

		SUM		571	38950.84						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R	218E128	399	27147.96	68.04	83.79	.21			
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	218W48	38	2585.52	68.04	7.98	.21			

		SUM		437	29733.48						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R	218W48	25	1701.00	68.04	5.25	.21			

		SUM		25	1701.00						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R	218W48	13	884.52	68.04	2.73	.21			

		SUM		13	884.52						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R	218W48	4	272.16	68.04	.84	.21			

		SUM		4	272.16						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R	218W48	3	204.12	68.04	.63	.21			

		SUM		3	204.12						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R	218W48	4	272.16	68.04	.84	.21			

		SUM		4	272.16						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R	218W48	5	340.20	68.04	1.05	.21			

		SUM		5	340.20						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R	218W4C	6	408.24	68.04	1.26	.21			

		SUM		6	408.24						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	224T	5	601.00	120.20	1.05	.21			

TRU WASTE - 202AL WHC

Container Discription	Container Size	Date	Type	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R		224T	17	851.84	50.11	3.57	.21

		SUM			22	1452.84			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1970 R		218E128	2	120.65	120.65	.27	.27

		SUM			2	120.65			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1971 R		218E128	1	68.04	68.04	.21	.21

		SUM			1	68.04			
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R		218E128	31	14519.04	468.36	32.67	1.05

		SUM			31	14519.04			
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970 R		218E128	11	4139.18	376.29	9.23	.84

		SUM			11	4139.18			

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APPENDIX C.4

202-A NON-TRU WASTE CONTAINERS

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202-A NON-TRU WASTE CONTAINERS

This subappendix provides information on 202-A nontransuranic (non-TRU) waste including container type, weight, volume, and primary waste type disposed of or stored at various facilities on the Hanford Site. The data provide the non-TRU waste generation from 202-A by year.

```

set linesize 175
set pagesize 45
set newpage 0
spool pot3a.srep
title center 'NON-TRU WASTE- 202A' -
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_facil_id = '202A'
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

```

NON-TRU WASTE- 202A

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg	
		Wast	Sec							Weight	Volume
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1973 R	2A	218E128	2	25.40	25.40	2	25.40	25.40	.26

		SUM			2	25.40					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1976 R	2A	218E128	1	12.70	12.70	1	12.70	12.70	.13

		SUM			1	12.70					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1977 R	2A	218E128	2	171.46	171.46	2	171.46	171.46	.38

		SUM			2	171.46					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1978 R	2A	218E128	10	918.06	459.03	10	918.06	459.03	17.91

		SUM			10	918.06					8.96
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1979 R	2A	218E128	3	127.00	63.50	3	127.00	63.50	.28

		SUM			3	127.00					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1980 R	2A	218E128	12	333.39	166.70	12	333.39	166.70	2.26

		SUM			12	333.39					1.13
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1983 R	2A	218E128	7	715.31	178.83	7	715.31	178.83	3.82

		SUM			7	715.31					.96
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1984 R	2A	218E128	19	1771.28	354.26	19	1771.28	354.26	13.80

		SUM			19	1771.28					2.76
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1986 R	2A	218E128	35	4692.40	938.48	35	4692.40	938.48	34.23

		SUM			35	4692.40					6.85
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1987 R	2A	218E128	110	4025.63	447.29	110	4025.63	447.29	33.73

		SUM			110	4025.63					3.75

NON-TRU WASTE- 202A

Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast									
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1988 R	2A	218E128	81	5701.62	712.70	43.50	5.44			
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	R	2A	218M5	13	453.59	453.59	3.63	3.63			

		SUM			94	6155.21						
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1989 R	2A	218E128	1	12.70	12.70	.13	.13			

		SUM			1	12.70						
CONCRETE BOXES	10*12*22	1987 H	3A	218E10	2	69626.07	34813.04	149.12	74.56			

		SUM			2	69626.07						
CONCRETE BOXES	10*12*22	1988 R	3A	218E10	2	68492.09	34246.05	149.23	74.62			
CONCRETE BOXES	10*12*23	R	3A	218E10	1	32658.48	32658.48	74.59	74.59			

		SUM			3	101150.57						
CONCRETE BOXES	1672 CU FT	1983 R	3A	218E10	3	96161.08	32053.69	132.35	44.12			

		SUM			3	96161.08						
CONCRETE BOXES	1728 CU FT	1969 R	UR	218E10	5	112481.24	22496.25	252.31	50.46			

		SUM			5	112481.24						
CONCRETE BOXES	7*10*19	1983 R	3A	218E10	1	23586.68	23586.68	37.66	37.66			

		SUM			1	23586.68						
CONCRETE BOXES	7*10*19	1984 R	3A	218E10	3	97521.85	32507.28	112.99	37.66			

		SUM			3	97521.85						
CONCRETE BOXES	7*11*23	1982 R	3A	218E10	2	60781.06	30390.53	85.01	42.50			

		SUM			2	60781.06						
CONCRETE BOXES	8*10*19	1979 R	3A	218E10	1	30844.12	30844.12	43.04	43.04			

NON-TRU WASTE- 202A

Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Sec									
CONCRETE BOXES	8*12*19			1980	R	3A	218E10	1	33202.79	33202.79	53.52	53.52

				sum				1	33202.79			
CONCRETE BOXES	UNKNOWN			1970	R	3A	218E10	2	60735.70	30367.85	100.92	50.46
CONCRETE BOXES	UNKNOWN				R	UB	218E10	1	59012.06	59012.06	50.46	50.46

				sum				3	119747.76			
CONCRETE BOXES	UNKNOWN			1971	R	3A	218E10	4	90536.56	22634.14	201.84	50.46

				sum				4	90536.56			
CONCRETE BOXES	UNKNOWN			1972	R	3A	218E10	7	158438.98	22634.14	353.23	50.46

				sum				7	158438.98			
CONCRETE BOXES	UNKNOWN			1974	R	2A	218E128	1	22634.14	22634.14	50.46	50.46

				sum				1	22634.14			
CONCRETE BOXES	UNKNOWN			1985	R	3A	218E10	5	164199.58	32839.92	286.51	57.30

				sum				5	164199.58			
CONCRETE BOXES	UNKNOWN			1986	R	3A	218E10	6	163292.40	27215.40	455.62	75.94

				sum				6	163292.40			
DUMP TRUCK	UNKNOWN			1985	R	2A	218E128	30	132709.10	4423.64	181.23	6.04

				sum				30	132709.10			
DUMP TRUCK	UNKNOWN			1986	R	2A	218E128	23	43170.44	1876.98	283.42	12.32

				sum				23	43170.44			
DUMP TRUCK	UNKNOWN			1987	R	2A	218E128	27	60656.33	2246.53	326.12	12.08

NON-TRU WASTE- 202A

Container Discription	Container Size	Wast		Pri Sec		Avg	Volume
		Date	Type	Code	Facility		

		SUM				27	60656.33
DUMP TRUCK	UNKNOWN	1988 R	2A	218E128	7	21772.32	3110.33

		SUM			7	21772.32	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970 R	2A	218E128	14	76.20	15.24

		SUM			14	76.20	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1971 R	2A	218E128	24	130.63	43.54

		SUM			24	130.63	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1972 R	2A	218E128	39	195.95	19.60

		SUM			39	195.95	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1974 R	2A	218E128	7	38.10	38.10

		SUM			7	38.10	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1975 R	2A	218E128	7	38.11	9.53

		SUM			7	38.11	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1976 R	2A	218E128	12	65.32	16.33

		SUM			12	65.32	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1977 R	2A	218E128	39	212.26	15.16

		SUM			39	212.26	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1978 R	2A	218E128	37	201.40	14.39

		SUM			37	201.40	
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1979 R	2A	218E128	2	10.89	10.89

NON-TRU WASTE- 202A

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast									

		sum						2	10.89			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1980 R	2A	218E128	5	27.22	27.22	.31	.31			

		sum			5	27.22						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1981 R	2A	218E128	4	21.77	7.26	.25	.08			

		sum			4	21.77						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1982 R	2A	218E128	4	38.10	12.70	.37	.12			

		sum			4	38.10						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	4*4*8	1991 R	3A	218U5	1	1495.00	1495.00	4.00	4.00			

		sum			1	1495.00						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 R	2A	218E128	117	1485.95	114.30	14.91	1.15			

		sum			117	1485.95						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1971 R	2A	218E128	14	177.80	59.27	1.79	.60			

		sum			14	177.80						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972 R	2A	218E128	26	330.21	33.02	3.31	.33			

		sum			26	330.21						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1974 R	2A	218E128	26	330.21	82.55	3.31	.83			

		sum			26	330.21						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1975 R	2A	218E128	35	444.50	74.08	4.46	.74			

		sum			35	444.50						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1976 R	2A	218E128	94	1193.85	149.23	11.98	1.50			

NON-TRU WASTE- 202A

Container Discription	Container Size	Pri	Sec	Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume

				sum				94	1193.85			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1977	R	2A	218E12B			326	4140.37	115.01	41.54	1.15

		sum						326	4140.37			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1978	R	2A	218E12B			500	6529.90	159.77	63.72	1.55

		sum						500	6529.90			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1979	R	2A	218E12B			180	2321.44	82.91	22.94	.82

		sum						180	2321.44			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1980	R	2A	218E12B			82	1181.14	118.11	10.45	1.04

		sum						82	1181.14			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1981	R	2A	218E12B			341	4170.33	119.15	43.48	1.24

		sum						341	4170.33			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1982	R	2A	218E12B			1206	18355.99	206.25	153.67	1.73

		sum						1206	18355.99			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1983	R	2A	218E12B			1882	27618.20	263.03	239.82	2.28

		sum						1882	27618.20			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1984	R	2A	218E12B			2370	30911.75	328.85	305.03	3.25

		sum						2370	30911.75			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1985	R	2A	218E12B			3505	42775.83	365.61	453.04	3.87

		sum						3505	42775.83			
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1986	R	2A	218E12B			2715	39235.78	445.86	347.77	3.95

NON-TRU WASTE - 202A

Container Description	Container Size	Date	Type	Sec	Facility	Count	Weight	Avg Weight	%Volume	Avg Volume	
											Wast

		Sum				2715	39235.78				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1987 R	2A	218E128	3050	36820.18	413.71	388.65	4.37		

		Sum			3050	36820.18					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1988 R	2A	218E128	2168	29598.16	469.81	276.05	4.38		

		Sum			2168	29598.16					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1989 R	2A	218E128	1364	18072.84	13.24	173.36	.13		

		Sum			1364	18072.84					
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1972 R	2A	218E128	2	81.65	81.65	.36	.36		

		Sum			2	81.65					
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS GLOVE BOXES	UNKNOWN UNKNOWN	1978 R	2A	218E128	1	40.82	40.82	.18	.18		
		R	2A	218E128	1	362.87	362.87	2.61	2.61		

		Sum			2	403.69					
HEPA FILTERS	UNKNOWN	1972 R	2A	218E128	28	2844.92	2844.92	6.34	6.34		

		Sum			28	2844.92					
HEPA FILTERS	UNKNOWN	1974 R	2A	218E128	4	228.61	228.61	.51	.51		

		Sum			4	228.61					
HEPA FILTERS	UNKNOWN	1980 R	2A	218E128	4	113.40	113.40	.34	.34		

		Sum			4	113.40					
HEPA FILTERS	UNKNOWN	1982 R	2A	218E128	50	520.27	173.42	4.25	1.42		

		Sum			50	520.27					

NON-TRU WASTE- 202A

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast									
HEPA FILTERS	UNKNOWN	1983 R	2A	218E128	72	1111.30	370.43	10.19	3.40			

		SUM			72	1111.30						
HEPA FILTERS	UNKNOWN	1984 R	2A	218E128	21	179.62	89.81	3.51	1.76			

		SUM			21	179.62						
HEPA FILTERS	UNKNOWN	1985 R	2A	218E128	8	72.57	72.57	.91	.91			

		SUM			8	72.57						
HEPA FILTERS	UNKNOWN	1986 R	2A	218E128	99	1097.69	274.42	14.69	3.67			

		SUM			99	1097.69						
HEPA FILTERS	UNKNOWN	1987 R	2A	218E128	26	521.63	173.88	5.49	1.83			

		SUM			26	521.63						
HEPA FILTERS	UNKNOWN	1988 R	2A	218E128	32	875.43	175.09	6.23	1.25			

		SUM			32	875.43						
HEPA FILTERS	UNKNOWN	1989 R	2A	218E128	17	347.44	20.44	2.94	.17			

		SUM			17	347.44						
METAL BOXES, CARTONS, CASES	8*8*20	1988 R	2A	218W5	1	5443.08	5443.08	34.43	34.43			

		SUM			1	5443.08						
METAL BOXES, CARTONS, CASES	UNKNOWN	1975 R	2A	218E128	2	188.24	188.24	.42	.42			

		SUM			2	188.24						
METAL BOXES, CARTONS, CASES	UNKNOWN	1979 R	2A	218E128	1	136.08	136.08	.51	.51			

		SUM			1	136.08						

NON-TRU WASTE- 202A

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg	
		Wast	Mast							Weight	Volume
METAL DRUMS, BARRELS, KEGS	30 GALLON	1978 R	2A	218E128	1	40.82	40.82	.12	.12		

		SUM			1	40.82					
METAL DRUMS, BARRELS, KEGS	30 GALLON	1981 R	2A	218E128	1	77.11	77.11	.12	.12		

		SUM			1	77.11					
METAL DRUMS, BARRELS, KEGS	30 GALLON	1989 MP	2A	2401W	1	34.55	34.55	.15	.15		

		SUM			1	34.55					
METAL DRUMS, BARRELS, KEGS	30 GALLON	1990 M	2A	2401W	1	46.45	46.45	.11	.11		
		M	2A	2402MB	3	151.71	50.57	.34	.11		
		M	2A	2402MC	2	64.60	32.30	.22	.11		
		M	2A	2402MD	1	38.60	38.60	.15	.15		
		M	2A	FS4	1	33.64	33.64	.11	.11		
		M	2A	FS5	1	49.99	49.99	.11	.11		
		MP	2A	2401W	1	21.40	21.40	.11	.11		

		SUM			10	406.39					
METAL DRUMS, BARRELS, KEGS	30 GALLON	1991 M	2A	2402MG	1	45.40	45.40	.11	.11		
		M	2A	2403MA	1	36.40	36.40	.11	.11		
		M	2A	FS5	2	42.70	21.35	.22	.11		

		SUM			4	124.50					
METAL DRUMS, BARRELS, KEGS	5 GALLON	1978 R	2A	218E128	44	952.54	317.51	1.87	.62		

		SUM			44	952.54					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970 R	2A	218E128	12	408.23	408.23	2.52	2.52		

		SUM			12	408.23					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R	2A	218E128	3	204.12	102.06	.63	.31		

		SUM			3	204.12					

NON-TRU WASTE- 202A

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	1972 R	2A	218E128	10	938.93	938.93	2.10	2.10			

		SUM			10	938.93						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R	2A	218E128	3	281.68	281.68	.63	.63			

		SUM			3	281.68						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R	2A	218E128	7	657.25	219.08	1.47	1.47			
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W3A	1	93.89	93.89	.21	.21			

		SUM			8	751.14						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R	2A	218E128	20	1877.86	469.47	4.19	4.19			

		SUM			20	1877.86						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R	2A	218E128	28	2629.00	328.63	5.87	5.87			

		SUM			28	2629.00						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R	2A	218E128	21	1925.48	320.91	4.40	4.40			

		SUM			21	1925.48						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 M	2A	218E128	1	93.89	93.89	.21	.21			
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218E128	53	3905.43	300.42	7.17	7.17			

		SUM			54	3999.32						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1980 R	2A	218E128	8	751.15	250.38	1.69	1.69			

		SUM			8	751.15						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1981 R	2A	218E128	93	9669.64	966.96	19.49	19.49			

		SUM			93	9669.64						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1982 R	2A	218E128	43	2463.45	246.35	9.02	9.02			

Container Discription	Container Size	Pri	Sec	Wast			Avg
				Date	Type	Code	
				Count	Weight	Volume	
		SUM		43	2463.45		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1983 R	2A	218E12B	73	7453.85	

		SUM		73	7453.85		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1984 R	2A	218E12B	121	7931.02	

		SUM		121	7931.02		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R	2A	218E12B	317	20847.04	

		SUM		317	20847.04		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 R	2A	218E12B	165	12056.43	

		SUM		165	12056.43		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	2A	218E12B	2	408.23	
		R	2A	218E12B	157	15140.84	
		R	3L	218W5	1	50.98	

		SUM		160	15600.05		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	2A	2401W	6	408.24	
		M	2A	2402W	2	136.08	
		R	2A	218E12B	202	23244.22	
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W5	17	1428.81	
		R	2A	2402WE	12	1632.96	
		R	3L	218W5	2	106.01	

		SUM		241	26956.32		
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	2A	2401W	1	86.18	
		M	2A	2402W	17	3304.88	
		M	2A	2402WD	7	712.14	
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	2402WJ	3	168.28	
		R	2A	218E12B	14	785.35	

		SUM		42	5056.83		

NON-TRU WASTE- 202A

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Sec									
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	M	2A	2402M			9	1234.90	137.21	1.89	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402MB			3	171.86	57.29	.63	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402MC			23	4917.15	213.79	4.83	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402MD			16	874.47	54.65	3.36	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402MI			2	266.30	133.15	.42	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	FS4			1	37.73	37.73	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		2A	218M5			20	1140.96	57.05	4.20	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		3A	218M5			635	45867.04	72.23	133.35	.21

SUM								709	54510.41			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	M	2A	2401W			1	55.90	55.90	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402W			3	360.74	120.25	.63	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402MB			1	51.80	51.80	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402ME			8	678.44	84.81	1.68	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402MG			2	141.39	70.70	.42	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2403MA			5	1134.60	226.92	1.05	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	FS2			1	45.50	45.50	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	FS6			1	44.50	44.50	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		3A	218M5			15	1087.67	72.51	3.11	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	RP		2A	2401W			1	49.00	49.00	.21	.21

SUM								38	3649.54			
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	M	2A	2402MB			3	77.70	77.70	.63	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2402ME			6	1100.90	183.48	1.26	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	2403MA			2	54.50	54.50	.42	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	FS5			1	62.50	62.50	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M		2A	FS8			1	53.00	53.00	.21	.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		2A	218M5			2	84.50	42.25	.40	.20
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		2A	2402ME			2	358.20	179.10	.40	.20
METAL DRUMS, BARRELS, KEGS	55 GALLON	R		3A	218M5			71	3502.40	49.33	14.20	.20

SUM								88	5293.70			
METAL DRUMS, BARRELS, KEGS	85 GALLON	1987	M	2A	218M3A			1	204.12	204.12	.33	.33
METAL DRUMS, BARRELS, KEGS	85 GALLON	R		2A	218E12B			11	1496.85	748.43	4.45	2.23

SUM								12	1700.97			

NON-TRU WASTE- 202A

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg	
		Wast	Mast							Weight	Volume
METAL DRUMS, BARRELS, KEGS	85 GALLON	1988 R	2A	218E128	3	226.80				226.80	1.22
METAL DRUMS, BARRELS, KEGS	85 GALLON	R	2A	218W5	2	385.55				385.55	.81

		SUM			5	612.35					
METAL DRUMS, BARRELS, KEGS	85 GALLON	1990 R	3A	218W5	13	1827.34				140.56	.40

		SUM			13	1827.34					
MISCELLANEOUS SCRAP	UNKNOWN	1970 R	2A	218E128	110	9525.39				9525.39	21.24

		SUM			110	9525.39					
MISCELLANEOUS SCRAP	UNKNOWN	1975 R	2A	218E128	4	628.67				314.34	1.40

		SUM			4	628.67					
MISCELLANEOUS SCRAP	UNKNOWN	1981 R	2A	218E128	1	214.09				214.09	1.29

		SUM			1	214.09					
MISCELLANEOUS SCRAP	UNKNOWN	1984 R	2A	218E128	1	286.22				286.22	1.05

		SUM			1	286.22					
MISCELLANEOUS SCRAP	UNKNOWN	1985 R	2A	218E128	2	6350.27				3175.14	10.14

		SUM			2	6350.27					
MISCELLANEOUS SCRAP	UNKNOWN	1986 R	2A	218E128	10	2213.52				442.70	4.11

		SUM			10	2213.52					
MISCELLANEOUS SCRAP	UNKNOWN	1988 R	2A	218E128	16	3175.13				793.78	5.24

		SUM			16	3175.13					
SELF CONTAINED, EQUIPMENT	1*13	1991 R	2A	218W5	1	258.00				258.00	.31
SELF CONTAINED, EQUIPMENT	1.1*7.5	R	3A	218W3A	1	125.00				125.00	.22

NON-TRU WASTE- 202A

Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Wast	Wast									
SELF CONTAINED, EQUIPMENT	1.9*22	1991	R	3A	218U3A			1	482.00	482.00	1.60	1.60
SELF CONTAINED, EQUIPMENT	10*6*3		R	2A	218U5			1	727.30	727.30	5.10	5.10
SELF CONTAINED, EQUIPMENT	10.05*10.7		R	3A	218U3A			1	3864.00	3864.00	23.72	23.72
SELF CONTAINED, EQUIPMENT	12*12*4		R	2A	218U5			1	1613.60	1613.60	17.00	17.00
SELF CONTAINED, EQUIPMENT	13.88*14		R	3A	218U3A			2	15000.00	7500.00	77.43	38.72
SELF CONTAINED, EQUIPMENT	2*8		R	3A	218U3A			1	523.00	523.00	.73	.73
SELF CONTAINED, EQUIPMENT	3.05*5		R	3A	218U3A			2	546.00	273.00	2.80	1.40
SELF CONTAINED, EQUIPMENT	3.82*8.5		R	3A	218U3A			1	1804.00	1804.00	2.95	2.95
SELF CONTAINED, EQUIPMENT	4*2*4		R	2A	218U5			1	909.10	909.10	.91	.91
SELF CONTAINED, EQUIPMENT	4*2*8		R	3A	218U3A			1	264.00	264.00	1.06	1.06
SELF CONTAINED, EQUIPMENT	4.5*5		R	3A	218U3A			1	841.00	841.00	2.32	2.32
SELF CONTAINED, EQUIPMENT	5*5*3		R	3A	218U3A			1	386.00	386.00	2.10	2.10
SELF CONTAINED, EQUIPMENT	5.7*12		R	3A	218U3A			1	2045.00	2045.00	8.62	8.62
SELF CONTAINED, EQUIPMENT	5.8*4		R	3A	218U3A			1	1682.00	1682.00	2.90	2.90
SELF CONTAINED, EQUIPMENT	7*3*8		R	2A	218U5			2	6818.00	3409.00	9.52	4.76
SELF CONTAINED, EQUIPMENT	7*9.33		R	3A	218U3A			1	2227.00	2227.00	10.10	10.10
SELF CONTAINED, EQUIPMENT	7.6*22		R	2A	218U3A			1	3136.00	3136.00	28.00	28.00
SELF CONTAINED, EQUIPMENT	7.86*9.33		R	3A	218U3A			1	2500.00	2500.00	12.70	12.70
SELF CONTAINED, EQUIPMENT	8*8*2		R	2A	218U5			1	7045.50	7045.50	3.20	3.20
SELF CONTAINED, EQUIPMENT	8.04*14.0		R	3A	218U3A			1	3500.00	3500.00	19.91	19.91
SELF CONTAINED, EQUIPMENT	8.04*8.00		R	3A	218U3A			1	2318.00	2318.00	11.40	11.40
SELF CONTAINED, EQUIPMENT	8.17*14.0		R	3A	218U3A			1	3545.00	3545.00	20.55	20.55
SELF CONTAINED, EQUIPMENT	9.5*9.8		R	3A	218U3A			1	3409.00	3409.00	26.20	26.20
SELF CONTAINED, EQUIPMENT	9.75*9.83		R	3A	218U3A			1	3455.00	3455.00	20.60	20.60
SELF CONTAINED, EQUIPMENT	NONE		R	2A	218U5			2	386.30	193.15	.95	.48

sum								31	69409.80			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1972	R	2A	218E12B			1	304.81	304.81	.68	.68

sum								1	304.81			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1973	R	2A	218E12B			5	63.50	63.50	.64	.64

sum								5	63.50			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1975	R	2A	218E12B			2	25.40	25.40	.26	.26

sum								2	25.40			

NON-TRU WASTE- 202A

Container Description	Container Size	Date	Type	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
SELF CONTAINED, EQUIPMENT	UNKNOWN	1978	R	2A	218E128	1	1221.97	1221.97	2.72	2.72

		SUM				1	1221.97			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1980	R	2A	218E128	1	362.87	362.87	.45	.45
SELF CONTAINED, EQUIPMENT	UNKNOWN	R	2A	218W3A	8	1088.62	1088.62	4.08	4.08	4.08

		SUM				9	1451.49			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1981	R	2A	218E128	3	326.58	326.58	4.25	4.25

		SUM				3	326.58			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1984	R	2A	218E128	4	3628.72	1209.57	50.12	16.71

		SUM				4	3628.72			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1986	R	2A	218E128	1	1814.36	1814.36	14.50	14.50

		SUM				1	1814.36			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1987	R	2A	218E128	43	4671.99	778.67	41.03	6.84

		SUM				43	4671.99			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1988	R	2A	218E128	8	4626.62	925.32	28.49	5.70

		SUM				8	4626.62			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1989	R	2A	218E128	46	1628.80	35.41	24.91	.54

		SUM				46	1628.80			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1990	R	2A	218W5	1	899.92	899.92	32.62	32.62
SELF CONTAINED, EQUIPMENT	UNKNOWN	R	3A	218W3AE	18	193943.28	10774.63	759.77	42.21	42.21

		SUM				19	194843.20			
SELF CONTAINED, EQUIPMENT	UNKNOWN	1991	R	3A	218W3A	1	19635.91	19635.91	111.99	111.99
SELF CONTAINED, EQUIPMENT	UNKNOWN	R	3A	218W3AE	10	75449.58	7544.96	403.89	40.39	40.39

NON-TRU WASTE - 202A

Container Description	Container Size	Date	Type	Code	Facility	Count	Weight	Pri Sec		Avg Weight	Volume	Avg Volume
								Wast	Sum			
TANKS, PORTABLE	7.6*22	1991	R	3A	218W3A	1	3136.00			3136.00	28.00	28.00
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	7*7*9	R	2A	218W5		2	500.00			250.00	25.00	12.50

		SUM				14	98721.49					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1972	R	2A	218E128	7	24339.65			8113.22	36.25	12.08

		SUM				7	24339.65					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1973	R	2A	218E128	1	635.03			635.03	1.42	1.42

		SUM				1	635.03					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1974	R	2A	218W3A	1	1433.34			1433.34	3.19	3.19

		SUM				1	1433.34					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1977	R	2A	218E128	4	6517.18			3258.59	14.53	7.26

		SUM				4	6517.18					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1978	R	2A	218E128	2	3530.74			3530.74	7.87	7.87

		SUM				2	3530.74					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1979	R	2A	218E128	3	1179.34			393.11	18.83	6.28

		SUM				3	1179.34					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1980	R	2A	218E128	3	4535.90			1511.97	8.87	2.96

		SUM				3	4535.90					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1981	R	2A	218E128	2	1814.36			1814.36	42.48	42.48

		SUM				2	1814.36					
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1982	R	2A	218E128	2	2041.16			1020.58	24.55	12.28

		SUM				2	2041.16					

NON-TRU WASTE- 202A

Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg	
		Wast	Wast							Weight	Volume
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1983	R	2A	218E12B	4	3447.29	861.82	33.70	8.42	

		SUM				4	3447.29				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1984	R	2A	218E12B	10	17826.10	1782.61	51.68	5.17	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	2A	218A3A	1	136.08	136.08	4.96	4.96	

		SUM				11	17962.18				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1985	R	2A	218E12B	49	119486.96	2438.51	395.23	8.07	

		SUM				49	119486.96				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1986	M	2A	218E12B	1	1814.36	1814.36	14.61	14.61	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	2A	218E12B	40	70499.26	1762.48	474.59	11.86	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	2A	218A3A	3	3084.41	1028.14	18.94	6.31	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	2A	218A5	1	1360.77	1360.77	9.06	9.06	

		SUM				45	76758.80				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1987	R	2A	218E12B	38	45238.83	1190.50	420.61	11.07	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	2A	218A5	1	453.59	453.59	16.31	16.31	

		SUM				39	45692.42				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1988	R	2A	218E12B	40	45667.45	1141.69	338.66	8.47	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	2A	218A5	1	498.95	498.95	9.06	9.06	

		SUM				41	46166.40				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1989	R	2A	218E12B	17	26657.44	1568.08	112.81	6.64	

		SUM				17	26657.44				
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1990	R	2A	218E12B	9	4459.08	495.45	59.79	6.64	
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	2A	218A3A	5	1583.11	316.62	82.20	16.44	

		SUM				14	6042.19				

NON-TRU WASTE- 202A

Container Discription	Container Size	Date	Type	Sec	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1991 R	2A	2A	218W5	6	1500.12	250.02	74.99	12.50

		sum				6	1500.12			
WOODEN BOXES, CARTONS, CASES	2*6*6	1974 R	2A	2A	218E12B	1	914.44	914.44	2.04	2.04

		sum				1	914.44			
WOODEN BOXES, CARTONS, CASES	4*4*8	1989 R	3A	3A	218W5	9	7438.87	826.54	44.86	4.98

		sum				9	7438.87			
WOODEN BOXES, CARTONS, CASES	4*4*8	1990 R	3A	3A	218W5	55	41824.60	760.45	224.40	4.08

		sum				55	41824.60			
WOODEN BOXES, CARTONS, CASES	4*4*8	1991 R	3A	3A	218W5	163	133735.96	820.47	654.44	4.01

		sum				163	133735.96			
WOODEN BOXES, CARTONS, CASES	4*4*8	1992 R	2A	2A	218W5	1	463.00	463.00	4.00	4.00
		R	3A	3A	218W5	40	29845.00	746.13	160.00	4.00

		sum				41	30308.00			
WOODEN BOXES, CARTONS, CASES	4*5*8	1989 R	3A	3A	218W5	10	7529.59	752.96	49.84	4.98

		sum				10	7529.59			
WOODEN BOXES, CARTONS, CASES	4*6*10	1981 R	2A	2A	218E12B	2	3912.22	1956.11	13.59	6.80

		sum				2	3912.22			
WOODEN BOXES, CARTONS, CASES	UNKNOWN	1983 R	2A	2A	218E12B	54	498.95	498.95	6.12	6.12

		sum				54	498.95			

246 rows selected.

APPENDIX C.5

202-AL NON-TRU WASTE CONTAINERS

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202-AL NON-TRU WASTE CONTAINERS

This subappendix provides information on 202-AL nontransuranic (non-TRU) waste including container type, weight, volume, and primary waste type disposed of or stored at various facilities on the Hanford Site. The data provide the non-TRU waste generation from 202-AL by year.

```

set linesize 175
set pagesize 45
set newpage 0
spool pot3a.srep
tttitle center 'NON-TRU WASTE- 202AL' -
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_facil_id = '202AL'
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

```

NON-TRU WASTE- 202AL

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg	
		Mast	Wast							Weight	Volume
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1979 R	2A	218E128	3	907.18	907.18	4.19	4.19		

		SUM			3	907.18					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1982 R	2A	218E128	1	14.97	14.97	.18	.18		

		SUM			1	14.97					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1983 R	2A	218E128	4	287.57	287.57	2.51	2.51		

		SUM			4	287.57					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1984 R	2A	218E128	4	671.31	671.31	1.20	1.20		

		SUM			4	671.31					
BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1989 R	2A	218E128	24	414.15	414.15	4.68	4.68		

		SUM			24	414.15					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1972 R	2A	218E128	6	32.65	32.65	.37	.37		

		SUM			6	32.65					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1973 R	2A	218E128	3	16.33	16.33	.19	.19		

		SUM			3	16.33					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 R	2A	218E128	4	50.80	50.80	.51	.51		

		SUM			4	50.80					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972 R	2A	218E128	272	3454.42	3454.42	34.66	34.66		

		SUM			272	3454.42					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1973 R	2A	218E128	234	2971.86	2971.86	29.82	29.82		

		SUM			234	2971.86					

NON-TRU WASTE - 202AL

Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg	
		Wast	Sec							Weight	Volume
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1974	R	2A	218E128	34	431.82	107.96	4.33	1.08	

		sum				34	431.82				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1975	R	2A	218E128	54	685.83	114.31	6.88	1.15	

		sum				54	685.83				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1976	R	2A	218E128	29	469.91	156.64	3.82	1.27	

		sum				29	469.91				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1977	R	2A	218E128	26	330.21	110.07	3.31	1.10	

		sum				26	330.21				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1978	R	2A	218E128	46	622.32	103.72	5.86	.98	

		sum				46	622.32				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1979	R	2A	218E128	4	50.80	50.80	.51	.51	

		sum				4	50.80				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1980	R	2A	218E128	6	76.20	76.20	.77	.77	

		sum				6	76.20				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1981	R	2A	218E128	12	152.41	152.41	1.53	1.53	

		sum				12	152.41				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1982	R	2A	218E128	181	2164.57	144.30	23.06	1.54	

		sum				181	2164.57				
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1983	R	2A	218E128	1061	12754.16	196.22	135.20	2.08	

		sum				1061	12754.16				

NON-TRU WASTE- 202AL

Container Description	Container Size	Pri Sec		Date	Wast Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1984 R	2A	218E128	2048	26700.61	256.74	260.97	2.51			

		sum			2048	26700.61						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1985 R	2A	218E128	2198	29834.86	278.83	281.62	2.63			

		sum			2198	29834.86						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1986 R	2A	218E128	1884	25655.04	275.86	240.12	2.58			

		sum			1884	25655.04						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1987 R	2A	218E128	1413	19254.92	296.23	207.87	3.20			

		sum			1413	19254.92						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1988 R	2A	218E128	1334	19300.29	316.40	170.00	2.79			

		sum			1334	19300.29						
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1989 R	2A	218E128	654	9278.26	14.19	83.06	.13			

		sum			654	9278.26						
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1972 R	2A	218E128	4	163.29	54.43	.53	.18			

		sum			4	163.29						
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1977 R	2A	218E128	1	40.82	40.82	.12	.12			

		sum			1	40.82						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1971 R	2A	218E128	1	40.82	40.82	.12	.12			

		sum			1	40.82						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1972 R	2A	218E128	84	3318.90	67.73	9.74	.20			

		sum			84	3318.90						

NON-TRU WASTE- 202AL

Container Description	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg Weight	Volume	Avg Volume
		Mast	Sec									
METAL DRUMS, BARRELS, KEGS	30 GALLON	1973 R	2A	218E128	48	1959.48	61.23	5.57	.17			

		SUM			48	1959.48						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1977 R	2A	218E128	1	40.82	40.82	.12	.12			

		SUM			1	40.82						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1978 R	2A	218E128	7	263.08	87.69	.81	.27			

		SUM			7	263.08						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1979 R	2A	218E128	5	204.12	204.12	.58	.58			

		SUM			5	204.12						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1981 R	2A	218E128	16	453.59	453.59	2.04	2.04			

		SUM			16	453.59						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1982 R	2A	218E128	1	56.70	56.70	.12	.12			

		SUM			1	56.70						
METAL DRUMS, BARRELS, KEGS	30 GALLON	1983 R	2A	218E128	1	68.04	68.04	.12	.12			

		SUM			1	68.04						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R	2A	218E128	3	204.12	204.12	.63	.63			

		SUM			3	204.12						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R	2A	218E128	1	93.89	93.89	.21	.21			

		SUM			1	93.89						
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R	2A	218E128	9	845.04	422.52	1.89	.94			

		SUM			9	845.04						

NOW-TRU WASTE- 202AL

Container Discription	Container Size	Pri Sec		Date	Type	Code	Facility	Count	Weight	Avg	
		Wast	Sec							Weight	Volume
METAL DRUMS, BARRELS, KEGS	55 GALLON	1981	R	2A	218E128	4	375.57	375.57	.84	.84	

		SUM				4	375.57				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1982	M	2A	218E128	9	326.58	326.58	1.89	1.89	
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218E128	27	978.40	163.07	5.66	.94		

		SUM				36	1304.98				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1983	R	2A	218E128	38	4921.02	378.54	7.96	.61	

		SUM				38	4921.02				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	R	2A	218E128	113	22758.87	910.35	23.73	.95	

		SUM				113	22758.87				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R	2A	218E128	172	46016.74	2300.84	36.12	1.81	

		SUM				172	46016.74				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R	2A	218E128	102	16726.12	1858.46	21.36	2.37	

		SUM				102	16726.12				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R	2A	218E128	32	3322.55	1107.52	6.71	2.24	

		SUM				32	3322.55				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R	2A	218E128	22	1905.08	635.03	4.61	1.54	
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A	218W5	4	2177.24	544.31	.84	.21		

		SUM				26	4082.32				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989	R	2A	218E128	27	1611.49	59.68	5.67	.21	
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A	218W5	17	7807.39	459.26	3.57	.21		

		SUM				44	9418.88				
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R	2A	218E128	138	5620.23	40.73	28.98	.21	

NON-TRU WASTE- 202AL

Container Description	Container Size	Date	Type	Code	Facility	Count	Weight	Pri Sec		Avg	Weight	Volume	Avg	Volume
								Mast	Wast					
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	3A	218W5	20	1002.58	50.13					4.20		.21

		SUM			158	6622.81								
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	3A	218W5	120	7074.16	58.95					25.20		.21

		SUM			120	7074.16								
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 M	2A	2402MB	3	164.73	54.91					.63		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	2402ME	3	154.09	51.36					.63		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	2402MI	2	114.09	57.05					.42		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2A	F55	1	66.82	66.82					.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	218W5	2	103.50	51.75					.42		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	2A	2401W	1	80.45	80.45					.21		.21
METAL DRUMS, BARRELS, KEGS	55 GALLON	R	3A	218W5	68	3773.00	55.49					14.28		.21

		SUM			80	4456.68								
MISCELLANEOUS SCRAP	UNKNOWN	1983 R	2A	218E128	2	1814.36	1814.36					1.70		1.70

		SUM			2	1814.36								
SELF CONTAINED, EQUIPMENT	UNKNOWN	1982 R	2A	218E128	6	1088.61	544.31					10.87		5.44

		SUM			6	1088.61								
SELF CONTAINED, EQUIPMENT	UNKNOWN	1983 R	2A	218E128	8	520.72	520.72					3.20		3.20

		SUM			8	520.72								
WOODEN BOXES, CARTONS, CASES	2*2*2	1972 R	2A	218E128	6	609.62	609.62					1.36		1.36

		SUM			6	609.62								
WOODEN BOXES, CARTONS, CASES	2*2*2	1975 R	2A	218E128	12	1219.25	1219.25					2.72		2.72

		SUM			12	1219.25								
WOODEN BOXES, CARTONS, CASES	4*4*4	1983 R	2A	218E128	4	1451.48	483.83					14.50		4.83
WOODEN BOXES, CARTONS, CASES	4*4*5	R	2A	218E128	1	181.44	181.44					2.27		2.27

NON-TRU WASTE- 202AL

Page: 7

Container Discription	Container Size	Pri	Sec	Date	Type	Code	Facility	Count	Weight	Avg	Weight	Volume	Avg	Volume

Sum														
									5	1632.92				

69 rows selected.

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APPENDIX C.6

RADIOLOGICAL DATA FOR TRU WASTE CONTAINERS

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RADIOLOGICAL DATA FOR TRU WASTE CONTAINERS

This subappendix summarizes the radiological data for all transuranic (TRU) waste containers generated at the Plutonium Uranium Extraction (PUREX) Plant between 1970 and 1992. 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 of alpha radiation was included on the Solid Waste Burial Records (SWBRs). These data are included in this run. The "Max Dose" column contains the highest value recorded for a given container in a given year, in millirems per hour.

Additional information about the isotopes present in PUREX waste containers can be found in subappendixes C.13 and C.14.

AIM

Association for Information and Image Management

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301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.

4 of 5

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set linesize 160
set pagesize 44
set newpage 0
spool judy4.srep
tttitle '202A/202AL (TRU Waste)'
bttitle skip 1 left 'pot4.sql'
break on dt skip 1
break on report
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 con_pwtyp_cd      format a4                heading "Pri|Wast|Type"
col sum(rdet_rswims_count) format 999999        heading "Count"
col cntry_descr       format a30              heading "Container Description"
col con_size_descr    format a20              heading "Container Size"
col con_locn_facil_id format a8               heading "Location"
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_qty)       format 999999.99        heading "Total|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 99999999.99   heading "Max|Dose"
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-70' and '17-jun-92' and
con_srce_facil_id in ('202A', '202AL') 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
bttitle off

```

Mon Aug 17

page 1

202A/202AL (TRU Waste)

Container Descr	Container Size	Date	Type	Location	Count	Total		Avg	Total	Alpha ci	Avg	Max
						TRU (g)	Tru (g)					
Pri												
Wast												
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES 2 CU FT		1970	M	218E12B	8	7.42	7.42					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES 2 CU FT		1970	R	218E12B	107	41.04	2.56					470.00
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES UNKNOWN		1970	M	218E12B	20	42.15	42.15					
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES UNKNOWN		1970	R	218E12B	53	11.15	.86					100.00
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES UNKNOWN		1971	R	218E12B	14	.00	.00					10.00
FIBERBOARD/PLASTIC BOXES, CARTONS, CASES UNKNOWN		1972	R	218E12B	4	.00	.00					2000.00
FIBERGLASS REINFORCED PLYWOOD (FRP) BOXE 8*10*16		1977	R	218W3A	1	168.00	168.00					1.00
S												
FIBERGLASS REINFORCED PLYWOOD (FRP) BOXE 8*10*16		1978	R	218W3A	1	1.00	1.00					1.00
S												
FIBERGLASS REINFORCED PLYWOOD (FRP) BOXE 9*10.67*16		1981	R	218W4C	3	208.00	69.33					3.50
S												
FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1970	R	218E12B	1	.51	.51					
HEPA FILTERS	UNKNOWN	1972	R	218E12B	8	29.15	3.64					6.00
HEPA FILTERS	UNKNOWN	1975	R	218W4B	8	.00	.00					1.00
METAL BOXES, CARTONS, CASES	2.5*2.5*4	1971	R	218E12B	18	.00	.00					15.00
METAL BOXES, CARTONS, CASES	2.5*2.5*4	1972	R	218E12B	7	.00	.00					1.00
METAL BOXES, CARTONS, CASES	3*3*4	1971	R	218E12B	1	.00	1.00					1.00
METAL BOXES, CARTONS, CASES	3*4*7	1972	R	218E12B	1	.00	.00					1500.00
METAL BOXES, CARTONS, CASES	4.3*2.6*2.6	1974	R	218W4B	3	3.00	1.00					.50
METAL BOXES, CARTONS, CASES	6*6*7	1989	M	2401W	1	22.00	22.00					1.00
METAL BOXES, CARTONS, CASES	6*6*7	1985	R	218W4C	3	109.00	36.33					1.00
METAL BOXES, CARTONS, CASES	UNKNOWN	1971	R	218E12B	1	.00	.00					20.00
METAL BOXES, CARTONS, CASES	UNKNOWN	1978	R	218W4B	6	3.00	.50					15.00
METAL BOXES, CARTONS, CASES	UNKNOWN	1984	R	218W4C	2	119.50	59.75					6.00
METAL BOXES, CARTONS, CASES	UNKNOWN	1985	R	218W4C	1	481.00	481.00					1.00
METAL DRUMS, BARRELS, KEGS	3*3*4	1971	R	218E12B	4	.00	.00					150.00
METAL DRUMS, BARRELS, KEGS	30 GALLON	1971	R	218E12B	2	.00	.00					400.00
METAL DRUMS, BARRELS, KEGS	30 GALLON	1972	R	218E12B	3	.00	.00					.90
METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M	218W4C	1	55.00	55.00					8.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M	218W4C	19	1673.80	88.09					7.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M	218W4C	5	415.00	83.00					

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202A/202AL (TRU Waste)

Container Descr	Container Size	Date	Type	Location	Count	Total TRU (g)	Avg TRU (g)	Total Alpha ci	Avg Alpha ci	Max Dose
METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	224T		31	2515.60	81.15			13.40
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	218W4C		2	65.00	32.50			10.50
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	224T		54	3947.00	73.09			36.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	224T		34	3095.00	91.03			35.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	2402W		1	14.00	14.00			.60
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	224T		21	1352.00	64.38			15.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	224T		7	410.10	58.59			27.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	224T		7	165.00	23.57			11.30
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 M	224T		3	26.32	8.77	2.42	.81	.90
METAL DRUMS, BARRELS, KEGS	55 GALLON	1970 R	218E12B		798	92.77	.12			5000.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R	218E12B		1282	29.73	.02			26000.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R	218E12B		766	14.06	.02			30000.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R	218W4B		77	.82	.01			2500.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R	218W4B		119	11.01	.09			10.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R	218W4B		81	93.31	1.15			5.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R	218W4B		35	.00	.00			1.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R	218W4B		3	.00	.00			1.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R	218W4B		4	.00	.00			700.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R	218W4B		5	.00	.00			350.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R	218W4C		10	20.00	2.00			1.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R	218W4C		72	27.01	.38			1.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1982 R	218W4C		227	91.59	.40			11.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1983 R	218W4C		10	109.00	10.90			40.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1984 R	218W4C		77	2691.60	34.96			50.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1985 R	218W4C		67	2537.00	37.87			44.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 R	218W4C		24	1245.30	51.89			9.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 R	224T		24	99.30	4.14			50.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	218W4C		4	252.00	63.00			5.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	224T		31	399.00	12.87			12.00
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 R	218W4C		4	226.00	56.50			3.30
METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 R	224T		9	22.40	2.49			.50
METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R	224T		16	47.00	2.94			2.80
METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	224T		22	109.43	4.97	.11	.02	1.60
METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	224T		26	580.97	22.34	8.36	.49	17.60
METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R	224T		4	214.50	53.63	16.43	5.48	6.20

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202A/202AL (TRU Waste)

Container Descr	Container Size	Date	Type	Location	Count	Total		Avg		Total	Avg		Max
						TRU (g)	(g)	Tru (g)	(g)	Alpha ci	Alpha ci	Dose	
METAL DRUMS, BARRELS, KEGS	85 GALLON	1992	M	FS8	3	4.09	1.33	1.33	.23	.08	.50		
SELF CONTAINED, EQUIPMENT	UNKNOWN	1970	M	218E128	5	8.43	8.43	500.00					
SELF CONTAINED, EQUIPMENT	UNKNOWN	1970	R	218E15	1	500.00	.00						
SELF CONTAINED, EQUIPMENT	UNKNOWN	1971	R	218E128	1	.00	.00					1.00	
sum					4273								

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APPENDIX C.7

**PHYSICAL CONTENTS DESCRIPTION OF 202-A TRU
WASTE IN 55-GALLON DRUMS**

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**PHYSICAL CONTENTS DESCRIPTION OF 202-A TRU
WASTE IN 55-GALLON DRUMS**

This subappendix describes the physical contents of the 55-gal drums of transuranic (TRU) waste generated at 202-A. Before 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.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot5.srep
tttitle center 'TRU WASTE - 202A 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 = '202A'
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 Description	Container Size	Date	Type	Facility	Count
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1969	R	218E12B	7
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R		382
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1971	R		711
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972	R		367
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1970	R		30

			SUM			1497
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R	218W48	8
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972	R		39
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1973	R		86
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1974	R		68
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1975	R		31

			SUM			232
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M	218W4C	1
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		3
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		2
ALUMINIUM	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		5
ALUMINIUM	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		4
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M		1
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		14
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		4
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978	R		2
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1982	R		182
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1983	R		2
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	R		5
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		8
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		8
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		3
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		4
CONCRETE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		1
COPPER METAL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		4
COPPER METAL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	R		1
COPPER METAL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		5
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M		1
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		2
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	R		3
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		11

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Physical Description	Container Description	Container Size	Date	Type	Facility	Count
FILTERS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R	21844C	3
FLOOR TILE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1982	R		11
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M		1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		9
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1982	R		37
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	R		11
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		46
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		10
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M		1
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		19
LEATHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		3
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		19
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		5
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	M		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1982	R		57
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1983	R		8
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	R		33
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		53
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		15
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		4
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979	R		19
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M		1
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		7
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		2
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	M		2
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978	R		2
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1982	R		195
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1983	R		2
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	R		31
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	R		55
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		13
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		4
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		4
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1984	M		1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1985	M		19
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		5

Physical Description	Container Description	Container Size	Waste	
			Date	Count
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	6
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	18
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 M	3
ABSORBANT/KITY LTR/VERMICULITE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R	4
ALUMINUM	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	1
BRICK/FIREBRICK	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	1
CHEMICALS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	1
CHEMICALS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	2
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	27
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	51
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	31
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	7
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	6
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	7
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 M	3
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 R	7
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	19
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 R	8
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	4
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	17
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R	4
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	10
COPPER METAL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	2
CORK	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	1
CORK	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	6
COTTON/KOTEX	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	1
EQUIPMENT	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	1
FILTERS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	3
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	6
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	10
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	3
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 M	2
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 R	21
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	24
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 R	7
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	14
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	6
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R	3

TRU WASTE - 202A WHC

Physical Description	Container Description	Container Size	Mast	
			Date	Facility Count
HAZARDOUS CONSTITUENTS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	224T 2
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	12
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	23
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	28
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	14
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	7
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	6
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 M	3
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	1
LEATHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	1
LEATHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	2
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	28
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	48
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	32
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	16
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	4
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 R	18
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	24
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 R	3
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	15
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	12
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R	4
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	7
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	11
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	6
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	3
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	2
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 R	21
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 R	24
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 R	7
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 R	14
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 R	10
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992 R	1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986 M	31
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987 M	54
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988 M	34
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M	16
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990 M	7
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991 M	7

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TRU WASTE - 202A WHC

Physical Description	Container Description	Container Size	Date	Type	Facility	Count
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	M	224T	3
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		24
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		24
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		8
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		16
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	R		18
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	R		4
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		29
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	M		53
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		30
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989	M		5
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	M		5
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	M		6
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	M		3
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		11
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		20
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		3
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		15
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	R		11
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	R		3
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		24
STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	M		29
STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		27
STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		9
STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		1
STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		5
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	M		4
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	M		20
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		10
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989	M		4
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	M		1
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	M		1
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1986	R		2
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1987	R		3
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		1
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		2
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1991	R		3
WOOD/LUMBER/PLYWOOD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1992	R		2
*****						-----
SUM						1360

Physical Description	Container Description	Container Size	Pri			Count
			Date	Type	Facility	
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M	2402A	1
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		1
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		1
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		1
STAINLESS STEEL	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	M		1
			*****			-----
			SUM			6
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R	2403A	1
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		1
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1988	R		1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		1
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1990	R		1
			*****			-----
			SUM			8

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APPENDIX C.8

**PHYSICAL CONTENTS DESCRIPTION OF 202-AL
TRU WASTE IN 55-GALLON DRUMS**

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**PHYSICAL CONTENTS DESCRIPTION OF 202-AL
TRU WASTE IN 55-GALLON DRUMS**

This subappendix describes the physical contents of the 55-gal drums of transuranic (TRU) waste generated at 202-AL. Before 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.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot5.srep
tttitle center 'TRU WASTE - 202AL 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 9999999     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 = '202AL'
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

```

TRU WASTE - 202AL WHC

Physical Description	Container Description	Container Size	Date	Type	Facility	Count
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1970 R		218E128	416
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1971 R			571
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R			399

					SUM	1386
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R		218H48	1
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1972 R			37
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1973 R			25
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1974 R			13
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1975 R			4
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1976 R			3
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1977 R			4
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1978 R			5

					SUM	92
	METAL DRUMS, BARRELS, KEGS	55 GALLON	1979 R		218H4C	6

					SUM	6
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M		224T	1
CLOTH/RAGS/NYLON	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			4
GLASS	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			17
LEAD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M			5
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M			4
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			17
PAPER/CARDBOARD	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			17
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 M			5
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			17
RUBBER	METAL DRUMS, BARRELS, KEGS	55 GALLON	1989 R			11

					SUM	98

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APPENDIX C.9

**PHYSICAL CONTENTS DESCRIPTION OF 202-A
TRU WASTE IN CONTAINERS OTHER THAN
55-GALLON DRUMS**

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**PHYSICAL CONTENTS DESCRIPTION OF 202-A
TRU WASTE IN CONTAINERS OTHER THAN
55-GALLON DRUMS**

This subappendix describes the physical contents of the transuranic (TRU) waste containers, other than 55-gal drums, generated at 202-A. Note that before 1978 physical contents were not required on the burial records, so a great many of the early records list the contents for a container 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.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot6.srep
ttitle center 'TRU WASTE - 202A 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 = '202A'
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

```

TRU WASTE - 202A WHC

Physical Description	Container Size	Container Description	Pri Sec		Date	Type	Facility	Count
			Wast	Wast				
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969 M	UG	218E128	UG	23	
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1969 M	UG		UG	1	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970 R	1A		1A	1	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1971 R	1A		1A	12	
MISCELLANEOUS/UNKNOWN/OTHER	METAL BOXES, CARTONS, CASES	2.5*2.5*4	1971 R	1A		1A	18	
MISCELLANEOUS/UNKNOWN/OTHER	METAL BOXES, CARTONS, CASES	3*3*4	1971 R	1A		1A	1	
MISCELLANEOUS/UNKNOWN/OTHER	METAL BOXES, CARTONS, CASES	UNKNOWN	1971 R	1A		1A	1	
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	3*3*4	1971 R	1A		1A	4	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972 R	1A		1A	2	
MISCELLANEOUS/UNKNOWN/OTHER	HEPA FILTERS	UNKNOWN	1972 R	1A		1A	8	
MISCELLANEOUS/UNKNOWN/OTHER	METAL BOXES, CARTONS, CASES	2.5*2.5*4	1972 R	1A		1A	7	
MISCELLANEOUS/UNKNOWN/OTHER	METAL BOXES, CARTONS, CASES	3*4*7	1972 R	1A		1A	1	
MISCELLANEOUS/UNKNOWN/OTHER	BURLAP, CLOTH, PAPER OR PLASTIC BAGS	UNKNOWN	1969 R	UG		UG	1	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1969 R	UG		UG	669	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969 R	UG		UG	1471	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1969 R	UG		UG	1	
MISCELLANEOUS/UNKNOWN/OTHER	MISCELLANEOUS SCRAP	UNKNOWN	1969 R	UG		UG	5	
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1969 R	UG		UG	16	
MISCELLANEOUS/UNKNOWN/OTHER	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969 R	UG		UG	5	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970 R	UG		UG	113	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 R	UG		UG	53	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970 M	UG		UG	8	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 M	UG		UG	20	
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1970 M	UG		UG	5	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970 R	UG		UG	191	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970 R	UG		UG	634	
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	1970 R	UG		UG	3	
MISCELLANEOUS/UNKNOWN/OTHER	HEPA FILTERS	UNKNOWN	1970 R	UG		UG	4	
MISCELLANEOUS/UNKNOWN/OTHER	MISCELLANEOUS SCRAP	UNKNOWN	1970 R	UG		UG	1	
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1970 R	UG		UG	7	
MISCELLANEOUS/UNKNOWN/OTHER	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970 R	UG		UG	1	
*****								1
SUM								3287
METAL/IRON/GALVANIZED/SHEET	SELF CONTAINED, EQUIPMENT	UNKNOWN	1969 R	UF	218E15	UF	1	
METAL/IRON/GALVANIZED/SHEET	SELF CONTAINED, EQUIPMENT	UNKNOWN	1983 R	UF		UF	1	
METAL/IRON/GALVANIZED/SHEET	SELF CONTAINED, EQUIPMENT	UNKNOWN	1987 R	UF		UF	1	
METAL/IRON/GALVANIZED/SHEET	SELF CONTAINED, EQUIPMENT	UNKNOWN	1988 R	UF		UF	1	
	SELF CONTAINED, EQUIPMENT	UNKNOWN	1970 R	UF		UF	2	
	SELF CONTAINED, EQUIPMENT	UNKNOWN	1971 R	UF		UF	3	

Physical Description	Container Size	Container Description	Pri	Sec	Wast	Count
			Date	Type	Facility	Count
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1972 R	UF	218E15	2
	SELF CONTAINED, EQUIPMENT	UNKNOWN	1986 R	UF	*****	3
					SUM	14
MISCELLANEOUS/UNKNOWN/OTHER	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	1978 R	1A	218J3A	1
	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	1977 R	1A	*****	1
					SUM	2
MISCELLANEOUS/UNKNOWN/OTHER	METAL BOXES, CARTONS, CASES	UNKNOWN	1978 R	1A	218J4B	1
	METAL BOXES, CARTONS, CASES	4.3*2.6*2.6	1974 R	1A		3
	HEPA FILTERS	UNKNOWN	1975 R	1A		8
	METAL BOXES, CARTONS, CASES	UNKNOWN	1978 R	1A	*****	5
					SUM	17
CLOTH/RAGS/NYLON	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A		3
	METAL BOXES, CARTONS, CASES	UNKNOWN	1984 R	1D		2
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		3
	METAL BOXES, CARTONS, CASES	UNKNOWN	1984 R	1D		1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		3
	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A		3
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1D		3
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
CLOTH/RAGS/NYLON	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
CLOTH/RAGS/NYLON	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
GLASS	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
METAL/IRON/GALVANIZED/SHEET	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
METAL/IRON/GALVANIZED/SHEET	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
PAPER/CARDBOARD	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
PLASTIC/POLYURATHANE	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
PLASTIC/POLYURATHANE	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
WOOD/LUMBER/PLYWOOD	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
WOOD/LUMBER/PLYWOOD	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	1981 R	1A	218J4C	1
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
	METAL BOXES, CARTONS, CASES	6*6*7	1985 R	1D		2
	METAL BOXES, CARTONS, CASES	UNKNOWN	1985 R	1A		1
CONCRETE					SUM	25
LEAD	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D	2401W	1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
PAPER/CARDBOARD	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
PLASTIC/POLYURATHANE	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
	METAL BOXES, CARTONS, CASES	6*6*7	1989 M	1D		1
RUBBER						

Physical Description	Container Size	Container Description	Date	Type	Facility	Count
WOOD/LUMBER/PLYWOOD	METAL BOXES, CARTONS, CASES	6*6*7	11pr pot6.sql	1989 M	ID 2401W	7

				SUM		7
CONWEB PADS	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C	2402WB	1
GLASS	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		1
HAZARDOUS CONSTITUENTS	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		1
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		1
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		1

				SUM		5
CONWEB PADS	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C	FSB	2
GLASS	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		2
HAZARDOUS CONSTITUENTS	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		2
METAL/IRON/GALVANIZED/SHEET	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		2
PLASTIC/POLYURATHANE	METAL DRUMS, BARRELS, KEGS	85 GALLON	1992 M	1C		2

				SUM		10

76 rows selected.

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APPENDIX C.10

**PHYSICAL CONTENTS DESCRIPTION OF 202-AL
TRU WASTE IN CONTAINERS OTHER
THAN 55-GALLON DRUMS**

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**PHYSICAL CONTENTS DESCRIPTION OF 202-AL
TRU WASTE IN CONTAINERS OTHER
THAN 55-GALLON DRUMS**

This subappendix describes the physical contents of the transuranic (TRU) waste containers, other than 55-gal drums, generated at 202-AL. Note that before 1978 physical contents were not required on the burial records, so a great many of the early records list the contents for a container 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.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot6.srep
tttitle center 'TRU WASTE - 202AL 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, cntype, 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 = '202AL'
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

```

TRU WASTE - 202AL WHC

Physical Description	Container Size	Container Description	Pri Sec		Date	Wast Type	Facility	Count
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970	R	1A	218E128		5
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1971	R	1A			2
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	30 GALLON	1971	R	1A			2
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1971	R	1A			1
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1972	R	1A			2
MISCELLANEOUS/UNKNOWN/OTHER	METAL DRUMS, BARRELS, KEGS	30 GALLON	1972	R	1A			3
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1969	R	UG			99
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1969	R	UG			765
MISCELLANEOUS/UNKNOWN/OTHER	HEPA FILTERS	UNKNOWN	1969	R	UG			5
MISCELLANEOUS/UNKNOWN/OTHER	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1969	R	UG			31
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	1970	R	UG			51
MISCELLANEOUS/UNKNOWN/OTHER	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	1970	R	UG			276
MISCELLANEOUS/UNKNOWN/OTHER	SELF CONTAINED, EQUIPMENT	UNKNOWN	1970	R	UG			2
MISCELLANEOUS/UNKNOWN/OTHER	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	1970	R	UG			11

SUM								1255

14 rows selected.

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APPENDIX C.11

HAZARDOUS CONSTITUENTS OF TRU WASTE IN 55-GALLON DRUMS

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HAZARDOUS CONSTITUENTS OF TRU WASTE IN 55-GALLON DRUMS

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 the Plutonium-Uranium Extraction (PUREX) Plant (202-A and 202-AL) are sorted by storage facility and year.

Information concerning the hazardous constituents of waste containers was not required before 1986. During the Richland — Solid Waste Information Management System (R-SWIMS) data re-entry 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
tttitle center 'TRU Waste - 202A 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 = '202A'
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

```

TRU Waste - 202A WHC

Hazardous	Date	Container Size	Container Description	Pri		Type	Facility	Count
				Waste	Count			
LEAD	1984	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	21844C			1
LEAD	1985	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				18
LEAD	1986	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				3
LEAD	1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				1
NITRIC ACID	1985	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				1
NITRIC ACID	1986	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				4
NITRIC ACID	1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				2
SODIUM HYDROXIDE	1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	*****			2
				sum				32
BARIUM	1972	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	224T			2
CADMIUM	1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				1
CADMIUM	1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				2
CALCIUM CHLOROFLUOROPHOSPHATE	1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				1
CAUSTIC	1986	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				1
COPPER	1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				6
LEAD	1986	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				26
LEAD	1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				51
LEAD	1988	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				29
LEAD	1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				16
LEAD	1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				7
LEAD	1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				6
LEAD	1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				3
MERCURY	1991	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				1
MERCURY	1992	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				2
NITRIC ACID	1986	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				28
NITRIC ACID	1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				50
SODIUM HYDROXIDE	1986	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				7
SODIUM HYDROXIDE	1987	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				50
SODIUM HYDROXIDE	1988	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				28
SODIUM HYDROXIDE	1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				10
SODIUM HYDROXIDE	1990	METAL DRUMS, BARRELS, KEGS	55 GALLON	M				4

				sum				331
LEAD	1988	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	2402W			1

				sum				1

```

set linesize 170
set pagesize 45
set newpage 0
spool pot7.srep
title center 'TRU Waste - 202AL 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 = '202AL'
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

```

TRU Waste - 202AL WHC

Hazardous	Date	Container Size	Container Description	Pri		Type	Facility	Count
				Waste	Waste			
LEAD	1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	224T	M	224T	5
SODIUM HYDROXIDE	1989	METAL DRUMS, BARRELS, KEGS	55 GALLON	M		M	*****	3
							SLUM	8

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APPENDIX C.12

**HAZARDOUS CONSTITUENTS OF TRU WASTE IN CONTAINERS
OTHER THAN 55-GALLON DRUMS**

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**HAZARDOUS CONSTITUENTS OF TRU WASTE IN CONTAINERS
OTHER THAN 55-GALLON DRUMS**

The presence of hazardous constituents in a radioactive waste container designates the waste as "Mixed" (primary waste code "M"). In this subappendix, the hazardous contents of containers, other than 55-gal drums, generated at PUREX (202-A and 202-AL) are sorted by storage facility and year.

Information concerning the hazardous constituents of waste containers was not required before 1986. During the Richland — Solid Waste Information Management System (R-SWIMS) data re-entry 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 pot8.srep
tttitle center 'TRU Waste - 202A 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 = '202A'
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

```

TRU Waste - 202A WHC

Hazardous	Date	Container Size	Container Description	Type	Facility	RDET	RSWIMS COUNT
LEAD	1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES UNKNOWN		M	218E12B		23
LEAD	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES 2 CU FT		M			8
LEAD	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES UNKNOWN		M			20
LEAD	1969	SELF CONTAINED, EQUIPMENT UNKNOWN		M			1
LEAD	1970	SELF CONTAINED, EQUIPMENT UNKNOWN		M			5
LEAD	1989	METAL BOXES, CARTONS, CASES 6*6*7		M	2401u		1
CARBON TETRACHLORIDE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M	2402uB		1
KEROSINE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
TRIBUTYL PHOSPHATE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
CHLOROFORM	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M	FS8		1
CYCLOHEXANE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
HEXONE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
KEROSINE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
THENOYL TRIFLUOROACETONE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
TRIBUTYL PHOSPHATE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
TRISDOCTYLAMINE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
TRIOCTYLPHOSPHINE OXIDE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1
XYLENE	1992	METAL DRUMS, BARRELS, KEGS 85 GALLON		M			1

18 rows selected.

WHC-EP-0646

```

set linesize 170
set pagesize 45
set newpage 0
spool pot8.srep
tttitle center 'TRU Waste - 202AL 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 = '202AL'
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

```

WHC-EP-0646

```
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 = '202AL'
"pot8.sql" 37 lines, 1186 characters
```

SQL> @pot8

no rows selected

SQL>

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°VT100° 80 COL° °7 BIT MODE°

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APPENDIX C.13

**ISOTOPES IN 55-GALLON DRUMS
OF TRU WASTE**

WHC-EP-0646

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**ISOTOPES IN 55-GALLON DRUMS
OF TRU WASTE**

This subappendix contains a listing of the Solid Waste Information Tracking System's (SWITS's) isotope information for transuranic (TRU) waste from the Plutonium-Uranium Extraction (PUREX) Plant that is stored in 55-gal drums. The isotope field in the SWITS contains the following types of information:

- Specific isotope (e.g., ^{241}Am , ^{237}Np , ^{233}U , and ^{238}Pu)
- Generic isotope listings (e.g., plutonium, uranium-enriched, uranium-depleted)
- ^{239}Pu fissile gram equivalents (^{239}Pu FSL GR equivalent)
- Total alpha
- Total beta/gamma
- Plutonium equivalent curies (PE-Ci).

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
tttitle center 'TRU Waste - 202A 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 9999999.999999 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 = '202A'
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

```

TRU Waste - 202A WHC

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Sec	Wast	Type	Facility	Count
AM-241	.000000	GM	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T			1

	SUM									1
AM-241	.067600	GM	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T			2

	SUM									2
CE-141	.001000	CI	1970 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218E128			1

	SUM									1
PE-CI	.000000	CI	1986 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C	224T			31
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T			24
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218MAC			5

	SUM									60
PE-CI	.000000	CI	1987 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C	224T			39
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	218MAC			2
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T			15
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T			12
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218MAC			4

	SUM									72
PE-CI	.000000	CI	1988 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C	224T			3
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T			29
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	2402M			1
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T			5
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218MAC			4

	SUM									42
PE-CI	.000000	CI	1989 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C	224T			3
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	224T			13

	SUM									16
PE-CI	.000000	CI	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C	224T			2

TRU Waste - 202A WHC

Isotope	Red Qty	Un Date	Container Size	Container Description	Pri Sec		Count
					Wast	Type Facility	
PE-CI	.000000	CI	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D 224T	5
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C 224T	8
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D 224T	7
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D 2403HA	1

	SUM						23
PE-CI	.000000	CI	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C 224T	1
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D 224T	6
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C 224T	5
PE-CI	.000000	CI	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D 224T	4

	SUM						16
PU	3.010866	GM	1969 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	UG 218E128	1

	SUM						1
PU	92.727600	GM	1970 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A 218E128	382

	SUM						382
PU	29.668700	GM	1971 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A 218E128	711

	SUM						711
PU	14.024300	GM	1972 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A 218E128	367
PU	.814500	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A 218A48	39

	SUM						406
PU	11.008300	GM	1973 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A 218A48	94

	SUM						94
PU	93.306000	GM	1974 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A 218A48	68

	SUM						68
PU	.003100	GM	1975 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A 218A48	31

Isotope	Red Qty	Un Date	Container Size	Container Description	Pri	Sec	Wast	Type	Facility	Count

	SUM									31
PU	20.000000	GM	1978 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C			10

	SUM									10
PU	27.004700	GM	1979 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C			66

	SUM									66
PU	91.593200	GM	1982 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C			227

	SUM									227
PU	.002000	GM	1983 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C			2
PU	109.001000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C			8

	SUM									10
PU	55.000000	GM	1984 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	218W4C			1
PU	496.800000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1A	218W4C			26
PU	2194.800000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C			51

	SUM									78
	1673.800000	GM	1985 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	218W4C			19
PU	2537.000100	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C			67

	SUM									86
PU	2515.600000	GM	1986 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C	224T			31
PU	415.000000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1D	218W4C			5
PU	99.300000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1C	224T			24
PU	1245.300000	GM	METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	218W4C			24

	SUM									84
PU	2984.000000	GM	1987 METAL DRUMS, BARRELS, KEGS	55 GALLON	M	1C	224T			39

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Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Sec			Type	Facility	Count
					Wast Wast					
					Type	Facility				
PU	963.000000	GM	1987	METAL DRUMS, BARRELS, KEGS	M	1D	224T			15
PU	249.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1C	224T			24
PU	252.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	218W4C			4
PU	150.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	224T			7

	Sum									91
PU	384.000000	GM	1988	METAL DRUMS, BARRELS, KEGS	M	1C	224T			3
PU	2711.000000	GM		METAL DRUMS, BARRELS, KEGS	M	1D	224T			31
PU	14.000000	GM		METAL DRUMS, BARRELS, KEGS	M	1D	2402W			1
PU	20.400000	GM		METAL DRUMS, BARRELS, KEGS	R	1C	224T			7
PU	226.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	218W4C			4
PU	1.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	224T			1
PU	1.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	2403WA			1

	Sum									48
PU	116.000000	GM	1989	METAL DRUMS, BARRELS, KEGS	M	1C	224T			3
PU	928.000000	GM		METAL DRUMS, BARRELS, KEGS	M	1D	224T			13

	Sum									16
PU	111.100000	GM	1990	METAL DRUMS, BARRELS, KEGS	M	1C	224T			2
PU	299.000000	GM		METAL DRUMS, BARRELS, KEGS	M	1D	224T			5
PU	78.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1C	224T			8
PU	29.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	224T			8
PU	2.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	2403WA			1

	Sum									24
PU	82.000000	GM	1991	METAL DRUMS, BARRELS, KEGS	M	1C	224T			1
PU	83.000000	GM		METAL DRUMS, BARRELS, KEGS	M	1D	224T			6
PU	259.000000	GM		METAL DRUMS, BARRELS, KEGS	R	1C	224T			5
PU	266.900000	GM		METAL DRUMS, BARRELS, KEGS	R	1D	224T			11

	Sum									23
PU	26.320000	GM	1992	METAL DRUMS, BARRELS, KEGS	M	1A	224T			3
PU	214.500000	GM		METAL DRUMS, BARRELS, KEGS	R	1A	224T			4

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Sec	Type	Facility	Count
									7
PU-238	.000100	GM	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		1

									1
PU-238	.054400	GM	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		2

									2
PU-239	.400000	GM	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		1

									1
PU-239	47.484700	GM	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		2

									2
PU-240	.025800	GM	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		1

									1
PU-240	6.212900	GM	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		2

									2
PU-241	.002300	GM	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		1

									1
PU-241	1.249300	GM	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		2

									2
PU-242	.000200	GM	1990 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		1

									1
PU-242	.002500	GM	1991 METAL DRUMS, BARRELS, KEGS	55 GALLON	R	1D	224T		1

[illegible]

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Sec		Type	Facility	Count
					Wast	Wast			
PU239 FSL GR EQUIV					R	10	224T		4
									16
TA-182					R	1A	218E128		1
									1
TOTAL BETA/GAMMA					R	UG	218E128		3
TOTAL BETA/GAMMA					R	UG	218E128		4
									7
TOTAL BETA/GAMMA					R	1A	218E128		382
TOTAL BETA/GAMMA					R	UG	218E128		2
TOTAL BETA/GAMMA					R	UG	218E128		28
									412
TOTAL BETA/GAMMA					R	1A	218E128		711
									711
TOTAL BETA/GAMMA					R	1A	218E128		367
TOTAL BETA/GAMMA					R	1A	218E128		35
									402
TOTAL BETA/GAMMA					R	1A	218E128		94
									94
TOTAL BETA/GAMMA					R	1A	218E128		68
									68
TOTAL BETA/GAMMA					R	1A	218E128		31
									31

TRU Waste - 202A WHC

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Sec		Wast	Type	Facility	Count
TOTAL BETA/GAMMA	.010000	CI	1978	METAL DRUMS, BARRELS, KEGS			R	1A	218W4C	10

	SUM									10
TOTAL BETA/GAMMA	1.065000	CI	1979	METAL DRUMS, BARRELS, KEGS			R	1A	218W4C	66

	SUM									66
TOTAL BETA/GAMMA	.262000	CI	1982	METAL DRUMS, BARRELS, KEGS			R	1A	218W4C	227

	SUM									227
TOTAL BETA/GAMMA	.010000	CI	1983	METAL DRUMS, BARRELS, KEGS			R	1A	218W4C	2
TOTAL BETA/GAMMA	.069000	CI		METAL DRUMS, BARRELS, KEGS			R	1D	218W4C	8

	SUM									10
TOTAL BETA/GAMMA	.050000	CI	1984	METAL DRUMS, BARRELS, KEGS			M	1D	218W4C	1
TOTAL BETA/GAMMA	.077000	CI		METAL DRUMS, BARRELS, KEGS			R	1A	218W4C	30
TOTAL BETA/GAMMA	.949500	CI		METAL DRUMS, BARRELS, KEGS			R	1D	218W4C	51

	SUM									82
TOTAL BETA/GAMMA	.950000	CI	1985	METAL DRUMS, BARRELS, KEGS			M	1D	218W4C	19
TOTAL BETA/GAMMA	3.350000	CI		METAL DRUMS, BARRELS, KEGS			R	1D	218W4C	67

	SUM									86
TOTAL BETA/GAMMA	1.550000	CI	1986	METAL DRUMS, BARRELS, KEGS			M	1C	224T	31
TOTAL BETA/GAMMA	.250000	CI		METAL DRUMS, BARRELS, KEGS			M	1D	218W4C	5
TOTAL BETA/GAMMA	1.200000	CI		METAL DRUMS, BARRELS, KEGS			R	1C	224T	24
TOTAL BETA/GAMMA	1.200000	CI		METAL DRUMS, BARRELS, KEGS			R	1D	218W4C	24

	SUM									84
TOTAL BETA/GAMMA	1.911000	CI	1987	METAL DRUMS, BARRELS, KEGS			M	1C	224T	39
TOTAL BETA/GAMMA	.100000	CI		METAL DRUMS, BARRELS, KEGS			M	1D	218W4C	2
TOTAL BETA/GAMMA	.067900	CI		METAL DRUMS, BARRELS, KEGS			M	1D	224T	15
TOTAL BETA/GAMMA	.661100	CI		METAL DRUMS, BARRELS, KEGS			R	1C	224T	24
TOTAL BETA/GAMMA	.200000	CI		METAL DRUMS, BARRELS, KEGS			R	1D	218W4C	4

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Sec		Count
					Waste	Type	

	SUM						84
TOTAL BETA/GAMMA	.035000	CI	1988	METAL DRUMS, BARRELS, KEYS	M	1C	224T
TOTAL BETA/GAMMA	1.258800	CI		METAL DRUMS, BARRELS, KEYS	M	1D	224T
TOTAL BETA/GAMMA	.000600	CI		METAL DRUMS, BARRELS, KEYS	M	1D	2402W
TOTAL BETA/GAMMA	.200700	CI		METAL DRUMS, BARRELS, KEYS	R	1C	224T
TOTAL BETA/GAMMA	.007400	CI		METAL DRUMS, BARRELS, KEYS	R	1D	218WAC

	SUM						44
TOTAL BETA/GAMMA	.016500	CI	1989	METAL DRUMS, BARRELS, KEYS	M	1C	224T
TOTAL BETA/GAMMA	.082100	CI		METAL DRUMS, BARRELS, KEYS	M	1D	224T

	SUM						16
TOTAL BETA/GAMMA	.004000	CI	1990	METAL DRUMS, BARRELS, KEYS	M	1C	224T
TOTAL BETA/GAMMA	.051500	CI		METAL DRUMS, BARRELS, KEYS	M	1D	224T
TOTAL BETA/GAMMA	.005300	CI		METAL DRUMS, BARRELS, KEYS	R	1C	224T
TOTAL BETA/GAMMA	.004500	CI		METAL DRUMS, BARRELS, KEYS	R	1D	224T
TOTAL BETA/GAMMA	.000500	CI		METAL DRUMS, BARRELS, KEYS	R	1D	2403WA

	SUM						25
TOTAL BETA/GAMMA	.000500	CI	1991	METAL DRUMS, BARRELS, KEYS	M	1C	224T
TOTAL BETA/GAMMA	.003000	CI		METAL DRUMS, BARRELS, KEYS	M	1D	224T
TOTAL BETA/GAMMA	.030800	CI		METAL DRUMS, BARRELS, KEYS	R	1C	224T
TOTAL BETA/GAMMA	.037400	CI		METAL DRUMS, BARRELS, KEYS	R	1D	224T

	SUM						25
TOTAL BETA/GAMMA	.001900	CI	1992	METAL DRUMS, BARRELS, KEYS	M	1A	224T
TOTAL BETA/GAMMA	.012400	CI		METAL DRUMS, BARRELS, KEYS	R	1A	224T

	SUM						7
TOTAL -ALPHA	.000000	CI	1986	METAL DRUMS, BARRELS, KEYS	M	1C	224T
TOTAL -ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEYS	R	1C	224T
TOTAL -ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEYS	R	1D	218WAC

Isotope	Rad	Qty	Un	Date	Container Size	Container Description	Pri Sec			Type	Facility	Count
							Wast		Wast			
							Type	Type				

												60
TOTAL-ALPHA	.000000	CI	1987	METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1C	224T	39
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1D	218W4C	2
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1D	224T	15
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1C	224T	12
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1D	218W4C	4
	****											-----
	SUM											72
TOTAL-ALPHA	.000000	CI	1988	METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1C	224T	3
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1D	224T	29
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1D	2402W	1
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1C	224T	5
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1D	218W4C	4
	****											-----
	SUM											42
TOTAL-ALPHA	.000000	CI	1989	METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1C	224T	3
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1D	224T	13
	****											-----
	SUM											16
TOTAL-ALPHA	.000000	CI	1990	METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1C	224T	2
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1D	224T	5
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1C	224T	8
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1D	224T	7
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1D	2403WA	1
	****											-----
	SUM											23
TOTAL-ALPHA	.000000	CI	1991	METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1C	224T	1
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			M	1D	224T	6
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1C	224T	5
TOTAL-ALPHA	.000000	CI		METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1D	224T	4
	****											-----
	SUM											16
URANIUM-NATURAL	.001000	GM	1972	METAL DRUMS, BARRELS, KEGS		55 GALLON			R	1A	218W4B	1
	****											-----

TRU Waste - 202A WHC					Page: 11	
Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Sec
					Wast	Wast
					Type	Type
					Facility	Count
Sum						1

183 rows selected.

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set pagesize 45
set newpage 0
spool pot9.srep
title center 'TRU Waste - 202AL WHC' -
right 'Page:' format 999 sql.pno skip 1
break on dt skip 1
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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 = '202AL'
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

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TRU Waste - 202AL WHC

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Sec		Type	Facility	Count
					Wast	Wast			
PE-CI	.000000	CI	1989	METAL DRUMS, BARRELS, KECS			M	1D 224T	5
PE-CI	.000000	CI		METAL DRUMS, BARRELS, KECS			R	1C 224T	16
	****								-----
	SUM								21
PU	.042500	GM	1970	METAL DRUMS, BARRELS, KECS			R	1A 218E128	416
	****								-----
	SUM								416
PU	.057100	GM	1971	METAL DRUMS, BARRELS, KECS			R	1A 218E128	571
	****								-----
	SUM								571
PU	.039900	GM	1972	METAL DRUMS, BARRELS, KECS			R	1A 218E128	399
PU	.003800	GM		METAL DRUMS, BARRELS, KECS			R	1A 218W48	38
	****								-----
	SUM								437
PU	.002500	GM	1973	METAL DRUMS, BARRELS, KECS			R	1A 218W48	25
	****								-----
	SUM								25
PU	.001300	GM	1974	METAL DRUMS, BARRELS, KECS			R	1A 218W48	13
	****								-----
	SUM								13
PU	.000400	GM	1975	METAL DRUMS, BARRELS, KECS			R	1A 218W48	4
	****								-----
	SUM								4
PU	.000300	GM	1976	METAL DRUMS, BARRELS, KECS			R	1A 218W48	3
	****								-----
	SUM								3
PU	.000400	GM	1977	METAL DRUMS, BARRELS, KECS			R	1A 218W48	4
	****								-----
	SUM								4
PU	.000500	GM	1978	METAL DRUMS, BARRELS, KECS			R	1A 218W48	5
	****								-----

TRU Waste - 202AL WHC

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Sec		Count
					Waste	Type	
TOTAL BETA/GAMMA	.009200	CI 1989	METAL DRUMS, BARRELS, KEYS	55 GALLON	M	1D 224T	5
TOTAL BETA/GAMMA	.010500	CI	METAL DRUMS, BARRELS, KEYS	55 GALLON	R	1C 224T	17
TOTAL-ALPHA	.000000	CI	METAL DRUMS, BARRELS, KEYS	55 GALLON	M	1D 224T	5
TOTAL-ALPHA	.000000	CI	METAL DRUMS, BARRELS, KEYS	55 GALLON	R	1C 224T	16
	****						-----
	SUM						6
URANIUM-NATURAL	10.000000	GM 1977	METAL DRUMS, BARRELS, KEYS	55 GALLON	R	1A 218M4B	4
	****						-----
	SUM						43

							4

30 rows selected.

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APPENDIX C.14

**ISOTOPES IN TRU WASTE CONTAINERS OTHER
THAN 55-GALLON DRUMS**

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**ISOTOPES IN TRU WASTE CONTAINERS OTHER
THAN 55-GALLON DRUMS**

This subappendix contains a listing of the Solid Waste Information Tracking System (SWITS's) isotope information for transuranic (TRU) waste from the Plutonium-Uranium Extraction Plant (PUREX) that is stored in containers other than 55-gal drums. The isotope field in SWITS contains several types of information:

- Specific isotope (e.g., ^{241}Am , ^{237}Np , ^{233}U , and ^{238}Pu)
- Generic isotope listings (e.g., plutonium, uranium-enriched, uranium-depleted)
- ^{239}Pu fissile gram equivalents (^{239}Pu FSL GR equivalent)
- Total alpha
- Total beta/gamma
- Plutonium equivalent curies (PE-Ci).

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 - 202A 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)
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 = '202A'
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	Type	Facility	Count
PE-CI	.000000	CI	1989	METAL BOXES, CARTONS, CASES	6*6*7	M	2401W	1

	SUM							1
PE-CI	.000000	CI	1992	METAL DRUMS, BARRELS, KEGS	85 GALLON	M	2402MB	1

	SUM							1
PU	7.418200	GM	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	M	218E12B	8
PU	42.148600	GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	M	218E12B	20
PU	8.427400	GM		SELF CONTAINED, EQUIPMENT	UNKNOWN	M	218E12B	5

	SUM							33
PU	22.000000	GM	1989	METAL BOXES, CARTONS, CASES	6*6*7	M	2401W	1

	SUM							1
PU	.500000	GM	1992	METAL DRUMS, BARRELS, KEGS	85 GALLON	M	2402MB	1
PU	3.500000	GM		METAL DRUMS, BARRELS, KEGS	85 GALLON	M	FSB	2

	SUM							3
PU	137.016852	GM	1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R	218E12B	141
PU	223.554182	GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	218E12B	86
PU	.531100	GM		SELF CONTAINED, EQUIPMENT	UNKNOWN	R	218E12B	5

	SUM							232
PU	40.462030	GM	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R	218E12B	99
PU	6.729050	GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	218E12B	19
PU	.509274	GM		FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN	R	218E12B	1

	SUM							119
PU	.001200	GM	1971	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	218E12B	12
PU	.001800	GM		METAL BOXES, CARTONS, CASES	2.5*2.5*4	R	218E12B	18
PU	.000100	GM		METAL BOXES, CARTONS, CASES	3*3*4	R	218E12B	1
PU	.000100	GM		METAL BOXES, CARTONS, CASES	UNKNOWN	R	218E12B	1
PU	.000400	GM		METAL DRUMS, BARRELS, KEGS	3*3*4	R	218E12B	4

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Waste	Type	Facility	Count

		SUM							36
PU	.000200	GM	1972 FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R		218E128		2
PU	29.150000	GM	HEPA FILTERS	UNKNOWN	R		218E128		8
PU	.000700	GM	METAL BOXES, CARTONS, CASES	2.5*2.5*4	R		218E128		7
PU	.000100	GM	METAL BOXES, CARTONS, CASES	3*4*7	R		218E128		1

		SUM							18
PU	500.000000	GM	1970 SELF CONTAINED, EQUIPMENT	UNKNOWN	R		218E15		1

		SUM							1
PU	168.000000	GM	1977 FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	R		218A3A		1

		SUM							1
PU	1.000000	GM	1978 FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	R		218A3A		1

		SUM							1
PU	3.000000	GM	1974 METAL BOXES, CARTONS, CASES	4.3*2.6*2.6	R		218A4B		3

		SUM							3
PU	.000800	GM	1975 HEPA FILTERS	UNKNOWN	R		218A4B		8

		SUM							8
PU	3.000000	GM	1978 METAL BOXES, CARTONS, CASES	UNKNOWN	R		218A4B		6

		SUM							6
PU	208.000000	GM	1981 FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	R		218A4C		3

		SUM							3
PU	119.500000	GM	1984 METAL BOXES, CARTONS, CASES	UNKNOWN	R		218A4C		2

Isotope	Rad	Qty	Un	Date	Container Size	Container Description	Pri	Wast	Type	Facility	Count
											2
PU		109.000000	GM	1985	METAL BOXES, CARTONS, CASES	6*6*7		R	218W4C		3
PU		481.000000	GM		METAL BOXES, CARTONS, CASES	UNKNOWN		R	218W4C		1

		SUM									4
PU239 FSL GR EQUIV		.000000	GM	1989	METAL BOXES, CARTONS, CASES	6*6*7		M	2401W		1

		SUM									1
TOTAL BETA/GAMMA		1.970640	CI	1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		M	218E128		23
TOTAL BETA/GAMMA		.171360	CI		SELF CONTAINED, EQUIPMENT	UNKNOWN		M	218E128		1

		SUM									24
TOTAL BETA/GAMMA		.000500	CI	1989	METAL BOXES, CARTONS, CASES	6*6*7		M	2401W		1

		SUM									1
TOTAL BETA/GAMMA		.000500	CI	1992	METAL DRUMS, BARRELS, KEGS	85 GALLON		M	2402WB		1
TOTAL BETA/GAMMA		.001000	CI		METAL DRUMS, BARRELS, KEGS	85 GALLON		M	FS8		2

		SUM									3
TOTAL BETA/GAMMA		14.123364	CI	1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT		R	218E128		602
TOTAL BETA/GAMMA		49.908635	CI		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		R	218E128		1257
TOTAL BETA/GAMMA		.228045	CI		FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN		R	218E128		1
TOTAL BETA/GAMMA		.153342	CI		MISCELLANEOUS SCRAP	UNKNOWN		R	218E128		5
TOTAL BETA/GAMMA		.391377	CI		SELF CONTAINED, EQUIPMENT	UNKNOWN		R	218E128		16
TOTAL BETA/GAMMA		.222787	CI		TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN		R	218E128		3

		SUM									1884
TOTAL BETA/GAMMA		3.461564	CI	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT		R	218E128		172
TOTAL BETA/GAMMA		59.685701	CI		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN		R	218E128		587
TOTAL BETA/GAMMA		.120583	CI		FIBERBOARD/PLASTIC DRUMS, BARRELS, KEGS	UNKNOWN		R	218E128		2
TOTAL BETA/GAMMA		17.040196	CI		HEPA FILTERS	UNKNOWN		R	218E128		4
TOTAL BETA/GAMMA		.080000	CI		MISCELLANEOUS SCRAP	UNKNOWN		R	218E128		1
TOTAL BETA/GAMMA		.217917	CI		SELF CONTAINED, EQUIPMENT	UNKNOWN		R	218E128		4

Isotope	Rad	Qty	Un	Date	Container Size	Container Description	Type	Facility	Count
TOTAL BETA/GAMMA		.125593	CI	1970	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	R	218E128	1

		SUM							771
TOTAL BETA/GAMMA		.084000	CI	1971	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	218E128	12
TOTAL BETA/GAMMA		.046000	CI		METAL BOXES, CARTONS, CASES	2.5*2.5*4	R	218E128	18
TOTAL BETA/GAMMA		.001000	CI		METAL BOXES, CARTONS, CASES	3*3*4	R	218E128	1
TOTAL BETA/GAMMA		.001000	CI		METAL BOXES, CARTONS, CASES	UNKNOWN	R	218E128	1
TOTAL BETA/GAMMA		.004000	CI		METAL DRUMS, BARRELS, KEGS	3*3*4	R	218E128	4

		SUM							36
TOTAL BETA/GAMMA		2.450000	CI	1972	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R	218E128	2
TOTAL BETA/GAMMA		.032000	CI		HEPA FILTERS	UNKNOWN	R	218E128	8
TOTAL BETA/GAMMA		.007000	CI		METAL BOXES, CARTONS, CASES	2.5*2.5*4	R	218E128	7
TOTAL BETA/GAMMA		12.000000	CI		METAL BOXES, CARTONS, CASES	3*4*7	R	218E128	1

		SUM							18
TOTAL BETA/GAMMA		500.000000	CI	1969	SELF CONTAINED, EQUIPMENT	UNKNOWN	R	218E15	1

		SUM							1
TOTAL BETA/GAMMA		700.000000	CI	1970	SELF CONTAINED, EQUIPMENT	UNKNOWN	R	218E15	1

		SUM							1
TOTAL BETA/GAMMA		80.000000	CI	1971	SELF CONTAINED, EQUIPMENT	UNKNOWN	R	218E15	3

		SUM							3
TOTAL BETA/GAMMA		17550.000000	CI	1972	SELF CONTAINED, EQUIPMENT	UNKNOWN	R	218E15	2

		SUM							2
TOTAL BETA/GAMMA		500.000000	CI	1983	SELF CONTAINED, EQUIPMENT	UNKNOWN	R	218E15	1

		SUM							1
TOTAL BETA/GAMMA		630.810000	CI	1986	SELF CONTAINED, EQUIPMENT	UNKNOWN	R	218E15	3

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri	Waste	Type	Facility	Count

	SUM								3
TOTAL BETA/GAMMA	33750.000000	CI	1987 SELF CONTAINED, EQUIPMENT	UNKNOWN	R		218E15		1

	SUM								1
TOTAL BETA/GAMMA	240.000000	CI	1988 SELF CONTAINED, EQUIPMENT	UNKNOWN	R		218E15		1

	SUM								1
TOTAL BETA/GAMMA	.001000	CI	1977 FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	R		218U3A		1

	SUM								1
TOTAL BETA/GAMMA	.001000	CI	1978 FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	8*10*16	R		218U3A		1

	SUM								1
TOTAL BETA/GAMMA	.240000	CI	1975 HEPA FILTERS	UNKNOWN	R		218U48		8

	SUM								8
TOTAL BETA/GAMMA	3.001000	CI	1978 METAL BOXES, CARTONS, CASES	UNKNOWN	R		218U48		6

	SUM								6
TOTAL BETA/GAMMA	.008000	CI	1981 FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	9*10.67*16	R		218U4C		3

	SUM								3
TOTAL BETA/GAMMA	.100000	CI	1984 METAL BOXES, CARTONS, CASES	UNKNOWN	R		218U4C		2

	SUM								2
TOTAL BETA/GAMMA	1350.000000	CI	1985 METAL BOXES, CARTONS, CASES	6*6*7	R		218U4C		3
TOTAL BETA/GAMMA	.050000	CI	METAL BOXES, CARTONS, CASES	UNKNOWN	R		218U4C		1

	SUM								4

TRU Waste - 202A WHC

Isotope	Rad Qty	Un Date	Container Size	Container Description	Pri Waste Type	Facility	Count
TOTAL-ALPHA	.000000	CI	1989 METAL BOXES, CARTONS, CASES	6'6*7	M	2401W	1

sum							
1							

78 rows selected.

```

set linesize 170
set pagesize 45
set newpage 0
spool pot10.srep
title center 'TRU Waste - 202AL 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 9999999.999999 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, isogty
where con_tsd_accept_dt between '01-jan-69' and '31-dec-92' and
con_srce_cmpny_id = 'WHC' and
con_srce_facil_id = '202AL'
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	
					Waste Type	Facility Count
PU	2.833350 GM	1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R 218E128	40
PU	48.550400 GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218E128	351
PU	12.616400 GM		TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	R 218E128	19

	sum					410
PU	.575650 GM	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R 218E128	8
PU	4.424900 GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218E128	34

	sum					42
PU	.000200 GM	1971	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218E128	2
PU	.000200 GM		METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218E128	2
PU	.000100 GM		SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218E128	1

	sum					5
PU	.000200 GM	1972	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218E128	2
PU	.000300 GM		METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218E128	3

	sum					5
TOTAL BETA/GAMMA	1.087021 CI	1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R 218E128	67
TOTAL BETA/GAMMA	28.437937 CI		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218E128	502
TOTAL BETA/GAMMA	31.452802 CI		TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	R 218E128	31

	sum					600
TOTAL BETA/GAMMA	.348276 CI	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	2 CU FT	R 218E128	46
TOTAL BETA/GAMMA	9.997140 CI		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218E128	239
TOTAL BETA/GAMMA	11.976143 CI		TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	UNKNOWN	R 218E128	11

	sum					296
TOTAL BETA/GAMMA	.002000 CI	1971	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	UNKNOWN	R 218E128	2
TOTAL BETA/GAMMA	.200000 CI		METAL DRUMS, BARRELS, KEGS	30 GALLON	R 218E128	2
TOTAL BETA/GAMMA	.001000 CI		SELF CONTAINED, EQUIPMENT	UNKNOWN	R 218E128	1

	sum					5

Isotope	Rad Qty Un Date Container Size			Container Description	Pri		Type	Facility	Count
					Waste				
TOTAL BETA/GAMMA	.002000	CI	1972	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES			R	218E128	2
TOTAL BETA/GAMMA	.640000	CI		METAL DRUMS, BARRELS, KEGS			R	218E128	3
			****						-----
			sum						5
URANIUM-ENRICHED	1.216980	GM	1969	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES			R	218E128	19
URANIUM-ENRICHED	24.304200	GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES			R	218E128	176
URANIUM-ENRICHED	6.479000	GM		TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER			R	218E128	11
URANIUM-NATURAL	1.616370	GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES			R	218E128	21
URANIUM-NATURAL	23.246200	GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES			R	218E128	170
URANIUM-NATURAL	6.137400	GM		TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER			R	218E128	8
			****						-----
			sum						405
URANIUM-NATURAL	.575650	GM	1970	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES			R	218E128	8
URANIUM-NATURAL	4.424400	GM		FIBERBOARD/PLASTIC BOXES, CARTONS, CASES			R	218E128	29
			****						-----
			sum						37

29 rows selected.

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APPENDIX D

**ORIGINAL SOLID WASTE INFORMATION TRACKING SYSTEM
RECORDS FOR HIGH MASS TRU WASTE**

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APPENDIX D.1

HIGH MASS 202-A TRU WASTE IN 55-GALLON DRUMS

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HIGH MASS 202-A TRU WASTE IN 55-GALLON DRUMS

This subappendix contains complete Solid Waste Information Tracking System (SWITS) records for the four 55-gal drums from 202-A weighing in excess of 130 kg (286.6 lb). Table 5-18 is based on the data in this appendix.

```
set pagesize 55
set linesize 90
set newpage 0
spool judy.srep
select con_pkg_id,
       con_gross_wgt,
       con_size_descr
from radwaste
where rdet_swtyp_cd between '1A' and '1E' and con_size_descr = '55 GALLON' and
con_srce_facil_id = '202A' and con_gross_wgt >= '130'
;
spool off
```

SWIR310

Solid Waste Information and Tracking System

12/09/92
12:35
Page: 1

Container Listing for Container ID: RHA87016
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: RHA87016

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 06/10/87
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 1.000E+00	Neutron Dose Rate:	.1 Container Volume:	0.210 Gross Wt: 135.99
Previous Container ID:		Organic Volume:	73 Organic Wt.: 22.80
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: DW Waste #:			
Generator Information:			
Name:	ID: WHC	Facility ID: 202A	Charge Code: KPKA3
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L03	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1C
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSR #:	870060
Container Empty Tare Wt.:	27.00 Container Thermal Power: 1.000E-01	Container Total Wt.:	
Content Wrap Category:	SDAR Approval #:		
Radioactive Information:			
Total Alpha (Ci): 3.679E+00			
Total Pu Equivalent (Ci): 5.569E+00			
SWEA General Comments:			
	Total Beta-Gamma (Ci): 5.000E-02		
	Total Pu Fissile Gram Equivalent: 3.306E+01		

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				3.700E+01	GM
44	TOTAL-ALPHA	3.679E+00			5.000E-02	CI
45	PU239 FSL GR EQUIV			3.306E+01	.000E+00	CI
46	PE-CI		5.569E+00		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD		9.9700	
NITRIC ACID		0.0000	
SODIUM HYDROXIDE		0.2500	

Physical Components:

Content Description	Volume	%	Weight (kg)
CLOTH/RAGS/NYLON	2		
METAL/IRON/GALVANIZED/SHEET	11		
PLASTIC/POLYETHYLENE	11		
RUBBER	60		
STAINLESS STEEL	16		

Relocation History:

Shipment Information:

AIM

Association for Information and Image Management

1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
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Container Listing for Container ID: RHA-87061
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: Z
for Facility ID: Z
for Primary Waste Type Code: Z
for Secondary Waste Type Code: Z

Container ID: RHA-87061

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 06/01/88
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 9.000E-01	Neutron Dose Rate:	.1 Container Volume:	0.210 Gross Wt: 150.00
Previous Container ID:		Organic Volume: 59	Organic Wt.: 8.80
Current Container ID:		Z Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RE	DW Waste #: D002		
Generator Information:			
Name:	ID: WHC	Facility ID: 202A	Charge Code: KPKA3
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	880033
Container Empty Tare Wt.:	27.00 Container Thermal Power:	1.000E-01	Container Total Wt.:
Content Wrap Category:	SDAR Approval #:		
Radioactive Information:			
Total Alpha (Ci): 3.200E+00			
Total Pu Equivalent (Ci): 4.900E+00			
SWEA General Comments:			
		Total Beta-Gamma (Ci): 5.000E-02	
		Total Pu Fissile Gram Equivalent:	2.880E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				3.200E+01	GM
44	TOTAL-ALPHA	3.200E+00			5.000E-02	CI
45	PU239 FSL GR EQUIV			2.880E+01	.000E+00	CI
46	PE-CI		4.900E+00		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD		1.4300	
SODIUM HYDROXIDE		0.1500	

Physical Components:

Content Description	Volume	%	Weight (kg)
CLOTH/RAGS/NYLON	3		
LEAD	1		
METAL/IRON/GALVANIZED/SHEET	5		
PLASTIC/POLYURATHANE	48		
RUBBER	8		
STAINLESS STEEL	35		

Relocation History:

Shipment Information:
 DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: WHA-88-301 CWDR Number:
 NMIT #: TSD Process: D810

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Container Listing for Container ID: RHA-90-010
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: %
 for Facility ID: %
 for Primary Waste Type Code: %
 for Secondary Waste Type Code: %

Container ID: RHA-90-010

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 10/17/91
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 5.000E-01	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt: 135.99
Previous Container ID:		Organic Volume:	70 Organic Wt.: 36.44
Current Container ID:	% Content Compaction:	Compactor PIN:	
Comments/Description:			
Designation Code: RD	DW Waste #: D008		

Generator Information:

Name:	ID: WHC	Facility ID: 202A	Charge Code: KP4WB
-------	---------	-------------------	--------------------

Location Information:

Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Physical State Code: S	Chemical Nature Code: I	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #: 910001	
Container Empty Tare Wt.: 27.00	Container Thermal Power: 1.000E-01	Container Total Wt.: 106.00	
Content Wrap Category: DM	SDAR Approval #: 16-1B-2EN-0		

Radioactive Information:

Total Alpha (Ci): .000E+00	Total Beta-Gamma (Ci): .000E+00
Total Pu Equivalent (Ci): .000E+00	Total Pu Fissile Gram Equivalent: .000E+00

SWEA General Comments:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				1.400E+01	GM
44	TOTAL-ALPHA	1.075E+00			5.000E-04	CI
45	PU239 FSL GR EQUIV			1.326E+01	.000E+00	CI
46	PE-CI		1.219E+00		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD	<500	55.2019	

Physical Components:

Content Description	Volume	%	Weight (kg)
ABSORBANT/KITY LTR/VERMICULITE	10		14.35
CLOTH/RAGS/NYLON	5		0.20
LEAD	20		55.21
PLASTIC/POLYURATHANE	15		2.04
RUBBER	50		34.20

Relocation History:

Shipment Information:

DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: 91019 CWDR Number:
 NMIT #: TSD Process: S01C

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Container Listing for Container ID: RHA-90-022
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: RHA-90-022

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 05/09/91
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 5.000E-01	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt: 135.99
Previous Container ID:		Organic Volume:	60 Organic Wt.: 41.00
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RD	DW Waste #: D008		
Generator Information:		ID: WHC	Facility ID: 202A
Name:			Charge Code: KPWBA
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code: I	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	910006
Container Empty Tare Wt.:	27.00 Container Thermal Power:	1.000E-01 Container Total Wt.:	106.00
Content Wrap Category: DM	SDAR Approval #:	16-1B-2EM-0	
Radioactive Information:			
Total Alpha (Ci):	.000E+00		
Total Pu Equivalent (Ci):	.000E+00		
SWEA General Comments:			
		Total Beta-Gamma (Ci):	.000E+00
		Total Pu Fissile Gram Equivalent:	.000E+00

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				8.000E+00	GM
44	TOTAL-ALPHA	6.142E-01			5.000E-04	CI
45	PU239 FSL GR EQUIV			7.578E+00	.000E+00	CI
46	PE-CI		6.966E-01		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD	<500	55.2926	

Physical Components:

Content Description	Volume	%	Weight (kg)
ABSORBANT/KITY LTR/VERMICULITE	10		9.70
CLOTH/RAGS/NYLON	2		0.54
LEAD	30		55.30
PLASTIC/POLYURATHANE	10		6.23
RUBBER	48		34.23

Relocation History:

Shipment Information:		Profile #:	RSR #:
DOE/NRC 741 #:			
Item #: 1	Manifest #: 10409	CWDR Number:	
NMIT #:	TSD Process: S01C		

APPENDIX D.2

**HIGH MASS 202-A TRU WASTE IN CONTAINERS
OTHER THAN 55-GALLON DRUMS**

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**HIGH MASS 202-A TRU WASTE IN CONTAINERS
OTHER THAN 55-GALLON DRUMS**

This subappendix contains complete Solid Waste Information Tracking System (SWITS) records for 10 TRU waste containers, other than 55-gal drums, from 202-A weighing in excess of 350 kg (771.6 lb). As discussed in the text, this appendix does not include all of the high mass TRU waste in containers other than 55-gal drums. Table 5-19 is based on the data in this appendix.

```
set pagesize 55
set linesize 90
set newpage 0
spool judy.srep
select con_pkg_id,
       con_gross_wgt,
       con_size_descr
from radwaste
where rdet_swtyp_cd between '1A' and '1E' and con_size_descr <> '55 GALLON' and
con_srce_facil_id = '202A' and con_gross_wgt >= '350'
;
spool off
```

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Container Listing for Container ID: 202A-71-0198S
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: 202A-71-0198S

Location Beginning Coordinates: N N44533 W W49504 Location Ending Coordinates: N W
Content Analysis Return Date: TSD Accept Date: 02/10/71
Certification Date: Container Type Code: DM Container Count: 1
Dose Rate: 1.000E+00 Neutron Dose Rate: Container Volume: 1.019 Gross Wt: 457.22
Previous Container ID: Organic Volume: Organic Wt.:
Current Container ID: % Content Compaction: Compactor PIN:

Comments/Description: DW Waste #:
Designation Code: DW Waste #:
Generator Information: ID: WHC Facility ID: 202A Charge Code:

Location Information:

Area Name: 200E Facility ID: 218E12B Module: Surface Area:
Tier Level: Tier Position: Unit: T27

Lab Pack Description:

Lab Pack Flag: N

Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A

Container Size Description: 3*3*4

Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 710068

Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:

Content Wrap Category: SDAR Approval #:

Radioactive Information:

Total Alpha (Ci):

Total Pu Equivalent (Ci):

SWEA General Comments:

Total Beta-Gamma (Ci): 1.000E-03
Total Pu Fissile Gram Equivalent:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.000E-04	GM
19	TOTAL BETA/GAMMA				1.000E-03	CI

Hazardous Chemical Components:

Component Text

Physical Components:

Content Description	Volume	Weight (kg)
MISCELLANEOUS/UNKNOWN/OTHER	100	

Relocation History:

Shipment Information:

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Container Listing for Container ID: 202A-72-0269S
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: X
for Facility ID: X
for Primary Waste Type Code: X
for Secondary Waste Type Code: X

Container ID: 202A-72-0269S

Location Beginning Coordinates: N N45453 W W49104 Location Ending Coordinates: N W
Content Analysis Return Date: Packaged Date: TSD Accept Date: 06/19/72
Certification Date: Container Type Code: CM Container Count: 1
Dose Rate: 1.500E+03 Neutron Dose Rate: Container Volume: 2.379 Gross Wt: 1066.84
Previous Container ID: Organic Volume: Organic Wt.:
Current Container ID: % Content Compaction: Compactor PIN:
Compaction Wt. (Prorated):
Comments/Description: DW Waste #:
Designation Code: DW Waste #:
Generator Information: ID: WHC Facility ID: 202A Charge Code:
Name:
Location Information: Area Name: 200E Facility ID: 218E12B Module: Surface Area:
Tier Level: Tier Position: Unit: T17
Lab Pack Description: Lab Pack Flag: N
Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A
Container Size Description: 3*4*7
Container Storage Category Code: SWIMS Waste Description Code: DS SWSDR #: 720267
Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:
Content Wrap Category: SDAR Approval #:
Radioactive Information: Total Beta-Gamma (Ci): 1.200E+01
Total Alpha (Ci): Total Pu Equivalent (Ci):
Total Pu Fissile Gram Equivalent:
SWEA General Comments:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.000E-04	GM
19	TOTAL BETA/GAMMA				1.200E+01	CI

Hazardous Chemical Components:

Component Text

Physical Components:

Content Description	Volume %	Weight (kg)
MISCELLANEOUS/UNKNOWN/OTHER	100	

Relocation History:

Shipment Information:

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Solid Waste Information and Tracking System

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Container Listing for Container ID: A-74-011
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: A-74-011

Location Beginning Coordinates: N N40770 W W77803 Location Ending Coordinates: N N40770 W W77779
Content Analysis Return Date: Packaged Date: TSD Accept Date: 03/01/74
Certification Date: Container Type Code: CM Container Count: 1
Dose Rate: Neutron Dose Rate: Container Volume: 0.830 Gross Wt: 371.94
Previous Container ID: Organic Volume: Organic Wt.:
Current Container ID: % Content Compaction: Compactor PIN:
Compaction Wt. (Prorated):
Comments/Description: DW Waste #:
Designation Code: DW Waste #:
Generator Information: Name: ID: WHC Facility ID: 202A Charge Code:
Location Information: Area Name: 200W Facility ID: 218W4B Module: Surface Area:
Tier Level: Tier Position: Unit: T07
Lab Pack Description: Lab Pack Flag: N
Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A
Container Size Description: 4.3*2.6*2.6
Container Storage Category Code: SWIMS Waste Description Code: DS SWSDR #: 740022
Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:
Content Wrap Category: SDAR Approval #:
Radioactive Information: Total Beta-Gamma (Ci):
Total Alpha (Ci): Total Pu Equivalent (Ci):
Total Pu Equivalent (Ci):
SWEA General Comments: Total Pu Fissile Gram Equivalent:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.000E+00	GM

Hazardous Chemical Components:

Component Text

Physical Components:

Content Description

Volume % Weight (kg)

Relocation History:

Shipment Information:

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Container Listing for Container ID: 202A77-01
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: 202A77-01

Location Beginning Coordinates: N N45060 W W77545 Location Ending Coordinates: N N45058 W W77533
Content Analysis Return Date: . TSD Accept Date: 10/31/77
Certification Date: .
Dose Rate: 1.000E+00 Neutron Dose Rate: . Container Volume: 36.246 Gross Wt: 7212.08
Previous Container ID: . Organic Volume: . Organic Wt.: .
Current Container ID: . % Content Compaction: . Compactor PIN: .
Compaction Wt. (Prorated): .
Comments/Description: .
Designation Code: DW Waste #: .
Generator Information: .
Name: . ID: WHC Facility ID: 202A Charge Code: .
Location Information: .
Area Name: 200W Facility ID: 218W3A Module: Surface Area: 2.000E+03
Tier Level: Tier Position: Unit: T17
Lab Pack Description: .
Lab Pack Flag: N
Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A
Container Size Description: 8*10*16
Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 770001
Container Empty Tare Wt.: . Container Thermal Power: . Container Total Wt.: .
Content Wrap Category: SDAR Approval #: .
Radioactive Information: .
Total Alpha (Ci): .
Total Pu Equivalent (Ci): .
SWEA General Comments: .
Total Beta-Gamma (Ci): 1.000E-03
Total Pu Fissile Gram Equivalent: .

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.680E+02	GM
19	TOTAL BETA/GAMMA				1.000E-03	CI

Hazardous Chemical Components:				PPM	Weight (kg)	%
Component Text						

Physical Components:		
Content Description	Volume %	Weight (kg)

Relocation History:

Shipment Information:

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Container Listing for Container ID: A037816F1
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: %
 for Facility ID: %
 for Primary Waste Type Code: %
 for Secondary Waste Type Code: %

Container ID: A037816F1

Location Beginning Coordinates: N N45060 W W77273 Location Ending Coordinates: N N45060 W W77261
 Content Analysis Return Date: Packaged Date: TSD Accept Date: 08/16/78
 Certification Date: Container Type Code: CA Container Count: 1
 Dose Rate: 1.000E+00 Neutron Dose Rate: Container Volume: 36.246 Gross Wt: 9978.98

Previous Container ID: Organic Volume: Organic Wt.:
 Current Container ID: % Content Compaction: Compactor PIN:
 Compaction Wt. (Prorated):

Comments/Description: DW Waste #:
 Designation Code: Generator Information:

Name: ID: WHC Facility ID: 202A Charge Code:

Location Information:

Area Name: 200W Facility ID: 218W3A Module: Surface Area:
 Tier Level: Tier Position: Unit: T17

Lab Pack Description:

Lab Pack Flag: N
 Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A

Container Size Description: 8*10*16

Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 780001

Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:

Content Wrap Category: SDAR Approval #:

Radioactive Information:

Total Alpha (Ci):
 Total Pu Equivalent (Ci): Total Beta-Gamma (Ci): 1.000E-03
 Total Pu Fissile Gram Equivalent:

SWEA General Comments:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.000E+00	GM
19	TOTAL BETA/GAMMA				1.000E-03	CI

Hazardous Chemical Components:

Component Text

Physical Components:

Content Description	Volume %	Weight (kg)
MISCELLANEOUS/UNKNOWN/OTHER	100	

Relocation History:

Shipment Information:

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Container Listing for Container ID: 202A7804
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: %
 for Facility ID: %
 for Primary Waste Type Code: %
 for Secondary Waste Type Code: %

Container ID: 202A7804

Location Beginning Coordinates: N N39950 W W77689 Location Ending Coordinates: N N39950 W W77671
 Content Analysis Return Date: Packaged Date: TSD Accept Date: 01/02/81
 Certification Date: Container Type Code: CA Container Count: 1
 Dose Rate: Neutron Dose Rate: Container Volume: 43.467 Gross Wt: 6713.13

Previous Container ID:
 Current Container ID:
 Compaction Wt. (Prorated): Organic Volume: Organic Wt.:
 Comments/Description: % Content Compaction: Compactor PIN:

Designation Code: DW Waste #:

Generator Information:

Name:

ID: WHC Facility ID: 202A

Charge Code: K3

Location Information:

Area Name: 200W Facility ID: 218W4C Module: Surface Area:

Tier Level: Tier Position: Unit: T07

Lab Pack Description:

Lab Pack Flag: N

Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A

Container Size Description: 9*10.67*16

Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 810002

Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:

Content Wrap Category: SDAR Approval #:

Radioactive Information:

Total Alpha (Ci):

Total Beta-Gamma (Ci): 2.000E-03

Total Pu Equivalent (Ci):

Total Pu Fissile Gram Equivalent:

SWEA General Comments:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				3.600E+01	GM
19	TOTAL BETA/GAMMA				2.000E-03	CI

Hazardous Chemical Components:						
Component Text				PPM	Weight (kg)	%

Physical Components:		
Content Description	Volume %	Weight (kg)
METAL/IRON/GALVANIZED/SHEET	80	
PLEXIGLASS	20	

Relocation History:

Shipment Information:

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Container Listing for Container ID: 202A7805
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: 202A7805

Location Beginning Coordinates: N N39950 W W77707 Location Ending Coordinates: N N39950 W W77689
Content Analysis Return Date: Packaged Date: TSD Accept Date: 01/02/81
Certification Date: Container Type Code: CA Container Count: 1
Dose Rate: 3.500E+00 Neutron Dose Rate: Container Volume: 43.467 Gross Wt: 8436.77

Previous Container ID: Organic Volume: Organic Wt.:
Current Container ID: % Content Compaction: Compactor PIN:

Compaction Wt. (Prorated): % Content Compaction:

Comments/Description: Designation Code: DW Waste #:

Generator Information:

Name: ID: WHC Facility ID: 202A Charge Code: K3

Location Information: Area Name: 200W Facility ID: 218W4C Module: Surface Area:

Tier Level: Tier Position: Unit: T07

Lab Pack Description:

Lab Pack Flag: N

Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A

Container Size Description: 9*10.67*16

Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 810001

Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:

Content Wrap Category: SDAR Approval #:

Radioactive Information:

Total Alpha (Ci):

Total Pu Equivalent (Ci):

SWEA General Comments:

Total Beta-Gamma (Ci): 4.000E-03
Total Pu Fissile Gram Equivalent:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.500E+02	GM
19	TOTAL BETA/GAMMA				4.000E-03	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%

Physical Components:

Content Description	Volume	%	Weight (kg)
CLOTH/RAGS/NYLON	10		
METAL/IRON/GALVANIZED/SHEET	80		
PLEXIGLASS	10		

Relocation History:

Shipment Information:

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Container Listing for Container ID: 202A7807
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: 202A7807

Location Beginning Coordinates: N N39950 W W77707 Location Ending Coordinates: N N39950 W W77689
Content Analysis Return Date: . TSD Accept Date: 01/02/81
Certification Date: . Container Type Code: CA Container Count: 1
Dose Rate: Neutron Dose Rate: Container Volume: 43.467 Gross Wt: 7983.18
Previous Container ID: Organic Volume: Organic Wt.:
Current Container ID: % Content Compaction: Compactor PIN:
Compaction Wt. (Prorated):
Comments/Description: DW Waste #:
Designation Code: Generator Information:
Name: ID: WHC Facility ID: 202A Charge Code: K3
Location Information:
Area Name: 200W Facility ID: 218W4C Module: Surface Area:
Tier Level: Tier Position: Unit: T07
Lab Pack Description:
Lab Pack Flag: N
Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A
Container Size Description: 9*10.67*16
Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 810003
Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:
Content Wrap Category: SDAR Approval #:
Radioactive Information:
Total Alpha (Ci):
Total Pu Equivalent (Ci):
SWEA General Comments: Total Beta-Gamma (Ci): 2.000E-03
Total Pu Fissile Gram Equivalent:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				2.200E+01	GM
19	TOTAL BETA/GAMMA				2.000E-03	CI

Hazardous Chemical Components:

Component Text

FPM Weight (kg) %

Physical Components:

Content Description	Volume %	Weight (kg)
METAL/IRON/GALVANIZED/SHEET	80	
PLEXIGLASS	20	

Relocation History:

Shipment Information:

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Container Listing for Container ID: SB83121.B
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: %
 for Facility ID: %
 for Primary Waste Type Code: %
 for Secondary Waste Type Code: %

Container ID: SB83121.B

Location Beginning Coordinates: N N39950 W W78011 Location Ending Coordinates: N N39950 W W77925
 Content Analysis Return Date: TSD Accept Date: 03/07/85
 Certification Date: Container Type Code: CM Container Count: 1
 Dose Rate: 6.000E+00 Neutron Dose Rate: Container Volume: 14.272 Gross Wt.: 6350.26
 Previous Container ID:
 Current Container ID:
 Compaction Wt. (Prorated): Organic Volume: Organic Wt.:
 Comments/Description: % Content Compaction: Compactor PIN:
 Designation Code: DW Waste #:
 Generator Information:
 Name: ID: WHC Facility ID: 202A Charge Code: KP
 Location Information:
 Area Name: 200W Facility ID: 218W4C Module: Surface Area:
 Tier Level: Tier Position: Unit: T07
 Lab Pack Description:
 Lab Pack Flag: N
 Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1A
 Container Size Description: UNKNOWN
 Container Storage Category Code: SWMS Waste Description Code: DS SWSR #: 850001
 Container Empty Tare Wt.: Container Thermal Power: Container Total Wt.:
 Content Wrap Category: SDAR Approval #:
 Radioactive Information:
 Total Alpha (Ci):
 Total Pu Equivalent (Ci): Total Beta-Gamma (Ci): 5.000E-02
 SWEA General Comments: Total Pu Fissile Gram Equivalent:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				4.810E+02	GM
19	TOTAL BETA/GAMMA				5.000E-02	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
----------------	-----	-------------	---

Physical Components:

Content Description	Volume	%	Weight (kg)
CLOTH/RAGS/NYLON	10		
GLASS	10		
PLASTIC/POLYURATHANE	15		
STAINLESS STEEL	65		

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Container Listing for Container ID: RHA-SB-84-06
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: Z
for Facility ID: Z
for Primary Waste Type Code: Z
for Secondary Waste Type Code: Z

Container ID: RHA-SB-84-06

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 08/17/89
Certification Date:		Container Type Code: CM	Container Count: 1
Dose Rate: 5.000E-01	Neutron Dose Rate:	Container Volume:	7.136 Gross Wt: 2159.09
Previous Container ID:		Organic Volume:	18 Organic Wt.: 299.10
Current Container ID:		Z Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RD	DW Waste #: D008 WT02		
Generator Information:		ID: WHC	Facility ID: 202A
Name:			Charge Code: KP135
Location Information:			
Area Name: 200W	Facility ID: 2401W	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 6*6*7			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	890001
Container Empty Tare Wt.:	1225.00 Container Thermal Power:	1.000E-01	Container Total Wt.:
Content Wrap Category: LM	SDAR Approval #:	1-3A-2AM-X	
Radioactive Information:			
Total Alpha (Ci):	2.186E+00		
Total Pu Equivalent (Ci):	2.600E+00		
SWEA General Comments:			
		Total Beta-Gamma (Ci):	.000E+00
		Total Pu Fissile Gram Equivalent:	2.020E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				2.200E+01	GM
44	TOTAL-ALPHA	2.186E+00			5.000E-04	CI
45	PU239 FSL GR EQUIV			2.020E+01	.000E+00	CI
46	PE-CI		2.600E+00		.000E+00	GM
					.000E+00	CI

Component Text	PPM	Weight (kg)	%
LEAD		5.7016	

Hazardous Chemical Components:

Content Description	Volume %	Weight (kg)
CONCRETE	1	7.27
LEAD	0	5.70
METAL/IRON/GALVANIZED/SHEET	80	687.00
PAPER/CARDBOARD	5	1.82
PLASTIC/POLYURATHANE	9	151.40
RUBBER	0	1.82
WOOD/LUMBER/PLYWOOD	5	66.82

Relocation History:

Shipment Information:
 DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: WHA89304 CWDR Number:
 NMIT #: TSD Process: D810

APPENDIX E

**ORIGINAL SOLID WASTE INFORMATION TRACKING SYSTEM RECORDS FOR
CONTAINERS OF TRU WASTE WITH HEAVY PLUTONIUM GRAM LOADING**

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APPENDIX E.1

**202-A WASTE WITH HEAVY TRU GRAM LOADING
CONTAINED IN 55-GALLON DRUMS**

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**202-A WASTE WITH HEAVY TRU GRAM LOADING
CONTAINED IN 55-GALLON DRUMS**

This subappendix contains the complete Solid Waste Information Tracking System (SWITS) records for the six 55-gal drums from 202-A that contain ≥ 175 g (26.2 oz) of plutonium. Table 5-22 is based on the data in this appendix.

```

set pagesize 55
set linesize 90
set newpage 0
spool judy.srep
select con_pkg_id,
       rad_qty,
       con_size_descr
from radwaste, isoqty
where rdet_swtyp_cd between '1A' and '1E' and con_size_descr = '55 GALLON' and
con_srce_facil_id = '202A' and rad_iso_num in (1,41) and rad_qty >= '175'
and con_pkg_id = rad_pkg_id
;
spool off

```

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Container Listing for Container ID: A-84-040
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: %
 for Facility ID: %
 for Primary Waste Type Code: %
 for Secondary Waste Type Code: %

Container ID: A-84-040

Location Beginning Coordinates: N N39050 W W77500 Location Ending Coordinates: N N39050 W W77476
 Content Analysis Return Date: Packaged Date: TSD Accept Date: 07/11/84
 Certification Date: Container Type Code: DM Container Count: 1
 Dose Rate: 7.000E+00 Neutron Dose Rate: Container Volume: 0.210 Gross Wt: 65.32
 Previous Container ID: Organic Volume: Organic Wt.:
 Current Container ID: % Content Compaction: Compactor PIN:
 Compaction Wt. (Prorated):
 Comments/Description: DW Waste #:
 Designation Code:
 Generator Information:
 Name: ID: WHC Facility ID: 202A Charge Code: KP
 Location Information:
 Area Name: 200W Facility ID: 218W4C Module: Surface Area:
 Tier Level: Tier Position: Unit: T29
 Lab Pack Description:
 Lab Pack Flag: N
 Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1D
 Container Size Description: 55 GALLON
 Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 840034
 Container Empty Tare Wt.: 27.00 Container Thermal Power: Container Total Wt.:
 Content Wrap Category: SDAR Approval #:
 Radioactive Information:
 Total Alpha (Ci):
 Total Pu Equivalent (Ci):
 SWEA General Comments:
 Total Beta-Gamma (Ci): 7.000E-03
 Total Pu Fissile Gram Equivalent:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.842E+02	GM
19	TOTAL BETA/GAMMA				7.000E-03	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%

Physical Components:

Content Description	Volume	%	Weight (kg)
CLOTH/RAGS/NYLON	15		
PLASTIC/POLYURATHANE	35		
RUBBER	50		

Relocation History:

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Container Listing for Container ID: A84066
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: A84066

Location Beginning Coordinates: N N39050 W W77596 Location Ending Coordinates: N N39050 W W77572
Content Analysis Return Date: TSD Accept Date: 11/16/85
Certification Date: Container Type Code: DM Container Count: 1
Dose Rate: 3.400E+00 Neutron Dose Rate: Container Volume: 0.210 Gross Wt: 46.99
Previous Container ID: Organic Volume: Organic Wt.: 20.00
Current Container ID: % Content Compaction: Compactor PIN:

Compaction Wt. (Prorated):

Comments/Description:

Designation Code: DW Waste #:

Generator Information:

Name: ID: WHC Facility ID: 202A Charge Code: KP

Location Information:

Area Name: 200W Facility ID: 218W4C Module: Surface Area:

Tier Level: Tier Position: Unit: T29

Lab Pack Description:

Lab Pack Flag: N

Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1D

Container Size Description: 55 GALLON

Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 850066

Container Empty Tare Wt.: 27.00 Container Thermal Power: 1.000E-01 Container Total Wt.:

Content Wrap Category: SDAR Approval #:

Radioactive Information:

Total Alpha (Ci):

Total Pu Equivalent (Ci):

SWEA General Comments:

Total Beta-Gamma (Ci): 5.000E-02

Total Pu Fissile Gram Equivalent:

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				2.000E+02	GM
19	TOTAL BE γ A/GAMMA				5.000E-02	CI

Hazardous Chemical Components:

Component Text

PPM Weight (kg) %

Physical Components:

Content Description	Volume %	Weight (kg)
METAL/IRON/GALVANIZED/SHEET	30	
PLASTIC/POLYURATHANE	25	
RUBBER	30	
STAINLESS STEEL	10	

Relocation History:

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Container Listing for Container ID: RHA-87045
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: RHA-87045

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 06/01/88
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 9.000E+00	Neutron Dose Rate:	.6	Container Volume: 0.210 Gross Wt: 108.00
Previous Container ID:		Organic Volume: 62	Organic Wt.: 23.40
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RE	DW Waste #: D002		
Generator Information:		ID: WHC	Facility ID: 202A
Name:			Charge Code: KPKA3
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	880026
Container Empty Tare Wt.:	27.00	Container Thermal Power:	1.000E-01
Container Total Wt.:		Container Total Wt.:	
Content Wrap Category:	SDAR Approval #:		
Radioactive Information:			
Total Alpha (Ci): 1.740E+01		Total Beta-Gamma (Ci):	5.000E-02
Total Pu Equivalent (Ci): 2.640E+01		Total Pu Fissile Gram Equivalent:	1.570E+02
SWEA General Comments:			

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.750E+02	GM
19	TOTAL BETA/GAMMA				5.000E-02	CI
44	TOTAL-ALPHA	1.740E+01			.000E+00	CI
45	PU239 FSL GR EQUIV			1.570E+02	.000E+00	GM
46	PE-CI		2.640E+01		.000E+00	CI

Hazardous Chemical Components:	PPM	Weight (kg)	%
Component Text			
LEAD		0.9500	
SODIUM HYDROXIDE		0.4500	

Physical Components:	Volume %	Weight (kg)
Content Description		
CLOTH/RAGS/NYLON	21	
METAL/IRON/GALVANIZED/SHEET	28	
PLASTIC/POLYURATHANE	31	
RUBBER	10	
STAINLESS STEEL	10	

Relocation History:

Shipment Information:
 DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: WHA-88-301 CWDR Number:
 NMIT #: TSD Process: D810

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Container Listing for Container ID: RHA87-060
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: Z
 for Facility ID: Z
 for Primary Waste Type Code: Z
 for Secondary Waste Type Code: Z

Container ID: RHA87-060

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 02/19/88
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 1.000E+00	Neutron Dose Rate:	.5 Container Volume:	0.210 Gross Wt: 86.00
Previous Container ID:		Organic Volume: 84	Organic Wt.: 12.30
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:	DW Waste #:		
Designation Code:			
Generator Information:			
Name:	ID: WHC	Facility ID: 202A	Charge Code: KPKA3
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	880006
Container Empty Tare Wt.: 27.00	Container Thermal Power: 1.000E-01	Container Total Wt.:	
Content Wrap Category:	SDAR Approval #:		
Radioactive Information:			
Total Alpha (Ci):		Total Beta-Gamma (Ci):	
Total Pu Equivalent (Ci):		Total Pu Fissile Gram Equivalent:	
SWEA General Comments:			

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.750E+02	GM

Hazardous Chemical Components:						
Component Text				PPM	Weight (kg)	%
LEAD					8.0700	

Physical Components:						
Content Description		Volume	%	Weight (kg)		
CLOTH/RAGS/NYLON		3				
GLASS		3				
LEAD		2				
METAL/IRON/GALVANIZED/SHEET		11				
PLASTIC/POLYURATHANE		48				
RUBBER		33				

Relocation History:

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Container Listing for Container ID: RHA-90-006
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: Z
for Facility ID: Z
for Primary Waste Type Code: Z
for Secondary Waste Type Code: Z

Container ID: RHA-90-006

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 05/31/90
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 2.700E+01	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt: 82.01
Previous Container ID:		Organic Volume:	75 Organic Wt.: 19.46
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RD	DW Waste #: D002 D008		
Generator Information:		ID: WHC	Facility ID: 202A
Name:			Charge Code: KPWBA
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	900004
Container Empty Tare Wt.:	27.00 Container Thermal Power:	1.000E-01	Container Total Wt.:
Content Wrap Category: LM	SDAR Approval #:	1-1B-2EM-5	
Radioactive Information:			
Total Alpha (Ci): 1.793E+01			
Total Pu Equivalent (Ci): 2.714E+01			
SWEA General Comments:			
		Total Beta-Gamma (Ci):	2.700E-02
		Total Pu Fissile Gram Equivalent:	1.592E+02

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.800E+02	GM
19	TOTAL BETA/GAMMA				2.700E-02	CI
44	TOTAL-ALPHA	1.793E+01			.000E+00	CI
45	PU239 FSL GR EQUIV			1.592E+02	.000E+00	GM
46	PE-CI		2.714E+01		.000E+00	CI

Hazardous Chemical Components:	Component Text	PPM	Weight (kg)	%
LEAD			16.0798	
SODIUM HYDROXIDE			0.0300	

Physical Components:	Content Description	Volume	%	Weight (kg)
ABSORBANT/KITY LTR/VERMICULITE		14		16.43
CHEMICALS		1		0.03
CLOTH/RAGS/NYLON		5		1.46
LEAD		10		16.08
PLASTIC/POLYURATHANE		30		8.00
RUBBER		40		10.00

Relocation History:

Shipment Information:
 DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: 90PX1 CWDR Number:
 NMIT #: TSD Process: S01C

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Container Listing for Container ID: RHA-90-012
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: Z
 for Facility ID: Z
 for Primary Waste Type Code: Z
 for Secondary Waste Type Code: Z

Container ID: RHA-90-012

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date: 10/30/90	TSD Accept Date: 05/09/91
Certification Date: 05/20/91		Container Type Code: DM	Container Count: 1
Dose Rate: 1.760E+01	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt.: 96.98
Previous Container ID:		Organic Volume:	50 Organic Wt.: 17.19
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: DW Waste #:			
Generator Information:			
Name:	ID: WHC	Facility ID: 202A	Charge Code: KPWBA
Location Information:			
Area Name: 200W	Facility ID: 224T	Module: 2	Surface Area:
Tier Level: 2	Tier Position:	Unit: L02	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: R	Secondary Waste Type Code: 1C
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #: 910008	
Container Empty Fare Wt.:	27.00 Container Thermal Power: 1.000E-01	Container Total Wt.:	67.00
Content Wrap Category: DM	SDAR Approval #: 16-1B-2E-0		
Radioactive Information:			
Total Alpha (Ci): 1.382E+01		Total Beta-Gamma (Ci):	1.760E-02
Total Pu Equivalent (Ci): 1.567E+01		Total Pu Fissile Gram Equivalent:	1.705E+02
SWEA General Comments:			

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				1.800E+02	GM
44	TOTAL-ALPHA	1.382E+01			1.760E-02	CI
45	PU239 FSL GR EQUIV			1.705E+02	.000E+00	CI
46	PE-CI		1.567E+01		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%

Physical Components:

Content Description	Volume %	Weight (kg)
ABSORBANT/KITY LTR/VERMICULITE	10	8.34
CLOTH/RAGS/NYLON	8	2.75
METAL/IRON/GALVANIZED/SHEET	40	41.47
PLASTIC/POLYURATHANE	40	13.75
WOOD/LUMBER/PLYWOOD	2	0.69

Relocation History:

Shipment Information:

APPENDIX E.2

**202-AL WASTE WITH HEAVY TRU GRAM LOADING
CONTAINED IN 55-GALLON DRUMS**

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**202-AL WASTE WITH HEAVY TRU GRAM LOADING
CONTAINED IN 55-GALLON DRUMS**

This subappendix contains the complete Solid Waste Information Tracking System (SWITS) records for the seven 55-gal drums from 202-AL that contain ≥ 10 g of plutonium. All seven drums were disposed of on July 13, 1989, and are stored at the Transuranic Waste Storage and Assay Facility (TRUSAF). Table 5-23 is based on the data in this appendix.

```

set pagesize 55
set linesize 90
set newpage 0
spool judy.srep
select con_pkg_id,
       rad_qty,
       con_size_descr
from radwaste, isoqty
where rdet_swtyp_cd between '1A' and '1E' and con_size_descr = '55 GALLON' and
con_srce_facil_id in ('202AL') and
rad_iso_num in ('1','41') and rad_qty >= '10' and
con_pkg_id = rad_pkg_id
;
spool off

```

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Container Listing for Container ID: RHA-85-299

FROM: 01/01/44 THRU: 01/01/93

for Generating Company: %

for Facility ID: %

for Primary Waste Type Code: %

for Secondary Waste Type Code: %

Container ID: RHA-85-299

Location Beginning Coordinates: N W Location Ending Coordinates: N W
 Content Analysis Return Date: Packaged Date: 09/12/85 TSD Accept Date: 07/13/89
 Certification Date: 07/19/89 Container Type Code: DM Container Count: 1
 Dose Rate: 2.800E+00 Neutron Dose Rate: Container Volume: 0.210 Gross Wt: 47.63

Previous Container ID: Organic Volume: 89 Organic Wt.: 6.37
 Current Container ID: % Content Compaction: Compactor PIN:
 Compaction Wt. (Prorated):

Comments/Description: DW Waste #:

Designation Code:

Generator Information:

Name:

ID: WHC Facility ID: 202AL Charge Code: KP135

Location Information:

Area Name: 200W Facility ID: 224T

Tier Level: Tier Position: Module: Surface Area:

Lab Pack Description:

Lab Pack Flag: N

Physical State Code: S Chemical Nature Code: Primary Waste Type Code: R Secondary Waste Type Code: 1C

Container Size Description: 55 GALLON

Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 900001

Container Empty Tare Wt.: 27.00 Container Thermal Power: 5.300E-03 Container Total Wt.:

Content Wrap Category: DM SDAR Approval #: 1-1B-2E-4

Radioactive Information:

Total Alpha (Ci): 1.200E+00

Total Pu Equivalent (Ci): 1.800E+00

SWEA General Comments:

Total Beta-Gamma (Ci): 5.000E-04

Total Pu Fissile Gram Equivalent: 1.100E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.200E+01	GM
19	TOTAL BETA/GAMMA				5.000E-04	CI
44	TOTAL-ALPHA	1.200E+00			.000E+00	CI
45	PU239 FSL GR EQUIV			1.100E+01	.000E+00	GM
46	PE-CI		1.800E+00		.000E+00	CI

Hazardous Chemical Components:
Component Text

Physical Components: Content Description	Volume	%	Weight (kg)
GLASS	10		13.02
METAL/IRON/GALVANIZED/SHEET	1		1.07
PAPER/CARDBOARD	44		3.02
PLASTIC/POLYURATHANE	45		3.35

Relocation History:

Shipment Information:

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Container Listing for Container ID: RHA-88-109
 FROM: 01/01/44 THRU: 01/01/93
 for Generating Company: Z
 for Facility ID: Z
 for Primary Waste Type Code: Z
 for Secondary Waste Type Code: Z

Container ID. RHA-88-109

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 07/20/89
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 5.000E-01	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt.: 45.81
Previous Container ID:		Organic Volume:	88 Organic Wt.: 11.03
Current Container ID:		Z Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: DW Waste #:			
Generator Information:		ID: WHC	Facility ID: 202AL
Name:			Charge Code: KP135
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L02	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: R	Secondary Waste Type Code: 1C
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	890015
Container Empty Tare Wt.:	27.00 Container Thermal Power:	5.800E-03	Container Total Wt.:
Content Wrap Category: DM	SDAR Approval #:	1-1B-2E-4	
Radioactive Information:			
Total Alpha (Ci): 1.300E+00			
Total Pu Equivalent (Ci): 2.000E+00			
SWEA General Comments:			
		Total Beta-Gamma (Ci):	5.000E-04
		Total Pu Fissile Gram Equivalent:	1.180E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				1.300E+01	GM
19	TOTAL BETA/GAMMA				5.000E-04	CI
44	TOTAL-ALPHA	1.300E+00			.000E+00	CI
45	PU239 FSL GR EQUIV			1.180E+01	.000E+00	GM
46	PE-CI		2.000E+00		.000E+00	CI

Hazardous Chemical Components:
Component Text

PPM	Weight (kg)	%
-----	-------------	---

Physical Components:

Content Description	Volume	%	Weight (kg)
GLASS	10		5.76
METAL/IRON/GALVANIZED/SHEET	2		1.85
PAPER/CARDBOARD	40		4.42
PLASTIC/POLYURATHANE	45		6.10
RUBBER	3		0.51

Relocation History:

Shipment Information:

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SWIR310

Solid Waste Information and Tracking System

Container Listing for Container ID: RHA-89-004
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: RHA-89-004

Location Beginning Coordinates: N W Location Ending Coordinates: N W
Content Analysis Return Date: TSD Accept Date: 07/13/89
Certification Date: Container Type Code: DM Container Count: 1
Dose Rate: 1.200E+01 Neutron Dose Rate: Container Volume: 0.210 Gross Wt: 120.20
Previous Container ID: Organic Volume: 90 Organic Wt.: 6.36
Current Container ID: % Content Compaction: Compactor PIN:
Compaction Wt. (Prorated):
Comments/Description:
Designation Code: RD DW Waste #: D008
Generator Information:
Name: ID: WHC Facility ID: 202AL Charge Code: KP135
Location Information:
Area Name: 200W Facility ID: 224T Module: Surface Area:
Tier Level: Tier Position: Unit: L01
Lab Pack Description:
Lab Pack Flag: N
Physical State Code: S Chemical Nature Code: Primary Waste Type Code: M Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON
Container Storage Category Code: SWIMS Waste Description Code: DS SWSR #: 890014
Container Empty Tare Wt.: 27.00 Container Thermal Power: 7.280E-02 Container Total Wt.:
Content Wrap Category: DM SDR Approval #: 1-1B-2E-4
Radioactive Information:
Total Alpha (Ci): 9.800E+00
Total Pu Equivalent (Ci): 1.420E+01
SWEA General Comments:
Total Beta-Gamma (Ci): 1.200E-03
Total Pu Fissile Gram Equivalent: 8.810E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				9.800E+01	GM
19	TOTAL BETA/GAMMA				1.200E-03	CI
44	TOTAL-ALPHA	9.800E+00			.000E+00	CI
45	PU239 FSL GR EQUIV			8.810E+01	.000E+00	GM
46	PE-CI		1.420E+01		.000E+00	CI

Hazardous Chemical Components:
Component Text

PPM	Weight (kg)	%
	27.6735	

LEAD

Physical Components:
Content Description

Volume	%	Weight (kg)
2		27.07
8		9.74
90		56.36

LEAD

METAL/IRON/GALVANIZED/SHEET
PLASTIC/POLYURATHANE

Relocation History:

Shipment Information:

DOE/NRC 741 #: Profile #: RSR #:
Item #: 1 Manifest #: WHA-89-303 CWDR Number:
NMIT #: TSD Process: D810

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Solid Waste Information and Tracking System

SWTR310

Container Listing for Container ID: RHA-89-005
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: RHA-89-005

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 07/13/89
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 3.500E+00	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt: 113.40
Previous Container ID:		Organic Volume:	75 Organic Wt.: 15.00
Current Container ID:	% Content Compaction:	Compactor PIN:	
Comments/Description:			
Designation Code: RD	DW Waste #: D002 D008		
Generator Information:		ID: WHC	Facility ID: 202AL
Name:			Charge Code: KPI35
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SMSDR #:	890015
Container Empty Tare Wt.:	27.00 Container Thermal Power:	1.550E-02 Container Total Wt.:	
Content Wrap Category: DM	SDAR Approval #:	1-1B-2E-4	
Radioactive Information:			
Total Alpha (Ci): 3.600E+00			
Total Pu Equivalent (Ci): 5.400E+00			
SWEA General Comments:			
		Total Beta-Gamma (Ci):	3.500E-03
		Total Pu Fissile Gram Equivalent:	3.200E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU				3.600E+01	GM
19	TOTAL BETA/GAMMA				3.500E-03	CI
44	TOTAL-ALPHA	3.600E+00			.000E+00	CI
45	PU239 FSL GR EQUIV			3.200E+01	.000E+00	GM
46	PE-CI		5.400E+00		.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD		4.2751	
SODIUM HYDROXIDE		0.0500	

Physical Components:

Content Description	Volume %	Weight (kg)
CLOTH/RAGS/NYLON	2	0.46
LEAD	1	4.28
METAL/IRON/GALVANIZED/SHEET	24	67.04
PLASTIC/POLYURATHANE	73	14.55

Relocation History:

Shipment Information:

DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: WHA-89-303 CWDR Number:
 NMIT #: TSD Process: D810

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Solid Waste Information and Tracking System

SWIR310

Container Listing for Container ID: RHA-89-006
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: RHA-89-006

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 07/13/89
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 5.000E-01	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt: 140.61
Previous Container ID:		Organic Volume:	80 Organic Wt.: 62.82
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RD	DW Waste #: D008		
Generator Information:		ID: WHC	Facility ID: 202AL
Name:			Charge Code: KP135
Location Information:		Module:	Surface Area:
Area Name: 200W	Facility ID: 224T	Unit: L01	
Tier Level:	Tier Position:		
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSR #:	890016
Container Empty Tare Wt.:	27.00 Container Thermal Power:	9.500E-03	Container Total Wt.:
Content Wrap Category: DM	SDAR Approval #:	1-1B-2E-4	
Radioactive Information:			
Total Alpha (Ci):	2.200E+00		
Total Pu Equivalent (Ci):	3.300E+00		
SWEA General Comments:			
		Total Beta-Gamma (Ci):	5.000E-04
		Total Pu Fissile Gram Equivalent:	1.950E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				2.200E+01	GM
44	TOTAL-ALPHA	2.200E+00			5.000E-04	CI
45	PU239 FSL GR EQUIV			1.950E+01	.000E+00	CI
46	PE-CI		3.300E+00		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD		50.8474	

Physical Components:

Content Description	Volume	%	Weight (kg)
LEAD	20		50.82
PLASTIC/POLYURATHANE	80		62.82

Relocation History:

Shipment Information:

DOE/NRC 741 #:	Profile #:	RSR #:
Item #: 1	Manifest #: WHA-89-303	CWDR Number:
NMIT #:	TSD Process: D810	

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Solid Waste Information and Tracking System

SWIR310

Container Listing for Container ID: RHA-89-007
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: Z
for Facility ID: Z
for Primary Waste Type Code: Z
for Secondary Waste Type Code: Z

Container ID: RHA-89-007

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 07/13/89
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 2.400E+00	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt: 108.86
Previous Container ID:		Organic Volume:	78 Organic Wt.: 26.36
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RD	DW Waste #: D002 D008		
Generator Information:			
Name:	ID: WHC	Facility ID: 202AL	Charge Code: KP135
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSR #:	890017
Container Empty Tare Wt.:	27.00 Container Thermal Power: 3.840E-02	Container Total Wt.:	
Content Wrap Category: DM	SDAR Approval #:	1-1B-2E-4	
Radioactive Information:			
Total Alpha (Ci): 8.800E+00			
Total Pu Equivalent (Ci): 1.330E+01			
SWEA General Comments:			
		Total Beta-Gamma (Ci):	2.400E-03
		Total Pu Fissile Gram Equivalent:	7.910E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				8.800E+01	GM
44	TOTAL-ALPHA	8.800E+00			2.400E-03	CI
45	PU239 FSL GR EQUIV			7.910E+01	.000E+00	CI
46	PE-CI		1.330E+01		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD		16.6241	
SODIUM HYDROXIDE		0.1500	

Physical Components:

Content Description	Volume %	Weight (kg)
LEAD	2	16.63
METAL/IRON/GALVANIZED/SHEET	20	38.68
PLASTIC/POLYURATHANE	78	26.36

Relocation History:

Shipment Information:

DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: WHA-89-303 CWDR Number:
 NMIT #: TSD Process: D810

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Solid Waste Information and Tracking System

SWIR310

Container Listing for Container ID: RHA-89-008
FROM: 01/01/44 THRU: 01/01/93
for Generating Company: %
for Facility ID: %
for Primary Waste Type Code: %
for Secondary Waste Type Code: %

Container ID: RHA-89-008

Location Beginning Coordinates: N	W	Location Ending Coordinates: N	W
Content Analysis Return Date:		Packaged Date:	TSD Accept Date: 07/13/89
Certification Date:		Container Type Code: DM	Container Count: 1
Dose Rate: 1.600E+00	Neutron Dose Rate:	Container Volume:	0.210 Gross Wt: 117.93
Previous Container ID:		Organic Volume:	75 Organic Wt.: 25.00
Current Container ID:		% Content Compaction:	Compactor PIN:
Compaction Wt. (Prorated):			
Comments/Description:			
Designation Code: RD	DW Waste #: D002 D008		
Generator Information:		ID: WHC	Facility ID: 202AL
Name:			Charge Code: KP135
Location Information:			
Area Name: 200W	Facility ID: 224T	Module:	Surface Area:
Tier Level:	Tier Position:	Unit: L01	
Lab Pack Description:			
Lab Pack Flag: N			
Physical State Code: S	Chemical Nature Code:	Primary Waste Type Code: M	Secondary Waste Type Code: 1D
Container Size Description: 55 GALLON			
Container Storage Category Code:	SWIMS Waste Description Code: DS	SWSDR #:	890018
Container Empty Tare Wt.:	27.00 Container Thermal Power:	2.780E-02	Container Total Wt.:
Content Wrap Category: DM	SDAR Approval #:	1-1B-2E-4	
Radioactive Information:			
Total Alpha (Ci):	6.400E+00		
Total Pu Equivalent (Ci):	9.700E+00		
SWEA General Comments:			
		Total Beta-Gamma (Ci):	1.600E-03
		Total Pu Fissile Gram Equivalent:	5.730E+01

Isotope Number	Isotope Name	Alpha Ci	PE-Ci	PU-FGE	Isotope Activity	Unit
1	PU					
19	TOTAL BETA/GAMMA				6.400E+01	GM
44	TOTAL-ALPHA	6.400E+00			1.600E-03	CI
45	PU239 FSL GR EQUIV			5.730E+01	.000E+00	CI
46	PE-CI		9.700E+00		.000E+00	GM
					.000E+00	CI

Hazardous Chemical Components:

Component Text	PPM	Weight (kg)	%
LEAD		8.6001	
SODIUM HYDROXIDE		0.1500	

Physical Components:

Content Description	Volume %	Weight (kg)
LEAD	5	8.60
METAL/IRON/GALVANIZED/SHEET	20	57.16
PLASTIC/POLYURATHANE	75	25.00

Relocation History:

Shipment Information:

DOE/NRC 741 #: Profile #: RSR #:
 Item #: 1 Manifest #: WHA-89-303 CWDR Number:
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