Reports

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Department of Energy
Albuquerque Operations Office
Office of Los Alamos Site Operations
Los Alamos, New Mexico 87544

FEB 27 2002

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, New Mexico 87505

Dear Mr. Bearzi:

Subject: 2001 Hazardous Waste Report for the Los Alamos National Laboratory, EPA I.D. NM890010515

The purpose of this letter is to transmit a copy of the 2001 Hazardous Waste Report for the Department of Energy (DOE) and the University of California (UC). The Resource Conservation and Recovery Act (RCRA) and 20 NMAC 4.1 require that generators of hazardous waste submit a report identifying hazardous (and mixed) waste generated during the previous year. This report details information of waste generation for Calendar Year 2001.

We have certified this document as "accurate and complete." However, because DOE/UC are continuously evaluating waste streams for hazardous waste constituents, information may become available in the future on wastes generated in 2001 requiring revisions or amendments to the enclosed report. Should this occur, DOE/UC will provide you with changes as soon as they become available.

If you have any questions regarding the contents of this report, please contact Gene Turner of my staff at (505) 667-5794 or James White of UC at (505) 665-0677.

Sincerely,

Joseph C. Vozella
Acting Associate Director
Office of Facility Operations

OFO:3GT-020

Enclosure

cc:
See Page 2

8208

cc w/enclosure:
Linda Montoya
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, New Mexico 87505

Beth Osheim, Counsel, OLASO
Gene Turner, OFO, OLASO
John Stetson, PWT, OLASO

cc w/o enclosure:
Jim White, ESH-19, LANL, MS-K490

2001
LOS ALAMOS NATIONAL LABORATORY'S HAZARDOUS WASTE REPORT

LA-UR-02-889

PREPARED BY
ESH-19
FWO-SWO
GREG ERPENBECK
JIM WHITE

MAIL THE COMPLETED FORM TO: The Appropriate EPA Regional or State Office	United States Environmental Protection Agency **RCRA SUBTITLE C SITE IDENTIFICATION FORM**	
1. Reason for Submittal and Status of Information Supplied (see instructions on pages 10 and 11) CHECK CORRECT BOX(ES)	**A. Reason for Submittal:** ☐ To provide initial notification (to obtain an EPA ID Number for hazardous waste, universal waste, or used oil activities). ☐ To provide subsequent notification (to update site identification information). ☐ As a component of a First RCRA Hazardous Waste Part A Permit Application. ☐ As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment #_____). ☒ As a component of the Hazardous Waste Report.	
2. Site EPA ID Number (see instructions on page 11)	**EPA ID Number:** NM0890010515	
3. Site Name (see instructions on page 11)	**Name:** U.S. DOE LOS ALAMOS NATIONAL LABORATORY	
4. Site Location Information (see instructions on page 11)	**Street Address:** PO BOX 1663 MS K490	
	City, Town, or Village: LOS ALAMOS	**State:** NM
	County Name: LOS ALAMOS	**Zip Code:** 87545- -
5. Site Land Type (see instructions on page 11)	**Site Land Type:** ☐ Private ☐ County ☐ District ☒ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other	
6. North American Industry Classification System (NAICS) Code(s) for the Site (see instructions on page 11)	**A.** 92811	**B.**
	C.	**D.**
7. Site Mailing Address (see instructions on page 12)	**Street Address:** P.O. BOX 1663, MS K490	
	City, Town, or Village: LOS ALAMOS	
	State: NM	
	Country:	**Zip Code:** 87545- -
8. Site Contact Person (see instructions on page 12)	**First Name:** JAMES **MI:** L	**Last Name:** WHITE
	Phone Number: (505) 665-0677	**Phone Number Extension:**
9. Legal Owner and Operator of the Site (see instructions on pages 12 and 13)	**A. Name of Site's Legal Owner:** DEPARTMENT OF ENERGY	**Date Became Owner (mm/dd/yyyy):** 11/01/1989
	Owner Type: ☐ Private ☐ County ☐ District ☒ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other	
	B. Name of Site's Operator: UNIVERSITY OF CALIFORNIA	**Date Became Operator (mm/dd/yyyy):** 11/01/1989
	Operator Type: ☐ Private ☐ County ☐ District ☒ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other	

EPA ID No. NM0890010515

10. Type of Regulated Waste Activity (Mark 'X' in the appropriate boxes. See instructions on pages 13, 14, 15, and 16)

A. Hazardous Waste Activities

1. Generator of Hazardous Waste (choose only one of the following three categories)

[X] a. LQG: Greater than 1,000 kg/mo (2,200 lbs.) of non-acute hazardous waste; or

[ ] b. SQG: 100 to 1,000 kg/mo (220 - 2,200 lbs.) of non-acute hazardous waste; or

[ ] c. CESQG: Less than 100 kg/mo of non-acute hazardous waste

In addition, indicate other generator activities (check all that apply)

[ ] d. United States Importer of Hazardous Waste

[X] e. Mixed Waste (hazardous and radioactive) Generator

For Items 2 through 6, check all that apply:

[ ] **2. Transporter of Hazardous Waste**

[X] **3. Treater, Storer, or Disposer of Hazardous Waste (at your site)** Note: A hazardous waste permit is required for this activity

[ ] **4. Recycler of Hazardous Waste (at your site)** Note: A hazardous waste permit may be required for this activity.

5. Exempt Boiler and/or Industrial Furnace

[ ] a. Small Quantity On-site Burner Exemption

[ ] b. Smelting, Melting, Refining Furnace Exemption

[ ] **6. Underground Injection Control**

B. Universal Waste Activities

1. Large Quantity Handler of Universal Waste [refer to your State regulations to determine what is regulated]. Indicate types of universal waste generated and/or accumulated at your site. (check all boxes that apply):

	Generated	Accumulated
a. Batteries	[X]	[ ]
b. Pesticides	[ ]	[ ]
c. Thermostats	[X]	[X]
d. Lamps	[X]	[X]
e. Other (specify) _____	[ ]	[ ]
f. Other (specify) _____	[ ]	[ ]
g. Other (specify) _____	[ ]	[ ]

2. Destination Facility for Universal Waste [ ]

Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

1. Used Oil Transporter - Indicate Type(s) of Activity(ies)

[ ] a. Transporter

[ ] b. Transfer Facility

2. Used Oil Processor and/or Re-refiner - Indicate Type(s) of Activity(ies)

[ ] a. Processor

[ ] b. Re-refiner

[ ] **3. Off-Specification Used Oil Burner**

4. Used Oil Fuel Marketer - Indicate Type(s) of Activity(ies)

[ ] a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner

[ ] b. Marketer Who First Claims the Used Oil Meets the Specifications

11. Description of Hazardous Wastes (see instructions on page 16)

A. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D002	D003	D004	D005	D006	D007
D008	D009	D010	D011	D018	D019	D021
D022	D023	D024	D025	D026	D027	D028
D029	D030	D031	D032	D033	D034	D035
D036	D037	D038	D039			D040
D041	D042	D043	F001	F002	F003	F004
F005	K045	P004	P005	P008	P010	P012

EPA ID No. NM0890010515

B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes. Please list the waste codes of the State-regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed for waste codes.

P014	P022	P023	P028	P029	P030	P047
P048	P063	P096	P098	P105	P106	P113
P120	U001	U002	U003	U004	U006	U007
U009	U012	U019	U022	U027	U029	U031
U037	U039	U042	U043	U044	U047	U048
U052	U055	U056	U057	U067	U068	U069
U070	U071	U073	U075	U076	U077	U078

12. Comments (see instructions on page 17)

U079	U080	U083	U092	U096	U102	U103
U105	U106	U107	U108	U112	U117	
U119	U120	U121	U122	U123	U127	U128
U131	U133	U134	U135	U144	U147	U151
U154	U159	U160	U161	U162	U163	U165
U166	U167	U169	U170	U181	U188	U190
U191	U196	U197	U201	U203	U204	U207
U208	U209	U210	U211	U213	U220	U223
U226	U227	U228	U239	U328	U353	U359
U404						

13. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. **(see instructions on page 17)**

Signature of owner, operator, or an authorized representative	Name and Official Title (type or print)	D. Date Signed (mm-dd-yyyy)
	JAMES L HOLT	02/23/2002
	OPS. ASS. DIR.	

CERTIFICATION

2001 Hazardous Waste Report

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Ray E Hahn 2/19/02

Ray Hahn, Date Signed
Group Leader for Solid Waste Operations Group
Los Alamos National Laboratory
Operator

W. James Holt 2/21/02

James L. Holt, Date Signed
Associate Director for Operations
Los Alamos National Laboratory
Operator

for Joseph C Valdez 2/27/02

Mr. Corey Cruz, Date Signed
Acting Director for Office of Los Alamos Site Operations
U.S. Department of Energy
Albuquerque Operations
Owner/Operator

LA-UR-01-6634

LOS ALAMOS NATIONAL LABORATORY
2001 POLLUTION PREVENTION ROADMAP

by

Thomas P. Starke, C. D'Ann Bretzke, Bryan J. Carlson, Eleanor Chapman, Robert Dodge, Patricia Gallagher, and James H. Scott

Environmental Stewardship Office
Los Alamos National Laboratory

Original published
December 1, 2001
LA-UR-01-6634

This roadmap and the FY00 plan for meeting the Department of Energy Secretarial Pollution Prevention/Energy Efficiency goals are certified to satisfy the requirements of 40CFR264.73(b)(9) [Resource Conservation and Recovery Act (RCRA)].

Thomas P. Starke
E Division, Environmental Stewardship Office
Los Alamos National Laboratory

LA-UR-01-6634

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4.0. MIXED LOW-LEVEL WASTE

4.1. Introduction

For waste to be considered mixed (M) low-level waste (LLW), it must contain Resource Conservation and Recovery Act (RCRA) materials and meet the definition of radioactive LLW. LLW is defined as waste that is radioactive and is not classified as high-level waste (HLW), transuranic (TRU) waste, spent nuclear fuel, or by-product materials (e.g., uranium or thorium mill tailings). Test specimens of fissionable material irradiated only for research and development (R&D)and not for the production of power or plutonium may be classified as LLW, provided that the activity of TRU waste elements is <100 nCi/g of waste. Because MLLW contains radioactive components, it is regulated by Department of Energy (DOE) Order 435.1. Because it contains RCRA waste components, MLLW also is regulated by the State of New Mexico through Los Alamos National Laboratory's (the Laboratory's) operating permit, the Federal Facility Compliance Order/Site Treatment Plan (FFCO/STP) provided by the New Mexico Environment Department (NMED), and the Environmental Protection Agency (EPA). Materials in use that will be RCRA waste upon disposal are defined as hazardous materials.

Most of the Laboratory's routine MLLW results from stockpile stewardship and management and from R&D programs. Most of the nonroutine waste is generated by off-normal events such as spills in legacy-contaminated areas. Environmental restoration and waste management legacy operations, which also produce MLLW, are not included for the purposes of this roadmap. Typical MLLW items include contaminated lead-shielding bricks, R&D chemicals, spent solution from analytic chemistry operations, mercury cleanup-kit waste from broken fluorescent bulbs and mercury thermometers, circuit boards from electronic equipment removed from a TRU waste radiation area, discarded lead-lined gloveboxes, and some contaminated water removed from sumps.

Figure 4-1 shows the process map for MLLW generation at the Laboratory.

Total MLLW generation by division is shown in the pie chart in Fig. 4-2.

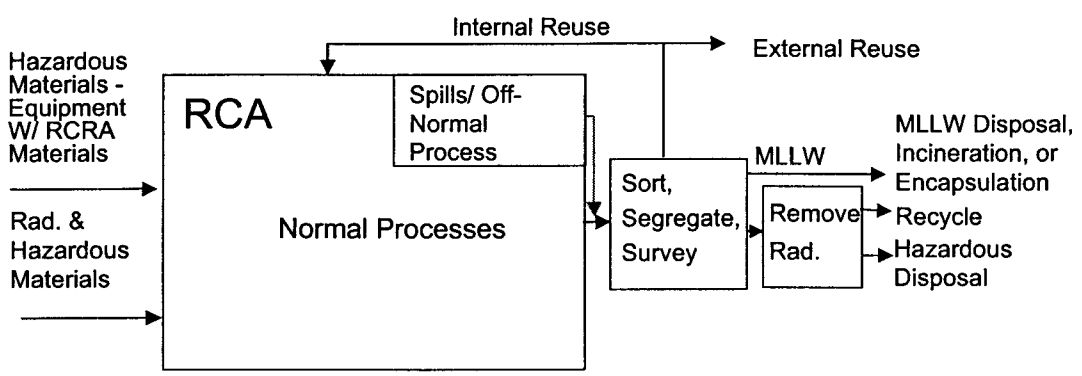

Fig. 4-1. Top-level MLLW process map.

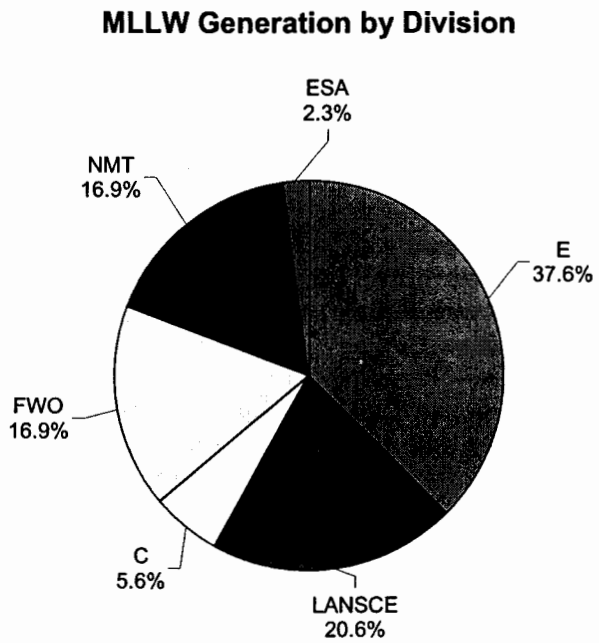

Fig. 4-2. Total MLLW generation by division.

Environmental Science and Waste Technology (E), Nuclear Materials Technology (NMT), Los Alamos Neutron Science Center (LANSCE), and Facility and Waste Operations (FWO) Divisions were the largest MLLW producers in fiscal year (FY) 01. The biggest contributor to E Division's waste volume was electronics from their sort-and-segregation activities [performed by the Environmental Technologies Group of the Environmental Science and Waste Technologies Division (E-ET)]. This sort-and-segregation activity is performed primarily for NMT and Chemistry (C) Divisions; the waste from this operation actually belongs to those divisions. The largest contributor to FWO waste volumes was nitric-acid bioassay waste left over from the nitrate destruction project at the Radioactive Liquid Waste Treatment Facility (RLWTF). This waste belonged to C Division before it was transferred to FWO Division. Mercury-contaminated debris from the drain system was the largest contributor to LANSCE-Division-generated volumes.

Routine MLLW generation by division is shown in the pie chart in Fig. 4-3.

E, NMT, C, and FWO Divisions were the largest routine MLLW producers in FY01. The largest contributor to E Division's waste volume was lead that could not be decontaminated. This lead was being decontaminated for other divisions. The largest contributor for NMT Division was lead solder in the copper joints and combustible debris from DOE Portsmouth. The major contributor for C Division was chemical and solvent waste, and the largest contributor for FWO Division was again nitric-acid waste from C-Division operations.

Routine and nonroutine MLLW generation is shown by year in Fig. 4-4.

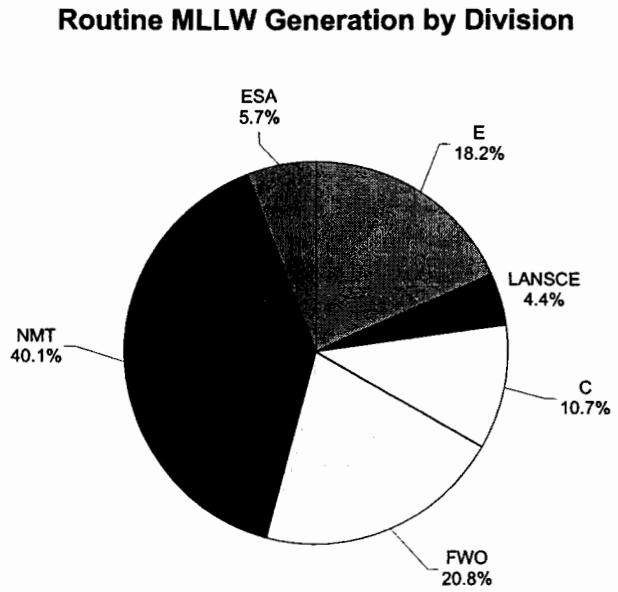

Fig. 4-3. Routine MLLW generation by division.

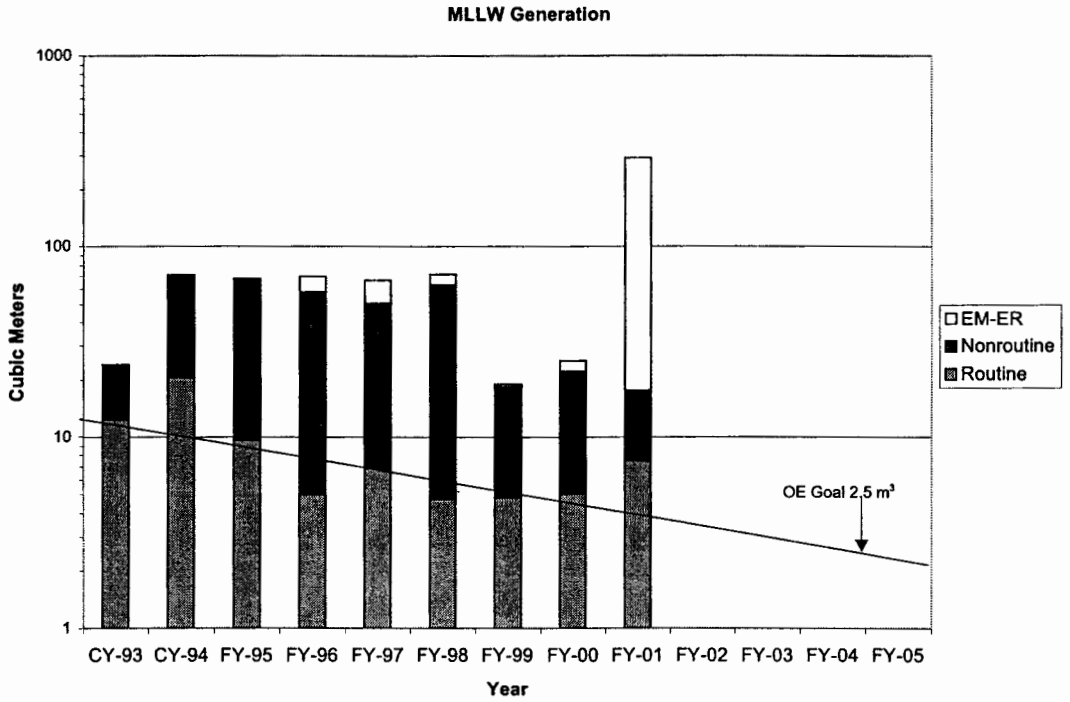

Fig. 4-4. Routine and nonroutine waste generation.

From FY94 to FY98, nonroutine MLLW has dominated the waste stream.

4.2. MLLW Minimization Performance

The DOE has implemented goals for waste minimization. The DOE-proposed MLLW goal is to reduce MLLW from routine operations by 80% by 2005 using calendar-year (CY)93 as the baseline. Because the MLLW generation in the baseline year was a low 12.3 m^3, the proposed DOE FY05 goal would be a very low 2.5 m^3. MLLW generation at the Laboratory is currently only ~5 m^3/yr. The Laboratory has proposed MLLW reduction projects that could reduce MLLW generation over the next 4 years. These projects include elimination of RCRA hazardous paint stripper, solidification of MLLW hydraulic oils, and improvements in chemical analysis processes. The Laboratory will continue to make every effort to reduce the MLLW generation to the lowest possible level consistent with funding and operational constraints.

Figure 4-5 shows the Laboratory's progress toward achieving this goal. For the past 3 years, the Laboratory has averaged ~5.75 m^3 of MLLW. The spike in waste generation of 7.45 m^3 that occurred in FY01 was caused by FY99 and FY00 waste that was placed in the Site Treatment Plan (STP) but not yet received at the disposal site at TA-54, Area G. All of this waste was added to the FY01 generation rate to avoid further complication of the waste accounting system. The actual FY01 generation was 4.39 m^3.

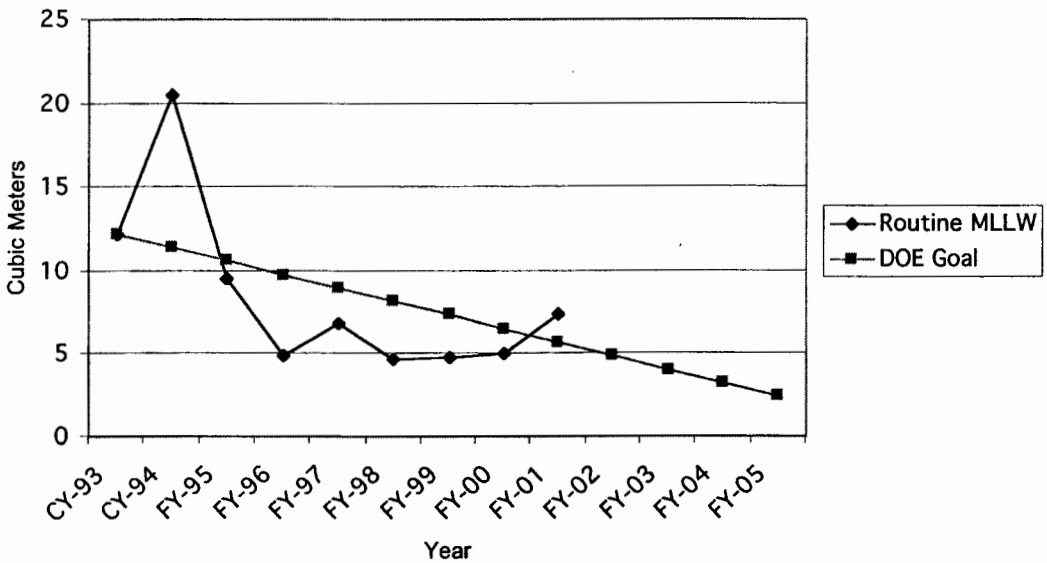

Fig. 4-5. Routine MLLW generation vs the DOE goal.

The FY02 Appendix F performance measure also requires Laboratory-wide implementation of waste minimization best practices. For MLLW minimization, these practices include

- implementing Green is Clean (GIC) in Laboratory radiological controlled areas (RCAs),
- neutralizing acids and bases where such action will make the waste non-RCRA, and
- replacing mercury thermometers and manometers in RCAs with mercury-free devices.

4.3. Waste Stream Analysis

MLLW is generated in RCAs. Hazardous materials and equipment containing RCRA materials, as well as MLLW materials, are introduced into the RCA as needed to accomplish specific activities. In the course of operations, hazardous materials become contaminated with LLW or become activated, becoming MLLW when the item is designated as waste.

Typically, MLLW is transferred to a satellite storage area after it is generated. Whenever possible, MLLW materials are surveyed to confirm the radiological contamination levels, and if decontamination will eliminate either the radiological or the hazardous component, materials are decontaminated and removed from the MLLW category.

Waste classified as MLLW is managed in accordance with appropriate waste management and Department of Transportation (DOT) requirements and shipped to TA-54.

From TA-54, MLLW is sent to commercial and DOE treatment and disposal facilities. The waste is treated/disposed of by various processes (e.g., segregation of hazardous components and macroencapsulation or incineration).

In some cases, the Laboratory procures spent MLLW materials from other DOE/commercial sites to avoid creating new MLLW. For example, LANSCE is designing several new beam stops and shutters from lead. Rather than fabricating these from uncontaminated lead, LANSCE can receive these parts at no expense from GTS Duratek (formerly SEG), a company that processes contaminated lead from naval nuclear reactor shielding. Duratek fabricates parts at no cost to the Laboratory because their fabrication costs are much less than those of MLLW lead disposal.

The largest waste streams are generated from one-time equipment removal operations, electronic components, and mercury-contaminated debris. These waste streams constitute ~50% of the MLLW waste type and are the primary targets for elimination. The waste streams were determined from the generation data for FY99 through FY01. The individual waste streams are listed in the following.

Electronic Equipment (5.83 m^3). This waste stream comprises circuit boards and other materials removed from electronic equipment containing lead.

Lead and Lead-Contaminated Debris (2.33 m^3). This waste stream comprises activated or surface-contaminated lead shielding, contaminated lead paint, and lead components. Lead normally is sent to Envirocare, Inc., for encapsulation and land disposal. Lead debris is contaminated copper pipe with lead solder joints, contaminated plastic sheets, duct tape, hoses, and used pump housings.

Mercury and Mercury-Contaminated Debris (1.75 m^3). This waste stream consists of elemental mercury and paper and plastic debris that has been contaminated with mercury.

Nitrate Waste (1.32 m^3). This waste stream consists of nitric acid used in Laboratory processes that is neutralized and disposed of. Previously, this waste stream was disposed of at the RLWTF. To meet new nitrate regulatory limits, the nitrate waste is being collected in carboys for off-site disposal.

Paint and Painting Debris (1.25 m^3).

Samples (1.10 m^3). MLLW samples are taken and analyzed routinely to determine radioactivity and hazardous constituent levels. This waste stream consists of the unused samples left over after the analytical procedures and treatability studies have been completed.

Copper-Pipe Solder Joints (0.87 m^3). This waste stream consists of copper piping and tubing with copper-pipe fitting joints soldered with lead-based solder. The Laboratory quit using lead-based solder some time ago. However, there is a legacy of this material present in the older facilities at the Laboratory.

Oil (0.75 m^3). This waste stream consists of oil removed from laboratory and facility machinery. Typically, the oil is contaminated with heavy metals from the bearings and other materials in the equipment. Laboratory vacuum pump oil also is typically contaminated with various laboratory solvents. This waste stream averages ~1 m^3 annually, although there are annual variances, depending on the month of generation.

Miscellaneous (0.40 m^3). This consists of contaminated water, decontamination fluids, unused commercial products, and other miscellaneous materials.

Asphalt (0.21 m^3).

Sump Cleanout (0.19 m^3).

The relative size of the various waste streams, expressed in per cent of total MLLW volume, is shown in Fig. 4-6.

The majority of waste produced from the electronics, lead/lead debris, mercury and mercury debris, copper-pipe solder joints, and fluorescent-light waste streams are legacy waste. Efforts to substitute alternatives and to improve sorting and segregation of these waste streams should reduce these volumes dramatically in the coming years. Nitrate waste, paint/paint debris waste, and oil wastes are ongoing waste streams for

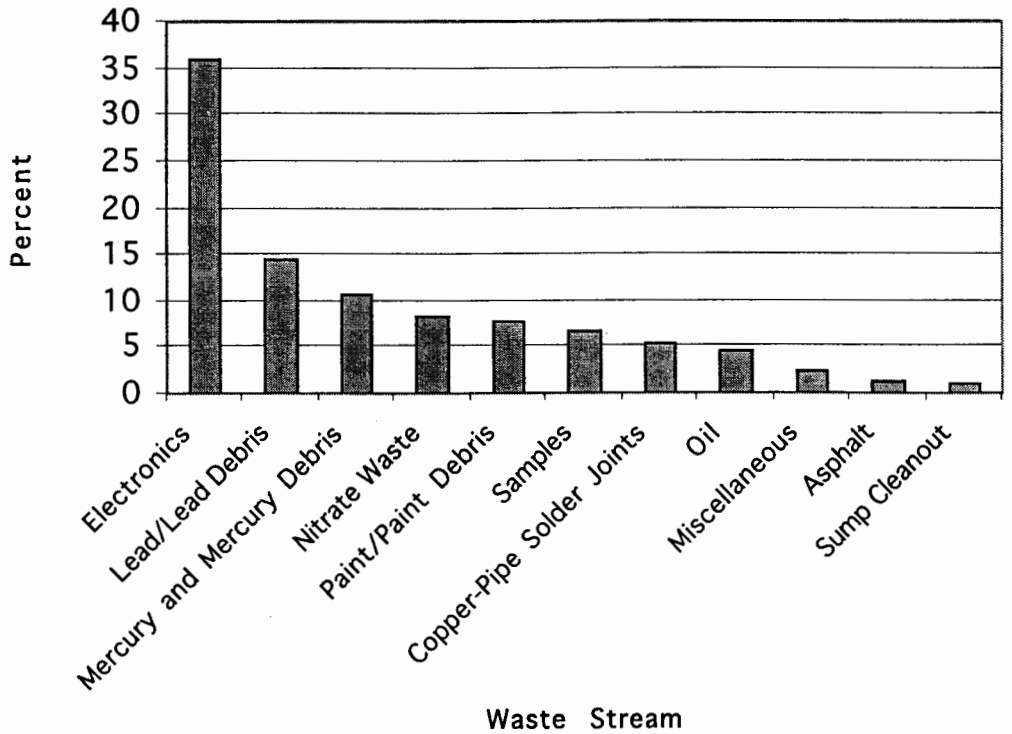

Fig. 4-6. Waste stream constituents.

which substantial improvement is possible. Improvement projects have been proposed that will lead to a reduction in MLLW. In the following sections, these projects are discussed.

MLLW cost an average of $36.85/kg to characterize, treat, and dispose of in FY01. Table 4-1 summarizes the Laboratory's typical unit costs for MLLW disposal. Waste is disposed of either by incineration or by macroencapsulation and land disposal. Macroencapsulation involves potting the waste (typically solid parts) in a suitable plastic and creating a barrier around the waste.

A small fraction of the MLLW generated has no disposal path. Typically, this waste is radiation-contaminated mercury or mercury compounds.

4.4. Improvement Projects

The following projects were identified as potential corrective measures for the MLLW type. These projects are divided into three categories: (1) projects completed in the last year, (2) projects currently funded and ongoing, and (3) unfunded proposed projects. Projects are characterized further by type: source reduction (SR), sort and segregate (SS), reuse/recycle (RR), treatment (T) or disposal (D).

TABLE 4-1
APPROXIMATE COSTS FOR MLLW STREAMS[4-1]

Waste Type	Treatment Method	Treatment and Disposal Cost	Transportation Cost
Activated or inseparable lead	Macroencapsulation	$15,000/m^3	$5000 per shipment
Surface-contaminated lead (for off-site recycling)	Standard decontamination methods (bead blasting, acid dip, etc.), followed by recycling	$8000/m^3	$5000 per shipment
RCRA waste-regulated solvents with radioactive components	Fuel recycling in Diversified Scientific Services, Inc. (DSSI)-permitted boiler	$19,815 to 52,840/m^3. Actual costs depend on levels of radionuclides, metal content, per cent water, and halogen content	$5000 per shipment
Activated RCRA waste components	Macroencapsulation	$15,000/m^3	$5000 per shipment
Fluorescent tubes with mercury	Amalgamation followed by landfill disposal	$105,900/m^3	$5000 per shipment
Printed circuit boards	Macroencapsulation	$15,000/m^3	$5000 per shipment

4.4.1. Completed Projects

These are projects that have been completed and/or implemented in the last year. Many projects completed in previous years, especially sort and segregate and recycle/resuse projects, continue to avoid MLLW.

Reduction of MLLW with Imaging Scanner (SR). Ion exchange and liquid scintillation are used to determine the ^{99}Tc chemical species in solution. These techniques have been replaced with paper chromatography using an imaging scanner to determine the distribution of ^{99}Tc on the paper chromatography strips, essentially eliminating this waste stream. This project has eliminated the generation of 0.05 m^3 of MLLW annually.

Mercury-Contaminated Radiation Waste Reduction (SS). This project evaluated the potential for segregation of mercury-contaminated debris during spill cleanup and other activities. The potential for segregation was determined by segregating and analyzing several actual mercury waste streams. This work was performed on actual waste during the performance of a mercury treatability study. The information clearly showed that personal protective equipment (PPE) and other paper and plastic wastes generated during cleanup activities were not contaminated and would pass toxicity-

characteristic-leaching-procedure (TCLP) testing. Based on these results, new sorting and segregation techniques will be deployed in FY02.

4.4.2. Ongoing Projects

These projects have been funded and currently are being executed. All of the ongoing MLLW projects are funded by the Environmental Stewardship Office (ESO) Base and Generator Set-Aside Fee (GSAF) Program.

Upgrade of Mercury Shutters (SR). The mercury beam shutters at the LANSCE facility are the major source of mercury-contaminated waste at the Laboratory. This project will redesign these shutters to eliminate this source of contamination.

LANSCE MLLW Reduction Project (SS). This project will implement the sorting and segregation techniques learned during the mercury-contaminated radiation waste reduction project performed during FY01.

Reduction of Perchlorate (SR). This project will evaluate the current aqueous waste streams discharging to the RLWTF to determine the best approach for reducing the quantity of perchlorates currently being discharged. It is unclear if the majority of perchlorates currently being discharged is the result of ongoing activities or is generated from the holdup of perchlorates in the effluent systems to the RLWTF.

Validation of New Chemical Oxygen Demand (COD) Test (SR). This project eliminates a no-path-forward mercury waste. Currently, a mercury reagent is used to perform COD analytical tests. This project will replace the mercury with manganese. After the EPA accepts the revised analytical method, the new method will eliminate the generation of 0.003 m^3/yr of MLLW.

Flat-Screen Monitors in RCAs (SR). Standard cathode ray tube (CRT) displays contain hazardous materials that, when contaminated in RCAs, become MLLW. About 100 CRT displays are removed from RCAs each year, and about 10% of these constitute ~3 m^3 of suspect MLLW. The balance is LLW. Flat-screen displays do not contain as much hazardous material (such as lead) as do CRTs. This replacement would eliminate one of the largest sources of contaminated electronics in the MLLW stream. In addition, the volume of a flat-screen monitor is about one-quarter of the volume of a CRT; thus, the volume of non-MLLW generated will be reduced. Waste avoidance after full deployment is estimated to be >1 m^3 of MLLW.

Oil-Free Vacuum Pumps (SR). This project is piloting the replacement of oil-filled vacuum pumps used in RCAs. Oil-free replacement pumps are being purchased. The use of these pumps will eliminate a significant amount of the MLLW oil produced at the Laboratory. Following this successful pilot, the use of oil-free vaccuum pumps in RCAs will be made a requirement. It is expected that when implemented sitewide, this project could eliminate up to 1 m^3 of MLLW annually.

Lead Reuse (RR). This project enables owners of unneeded, contaminated lead to identify, contact, and transfer that lead to projects that need it. In many cases, this avoids the need to either decontaminate or dispose of the lead.

Lead Removal from Gloveboxes (RR). Gloveboxes decontaminated to LLW levels are classified as MLLW because of the lead shielding present. This project funded the development of techniques to remove the lead and recycle the lead shielding. The lead from several gloveboxes was recycled as part of this project. This project will be incorporated into the Decontamination and Volume Reduction System (DVRS) in the future.

Sorting, Segregation, Recycle, and Reuse of Electronic Equipment (SS). Miscellaneous electronic equipment leaving RCAs is disassembled, and the individual components are surveyed. Those components that are nonradioactive are recycled. It is estimated that this project avoids up to 10 m^3 annually of MLLW generation.

Sorting, Segregation, Recycle, and Reuse of Miscellaneous Equipment from RCAs (SS). Equipment or materials (copper pipe with lead solder joints) are disassembled and surveyed. Materials that can be determined as nonradioactive are recycled. The ESO continues to support this project as part of its Base program activities.

Nitrate Bioassay Diversion Projects (SS). Nitric-acid waste currently generated by the bioassay laboratories must be disposed of as MLLW. This project allows this waste to be neutralized and, because of its extremely low level of radioactivity, diverted to the sanitary wastewater treatment facility.

Oil Solidification (T). Contamination of oils with radioisotopes is a common problem in RCAs. These oils become MLLW and must be disposed of as such. Recent tests, using the NoChar solidification media developed at Mound Laboratory, indicate that if the oil is solidified with this product, the oil would pass TCLP testing and could be buried as LLW, saving substantial waste disposal costs. This project is providing the data necessary to adopt and use this technology for routine management of contaminated oil wastes. When implemented, it is estimated that this process will eliminate up to 0.75 m^3 of MLLW generation annually.

4.4.3. Project Development and Unfunded Projects

These projects either have been proposed or are under development to help reduce MLLW. Proposed projects that are currently unfunded and projects under development are designated as such.

Improved Plutonium and Americium Analytical Methods for Environmental Matrices (SR) (Unfunded). Current methods for radioisotopic analyses of plutonium and americium in soil and water samples by alpha spectrometry performed by the Isotope and Nuclear Chemistry Group in the Chemistry Division (C-INC) were largely developed 15 or more years ago. Several modifications to the digestion, separation, electroplating, and counting steps of these methods, which should significantly improve the overall analyses, have been proposed. For soils, the aliquot size will be reduced from 10 to 5 g, and count length will be increased from 22 to 50 hours to maintain the current level of sensitivity of 0.002 pCi/g soil. For water samples, the current sample size will be maintained but the count length will be increased to 50 hours, resulting in improved sensitivity. Operational benefits include a reduction in both liquid waste discharges and airborne emissions, improvements in operational efficiency, reductions in the cost and time required to complete the analyses, reduced

exposure to hazardous chemicals to workers, and simplification of operations. These benefits will extend to future years.

Reduction of Total Nitrate-Containing Waste in Sample Coprecipitation Methods (SR) (Unfunded). This project proposes a modification of current methods to reduce the production of total nitrate waste in the urine bioassay for uranium and americium. Modifications in the precipitation and ion exchange steps may result in the elimination of ~70% of the total nitrates produced by the current process. New ion exchange technology has yielded a class of resins that requires much smaller volumes and a lower concentration of acids. Precision or accuracy of the data produced by these new technologies is unchanged. Changes in coprecipitation and the use of these new resins could reduce the total nitrates produced in this preliminary step. Added benefits include a reduction in both liquid waste discharges and airborne emissions, improvements in operational efficiency, reductions in cost and time required to complete the analyses, reduced exposure of hazardous chemicals to workers, and simplification of operations.

Reduction of Perchlorate Use in Environmental Radioanalytical Methods (SR) (Unfunded). The Analytical Chemistry Sciences Group (C-ACS) provides radioanalytical support for a wide variety of programs throughout the Laboratory. Of all the analytical methods currently in use, only one remaining program still utilizes concentrated (67% to 71%) perchloric acid as part of the analytical process. Using the acid has the following two functions: (1) in conjunction with concentrated HNO_3, the mixture is used to destroy and oxidize any remaining organic substances within the samples and (2) the addition of perchloric acid allows for the modification of the oxidation state that is needed to prepare the sample. With the new anion exchange resins commercially available today, along with the use of alternative methods for the destruction of residual organic materials, we believe that alternative methods can be developed that would remove the use of perchloric acid from the analytical process. On an average year, the Laboratory processes approximately 300 to 350 samples that require the use of this particular method. If an alternative method could be developed that would process the samples without the use of perchloric acid, the reduction would equate to (at 350 samples/year) ~3.50 liters. Modifying the method also would eliminate using a variety of other organic solvents (e.g., HDEHP and Dodecane) that are currently part of the liquid/liquid extraction methodology, thus removing a mixed waste component.

Lifetime Monitoring of Suspect Clean Materials (SS) (Unfunded). Much of the equipment that is used in RCAs is uncontaminated but must be surveyed before it can be declared nonradioactive under DOE Order 5400.5. The survey usually requires dismantling the equipment. This project will develop techniques for *in situ*, lifetime monitoring of equipment in RCAs. Many options exist for accomplishing this, but a protocol will be required to certify the accuracy of the monitoring techniques. The project will focus initially on the use of adhesives to collect radioactive materials. Other approaches are possible. A qualification program will be needed to verify that the selected rapid survey technique accurately represents the degree of contamination over time.

MLLW Aqueous Waste Stream Dose Assessment (SS) (Unfunded). A standard does not exist to release aqueous waste streams from radiological areas. Drinking-water limits exist for aqueous discharges to the environment, but no similar limits exist for hazardous aqueous waste streams being shipped to an MLLW treatment facility. If such a limit existed, many of our current MLLW streams could be classified as hazardous waste and the cost of treatment could be substantially reduced. This project will supply the funds necessary to perform a dose assessment to define release limits for this waste stream. The dose assessment will be prepared and submitted to the DOE Office of Environment, Safety, and Health (DOE-EH) for approval.

Improved Alpha Contamination Monitoring (SS) (Development). Many of the items in the MLLW stream are present because an accurate means of monitoring the alpha contamination levels is not available. This is especially true for circuit boards and copper-pipe solder joints having areas that are inaccessible to standard survey instrumentation. It is estimated that a more effective survey method could reduce the MLLW stream by as much as 1 m^3 annually.

Mercury Amalgamation (T) (Development). The Laboratory does not use the treatment standard for disposal of elemental mercury, i.e., amalgamation. The Laboratory adds elemental mercury to the debris collected during spill cleanup activities, although it is much more cost effective to amalgamate the elemental mercury so that it can be handled as a non-RCRA waste. Mercury spills generated in radiological areas generate MLLW, which frequently has no path to disposal; disposal also is very expensive when it is an available option. This project would develop suitable methods to collect and amalgamate elemental mercury during spill cleanup activities and avoid the generation of this MLLW stream.

If these projects are implemented, the Laboratory expects to see a significant reduction in MLLW next year. Because these projects address the routine MLLW stream components, the effects will be seen there. Figure 4-7 illustrates how the routine MLLW waste stream would be affected by implementation of these projects.

4.5. FY02 Performance Metrics

To ensure that the Laboratory continues to exhibit outstanding improvement in meeting the Laboratory's waste minimization goals, the ESO has established performance metrics for the individual waste streams and other aspects of concern. These metrics will be used to measure performance throughout the year to measure success. A score of 3 has been established for each completed project having a significant impact on a waste stream. Scores between 1 and 2 are assigned to projects with minimum waste stream impact or to the completion of major milestones. The metrics in Table 4-2 have been developed for the MLLW stream.

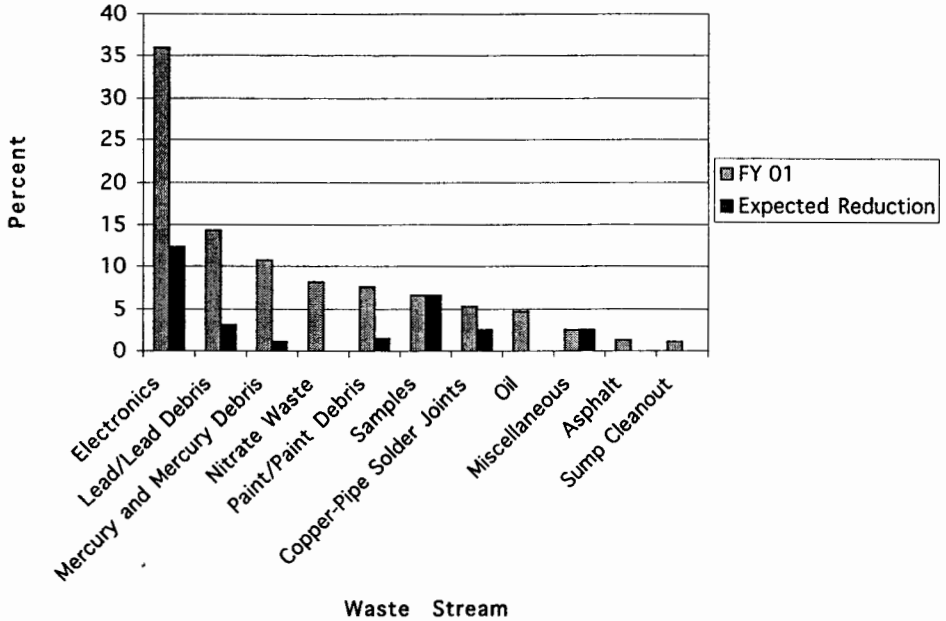

Fig. 4-7. MLLW stream and expected reductions.

TABLE 4-2
MLLW PERFORMANCE METRICS

Initiative (Score)	Comments
Complete Nitrate Bioassay Diversion Project (3)	This project will eliminate 1.32 m^3 of MLLW generated annually.
Complete Oil Solidification Project (3)	Although not present in this year's data, this stream averages 0.75 m^3 annually. This project will eliminate this waste stream.
Complete new Mercury Shutter Design (1)	
Obtain funding for FY03 Mercury Shutter Project (1)	$150K needed.
Complete LANSCE MLLW Reduction Project (3)	
Complete development and obtain funding for mercury amalgamation in <90-day-storage areas (1)	Legacy issues will continue to produce elemental mercury waste streams. These nonroutine waste streams average ~1 m^3 annually. If successful, this project will eliminate the majority of this waste.
Complete validation of new COD test (1)	This project will eliminate the generation of 0.003 m^3 of no-path-forward MLLW.
Complete development and obtain funding for improved alpha-contamination-monitoring instrumentation (1)	This project is technically difficult, and the potential for success is unknown at this time. However, if successful, it is estimated that improved monitoring could eliminate 1 m^3 of MLLW annually.

REFERENCES

4-1. John Kelly, Los Alamos National Laboratory, personal communication, November 2, 2000.

5.0. HAZARDOUS WASTE

5.1. Introduction

Hazardous waste is divided into three waste types: Resource Conservation and Recovery Act (RCRA) waste, Toxic Substances Control Act (TSCA) waste, and State special solid waste. For purposes of reporting the waste minimization University of California (UC) Contract (Appendix F, performance measure), Los Alamos National Laboratory (the Laboratory) distinguishes between routine and nonroutine waste generation. Routine generation results from production, analytical, and/or other research and development (R&D) laboratory operations; treatment, storage, and disposal operations; and "work for others" or any other periodic and recurring work that is considered ongoing. Nonroutine waste is cleanup stabilization waste and relates mostly to the legacy from previous site operations.

The RCRA and 40 Code of Federal Regulations (CFR) 261.3, as adopted by the New Mexico Environment Department (NMED), define hazardous waste as any solid waste that

- is generally hazardous if not specifically excluded from regulation as a hazardous waste;
- is listed in the regulations as a hazardous waste;
- exhibits any of the defined characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity); or
- is a mixture of solid and hazardous waste.

Hazardous waste also includes substances regulated under the TSCA, such as polychlorinated biphenyls (PCBs) and asbestos.

Finally, a material is hazardous if it is regulated as a special waste by the State of New Mexico as required by the New Mexico Solid Waste Act of 1990 (State of New Mexico) and defined by the most recent New Mexico Solid Waste Management Regulations, 20NMAC 9.1 (NMED) or current revisions. This determination includes the following types of solid wastes that have unique handling, transportation, or disposal requirements to ensure protection of the environment and the public health, welfare, and safety:

- treated formerly characteristic hazardous (TFCH) wastes;
- packing house and killing plant offal;
- asbestos waste;
- ash;
- infectious waste;
- sludge (except compost, which meets the provisions of 40 CFR 503);
- industrial solid waste;
- spill of a chemical substance or commercial product;
- dry chemicals that, when wetted, become characteristically hazardous; and

- petroleum-contaminated soils.

Hazardous waste commonly generated at the Laboratory includes many types of laboratory research chemicals, solvents, acids, bases, carcinogens, compressed gases, metals, and other solid waste contaminated with hazardous waste. This waste may include equipment, containers, structures, and other items that are intended for disposal and are contaminated with hazardous waste (e.g., compressed gas cylinders). Also included are asbestos waste from the abatement program, wastes from removal of PCB components, contaminated soils, and contaminated waste waters that cannot be sent to the sanitary wastewater system (SWS)s consolidation (SWSC) or high-explosives (HE) wastewater treatment plants.

Most hazardous wastes are disposed of through Duratek Federal Services, a Laboratory subcontractor. This company sends waste to permitted treatment, storage, or treatment storage disposal facilities (TSDFs), recyclers, energy recovery facilities for fuel blending or burning for British-thermal-unit recovery, or other licensed vendors (as in the case of mercury recovery). The treatment and disposal fees are charged back to the Laboratory at commercial rates specific to the treatment and disposal circumstance. The actual cost varies with the circumstances; however, the average cost for onsite waste handling by solid waste operation (SWO) and offsite disposal is $5.92/kg.

Figure 5-1 shows the process map for hazardous waste generation at the Laboratory.

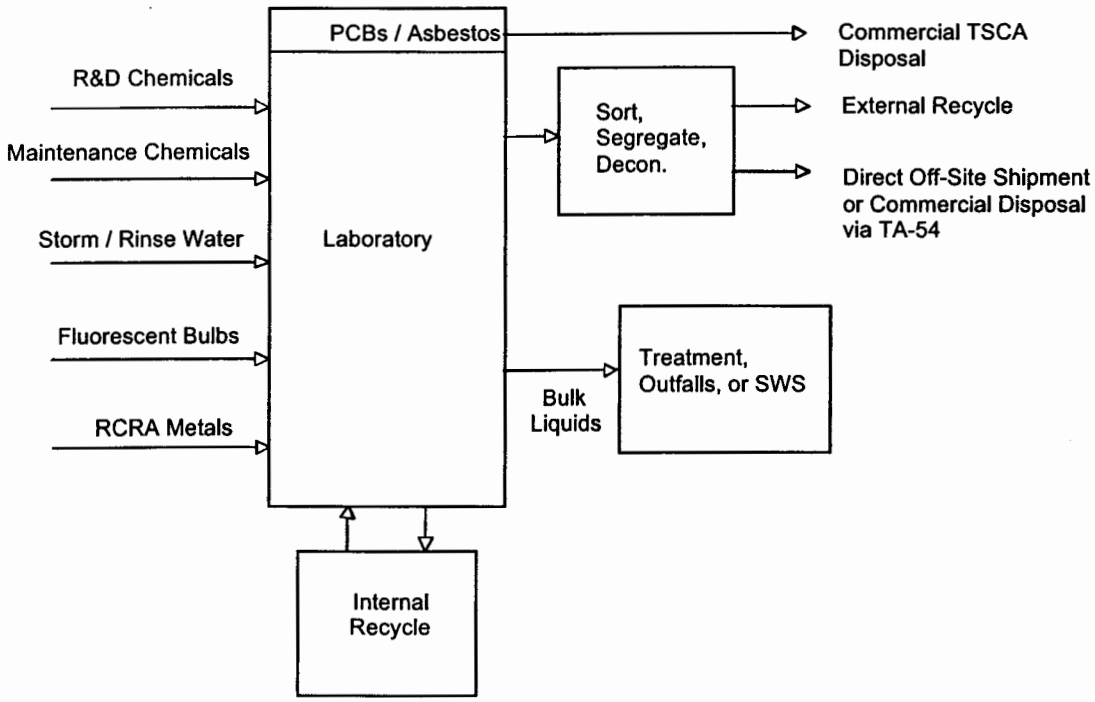

Fig. 5-1. Hazardous waste process map.

The total quantity of hazardous waste generated at the Laboratory during the past 5 fiscal years (FYs) is shown in Fig. 5-2. The waste quantities shown include routine, nonroutine, and environmental-restoration (ER)-generated waste.

The large volumes of environmental management (EM)-ER-generated hazardous waste in FY00 and 01 resulted from remediation activities. Nearly all of the EM-ER hazardous waste derives from projects in which large amounts of potentially contaminated soil and sod were removed. Routine hazardous waste decreased abruptly from FY99 to FY00 because the Laboratory began excluding recycled hazardous waste from the hazardous waste total. Routine hazardous waste generation unexpectedly increased in FY01 for several reasons, all of which are discussed in Section 5.2 (Hazardous Waste Minimization Performance).

As previously discussed, the Laboratory produces three types of hazardous waste: RCRA waste, TSCA waste, and New Mexico Special waste. The quantity of each type of waste, along with the quantity of recycled waste, is shown in Fig. 5-3. The waste shown in the figure excludes EM-ER-generated waste.

The total (routine and nonroutine) hazardous waste generation by division, excluding EM-ER, is shown in the pie chart in Fig. 5-4.

Johnson Controls Northern New Mexico (JCNNM), the Laboratory's crafts support contractor, generated the most hazardous waste, followed by the Facility and Waste Operations (FWO) Division and the Environment, Safety, and Health (ESH) Division. JCNNM waste results primarily from support of Laboratory operating divisions and special cleanups (e.g., the Cerro Grande Fire recovery effort).

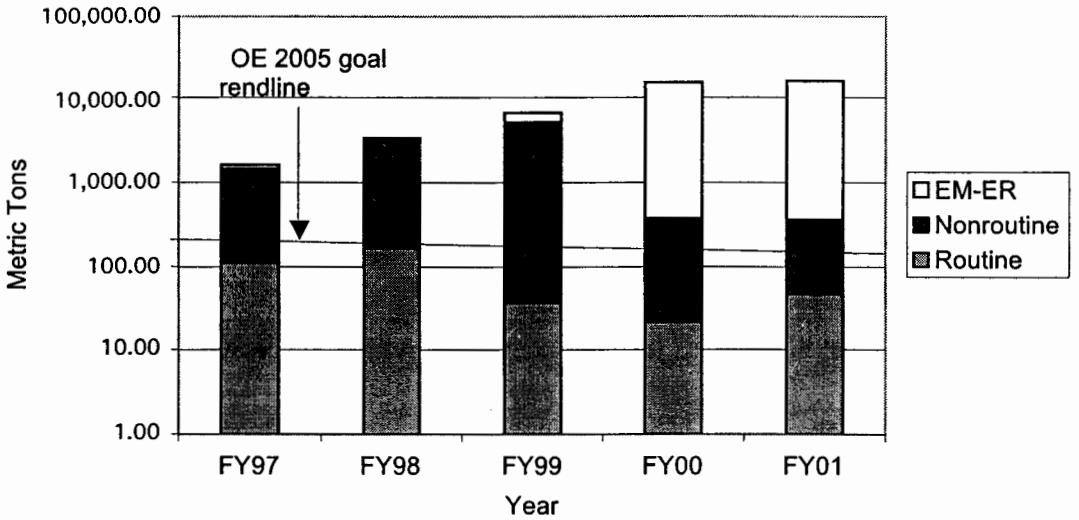

Fig. 5-2. Hazardous waste generation for FY97 through FY01.

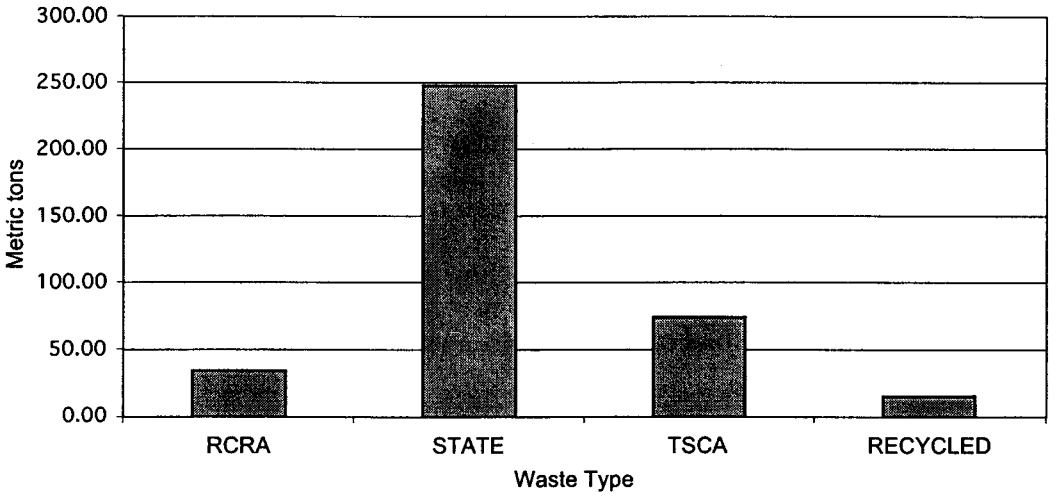

Fig. 5-3. FY01 hazardous waste by type.

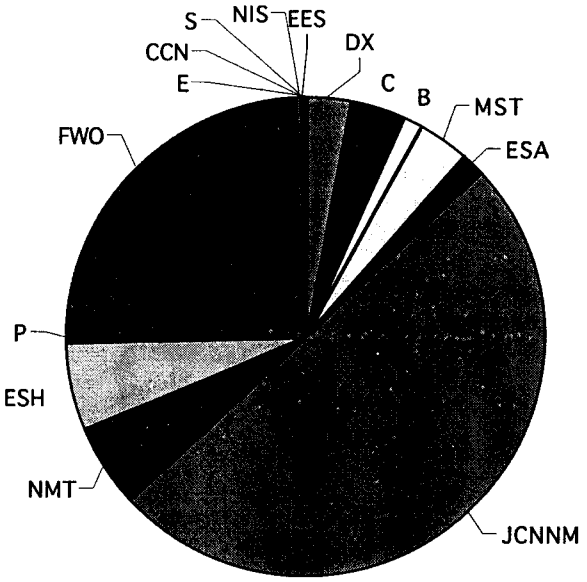

Fig. 5-4. The total hazardous waste by division, which excludes EM-ER waste.

The organizations that produced the most routine hazardous waste in FY01 were the Dynamic Experimentation (DX), Chemistry (C), and Bioscience (B) Divisions. The routine hazardous waste generation by division is shown in Fig. 5-5.

Additional information on hazardous waste, Laboratory procedures for managing hazardous waste, and historical waste generation can be found in Refs. 5-1 through 5-5.

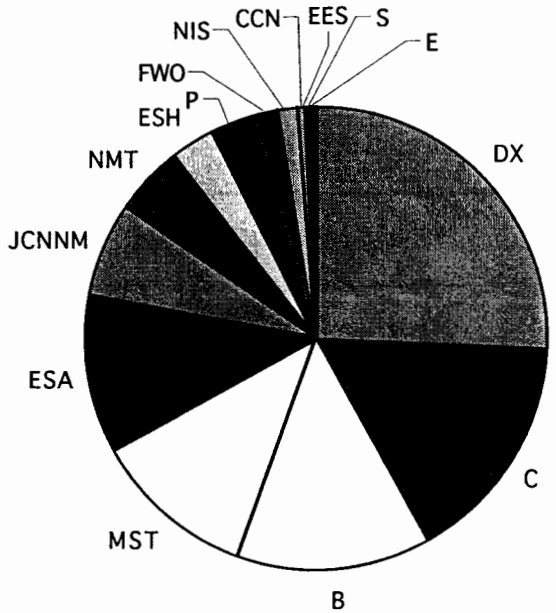

Fig. 5-5. Routine hazardous waste by division, which excludes EM-ER waste.

5.2. Hazardous Waste Minimization Performance

In a November 12, 1999, memorandum, the Secretary of Energy established a 2005 goal to reduce hazardous waste from routine operations by 90%, using a calendar year (CY) 1993 baseline. The Laboratory's CY93 baseline quantity was 307,000 kg; therefore, the FY05 target becomes 31,000 kg.

The FY01 performance measure in the UC contract, Appendix F for hazardous waste was more restrictive than the DOE 2005 goal because it required the Laboratory to generate no more than the FY00 quantity of hazardous waste, or 22,183 kg.

Although the trend over the last several years has been very good, the Laboratory is projected to dispose of 48,652 kg (48.6 tonnes) of hazardous waste in FY01 and is now above the FY05 goal. In addition, the Laboratory failed to stay below the FY00 hazardous waste generation rate as required by the FY01, Appendix F performance measure. The Laboratory's performance in hazardous waste generation is shown in Fig. 5-6.

A major factor in increased hazardous waste generation was the disposal of hazardous wastes in FY01 that have been recycled in the past. Approximately 10,250 kg of hazardous waste that could have been recycled was instead sent off-site for disposal. This action resulted from a conflict between the Laboratory's Appendix F performance measure for hazardous waste minimization and the waste management performance measure to process waste as quickly and cost effectively as possible. The cost to recycle

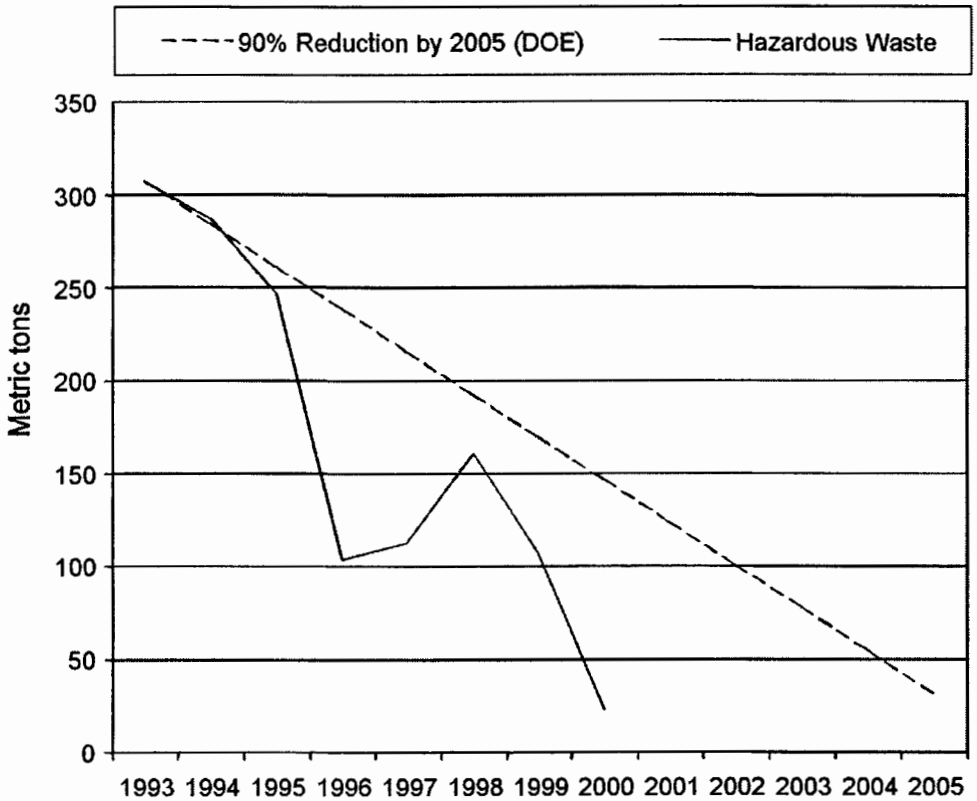

Fig. 5-6. Routine hazardous waste generation compared with the DOE's FY05 goal.

waste is currently higher than the cost to dispose of it. In addition, spent materials to be recycled frequently must be accumulated until there is a full truckload. Thus, disposal was chosen over recycling. This issue has been resolved, and wastes that can be recycked will be recycled in the future.

It is estimated that 15,000 kg of unused, unspent chemicals will be disposed of in FY01, as compared with 8000 kg in FY00. This increase is attributed to a continuing emphasis on reducing chemical inventories and to NMED interest in chemical stores during a recent RCRA audit. Also, a Green Zia tools analysis of chemical practices at TA-48, RC-1 stimulated over 3000 kg of additional unused/unspent chemical disposal.

5.3. Waste Stream Analysis

Hazardous waste is derived from hazardous materials/chemicals purchased, used, and disposed of; hazardous materials already resident at the Laboratory that are disposed of as part of equipment replacement, facility replacement, or facility decommissioning; and water contaminated with hazardous materials. After it is declared waste, hazardous waste is described (assayed if necessary), labeled, and collected at less-than-90-day storage areas. This waste then is either directly shipped to off-site TSDFs or transshipped to Area L, TA-54, from which it will be subsequently shipped to an off-site TSD. ER project waste typically is shipped directly from ER sites to commercial TSDFs.

Spent research and production chemicals make up the largest number of hazardous waste items; however, they account for only a small fraction of total hazardous waste volume. The ER project is the largest hazardous waste generator on-site, accounting for over 95% of all hazardous waste. The Laboratory spent a total of $6,500,000 managing newly generated hazardous waste in FY01.

The largest waste streams in the hazardous waste category for FY01 are described in the following list. These wastes are treated/disposed of off-site. This list includes both routine and nonroutine wastes but excludes EM-ER wastes. The Laboratory also has high explosives (HEs) and HE water wastes that are treated on site; these are not included below.

Sludge from the Sanitary Waste Plant (137,601 kg). In CY95, the Laboratory's grit screenings contained one sample that exceeded the regulatory limit for PCBs. Since then, sanitary sewage sludge has been disposed of as TSCA waste. The largest single constituent of the TSCA hazardous waste type is the PCB-contaminated sanitary sludge. In FY00, the Laboratory cleaned the PCB-contaminated drains and, because the Laboratory has not had another high-PCB event in the sanitary sludge, it received Environmental Protection Agency (EPA) approval to no longer treat the sludge as a TSCA waste. The EPA and NMED require that this waste be disposed of at an industrial landfill and that it not be allowed to be used as a soil amendment.

Cerro Grande Fire Debris (54,432 kg). This waste is contaminated debris from the Cerro Grande fire.

Oil, Petroleum, and Petroleum Contaminated Materials (42,762 kg). This waste stream is composed of both routine and nonroutine oil- or petroleum-contaminated materials. Approximately 91% of this waste stream is nonroutine legacy materials.

Asbestos (26,463 kg). All of the asbestos waste stream is TSCA waste and as such is nonroutine. The asbestos is almost exclusively in friable form.

Various Liquids (10,607 kg). This nonroutine waste stream is composed of contaminated rainwater and various unspecified contaminated liquids derived from EM-ER sites.

Unused/ Unspent Chemicals (14,850 kg). This waste stream is by far the largest routine waste stream for FY01 and constitutes more than 30% of the total routine hazardous waste disposed. It consists primarily of unopened or unused research and production chemicals, many in their original containers.

Ferric Chloride (4034 kg). This waste stream is composed of ferric chloride etchant used largely in production operations.

Corrosives (2905 kg). Large quantities of unneutralized acids and bases are disposed of each year at the Laboratory. These are primarily spent chemicals and consist mostly of sodium hydroxide and nitric acid.

Photochemicals (2233 kg). The Laboratory still operates several wet photographic processes. These processes generate waste in the form of spent fixers, developers, and silver-contaminated fluids or other items. Normally, these are recycled.

Commercial Products (1818 kg). The Laboratory routinely disposes of both used and unused industrial products, such as cleaners, strippers, rust inhibitors, and detergents.

Other (1784 kg). This waste stream consists primarily of laboratory trash, used glassware, other used containers, and spent equipment and components contaminated with hazardous materials, such as high-efficiency particulate air filter (HEPA) filters.

Ash (1739 kg). A persistent component of the hazardous waste stream is ash collected from the various Laboratory burn grounds.

Solvents (1170 kg). Solvents are widely used at the Laboratory in research, maintenance, and production operations. They constitute the single largest number of items sent for disposal each year and are persistent year-to-year.

Acetonitrile (1100 kg). This hazardous substance is used in the synthesis of nucleo-peptides. Because of program growth, the Laboratory expects to double the amount of waste generated next year.

Electoplating Fluids (888 kg). Electroplating is required, both for production and research operations. Most electroplating chemicals are continuously recycled; this waste constitutes the small residue that is disposed of.

Biomedical Waste (273 kg). This waste stream consists primarily of blood, blood-contaminated items, and used sharps.

Mercury (132 kg). Mercury waste is generated primarily from breakage of mercury-containing laboratory instruments and mercury spills. The 13 largest waste streams in the routine hazardous waste category for FY01 are shown in Fig. 5-7.

The waste streams are shown as a percent of total hazardous waste in Fig. 5-7. This chart excludes EM-ER waste and sanitary sludge with legacy contamination. Such wastes also were excluded from the calculation of percentages.

5.4. Improvement Projects

The following projects were identified as potential corrective measures for the hazardous waste type. These projects are divided into three categories: (1) projects completed in the last year, (2) projects currently funded and ongoing, and (3) proposed projects that are unfunded. Projects are characterized further by type: source reduction (SR), sort and segregate (SS), reuse/recycle (RR), treatment (T), or disposal (D).

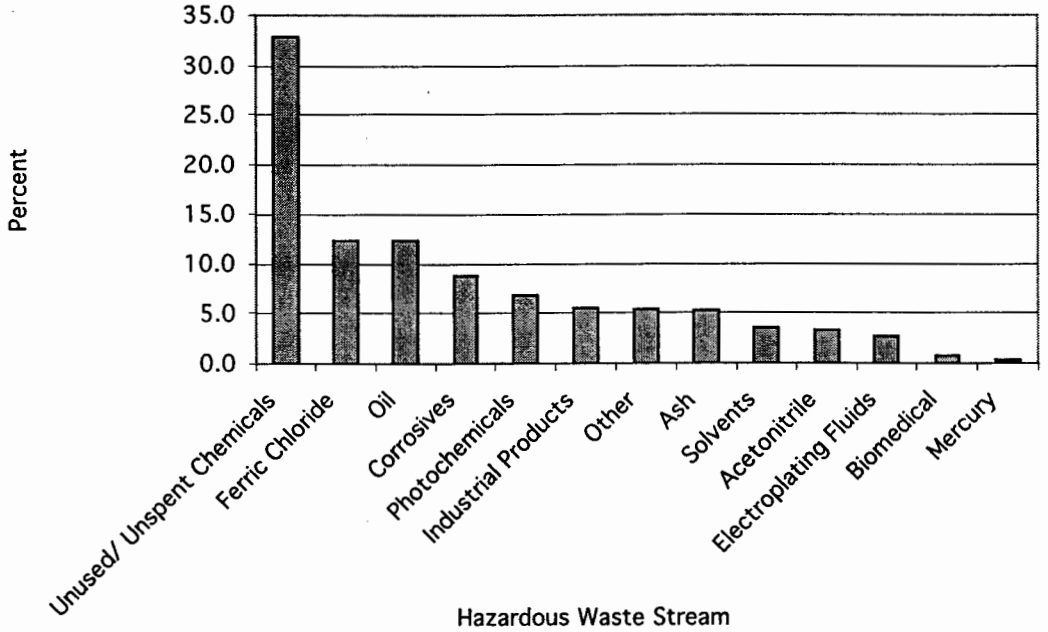

Fig. 5-7. FY01 routine hazardous waste streams.

5.4.1. Completed Projects

These projects have been completed and/or implemented in the last year.

Phosphor Scanner (SR). DX-3 has procured and is installing a large-format phosphor scanner that enables two large phosphor screens to replace photographic film in explosive hydrotest radiographs. By switching to the phosphor screens, DX-3 saves over $50,000 annually from reduced waste disposal, lower equipment costs, and labor. Approximately 450 gallons of spent photochemicals per year is no longer generated, and the administrative activities associated with storing, characterizing, documenting, and disposing of this waste have been eliminated. The film development area is being remodeled for other use.

Nonoperational Wastewater Sumps Eliminated (SR). Eight sumps at TA-9 (DX-1) have been capped and protected so that they no longer fill with rainwater that must be treated at the HE wastewater treatment plant. This process will avoid 40,000 gallons of HE wastewater. It also avoids the risk of sump overflow and release of contaminated water to the environment. This work was conducted by the IT Corporation under the direction of DX-1 and the ER Project.

Neutralize Radioactive Liquid Waste. Printed circuit fabrication at the detonator production facility generates 2000 kg of caustic hazardous waste annually. The Radioactive Liquid Waste Treatment Facility (RLWTF) will neutralize its acidic influent with the caustic stripper solution.

Sanitary Sewage Grit Screenings (SR). PCB-contaminated drains in the Sigma facility were cleaned to regulatorily prescribed levels as a corrective action for PCB contamination found in the SWSC plant screening grit.

Machine Coolant Recycle (RR). The MST-6 and ESA main machine shops have installed coolant filtration and management systems that achieve a tenfold-to-one-hundred-fold increase in coolant lifetime.

HE Waste Water Reduction (SR). DX-2 replaced handwashing of glassware with industrial dishwashers that use less water.

Nonhazardous Ink Plotter (SR). JCNNM replaced a plotter using hazardous inks with a dry-ink model.

Biowaste Autoclaving (T). B Division routinely autoclaves all biomedical waste so that it can be disposed of at the sanitary landfill.

5.4.2. Ongoing Projects

These projects have been funded and are currently being executed. In some cases, the remedies are administrative actions that have been taken to resolve conflicting goals. Hazardous waste reduction projects are funded by the Defense Programs (DP)-funded Pollution Prevention Program, Generator Set-Aside Fee (GSAF) Program, and mission programs.

Recycle vs Disposal (RR). As discussed in Section 5.2, Waste Minimization Performance, the major contributor to poor performance on the hazardous waste goal in FY01, arose out of the conflict between the waste minimization performance measure and the FWO-Division performance measure. This problem has now been rectified, and in the future, all recyclable waste will be recycled. The Laboratory will keep a record of increased costs resulting from recycling and report this to the DOE in the future. No additional action is required. This action will reduce hazardous waste disposal by ~10,000 kg.

Hydraulic Systems Improvements (SR). JCNNM is redesigning hydraulic couplings on backhoes and other machinery to reduce the likelihood of coupling failure and the resulting oil spills. Oil spill cleanup generates New Mexico State special waste. JCNNM is replacing the oldest Pakmaster (trash compacting truck), which has had frequent hydraulic line failures. (These improvements are based on a Green Zia Tools assessment conducted by JCNNM in FY00.)

Bio-Based Hydraulic Oil (SR). JCNNM is converting Laboratory heavy equipment to use bio-based hydraulic oils. These are not regulated as hazardous waste; consequently, oil spills and spill cleanup will become sanitary waste.

Non-RCRA Wastewater Pretreatment (T). The JCNNM-managed sanitary wastewater system (SWS) has configured a wastewater pretreatment trailer to process wastewaters that do not meet the SWS-plant waste acceptance criteria (WAC). These screenings are now disposed of as State special solid waste. Once treated, they can be sent to the SWS plant. Floor stripper (for removing wax) and mop water from some floor-cleaning

operations are examples of this kind of waste. Hazardous waste will be reduced by ~900 kg.

Ferric Chloride Recycle/Disposition (RR). Ferric chloride suppliers will pick up spent ferric chloride solution for recycle. This action will reduce hazardous waste by ~4000 kg.

5.4.3. Proposed Projects

These projects or actions have been proposed to (1) allow further reduction in the routine hazardous waste stream; (2) improve operational efficiency; and, in the case of fixing finely divided powders, (3) increase safety. Many projects currently are unfunded. If implemented, they will provide an additional margin against unexpected and unplanned increases in waste generation. The projects are presented in the order of the waste streams they are intended to reduce, with the largest streams first.

Distributed Chemical Pharmacy (SR). The Laboratory is in the process of procuring a new chemical management software system, which will create the opportunity for much more effective management of chemicals, both maintenance/production chemicals and research chemicals. This project will develop and implement site-wide procedures for (1) sharing and exchanging chemicals, (2) minimizing the amount of chemicals purchased, and (3) implementing an external chemical exchange system. The external exchange system will enable the Laboratory to share excess chemicals with other institutions. This will be a distributed system in that chemicals will not be stored or dispensed from a central facility. This project should have an impact on the unused chemical and the solvent waste streams, which are large and persistent.

Oil Waste Reduction (SR). The continuing expansion of ongoing programs is expected to reduce this waste stream significantly over the next 2 to 3 years.

Digital Photography Implementation (SR). The photochemical waste stream is one of the large components of FY01 hazardous waste. The Laboratory has been gradually making the transition from film and wet chemistry photodevelopment to digital photography. This project will complete that transition, including development of Laboratory photographic and x-ray photographic standards that would preclude future purchase of film photography and wet film development equipment, except where it is the only possible option. The project involves replacing wet chemistry systems (cameras, development, and printing) at low-volume activities, followed by a changeover in the Laboratory's production photographic services. This project, combined with recycle of photochemical waste, should virtually eliminate this waste stream.

Sitewide Process Neutralization (T). Currently, spent acidic or basic chemicals are disposed of as waste. Because of their corrosive nature, they are RCRA hazardous waste. By implementing a simple neutralization step at the end of the processing cycle, many kilograms of hazardous waste (in the form of corrosives) could be converted to less-hazardous New Mexico State special waste. Neutralized waste should be easier to recycle than the original corrosives.

Acetonitrile (RR). The Laboratory produces ~1 tonne of this waste material per year. The chemical is used in the production of nucleopeptides. The Laboratory expects programmatic growth, which would effectively double yearly production starting in FY02. The Laboratory has initiated an investigation of recycling options for this material, including both on- and off-site recycle. After evaluating these options, the Laboratory will pursue the selected option.

Fixing Finely Divided Powders (T). Many waste products that are not inherently hazardous are classified as hazardous waste because they are in the physical form of fine, respirable powders. By potting, melting, or otherwise immobilizing these powders, they can be removed from the hazardous waste stream.

Nonhazardous Fluorescent Light Bulbs (SR). Several Laboratory groups have switched to low-mercury (nonhazardous) fluorescent light bulbs that can be managed as salvage rather than as hazardous waste at the end of their useful life. These are cost competitive with high-mercury light bulbs and are available through the Laboratory's Just-in-Time (JIT) procurement system. Low-mercury bulbs are now available for almost all Laboratory light fixtures. Procurement group BUS-5 and Summit Electric (the Laboratory's fluorescent-bulb supplier) are working to update JIT to direct purchasers to the low-mercury bulbs. A Laboratory-wide conversion to low-mercury bulbs will simplify broken-bulb cleanup (which no longer must be treated as hazardous waste spills), eliminate the cost of managing bulbs as hazardous waste, and eliminate the risk of compliance failure from improper bulb management. This improvement does not reduce waste generation because high-mercury bulbs are already being recycled.

Paint Shop Waste Minimization (SR or RR). The JCNNM paint shop generates considerable hazardous waste. During FY02, JCNNM will be conducting a Green Zia tools analysis of lacquer and thinner waste streams to identify waste minimization options.

Heat-Exchanger-Cleaner Spent Solution (SR or RR). Chemical cleaning of cooling-tower heat exchangers leads to significant volumes of hazardous waste. The Laboratory is now completing a Green Zia tools analysis of this waste stream that identifies several waste minimization strategies that will be pursued in the coming year.

Mercury Elimination (SR). The use of mercury-containing devices (thermometers) is a frequent source of hazardous waste. When these break, they generate significant hazardous waste. The Laboratory's pollution prevention program has funded replacement of mercury thermometers with alcohol and electronic ones.

Recover and Recycle Silver from Photochemical Fluids (RR). A vendor will be identified and a contract will be placed to recover silver from photochemical fluids. This will allow recycling of the silver.

Initiate Puncture and Recycle of Aerosol Cans (RR). Aerosol propellants are normally hazardous substances. Aerosol cans cannot be recycled if they contain residual propellant. By puncturing the cans and recovering the propellant, the cans can be recycled.

If these projects are implemented, the Laboratory should see a significant reduction in hazardous waste. Because these projects address the routine hazardous waste stream components, the effects will be seen there. Figure 5-8 illustrates how the routine hazardous waste stream would be affected by implementation of these projects over the next few years.

Successful implementation of these projects will reduce the hazardous waste stream to a total value below the FY05 goal of 31 tonnes.

5.5. FY02 Performance Metrics

The Environmental Stewardship Office (ESO) has established performance metrics for the waste stream minimization project completion. These metrics will be used to measure performance throughout the year to assess progress. A score of 3 has been established for each completed project having a significant impact on a waste stream. Scores of 1 or 2 are assigned to projects with minimum waste stream impact or to the completion of major milestones. The metrics in Table 5-1 have been developed for the hazardous waste stream.

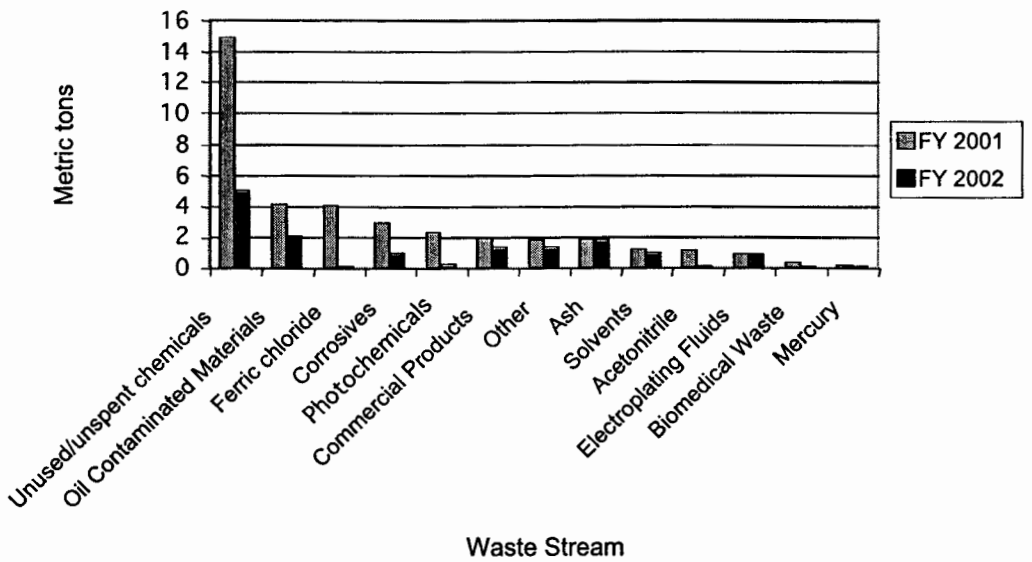

Fig. 5-8. Projected routine hazardous waste in FY02.

TABLE 5-1
HAZARDOUS WASTE METRICS

Initiative (Score)	Comments
Develop distributed chemical pharmacy protocol (1) Implement distributed chemical pharmacy (2)	This project will reduce the unused/unspent chemical waste stream significantly.
Implement digital photography (80% of Laboratory) (2)	
Perform sitewide conversion to bio-based hydraulic oils (2)	
Develop sitewide process neutralization protocol (1) Implement in 80% of possible processes (2)	
Identify and implement recycling options for acetonitrile (3)	This project will counter the expected growth of this waste stream and could eliminate all such waste being disposed of.
Recover and recycle silver from photochemicals (1)	
Initiate puncture of aerosol cans (1)	
Implement other proposed projects (2 each)	

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5-2. United States Department of Energy, "Mitigation Action Plan for the Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory," United States Department of Energy document DOE/EIS-0238 (September 1999).

5-3. "General Waste Management Laboratory Implementing Requirement (LIR)," Laboratory Implementation Requirement LIR404-00-02.2 (Issue Date: November 1, 1998, Revised Date: October 6, 1999).

5-4. "Hazardous Waste Management LIR—Laboratory Implementation Requirements," LIR404-00-03.0 (Effective Date: December 16, 1996).

5-5. Los Alamos National Laboratory Hazardous Waste Permit NM0890010515-1 (1989).

ENVIRONMENTAL RESTORATION PROJECT

A Department of Energy
Environmental Cleanup Program

LA-UR-01-6385
December 2001
ER2001-0937

Waste Minimization Awareness Plan

Los Alamos
NATIONAL LABORATORY
Los Alamos NM 87545

Produced by the Regulatory Compliance Focus Area

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List of Acronyms and Abbreviations

DOE	US Department of Energy
E	Environmental Science and Waste Technology (Division)
EPA	US Environmental Protection Agency
ER	environmental restoration
ESH	Environment, Safety, and Health (Division)
ESH-ID	Environment, Safety, and Health Identification (process)
ESO	Environmental Stewardship Office
FIMAD	Facility for Information Management, Analysis, and Display
FY	fiscal year
GIS	Geographical Information System
GW	groundwater
HE	high explosive
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
LLMW	low-level mixed waste
LLW	low-level waste
MDA	material disposal area
NMED	New Mexico Environment Department
NMED-HWB	New Mexico Environment Department-Hazardous Waste Bureau
PRS	potential release site
RCRA	Resource Conservation and Recovery Act
SMO	Sample Management Office
SWMU	solid waste management unit
TA	technical area
TSCA	Toxic Substances Control Act
WMin/PP	waste minimization and pollution prevention

Los Alamos National Laboratory
Environmental Restoration Project

WASTE MINIMIZATION AWARENESS PLAN

1.0 INTRODUCTION

Waste minimization is an inherent goal within all the operating procedures of the Los Alamos National Laboratory (the Laboratory). The U.S. Department of Energy (DOE) and the Laboratory are required to annually submit a waste minimization plan to the New Mexico Environment Department (NMED) in accordance with the Laboratory's Hazardous Waste Facility Permit. This document represents the waste minimization and pollution prevention (WMin/PP) awareness plan for the Laboratory's Environmental Restoration (ER) Project.

This plan supports the ER Project's WMin/PP goals and describes its program to incorporate waste reduction practices into ER activities and procedures. The plan was prepared by the ER Project Office, in the Environmental Science and Waste Technology (E) Division, pursuant to the requirements of Module VIII, Section B.1 of the Laboratory's Hazardous Waste Facility Permit (NM0890010515-1). This plan is specific to the ER Project and should be considered a companion document to the Laboratory's May 1997 site-wide plan, "Site Pollution Prevention Plan for Los Alamos National Laboratory," and the annual certification document "Los Alamos National Laboratory 2000 Environmental Stewardship Roadmap." The "Los Alamos National Laboratory 2001 Environmental Stewardship Roadmap" is planned for release in December 2001.

1.1 Background

The mission of the Laboratory's ER Project is to protect human health and the environment by identifying risks posed by inactive and surplus DOE facilities and contaminated areas, and by remediating sites, as necessary, in the most cost-effective and responsible manner possible to provide for future beneficial use. In completing this mission, ER activities may generate large volumes of waste, some of which may require special handling, treatment, storage, and disposal. Because the ER Project is tasked to investigate and conduct corrective action, as necessary, at historically contaminated sites within the Laboratory, source reduction and material substitution are difficult to implement. However, the ER Project generates waste in the conduct of site cleanups and thus is faced with the responsibility and the challenge to minimize the amounts of waste that will require subsequent management or disposal. Minimization is necessary because of the high cost of waste management; the limited capacity for on-site or off-site waste treatment, storage, or disposal; and the desire to minimize the associated liability.

In 1990, Congress passed the Pollution Prevention Act, which changed the focus of environmental policy from "end-of-pipe" regulation to encouraging source reduction or minimizing waste generation. Under the Pollution Prevention Act and other institutional requirements for treatment, storage, and disposal of wastes, all waste generators must certify that they have a waste minimization program in place. The elements of this program are further defined in the May 1993 U.S. Environmental Protection Agency (EPA) interim final guidance, "Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program." The program guidance lists what EPA considers the minimum level of infrastructure and effort that must be expended to have an acceptable program. This includes top management support, process evaluation, technology exchange, waste minimization employee training, and waste generation tracking and projections.

The DOE Office of the Secretary also requires a pollution prevention program as outlined in the 1996 Pollution Prevention Program Plan. The DOE plan has specific program requirements for every waste

generator, including evaluating waste minimization options as early in the planning process as possible. The DOE plan also places responsibility for WMin/PP implementation with the waste-generating program. In a November 12, 1999, memorandum the DOE Secretary of Energy set an annual 10% reduction goal for all wastes generated from facility decommissioning and site stabilization activities; the Laboratory's approach to achieving this goal is addressed later in this document.

1.2 Purpose and Scope

The purpose of this plan is to document the ER Project's approach for minimizing the wastes it generates. This plan discusses the goals, methods, and activities that will be routinely employed to prevent or reduce waste generation in fiscal year 2002 (FY02), and it reports FY01 waste generation quantities and significant waste minimization accomplishments for FY01. This plan also discusses the ER Project program manager's commitment to WMin/PP, provides a discussion of specific program elements of the ER WMin/PP Program, and presents the barriers to implementation of further significant reductions.

This plan is designed to fulfill the waste minimization requirements in Module VIII, Section B.1, of the Laboratory's Hazardous Waste Facility Permit and of the Hazardous and Solid Waste Amendments.

This plan addresses all waste classifications generated by the ER Project during the course of planning and conducting the investigation and remediation of environmental media funded by the DOE Office of Environmental Restoration. Wastes generated by ER include "primary" and "secondary" waste streams. Primary waste consists of generated contaminated material or environmental media that was present as a result of past DOE activities, before any containment and restoration activities. It includes contaminated building debris or soil from investigations and remedial activities. Secondary waste streams consist of materials that were used in the investigative or remedial process and may include investigative-derived waste (e.g., personal protective equipment, sampling waste, drill cuttings); treatment residues; wastes resulting from storage or handling operations; and additives used to stabilize waste. The ER Project may generate the following waste classifications: low-level waste (LLW); low-level mixed waste (LLMW); transuranic radioactive waste; chemical wastes (which include Resource Conservation and Recovery Act [RCRA] hazardous, Toxic Substances Control Act [TSCA], and New Mexico Special wastes); and/or solid waste.

The scope of a WMin/PP effort for an individual ER project will be dependent on the primary and secondary wastes anticipated to be generated and the feasibility of waste reduction for those waste streams.

1.3 Requirements of the Operating Permit

Module VIII, Section B.1, of the Laboratory's Hazardous Waste Facility Permit requires that a waste minimization program be in place and that a certified plan be submitted annually to the administrative authority. The specific requirements of the permit are listed in Table 1.3-1 along with the corresponding section of the plan that addresses the requirement.

Table 1.3-1
Los Alamos National Laboratory Hazardous Waste Facility Permit, Module VIII, Section B.1

Permit Requirement	Topic	Refer to Report Section
Section B.1.a.1	Policy Statement	Section 2.0
Section B.1.a.2	Employee Training	Section 6.3
Section B.1.a.2	Incentives	Section 6.10
Section B.1.a.3	Past Source Reduction and Recycling	Section 5.4
Section B.1.a.4	Itemized Capital Expenditures	Section 5.4
Section B.1.a.5	Barriers to Implementation	Section 7.0
Section B.1.a.6	Sources of Information	Section 6.4
Section B.1.a.7	Investigation of Additional WMin Efforts	Section 6.2
Section B.1.a.8	Utilization of Hazardous Materials	Section 5.2
Section B.1.a.9	Justification of Waste Generation	Section 5.0
Section B.1.a.10.a	Site Lead Inventory Program	Section 6.11
Section B.1.a.10.b	Steel for Lead Substitution Program	Section 6.11
Section B.1.a.10.c	Lead Shielding Coating Program	Section 6.11
Section B.1.a.10.d	Lead Decontamination Program	Section 6.6
Section B.1.a.10.e	Scintillation Cocktail Substitution Program	Section 5.2
Section B.1.a.10.f	Radioactive Waste Segregation Program	Section 6.6

2.0 ER PROJECT PROGRAM MANAGER POLICY STATEMENT AND MANAGEMENT COMMITMENT

The Laboratory's ER Project program manager, focus area leaders, and other ER Project personnel are committed to preventing or reducing the generation of waste from ER Project activities, as much as is technically and economically feasible and consistent with the ER Project mission.

The Laboratory's support for pollution prevention and waste minimization programs is documented in the Laboratory waste management requirements. The ER Project additionally mandates waste minimization techniques in several of its standard operating procedures. In addition, the E Division Environmental Stewardship Office (ESO) is tasked by DOE and the Laboratory to champion and implement an aggressive waste minimization and environmental stewardship program for the entire Laboratory.

Another management program in place at the Laboratory is the Environment, Safety, and Health Identification (ESH-ID) process, which is a tool designed to assist Laboratory personnel in identifying and managing Environment, Safety, and Health Laboratory implementation requirements, which may impact project planning and execution. This process incorporates the evaluation of potential waste-generating activities before project startup and includes review by a waste minimization/pollution prevention subject-matter expert.

The ER Project fully supports the Laboratory's and E Division's written WMin/PP policies, programs, and commitments. The ER Project will support the goal of waste reduction by giving preference to source reduction, improved segregation and characterization, and environmentally sound recycling practices regarding waste treatment and disposal techniques, to the degree determined to be economically practicable. Evidence of the ER Project commitment is demonstrated by this plan, as well as by the documentation of past

waste reduction efforts within the ER Project (Section 5.4). The ER Project will allocate sufficient resources to pursue the goals and approaches established by this plan and will coordinate with the Laboratory's ESO, as necessary.

3.0 ORGANIZATIONAL STRUCTURE AND STAFF RESPONSIBILITIES

The ER Project is part of the E Division at the Laboratory and is subject to all Laboratory and E Division policies and requirements. The organizational structure of the ER Project as of November 2001 is shown in Figure 3.0-1.

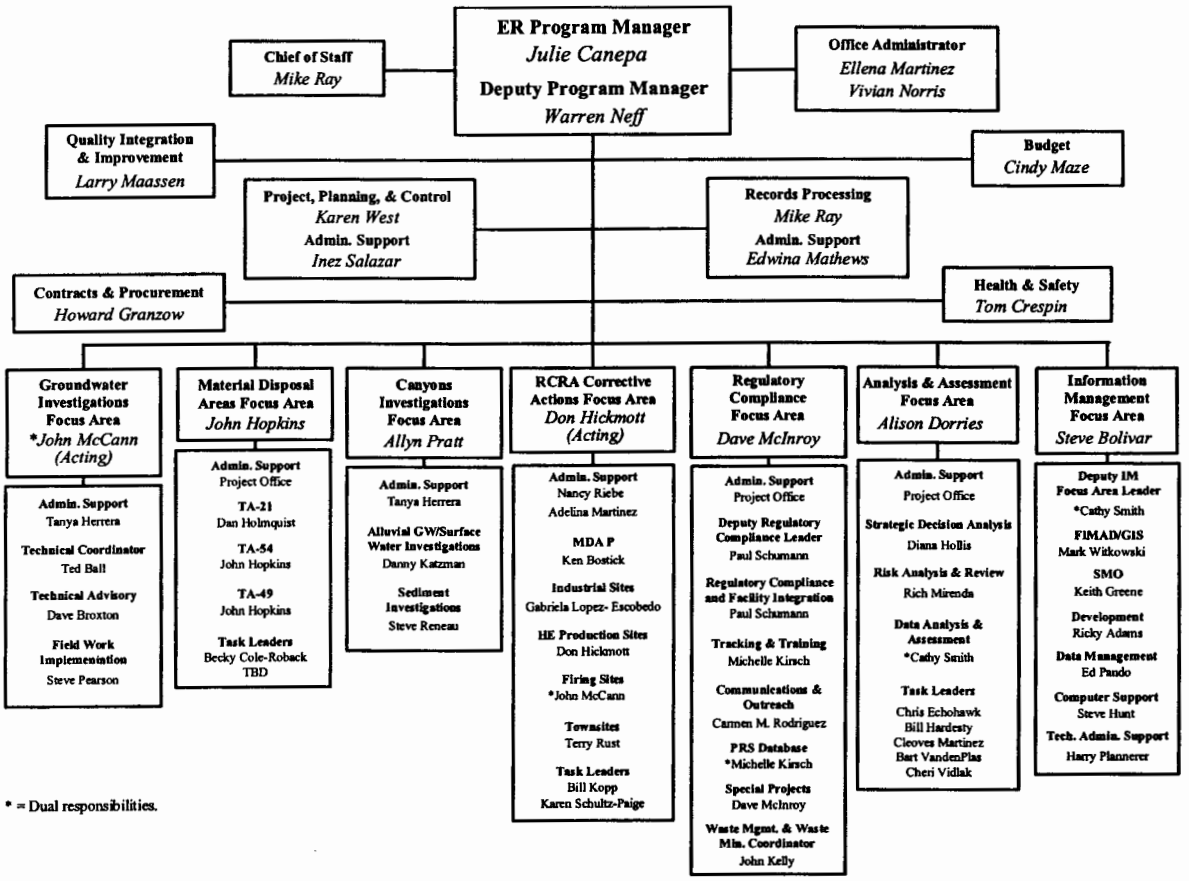

Figure 3.0-1. ER Project Organization Chart

The organizational structure for developing and implementing WMin/PP programs is outlined below:

- The Laboratory director and the deputy director for operations have oversight responsibilities and provide annual review of the Laboratory-wide WMin/PP Program goals and performance.
- The E Division has primary responsibility for the Laboratory-wide WMin/PP Program, including the ER Project.
- The ESO has been delegated by the E Division to develop and manage the Laboratory-wide WMin/PP and environmental stewardship program. The ESO provides oversight for WMin/PP implementation; a base of technical knowledge and resources for WMin/PP practices; assistance with

identifying waste generation trends and WMin/PP opportunities; recommendations for WMin/PP solutions and applications; support in tracking and reporting waste generation trends and WMin/PP successes and lessons learned; assistance in preparing funding applications and proposals for WMin/PP projects; and assistance in overcoming WMin/PP implementation barriers.

- The ER Project focus area leader has primary responsibility for developing and implementing WMin/PP programs and strategies for all ER projects that result in waste generation, as described in this plan. The ER Project must allocate sufficient resources to attain the goals and approaches identified in this plan. The ER Project is responsible for establishing and submitting an annual WMin/PP plan to the administrative authority, establishing WMin/PP goals and performance measures, and coordinating with the ESO to implement WMin/PP activities and to report success stories.
- The ER Project Regulatory Compliance Focus Area leader is the focal point for planning and implementing waste minimization activities and reporting waste minimization successes and lessons learned for the ER Project.
- ER Project focus area leaders, who report to the ER Project program manager, are responsible for identifying and incorporating WMin/PP practices into project plans and field activities, as much as technically and economically feasible.
- The ER Project waste management and minimization coordinator is responsible for coordination of waste minimization activities, coordinating proposals for waste minimization implementation projects, advising project leaders on Wmin/PP technologies and techniques, recommending ER Project-wide policy, and compiling waste generation and minimization data.

4.0 GOALS AND PERFORMANCE MEASURES

The DOE Headquarters established an annual DOE complex-wide 10% reduction goal for environmental restoration activities based upon the overall waste projections. Additionally, the University of California FY02 contract performance measures include the same 10% cleanup/stabilization waste reduction goal.

The ER FY02 WMin/PP approach will focus on

- integrating waste minimization principles into the remedial planning process;
- recycling and reusing materials;
- utilizing material substitution as appropriate;
- developing subcontractor waste minimization incentives through contract specifications;
- dedicating waste minimization resources to assist with large remedial actions; and
- tracking, projecting, and analyzing waste data to improve waste management economies of scale.

Figure 4.0-1 shows the environmental hierarchy for ER wastes. Although source reduction is preferred, the ER WMin/PP approach recognizes there may be limited opportunity for source reduction of primary wastes because the ER Project is tasked to investigate and conduct corrective actions, as necessary, at historically contaminated sites within the Laboratory, and potential environmental concerns may require removal. When appropriate, source reduction of primary wastes will be accomplished through the application of risk-based cleanup criteria, land-use scenarios, and the consideration of in-situ or non-intrusive remediation technologies during project planning and negotiation stages, and improved characterization and segregation during the execution of field activities. Source reduction of secondary wastes will be accomplished through proper planning; improved housekeeping, segregation, and characterization; and application of WMin/PP criteria

during technology selection, design, and construction activities. Recycling and reuse practices will be considered for all primary and secondary wastes. Volume reduction, including size reduction, compaction, and optimal packaging, will be considered for all primary and secondary wastes that cannot be avoided or recycled.

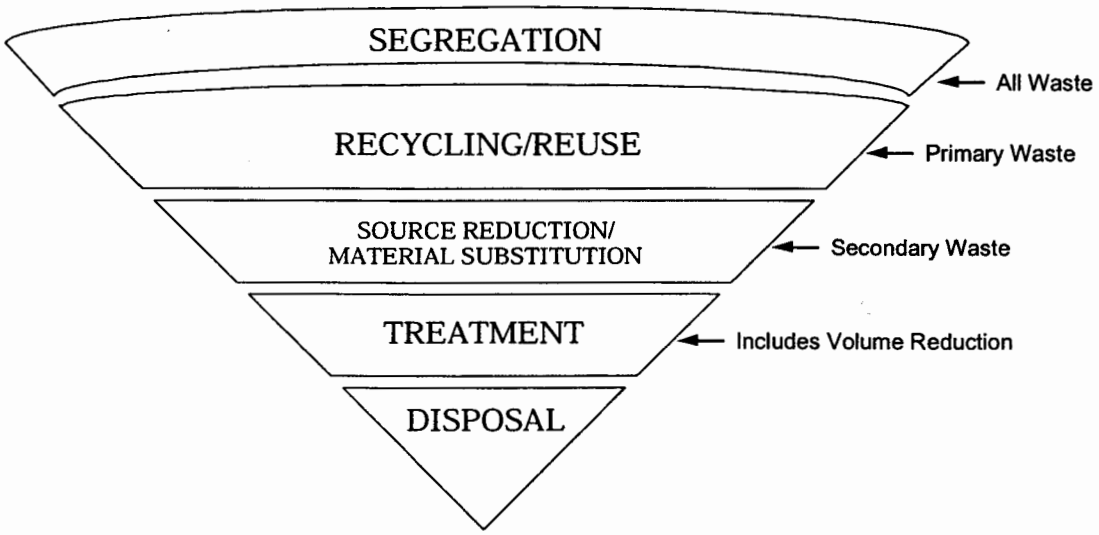

Figure 4.0-1. Environmental Management Hierarchy within Environmental Restoration

The WMin/PP approaches outlined above are consistent with the waste reduction priorities established by the Laboratory's sitewide waste minimization plan, which recognizes the severe limitations of on-site disposal capacity for LLW and on-site storage capacity for LLMW. In addition, the approach was adopted to address the variable and non-recurring nature of wastes coming from ER activities.

5.0 SITUATION ANALYSIS

The FY01 activities that resulted in waste generation included remedial actions and site investigations. These types of activities will continue throughout the life of the Laboratory's ER Project. It should be noted that the majority of FY01 waste generation was the result of RCRA clean closure activities at Material Disposal Area (MDA) P, and cleanup activities at Technical Area (TA)-16 explosives sites, Acid Canyon, and Solid Waste Management Unit (SWMU) 03-056(c).

The FY02 planned activities include additional deep groundwater characterization and intermediate well installation, completion of the MDA P clean closure, generation of waste from interim actions at a high-explosives site and consolidated SWMU 53-002(a)-99, remediation of several historical radioactive releases, and other small site investigations and corrective action projects.

5.1 Applicable Regulations

The Laboratory's ER Project is subject to many environmental regulations. The key drivers for the WMin/PP program are listed below. A complete description of these regulations may be found in the Laboratory's Waste Minimization Awareness Plan or the "Waste Minimization and Pollution Prevention Regulations and Orders, Requirements and Identification List."

Federal Acts/Regulations and Executive Orders

- Resource Conservation and Recovery Act
- Pollution Prevention Act
- Executive Order 12873 — Federal Acquisition, Recycling, and Waste Prevention
- Executive Order 12856 — Federal Compliance with Right-to-Know Laws and Pollution Prevention
- Executive Order 13148 — Greening the Government Through Leadership in Environmental Management

State of New Mexico Regulations

- New Mexico Solid Waste Management Regulations, Title 20, Chapter 9, Part 1, New Mexico Administrative Code
- New Mexico Hazardous Waste Management Regulations, Title 20, Chapter 4, Part 1, New Mexico Administrative Code

DOE Policy

- DOE Order 5400.1, "General Environmental Protection Program"
- DOE Order 5400.3, "Hazardous and Radioactive Mixed Waste Program"
- DOE Order 5400.5, "Radiation Protection of the Public and the Environment"
- DOE Order 435.1, "Radioactive Waste Management"
- Secretary of Energy Notice 37-92, "Waste Minimization Policy Statement"
- DOE Pollution Prevention Program Plan, 1996

Los Alamos National Laboratory Directives and Policies

- Los Alamos National Laboratory 2000 Environmental Stewardship Roadmap, LA-UR-00-5601, December 2000
- Laboratory waste management requirements

5.2 Justification for the Usage of Hazardous Materials

ER Project activities currently introduce only small amounts of hazardous materials into field and support operations. During the past years, most usage of hazardous materials has been substituted with less hazardous alternatives in an effort to reduce the generation of secondary hazardous or mixed waste. These efforts include the following list.

- Decontamination Solvents — The use of the hazardous solvents has been eliminated in the ER Project.
- Scintillation Cocktails — The routine use of scintillation cocktail media that results in a RCRA mixed waste has been discontinued at the Laboratory.

- Analytical Processes — Some samples collected for site characterization may require the use of hazardous substances as a preservative prescribed by EPA analytical methods. These analytical processes have been evaluated by EPA, private companies, and universities for potential alternative processes and material substitution. The use of hazardous substances for sample preservation is currently viewed as necessary.

5.3 FY01 Waste Generation Summary

The ER Project FY01 waste generation and waste minimization summary is listed in Table 5.3-1. Waste projections and reduction goals for FY02 are listed in Table 5.3-2.

Table 5.3-1
Fiscal Year 2001 Waste Generation Summary
(October 1, 2000, Through September 30, 2001)

Waste Type	FY01 Planned Waste Volume (m^3) from ER and Stabilization Activities[a]	Volume (m^3) of Waste Targeted for Reduction/ Recycle to Achieve Goal	FY01 Waste Generation Volume (m^3)[b]	FY01 Year to Date Reduction/ Recycle Volume (m^3)	FY01 Overall Waste Reduction
					14%
Solid – Transuranic Radioactive	0.2	0	0	0	
Solid – Mixed Low-Level Radioactive	12.54	2	22	1018	
Solid – Low-Level Radioactive	395	39	364	0	
Solid – Hazardous[c]	9039	900	5102	1900	
Solid – Sanitary	1916	190	18845	474	

[a] Based on January 2001 Integrated Planning, Accountability, and Budgeting data.

[b] Includes wastes generated by DOE-EM activities; and excludes wastes generated by fire recovery activities and flood preparation projects.

[c] Includes RCRA, TSCA, and New Mexico Special wastes.

Table 5.3-2
Fiscal Year 2002 Projected Waste Generation
(October 1, 2001, Through September 30, 2002)

Waste Type	FY02 Projected Waste Volume (m^3) from ER and Stabilization Activities	Volume (m^3) of Waste Targeted for Reduction/ Recycle to Achieve Goal	Percent Reduction Goal
			10%
Solid – Transuranic Radioactive	0.8	0	
Solid – Mixed Low-Level Radioactive	0	0	
Solid – Low-Level Radioactive	1640	164	
Solid – Hazardous*	3.8	0.3	
Solid – Sanitary	783	75	

*Includes RCRA, TSCA, and New Mexico Special wastes.

5.4 Waste Minimization Accomplishments FY01

WMin/PP was an integral part of the FY01 ER planning activities and field projects through recycling, reuse, contamination avoidance, risk-based cleanup strategies, and many other practices. Waste reduction benefits are typically difficult to track and quantify because the data to measure the amount of waste reduced (as a direct result of a WMin/PP activity) are often not available and are not easily extrapolated. In addition, many waste minimization practices employed during previous years are incorporated into standard operating procedures and no longer reported. Operating expenses of approximately $50,000 are provided annually to evaluate best management approaches, source reduction, and recycling options.

Pollution prevention capital projects not funded from project funds may also be funded through a Laboratory-wide "Waste Minimization/Waste Generation Set-Aside Tax" system. This system taxes waste generators according to the volumes and toxicity of wastes generated. The ER Project has previously submitted Return on Investment proposals for WMin/PP projects that are eligible for funding through this program. The Laboratory annually funds over $1M in pollution prevention projects through this program. A list of the projects funded in FY01 can be found at `http://emeso.lanl.gov/eso_projects/set_aside/gsaf.html`.

High-volume waste streams resulting from ER activities include contaminated soil and demolition debris such as metal and concrete. The WMin/PP techniques used in FY01 to reduce these high-volume waste streams led to the following accomplishments:

- At MDA P, 820 cubic meters of mixed wastes were released from radiological control allowing reclassification to hazardous waste using a risk-based DOE "authorized limits" disposal process.
- At MDA P, 474 cubic meters of rock was reused in the construction of stormwater control devices at various ER Project sites at TA-16.
- At MDA P, 300 cubic meters of concrete was sent to the Laboratory's TA-54 Area J for use as fill material in site closure preparation.
- At the SWMU 21-024(i) septic tank site, 18 cubic meters of mixed wastes were released from radiological control, allowing reclassification to hazardous waste using a risk-based DOE "authorized limits" disposal process.
- At SWMU 03-056(c), 1700 cubic meters of hazardous waste contaminated with low levels of polychlorinated biphenyls were granted disposal approval under the TSCA "as found" concentration disposal criteria, thus saving significant disposal costs. NMED-Hazardous Waste Bureau (HWB) also granted approval for disposal of a subset of the wastes at a solid waste disposal facility under a risk-based "no longer contained in" determination for the hazardous constituents present in the waste.
- At the Acid Canyon site, 180 cubic meters of potentially low-level mixed waste was reclassified to LLW based upon approval from NMED-HWB of a risk-based "no longer contained in" determination for the organic hazardous constituents present in the waste.

6.0 WASTE MINIMIZATION PROGRAM ELEMENTS

Listed below are program elements of the Laboratory's ER Project waste minimization program for FY02. Several of the elements are currently in place; however, several are in the planning stages. The elements will be implemented if economically and technically feasible.

6.1 WMin Coordinator

The WMin/PP coordinator will have a primary role in FY02 for developing and implementing programmatic elements of the ER WMin/PP Program by conducting the following activities:

- Improve WMin/PP awareness and information exchange within the ER Project.
- Provide technical reviews and WMin/PP input for ER documents and procedures, such as corrective measures studies, sampling and analysis plans, or other project work plans and provide working examples of "model" documents that incorporate WMin/PP elements.
- Provide technical assistance and consistency among focus areas to formalize standard approaches for WMin/PP in ER Project plans and procedures and institutionalize the use of design reviews, WMin/PP checklists, or value engineering for WMin/PP applications.
- Assist in developing WMin/PP language for ER subcontractor documents and project specifications, thus providing incentives and measurable goals for waste reduction.
- Pilot test or demonstrate site-specific waste reduction activities with a high potential for immediate return on investment.

The WMin coordinator(s) will provide WMin/PP tools and practices to the ER Project. The specific application and waste reduction potential of a tool will be dependent on the ER project and will be left to the judgment of the individual project leaders. The common Wmin/PP tools for use in the ER Project are summarized in the list that follows.

- WMin/PP tools for the negotiations and planning phases
  - Negotiate with regulators to recognize and implement WMin/PP where appropriate
  - Write WMin/PP into ER program documents
  - Include WMin/PP in budgets and contracts
  - Integrate WMin/PP into construction of engineered structures and best management practices
  - Train ER personnel on WMin/PP and build WMin/PP awareness
- WMin/PP tools for the assessment phase
  - Conduct efficient sample management and analysis
  - Consider alternative sampling techniques
  - Consider alternative drilling techniques
  - Segregate materials and waste through field screening
  - Use site control techniques
  - Use bulk waste packaging
  - Train ER personnel on WMin/PP and build WMin/PP awareness
- WMin/PP tools for the alternative evaluation and selection phase
  - Identify WMin/PP as a key criterion during treatment selection
  - Incorporate WMin/PP in key decision-making documents
  - Conduct treatability studies that support WMin/PP

- Train ER personnel on WMin/PP and build WMin/PP awareness

- WMin/PP tools for the implementation phase
  - Scour and decontaminate building materials
  - Recycle and reuse materials from decommissioning activities
  - Prevent contamination migration
  - Dedicate a person on each ER project to promote WMin/PP (e.g., a WMin coordinator)
  - Reuse equipment
  - Train ER personnel on WMin/PP and build WMin/PP awareness

6.2 WMin Planning

WMin/PP is best integrated during the project planning, design, and engineering phases. WMin/PP strategies incorporated during the planning (and negotiations) phases are some of the few opportunities for "source reduction" because they have the potential to avoid or reduce the generation of contaminated soil and building debris, which represent a significant waste volume within the ER Project. Well-defined agreements (with regulators and stakeholders) regarding land-use scenarios, cleanup performance standards, and risk and pathway scenarios are highly effective in avoiding or reducing these primary wastes (e.g., soil, building debris) and secondary wastes.

The ESH-ID process provides a tool in the planning and design phase to assist Laboratory personnel in identifying and managing Environment, Safety, and Health Laboratory implementation requirements having the potential to impact the project. This process incorporates evaluation of potential waste-generating activities before project startup and includes review by a waste minimization/pollution prevention subject-matter expert.

6.3 Employee Training and Awareness

Waste minimization implementation is most effective when all employees consider WMin/PP part of their job responsibilities. To accomplish this, a planned approach to building waste minimization awareness has been developed. The goals of the awareness program are to

- improve recognition among employees that WMin/PP practices apply to ER activities;
- educate employees about successful implementation at the Laboratory and within DOE; and
- improve documentation of WMin/PP accomplishments.

In addition to awareness activities, during FY01 the Laboratory ESO updated the following general site training classes to emphasize waste minimization:

- "Waste Management Coordinator Requirements"
- "OSHA 1910.120 Hazardous Waste Operations"
- "Waste Generator Overview"
- "Waste Documentation Forms"
- "Radworker Training"

In addition to the above classes, each focus area's waste management coordinator is required to attend quarterly meetings as ongoing training in issues important to performing the duties of a waste management coordinator, including periodic updates from the ESO.

Laboratory managers are required to attend Integrated Safety Management training, which addresses management of all ES&H issues, including waste minimization and pollution prevention awareness.

6.4 Information and Technology Introduction

The introduction of new technologies for WMin/PP and waste management approaches is important to minimizing wastes. To support technology exchange, the waste minimization coordinator is available to research technologies or WMin/PP tools for ER Project focus area leaders, as necessary to obtain information on technical or economic feasibility. Some example sources for documents include

- DOE, Remedial Action Project Information Center, Oak Ridge, Tennessee
- DOE, EPIC (the DOE Pollution Prevention Information Clearinghouse), Pacific Northwest Labs, Richland, Washington
- EPA, Superfund Innovative Technology Evaluation (SITE) Database
- DOE, Technology Information Exchanges Conferences and Abstract Summaries
- EPA, Pollution Prevention Homepage Web Site
- EPA, Pollution Prevention Clearing House Web Site
- EPA, Envirosense Web Site
- EPA, National Center for Environmental Publications Web Site
- DOE, Environmental Web Site
- University of Texas El Paso, Southwest Pollution Prevention Center Web Site
- U.S. Navy, Joint Service Pollution Prevention Technical Library Web Site
- State of Kentucky, Kentucky Pollution Prevention Center Web Site
- DOE Oak Ridge National Laboratory, ORNL Pollution Prevention Web Site

6.5 Tracking and Reporting

The routine collection of data regarding waste minimization was established in FY96. Project managers are asked to provide a list of accomplishments as they occur, with a formal quarterly data consolidation effort.

6.6 Sort, Decontaminate, and Segregate

This task is currently implemented and is designed to sort and decontaminate LLW materials from decommissioning operations for the purpose of eliminating their disposal at TA-54 as low-level waste. Typical sorting practices include collection of all metal debris (including steel, lead, etc.) in separate boxes destined for shipment to a decontamination facility or commercial smelter for metals recovery. Decontamination work will involve the removal of surface radioactive contamination on equipment to allow for its reuse either at Los Alamos or other DOE facilities.

Additionally, many sites containing radioactively contaminated heterogeneous materials will place emphasis on proper segregation at the source to attain the maximum recycling and waste classification advantages.

6.7 Compaction

The ER Project plans to improve this process by using the compaction unit at TA-54 on suitable waste before final disposal. The compactor at TA-54 has a higher compaction yield than past equipment.

6.8 Survey and Release

Past practices have conservatively classified non-indigenous investigative-derived waste (e.g. personal protective equipment, sampling materials) as contaminated, based on association with contaminated areas. New policy within the Laboratory allows the ER Project to develop procedures to survey and release these materials as nonradioactive. This will reduce the volume of low-level waste buried at Area G from ER activities. Waste management coordinators will be trained in the Laboratory occupational radiation protection requirements.

6.9 Risk Assessment

Risk assessments are routinely conducted for ER projects, as prescribed in the Laboratory's Installation Work Plan (LANL 1998, 62060). Risk assessments allow the ER Project to plan remediation activities on the basis of the future risk to health and the environment. Often the risk assessment may determine that it is adequately protective and appropriate or beneficial to leave the material in the ground, thus avoiding the generation of waste.

Properly designed land-use agreements and risk-based cleanup strategies can provide flexibility to select remedial actions (or other technical activities) that may avoid or reduce the need to excavate or conduct other actions that typically generate high volumes of remedial waste. This is one of the few opportunities available to the ER Project for source reduction.

6.10 Incentives

The Laboratory's Environmental Stewardship Office and DOE Headquarters sponsor annual pollution prevention awards programs. Both of these programs provide financial awards and recognition to personnel who implement pollution prevention projects.

In 2000, the ER Project received an award for waste minimization efforts. This effort involved ER Project team members considering the different possibilities for disposal for a cleanup site, SWMU 03-056(c), and taking a proactive approach to the categorization of cleanup waste that resulted in a transportation and disposal cost savings of $525,000. By ensuring the waste was duly categorized, the team was able to prevent 2400 cubic yards of waste from being transported to a TSCA/RCRA facility in California or Texas. The team members provided documentation to EPA Region 6 and the NMED-HWB personnel indicating that the soil was not a human health risk. As a result, 1700 cubic meters of this waste was disposed of in-state, at Rio Rancho, New Mexico.

The ER Project participates in the Laboratory-wide "Waste Minimization/Waste Generation Set-aside Tax" system. This system charges waste generators according to the volumes and toxicity of wastes generated. This financial burden is an incentive for waste generators to reduce waste generation to lower total project

costs. The ER Project has previously submitted Return-on-Investigation proposals for WMin/PP projects that are eligible for funding through this tax. The Laboratory annually funds over $1M in pollution prevention projects through this program.

6.11 Lead-Handling Procedures

The ER Project does not routinely procure or use lead or handle excess lead. The inventory and decontamination of existing lead at the Laboratory has been conducted as part of a milestone of the Laboratory's Federal Facilities Compliance Act agreement and is outside the scope of the ER Project.

ER personnel will manage and minimize the amount of lead-contaminated waste using the following approaches.

- Projects will specify a preference to avoid the procurement or use of lead, when possible, giving preference to the use of steel in place of lead.
- Projects will specify the use of strippable or washable coatings for any lead materials that must be used and have the potential to become contaminated.
- Projects will plan for the decontamination of lead materials, when economically feasible, using blast grit, carbon dioxide blast (or other nondestructive blast), or chemical decontamination techniques. Preference will be given to decontamination techniques that minimize the generation of secondary waste (from the treatment process).
- Projects that handle noncontaminated lead waste as a primary waste from the removal action or decommissioning activity will make efforts to recover and redistribute the lead for use at the Laboratory or at another DOE facility.
- Projects will coordinate with the Laboratory's Solid Waste Operations Group for the appropriate handling and disposition of radioactively contaminated lead that cannot be decontaminated or redistributed.

6.12 Equipment Reuse

The reuse of equipment and materials (after proper decontamination to prevent cross contamination) such as plastic gloves, sampling scoops, plastic sheeting, and personal protective equipment will produce waste reduction and cost savings in FY02.

In addition, the Laboratory has initiated an equipment-exchange program, which identifies surplus or inactive equipment available for use. This not only eliminates the cost of purchasing the equipment, but it also delays the point at which the equipment is no longer needed and must be disposed.

7.0 BARRIERS TO WASTE MINIMIZATION IMPLEMENTATION

In some instances, regulatory requirements created situations where levels of waste minimization achieved fell below potentially achievable levels based on site conditions. Examples follow:

- A closure plan for MDA P, submitted to regulatory agencies, required clean-closure of the disposal area. Some materials from the disposal area, upon sampling and segregation, could be proved to be within acceptable cleanup criteria and left on-site for use in final site grading. However, because of the closure plan requirements, this material is being shipped off-site as waste.

- At MDA P, 200 cubic meters of steel was decontaminated, segregated, and prepared for shipment to a commercial steel recycling facility. However, because of the DOE moratorium on release of metal from radiological controlled areas, this material was not shipped to a recycler.
- At SWMU 03-056(c), the requirement to remediate the site to a 1 part per million clean-up level rather than using a risk-based approach contributed to much greater generated waste volumes.
- A risk-based analysis of the Acid Canyon site indicated that contamination levels quantified through a RCRA facility investigation did not pose significant risk to human health or the environment. However, DOE determined that the materials were to be removed resulting in several hundred cubic meters of additional waste disposal.
- Laboratory environmental requirements to protect wetlands, which result in continued National Pollutant Discharge Elimination System discharge of waters into canyons throughout the Laboratory, may result in additional transport of contaminants and drive future remedial requirements. A risk-benefit analysis could have been performed to determine if the transport of contaminants is more environmentally destructive than protecting wildlife and wetlands through continued discharge practices.

REFERENCES

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"Installation Work Plan for Environmental Restoration Project," Revision 7, Los Alamos National Laboratory report LA-UR-98-4652, November 1998.

"Los Alamos National Laboratory 2000 Environmental Stewardship Roadmap," Los Alamos National Laboratory report LA-UR-00-5601, December 1, 2000, available at `http://emeso.lanl.gov`.

Pollution Prevention Act of 1990 (*Omnibus Budget Reconciliation Act of 1990*), 42 U.S.C. 13101, et seq., available at `http://www.cornell.edu/uscode`.

Resource Conservation and Recovery Act (*Solid Waste Disposal Act) 1984,* as amended, 42 U.S.C 6901, et seq., available at `http://www.cornell.edu/uscode`.

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"Guidance on Establishment and Coordination of Authorized Limits for Release of Hazardous Waste Containing Residual Radioactive Material," U.S. Department of Energy, January 1997.

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00066 WARN: G105 DENSITY NUMBER RE-FORMATTED
00066 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00067 WARN: G105 DENSITY NUMBER RE-FORMATTED
00067 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00068 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00069 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00070 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00081 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00082 WARN: G105 DENSITY NUMBER RE-FORMATTED
00082 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00083 WARN: G105 DENSITY NUMBER RE-FORMATTED
00083 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00114 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00115 WARN: G105 DENSITY NUMBER RE-FORMATTED
00115 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00116 WARN: G105 DENSITY NUMBER RE-FORMATTED
00116 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00117 WARN: G105 DENSITY NUMBER RE-FORMATTED
00117 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00118 WARN: G105 DENSITY NUMBER RE-FORMATTED
00118 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00119 WARN: G105 DENSITY NUMBER RE-FORMATTED
00119 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00120 WARN: G105 DENSITY NUMBER RE-FORMATTED
00120 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00121 WARN: G105 DENSITY NUMBER RE-FORMATTED
00121 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00122 WARN: G105 DENSITY NUMBER RE-FORMATTED
00122 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00122 WARN:  Possible duplicate GM page: 00089
00123 WARN: G105 DENSITY NUMBER RE-FORMATTED
00123 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00124 WARN: G105 DENSITY NUMBER RE-FORMATTED
00124 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00125 WARN: G105 DENSITY NUMBER RE-FORMATTED
00125 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00126 WARN: G105 DENSITY NUMBER RE-FORMATTED
00126 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00127 WARN: G105 DENSITY NUMBER RE-FORMATTED
00127 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00128 WARN: G105 DENSITY NUMBER RE-FORMATTED
00128 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00129 WARN: G105 DENSITY NUMBER RE-FORMATTED
00129 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00129 WARN:  Possible duplicate GM page: 00019
00130 WARN: G105 DENSITY NUMBER RE-FORMATTED
00130 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00131 WARN: G105 DENSITY NUMBER RE-FORMATTED
00131 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00132 WARN: G105 DENSITY NUMBER RE-FORMATTED
00132 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00134 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00135 WARN: G105 DENSITY NUMBER RE-FORMATTED
00135 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00136 WARN: G105 DENSITY NUMBER RE-FORMATTED
00136 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00137 WARN: G105 DENSITY NUMBER RE-FORMATTED
00137 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00138 WARN: G105 DENSITY NUMBER RE-FORMATTED
00138 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00139 WARN: G105 DENSITY NUMBER RE-FORMATTED
00139 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00139 WARN:  Possible duplicate GM page: 00043
00139 WARN:  Possible duplicate GM page: 00057
00140 WARN: G105 DENSITY NUMBER RE-FORMATTED
00140 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00141 WARN: G105 DENSITY NUMBER RE-FORMATTED
00141 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00142 WARN: G105 DENSITY NUMBER RE-FORMATTED
00142 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00143 WARN: G105 DENSITY NUMBER RE-FORMATTED
00143 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00144 WARN: G105 DENSITY NUMBER RE-FORMATTED
00144 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00145 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00146 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00151 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00170 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00171 WARN: G105 DENSITY NUMBER RE-FORMATTED
00171 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00172 WARN: G105 DENSITY NUMBER RE-FORMATTED
00172 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00172 WARN:  Possible duplicate GM page: 00126
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00173 WARN: G105 DENSITY NUMBER RE-FORMATTED
00173 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00174 WARN: G105 DENSITY NUMBER RE-FORMATTED
00174 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00175 WARN: G105 DENSITY NUMBER RE-FORMATTED
00175 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00176 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00178 WARN: G105 DENSITY NUMBER RE-FORMATTED
00178 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00179 WARN: G105 DENSITY NUMBER RE-FORMATTED
00179 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00179 WARN:  Possible duplicate GM page: 00157
00180 WARN: G105 DENSITY NUMBER RE-FORMATTED
00180 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00181 WARN: G105 DENSITY NUMBER RE-FORMATTED
00181 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00182 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00197 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00198 WARN: G105 DENSITY NUMBER RE-FORMATTED
00198 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00199 WARN: G105 DENSITY NUMBER RE-FORMATTED
00199 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00199 WARN:  Possible duplicate GM page: 00056
00200 WARN: G105 DENSITY NUMBER RE-FORMATTED
00200 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00201 WARN: G105 DENSITY NUMBER RE-FORMATTED
00201 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00202 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00202 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00203 WARN: G105 DENSITY NUMBER RE-FORMATTED
00203 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00204 WARN: G105 DENSITY NUMBER RE-FORMATTED
00204 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00204 WARN:  Possible duplicate GM page: 00093
00205 WARN: G105 DENSITY NUMBER RE-FORMATTED
00205 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00205 WARN:  Possible duplicate GM page: 00195
00206 WARN: G105 DENSITY NUMBER RE-FORMATTED
00206 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00207 WARN: G105 DENSITY NUMBER RE-FORMATTED
00207 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00208 WARN: G105 DENSITY NUMBER RE-FORMATTED
00208 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00209 WARN: G105 DENSITY NUMBER RE-FORMATTED
00209 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00210 WARN: G105 DENSITY NUMBER RE-FORMATTED
00210 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00211 WARN: G105 DENSITY NUMBER RE-FORMATTED
00211 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00212 WARN: G105 DENSITY NUMBER RE-FORMATTED
00212 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00212 WARN:  Possible duplicate GM page: 00044
00212 WARN:  Possible duplicate GM page: 00048
00212 WARN:  Possible duplicate GM page: 00050
00212 WARN:  Possible duplicate GM page: 00052
00212 WARN:  Possible duplicate GM page: 00059
00213 WARN: G105 DENSITY NUMBER RE-FORMATTED
00213 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00214 WARN: G105 DENSITY NUMBER RE-FORMATTED
00214 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00214 WARN:  Possible duplicate GM page: 00045
00215 WARN: G105 DENSITY NUMBER RE-FORMATTED
00215 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00216 WARN: G105 DENSITY NUMBER RE-FORMATTED
00216 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00216 WARN:  Possible duplicate GM page: 00045
00216 WARN:  Possible duplicate GM page: 00214
00217 WARN: G105 DENSITY NUMBER RE-FORMATTED
00217 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00218 WARN: G105 DENSITY NUMBER RE-FORMATTED
00218 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00219 WARN: G105 DENSITY NUMBER RE-FORMATTED
00219 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00220 WARN: G105 DENSITY NUMBER RE-FORMATTED
00220 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00221 WARN: G105 DENSITY NUMBER RE-FORMATTED
00221 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00221 WARN:  Possible duplicate GM page: 00044
00221 WARN:  Possible duplicate GM page: 00048
00221 WARN:  Possible duplicate GM page: 00050
00221 WARN:  Possible duplicate GM page: 00052
00221 WARN:  Possible duplicate GM page: 00059
00221 WARN:  Possible duplicate GM page: 00212
00222 WARN: G105 DENSITY NUMBER RE-FORMATTED
00222 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00222 WARN:  Possible duplicate GM page: 00093
00222 WARN:  Possible duplicate GM page: 00204
00223 WARN: G105 DENSITY NUMBER RE-FORMATTED
00223 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00224 WARN: G105 DENSITY NUMBER RE-FORMATTED
00224 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00224 WARN:  Possible duplicate GM page: 00195
00224 WARN:  Possible duplicate GM page: 00205
00225 WARN: G105 DENSITY NUMBER RE-FORMATTED
00225 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00226 WARN: G105 DENSITY NUMBER RE-FORMATTED
00226 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00226 WARN:  Possible duplicate GM page: 00209
00227 WARN: G105 DENSITY NUMBER RE-FORMATTED
00227 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00227 WARN:  Possible duplicate GM page: 00056
00227 WARN:  Possible duplicate GM page: 00199
00228 WARN: G105 DENSITY NUMBER RE-FORMATTED
00228 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00228 WARN:  Possible duplicate GM page: 00093
00228 WARN:  Possible duplicate GM page: 00204
00228 WARN:  Possible duplicate GM page: 00222
00229 WARN: G105 DENSITY NUMBER RE-FORMATTED
00229 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00230 WARN: G105 DENSITY NUMBER RE-FORMATTED
00230 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00231 WARN: G105 DENSITY NUMBER RE-FORMATTED
00231 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00232 WARN: G105 DENSITY NUMBER RE-FORMATTED
00232 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00233 WARN: G105 DENSITY NUMBER RE-FORMATTED
00233 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00234 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00235 WARN: G105 DENSITY NUMBER RE-FORMATTED
00235 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00236 WARN: G105 DENSITY NUMBER RE-FORMATTED
00236 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00237 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00238 WARN: G105 DENSITY NUMBER RE-FORMATTED
00238 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00239 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00240 WARN: G105 DENSITY NUMBER RE-FORMATTED
00240 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00241 WARN: G105 DENSITY NUMBER RE-FORMATTED
00241 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00242 WARN: G105 DENSITY NUMBER RE-FORMATTED
00242 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00242 WARN:  Possible duplicate GM page: 00127
00243 WARN: G105 DENSITY NUMBER RE-FORMATTED
00243 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00244 WARN: G105 DENSITY NUMBER RE-FORMATTED
00244 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00245 WARN: G105 DENSITY NUMBER RE-FORMATTED
00245 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00246 WARN: G105 DENSITY NUMBER RE-FORMATTED
00246 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00247 WARN: G105 DENSITY NUMBER RE-FORMATTED
00247 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00248 WARN: G105 DENSITY NUMBER RE-FORMATTED
00248 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00248 WARN:  Possible duplicate GM page: 00093
00248 WARN:  Possible duplicate GM page: 00204
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00248 WARN:  Possible duplicate GM page: 00222
00248 WARN:  Possible duplicate GM page: 00228
00249 WARN: G105 DENSITY NUMBER RE-FORMATTED
00249 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00250 WARN: G105 DENSITY NUMBER RE-FORMATTED
00250 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00251 WARN: G105 DENSITY NUMBER RE-FORMATTED
00251 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00251 WARN:  Possible duplicate GM page: 00093
00251 WARN:  Possible duplicate GM page: 00204
00251 WARN:  Possible duplicate GM page: 00222
00251 WARN:  Possible duplicate GM page: 00228
00251 WARN:  Possible duplicate GM page: 00248
00252 WARN: G105 DENSITY NUMBER RE-FORMATTED
00252 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00252 WARN:  Possible duplicate GM page: 00093
00252 WARN:  Possible duplicate GM page: 00204
00252 WARN:  Possible duplicate GM page: 00222
00252 WARN:  Possible duplicate GM page: 00228
00252 WARN:  Possible duplicate GM page: 00248
00252 WARN:  Possible duplicate GM page: 00251
00253 WARN: G105 DENSITY NUMBER RE-FORMATTED
00253 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00254 WARN: G105 DENSITY NUMBER RE-FORMATTED
00254 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00254 WARN:  Possible duplicate GM page: 00045
00254 WARN:  Possible duplicate GM page: 00214
00254 WARN:  Possible duplicate GM page: 00216
00255 WARN: G105 DENSITY NUMBER RE-FORMATTED
00255 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00256 WARN: G105 DENSITY NUMBER RE-FORMATTED
00256 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00257 WARN: G105 DENSITY NUMBER RE-FORMATTED
00257 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00258 WARN: G105 DENSITY NUMBER RE-FORMATTED
00258 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00259 WARN: G105 DENSITY NUMBER RE-FORMATTED
00259 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00260 WARN: G105 DENSITY NUMBER RE-FORMATTED
00260 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00261 WARN: G105 DENSITY NUMBER RE-FORMATTED
00261 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00261 WARN:  Possible duplicate GM page: 00237
00262 WARN: G105 DENSITY NUMBER RE-FORMATTED
00262 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00263 WARN: G105 DENSITY NUMBER RE-FORMATTED
00263 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00264 WARN: G105 DENSITY NUMBER RE-FORMATTED
00264 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00265 WARN: G105 DENSITY NUMBER RE-FORMATTED
00265 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00266 WARN: G105 DENSITY NUMBER RE-FORMATTED
00266 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00267 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00268 WARN: G105 DENSITY NUMBER RE-FORMATTED
00268 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00269 WARN: G105 DENSITY NUMBER RE-FORMATTED
00269 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00270 WARN: G105 DENSITY NUMBER RE-FORMATTED
00270 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00271 WARN: G105 DENSITY NUMBER RE-FORMATTED
00271 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00272 WARN: G105 DENSITY NUMBER RE-FORMATTED
00272 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00273 WARN: G105 DENSITY NUMBER RE-FORMATTED
00273 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00273 G109 BAD FORM CODE = B315
00274 WARN: G105 DENSITY NUMBER RE-FORMATTED
00274 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00275 WARN: G105 DENSITY NUMBER RE-FORMATTED
00275 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00276 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00279 WARN: G105 DENSITY NUMBER RE-FORMATTED
00279 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00280 WARN: G105 DENSITY NUMBER RE-FORMATTED
00280 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00281 WARN: G105 DENSITY NUMBER RE-FORMATTED
00281 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00282 WARN: G105 DENSITY NUMBER RE-FORMATTED
00282 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00283 WARN: G105 DENSITY NUMBER RE-FORMATTED
00283 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00284 WARN: G105 DENSITY NUMBER RE-FORMATTED
00284 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00285 WARN: G105 DENSITY NUMBER RE-FORMATTED
00285 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00286 WARN: G105 DENSITY NUMBER RE-FORMATTED
00286 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00287 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00288 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00290 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00291 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00293 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00298 WARN: G105 DENSITY NUMBER RE-FORMATTED
00298 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00299 WARN: G105 DENSITY NUMBER RE-FORMATTED
00299 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00300 WARN: G105 DENSITY NUMBER RE-FORMATTED
00300 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00301 WARN: G105 DENSITY NUMBER RE-FORMATTED
00301 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00302 WARN: G105 DENSITY NUMBER RE-FORMATTED
00302 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00303 WARN: G105 DENSITY NUMBER RE-FORMATTED
00303 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00304 WARN: G105 DENSITY NUMBER RE-FORMATTED
00304 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00305 WARN: G105 DENSITY NUMBER RE-FORMATTED
00305 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00306 WARN: G105 DENSITY NUMBER RE-FORMATTED
00306 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00307 WARN: G105 DENSITY NUMBER RE-FORMATTED
00307 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00308 WARN: G105 DENSITY NUMBER RE-FORMATTED
00308 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00309 WARN: G105 DENSITY NUMBER RE-FORMATTED
00309 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00310 WARN: G105 DENSITY NUMBER RE-FORMATTED
00310 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00311 WARN: G105 DENSITY NUMBER RE-FORMATTED
00311 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00312 WARN: G105 DENSITY NUMBER RE-FORMATTED
00312 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00313 WARN: G105 DENSITY NUMBER RE-FORMATTED
00313 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00314 WARN: G105 DENSITY NUMBER RE-FORMATTED
00314 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00315 WARN: G105 DENSITY NUMBER RE-FORMATTED
00315 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00316 WARN: G105 DENSITY NUMBER RE-FORMATTED
00316 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00317 WARN: G105 DENSITY NUMBER RE-FORMATTED
00317 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00318 WARN: G105 DENSITY NUMBER RE-FORMATTED
00318 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00319 WARN: G105 DENSITY NUMBER RE-FORMATTED
00319 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00319 WARN:  Possible duplicate GM page: 00195
00319 WARN:  Possible duplicate GM page: 00205
00319 WARN:  Possible duplicate GM page: 00224
00320 WARN: G105 DENSITY NUMBER RE-FORMATTED
00320 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00321 WARN: G105 DENSITY NUMBER RE-FORMATTED
00321 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00322 WARN: G105 DENSITY NUMBER RE-FORMATTED
00322 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00323 WARN: G105 DENSITY NUMBER RE-FORMATTED
00323 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00324 WARN: G105 DENSITY NUMBER RE-FORMATTED
00324 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00325 WARN: G105 DENSITY NUMBER RE-FORMATTED
00325 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00325 WARN:  Possible duplicate GM page: 00209
00325 WARN:  Possible duplicate GM page: 00226
00326 WARN: G105 DENSITY NUMBER RE-FORMATTED
00326 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00327 WARN: G105 DENSITY NUMBER RE-FORMATTED
00327 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00328 WARN: G105 DENSITY NUMBER RE-FORMATTED
00328 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00329 WARN: G105 DENSITY NUMBER RE-FORMATTED
00329 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00329 WARN:  Possible duplicate GM page: 00055
00330 WARN: G105 DENSITY NUMBER RE-FORMATTED
00330 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00331 WARN: G105 DENSITY NUMBER RE-FORMATTED
00331 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00332 WARN: G105 DENSITY NUMBER RE-FORMATTED
00332 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00332 WARN:  Possible duplicate GM page: 00044
00332 WARN:  Possible duplicate GM page: 00048
00332 WARN:  Possible duplicate GM page: 00050
00332 WARN:  Possible duplicate GM page: 00052
00332 WARN:  Possible duplicate GM page: 00059
00332 WARN:  Possible duplicate GM page: 00212
00332 WARN:  Possible duplicate GM page: 00221
00333 WARN: G105 DENSITY NUMBER RE-FORMATTED
00333 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00334 WARN: G105 DENSITY NUMBER RE-FORMATTED
00334 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00335 WARN: G105 DENSITY NUMBER RE-FORMATTED
00335 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00336 WARN: G105 DENSITY NUMBER RE-FORMATTED
00336 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00337 WARN: G105 DENSITY NUMBER RE-FORMATTED
00337 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00338 WARN: G105 DENSITY NUMBER RE-FORMATTED
00338 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00339 WARN: G105 DENSITY NUMBER RE-FORMATTED
00339 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00340 WARN: G105 DENSITY NUMBER RE-FORMATTED
00340 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00341 WARN: G105 DENSITY NUMBER RE-FORMATTED
00341 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00342 WARN: G105 DENSITY NUMBER RE-FORMATTED
00342 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00343 WARN: G105 DENSITY NUMBER RE-FORMATTED
00343 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00344 WARN: G105 DENSITY NUMBER RE-FORMATTED
00344 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00344 WARN:  Possible duplicate GM page: 00005
00345 WARN: G105 DENSITY NUMBER RE-FORMATTED
00345 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00345 WARN:  Possible duplicate GM page: 00055
00345 WARN:  Possible duplicate GM page: 00329
00346 WARN: G105 DENSITY NUMBER RE-FORMATTED
00346 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00347 WARN: G105 DENSITY NUMBER RE-FORMATTED
00347 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00348 WARN: G105 DENSITY NUMBER RE-FORMATTED
00348 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00349 WARN: G105 DENSITY NUMBER RE-FORMATTED
00349 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00350 WARN: G105 DENSITY NUMBER RE-FORMATTED
00350 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00351 WARN: G105 DENSITY NUMBER RE-FORMATTED
00351 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00351 WARN:  Possible duplicate GM page: 00101
00352 WARN: G105 DENSITY NUMBER RE-FORMATTED
00352 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00353 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00353 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00354 WARN: G105 DENSITY NUMBER RE-FORMATTED
00354 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00355 WARN: G105 DENSITY NUMBER RE-FORMATTED
00355 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00356 WARN: G105 DENSITY NUMBER RE-FORMATTED
00356 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00357 WARN: G105 DENSITY NUMBER RE-FORMATTED
00357 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00358 WARN: G105 DENSITY NUMBER RE-FORMATTED
00358 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00359 WARN: G105 DENSITY NUMBER RE-FORMATTED
00359 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00360 WARN: G105 DENSITY NUMBER RE-FORMATTED
00360 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00361 WARN: G105 DENSITY NUMBER RE-FORMATTED
00361 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00362 WARN: G105 DENSITY NUMBER RE-FORMATTED
00362 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00363 WARN: G105 DENSITY NUMBER RE-FORMATTED
00363 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00364 WARN: G105 DENSITY NUMBER RE-FORMATTED
00364 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00365 WARN: G105 DENSITY NUMBER RE-FORMATTED
00365 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00366 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00367 WARN: G105 DENSITY NUMBER RE-FORMATTED
00367 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00368 WARN: G105 DENSITY NUMBER RE-FORMATTED
00368 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00369 WARN: G105 DENSITY NUMBER RE-FORMATTED
00369 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00369 WARN:  Possible duplicate GM page: 00017
00370 WARN: G105 DENSITY NUMBER RE-FORMATTED
00370 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00371 WARN: G105 DENSITY NUMBER RE-FORMATTED
00371 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00372 WARN: G105 DENSITY NUMBER RE-FORMATTED
00372 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00373 WARN: G105 DENSITY NUMBER RE-FORMATTED
00373 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00374 WARN: G105 DENSITY NUMBER RE-FORMATTED
00374 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00375 WARN: G105 DENSITY NUMBER RE-FORMATTED
00375 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00376 WARN: G105 DENSITY NUMBER RE-FORMATTED
00376 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00377 WARN: G105 DENSITY NUMBER RE-FORMATTED
00377 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00377 WARN:  Possible duplicate GM page: 00365
00378 WARN: G105 DENSITY NUMBER RE-FORMATTED
00378 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00379 WARN: G105 DENSITY NUMBER RE-FORMATTED
00379 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00380 WARN: G105 DENSITY NUMBER RE-FORMATTED
00380 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00380 WARN:  Possible duplicate GM page: 00340
00381 WARN: G105 DENSITY NUMBER RE-FORMATTED
00381 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00382 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00382 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00383 WARN: G105 DENSITY NUMBER RE-FORMATTED
00383 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00383 WARN:  Possible duplicate GM page: 00017
00383 WARN:  Possible duplicate GM page: 00369
00384 WARN: G105 DENSITY NUMBER RE-FORMATTED
00384 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00385 WARN: G105 DENSITY NUMBER RE-FORMATTED
00385 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00386 WARN: G105 DENSITY NUMBER RE-FORMATTED
00386 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00387 WARN: G105 DENSITY NUMBER RE-FORMATTED
00387 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00387 WARN:  Possible duplicate GM page: 00045
00387 WARN:  Possible duplicate GM page: 00214
00387 WARN:  Possible duplicate GM page: 00216
00387 WARN:  Possible duplicate GM page: 00254
00388 WARN: G105 DENSITY NUMBER RE-FORMATTED
00388 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00389 WARN: G105 DENSITY NUMBER RE-FORMATTED
00389 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00390 WARN: G105 DENSITY NUMBER RE-FORMATTED
00390 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00390 WARN:  Possible duplicate GM page: 00209
00390 WARN:  Possible duplicate GM page: 00226
00390 WARN:  Possible duplicate GM page: 00325
00391 WARN: G105 DENSITY NUMBER RE-FORMATTED
00391 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00391 WARN:  Possible duplicate GM page: 00044
00391 WARN:  Possible duplicate GM page: 00048
00391 WARN:  Possible duplicate GM page: 00050
00391 WARN:  Possible duplicate GM page: 00052
00391 WARN:  Possible duplicate GM page: 00059
00391 WARN:  Possible duplicate GM page: 00212
00391 WARN:  Possible duplicate GM page: 00221
00391 WARN:  Possible duplicate GM page: 00332
00392 WARN: G105 DENSITY NUMBER RE-FORMATTED
00392 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00393 WARN: G105 DENSITY NUMBER RE-FORMATTED
00393 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00394 WARN: G105 DENSITY NUMBER RE-FORMATTED
00394 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00395 WARN: G105 DENSITY NUMBER RE-FORMATTED
00395 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00396 WARN: G105 DENSITY NUMBER RE-FORMATTED
00396 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00397 WARN: G105 DENSITY NUMBER RE-FORMATTED
00397 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00398 WARN: G105 DENSITY NUMBER RE-FORMATTED
00398 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00399 WARN: G105 DENSITY NUMBER RE-FORMATTED
00399 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00400 WARN: G105 DENSITY NUMBER RE-FORMATTED
00400 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00401 WARN: G105 DENSITY NUMBER RE-FORMATTED
00401 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00402 WARN: G105 DENSITY NUMBER RE-FORMATTED
00402 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00403 WARN: G105 DENSITY NUMBER RE-FORMATTED
00403 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00404 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00404 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00405 WARN: G105 DENSITY NUMBER RE-FORMATTED
00405 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00406 WARN: G105 DENSITY NUMBER RE-FORMATTED
00406 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00407 WARN: G105 DENSITY NUMBER RE-FORMATTED
00407 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00408 WARN: G105 DENSITY NUMBER RE-FORMATTED
00408 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00409 WARN: G105 DENSITY NUMBER RE-FORMATTED
00409 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00410 WARN: G105 DENSITY NUMBER RE-FORMATTED
00410 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00411 WARN: G105 DENSITY NUMBER RE-FORMATTED
00411 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00412 WARN: G105 DENSITY NUMBER RE-FORMATTED
00412 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00413 WARN: G105 DENSITY NUMBER RE-FORMATTED
00413 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00414 WARN: G105 DENSITY NUMBER RE-FORMATTED
00414 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00415 WARN: G105 DENSITY NUMBER RE-FORMATTED
00415 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00416 WARN: G105 DENSITY NUMBER RE-FORMATTED
00416 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00417 WARN: G105 DENSITY NUMBER RE-FORMATTED
00417 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00418 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00419 WARN: G105 DENSITY NUMBER RE-FORMATTED
00419 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00420 WARN: G105 DENSITY NUMBER RE-FORMATTED
00420 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00421 WARN: G105 DENSITY NUMBER RE-FORMATTED
00421 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00422 WARN: G105 DENSITY NUMBER RE-FORMATTED
00422 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00423 WARN: G105 DENSITY NUMBER RE-FORMATTED
00423 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00424 WARN: G105 DENSITY NUMBER RE-FORMATTED
00424 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00425 WARN: G105 DENSITY NUMBER RE-FORMATTED
00425 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00426 WARN: G105 DENSITY NUMBER RE-FORMATTED
00426 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00427 WARN: G105 DENSITY NUMBER RE-FORMATTED
00427 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00427 WARN:  Possible duplicate GM page: 00363
00428 WARN: G105 DENSITY NUMBER RE-FORMATTED
00428 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00429 WARN: G105 DENSITY NUMBER RE-FORMATTED
00429 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00430 WARN: G105 DENSITY NUMBER RE-FORMATTED
00430 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00431 WARN: G105 DENSITY NUMBER RE-FORMATTED
00431 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00432 WARN: G105 DENSITY NUMBER RE-FORMATTED
00432 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00433 WARN: G105 DENSITY NUMBER RE-FORMATTED
00433 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00434 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00434 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00435 WARN: G105 DENSITY NUMBER RE-FORMATTED
00435 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00436 WARN: G105 DENSITY NUMBER RE-FORMATTED
00436 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00436 WARN:  Possible duplicate GM page: 00044
00436 WARN:  Possible duplicate GM page: 00048
00436 WARN:  Possible duplicate GM page: 00050
00436 WARN:  Possible duplicate GM page: 00052
00436 WARN:  Possible duplicate GM page: 00059
00436 WARN:  Possible duplicate GM page: 00212
00436 WARN:  Possible duplicate GM page: 00221
00436 WARN:  Possible duplicate GM page: 00332
00436 WARN:  Possible duplicate GM page: 00391
00437 WARN: G105 DENSITY NUMBER RE-FORMATTED
00437 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00438 WARN: G105 DENSITY NUMBER RE-FORMATTED
00438 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00439 WARN: G105 DENSITY NUMBER RE-FORMATTED
00439 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00440 WARN: G105 DENSITY NUMBER RE-FORMATTED
00440 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00441 WARN: G105 DENSITY NUMBER RE-FORMATTED
00441 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00441 WARN:  Possible duplicate GM page: 00045
00441 WARN:  Possible duplicate GM page: 00214
00441 WARN:  Possible duplicate GM page: 00216
00441 WARN:  Possible duplicate GM page: 00254
00441 WARN:  Possible duplicate GM page: 00387
00442 WARN: G105 DENSITY NUMBER RE-FORMATTED
00442 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00443 WARN: G105 DENSITY NUMBER RE-FORMATTED
00443 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00444 WARN: G105 DENSITY NUMBER RE-FORMATTED
00444 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00444 WARN:  Possible duplicate GM page: 00003
00445 WARN: G105 DENSITY NUMBER RE-FORMATTED
00445 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00446 WARN: G105 DENSITY NUMBER RE-FORMATTED
00446 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00447 WARN: G105 DENSITY NUMBER RE-FORMATTED
00447 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00448 WARN: G105 DENSITY NUMBER RE-FORMATTED
00448 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00448 WARN:  Possible duplicate GM page: 00044
00448 WARN:  Possible duplicate GM page: 00048
00448 WARN:  Possible duplicate GM page: 00050
00448 WARN:  Possible duplicate GM page: 00052
00448 WARN:  Possible duplicate GM page: 00059
00448 WARN:  Possible duplicate GM page: 00212
00448 WARN:  Possible duplicate GM page: 00221
00448 WARN:  Possible duplicate GM page: 00332
00448 WARN:  Possible duplicate GM page: 00391
00448 WARN:  Possible duplicate GM page: 00436
00449 WARN: G105 DENSITY NUMBER RE-FORMATTED
00449 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00450 WARN: G105 DENSITY NUMBER RE-FORMATTED
00450 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00450 WARN:  Possible duplicate GM page: 00044
00450 WARN:  Possible duplicate GM page: 00048
00450 WARN:  Possible duplicate GM page: 00050
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00450 WARN:  Possible duplicate GM page: 00052
00450 WARN:  Possible duplicate GM page: 00059
00450 WARN:  Possible duplicate GM page: 00212
00450 WARN:  Possible duplicate GM page: 00221
00450 WARN:  Possible duplicate GM page: 00332
00450 WARN:  Possible duplicate GM page: 00391
00450 WARN:  Possible duplicate GM page: 00436
00450 WARN:  Possible duplicate GM page: 00448
00451 WARN: G105 DENSITY NUMBER RE-FORMATTED
00451 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00452 WARN: G105 DENSITY NUMBER RE-FORMATTED
00452 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00453 WARN: G105 DENSITY NUMBER RE-FORMATTED
00453 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00454 WARN: G105 DENSITY NUMBER RE-FORMATTED
00454 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00455 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00456 WARN: G105 DENSITY NUMBER RE-FORMATTED
00456 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00457 WARN: G105 DENSITY NUMBER RE-FORMATTED
00457 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00458 WARN: G105 DENSITY NUMBER RE-FORMATTED
00458 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00459 WARN: G105 DENSITY NUMBER RE-FORMATTED
00459 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00460 WARN: G105 DENSITY NUMBER RE-FORMATTED
00460 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00461 WARN: G105 DENSITY NUMBER RE-FORMATTED
00461 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00462 WARN: G105 DENSITY NUMBER RE-FORMATTED
00462 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00463 WARN: G105 DENSITY NUMBER RE-FORMATTED
00463 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00463 WARN:  Possible duplicate GM page: 00003
00463 WARN:  Possible duplicate GM page: 00444
00464 WARN: G105 DENSITY NUMBER RE-FORMATTED
00464 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00464 WARN:  Possible duplicate GM page: 00093
00464 WARN:  Possible duplicate GM page: 00204
00464 WARN:  Possible duplicate GM page: 00222
00464 WARN:  Possible duplicate GM page: 00228
00464 WARN:  Possible duplicate GM page: 00248
00464 WARN:  Possible duplicate GM page: 00251
00464 WARN:  Possible duplicate GM page: 00252
00465 WARN: G105 DENSITY NUMBER RE-FORMATTED
00465 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00466 WARN: G105 DENSITY NUMBER RE-FORMATTED
00466 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00467 WARN: G105 DENSITY NUMBER RE-FORMATTED
00467 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00468 WARN: G105 DENSITY NUMBER RE-FORMATTED
00468 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00469 WARN: G105 DENSITY NUMBER RE-FORMATTED
00469 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00470 WARN: G105 DENSITY NUMBER RE-FORMATTED
00470 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00471 WARN: G105 DENSITY NUMBER RE-FORMATTED
00471 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00472 WARN: G105 DENSITY NUMBER RE-FORMATTED
00472 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00472 WARN:  Possible duplicate GM page: 00031
00473 WARN: G105 DENSITY NUMBER RE-FORMATTED
00473 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00474 WARN: G105 DENSITY NUMBER RE-FORMATTED
00474 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00475 WARN: G105 DENSITY NUMBER RE-FORMATTED
00475 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00476 WARN: G105 DENSITY NUMBER RE-FORMATTED
00476 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00477 WARN: G105 DENSITY NUMBER RE-FORMATTED
00477 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00478 WARN: G105 DENSITY NUMBER RE-FORMATTED
00478 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00479 WARN: G105 DENSITY NUMBER RE-FORMATTED
00479 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00480 WARN: G105 DENSITY NUMBER RE-FORMATTED
00480 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00480 WARN:  Possible duplicate GM page: 00104
00481 WARN: G105 DENSITY NUMBER RE-FORMATTED
00481 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00482 WARN: G105 DENSITY NUMBER RE-FORMATTED
00482 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00483 WARN: G105 DENSITY NUMBER RE-FORMATTED
00483 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00484 WARN: G105 DENSITY NUMBER RE-FORMATTED
00484 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00485 WARN: G105 DENSITY NUMBER RE-FORMATTED
00485 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00486 WARN: G105 DENSITY NUMBER RE-FORMATTED
00486 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00487 WARN: G105 DENSITY NUMBER RE-FORMATTED
00487 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00488 WARN: G105 DENSITY NUMBER RE-FORMATTED
00488 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00488 WARN:  Possible duplicate GM page: 00101
00488 WARN:  Possible duplicate GM page: 00351
00489 WARN: G105 DENSITY NUMBER RE-FORMATTED
00489 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00490 WARN: G105 DENSITY NUMBER RE-FORMATTED
00490 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00490 WARN:  Possible duplicate GM page: 00195
00490 WARN:  Possible duplicate GM page: 00205
00490 WARN:  Possible duplicate GM page: 00224
00490 WARN:  Possible duplicate GM page: 00319
00491 WARN: G105 DENSITY NUMBER RE-FORMATTED
00491 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00492 WARN: G105 DENSITY NUMBER RE-FORMATTED
00492 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00492 WARN:  Possible duplicate GM page: 00402
00493 WARN: G105 DENSITY NUMBER RE-FORMATTED
00493 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00494 WARN: G105 DENSITY NUMBER RE-FORMATTED
00494 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00495 WARN: G105 DENSITY NUMBER RE-FORMATTED
00495 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00496 WARN: G105 DENSITY NUMBER RE-FORMATTED
00496 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00497 WARN: G105 DENSITY NUMBER RE-FORMATTED
00497 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00498 WARN: G105 DENSITY NUMBER RE-FORMATTED
00498 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00499 WARN: G105 DENSITY NUMBER RE-FORMATTED
00499 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00499 WARN:  Possible duplicate GM page: 00378
00500 WARN: G105 DENSITY NUMBER RE-FORMATTED
00500 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00500 WARN:  Possible duplicate GM page: 00477
00501 WARN: G105 DENSITY NUMBER RE-FORMATTED
00501 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00502 WARN: G105 DENSITY NUMBER RE-FORMATTED
00502 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00503 WARN: G105 DENSITY NUMBER RE-FORMATTED
00503 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00503 WARN:  Possible duplicate GM page: 00486
00504 WARN: G105 DENSITY NUMBER RE-FORMATTED
00504 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00505 WARN: G105 DENSITY NUMBER RE-FORMATTED
00505 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00506 WARN: G105 DENSITY NUMBER RE-FORMATTED
00506 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00507 WARN: G105 DENSITY NUMBER RE-FORMATTED
00507 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00508 WARN: G105 DENSITY NUMBER RE-FORMATTED
00508 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00509 WARN: G105 DENSITY NUMBER RE-FORMATTED
00509 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00509 CHECK:        384 TONS GENERATED
00510 WARN: G105 DENSITY NUMBER RE-FORMATTED
00510 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00511 WARN: G105 DENSITY NUMBER RE-FORMATTED
00511 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00512 WARN: G105 DENSITY NUMBER RE-FORMATTED
00512 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00513 WARN: G105 DENSITY NUMBER RE-FORMATTED
00513 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00514 WARN: G105 DENSITY NUMBER RE-FORMATTED
00514 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00515 WARN: G105 DENSITY NUMBER RE-FORMATTED
00515 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00515 WARN:  Possible duplicate GM page: 00220
00516 WARN: G105 DENSITY NUMBER RE-FORMATTED
00516 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00517 WARN: G105 DENSITY NUMBER RE-FORMATTED
00517 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00518 WARN: G105 DENSITY NUMBER RE-FORMATTED
00518 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00519 WARN: G105 DENSITY NUMBER RE-FORMATTED
00519 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00519 CHECK:       3083 TONS GENERATED
00520 WARN: G105 DENSITY NUMBER RE-FORMATTED
00520 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00521 WARN: G105 DENSITY NUMBER RE-FORMATTED
00521 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00522 WARN: G105 DENSITY NUMBER RE-FORMATTED
00522 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00523 WARN: G105 DENSITY NUMBER RE-FORMATTED
00523 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00524 WARN: G105 DENSITY NUMBER RE-FORMATTED
00524 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00525 WARN: G105 DENSITY NUMBER RE-FORMATTED
00525 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00526 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00526 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00527 WARN: G105 DENSITY NUMBER RE-FORMATTED
00527 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00528 WARN: G105 DENSITY NUMBER RE-FORMATTED
00528 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00529 WARN: G105 DENSITY NUMBER RE-FORMATTED
00529 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00530 WARN: G105 DENSITY NUMBER RE-FORMATTED
00530 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00531 WARN: G105 DENSITY NUMBER RE-FORMATTED
00531 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00532 WARN: G105 DENSITY NUMBER RE-FORMATTED
00532 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00533 WARN: G105 DENSITY NUMBER RE-FORMATTED
00533 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00534 WARN: G105 DENSITY NUMBER RE-FORMATTED
00534 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00534 WARN:  Possible duplicate GM page: 00056
00534 WARN:  Possible duplicate GM page: 00199
00534 WARN:  Possible duplicate GM page: 00227
00535 WARN: G105 DENSITY NUMBER RE-FORMATTED
00535 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00536 WARN: G105 DENSITY NUMBER RE-FORMATTED
00536 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00537 WARN: G105 DENSITY NUMBER RE-FORMATTED
00537 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00538 WARN: G105 DENSITY NUMBER RE-FORMATTED
00538 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00539 WARN: G105 DENSITY NUMBER RE-FORMATTED
00539 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00540 WARN: G105 DENSITY NUMBER RE-FORMATTED
00540 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00541 WARN: G105 DENSITY NUMBER RE-FORMATTED
00541 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00542 WARN: G105 DENSITY NUMBER RE-FORMATTED
00542 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00543 WARN: G105 DENSITY NUMBER RE-FORMATTED
00543 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00544 WARN: G105 DENSITY NUMBER RE-FORMATTED
00544 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00545 WARN: G105 DENSITY NUMBER RE-FORMATTED
00545 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00546 WARN: G105 DENSITY NUMBER RE-FORMATTED
00546 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00547 WARN: G105 DENSITY NUMBER RE-FORMATTED
00547 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00548 WARN: G105 DENSITY NUMBER RE-FORMATTED
00548 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00549 WARN: G105 DENSITY NUMBER RE-FORMATTED
00549 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00549 G109 BAD FORM CODE = B206
00550 WARN: G105 DENSITY NUMBER RE-FORMATTED
00550 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00551 WARN: G105 DENSITY NUMBER RE-FORMATTED
00551 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00551 WARN:  Possible duplicate GM page: 00101
00551 WARN:  Possible duplicate GM page: 00351
00551 WARN:  Possible duplicate GM page: 00488
00552 WARN: G105 DENSITY NUMBER RE-FORMATTED
00552 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00553 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00553 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00553 WARN:  Possible duplicate GM page: 00055
00553 WARN:  Possible duplicate GM page: 00329
00553 WARN:  Possible duplicate GM page: 00345
00554 WARN: G105 DENSITY NUMBER RE-FORMATTED
00554 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00555 WARN: G105 DENSITY NUMBER RE-FORMATTED
00555 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00556 WARN: G105 DENSITY NUMBER RE-FORMATTED
00556 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00557 WARN: G105 DENSITY NUMBER RE-FORMATTED
00557 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00557 WARN:  Possible duplicate GM page: 00031
00557 WARN:  Possible duplicate GM page: 00472
00558 WARN: G105 DENSITY NUMBER RE-FORMATTED
00558 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00559 WARN: G105 DENSITY NUMBER RE-FORMATTED
00559 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00559 WARN:  Possible duplicate GM page: 00101
00559 WARN:  Possible duplicate GM page: 00351
00559 WARN:  Possible duplicate GM page: 00488
00559 WARN:  Possible duplicate GM page: 00551
00560 WARN: G105 DENSITY NUMBER RE-FORMATTED
00560 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00561 WARN: G105 DENSITY NUMBER RE-FORMATTED
00561 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00562 WARN: G105 DENSITY NUMBER RE-FORMATTED
00562 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00563 WARN: G105 DENSITY NUMBER RE-FORMATTED
00563 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00564 WARN: G105 DENSITY NUMBER RE-FORMATTED
00564 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00565 WARN: G105 DENSITY NUMBER RE-FORMATTED
00565 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00565 WARN:  Possible duplicate GM page: 00486
00565 WARN:  Possible duplicate GM page: 00503
00566 WARN: G105 DENSITY NUMBER RE-FORMATTED
00566 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00567 WARN: G105 DENSITY NUMBER RE-FORMATTED
00567 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00567 WARN:  Possible duplicate GM page: 00486
00567 WARN:  Possible duplicate GM page: 00503
00567 WARN:  Possible duplicate GM page: 00565
00568 WARN: G105 DENSITY NUMBER RE-FORMATTED
00568 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00568 WARN:  Possible duplicate GM page: 00477
00568 WARN:  Possible duplicate GM page: 00500
00569 WARN: G105 DENSITY NUMBER RE-FORMATTED
00569 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00570 WARN: G105 DENSITY NUMBER RE-FORMATTED
00570 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00571 WARN: G105 DENSITY NUMBER RE-FORMATTED
00571 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00572 WARN: G105 DENSITY NUMBER RE-FORMATTED
00572 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00573 WARN: G105 DENSITY NUMBER RE-FORMATTED
00573 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00573 WARN:  Possible duplicate GM page: 00114
00574 WARN: G105 DENSITY NUMBER RE-FORMATTED
00574 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00574 WARN:  Possible duplicate GM page: 00539
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00575 WARN: G105 DENSITY NUMBER RE-FORMATTED
00575 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00576 WARN: G105 DENSITY NUMBER RE-FORMATTED
00576 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00577 WARN: G105 DENSITY NUMBER RE-FORMATTED
00577 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00578 WARN: G105 DENSITY NUMBER RE-FORMATTED
00578 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00579 WARN: G105 DENSITY NUMBER RE-FORMATTED
00579 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00580 WARN: G105 DENSITY NUMBER RE-FORMATTED
00580 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00581 WARN: G105 DENSITY NUMBER RE-FORMATTED
00581 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00582 WARN: G105 DENSITY NUMBER RE-FORMATTED
00582 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00583 WARN: G105 DENSITY NUMBER RE-FORMATTED
00583 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00583 WARN:  Possible duplicate GM page: 00476
00584 WARN: G105 DENSITY NUMBER RE-FORMATTED
00584 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00585 WARN: G105 DENSITY NUMBER RE-FORMATTED
00585 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00586 WARN: G105 DENSITY NUMBER RE-FORMATTED
00586 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00587 WARN: G105 DENSITY NUMBER RE-FORMATTED
00587 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00588 WARN: G105 DENSITY NUMBER RE-FORMATTED
00588 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00589 WARN: G105 DENSITY NUMBER RE-FORMATTED
00589 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00590 WARN: G105 DENSITY NUMBER RE-FORMATTED
00590 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00591 WARN: G105 DENSITY NUMBER RE-FORMATTED
00591 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00592 WARN: G105 DENSITY NUMBER RE-FORMATTED
00592 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00593 WARN: G105 DENSITY NUMBER RE-FORMATTED
00593 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00593 WARN:  Possible duplicate GM page: 00476
00593 WARN:  Possible duplicate GM page: 00583
00594 WARN: G105 DENSITY NUMBER RE-FORMATTED
00594 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00594 WARN:  Possible duplicate GM page: 00591
00595 WARN: G105 DENSITY NUMBER RE-FORMATTED
00595 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00596 WARN: G105 DENSITY NUMBER RE-FORMATTED
00596 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00597 WARN: G105 DENSITY NUMBER RE-FORMATTED
00597 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00598 WARN: G105 DENSITY NUMBER RE-FORMATTED
00598 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00599 WARN: G105 DENSITY NUMBER RE-FORMATTED
00599 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00600 WARN: G105 DENSITY NUMBER RE-FORMATTED
00600 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00600 WARN:  Possible duplicate GM page: 00018
00601 WARN: G105 DENSITY NUMBER RE-FORMATTED
00601 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00602 WARN: G105 DENSITY NUMBER RE-FORMATTED
00602 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00603 WARN: G105 DENSITY NUMBER RE-FORMATTED
00603 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00604 WARN: G105 DENSITY NUMBER RE-FORMATTED
00604 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00605 WARN: G105 DENSITY NUMBER RE-FORMATTED
00605 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00606 WARN: G105 DENSITY NUMBER RE-FORMATTED
00606 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00607 WARN: G105 DENSITY NUMBER RE-FORMATTED
00607 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00608 WARN: G105 DENSITY NUMBER RE-FORMATTED
00608 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00609 WARN: G105 DENSITY NUMBER RE-FORMATTED
00609 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00610 WARN: G105 DENSITY NUMBER RE-FORMATTED
00610 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00610 WARN:  Possible duplicate GM page: 00093
00610 WARN:  Possible duplicate GM page: 00204
00610 WARN:  Possible duplicate GM page: 00222
00610 WARN:  Possible duplicate GM page: 00228
00610 WARN:  Possible duplicate GM page: 00248
00610 WARN:  Possible duplicate GM page: 00251
00610 WARN:  Possible duplicate GM page: 00252
00610 WARN:  Possible duplicate GM page: 00464
00611 WARN: G105 DENSITY NUMBER RE-FORMATTED
00611 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00612 WARN: G105 DENSITY NUMBER RE-FORMATTED
00612 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00613 WARN: G105 DENSITY NUMBER RE-FORMATTED
00613 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00613 WARN:  Possible duplicate GM page: 00384
00614 WARN: G105 DENSITY NUMBER RE-FORMATTED
00614 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00615 WARN: G105 DENSITY NUMBER RE-FORMATTED
00615 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00615 WARN:  Possible duplicate GM page: 00223
00616 WARN: G105 DENSITY NUMBER RE-FORMATTED
00616 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00617 WARN: G105 DENSITY NUMBER RE-FORMATTED
00617 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00617 WARN:  Possible duplicate GM page: 00234
00618 WARN: G105 DENSITY NUMBER RE-FORMATTED
00618 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00619 WARN: G105 DENSITY NUMBER RE-FORMATTED
00619 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00620 WARN: G105 DENSITY NUMBER RE-FORMATTED
00620 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00621 WARN: G105 DENSITY NUMBER RE-FORMATTED
00621 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00622 WARN: G105 DENSITY NUMBER RE-FORMATTED
00622 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00622 WARN:  Possible duplicate GM page: 00476
00622 WARN:  Possible duplicate GM page: 00583
00622 WARN:  Possible duplicate GM page: 00593
00623 WARN: G105 DENSITY NUMBER RE-FORMATTED
00623 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00624 WARN: G105 DENSITY NUMBER RE-FORMATTED
00624 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00625 WARN: G105 DENSITY NUMBER RE-FORMATTED
00625 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00626 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00626 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00627 WARN: G105 DENSITY NUMBER RE-FORMATTED
00627 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00628 WARN: G105 DENSITY NUMBER RE-FORMATTED
00628 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00629 WARN: G105 DENSITY NUMBER RE-FORMATTED
00629 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00630 WARN: G105 DENSITY NUMBER RE-FORMATTED
00630 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00631 WARN: G105 DENSITY NUMBER RE-FORMATTED
00631 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00632 WARN: G105 DENSITY NUMBER RE-FORMATTED
00632 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00633 WARN: G105 DENSITY NUMBER RE-FORMATTED
00633 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00633 WARN:  Possible duplicate GM page: 00625
00634 WARN: G105 DENSITY NUMBER RE-FORMATTED
00634 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00635 WARN: G105 DENSITY NUMBER RE-FORMATTED
00635 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00636 WARN: G105 DENSITY NUMBER RE-FORMATTED
00636 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00636 WARN:  Possible duplicate GM page: 00511
00637 WARN: G105 DENSITY NUMBER RE-FORMATTED
00637 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00638 WARN: G105 DENSITY NUMBER RE-FORMATTED
00638 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00639 WARN: G105 DENSITY NUMBER RE-FORMATTED
00639 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00640 WARN: G105 DENSITY NUMBER RE-FORMATTED
00640 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00641 WARN: G105 DENSITY NUMBER RE-FORMATTED
00641 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00642 WARN: G105 DENSITY NUMBER RE-FORMATTED
00642 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00643 WARN: G105 DENSITY NUMBER RE-FORMATTED
00643 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00643 WARN:  Possible duplicate GM page: 00486
00643 WARN:  Possible duplicate GM page: 00503
00643 WARN:  Possible duplicate GM page: 00565
00643 WARN:  Possible duplicate GM page: 00567
00644 WARN: G105 DENSITY NUMBER RE-FORMATTED
00644 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00645 WARN: G105 DENSITY NUMBER RE-FORMATTED
00645 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00646 WARN: G105 DENSITY NUMBER RE-FORMATTED
00646 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00647 WARN: G105 DENSITY NUMBER RE-FORMATTED
00647 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00648 WARN: G105 DENSITY NUMBER RE-FORMATTED
00648 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00649 WARN: G105 DENSITY NUMBER RE-FORMATTED
00649 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00650 WARN: G105 DENSITY NUMBER RE-FORMATTED
00650 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00651 WARN: G105 DENSITY NUMBER RE-FORMATTED
00651 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00652 WARN: G105 DENSITY NUMBER RE-FORMATTED
00652 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00653 WARN: G105 DENSITY NUMBER RE-FORMATTED
00653 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00654 WARN: G105 DENSITY NUMBER RE-FORMATTED
00654 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00655 WARN: G105 DENSITY NUMBER RE-FORMATTED
00655 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00656 WARN: G105 DENSITY NUMBER RE-FORMATTED
00656 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00657 WARN: G105 DENSITY NUMBER RE-FORMATTED
00657 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00658 WARN: G105 DENSITY NUMBER RE-FORMATTED
00658 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00659 WARN: G105 DENSITY NUMBER RE-FORMATTED
00659 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00660 WARN: G105 DENSITY NUMBER RE-FORMATTED
00660 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00661 WARN: G105 DENSITY NUMBER RE-FORMATTED
00661 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00662 WARN: G105 DENSITY NUMBER RE-FORMATTED
00662 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00663 WARN: G105 DENSITY NUMBER RE-FORMATTED
00663 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00664 WARN: G105 DENSITY NUMBER RE-FORMATTED
00664 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00665 WARN: G105 DENSITY NUMBER RE-FORMATTED
00665 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00666 WARN: G105 DENSITY NUMBER RE-FORMATTED
00666 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00667 WARN: G105 DENSITY NUMBER RE-FORMATTED
00667 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00668 WARN: G105 DENSITY NUMBER RE-FORMATTED
00668 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00669 WARN: G105 DENSITY NUMBER RE-FORMATTED
00669 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00669 WARN:  Possible duplicate GM page: 00473
00670 WARN: G105 DENSITY NUMBER RE-FORMATTED
00670 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00671 WARN: G105 DENSITY NUMBER RE-FORMATTED
00671 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00672 WARN: G105 DENSITY NUMBER RE-FORMATTED
00672 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00673 WARN: G105 DENSITY NUMBER RE-FORMATTED
00673 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00674 WARN: G105 DENSITY NUMBER RE-FORMATTED
00674 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00675 WARN: G105 DENSITY NUMBER RE-FORMATTED
00675 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00676 WARN: G105 DENSITY NUMBER RE-FORMATTED
00676 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00677 WARN: G105 DENSITY NUMBER RE-FORMATTED
00677 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00678 WARN: G105 DENSITY NUMBER RE-FORMATTED
00678 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00679 WARN: G105 DENSITY NUMBER RE-FORMATTED
00679 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00680 WARN: G105 DENSITY NUMBER RE-FORMATTED
00680 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00681 WARN: G105 DENSITY NUMBER RE-FORMATTED
00681 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00682 WARN: G105 DENSITY NUMBER RE-FORMATTED
00682 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00683 WARN: G105 DENSITY NUMBER RE-FORMATTED
00683 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00683 WARN:  Possible duplicate GM page: 00088
00684 WARN: G105 DENSITY NUMBER RE-FORMATTED
00684 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00685 WARN: G105 DENSITY NUMBER RE-FORMATTED
00685 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00686 WARN: G105 DENSITY NUMBER RE-FORMATTED
00686 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00687 WARN: G105 DENSITY NUMBER RE-FORMATTED
00687 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00688 WARN: G105 DENSITY NUMBER RE-FORMATTED
00688 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00689 WARN: G105 DENSITY NUMBER RE-FORMATTED
00689 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00690 WARN: G105 DENSITY NUMBER RE-FORMATTED
00690 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00691 WARN: G105 DENSITY NUMBER RE-FORMATTED
00691 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00692 WARN: G105 DENSITY NUMBER RE-FORMATTED
00692 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00693 WARN: G105 DENSITY NUMBER RE-FORMATTED
00693 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00694 WARN: G105 DENSITY NUMBER RE-FORMATTED
00694 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00695 WARN: G105 DENSITY NUMBER RE-FORMATTED
00695 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00696 WARN: G105 DENSITY NUMBER RE-FORMATTED
00696 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00697 WARN: G105 DENSITY NUMBER RE-FORMATTED
00697 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00698 WARN: G105 DENSITY NUMBER RE-FORMATTED
00698 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00699 WARN: G105 DENSITY NUMBER RE-FORMATTED
00699 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00700 WARN: G105 DENSITY NUMBER RE-FORMATTED
00700 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00701 WARN: G105 DENSITY NUMBER RE-FORMATTED
00701 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00702 WARN: G105 DENSITY NUMBER RE-FORMATTED
00702 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00703 WARN: G105 DENSITY NUMBER RE-FORMATTED
00703 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00704 WARN: G105 DENSITY NUMBER RE-FORMATTED
00704 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00705 WARN: G105 DENSITY NUMBER RE-FORMATTED
00705 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00706 WARN: G105 DENSITY NUMBER RE-FORMATTED
00706 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00707 WARN: G105 DENSITY NUMBER RE-FORMATTED
00707 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00707 WARN:  Possible duplicate GM page: 00330
00708 WARN: G105 DENSITY NUMBER RE-FORMATTED
00708 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00708 WARN:  Possible duplicate GM page: 00363
00708 WARN:  Possible duplicate GM page: 00427
00709 WARN: G105 DENSITY NUMBER RE-FORMATTED
00709 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00710 WARN: G105 DENSITY NUMBER RE-FORMATTED
00710 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00711 WARN: G105 DENSITY NUMBER RE-FORMATTED
00711 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00712 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00712 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00713 WARN: G105 DENSITY NUMBER RE-FORMATTED
00713 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00714 WARN: G105 DENSITY NUMBER RE-FORMATTED
00714 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00715 WARN: G105 DENSITY NUMBER RE-FORMATTED
00715 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00716 WARN: G105 DENSITY NUMBER RE-FORMATTED
00716 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00717 WARN: G105 DENSITY NUMBER RE-FORMATTED
00717 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00717 WARN:  Possible duplicate GM page: 00386
00718 WARN: G105 DENSITY NUMBER RE-FORMATTED
00718 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00719 WARN: G105 DENSITY NUMBER RE-FORMATTED
00719 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00720 WARN: G105 DENSITY NUMBER RE-FORMATTED
00720 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00721 WARN: G105 DENSITY NUMBER RE-FORMATTED
00721 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00722 WARN: G105 DENSITY NUMBER RE-FORMATTED
00722 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00723 WARN: G105 DENSITY NUMBER RE-FORMATTED
00723 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00724 WARN: G105 DENSITY NUMBER RE-FORMATTED
00724 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00725 WARN: G105 DENSITY NUMBER RE-FORMATTED
00725 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00725 WARN:  Possible duplicate GM page: 00619
00726 WARN: G105 DENSITY NUMBER RE-FORMATTED
00726 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00727 WARN: G105 DENSITY NUMBER RE-FORMATTED
00727 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00728 WARN: G105 DENSITY NUMBER RE-FORMATTED
00728 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00729 WARN: G105 DENSITY NUMBER RE-FORMATTED
00729 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00730 WARN: G105 DENSITY NUMBER RE-FORMATTED
00730 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00730 WARN:  Possible duplicate GM page: 00089
00730 WARN:  Possible duplicate GM page: 00122
00731 WARN: G105 DENSITY NUMBER RE-FORMATTED
00731 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00732 WARN: G105 DENSITY NUMBER RE-FORMATTED
00732 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00733 WARN: G105 DENSITY NUMBER RE-FORMATTED
00733 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00734 WARN: G105 DENSITY NUMBER RE-FORMATTED
00734 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00735 WARN: G105 DENSITY NUMBER RE-FORMATTED
00735 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00736 WARN: G105 DENSITY NUMBER RE-FORMATTED
00736 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00737 WARN: G105 DENSITY NUMBER RE-FORMATTED
00737 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00737 WARN:  Possible duplicate GM page: 00045
00737 WARN:  Possible duplicate GM page: 00214
00737 WARN:  Possible duplicate GM page: 00216
00737 WARN:  Possible duplicate GM page: 00254
00737 WARN:  Possible duplicate GM page: 00387
00737 WARN:  Possible duplicate GM page: 00441
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00738 WARN: G105 DENSITY NUMBER RE-FORMATTED
00738 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00739 WARN: G105 DENSITY NUMBER RE-FORMATTED
00739 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00739 WARN:  Possible duplicate GM page: 00193
00740 WARN: G105 DENSITY NUMBER RE-FORMATTED
00740 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00740 WARN:  Possible duplicate GM page: 00044
00740 WARN:  Possible duplicate GM page: 00048
00740 WARN:  Possible duplicate GM page: 00050
00740 WARN:  Possible duplicate GM page: 00052
00740 WARN:  Possible duplicate GM page: 00059
00740 WARN:  Possible duplicate GM page: 00212
00740 WARN:  Possible duplicate GM page: 00221
00740 WARN:  Possible duplicate GM page: 00332
00740 WARN:  Possible duplicate GM page: 00391
00740 WARN:  Possible duplicate GM page: 00436
00740 WARN:  Possible duplicate GM page: 00448
00740 WARN:  Possible duplicate GM page: 00450
00741 WARN: G105 DENSITY NUMBER RE-FORMATTED
00741 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00742 WARN: G105 DENSITY NUMBER RE-FORMATTED
00742 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00743 WARN: G105 DENSITY NUMBER RE-FORMATTED
00743 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00744 WARN: G105 DENSITY NUMBER RE-FORMATTED
00744 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00745 WARN: G105 DENSITY NUMBER RE-FORMATTED
00745 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00746 WARN: G105 DENSITY NUMBER RE-FORMATTED
00746 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00747 WARN: G105 DENSITY NUMBER RE-FORMATTED
00747 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00747 WARN:  Possible duplicate GM page: 00612
00748 WARN: G105 DENSITY NUMBER RE-FORMATTED
00748 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00748 WARN:  Possible duplicate GM page: 00118
00749 WARN: G105 DENSITY NUMBER RE-FORMATTED
00749 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00750 WARN: G105 DENSITY NUMBER RE-FORMATTED
00750 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00751 WARN: G105 DENSITY NUMBER RE-FORMATTED
00751 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00752 WARN: G105 DENSITY NUMBER RE-FORMATTED
00752 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00753 WARN: G105 DENSITY NUMBER RE-FORMATTED
00753 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00753 WARN:  Possible duplicate GM page: 00650
00754 WARN: G105 DENSITY NUMBER RE-FORMATTED
00754 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00755 WARN: G105 DENSITY NUMBER RE-FORMATTED
00755 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00756 WARN: G105 DENSITY NUMBER RE-FORMATTED
00756 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00756 WARN:  Possible duplicate GM page: 00044
00756 WARN:  Possible duplicate GM page: 00048
00756 WARN:  Possible duplicate GM page: 00050
00756 WARN:  Possible duplicate GM page: 00052
00756 WARN:  Possible duplicate GM page: 00059
00756 WARN:  Possible duplicate GM page: 00212
00756 WARN:  Possible duplicate GM page: 00221
```

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00756 WARN:  Possible duplicate GM page: 00332
00756 WARN:  Possible duplicate GM page: 00391
00756 WARN:  Possible duplicate GM page: 00436
00756 WARN:  Possible duplicate GM page: 00448
00756 WARN:  Possible duplicate GM page: 00450
00756 WARN:  Possible duplicate GM page: 00740
00757 WARN: G105 DENSITY NUMBER RE-FORMATTED
00757 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00758 WARN: G105 DENSITY NUMBER RE-FORMATTED
00758 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00759 WARN: G105 DENSITY NUMBER RE-FORMATTED
00759 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00760 WARN: G105 DENSITY NUMBER RE-FORMATTED
00760 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00761 WARN: G105 DENSITY NUMBER RE-FORMATTED
00761 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00762 WARN: G105 DENSITY NUMBER RE-FORMATTED
00762 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00762 WARN:  Possible duplicate GM page: 00031
00762 WARN:  Possible duplicate GM page: 00472
00762 WARN:  Possible duplicate GM page: 00557
00763 WARN: G105 DENSITY NUMBER RE-FORMATTED
00763 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00764 WARN: G105 DENSITY NUMBER RE-FORMATTED
00764 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00765 WARN: G105 DENSITY NUMBER RE-FORMATTED
00765 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00765 WARN:  Possible duplicate GM page: 00665
00766 WARN: G105 DENSITY NUMBER RE-FORMATTED
00766 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00766 WARN:  Possible duplicate GM page: 00763
00767 WARN: G105 DENSITY NUMBER RE-FORMATTED
00767 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00767 WARN:  Possible duplicate GM page: 00386
00767 WARN:  Possible duplicate GM page: 00717
00768 WARN: G105 DENSITY NUMBER RE-FORMATTED
00768 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00769 WARN: G105 DENSITY NUMBER RE-FORMATTED
00769 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00769 WARN:  Possible duplicate GM page: 00386
00769 WARN:  Possible duplicate GM page: 00717
00769 WARN:  Possible duplicate GM page: 00767
00770 WARN: G105 DENSITY NUMBER RE-FORMATTED
00770 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00771 WARN: G105 DENSITY NUMBER RE-FORMATTED
00771 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00772 WARN: G105 DENSITY NUMBER RE-FORMATTED
00772 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00773 WARN: G105 DENSITY NUMBER RE-FORMATTED
00773 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00774 WARN: G105 DENSITY NUMBER RE-FORMATTED
00774 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00775 WARN: G105 DENSITY NUMBER RE-FORMATTED
00775 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00776 WARN: G105 DENSITY NUMBER RE-FORMATTED
00776 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00776 WARN:  Possible duplicate GM page: 00614
00777 WARN: G105 DENSITY NUMBER RE-FORMATTED
00777 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00778 WARN: G105 DENSITY NUMBER RE-FORMATTED
00778 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00778 WARN:  Possible duplicate GM page: 00220
00778 WARN:  Possible duplicate GM page: 00515
00779 WARN: G105 DENSITY NUMBER RE-FORMATTED
00779 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00780 WARN: G105 DENSITY NUMBER RE-FORMATTED
00780 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00781 WARN: G105 DENSITY NUMBER RE-FORMATTED
00781 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00782 WARN: G105 DENSITY NUMBER RE-FORMATTED
00782 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00783 WARN: G105 DENSITY NUMBER RE-FORMATTED
00783 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00784 WARN: G105 DENSITY NUMBER RE-FORMATTED
00784 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00785 WARN: G105 DENSITY NUMBER RE-FORMATTED
00785 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00786 WARN: G105 DENSITY NUMBER RE-FORMATTED
00786 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00787 WARN: G105 DENSITY NUMBER RE-FORMATTED
00787 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00788 WARN: G105 DENSITY NUMBER RE-FORMATTED
00788 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00789 WARN: G105 DENSITY NUMBER RE-FORMATTED
00789 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00790 WARN: G105 DENSITY NUMBER RE-FORMATTED
00790 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00791 WARN: G105 DENSITY NUMBER RE-FORMATTED
00791 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00792 WARN: G105 DENSITY NUMBER RE-FORMATTED
00792 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00793 WARN: G105 DENSITY NUMBER RE-FORMATTED
00793 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00794 WARN: G105 DENSITY NUMBER RE-FORMATTED
00794 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00795 WARN: G105 DENSITY NUMBER RE-FORMATTED
00795 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00796 WARN: G105 DENSITY NUMBER RE-FORMATTED
00796 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00797 WARN: G105 DENSITY NUMBER RE-FORMATTED
00797 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00798 WARN: G105 DENSITY NUMBER RE-FORMATTED
00798 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00799 WARN: G105 DENSITY NUMBER RE-FORMATTED
00799 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00800 WARN: G105 DENSITY NUMBER RE-FORMATTED
00800 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00801 WARN: G105 DENSITY NUMBER RE-FORMATTED
00801 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00802 WARN: G105 DENSITY NUMBER RE-FORMATTED
00802 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00803 WARN: G105 DENSITY NUMBER RE-FORMATTED
00803 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00804 WARN: G105 DENSITY NUMBER RE-FORMATTED
00804 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00805 WARN: G105 DENSITY NUMBER RE-FORMATTED
00805 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00806 WARN: G105 DENSITY NUMBER RE-FORMATTED
00806 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00806 G109 BAD FORM CODE = B319
00807 WARN: G105 DENSITY NUMBER RE-FORMATTED
00807 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00807 WARN:  Possible duplicate GM page: 00044
00807 WARN:  Possible duplicate GM page: 00048
00807 WARN:  Possible duplicate GM page: 00050
00807 WARN:  Possible duplicate GM page: 00052
00807 WARN:  Possible duplicate GM page: 00059
00807 WARN:  Possible duplicate GM page: 00212
00807 WARN:  Possible duplicate GM page: 00221
00807 WARN:  Possible duplicate GM page: 00332
00807 WARN:  Possible duplicate GM page: 00391
00807 WARN:  Possible duplicate GM page: 00436
00807 WARN:  Possible duplicate GM page: 00448
00807 WARN:  Possible duplicate GM page: 00450
00807 WARN:  Possible duplicate GM page: 00740
00807 WARN:  Possible duplicate GM page: 00756
00808 WARN: G105 DENSITY NUMBER RE-FORMATTED
00808 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00809 WARN: G105 DENSITY NUMBER RE-FORMATTED
00809 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00810 WARN: G105 DENSITY NUMBER RE-FORMATTED
00810 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00810 WARN:  Possible duplicate GM page: 00237
00810 WARN:  Possible duplicate GM page: 00261
00811 WARN: G105 DENSITY NUMBER RE-FORMATTED
00811 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00812 WARN: G105 DENSITY NUMBER RE-FORMATTED
00812 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00813 WARN: G105 DENSITY NUMBER RE-FORMATTED
00813 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00814 WARN: G105 DENSITY NUMBER RE-FORMATTED
00814 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00815 WARN: G105 DENSITY NUMBER RE-FORMATTED
00815 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00815 G109 BAD FORM CODE = B319
00816 WARN: G105 DENSITY NUMBER RE-FORMATTED
00816 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00817 WARN: G105 DENSITY NUMBER RE-FORMATTED
00817 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00818 WARN: G105 DENSITY NUMBER RE-FORMATTED
00818 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00819 WARN: G105 DENSITY NUMBER RE-FORMATTED
00819 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00819 WARN:  Possible duplicate GM page: 00253
00820 WARN: G105 DENSITY NUMBER RE-FORMATTED
00820 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00821 WARN: G105 DENSITY NUMBER RE-FORMATTED
00821 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00822 WARN: G105 DENSITY NUMBER RE-FORMATTED
00822 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00823 WARN: G105 DENSITY NUMBER RE-FORMATTED
00823 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00824 WARN: G105 DENSITY NUMBER RE-FORMATTED
00824 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00825 WARN: G105 DENSITY NUMBER RE-FORMATTED
00825 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00826 WARN: G105 DENSITY NUMBER RE-FORMATTED
00826 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00827 WARN: G105 DENSITY NUMBER RE-FORMATTED
00827 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00828 WARN: G105 DENSITY NUMBER RE-FORMATTED
00828 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00829 WARN: G105 DENSITY NUMBER RE-FORMATTED
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00829 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00830 WARN: G105 DENSITY NUMBER RE-FORMATTED
00830 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00831 WARN: G105 DENSITY NUMBER RE-FORMATTED
00831 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00832 WARN: G105 DENSITY NUMBER RE-FORMATTED
00832 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00833 WARN: G105 DENSITY NUMBER RE-FORMATTED
00833 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00834 WARN: G105 DENSITY NUMBER RE-FORMATTED
00834 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00835 WARN: G105 DENSITY NUMBER RE-FORMATTED
00835 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00836 WARN: G105 DENSITY NUMBER RE-FORMATTED
00836 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00837 WARN: G105 DENSITY NUMBER RE-FORMATTED
00837 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00838 WARN: G105 DENSITY NUMBER RE-FORMATTED
00838 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00839 WARN: G105 DENSITY NUMBER RE-FORMATTED
00839 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00840 WARN: G105 DENSITY NUMBER RE-FORMATTED
00840 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00841 WARN: G105 DENSITY NUMBER RE-FORMATTED
00841 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00842 WARN: G105 DENSITY NUMBER RE-FORMATTED
00842 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00843 WARN: G105 DENSITY NUMBER RE-FORMATTED
00843 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00844 WARN: G105 DENSITY NUMBER RE-FORMATTED
00844 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00845 WARN: G105 DENSITY NUMBER RE-FORMATTED
00845 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00846 WARN: G105 DENSITY NUMBER RE-FORMATTED
00846 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00846 WARN:  Possible duplicate GM page: 00121
00847 WARN: G105 DENSITY NUMBER RE-FORMATTED
00847 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00848 WARN: G105 DENSITY NUMBER RE-FORMATTED
00848 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00849 WARN: G105 DENSITY NUMBER RE-FORMATTED
00849 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00850 WARN: G105 DENSITY NUMBER RE-FORMATTED
00850 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00851 WARN: G105 DENSITY NUMBER RE-FORMATTED
00851 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00852 WARN: G105 DENSITY NUMBER RE-FORMATTED
00852 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00853 WARN: G105 DENSITY NUMBER RE-FORMATTED
00853 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00854 WARN: G105 DENSITY NUMBER RE-FORMATTED
00854 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00854 WARN:  Possible duplicate GM page: 00759
00855 WARN: G105 DENSITY NUMBER RE-FORMATTED
00855 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00856 WARN: G105 DENSITY NUMBER RE-FORMATTED
00856 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00857 WARN: G105 DENSITY NUMBER RE-FORMATTED
00857 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00858 WARN: G105 DENSITY NUMBER RE-FORMATTED
00858 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00859 WARN: G105 DENSITY NUMBER RE-FORMATTED
00859 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00859 WARN:  Possible duplicate GM page: 00791
00860 WARN: G105 DENSITY NUMBER RE-FORMATTED
00860 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00860 WARN:  Possible duplicate GM page: 00619
00860 WARN:  Possible duplicate GM page: 00725
00861 WARN: G105 DENSITY NUMBER RE-FORMATTED
00861 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00862 WARN: G105 DENSITY NUMBER RE-FORMATTED
00862 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00863 WARN: G105 DENSITY NUMBER RE-FORMATTED
00863 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00864 WARN: G105 DENSITY NUMBER RE-FORMATTED
00864 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00865 WARN: G105 DENSITY NUMBER RE-FORMATTED
00865 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00866 WARN: G105 DENSITY NUMBER RE-FORMATTED
00866 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00867 WARN: G105 DENSITY NUMBER RE-FORMATTED
00867 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00867 WARN:  Possible duplicate GM page: 00863
00868 WARN: G105 DENSITY NUMBER RE-FORMATTED
00868 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00869 WARN: G105 DENSITY NUMBER RE-FORMATTED
00869 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00870 WARN: G105 DENSITY NUMBER RE-FORMATTED
00870 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00870 WARN:  Possible duplicate GM page: 00442
00871 WARN: G105 DENSITY NUMBER RE-FORMATTED
00871 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00872 WARN: G105 DENSITY NUMBER RE-FORMATTED
00872 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00872 WARN:  Possible duplicate GM page: 00445
00873 WARN: G105 DENSITY NUMBER RE-FORMATTED
00873 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00874 WARN: G105 DENSITY NUMBER RE-FORMATTED
00874 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00875 WARN: G105 DENSITY NUMBER RE-FORMATTED
00875 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00875 WARN:  Possible duplicate GM page: 00442
00875 WARN:  Possible duplicate GM page: 00870
00876 WARN: G105 DENSITY NUMBER RE-FORMATTED
00876 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00876 WARN:  Possible duplicate GM page: 00874
00877 WARN: G105 DENSITY NUMBER RE-FORMATTED
00877 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00878 WARN: G105 DENSITY NUMBER RE-FORMATTED
00878 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00879 WARN: G105 DENSITY NUMBER RE-FORMATTED
00879 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00880 WARN: G105 DENSITY NUMBER RE-FORMATTED
00880 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00881 WARN: G105 DENSITY NUMBER RE-FORMATTED
00881 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00881 WARN:  Possible duplicate GM page: 00008
00882 WARN: G105 DENSITY NUMBER RE-FORMATTED
00882 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00883 WARN: G105 DENSITY NUMBER RE-FORMATTED
00883 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00884 WARN: G105 DENSITY NUMBER RE-FORMATTED
```

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00884 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00884 WARN:  Possible duplicate GM page: 00110
00885 WARN: G105 DENSITY NUMBER RE-FORMATTED
00885 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00885 WARN:  Possible duplicate GM page: 00045
00885 WARN:  Possible duplicate GM page: 00214
00885 WARN:  Possible duplicate GM page: 00216
00885 WARN:  Possible duplicate GM page: 00254
00885 WARN:  Possible duplicate GM page: 00387
00885 WARN:  Possible duplicate GM page: 00441
00885 WARN:  Possible duplicate GM page: 00737
00886 WARN: G105 DENSITY NUMBER RE-FORMATTED
00886 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00886 WARN:  Possible duplicate GM page: 00882
00887 WARN: G105 DENSITY NUMBER RE-FORMATTED
00887 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00887 WARN:  Possible duplicate GM page: 00386
00887 WARN:  Possible duplicate GM page: 00717
00887 WARN:  Possible duplicate GM page: 00767
00887 WARN:  Possible duplicate GM page: 00769
00888 WARN: G105 DENSITY NUMBER RE-FORMATTED
00888 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00888 WARN:  Possible duplicate GM page: 00144
00889 WARN: G105 DENSITY NUMBER RE-FORMATTED
00889 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00890 WARN: G105 DENSITY NUMBER RE-FORMATTED
00890 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00890 WARN:  Possible duplicate GM page: 00195
00890 WARN:  Possible duplicate GM page: 00205
00890 WARN:  Possible duplicate GM page: 00224
00890 WARN:  Possible duplicate GM page: 00319
00890 WARN:  Possible duplicate GM page: 00490
00891 WARN: G105 DENSITY NUMBER RE-FORMATTED
00891 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00892 WARN: G105 DENSITY NUMBER RE-FORMATTED
00892 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00893 WARN: G105 DENSITY NUMBER RE-FORMATTED
00893 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00894 WARN: G105 DENSITY NUMBER RE-FORMATTED
00894 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00894 WARN:  Possible duplicate GM page: 00264
00895 WARN: G105 DENSITY NUMBER RE-FORMATTED
00895 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00896 WARN: G105 DENSITY NUMBER RE-FORMATTED
00896 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00896 WARN:  Possible duplicate GM page: 00055
00896 WARN:  Possible duplicate GM page: 00329
00896 WARN:  Possible duplicate GM page: 00345
00896 WARN:  Possible duplicate GM page: 00553
00897 WARN: G105 DENSITY NUMBER RE-FORMATTED
00897 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00898 WARN: G105 DENSITY NUMBER RE-FORMATTED
00898 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00899 WARN: G105 DENSITY NUMBER RE-FORMATTED
00899 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00900 WARN: G105 DENSITY NUMBER RE-FORMATTED
00900 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00901 WARN: G105 DENSITY NUMBER RE-FORMATTED
00901 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00901 WARN:  Possible duplicate GM page: 00386
00901 WARN:  Possible duplicate GM page: 00717
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00901 WARN:  Possible duplicate GM page: 00767
00901 WARN:  Possible duplicate GM page: 00769
00901 WARN:  Possible duplicate GM page: 00887
00902 WARN: G105 DENSITY NUMBER RE-FORMATTED
00902 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00902 WARN:  Possible duplicate GM page: 00223
00902 WARN:  Possible duplicate GM page: 00615
00903 WARN: G105 DENSITY NUMBER RE-FORMATTED
00903 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00904 WARN: G105 DENSITY NUMBER RE-FORMATTED
00904 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00904 WARN:  Possible duplicate GM page: 00898
00905 WARN: G105 DENSITY NUMBER RE-FORMATTED
00905 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00905 WARN:  Possible duplicate GM page: 00386
00905 WARN:  Possible duplicate GM page: 00717
00905 WARN:  Possible duplicate GM page: 00767
00905 WARN:  Possible duplicate GM page: 00769
00905 WARN:  Possible duplicate GM page: 00887
00905 WARN:  Possible duplicate GM page: 00901
00906 WARN: G105 DENSITY NUMBER RE-FORMATTED
00906 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00906 WARN:  Possible duplicate GM page: 00386
00906 WARN:  Possible duplicate GM page: 00717
00906 WARN:  Possible duplicate GM page: 00767
00906 WARN:  Possible duplicate GM page: 00769
00906 WARN:  Possible duplicate GM page: 00887
00906 WARN:  Possible duplicate GM page: 00901
00906 WARN:  Possible duplicate GM page: 00905
00907 WARN: G105 DENSITY NUMBER RE-FORMATTED
00907 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00908 WARN: G105 DENSITY NUMBER RE-FORMATTED
00908 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00909 WARN: G105 DENSITY NUMBER RE-FORMATTED
00909 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00910 WARN: G105 DENSITY NUMBER RE-FORMATTED
00910 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00911 WARN: G105 DENSITY NUMBER RE-FORMATTED
00911 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00911 WARN:  Possible duplicate GM page: 00386
00911 WARN:  Possible duplicate GM page: 00717
00911 WARN:  Possible duplicate GM page: 00767
00911 WARN:  Possible duplicate GM page: 00769
00911 WARN:  Possible duplicate GM page: 00887
00911 WARN:  Possible duplicate GM page: 00901
00911 WARN:  Possible duplicate GM page: 00905
00911 WARN:  Possible duplicate GM page: 00906
00912 WARN: G105 DENSITY NUMBER RE-FORMATTED
00912 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00912 WARN:  Possible duplicate GM page: 00144
00912 WARN:  Possible duplicate GM page: 00888
00913 WARN: G105 DENSITY NUMBER RE-FORMATTED
00913 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00913 WARN:  Possible duplicate GM page: 00386
00913 WARN:  Possible duplicate GM page: 00717
00913 WARN:  Possible duplicate GM page: 00767
00913 WARN:  Possible duplicate GM page: 00769
00913 WARN:  Possible duplicate GM page: 00887
00913 WARN:  Possible duplicate GM page: 00901
00913 WARN:  Possible duplicate GM page: 00905
00913 WARN:  Possible duplicate GM page: 00906
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00913 WARN:  Possible duplicate GM page: 00911
00914 WARN: G105 DENSITY NUMBER RE-FORMATTED
00914 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00914 WARN:  Possible duplicate GM page: 00898
00914 WARN:  Possible duplicate GM page: 00904
00915 WARN: G105 DENSITY NUMBER RE-FORMATTED
00915 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00916 WARN: G105 DENSITY NUMBER RE-FORMATTED
00916 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00917 WARN: G105 DENSITY NUMBER RE-FORMATTED
00917 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00917 WARN:  Possible duplicate GM page: 00386
00917 WARN:  Possible duplicate GM page: 00717
00917 WARN:  Possible duplicate GM page: 00767
00917 WARN:  Possible duplicate GM page: 00769
00917 WARN:  Possible duplicate GM page: 00887
00917 WARN:  Possible duplicate GM page: 00901
00917 WARN:  Possible duplicate GM page: 00905
00917 WARN:  Possible duplicate GM page: 00906
00917 WARN:  Possible duplicate GM page: 00911
00917 WARN:  Possible duplicate GM page: 00913
00918 WARN: G105 DENSITY NUMBER RE-FORMATTED
00918 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00918 WARN:  Possible duplicate GM page: 00055
00918 WARN:  Possible duplicate GM page: 00329
00918 WARN:  Possible duplicate GM page: 00345
00918 WARN:  Possible duplicate GM page: 00553
00918 WARN:  Possible duplicate GM page: 00896
00919 WARN: G105 DENSITY NUMBER RE-FORMATTED
00919 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00919 WARN:  Possible duplicate GM page: 00898
00919 WARN:  Possible duplicate GM page: 00904
00919 WARN:  Possible duplicate GM page: 00914
00920 WARN: G105 DENSITY NUMBER RE-FORMATTED
00920 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00920 WARN:  Possible duplicate GM page: 00910
00921 WARN: G105 DENSITY NUMBER RE-FORMATTED
00921 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00921 WARN:  Possible duplicate GM page: 00008
00921 WARN:  Possible duplicate GM page: 00881
00922 WARN: G105 DENSITY NUMBER RE-FORMATTED
00922 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00922 WARN:  Possible duplicate GM page: 00898
00922 WARN:  Possible duplicate GM page: 00904
00922 WARN:  Possible duplicate GM page: 00914
00922 WARN:  Possible duplicate GM page: 00919
00923 WARN: G105 DENSITY NUMBER RE-FORMATTED
00923 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00923 WARN:  Possible duplicate GM page: 00763
00923 WARN:  Possible duplicate GM page: 00766
00924 WARN: G105 DENSITY NUMBER RE-FORMATTED
00924 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00924 WARN:  Possible duplicate GM page: 00893
00925 WARN: G105 DENSITY NUMBER RE-FORMATTED
00925 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00926 WARN: G105 DENSITY NUMBER RE-FORMATTED
00926 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00926 WARN:  Possible duplicate GM page: 00893
00926 WARN:  Possible duplicate GM page: 00924
00927 WARN: G105 DENSITY NUMBER RE-FORMATTED
00927 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
```

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00927 WARN:  Possible duplicate GM page: 00602
00928 WARN: G105 DENSITY NUMBER RE-FORMATTED
00928 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00928 WARN:  Possible duplicate GM page: 00386
00928 WARN:  Possible duplicate GM page: 00717
00928 WARN:  Possible duplicate GM page: 00767
00928 WARN:  Possible duplicate GM page: 00769
00928 WARN:  Possible duplicate GM page: 00887
00928 WARN:  Possible duplicate GM page: 00901
00928 WARN:  Possible duplicate GM page: 00905
00928 WARN:  Possible duplicate GM page: 00906
00928 WARN:  Possible duplicate GM page: 00911
00928 WARN:  Possible duplicate GM page: 00913
00928 WARN:  Possible duplicate GM page: 00917
00929 WARN: G105 DENSITY NUMBER RE-FORMATTED
00929 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00930 WARN: G105 DENSITY NUMBER RE-FORMATTED
00930 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00931 WARN: G105 DENSITY NUMBER RE-FORMATTED
00931 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00931 WARN:  Possible duplicate GM page: 00144
00931 WARN:  Possible duplicate GM page: 00888
00931 WARN:  Possible duplicate GM page: 00912
00932 WARN: G105 DENSITY NUMBER RE-FORMATTED
00932 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00933 WARN: G105 DENSITY NUMBER RE-FORMATTED
00933 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00934 WARN: G105 DENSITY NUMBER RE-FORMATTED
00934 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00934 WARN:  Possible duplicate GM page: 00044
00934 WARN:  Possible duplicate GM page: 00048
00934 WARN:  Possible duplicate GM page: 00050
00934 WARN:  Possible duplicate GM page: 00052
00934 WARN:  Possible duplicate GM page: 00059
00934 WARN:  Possible duplicate GM page: 00212
00934 WARN:  Possible duplicate GM page: 00221
00934 WARN:  Possible duplicate GM page: 00332
00934 WARN:  Possible duplicate GM page: 00391
00934 WARN:  Possible duplicate GM page: 00436
00934 WARN:  Possible duplicate GM page: 00448
00934 WARN:  Possible duplicate GM page: 00450
00934 WARN:  Possible duplicate GM page: 00740
00934 WARN:  Possible duplicate GM page: 00756
00934 WARN:  Possible duplicate GM page: 00807
00935 WARN: G105 DENSITY NUMBER RE-FORMATTED
00935 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00935 WARN:  Possible duplicate GM page: 00045
00935 WARN:  Possible duplicate GM page: 00214
00935 WARN:  Possible duplicate GM page: 00216
00935 WARN:  Possible duplicate GM page: 00254
00935 WARN:  Possible duplicate GM page: 00387
00935 WARN:  Possible duplicate GM page: 00441
00935 WARN:  Possible duplicate GM page: 00737
00935 WARN:  Possible duplicate GM page: 00885
00936 WARN: G105 DENSITY NUMBER RE-FORMATTED
00936 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00936 WARN:  Possible duplicate GM page: 00225
00937 WARN: G105 DENSITY NUMBER RE-FORMATTED
00937 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00938 WARN: G105 DENSITY NUMBER RE-FORMATTED
00938 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00939 WARN: G105 DENSITY NUMBER RE-FORMATTED
00939 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00940 WARN: G105 DENSITY NUMBER RE-FORMATTED
00940 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00941 WARN: G105 DENSITY NUMBER RE-FORMATTED
00941 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00942 WARN: G105 DENSITY NUMBER RE-FORMATTED
00942 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00943 WARN: G105 DENSITY NUMBER RE-FORMATTED
00943 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00944 WARN: G105 DENSITY NUMBER RE-FORMATTED
00944 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00945 WARN: G105 DENSITY NUMBER RE-FORMATTED
00945 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00945 WARN:  Possible duplicate GM page: 00055
00945 WARN:  Possible duplicate GM page: 00329
00945 WARN:  Possible duplicate GM page: 00345
00945 WARN:  Possible duplicate GM page: 00553
00945 WARN:  Possible duplicate GM page: 00896
00945 WARN:  Possible duplicate GM page: 00918
00946 WARN: G105 DENSITY NUMBER RE-FORMATTED
00946 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00946 WARN:  Possible duplicate GM page: 00898
00946 WARN:  Possible duplicate GM page: 00904
00946 WARN:  Possible duplicate GM page: 00914
00946 WARN:  Possible duplicate GM page: 00919
00946 WARN:  Possible duplicate GM page: 00922
00947 WARN: G105 DENSITY NUMBER RE-FORMATTED
00947 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00947 WARN:  Possible duplicate GM page: 00910
00947 WARN:  Possible duplicate GM page: 00920
00948 WARN: G105 DENSITY NUMBER RE-FORMATTED
00948 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00948 WARN:  Possible duplicate GM page: 00898
00948 WARN:  Possible duplicate GM page: 00904
00948 WARN:  Possible duplicate GM page: 00914
00948 WARN:  Possible duplicate GM page: 00919
00948 WARN:  Possible duplicate GM page: 00922
00948 WARN:  Possible duplicate GM page: 00946
00949 WARN: G105 DENSITY NUMBER RE-FORMATTED
00949 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00949 WARN:  Possible duplicate GM page: 00249
00950 WARN: G105 DENSITY NUMBER RE-FORMATTED
00950 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00951 WARN: G105 DENSITY NUMBER RE-FORMATTED
00951 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00952 WARN: G105 DENSITY NUMBER RE-FORMATTED
00952 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00953 WARN: G105 DENSITY NUMBER RE-FORMATTED
00953 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00954 WARN: G105 DENSITY NUMBER RE-FORMATTED
00954 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00955 WARN: G105 DENSITY NUMBER RE-FORMATTED
00955 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00955 WARN:  Possible duplicate GM page: 00043
00955 WARN:  Possible duplicate GM page: 00057
00955 WARN:  Possible duplicate GM page: 00139
00956 WARN: G105 DENSITY NUMBER RE-FORMATTED
00956 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00957 WARN: G105 DENSITY NUMBER RE-FORMATTED
00957 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
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00957 WARN:  Possible duplicate GM page: 00721
00958 WARN: G105 DENSITY NUMBER RE-FORMATTED
00958 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00959 WARN: G105 DENSITY NUMBER RE-FORMATTED
00959 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00960 WARN: G105 DENSITY NUMBER RE-FORMATTED
00960 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00960 WARN:  Possible duplicate GM page: 00171
00961 WARN: G105 DENSITY NUMBER RE-FORMATTED
00961 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00962 WARN: G105 DENSITY NUMBER RE-FORMATTED
00962 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00962 WARN:  Possible duplicate GM page: 00879
00963 WARN: G105 DENSITY NUMBER RE-FORMATTED
00963 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00963 WARN:  Possible duplicate GM page: 00889
00964 WARN: G105 DENSITY NUMBER RE-FORMATTED
00964 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00965 WARN: G105 DENSITY NUMBER RE-FORMATTED
00965 WARN: G105 GENERATED QTY NUMBER RE-FORMATTED
00965 WARN:  Possible duplicate GM page: 00110
00965 WARN:  Possible duplicate GM page: 00884
00054   Note: G208 WASTE CODE = P022 ACUTE WASTE
00194   Note: G208 WASTE CODE = P005 ACUTE WASTE
00195   Note: G208 WASTE CODE = P014 ACUTE WASTE
00196   Note: G208 WASTE CODE = P022 ACUTE WASTE
00197   Note: G208 WASTE CODE = P048 ACUTE WASTE
00198   Note: G208 WASTE CODE = P096 ACUTE WASTE
00384   Note: G208 WASTE CODE = P023 ACUTE WASTE
00385   Note: G208 WASTE CODE = P028 ACUTE WASTE
00453   Note: G208 WASTE CODE = P029 ACUTE WASTE
00454   Note: G208 WASTE CODE = P030 ACUTE WASTE
00455   Note: G208 WASTE CODE = P063 ACUTE WASTE
00456   Note: G208 WASTE CODE = P098 ACUTE WASTE
00457   Note: G208 WASTE CODE = P098 ACUTE WASTE
00490   Note: G208 WASTE CODE = P010 ACUTE WASTE
00491   Note: G208 WASTE CODE = P012 ACUTE WASTE
00862   Note: G208 WASTE CODE = P004 ACUTE WASTE
00863   Note: G208 WASTE CODE = P008 ACUTE WASTE
00864   Note: G208 WASTE CODE = P030 ACUTE WASTE
00865   Note: G208 WASTE CODE = P030 ACUTE WASTE
00866   Note: G208 WASTE CODE = P047 ACUTE WASTE
00867   Note: G208 WASTE CODE = P048 ACUTE WASTE
00868   Note: G208 WASTE CODE = P048 ACUTE WASTE
00869   Note: G208 WASTE CODE = P098 ACUTE WASTE
00870   Note: G208 WASTE CODE = P104 ACUTE WASTE
00870   Note: G208 WASTE CODE = P106 ACUTE WASTE
00871   Note: G208 WASTE CODE = P105 ACUTE WASTE
00872   Note: G208 WASTE CODE = P105 ACUTE WASTE
00873   Note: G208 WASTE CODE = P105 ACUTE WASTE
00874   Note: G208 WASTE CODE = P106 ACUTE WASTE
00875   Note: G208 WASTE CODE = P106 ACUTE WASTE
00876   Note: G208 WASTE CODE = P113 ACUTE WASTE
00877   Note: G208 WASTE CODE = P120 ACUTE WASTE
00003 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00004 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00005 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00006 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00007 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00008 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00009 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00010 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00012 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00013 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00014 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00015 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00016 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00017 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00018 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00019 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00020 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00022 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00023 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00024 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00025 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00026 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00027 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00028 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00029 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00030 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00031 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00032 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00033 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00034 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00035 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00036 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00037 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00038 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00039 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00040 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00041 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00043 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00044 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00045 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00046 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00047 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00048 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00049 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00050 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00051 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00052 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00053 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00054 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00055 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00056 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00057 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00058 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00059 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00060 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00062 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00063 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00065 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00066 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00067 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00067 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00068 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00069 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00070 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00071 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00072 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00073 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00074 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00075 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00075 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00075 WARN: G407 TXD055135388 DID NOT REPORT HAVING H040 TREATMENT SYS.
IN 1999
00076 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00077 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00078 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00079 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00081 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00083 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00084 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00085 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00086 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00087 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00087  WARN: G400 OFFSITE TREATMENT SYS CODE WRONG FOR FORM CODE?:
                INORGANIC  LIQUIDS SENT TO H050 SYSTEM
00087 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS.
IN 1999
00088 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00089 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00090 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00091 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00092 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00093 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00094 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00095 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00096 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00097 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00098 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00099 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00100 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00101 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00102 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00103 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00104 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00105 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00106 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00106 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00107 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00107 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00108 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00109 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00110 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00111 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00112 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00113 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00114 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00115 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00116 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00117 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00118 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00119 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00120 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00121 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00122 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00123 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00124 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00125 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00126 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00127 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00127 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00128 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00129 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00130 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00131 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00132 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00133 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00134 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00136 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00138 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00139 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00140 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00140 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS.
IN 1999
00141 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00142 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00143 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00144 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00145 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00146 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00147 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00148 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00149 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00151 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00152 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00154 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00155 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00156 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00157 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00158 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00159 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00160 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00161 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00162 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00162 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00163 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00165 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00166 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00167 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00168 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00168 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00169 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00170 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00171 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00172 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00173 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00174 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00175 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00176 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00177 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00177 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00177 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00177 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS.
IN 1999
00178 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00179 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00180 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00181 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00182 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00183 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00184 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00185 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00186 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00187 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00187 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00188 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00189 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00190 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00191 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00192 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00194 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00195 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00200 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00201 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00202 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00203 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00204 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00205 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00206 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00207 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00208 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00209 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00210 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00211 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00212 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00213 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00214 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00215 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00216 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00217 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00218 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00219 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00220 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00221 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00222 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00223 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00224 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00225 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00226 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00227 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00228 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00229 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00230 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00231 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00232 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00233 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00234 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00235 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00236 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00237 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00238 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00239 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00240 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00241 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00242 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00243 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00245 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00246 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00247 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00248 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00249 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00250 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00251 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00252 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00253 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00254 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00255 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00256 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00257 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00258 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00259 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00260 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00261 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00262 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00263 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00264 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00265 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00266 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00267 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00268 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00269 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00269 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00270 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00271 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00273 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00274 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00275 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00276 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00276  WARN: G400 OFFSITE TREATMENT SYS CODE WRONG FOR FORM CODE?:
                INORGANIC  LIQUIDS SENT TO H061 SYSTEM
00276 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00276 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00276  WARN: G400 OFFSITE TREATMENT SYS CODE WRONG FOR FORM CODE?:
                INORGANIC  LIQUIDS SENT TO H050 SYSTEM
00276 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS.
IN 1999
00277 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00278 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00278 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00279 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00280 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00281 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00282 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00283 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00284 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00285 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00286 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00287 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00288 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00289 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00290 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00290 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00291 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00292 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00293 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00294 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00294 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00294 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00294 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00295 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00296 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00297 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00297 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00298 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00299 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00301 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00302 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00304 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00305 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00306 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00307 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00308 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00309 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00310 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00311 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00312 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00313 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00314 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00314 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00315 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00316 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00317 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00318 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00319 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00320 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00322 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00323 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00324 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00325 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00326 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00327 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00327  WARN: G400 OFFSITE TREATMENT SYS CODE WRONG FOR FORM CODE?:
                INORGANIC  LIQUIDS SENT TO H061 SYSTEM
00327 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00328 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00329 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00330 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00331 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00332 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00333 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00334 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00335 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00336 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00336 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00338 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00339 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00340 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00341 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00343 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00344 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00345 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00346 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00347 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00348 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00349 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00350 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00351 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00352 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00354 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00355 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00356 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00358 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00360 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00361 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00362 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00363 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00364 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00365 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00366 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00367 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00368 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00372 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00373 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00374 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00375 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00376 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00377 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00378 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00379 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00379 WARN: G407 TXD988088464 DID NOT REPORT HAVING H073 TREATMENT SYS.
IN 1999
00380 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00381 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00382 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00384 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00385 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00386 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00387 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00388 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00389 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00390 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00391 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00392 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00393 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00394 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00395 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00395 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00396 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00397 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00398 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00399 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00400 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00401 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00402 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00403 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00404 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00404 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00406 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00407 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00407 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00409 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00410 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00411 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00412 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00413 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00414 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00414 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00414 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00415 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00416 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00417 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00418 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00419 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00420 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00421 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00422 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00423 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00424 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00425 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00426 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00427 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00428 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00429 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00429 WARN: G407 TXD988088464 DID NOT REPORT HAVING H073 TREATMENT SYS.
IN 1999
00430 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00430 WARN: G407 TXD988088464 DID NOT REPORT HAVING H073 TREATMENT SYS.
IN 1999
00431 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00432 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00434 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00435 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00436 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00437 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00439 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00441 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00442 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00443 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00444 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00446 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00448 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00448 WARN: G407 TXD988088464 DID NOT REPORT HAVING H073 TREATMENT SYS.
IN 1999
00450 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00451 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00452 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00452 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00453 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00454 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00455 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00456 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00457 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00458 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00459 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00460 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00462 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00462 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00462 CHECK:        216 TONS SHIPPED TO LAD000777201
00462 WARN: G407 LAD000777201 DID NOT REPORT HAVING H040 TREATMENT SYS.
IN 1999
00463 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00464 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00465 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00465 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00466 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00467 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00468 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00469 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00469 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00470 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00472 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00474 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00475 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00479 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00480 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00481 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00483 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00484 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00485 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00487 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00488 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00489 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00489 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00490 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00491 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00492 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00493 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00494 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00495 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00496 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00497 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00498 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00499 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00501 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00504 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00506 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00507 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00509 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00509 CHECK:        384 TONS SHIPPED TO TXD988088464
00510 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00511 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00512 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00513 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00514 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00515 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00516 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00517 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00519 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00519 CHECK:       3083 TONS SHIPPED TO TXD988088464
00520 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00521 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00522 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00525 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00527 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00529 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00530 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00532 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00533 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00538 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00539 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00540 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00542 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00543 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00543 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00544 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00546 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00548 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00550 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00550 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00552 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00554 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00555 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00557 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00558 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00559 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00560 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00566 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00571 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00573 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00574 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00577 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00578 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00579 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00580 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00581 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00584 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00586 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00587 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00588 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00589 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00590 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00592 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00596 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00597 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00598 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00600 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00601 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00602 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00603 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00604 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00605 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00606 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00610 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00611 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00612 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00614 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00614 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00615 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00616 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00617 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00618 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00620 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00621 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00622 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00624 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00624 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00625 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00626 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00626 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00627 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00630 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00631 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00632 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00633 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00634 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00635 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00636 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00639 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00641 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00642 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00644 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00645 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00646 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00648 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00649 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00650 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00651 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00653 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00654 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00655 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00656 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00657 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00658 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00659 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00660 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00662 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00663 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00664 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00664 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00664 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00664 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00665 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00666 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00667 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00667 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00668 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00671 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00673 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00674 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00674 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00675 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00676 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00677 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00677 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00678 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00679 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00680 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00681 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00682 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00683 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00684 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00685 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00685 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00687 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00688 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00688 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00688 WARN: G407 TXD988088464 DID NOT REPORT HAVING H010 TREATMENT SYS.
IN 1999
00689 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00689 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00690 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00693 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00693 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00694 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00695 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00695 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00696 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00696 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00697 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00698 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00699 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00700 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00701 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00702 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00703 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00704 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00705 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00706 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00707 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00708 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00709 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00710 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00711 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00712 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00713 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00714 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00715 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00716 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00717 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00718 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00719 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00720 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00721 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00722 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00723 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00724 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00725 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00726 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00727 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00728 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00728 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00729 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00729 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS.
IN 1999
00730 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00731 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00732 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00733 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00734 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00735 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00737 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00738 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00739 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00740 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00741 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00742 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00745 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00746 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00747 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00748 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00749 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00749 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00750 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00751 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00752 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00753 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00755 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00756 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00757 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00759 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00759 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00760 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00761 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00762 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00763 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00764 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00765 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00766 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00767 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00768 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00769 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00770 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00770 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00771 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00771 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00772 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00772 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00773 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00773 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00775 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00775 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00776 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00776 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00777 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00777 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00777 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00777 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00778 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00778 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
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00779 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00779 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00780 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00780 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00781 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00781 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00781 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00781 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00782 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00782 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00783 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00784 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00785 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00786 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00787 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00787 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00788 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00788 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00789 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00789 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00790 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00791 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00791 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00792 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00793 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00794 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00794 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00795 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00795 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00796 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00797 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00798 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00798 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00799 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00800 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00800 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00801 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00801 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00802 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00802 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00803 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00803 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00804 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00804 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS.
IN 1999

00806 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00806 WARN: G400 OFFSITE TREATMENT SYS CODE WRONG FOR FORM CODE?: INVALID FORM CODE
00806 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00807 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00808 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00809 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00809 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00810 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00810 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS. IN 1999
00811 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00812 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00813 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00814 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00814 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00815 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00815 WARN: G400 OFFSITE TREATMENT SYS CODE WRONG FOR FORM CODE?: INVALID FORM CODE
00815 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00816 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00816 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS. IN 1999
00817 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00818 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00818 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00819 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00821 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00821 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00822 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00822 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00822 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00822 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00823 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00824 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00824 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00825 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00826 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00826 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00826 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00826 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00827 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00827 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00828 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00828 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999
00828 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00828 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS. IN 1999

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00829 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00830 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00830 WARN: G407 WAR000010355 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00831 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00831 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00832 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00832  WARN: G400 OFFSITE TREATMENT SYS CODE WRONG FOR FORM CODE?:
                INORGANIC  SLUDGES SENT TO H050 SYSTEM
00832 WARN: G407 TND982109142 DID NOT REPORT HAVING H050 TREATMENT SYS.
IN 1999
00833 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00834 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00835 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00836 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00837 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00838 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00838 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00839 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00839 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00840 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00840 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00841 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00841 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00842 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00842 WARN: G407 FLD980711071 DID NOT REPORT HAVING H061 TREATMENT SYS.
IN 1999
00843 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
00843 WARN: G407 FLD980711071 DID NOT REPORT HAVING H111 TREATMENT SYS.
IN 1999
00844 WARN: G405 SHIP QTY NUMBER RE-FORMATTED
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00867 WARN: G505 TREAT QTY NUMBER RE-FORMATTED
00916 WARN: G505 TREAT QTY NUMBER RE-FORMATTED
. FORM IC ERROR LIST
 CHECK:  NO G3 FILE FOUND - NO STATE WASTE CODES?

 CHECK:  NO FORM(S) WR FOUND - NO WASTE RECEIVED FROM OFF-SITE

. FORM GM DETAILS LIST
. FORM OI ERROR LIST
 CHECK:  NO TRANSPORTER FORM OI FOUND
. REPORT TOTALS FOR U.S. DOE LOS ALAMOS NATIONAL LABORATORY  IN TONS

 TOTAL GENERATED (GM)  =        3904.68
 TOTAL RECEIVED (WR)   =           0.00
 TOTAL RECEIVED (GM)   =           0.00
 TOTAL SHIPPED (GM)    =        3827.50
 TOTAL TREATED (GM)    =          25.53
 TOTAL UI,POTW,& NPDES =           0.00
 TOTAL RCRA GENERATION =        3904.68

. RCRA WASTE TONS GENERATED ON-SITE BY WASTE FORM (TYPE)

FORM CODE                                                TONS GENERATED

B206 Invalid FORM Code                                             0.01
B315 Invalid FORM Code                                             0.00
B319 Invalid FORM Code                                             0.24
W001 Lab packs with no acute hazardous waste (from any             4.20
W002 Contaminated debris: paper, clothing, rags, wood,             2.44
```

W004	Lab packs containing acute hazardous waste (from a	0.01
W101	Very dilute aqueous waste containing more than 99%	4.48
W103	Spent concentrated acid	0.36
W105	Acidic aqueous wastes less than 5% acid (diluted b	19.18
W107	Aqueous waste containing cyanides (generally Caust	0.17
W110	Caustic aqueous waste without cyanides(Ph >12.5)	13.16
W113	Other aqueous waste or wastewaters (fluid, not slu	5.95
W117	Waste liquid mercury (metallic)	0.20
W119	Other inorganic liquid (specify in comments)	1.21
W202	Concentrated halogenated (E.G. chlorinated) solven	2.03
W203	Concentrated non-halogenated (E.G. chlorinated) so	19.30
W204	Concentrated halogenated/ non-halogenated solvent	3.10
W206	Waste oil	3.36
W209	Paint, ink, lacquer, or varnish (fluid, not dry or	0.37
W210	Reactive or polymerizable organic liquids and adhe	0.05
W211	Paint thinner or petroleum distillates	1.33
W219	Other organic liquid (specify in comments)	0.28
W301	Contaminated soil (usually from remediation, demol	3092.13
W303	Ash (from combustion of any type)	0.57
W307	Metal scale, filings and scrap (including metal dr	19.87
W309	Batteries, battery parts, cores, casings (lead-aci	0.26
W310	Filters, solid adsorbents, ion exchange resins and	2.03
W312	Cyanide or metal cyanide bearing solids, salts or	0.01
W316	Metal salts or chemicals not containing cyanides	0.73
W319	Other inorganic solids (specify in comments)	312.28
W320	Electrical devices (lamps, thermostats, CRTs, etc)	3.74
W403	Solid resins, plastics or polymerized organics	0.14
W405	Explosives or reactive organic solids	3.61
W409	Other organic solids (specify in comments)	385.40
W501	Lime and/or metal hydroxide sludges and solids wit	0.46
W519	Other inorganic sludges (specify in comments - not	1.20
W606	Resins, tars, polymer or tarry sludge (not W512 co	0.29
W609	Other organic sludge (specify in comments)	0.00
W801	Compressed gases (any type)	0.03

. RCRA WASTE TONS GENERATED ON-SITE BY WASTE SOURCE

SOURCE CODE		TONS GENERATED
G01	Dip, flush or spray rinsing (using solvents to cle	0.00
G02	Stripping and acid or caustic cleaning (using caus	5.42
G03	Plating and phosphating (electro- or non-electropl	0.78
G04	Etching(using caustics or other methods to remove	5.43
G06	Painting and coating (manufacturing, building, or	1.54
G07	Product and by-product processing (direct flow of	0.46
G08	Removal of spent process liquids or catalysts(bulk	0.34
G09	Other production or service-related processes(wher	285.64
G11	Discarding off-specification or out-of-date chemic	10.49
G13	Cleaning out process equipment (periodic sludge or	0.10
G14	Removal of tank sludge, sediments or slag(periodic	11.46
G15	Process equipment change-out or discontinue use of	6.74
G16	Oil changes and filter or battery replacement (aut	1.52
G19	Other one-time or intermittent processes(specify i	31.09
G21	Air pollution control devices (baghouse dust, etc	0.63
G22	Laboratory analytical wastes (used chemicals from	6.93
G24	Solvent or product distillation or recovery (sludg	0.00
G25	Hazardous waste management - indicate management m	4.26
G31	Accidental contamination of products, materials or	1.98
G32	Cleanup of spill residues	0.04
G33	Leak collection and floor sweeping (generally on-g	0.12
G42	Corrective action at a solid waste management unit	2.17

G49 Other remediation(specify in comments) 3527.04

. RCRA WASTE TONS GENERATED ON-SITE BY WASTE ONSITE SYSTEM

SYSTEM CODE	TONS TREATED
H040 Incineration - thermal destruction other than use	0.78
1.93	
! Did you report the influent on a separate form GM?	
H071 Chemical reduction with or without precipitation (	0.32
0.00	
H082 Adsorption (as the major component of treatment)	0.00
1.80	
! Did you report the influent on a separate form GM?	
H101 Sludge treatment and/or dewatering (as the major c	19.32
0.00	
H111 Stabilization or chemical fixation prior to dispos	0.56
0.53	
H129 Other treatment (specify in comments - not H071-H1	4.53
0.00	

. RCRA WASTE TONS SHIPPED TO OFFSITE TREATMENT SYSTEMS

SYSTEM	TONS SHIPPED
H010 Metals recovery including retorting, smelting, che	3.64
H040 Incineration - thermal destruction other than use	217.74
H050 Energy recovery at this site - use as fuel (includ	2.21
H061 Fuel blending prior to energy recovery at another	0.35
H073 Cyanide destruction with or without precipitation(	0.19
H111 Stabilization or chemical fixation prior to dispos	54.90
H112 Macro-encapsulation prior to disposal at another s	3.90
H132 Landfill or surface impoundment that will be close	3508.33
H141 Storage, bulking, and/or transfer off-site - no tr	35.77

ENVIRONMENTAL RESTORATION PROJECT

A Department of Energy
Environmental Cleanup Program

LA-UR-01-6385
December 2001
ER2001-0937

Waste Minimization Awareness Plan

Los Alamos
NATIONAL LABORATORY

Los Alamos NM 87545

Produced by the Regulatory Compliance Focus Area

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List of Acronyms and Abbreviations

DOE	US Department of Energy
E	Environmental Science and Waste Technology (Division)
EPA	US Environmental Protection Agency
ER	environmental restoration
ESH	Environment, Safety, and Health (Division)
ESH-ID	Environment, Safety, and Health Identification (process)
ESO	Environmental Stewardship Office
FIMAD	Facility for Information Management, Analysis, and Display
FY	fiscal year
GIS	Geographical Information System
GW	groundwater
HE	high explosive
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
LLMW	low-level mixed waste
LLW	low-level waste
MDA	material disposal area
NMED	New Mexico Environment Department
NMED-HWB	New Mexico Environment Department-Hazardous Waste Bureau
PRS	potential release site
RCRA	Resource Conservation and Recovery Act
SMO	Sample Management Office
SWMU	solid waste management unit
TA	technical area
TSCA	Toxic Substances Control Act
WMin/PP	waste minimization and pollution prevention

Los Alamos National Laboratory
Environmental Restoration Project

WASTE MINIMIZATION AWARENESS PLAN

1.0 INTRODUCTION

Waste minimization is an inherent goal within all the operating procedures of the Los Alamos National Laboratory (the Laboratory). The U.S. Department of Energy (DOE) and the Laboratory are required to annually submit a waste minimization plan to the New Mexico Environment Department (NMED) in accordance with the Laboratory's Hazardous Waste Facility Permit. This document represents the waste minimization and pollution prevention (WMin/PP) awareness plan for the Laboratory's Environmental Restoration (ER) Project.

This plan supports the ER Project's WMin/PP goals and describes its program to incorporate waste reduction practices into ER activities and procedures. The plan was prepared by the ER Project Office, in the Environmental Science and Waste Technology (E) Division, pursuant to the requirements of Module VIII, Section B.1 of the Laboratory's Hazardous Waste Facility Permit (NM0890010515-1). This plan is specific to the ER Project and should be considered a companion document to the Laboratory's May 1997 site-wide plan, "Site Pollution Prevention Plan for Los Alamos National Laboratory," and the annual certification document "Los Alamos National Laboratory 2000 Environmental Stewardship Roadmap." The "Los Alamos National Laboratory 2001 Environmental Stewardship Roadmap" is planned for release in December 2001.

1.1 Background

The mission of the Laboratory's ER Project is to protect human health and the environment by identifying risks posed by inactive and surplus DOE facilities and contaminated areas, and by remediating sites, as necessary, in the most cost-effective and responsible manner possible to provide for future beneficial use. In completing this mission, ER activities may generate large volumes of waste, some of which may require special handling, treatment, storage, and disposal. Because the ER Project is tasked to investigate and conduct corrective action, as necessary, at historically contaminated sites within the Laboratory, source reduction and material substitution are difficult to implement. However, the ER Project generates waste in the conduct of site cleanups and thus is faced with the responsibility and the challenge to minimize the amounts of waste that will require subsequent management or disposal. Minimization is necessary because of the high cost of waste management; the limited capacity for on-site or off-site waste treatment, storage, or disposal; and the desire to minimize the associated liability.

In 1990, Congress passed the Pollution Prevention Act, which changed the focus of environmental policy from "end-of-pipe" regulation to encouraging source reduction or minimizing waste generation. Under the Pollution Prevention Act and other institutional requirements for treatment, storage, and disposal of wastes, all waste generators must certify that they have a waste minimization program in place. The elements of this program are further defined in the May 1993 U.S. Environmental Protection Agency (EPA) interim final guidance, "Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program." The program guidance lists what EPA considers the minimum level of infrastructure and effort that must be expended to have an acceptable program. This includes top management support, process evaluation, technology exchange, waste minimization employee training, and waste generation tracking and projections.

The DOE Office of the Secretary also requires a pollution prevention program as outlined in the 1996 Pollution Prevention Program Plan. The DOE plan has specific program requirements for every waste

generator, including evaluating waste minimization options as early in the planning process as possible. The DOE plan also places responsibility for WMin/PP implementation with the waste-generating program. In a November 12, 1999, memorandum the DOE Secretary of Energy set an annual 10% reduction goal for all wastes generated from facility decommissioning and site stabilization activities; the Laboratory's approach to achieving this goal is addressed later in this document.

1.2 Purpose and Scope

The purpose of this plan is to document the ER Project's approach for minimizing the wastes it generates. This plan discusses the goals, methods, and activities that will be routinely employed to prevent or reduce waste generation in fiscal year 2002 (FY02), and it reports FY01 waste generation quantities and significant waste minimization accomplishments for FY01. This plan also discusses the ER Project program manager's commitment to WMin/PP, provides a discussion of specific program elements of the ER WMin/PP Program, and presents the barriers to implementation of further significant reductions.

This plan is designed to fulfill the waste minimization requirements in Module VIII, Section B.1, of the Laboratory's Hazardous Waste Facility Permit and of the Hazardous and Solid Waste Amendments.

This plan addresses all waste classifications generated by the ER Project during the course of planning and conducting the investigation and remediation of environmental media funded by the DOE Office of Environmental Restoration. Wastes generated by ER include "primary" and "secondary" waste streams. Primary waste consists of generated contaminated material or environmental media that was present as a result of past DOE activities, before any containment and restoration activities. It includes contaminated building debris or soil from investigations and remedial activities. Secondary waste streams consist of materials that were used in the investigative or remedial process and may include investigative-derived waste (e.g., personal protective equipment, sampling waste, drill cuttings); treatment residues; wastes resulting from storage or handling operations; and additives used to stabilize waste. The ER Project may generate the following waste classifications: low-level waste (LLW); low-level mixed waste (LLMW); transuranic radioactive waste; chemical wastes (which include Resource Conservation and Recovery Act [RCRA] hazardous, Toxic Substances Control Act [TSCA], and New Mexico Special wastes); and/or solid waste.

The scope of a WMin/PP effort for an individual ER project will be dependent on the primary and secondary wastes anticipated to be generated and the feasibility of waste reduction for those waste streams.

1.3 Requirements of the Operating Permit

Module VIII, Section B.1, of the Laboratory's Hazardous Waste Facility Permit requires that a waste minimization program be in place and that a certified plan be submitted annually to the administrative authority. The specific requirements of the permit are listed in Table 1.3-1 along with the corresponding section of the plan that addresses the requirement.

Table 1.3-1
Los Alamos National Laboratory Hazardous Waste Facility Permit, Module VIII, Section B.1

Permit Requirement	Topic	Refer to Report Section
Section B.1.a.1	Policy Statement	Section 2.0
Section B.1.a.2	Employee Training	Section 6.3
Section B.1.a.2	Incentives	Section 6.10
Section B.1.a.3	Past Source Reduction and Recycling	Section 5.4
Section B.1.a.4	Itemized Capital Expenditures	Section 5.4
Section B.1.a.5	Barriers to Implementation	Section 7.0
Section B.1.a.6	Sources of Information	Section 6.4
Section B.1.a.7	Investigation of Additional WMin Efforts	Section 6.2
Section B.1.a.8	Utilization of Hazardous Materials	Section 5.2
Section B.1.a.9	Justification of Waste Generation	Section 5.0
Section B.1.a.10.a	Site Lead Inventory Program	Section 6.11
Section B.1.a.10.b	Steel for Lead Substitution Program	Section 6.11
Section B.1.a.10.c	Lead Shielding Coating Program	Section 6.11
Section B.1.a.10.d	Lead Decontamination Program	Section 6.6
Section B.1.a.10.e	Scintillation Cocktail Substitution Program	Section 5.2
Section B.1.a.10.f	Radioactive Waste Segregation Program	Section 6.6

2.0 ER PROJECT PROGRAM MANAGER POLICY STATEMENT AND MANAGEMENT COMMITMENT

The Laboratory's ER Project program manager, focus area leaders, and other ER Project personnel are committed to preventing or reducing the generation of waste from ER Project activities, as much as is technically and economically feasible and consistent with the ER Project mission.

The Laboratory's support for pollution prevention and waste minimization programs is documented in the Laboratory waste management requirements. The ER Project additionally mandates waste minimization techniques in several of its standard operating procedures. In addition, the E Division Environmental Stewardship Office (ESO) is tasked by DOE and the Laboratory to champion and implement an aggressive waste minimization and environmental stewardship program for the entire Laboratory.

Another management program in place at the Laboratory is the Environment, Safety, and Health Identification (ESH-ID) process, which is a tool designed to assist Laboratory personnel in identifying and managing Environment, Safety, and Health Laboratory implementation requirements, which may impact project planning and execution. This process incorporates the evaluation of potential waste-generating activities before project startup and includes review by a waste minimization/pollution prevention subject-matter expert.

The ER Project fully supports the Laboratory's and E Division's written WMin/PP policies, programs, and commitments. The ER Project will support the goal of waste reduction by giving preference to source reduction, improved segregation and characterization, and environmentally sound recycling practices regarding waste treatment and disposal techniques, to the degree determined to be economically practicable. Evidence of the ER Project commitment is demonstrated by this plan, as well as by the documentation of past

waste reduction efforts within the ER Project (Section 5.4). The ER Project will allocate sufficient resources to pursue the goals and approaches established by this plan and will coordinate with the Laboratory's ESO, as necessary.

3.0 ORGANIZATIONAL STRUCTURE AND STAFF RESPONSIBILITIES

The ER Project is part of the E Division at the Laboratory and is subject to all Laboratory and E Division policies and requirements. The organizational structure of the ER Project as of November 2001 is shown in Figure 3.0-1.

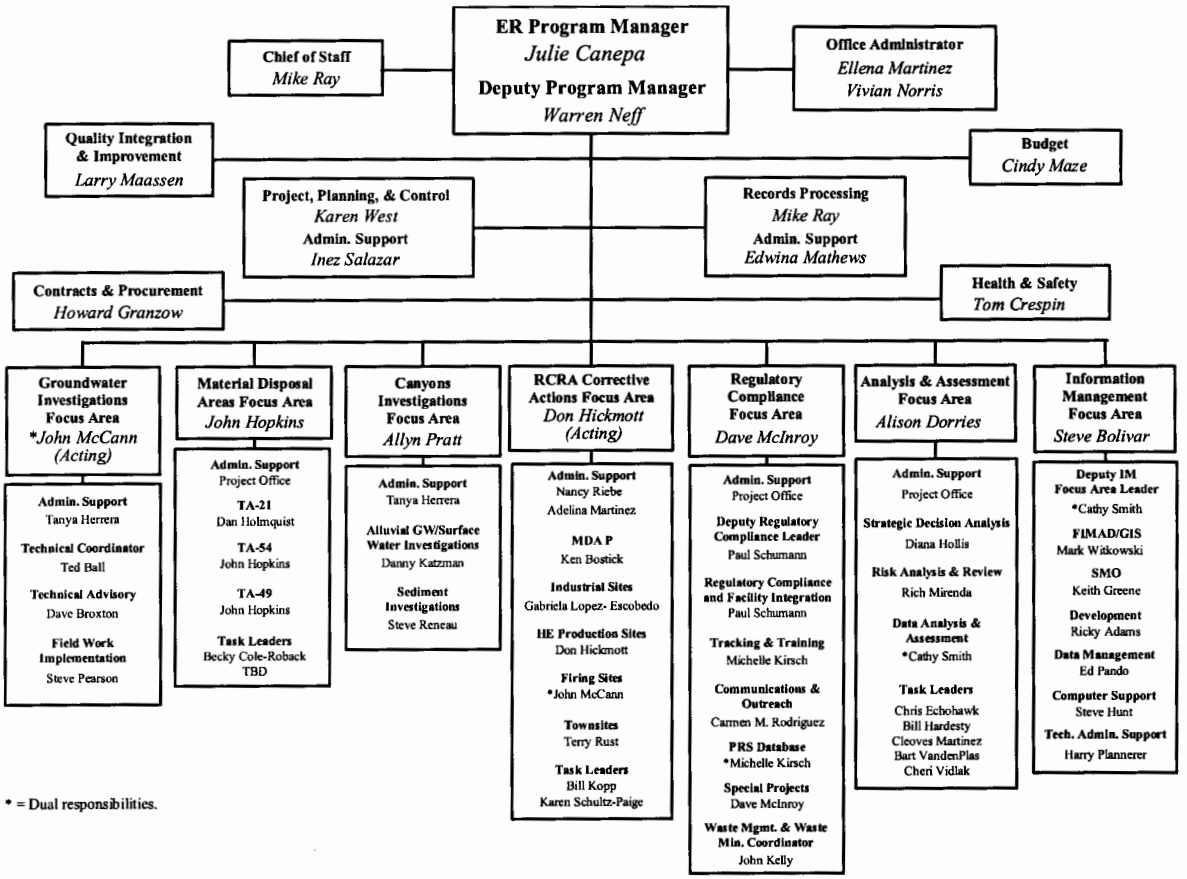

Figure 3.0-1. ER Project Organization Chart

The organizational structure for developing and implementing WMin/PP programs is outlined below:

- The Laboratory director and the deputy director for operations have oversight responsibilities and provide annual review of the Laboratory-wide WMin/PP Program goals and performance.
- The E Division has primary responsibility for the Laboratory-wide WMin/PP Program, including the ER Project.
- The ESO has been delegated by the E Division to develop and manage the Laboratory-wide WMin/PP and environmental stewardship program. The ESO provides oversight for WMin/PP implementation; a base of technical knowledge and resources for WMin/PP practices; assistance with

identifying waste generation trends and WMin/PP opportunities; recommendations for WMin/PP solutions and applications; support in tracking and reporting waste generation trends and WMin/PP successes and lessons learned; assistance in preparing funding applications and proposals for WMin/PP projects; and assistance in overcoming WMin/PP implementation barriers.

- The ER Project focus area leader has primary responsibility for developing and implementing WMin/PP programs and strategies for all ER projects that result in waste generation, as described in this plan. The ER Project must allocate sufficient resources to attain the goals and approaches identified in this plan. The ER Project is responsible for establishing and submitting an annual WMin/PP plan to the administrative authority, establishing WMin/PP goals and performance measures, and coordinating with the ESO to implement WMin/PP activities and to report success stories.
- The ER Project Regulatory Compliance Focus Area leader is the focal point for planning and implementing waste minimization activities and reporting waste minimization successes and lessons learned for the ER Project.
- ER Project focus area leaders, who report to the ER Project program manager, are responsible for identifying and incorporating WMin/PP practices into project plans and field activities, as much as technically and economically feasible.
- The ER Project waste management and minimization coordinator is responsible for coordination of waste minimization activities, coordinating proposals for waste minimization implementation projects, advising project leaders on Wmin/PP technologies and techniques, recommending ER Project-wide policy, and compiling waste generation and minimization data.

4.0 GOALS AND PERFORMANCE MEASURES

The DOE Headquarters established an annual DOE complex-wide 10% reduction goal for environmental restoration activities based upon the overall waste projections. Additionally, the University of California FY02 contract performance measures include the same 10% cleanup/stabilization waste reduction goal.

The ER FY02 WMin/PP approach will focus on

- integrating waste minimization principles into the remedial planning process;
- recycling and reusing materials;
- utilizing material substitution as appropriate;
- developing subcontractor waste minimization incentives through contract specifications;
- dedicating waste minimization resources to assist with large remedial actions; and
- tracking, projecting, and analyzing waste data to improve waste management economies of scale.

Figure 4.0-1 shows the environmental hierarchy for ER wastes. Although source reduction is preferred, the ER WMin/PP approach recognizes there may be limited opportunity for source reduction of primary wastes because the ER Project is tasked to investigate and conduct corrective actions, as necessary, at historically contaminated sites within the Laboratory, and potential environmental concerns may require removal. When appropriate, source reduction of primary wastes will be accomplished through the application of risk-based cleanup criteria, land-use scenarios, and the consideration of in-situ or non-intrusive remediation technologies during project planning and negotiation stages, and improved characterization and segregation during the execution of field activities. Source reduction of secondary wastes will be accomplished through proper planning; improved housekeeping, segregation, and characterization; and application of WMin/PP criteria

during technology selection, design, and construction activities. Recycling and reuse practices will be considered for all primary and secondary wastes. Volume reduction, including size reduction, compaction, and optimal packaging, will be considered for all primary and secondary wastes that cannot be avoided or recycled.

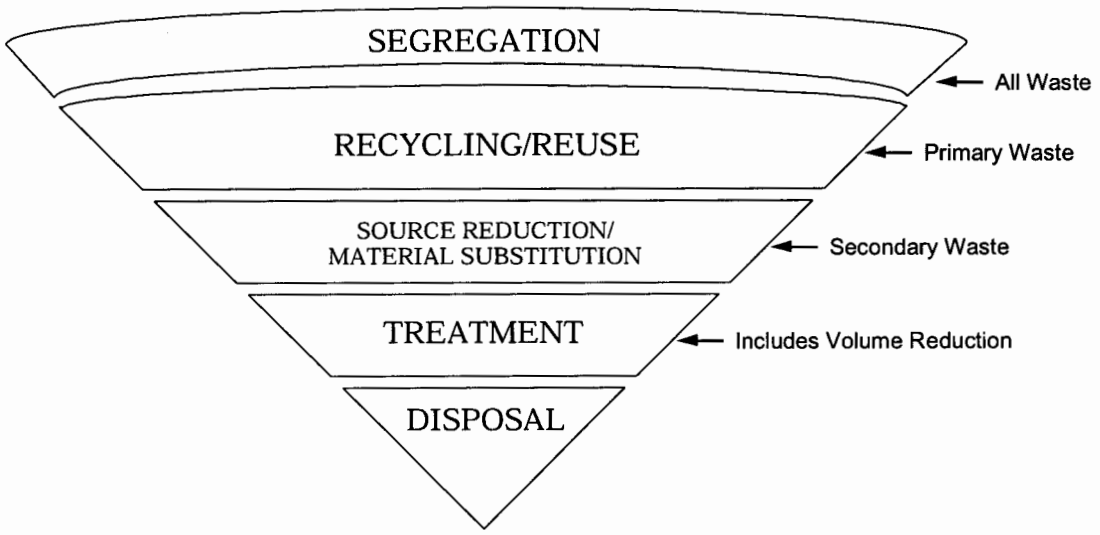

Figure 4.0-1. Environmental Management Hierarchy within Environmental Restoration

The WMin/PP approaches outlined above are consistent with the waste reduction priorities established by the Laboratory's sitewide waste minimization plan, which recognizes the severe limitations of on-site disposal capacity for LLW and on-site storage capacity for LLMW. In addition, the approach was adopted to address the variable and non-recurring nature of wastes coming from ER activities.

5.0 SITUATION ANALYSIS

The FY01 activities that resulted in waste generation included remedial actions and site investigations. These types of activities will continue throughout the life of the Laboratory's ER Project. It should be noted that the majority of FY01 waste generation was the result of RCRA clean closure activities at Material Disposal Area (MDA) P, and cleanup activities at Technical Area (TA)-16 explosives sites, Acid Canyon, and Solid Waste Management Unit (SWMU) 03-056(c).

The FY02 planned activities include additional deep groundwater characterization and intermediate well installation, completion of the MDA P clean closure, generation of waste from interim actions at a high-explosives site and consolidated SWMU 53-002(a)-99, remediation of several historical radioactive releases, and other small site investigations and corrective action projects.

5.1 Applicable Regulations

The Laboratory's ER Project is subject to many environmental regulations. The key drivers for the WMin/PP program are listed below. A complete description of these regulations may be found in the Laboratory's Waste Minimization Awareness Plan or the "Waste Minimization and Pollution Prevention Regulations and Orders, Requirements and Identification List."

Federal Acts/Regulations and Executive Orders

- Resource Conservation and Recovery Act
- Pollution Prevention Act
- Executive Order 12873 — Federal Acquisition, Recycling, and Waste Prevention
- Executive Order 12856 — Federal Compliance with Right-to-Know Laws and Pollution Prevention
- Executive Order 13148 — Greening the Government Through Leadership in Environmental Management

State of New Mexico Regulations

- New Mexico Solid Waste Management Regulations, Title 20, Chapter 9, Part 1, New Mexico Administrative Code
- New Mexico Hazardous Waste Management Regulations, Title 20, Chapter 4, Part 1, New Mexico Administrative Code

DOE Policy

- DOE Order 5400.1, "General Environmental Protection Program"
- DOE Order 5400.3, "Hazardous and Radioactive Mixed Waste Program"
- DOE Order 5400.5, "Radiation Protection of the Public and the Environment"
- DOE Order 435.1, "Radioactive Waste Management"
- Secretary of Energy Notice 37-92, "Waste Minimization Policy Statement"
- DOE Pollution Prevention Program Plan, 1996

Los Alamos National Laboratory Directives and Policies

- Los Alamos National Laboratory 2000 Environmental Stewardship Roadmap, LA-UR-00-5601, December 2000
- Laboratory waste management requirements

5.2 Justification for the Usage of Hazardous Materials

ER Project activities currently introduce only small amounts of hazardous materials into field and support operations. During the past years, most usage of hazardous materials has been substituted with less hazardous alternatives in an effort to reduce the generation of secondary hazardous or mixed waste. These efforts include the following list.

- Decontamination Solvents — The use of the hazardous solvents has been eliminated in the ER Project.
- Scintillation Cocktails — The routine use of scintillation cocktail media that results in a RCRA mixed waste has been discontinued at the Laboratory.

- Analytical Processes — Some samples collected for site characterization may require the use of hazardous substances as a preservative prescribed by EPA analytical methods. These analytical processes have been evaluated by EPA, private companies, and universities for potential alternative processes and material substitution. The use of hazardous substances for sample preservation is currently viewed as necessary.

5.3 FY01 Waste Generation Summary

The ER Project FY01 waste generation and waste minimization summary is listed in Table 5.3-1. Waste projections and reduction goals for FY02 are listed in Table 5.3-2.

Table 5.3-1
Fiscal Year 2001 Waste Generation Summary
(October 1, 2000, Through September 30, 2001)

Waste Type	FY01 Planned Waste Volume (m^3) from ER and Stabilization Activities[a]	Volume (m^3) of Waste Targeted for Reduction/ Recycle to Achieve Goal	FY01 Waste Generation Volume (m^3)[b]	FY01 Year to Date Reduction/ Recycle Volume (m^3)	FY01 Overall Waste Reduction
					14%
Solid – Transuranic Radioactive	0.2	0	0	0	
Solid – Mixed Low-Level Radioactive	12.54	2	22	1018	
Solid – Low-Level Radioactive	395	39	364	0	
Solid – Hazardous[c]	9039	900	5102	1900	
Solid – Sanitary	1916	190	18845	474	

[a] Based on January 2001 Integrated Planning, Accountability, and Budgeting data.

[b] Includes wastes generated by DOE-EM activities; and excludes wastes generated by fire recovery activities and flood preparation projects.

[c] Includes RCRA, TSCA, and New Mexico Special wastes.

Table 5.3-2
Fiscal Year 2002 Projected Waste Generation
(October 1, 2001, Through September 30, 2002)

Waste Type	FY02 Projected Waste Volume (m^3) from ER and Stabilization Activities	Volume (m^3) of Waste Targeted for Reduction/ Recycle to Achieve Goal	Percent Reduction Goal
			10%
Solid – Transuranic Radioactive	0.8	0	
Solid – Mixed Low-Level Radioactive	0	0	
Solid – Low-Level Radioactive	1640	164	
Solid – Hazardous*	3.8	0.3	
Solid – Sanitary	783	75	

*Includes RCRA, TSCA, and New Mexico Special wastes.

5.4 Waste Minimization Accomplishments FY01

WMin/PP was an integral part of the FY01 ER planning activities and field projects through recycling, reuse, contamination avoidance, risk-based cleanup strategies, and many other practices. Waste reduction benefits are typically difficult to track and quantify because the data to measure the amount of waste reduced (as a direct result of a WMin/PP activity) are often not available and are not easily extrapolated. In addition, many waste minimization practices employed during previous years are incorporated into standard operating procedures and no longer reported. Operating expenses of approximately $50,000 are provided annually to evaluate best management approaches, source reduction, and recycling options.

Pollution prevention capital projects not funded from project funds may also be funded through a Laboratory-wide "Waste Minimization/Waste Generation Set-Aside Tax" system. This system taxes waste generators according to the volumes and toxicity of wastes generated. The ER Project has previously submitted Return on Investment proposals for WMin/PP projects that are eligible for funding through this program. The Laboratory annually funds over $1M in pollution prevention projects through this program. A list of the projects funded in FY01 can be found at `http://emeso.lanl.gov/eso_projects/set_aside/gsaf.html`.

High-volume waste streams resulting from ER activities include contaminated soil and demolition debris such as metal and concrete. The WMin/PP techniques used in FY01 to reduce these high-volume waste streams led to the following accomplishments:

- At MDA P, 820 cubic meters of mixed wastes were released from radiological control allowing reclassification to hazardous waste using a risk-based DOE "authorized limits" disposal process.
- At MDA P, 474 cubic meters of rock was reused in the construction of stormwater control devices at various ER Project sites at TA-16.
- At MDA P, 300 cubic meters of concrete was sent to the Laboratory's TA-54 Area J for use as fill material in site closure preparation.
- At the SWMU 21-024(i) septic tank site, 18 cubic meters of mixed wastes were released from radiological control, allowing reclassification to hazardous waste using a risk-based DOE "authorized limits" disposal process.
- At SWMU 03-056(c), 1700 cubic meters of hazardous waste contaminated with low levels of polychlorinated biphenyls were granted disposal approval under the TSCA "as found" concentration disposal criteria, thus saving significant disposal costs. NMED-Hazardous Waste Bureau (HWB) also granted approval for disposal of a subset of the wastes at a solid waste disposal facility under a risk-based "no longer contained in" determination for the hazardous constituents present in the waste.
- At the Acid Canyon site, 180 cubic meters of potentially low-level mixed waste was reclassified to LLW based upon approval from NMED-HWB of a risk-based "no longer contained in" determination for the organic hazardous constituents present in the waste.

6.0 WASTE MINIMIZATION PROGRAM ELEMENTS

Listed below are program elements of the Laboratory's ER Project waste minimization program for FY02. Several of the elements are currently in place; however, several are in the planning stages. The elements will be implemented if economically and technically feasible.

6.1 WMin Coordinator

The WMin/PP coordinator will have a primary role in FY02 for developing and implementing programmatic elements of the ER WMin/PP Program by conducting the following activities:

- Improve WMin/PP awareness and information exchange within the ER Project.
- Provide technical reviews and WMin/PP input for ER documents and procedures, such as corrective measures studies, sampling and analysis plans, or other project work plans and provide working examples of "model" documents that incorporate WMin/PP elements.
- Provide technical assistance and consistency among focus areas to formalize standard approaches for WMin/PP in ER Project plans and procedures and institutionalize the use of design reviews, WMin/PP checklists, or value engineering for WMin/PP applications.
- Assist in developing WMin/PP language for ER subcontractor documents and project specifications, thus providing incentives and measurable goals for waste reduction.
- Pilot test or demonstrate site-specific waste reduction activities with a high potential for immediate return on investment.

The WMin coordinator(s) will provide WMin/PP tools and practices to the ER Project. The specific application and waste reduction potential of a tool will be dependent on the ER project and will be left to the judgment of the individual project leaders. The common Wmin/PP tools for use in the ER Project are summarized in the list that follows.

- WMin/PP tools for the negotiations and planning phases
  - Negotiate with regulators to recognize and implement WMin/PP where appropriate
  - Write WMin/PP into ER program documents
  - Include WMin/PP in budgets and contracts
  - Integrate WMin/PP into construction of engineered structures and best management practices
  - Train ER personnel on WMin/PP and build WMin/PP awareness
- WMin/PP tools for the assessment phase
  - Conduct efficient sample management and analysis
  - Consider alternative sampling techniques
  - Consider alternative drilling techniques
  - Segregate materials and waste through field screening
  - Use site control techniques
  - Use bulk waste packaging
  - Train ER personnel on WMin/PP and build WMin/PP awareness
- WMin/PP tools for the alternative evaluation and selection phase
  - Identify WMin/PP as a key criterion during treatment selection
  - Incorporate WMin/PP in key decision-making documents
  - Conduct treatability studies that support WMin/PP

  - Train ER personnel on WMin/PP and build WMin/PP awareness

- WMin/PP tools for the implementation phase
  - Scour and decontaminate building materials
  - Recycle and reuse materials from decommissioning activities
  - Prevent contamination migration
  - Dedicate a person on each ER project to promote WMin/PP (e.g., a WMin coordinator)
  - Reuse equipment
  - Train ER personnel on WMin/PP and build WMin/PP awareness

6.2 WMin Planning

WMin/PP is best integrated during the project planning, design, and engineering phases. WMin/PP strategies incorporated during the planning (and negotiations) phases are some of the few opportunities for "source reduction" because they have the potential to avoid or reduce the generation of contaminated soil and building debris, which represent a significant waste volume within the ER Project. Well-defined agreements (with regulators and stakeholders) regarding land-use scenarios, cleanup performance standards, and risk and pathway scenarios are highly effective in avoiding or reducing these primary wastes (e.g., soil, building debris) and secondary wastes.

The ESH-ID process provides a tool in the planning and design phase to assist Laboratory personnel in identifying and managing Environment, Safety, and Health Laboratory implementation requirements having the potential to impact the project. This process incorporates evaluation of potential waste-generating activities before project startup and includes review by a waste minimization/pollution prevention subject-matter expert.

6.3 Employee Training and Awareness

Waste minimization implementation is most effective when all employees consider WMin/PP part of their job responsibilities. To accomplish this, a planned approach to building waste minimization awareness has been developed. The goals of the awareness program are to

- improve recognition among employees that WMin/PP practices apply to ER activities;
- educate employees about successful implementation at the Laboratory and within DOE; and
- improve documentation of WMin/PP accomplishments.

In addition to awareness activities, during FY01 the Laboratory ESO updated the following general site training classes to emphasize waste minimization:

- "Waste Management Coordinator Requirements"
- "OSHA 1910.120 Hazardous Waste Operations"
- "Waste Generator Overview"
- "Waste Documentation Forms"
- "Radworker Training"

In addition to the above classes, each focus area's waste management coordinator is required to attend quarterly meetings as ongoing training in issues important to performing the duties of a waste management coordinator, including periodic updates from the ESO.

Laboratory managers are required to attend Integrated Safety Management training, which addresses management of all ES&H issues, including waste minimization and pollution prevention awareness.

6.4 Information and Technology Introduction

The introduction of new technologies for WMin/PP and waste management approaches is important to minimizing wastes. To support technology exchange, the waste minimization coordinator is available to research technologies or WMin/PP tools for ER Project focus area leaders, as necessary to obtain information on technical or economic feasibility. Some example sources for documents include

- DOE, Remedial Action Project Information Center, Oak Ridge, Tennessee
- DOE, EPIC (the DOE Pollution Prevention Information Clearinghouse), Pacific Northwest Labs, Richland, Washington
- EPA, Superfund Innovative Technology Evaluation (SITE) Database
- DOE, Technology Information Exchanges Conferences and Abstract Summaries
- EPA, Pollution Prevention Homepage Web Site
- EPA, Pollution Prevention Clearing House Web Site
- EPA, Envirosense Web Site
- EPA, National Center for Environmental Publications Web Site
- DOE, Environmental Web Site
- University of Texas El Paso, Southwest Pollution Prevention Center Web Site
- U.S. Navy, Joint Service Pollution Prevention Technical Library Web Site
- State of Kentucky, Kentucky Pollution Prevention Center Web Site
- DOE Oak Ridge National Laboratory, ORNL Pollution Prevention Web Site

6.5 Tracking and Reporting

The routine collection of data regarding waste minimization was established in FY96. Project managers are asked to provide a list of accomplishments as they occur, with a formal quarterly data consolidation effort.

6.6 Sort, Decontaminate, and Segregate

This task is currently implemented and is designed to sort and decontaminate LLW materials from decommissioning operations for the purpose of eliminating their disposal at TA-54 as low-level waste. Typical sorting practices include collection of all metal debris (including steel, lead, etc.) in separate boxes destined for shipment to a decontamination facility or commercial smelter for metals recovery. Decontamination work will involve the removal of surface radioactive contamination on equipment to allow for its reuse either at Los Alamos or other DOE facilities.

Additionally, many sites containing radioactively contaminated heterogeneous materials will place emphasis on proper segregation at the source to attain the maximum recycling and waste classification advantages.

6.7 Compaction

The ER Project plans to improve this process by using the compaction unit at TA-54 on suitable waste before final disposal. The compactor at TA-54 has a higher compaction yield than past equipment.

6.8 Survey and Release

Past practices have conservatively classified non-indigenous investigative-derived waste (e.g. personal protective equipment, sampling materials) as contaminated, based on association with contaminated areas. New policy within the Laboratory allows the ER Project to develop procedures to survey and release these materials as nonradioactive. This will reduce the volume of low-level waste buried at Area G from ER activities. Waste management coordinators will be trained in the Laboratory occupational radiation protection requirements.

6.9 Risk Assessment

Risk assessments are routinely conducted for ER projects, as prescribed in the Laboratory's Installation Work Plan (LANL 1998, 62060). Risk assessments allow the ER Project to plan remediation activities on the basis of the future risk to health and the environment. Often the risk assessment may determine that it is adequately protective and appropriate or beneficial to leave the material in the ground, thus avoiding the generation of waste.

Properly designed land-use agreements and risk-based cleanup strategies can provide flexibility to select remedial actions (or other technical activities) that may avoid or reduce the need to excavate or conduct other actions that typically generate high volumes of remedial waste. This is one of the few opportunities available to the ER Project for source reduction.

6.10 Incentives

The Laboratory's Environmental Stewardship Office and DOE Headquarters sponsor annual pollution prevention awards programs. Both of these programs provide financial awards and recognition to personnel who implement pollution prevention projects.

In 2000, the ER Project received an award for waste minimization efforts. This effort involved ER Project team members considering the different possibilities for disposal for a cleanup site, SWMU 03-056(c), and taking a proactive approach to the categorization of cleanup waste that resulted in a transportation and disposal cost savings of $525,000. By ensuring the waste was duly categorized, the team was able to prevent 2400 cubic yards of waste from being transported to a TSCA/RCRA facility in California or Texas. The team members provided documentation to EPA Region 6 and the NMED-HWB personnel indicating that the soil was not a human health risk. As a result, 1700 cubic meters of this waste was disposed of in-state, at Rio Rancho, New Mexico.

The ER Project participates in the Laboratory-wide "Waste Minimization/Waste Generation Set-aside Tax" system. This system charges waste generators according to the volumes and toxicity of wastes generated. This financial burden is an incentive for waste generators to reduce waste generation to lower total project

costs. The ER Project has previously submitted Return on Investigation proposals for WMin/PP projects that are eligible for funding through this tax. The Laboratory annually funds over $1M in pollution prevention projects through this program.

6.11 Lead-Handling Procedures

The ER Project does not routinely procure or use lead or handle excess lead. The inventory and decontamination of existing lead at the Laboratory has been conducted as part of a milestone of the Laboratory's Federal Facilities Compliance Act agreement and is outside the scope of the ER Project.

ER personnel will manage and minimize the amount of lead-contaminated waste using the following approaches.

- Projects will specify a preference to avoid the procurement or use of lead, when possible, giving preference to the use of steel in place of lead.
- Projects will specify the use of strippable or washable coatings for any lead materials that must be used and have the potential to become contaminated.
- Projects will plan for the decontamination of lead materials, when economically feasible, using blast grit, carbon dioxide blast (or other nondestructive blast), or chemical decontamination techniques. Preference will be given to decontamination techniques that minimize the generation of secondary waste (from the treatment process).
- Projects that handle noncontaminated lead waste as a primary waste from the removal action or decommissioning activity will make efforts to recover and redistribute the lead for use at the Laboratory or at another DOE facility.
- Projects will coordinate with the Laboratory's Solid Waste Operations Group for the appropriate handling and disposition of radioactively contaminated lead that cannot be decontaminated or redistributed.

6.12 Equipment Reuse

The reuse of equipment and materials (after proper decontamination to prevent cross contamination) such as plastic gloves, sampling scoops, plastic sheeting, and personal protective equipment will produce waste reduction and cost savings in FY02.

In addition, the Laboratory has initiated an equipment-exchange program, which identifies surplus or inactive equipment available for use. This not only eliminates the cost of purchasing the equipment, but it also delays the point at which the equipment is no longer needed and must be disposed.

7.0 BARRIERS TO WASTE MINIMIZATION IMPLEMENTATION

In some instances, regulatory requirements created situations where levels of waste minimization achieved fell below potentially achievable levels based on site conditions. Examples follow:

- A closure plan for MDA P, submitted to regulatory agencies, required clean-closure of the disposal area. Some materials from the disposal area, upon sampling and segregation, could be proved to be within acceptable cleanup criteria and left on-site for use in final site grading. However, because of the closure plan requirements, this material is being shipped off-site as waste.

- At MDA P, 200 cubic meters of steel was decontaminated, segregated, and prepared for shipment to a commercial steel recycling facility. However, because of the DOE moratorium on release of metal from radiological controlled areas, this material was not shipped to a recycler.
- At SWMU 03-056(c), the requirement to remediate the site to a 1 part per million clean-up level rather than using a risk-based approach contributed to much greater generated waste volumes.
- A risk-based analysis of the Acid Canyon site indicated that contamination levels quantified through a RCRA facility investigation did not pose significant risk to human health or the environment. However, DOE determined that the materials were to be removed resulting in several hundred cubic meters of additional waste disposal.
- Laboratory environmental requirements to protect wetlands, which result in continued National Pollutant Discharge Elimination System discharge of waters into canyons throughout the Laboratory, may result in additional transport of contaminants and drive future remedial requirements. A risk-benefit analysis could have been performed to determine if the transport of contaminants is more environmentally destructive than protecting wildlife and wetlands through continued discharge practices.

REFERENCES

"Guidance to Hazardous Waste Generators on the Elements of A Waste Minimization Program," Environmental Protection Agency, Federal Register Notice, Vol. 58, No. 102, May 28, 1993.

"Installation Work Plan for Environmental Restoration Project," Revision 7, Los Alamos National Laboratory report LA-UR-98-4652, November 1998.

"Los Alamos National Laboratory 2000 Environmental Stewardship Roadmap," Los Alamos National Laboratory report LA-UR-00-5601, December 1, 2000, available at `http://emeso.lanl.gov`.

Pollution Prevention Act of 1990 (*Omnibus Budget Reconciliation Act of 1990*), 42 U.S.C. 13101, et seq., available at `http://www.cornell.edu/uscode`.

Resource Conservation and Recovery Act (*Solid Waste Disposal Act) 1984,* as amended, 42 U.S.C 6901, et seq., available at `http://www.cornell.edu/uscode`.

"Site Pollution Prevention Plan for Los Alamos National Laboratory", Los Alamos National Laboratory report LA-UR-97-1726, May 1997 available at `http://emeso.lanl.gov/useful_info/publications/publications.html`.

"Waste Minimization and Pollution Prevention Regulations and Orders, Requirements and Identification List," U.S. Department of Energy, Office of Environmental Restoration and Waste Management, Revision 0, May 1995.

"Guidance on Establishment and Coordination of Authorized Limits for Release of Hazardous Waste Containing Residual Radioactive Material," U.S. Department of Energy, January 1997.

(6)

Los Alamos National Laboratory

UNIVERSITY OF CALIFORNIA

Environmental Restoration Project
MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

Date: September 13, 1996
Refer to: EM/ER:96-469

Mr. Ted Taylor
Los Alamos Area Office
U.S. Department of Energy, MS A316
Los Alamos, NM 87544

SUBJECT: INTERIM ACTION PLAN FOR ACTIVITIES AT TA-21, PRSs 21-023(c) and 21-024(b)

Dear Ted:

Enclosed for your records please find a copy of the Interim Action Plan for activities at Technical Area 21, Potential Release Sites 21-023(c) and 21-024(b). These activities are planned for completion in Fiscal Year 1997. Informational copies of this plan are being distributed to the regulators.

If you have any questions, please call Garry Allen at (505) 667-6080 or Bonnie Koch at (505) 665-7202. Thank you for your cooperation in this matter.

Sincerely,

Jorg Jansen
Program Manager

JJ/el

Enclosure: Interim Action Plan for TA-21, PRSs 21-023(c) and 21-024(b)

Received by EM DO
SEP 23 1996
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Attachment 17

Cy (w/enc.):
G. Allen, CST-18, MS E525
B. Garcia, NMED-HRMB (2 copies)
D. Griswold, AL-ERD, MS A906
J. Harry, EES-5, MS M992
B. Hoditschek, NMED-HRMB
B. Koch, LAAO, MS A316
N. Naraine, DOE-HQ, EM-453
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G. McMath, ERM-Golder, MS M327
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K. Zamora, LAAO, MS A316
EM/ER File, MS M992

Interim Action Plan for Potential Release Site

21-02300

Field Unit 1

Environmental Restoration Project

LAUR 96-2836

Los Alamos

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Fig. 1. Location of PRS 21-023(c) showing area of contamination and the location of the proposed fence. 2

1.0 RATIONALE AND OBJECTIVE OF INTERIM ACTION

Surface soils at the potential release site (PRS) 21-023(c) are contaminated with plutonium-239 and americium-241 at levels that exceed action limits for soil contamination areas established by the Environment, Safety, and Health (ESH) division at Los Alamos National Laboratory (LANL). ESH direction requires areas exceeding these limits be fenced and posted as a radioactive soil contamination area. The PRS is located in an uncontrolled area on US Department of Energy (DOE) property and the potential exists for exposure and/or contamination of Los Alamos National Laboratory (LANL) personnel or the public. The proposed interim action will limit the risk of potential exposure to LANL personnel and the public as well as bring PRS 21-023(c) into compliance with the site control and posting requirements for radioactive soil contamination areas.

2.0 SITE DESCRIPTION AND CHARACTERIZATION DATA

PRS 21-023(c) is a former septic system that routed sewage from building TA-21-33, the former waste treatment laboratory, through a septic tank to the surface on the south rim of DP Mesa above Los Alamos Canyon. Surface soil sampling at this PRS indicates plutonium-239 contamination to be as high as 300 pCi/g and americium-241 to be as high as 344 pCi/g. The ESH-1 action limit for plutonium-239 is 287 pCi/g, and for americium-241 the limit is 265 pCi/g. The site location and the extent of contamination are shown in Figure 1.

3.0 INTERIM ACTION

The proposed interim action involves placing a fence, with a locking vehicle gate, between the southeast corner of material disposal area (MDA) B and the northwest corner of MDA V (Figure 1). This fence will not encircle PRS 21-023(c) but it will keep unsuspecting individuals from accidentally coming into contact with contaminated soil since the area will be posted with signs indicating a radioactive soil contamination area. This interim action will bring the PRS into compliance with the access control and posting requirements for radioactive soil contamination areas and limit the potential for exposure of LANL personnel and the public.

4.0 MONITORING AND CONFIRMATORY ACTIVITIES

No monitoring or confirmatory sampling activities will be necessary after assembling the fence and posting signs in the area.

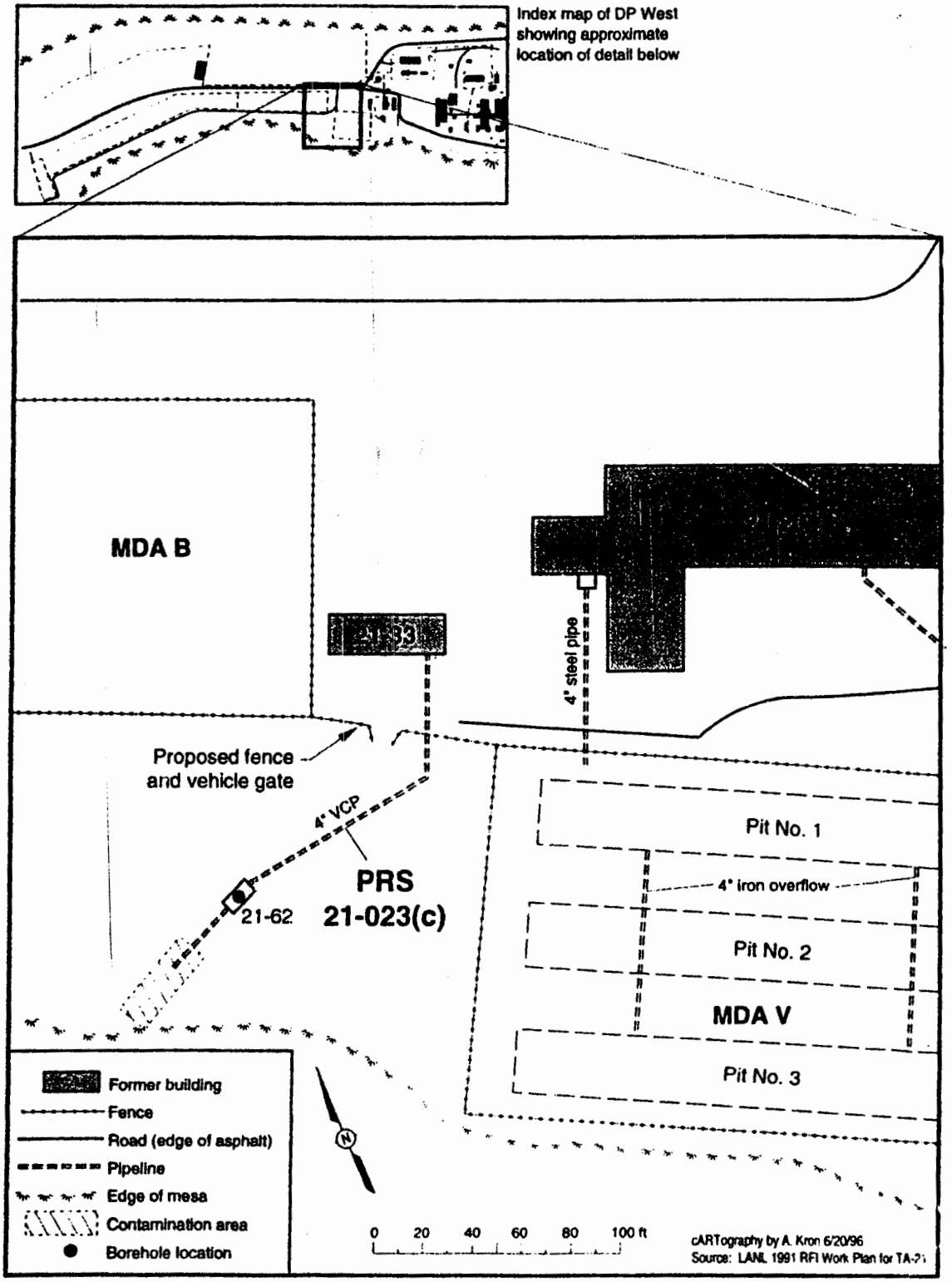

Fig. 1. Location of PRS 21-023(c) showing area of contamination and the location of the proposed fence.

5.0 MAINTENANCE AND INSPECTION

Limited maintenance of the fence and inspections of the signage will be required as a result of this proposed interim action. Maintenance will be limited to repairing the fence on an as-needed basis. The signage will be inspected annually to ensure legibility.

6.0 WASTE MANAGEMENT

No waste will be generated or require disposal as a result of the proposed interim action.

7.0 SCHEDULE AND COST

The fence and signage can be completed in approximately one day. The cost of this interim action is estimated to be less than $5 000.

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INTERIM ACTION PLAN
APPROVAL/DISAPPROVAL FORM

PRS(s) 21-023(c)

The undersigned have reviewed the Interim Action Plan and believe that an Interim Action is appropriate.

FPL GRAllen Date 4 Sept 96

FPC [illegible] Date 9/5/96

I, Theodore J. Taylor, DOE-LAAO, **APPROVE** ✓, **DISAPPROVE** _____ the accompanying Interim Action Plan for PRS(s) 21-023(c), TA-21.

The following reasons reflect the decision for disapproval:

Signed: [illegible] Date: 9/13/96

MAIL THE COMPLETED FORM TO: The Appropriate EPA Regional or State Office	United States Environmental Protection Agency **RCRA SUBTITLE C SITE IDENTIFICATION FORM**	
1. Reason for Submittal and Status of Information Supplied (see instructions on pages 10 and 11) CHECK CORRECT BOX(ES)	**A. Reason for Submittal:** ☐ To provide initial notification (to obtain an EPA ID Number for hazardous waste, universal waste, or used oil activities). ☐ To provide subsequent notification (to update site identification information). ☐ As a component of a First RCRA Hazardous Waste Part A Permit Application. ☐ As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment #_____). ☒ As a component of the Hazardous Waste Report.	
2. Site EPA ID Number (see instructions on page 11)	**EPA ID Number:** NM0890010515	
3. Site Name (see instructions on page 11)	**Name:** U.S. DOE LOS ALAMOS NATIONAL LABORATORY	
4. Site Location Information (see instructions on page 11)	**Street Address:** PO BOX 1663 MS K490 **City, Town, or Village:** LOS ALAMOS **State:** NM **County Name:** LOS ALAMOS **Zip Code:** 87545- -	
5. Site Land Type (see instructions on page 11)	**Site Land Type:** ☐ Private ☐ County ☐ District ☒ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other	
6. North American Industry Classification System (NAICS) Code(s) for the Site (see instructions on page 11)	**A.** 92811 **B.** **C.** **D.**	
7. Site Mailing Address (see instructions on page 12)	**Street Address:** P.O. BOX 1663, MS K490 **City, Town, or Village:** LOS ALAMOS **State:** NM **Country:** **Zip Code:** 87545- -	
8. Site Contact Person (see instructions on page 12)	**First Name:** JAMES **MI:** L **Last Name:** WHITE **Phone Number:** (505) 665-0677 **Phone Number Extension:**	
9. Legal Owner and Operator of the Site (see instructions on pages 12 and 13)	**A. Name of Site's Legal Owner:** DEPARTMENT OF ENERGY **Date Became Owner (mm/dd/yyyy):** 11/01/1989 **Owner Type:** ☐ Private ☐ County ☐ District ☒ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other **B. Name of Site's Operator:** UNIVERSITY OF CALIFORNIA **Date Became Operator (mm/dd/yyyy):** 11/01/1989 **Operator Type:** ☐ Private ☐ County ☐ District ☒ Federal ☐ Indian ☐ Municipal ☐ State ☐ Other	

EPA ID No. NM0890010515

10. Type of Regulated Waste Activity (Mark 'X' in the appropriate boxes. See instructions on pages 13, 14, 15, and 16)

A. Hazardous Waste Activities

1. Generator of Hazardous Waste (choose only one of the following three categories)

[X] a. LQG: Greater than 1,000 kg/mo (2,200 lbs.) of non-acute hazardous waste; or

[ ] b. SQG: 100 to 1,000 kg/mo (220 - 2,200 lbs.) of non-acute hazardous waste; or

[ ] c. CESQG: Less than 100 kg/mo of non-acute hazardous waste

In addition, indicate other generator activities (check all that apply)

[ ] d. United States Importer of Hazardous Waste

[X] e. Mixed Waste (hazardous and radioactive) Generator

For Items 2 through 6, check all that apply:

[ ] **2. Transporter of Hazardous Waste**

[X] **3. Treater, Storer, or Disposer of Hazardous Waste (at your site)** Note: A hazardous waste permit is required for this activity

[ ] **4. Recycler of Hazardous Waste (at your site)** Note: A hazardous waste permit may be required for this activity.

5. Exempt Boiler and/or Industrial Furnace

[ ] a. Small Quantity On-site Burner Exemption

[ ] b. Smelting, Melting, Refining Furnace Exemption

[ ] **6. Underground Injection Control**

B. Universal Waste Activities

1. Large Quantity Handler of Universal Waste [refer to your State regulations to determine what is regulated]. Indicate types of universal waste generated and/or accumulated at your site. (check all boxes that apply):

	Generated	Accumulated
a. Batteries	[X]	[ ]
b. Pesticides	[ ]	[ ]
c. Thermostats	[X]	[X]
d. Lamps	[X]	[X]
e. Other (specify) _____	[ ]	[ ]
f. Other (specify) _____	[ ]	[ ]
g. Other (specify) _____	[ ]	[ ]

2. Destination Facility for Universal Waste [ ]

Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

1. Used Oil Transporter - Indicate Type(s) of Activity(ies)

[ ] a. Transporter

[ ] b. Transfer Facility

2. Used Oil Processor and/or Re-refiner - Indicate Type(s) of Activity(ies)

[ ] a. Processor

[ ] b. Re-refiner

[ ] **3. Off-Specification Used Oil Burner**

4. Used Oil Fuel Marketer - Indicate Type(s) of Activity(ies)

[ ] a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner

[ ] b. Marketer Who First Claims the Used Oil Meets the Specifications

11. Description of Hazardous Wastes (see instructions on page 16)

A. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D002	D003	D004	D005	D006	D007
D008	D009	D010	D011	D018	D019	D021
D022	D023	D024	D025	D026	D027	D028
D029	D030	D031	D032	D033	D034	D035
D036	D037	D038	D039			D040
D041	D042	D043	F001	F002	F003	F004
F005	K045	P004	P005	P008	P010	P012

EPA ID No. NM0890010515

B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes. Please list the waste codes of the State-regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed for waste codes.

P014	P022	P023	P028	P029	P030	P047
P048	P063	P096	P098	P105	P106	P113
P120	U001	U002	U003	U004	U006	U007
U009	U012	U019	U022	U027	U029	U031
U037	U039	U042	U043	U044	U047	U048
U052	U055	U056	U057	U067	U068	U069
U070	U071	U073	U075	U076	U077	U078

12. Comments (see instructions on page 17)

U079	U080	U083	U092	U096	U102	U103
U105	U106	U107	U108	U112	U117	
U119	U120	U121	U122	U123	U127	U128
U131	U133	U134	U135	U144	U147	U151
U154	U159	U160	U161	U162	U163	U165
U166	U167	U169	U170	U181	U188	U190
U191	U196	U197	U201	U203	U204	U207
U208	U209	U210	U211	U213	U220	U223
U226	U227	U228	U239	U328	U353	U359
U404						

13. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. **(see instructions on page 17)**

Signature of owner, operator, or an authorized representative	Name and Official Title (type or print)	D. Date Signed (mm-dd-yyyy)
	JAMES L HOLT	02/23/2002
	OPS. ASS. DIR.	

CERTIFICATION

2001 Hazardous Waste Report

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Ray E Hahn 2/19/02

Ray Hahn, Date Signed
Group Leader for Solid Waste Operations Group
Los Alamos National Laboratory
Operator

W. James Holt 2/21/02

James L. Holt, Date Signed
Associate Director for Operations
Los Alamos National Laboratory
Operator

for Corey Cruz 2/27/02

Mr. Corey Cruz, Date Signed
Acting Director for Office of Los Alamos Site Operations
U.S. Department of Energy
Albuquerque Operations
Owner/Operator

LA-UR-01-6634

LOS ALAMOS NATIONAL LABORATORY
2001 POLLUTION PREVENTION ROADMAP

by

Thomas P. Starke, C. D'Ann Bretzke, Bryan J. Carlson, Eleanor Chapman, Robert Dodge, Patricia Gallagher, and James H. Scott

Environmental Stewardship Office
Los Alamos National Laboratory

Original published
December 1, 2001
LA-UR-01-6634

This roadmap and the FY00 plan for meeting the Department of Energy Secretarial Pollution Prevention/Energy Efficiency goals are certified to satisfy the requirements of 40CFR264.73(b)(9) [Resource Conservation and Recovery Act (RCRA)].

Thomas P. Starke
E Division, Environmental Stewardship Office
Los Alamos National Laboratory

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4.0. MIXED LOW-LEVEL WASTE

4.1. Introduction

For waste to be considered mixed (M) low-level waste (LLW), it must contain Resource Conservation and Recovery Act (RCRA) materials and meet the definition of radioactive LLW. LLW is defined as waste that is radioactive and is not classified as high-level waste (HLW), transuranic (TRU) waste, spent nuclear fuel, or by-product materials (e.g., uranium or thorium mill tailings). Test specimens of fissionable material irradiated only for research and development (R&D)and not for the production of power or plutonium may be classified as LLW, provided that the activity of TRU waste elements is <100 nCi/g of waste. Because MLLW contains radioactive components, it is regulated by Department of Energy (DOE) Order 435.1. Because it contains RCRA waste components, MLLW also is regulated by the State of New Mexico through Los Alamos National Laboratory's (the Laboratory's) operating permit, the Federal Facility Compliance Order/Site Treatment Plan (FFCO/STP) provided by the New Mexico Environment Department (NMED), and the Environmental Protection Agency (EPA). Materials in use that will be RCRA waste upon disposal are defined as hazardous materials.

Most of the Laboratory's routine MLLW results from stockpile stewardship and management and from R&D programs. Most of the nonroutine waste is generated by off-normal events such as spills in legacy-contaminated areas. Environmental restoration and waste management legacy operations, which also produce MLLW, are not included for the purposes of this roadmap. Typical MLLW items include contaminated lead-shielding bricks, R&D chemicals, spent solution from analytic chemistry operations, mercury cleanup-kit waste from broken fluorescent bulbs and mercury thermometers, circuit boards from electronic equipment removed from a TRU waste radiation area, discarded lead-lined gloveboxes, and some contaminated water removed from sumps.

Figure 4-1 shows the process map for MLLW generation at the Laboratory.

Total MLLW generation by division is shown in the pie chart in Fig. 4-2.

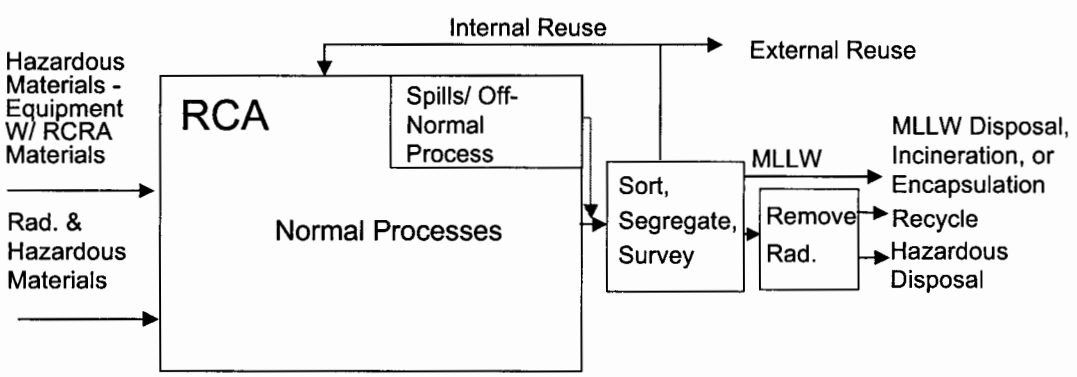

Fig. 4-1. Top-level MLLW process map.

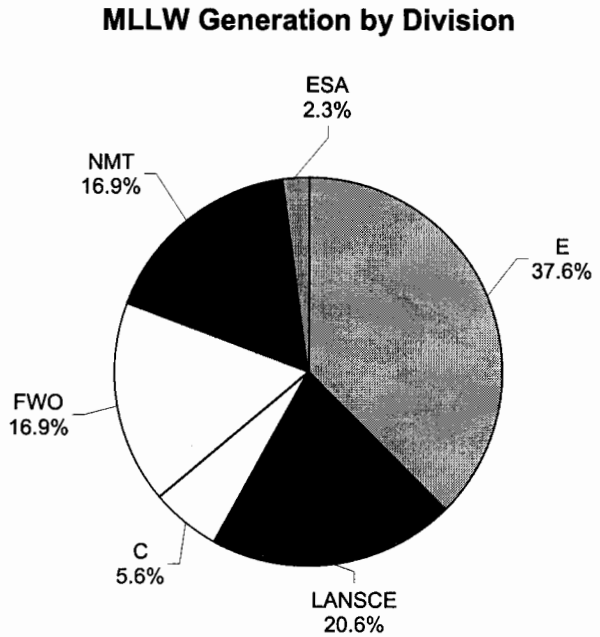

Fig. 4-2. Total MLLW generation by division.

Environmental Science and Waste Technology (E), Nuclear Materials Technology (NMT), Los Alamos Neutron Science Center (LANSCE), and Facility and Waste Operations (FWO) Divisions were the largest MLLW producers in fiscal year (FY) 01. The biggest contributor to E Division's waste volume was electronics from their sort-and-segregation activities [performed by the Environmental Technologies Group of the Environmental Science and Waste Technologies Division (E-ET)]. This sort-and-segregation activity is performed primarily for NMT and Chemistry (C) Divisions; the waste from this operation actually belongs to those divisions. The largest contributor to FWO waste volumes was nitric-acid bioassay waste left over from the nitrate destruction project at the Radioactive Liquid Waste Treatment Facility (RLWTF). This waste belonged to C Division before it was transferred to FWO Division. Mercury-contaminated debris from the drain system was the largest contributor to LANSCE-Division-generated volumes.

Routine MLLW generation by division is shown in the pie chart in Fig. 4-3.

E, NMT, C, and FWO Divisions were the largest routine MLLW producers in FY01. The largest contributor to E Division's waste volume was lead that could not be decontaminated. This lead was being decontaminated for other divisions. The largest contributor for NMT Division was lead solder in the copper joints and combustible debris from DOE Portsmouth. The major contributor for C Division was chemical and solvent waste, and the largest contributor for FWO Division was again nitric-acid waste from C-Division operations.

Routine and nonroutine MLLW generation is shown by year in Fig. 4-4.

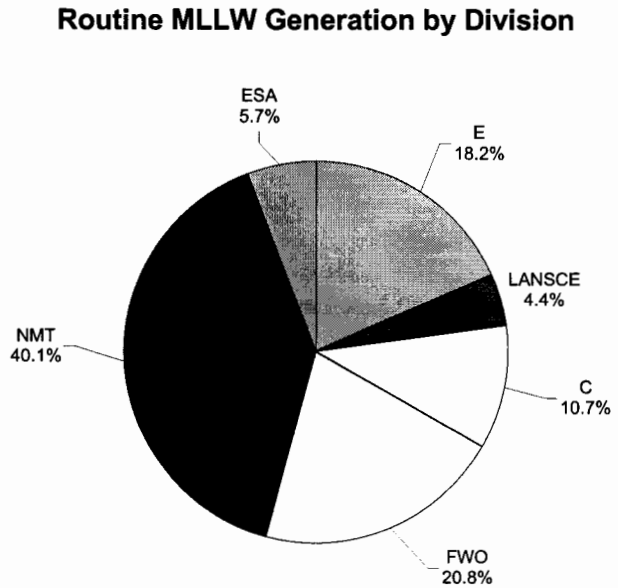

Fig. 4-3. Routine MLLW generation by division.

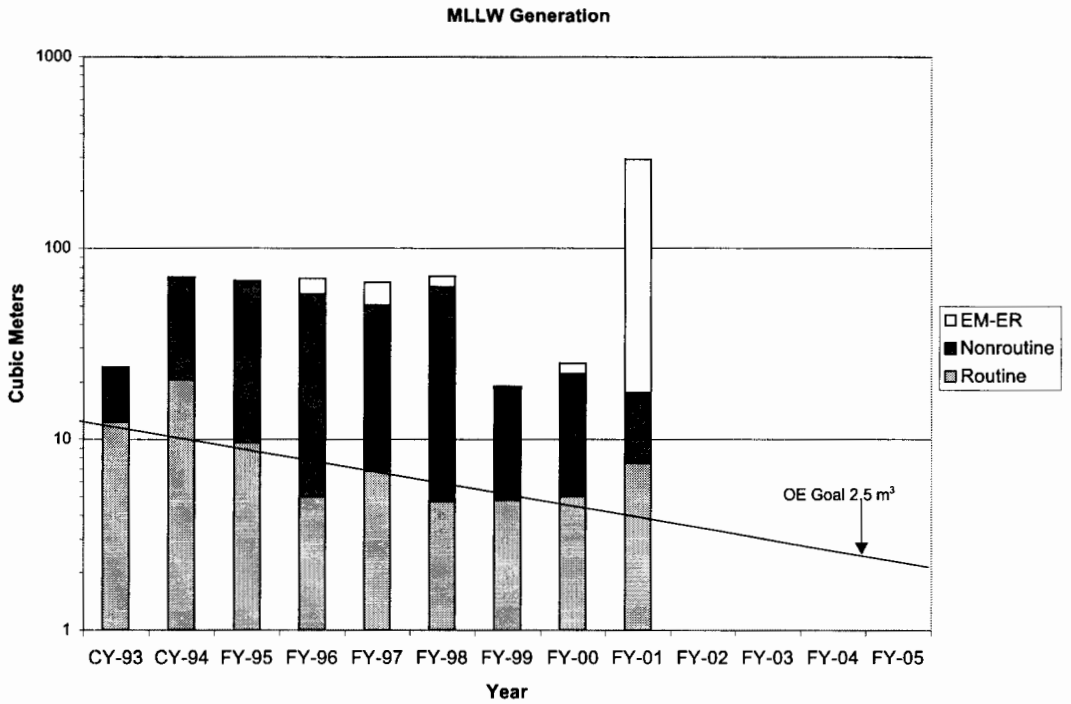

Fig. 4-4. Routine and nonroutine waste generation.

From FY94 to FY98, nonroutine MLLW has dominated the waste stream.

4.2. MLLW Minimization Performance

The DOE has implemented goals for waste minimization. The DOE-proposed MLLW goal is to reduce MLLW from routine operations by 80% by 2005 using calendar-year (CY)93 as the baseline. Because the MLLW generation in the baseline year was a low 12.3 m^3, the proposed DOE FY05 goal would be a very low 2.5 m^3. MLLW generation at the Laboratory is currently only ~5 m^3/yr. The Laboratory has proposed MLLW reduction projects that could reduce MLLW generation over the next 4 years. These projects include elimination of RCRA hazardous paint stripper, solidification of MLLW hydraulic oils, and improvements in chemical analysis processes. The Laboratory will continue to make every effort to reduce the MLLW generation to the lowest possible level consistent with funding and operational constraints.

Figure 4-5 shows the Laboratory's progress toward achieving this goal. For the past 3 years, the Laboratory has averaged ~5.75 m^3 of MLLW. The spike in waste generation of 7.45 m^3 that occurred in FY01 was caused by FY99 and FY00 waste that was placed in the Site Treatment Plan (STP) but not yet received at the disposal site at TA-54, Area G. All of this waste was added to the FY01 generation rate to avoid further complication of the waste accounting system. The actual FY01 generation was 4.39 m^3.

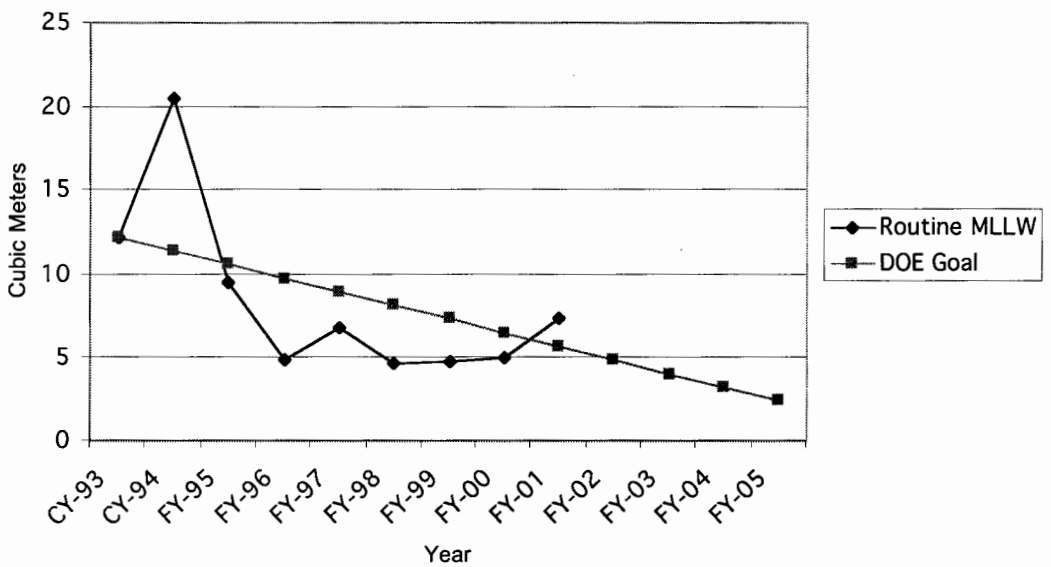

Fig. 4-5. Routine MLLW generation vs the DOE goal.

The FY02 Appendix F performance measure also requires Laboratory-wide implementation of waste minimization best practices. For MLLW minimization, these practices include

- implementing Green is Clean (GIC) in Laboratory radiological controlled areas (RCAs),
- neutralizing acids and bases where such action will make the waste non-RCRA, and
- replacing mercury thermometers and manometers in RCAs with mercury-free devices.

4.3. Waste Stream Analysis

MLLW is generated in RCAs. Hazardous materials and equipment containing RCRA materials, as well as MLLW materials, are introduced into the RCA as needed to accomplish specific activities. In the course of operations, hazardous materials become contaminated with LLW or become activated, becoming MLLW when the item is designated as waste.

Typically, MLLW is transferred to a satellite storage area after it is generated. Whenever possible, MLLW materials are surveyed to confirm the radiological contamination levels, and if decontamination will eliminate either the radiological or the hazardous component, materials are decontaminated and removed from the MLLW category.

Waste classified as MLLW is managed in accordance with appropriate waste management and Department of Transportation (DOT) requirements and shipped to TA-54.

From TA-54, MLLW is sent to commercial and DOE treatment and disposal facilities. The waste is treated/disposed of by various processes (e.g., segregation of hazardous components and macroencapsulation or incineration).

In some cases, the Laboratory procures spent MLLW materials from other DOE/commercial sites to avoid creating new MLLW. For example, LANSCE is designing several new beam stops and shutters from lead. Rather than fabricating these from uncontaminated lead, LANSCE can receive these parts at no expense from GTS Duratek (formerly SEG), a company that processes contaminated lead from naval nuclear reactor shielding. Duratek fabricates parts at no cost to the Laboratory because their fabrication costs are much less than those of MLLW lead disposal.

The largest waste streams are generated from one-time equipment removal operations, electronic components, and mercury-contaminated debris. These waste streams constitute ~50% of the MLLW waste type and are the primary targets for elimination. The waste streams were determined from the generation data for FY99 through FY01. The individual waste streams are listed in the following.

Electronic Equipment (5.83 m^3). This waste stream comprises circuit boards and other materials removed from electronic equipment containing lead.

Lead and Lead-Contaminated Debris (2.33 m^3). This waste stream comprises activated or surface-contaminated lead shielding, contaminated lead paint, and lead components. Lead normally is sent to Envirocare, Inc., for encapsulation and land disposal. Lead debris is contaminated copper pipe with lead solder joints, contaminated plastic sheets, duct tape, hoses, and used pump housings.

Mercury and Mercury-Contaminated Debris (1.75 m^3). This waste stream consists of elemental mercury and paper and plastic debris that has been contaminated with mercury.

Nitrate Waste (1.32 m^3). This waste stream consists of nitric acid used in Laboratory processes that is neutralized and disposed of. Previously, this waste stream was disposed of at the RLWTF. To meet new nitrate regulatory limits, the nitrate waste is being collected in carboys for off-site disposal.

Paint and Painting Debris (1.25 m^3).

Samples (1.10 m^3). MLLW samples are taken and analyzed routinely to determine radioactivity and hazardous constituent levels. This waste stream consists of the unused samples left over after the analytical procedures and treatability studies have been completed.

Copper-Pipe Solder Joints (0.87 m^3). This waste stream consists of copper piping and tubing with copper-pipe fitting joints soldered with lead-based solder. The Laboratory quit using lead-based solder some time ago. However, there is a legacy of this material present in the older facilities at the Laboratory.

Oil (0.75 m^3). This waste stream consists of oil removed from laboratory and facility machinery. Typically, the oil is contaminated with heavy metals from the bearings and other materials in the equipment. Laboratory vacuum pump oil also is typically contaminated with various laboratory solvents. This waste stream averages ~1 m^3 annually, although there are annual variances, depending on the month of generation.

Miscellaneous (0.40 m^3). This consists of contaminated water, decontamination fluids, unused commercial products, and other miscellaneous materials.

Asphalt (0.21 m^3).

Sump Cleanout (0.19 m^3).

The relative size of the various waste streams, expressed in per cent of total MLLW volume, is shown in Fig. 4-6.

The majority of waste produced from the electronics, lead/lead debris, mercury and mercury debris, copper-pipe solder joints, and fluorescent-light waste streams are legacy waste. Efforts to substitute alternatives and to improve sorting and segregation of these waste streams should reduce these volumes dramatically in the coming years. Nitrate waste, paint/paint debris waste, and oil wastes are ongoing waste streams for

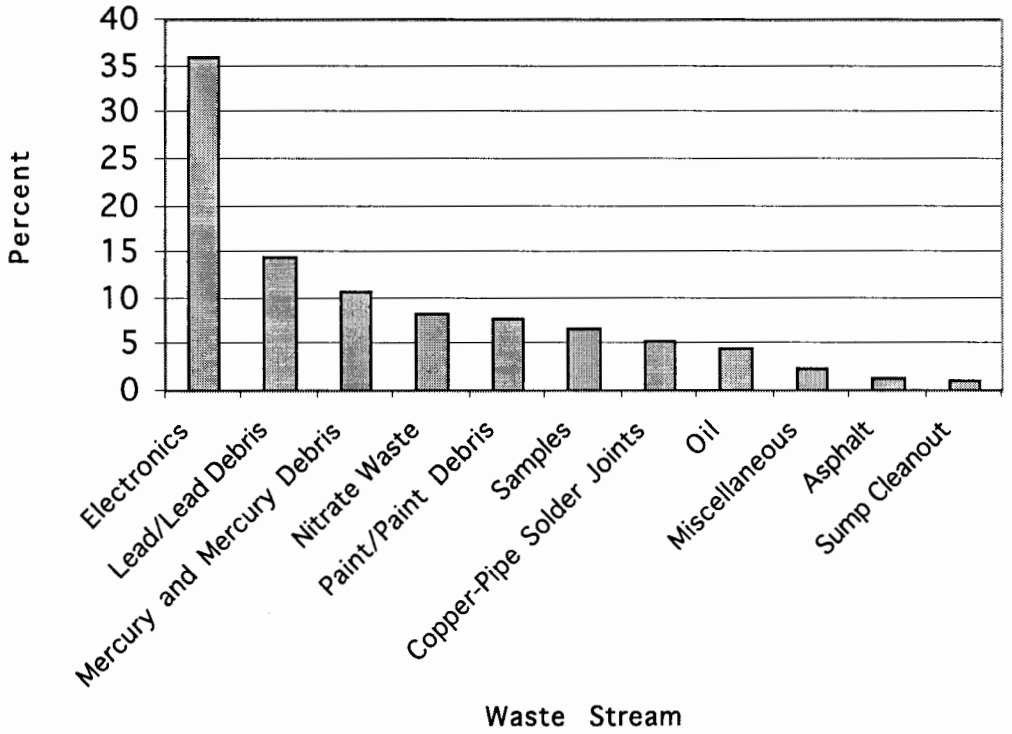

Fig. 4-6. Waste stream constituents.

which substantial improvement is possible. Improvement projects have been proposed that will lead to a reduction in MLLW. In the following sections, these projects are discussed.

MLLW cost an average of $36.85/kg to characterize, treat, and dispose of in FY01. Table 4-1 summarizes the Laboratory's typical unit costs for MLLW disposal. Waste is disposed of either by incineration or by macroencapsulation and land disposal. Macroencapsulation involves potting the waste (typically solid parts) in a suitable plastic and creating a barrier around the waste.

A small fraction of the MLLW generated has no disposal path. Typically, this waste is radiation-contaminated mercury or mercury compounds.

4.4. Improvement Projects

The following projects were identified as potential corrective measures for the MLLW type. These projects are divided into three categories: (1) projects completed in the last year, (2) projects currently funded and ongoing, and (3) unfunded proposed projects. Projects are characterized further by type: source reduction (SR), sort and segregate (SS), reuse/recycle (RR), treatment (T) or disposal (D).

TABLE 4-1
APPROXIMATE COSTS FOR MLLW STREAMS[4-1]

Waste Type	Treatment Method	Treatment and Disposal Cost	Transportation Cost
Activated or inseparable lead	Macroencapsulation	$15,000/m^3	$5000 per shipment
Surface-contaminated lead (for off-site recycling)	Standard decontamination methods (bead blasting, acid dip, etc.), followed by recycling	$8000/m^3	$5000 per shipment
RCRA waste-regulated solvents with radioactive components	Fuel recycling in Diversified Scientific Services, Inc. (DSSI)-permitted boiler	$19,815 to 52,840/m^3. Actual costs depend on levels of radionuclides, metal content, per cent water, and halogen content	$5000 per shipment
Activated RCRA waste components	Macroencapsulation	$15,000/m^3	$5000 per shipment
Fluorescent tubes with mercury	Amalgamation followed by landfill disposal	$105,900/m^3	$5000 per shipment
Printed circuit boards	Macroencapsulation	$15,000/m^3	$5000 per shipment

4.4.1. Completed Projects

These are projects that have been completed and/or implemented in the last year. Many projects completed in previous years, especially sort and segregate and recycle/resuse projects, continue to avoid MLLW.

Reduction of MLLW with Imaging Scanner (SR). Ion exchange and liquid scintillation are used to determine the ^{99}Tc chemical species in solution. These techniques have been replaced with paper chromatography using an imaging scanner to determine the distribution of ^{99}Tc on the paper chromatography strips, essentially eliminating this waste stream. This project has eliminated the generation of 0.05 m^3 of MLLW annually.

Mercury-Contaminated Radiation Waste Reduction (SS). This project evaluated the potential for segregation of mercury-contaminated debris during spill cleanup and other activities. The potential for segregation was determined by segregating and analyzing several actual mercury waste streams. This work was performed on actual waste during the performance of a mercury treatability study. The information clearly showed that personal protective equipment (PPE) and other paper and plastic wastes generated during cleanup activities were not contaminated and would pass toxicity-

characteristic-leaching-procedure (TCLP) testing. Based on these results, new sorting and segregation techniques will be deployed in FY02.

4.4.2. Ongoing Projects

These projects have been funded and currently are being executed. All of the ongoing MLLW projects are funded by the Environmental Stewardship Office (ESO) Base and Generator Set-Aside Fee (GSAF) Program.

Upgrade of Mercury Shutters (SR). The mercury beam shutters at the LANSCE facility are the major source of mercury-contaminated waste at the Laboratory. This project will redesign these shutters to eliminate this source of contamination.

LANSCE MLLW Reduction Project (SS). This project will implement the sorting and segregation techniques learned during the mercury-contaminated radiation waste reduction project performed during FY01.

Reduction of Perchlorate (SR). This project will evaluate the current aqueous waste streams discharging to the RLWTF to determine the best approach for reducing the quantity of perchlorates currently being discharged. It is unclear if the majority of perchlorates currently being discharged is the result of ongoing activities or is generated from the holdup of perchlorates in the effluent systems to the RLWTF.

Validation of New Chemical Oxygen Demand (COD) Test (SR). This project eliminates a no-path-forward mercury waste. Currently, a mercury reagent is used to perform COD analytical tests. This project will replace the mercury with manganese. After the EPA accepts the revised analytical method, the new method will eliminate the generation of 0.003 m^3/yr of MLLW.

Flat-Screen Monitors in RCAs (SR). Standard cathode ray tube (CRT) displays contain hazardous materials that, when contaminated in RCAs, become MLLW. About 100 CRT displays are removed from RCAs each year, and about 10% of these constitute ~3 m^3 of suspect MLLW. The balance is LLW. Flat-screen displays do not contain as much hazardous material (such as lead) as do CRTs. This replacement would eliminate one of the largest sources of contaminated electronics in the MLLW stream. In addition, the volume of a flat-screen monitor is about one-quarter of the volume of a CRT; thus, the volume of non-MLLW generated will be reduced. Waste avoidance after full deployment is estimated to be >1 m^3 of MLLW.

Oil-Free Vacuum Pumps (SR). This project is piloting the replacement of oil-filled vacuum pumps used in RCAs. Oil-free replacement pumps are being purchased. The use of these pumps will eliminate a significant amount of the MLLW oil produced at the Laboratory. Following this successful pilot, the use of oil-free vaccuum pumps in RCAs will be made a requirement. It is expected that when implemented sitewide, this project could eliminate up to 1 m^3 of MLLW annually.

Lead Reuse (RR). This project enables owners of unneeded, contaminated lead to identify, contact, and transfer that lead to projects that need it. In many cases, this avoids the need to either decontaminate or dispose of the lead.

Lead Removal from Gloveboxes (RR). Gloveboxes decontaminated to LLW levels are classified as MLLW because of the lead shielding present. This project funded the development of techniques to remove the lead and recycle the lead shielding. The lead from several gloveboxes was recycled as part of this project. This project will be incorporated into the Decontamination and Volume Reduction System (DVRS) in the future.

Sorting, Segregation, Recycle, and Reuse of Electronic Equipment (SS). Miscellaneous electronic equipment leaving RCAs is disassembled, and the individual components are surveyed. Those components that are nonradioactive are recycled. It is estimated that this project avoids up to 10 m^3 annually of MLLW generation.

Sorting, Segregation, Recycle, and Reuse of Miscellaneous Equipment from RCAs (SS). Equipment or materials (copper pipe with lead solder joints) are disassembled and surveyed. Materials that can be determined as nonradioactive are recycled. The ESO continues to support this project as part of its Base program activities.

Nitrate Bioassay Diversion Projects (SS). Nitric-acid waste currently generated by the bioassay laboratories must be disposed of as MLLW. This project allows this waste to be neutralized and, because of its extremely low level of radioactivity, diverted to the sanitary wastewater treatment facility.

Oil Solidification (T). Contamination of oils with radioisotopes is a common problem in RCAs. These oils become MLLW and must be disposed of as such. Recent tests, using the NoChar solidification media developed at Mound Laboratory, indicate that if the oil is solidified with this product, the oil would pass TCLP testing and could be buried as LLW, saving substantial waste disposal costs. This project is providing the data necessary to adopt and use this technology for routine management of contaminated oil wastes. When implemented, it is estimated that this process will eliminate up to 0.75 m^3 of MLLW generation annually.

4.4.3. Project Development and Unfunded Projects

These projects either have been proposed or are under development to help reduce MLLW. Proposed projects that are currently unfunded and projects under development are designated as such.

Improved Plutonium and Americium Analytical Methods for Environmental Matrices (SR) (Unfunded). Current methods for radioisotopic analyses of plutonium and americium in soil and water samples by alpha spectrometry performed by the Isotope and Nuclear Chemistry Group in the Chemistry Division (C-INC) were largely developed 15 or more years ago. Several modifications to the digestion, separation, electroplating, and counting steps of these methods, which should significantly improve the overall analyses, have been proposed. For soils, the aliquot size will be reduced from 10 to 5 g, and count length will be increased from 22 to 50 hours to maintain the current level of sensitivity of 0.002 pCi/g soil. For water samples, the current sample size will be maintained but the count length will be increased to 50 hours, resulting in improved sensitivity. Operational benefits include a reduction in both liquid waste discharges and airborne emissions, improvements in operational efficiency, reductions in the cost and time required to complete the analyses, reduced

exposure to hazardous chemicals to workers, and simplification of operations. These benefits will extend to future years.

Reduction of Total Nitrate-Containing Waste in Sample Coprecipitation Methods (SR) (Unfunded). This project proposes a modification of current methods to reduce the production of total nitrate waste in the urine bioassay for uranium and americium. Modifications in the precipitation and ion exchange steps may result in the elimination of ~70% of the total nitrates produced by the current process. New ion exchange technology has yielded a class of resins that requires much smaller volumes and a lower concentration of acids. Precision or accuracy of the data produced by these new technologies is unchanged. Changes in coprecipitation and the use of these new resins could reduce the total nitrates produced in this preliminary step. Added benefits include a reduction in both liquid waste discharges and airborne emissions, improvements in operational efficiency, reductions in cost and time required to complete the analyses, reduced exposure of hazardous chemicals to workers, and simplification of operations.

Reduction of Perchlorate Use in Environmental Radioanalytical Methods (SR) (Unfunded). The Analytical Chemistry Sciences Group (C-ACS) provides radioanalytical support for a wide variety of programs throughout the Laboratory. Of all the analytical methods currently in use, only one remaining program still utilizes concentrated (67% to 71%) perchloric acid as part of the analytical process. Using the acid has the following two functions: (1) in conjunction with concentrated HNO_3, the mixture is used to destroy and oxidize any remaining organic substances within the samples and (2) the addition of perchloric acid allows for the modification of the oxidation state that is needed to prepare the sample. With the new anion exchange resins commercially available today, along with the use of alternative methods for the destruction of residual organic materials, we believe that alternative methods can be developed that would remove the use of perchloric acid from the analytical process. On an average year, the Laboratory processes approximately 300 to 350 samples that require the use of this particular method. If an alternative method could be developed that would process the samples without the use of perchloric acid, the reduction would equate to (at 350 samples/year) ~3.50 liters. Modifying the method also would eliminate using a variety of other organic solvents (e.g., HDEHP and Dodecane) that are currently part of the liquid/liquid extraction methodology, thus removing a mixed waste component.

Lifetime Monitoring of Suspect Clean Materials (SS) (Unfunded). Much of the equipment that is used in RCAs is uncontaminated but must be surveyed before it can be declared nonradioactive under DOE Order 5400.5. The survey usually requires dismantling the equipment. This project will develop techniques for *in situ*, lifetime monitoring of equipment in RCAs. Many options exist for accomplishing this, but a protocol will be required to certify the accuracy of the monitoring techniques. The project will focus initially on the use of adhesives to collect radioactive materials. Other approaches are possible. A qualification program will be needed to verify that the selected rapid survey technique accurately represents the degree of contamination over time.

MLLW Aqueous Waste Stream Dose Assessment (SS) (Unfunded). A standard does not exist to release aqueous waste streams from radiological areas. Drinking-water limits exist for aqueous discharges to the environment, but no similar limits exist for hazardous aqueous waste streams being shipped to an MLLW treatment facility. If such a limit existed, many of our current MLLW streams could be classified as hazardous waste and the cost of treatment could be substantially reduced. This project will supply the funds necessary to perform a dose assessment to define release limits for this waste stream. The dose assessment will be prepared and submitted to the DOE Office of Environment, Safety, and Health (DOE-EH) for approval.

Improved Alpha Contamination Monitoring (SS) (Development). Many of the items in the MLLW stream are present because an accurate means of monitoring the alpha contamination levels is not available. This is especially true for circuit boards and copper-pipe solder joints having areas that are inaccessible to standard survey instrumentation. It is estimated that a more effective survey method could reduce the MLLW stream by as much as 1 m^3 annually.

Mercury Amalgamation (T) (Development). The Laboratory does not use the treatment standard for disposal of elemental mercury, i.e., amalgamation. The Laboratory adds elemental mercury to the debris collected during spill cleanup activities, although it is much more cost effective to amalgamate the elemental mercury so that it can be handled as a non-RCRA waste. Mercury spills generated in radiological areas generate MLLW, which frequently has no path to disposal; disposal also is very expensive when it is an available option. This project would develop suitable methods to collect and amalgamate elemental mercury during spill cleanup activities and avoid the generation of this MLLW stream.

If these projects are implemented, the Laboratory expects to see a significant reduction in MLLW next year. Because these projects address the routine MLLW stream components, the effects will be seen there. Figure 4-7 illustrates how the routine MLLW waste stream would be affected by implementation of these projects.

4.5. FY02 Performance Metrics

To ensure that the Laboratory continues to exhibit outstanding improvement in meeting the Laboratory's waste minimization goals, the ESO has established performance metrics for the individual waste streams and other aspects of concern. These metrics will be used to measure performance throughout the year to measure success. A score of 3 has been established for each completed project having a significant impact on a waste stream. Scores between 1 and 2 are assigned to projects with minimum waste stream impact or to the completion of major milestones. The metrics in Table 4-2 have been developed for the MLLW stream.

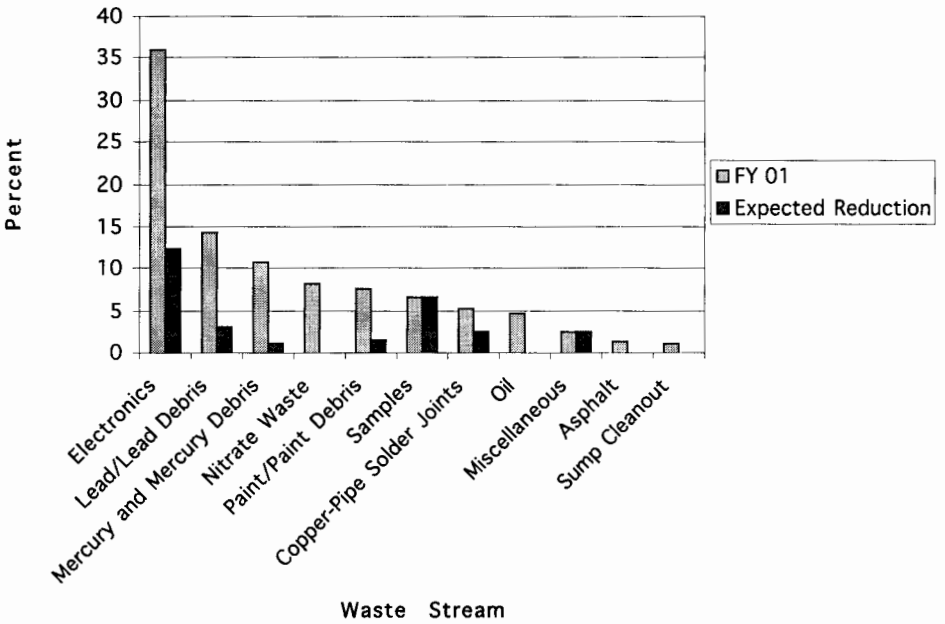

Fig. 4-7. MLLW stream and expected reductions.

TABLE 4-2
MLLW PERFORMANCE METRICS

Initiative (Score)	Comments
Complete Nitrate Bioassay Diversion Project (3)	This project will eliminate 1.32 m^3 of MLLW generated annually.
Complete Oil Solidification Project (3)	Although not present in this year's data, this stream averages 0.75 m^3 annually. This project will eliminate this waste stream.
Complete new Mercury Shutter Design (1)	
Obtain funding for FY03 Mercury Shutter Project (1)	$150K needed.
Complete LANSCE MLLW Reduction Project (3)	
Complete development and obtain funding for mercury amalgamation in <90-day-storage areas (1)	Legacy issues will continue to produce elemental mercury waste streams. These nonroutine waste streams average ~1 m^3 annually. If successful, this project will eliminate the majority of this waste.
Complete validation of new COD test (1)	This project will eliminate the generation of 0.003 m^3 of no-path-forward MLLW.
Complete development and obtain funding for improved alpha-contamination-monitoring instrumentation (1)	This project is technically difficult, and the potential for success is unknown at this time. However, if successful, it is estimated that improved monitoring could eliminate 1 m^3 of MLLW annually.

REFERENCES

4-1. John Kelly, Los Alamos National Laboratory, personal communication, November 2, 2000.

5.0. HAZARDOUS WASTE

5.1. Introduction

Hazardous waste is divided into three waste types: Resource Conservation and Recovery Act (RCRA) waste, Toxic Substances Control Act (TSCA) waste, and State special solid waste. For purposes of reporting the waste minimization University of California (UC) Contract (Appendix F, performance measure), Los Alamos National Laboratory (the Laboratory) distinguishes between routine and nonroutine waste generation. Routine generation results from production, analytical, and/or other research and development (R&D) laboratory operations; treatment, storage, and disposal operations; and "work for others" or any other periodic and recurring work that is considered ongoing. Nonroutine waste is cleanup stabilization waste and relates mostly to the legacy from previous site operations.

The RCRA and 40 Code of Federal Regulations (CFR) 261.3, as adopted by the New Mexico Environment Department (NMED), define hazardous waste as any solid waste that

- is generally hazardous if not specifically excluded from regulation as a hazardous waste;
- is listed in the regulations as a hazardous waste;
- exhibits any of the defined characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity); or
- is a mixture of solid and hazardous waste.

Hazardous waste also includes substances regulated under the TSCA, such as polychlorinated biphenyls (PCBs) and asbestos.

Finally, a material is hazardous if it is regulated as a special waste by the State of New Mexico as required by the New Mexico Solid Waste Act of 1990 (State of New Mexico) and defined by the most recent New Mexico Solid Waste Management Regulations, 20NMAC 9.1 (NMED) or current revisions. This determination includes the following types of solid wastes that have unique handling, transportation, or disposal requirements to ensure protection of the environment and the public health, welfare, and safety:

- treated formerly characteristic hazardous (TFCH) wastes;
- packing house and killing plant offal;
- asbestos waste;
- ash;
- infectious waste;
- sludge (except compost, which meets the provisions of 40 CFR 503);
- industrial solid waste;
- spill of a chemical substance or commercial product;
- dry chemicals that, when wetted, become characteristically hazardous; and

- petroleum-contaminated soils.

Hazardous waste commonly generated at the Laboratory includes many types of laboratory research chemicals, solvents, acids, bases, carcinogens, compressed gases, metals, and other solid waste contaminated with hazardous waste. This waste may include equipment, containers, structures, and other items that are intended for disposal and are contaminated with hazardous waste (e.g., compressed gas cylinders). Also included are asbestos waste from the abatement program, wastes from removal of PCB components, contaminated soils, and contaminated waste waters that cannot be sent to the sanitary wastewater system (SWS)s consolidation (SWSC) or high-explosives (HE) wastewater treatment plants.

Most hazardous wastes are disposed of through Duratek Federal Services, a Laboratory subcontractor. This company sends waste to permitted treatment, storage, or treatment storage disposal facilities (TSDFs), recyclers, energy recovery facilities for fuel blending or burning for British-thermal-unit recovery, or other licensed vendors (as in the case of mercury recovery). The treatment and disposal fees are charged back to the Laboratory at commercial rates specific to the treatment and disposal circumstance. The actual cost varies with the circumstances; however, the average cost for onsite waste handling by solid waste operation (SWO) and offsite disposal is $5.92/kg.

Figure 5-1 shows the process map for hazardous waste generation at the Laboratory.

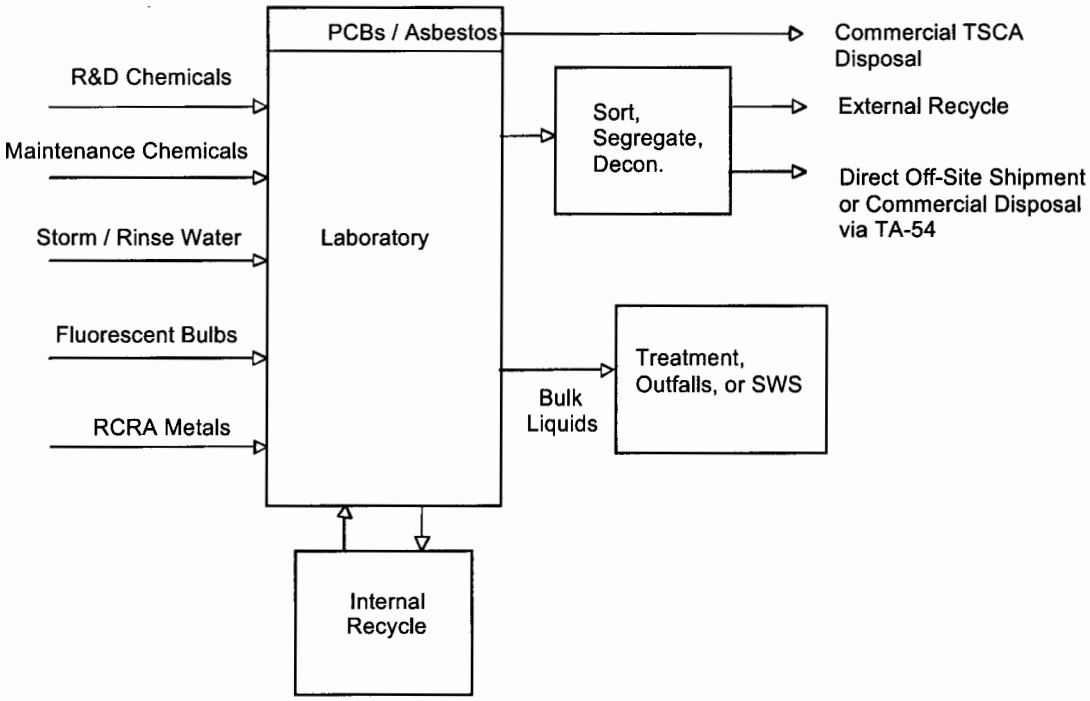

Fig. 5-1. Hazardous waste process map.

The total quantity of hazardous waste generated at the Laboratory during the past 5 fiscal years (FYs) is shown in Fig. 5-2. The waste quantities shown include routine, nonroutine, and environmental-restoration (ER)-generated waste.

The large volumes of environmental management (EM)-ER-generated hazardous waste in FY00 and 01 resulted from remediation activities. Nearly all of the EM-ER hazardous waste derives from projects in which large amounts of potentially contaminated soil and sod were removed. Routine hazardous waste decreased abruptly from FY99 to FY00 because the Laboratory began excluding recycled hazardous waste from the hazardous waste total. Routine hazardous waste generation unexpectedly increased in FY01 for several reasons, all of which are discussed in Section 5.2 (Hazardous Waste Minimization Performance).

As previously discussed, the Laboratory produces three types of hazardous waste: RCRA waste, TSCA waste, and New Mexico Special waste. The quantity of each type of waste, along with the quantity of recycled waste, is shown in Fig. 5-3. The waste shown in the figure excludes EM-ER-generated waste.

The total (routine and nonroutine) hazardous waste generation by division, excluding EM-ER, is shown in the pie chart in Fig. 5-4.

Johnson Controls Northern New Mexico (JCNNM), the Laboratory's crafts support contractor, generated the most hazardous waste, followed by the Facility and Waste Operations (FWO) Division and the Environment, Safety, and Health (ESH) Division. JCNNM waste results primarily from support of Laboratory operating divisions and special cleanups (e.g., the Cerro Grande Fire recovery effort).

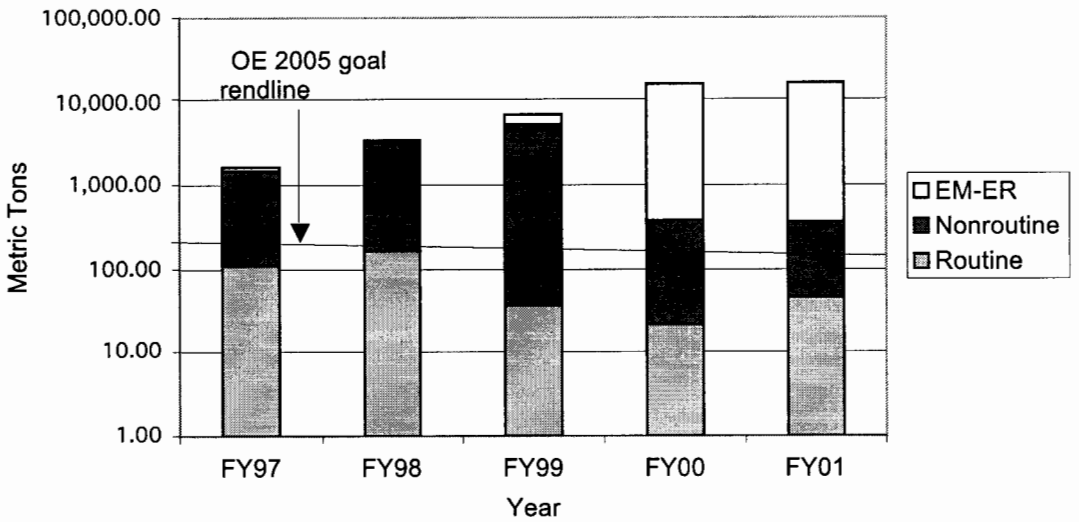

Fig. 5-2. Hazardous waste generation for FY97 through FY01.

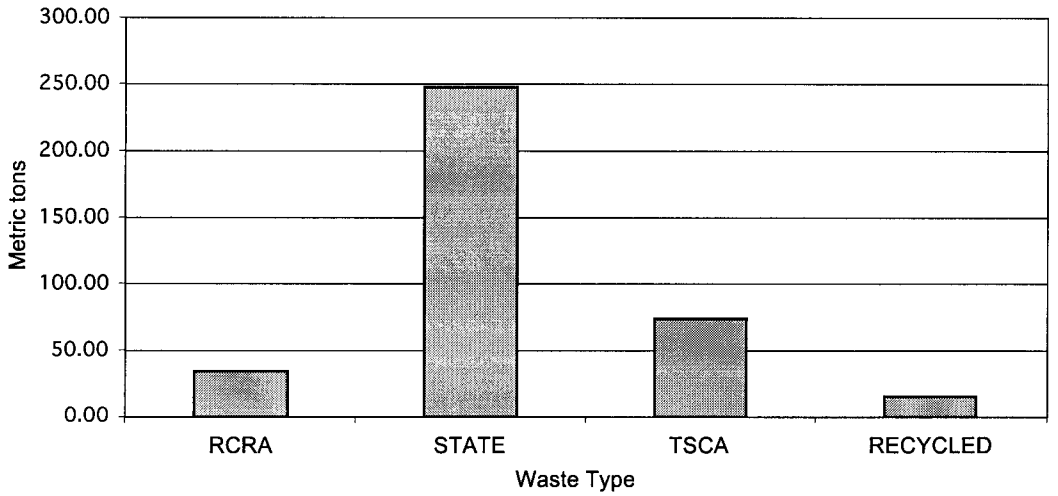

Fig. 5-3. FY01 hazardous waste by type.

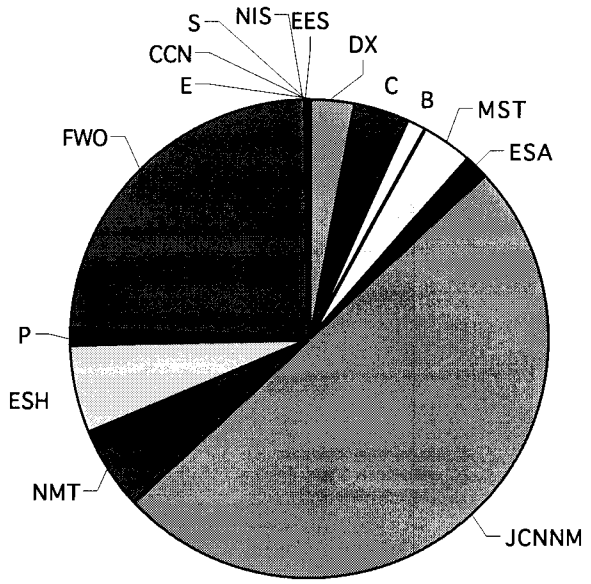

Fig. 5-4. The total hazardous waste by division, which excludes EM-ER waste.

The organizations that produced the most routine hazardous waste in FY01 were the Dynamic Experimentation (DX), Chemistry (C), and Bioscience (B) Divisions. The routine hazardous waste generation by division is shown in Fig. 5-5.

Additional information on hazardous waste, Laboratory procedures for managing hazardous waste, and historical waste generation can be found in Refs. 5-1 through 5-5.

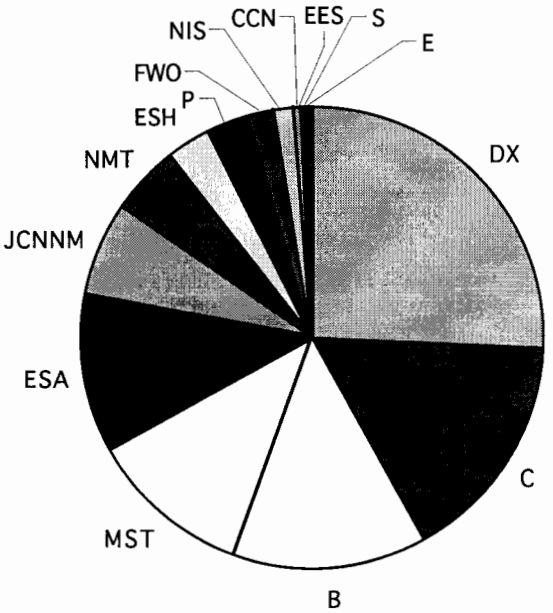

Fig. 5-5. Routine hazardous waste by division, which excludes EM-ER waste.

5.2. Hazardous Waste Minimization Performance

In a November 12, 1999, memorandum, the Secretary of Energy established a 2005 goal to reduce hazardous waste from routine operations by 90%, using a calendar year (CY) 1993 baseline. The Laboratory's CY93 baseline quantity was 307,000 kg; therefore, the FY05 target becomes 31,000 kg.

The FY01 performance measure in the UC contract, Appendix F for hazardous waste was more restrictive than the DOE 2005 goal because it required the Laboratory to generate no more than the FY00 quantity of hazardous waste, or 22,183 kg.

Although the trend over the last several years has been very good, the Laboratory is projected to dispose of 48,652 kg (48.6 tonnes) of hazardous waste in FY01 and is now above the FY05 goal. In addition, the Laboratory failed to stay below the FY00 hazardous waste generation rate as required by the FY01, Appendix F performance measure. The Laboratory's performance in hazardous waste generation is shown in Fig. 5-6.

A major factor in increased hazardous waste generation was the disposal of hazardous wastes in FY01 that have been recycled in the past. Approximately 10,250 kg of hazardous waste that could have been recycled was instead sent off-site for disposal. This action resulted from a conflict between the Laboratory's Appendix F performance measure for hazardous waste minimization and the waste management performance measure to process waste as quickly and cost effectively as possible. The cost to recycle

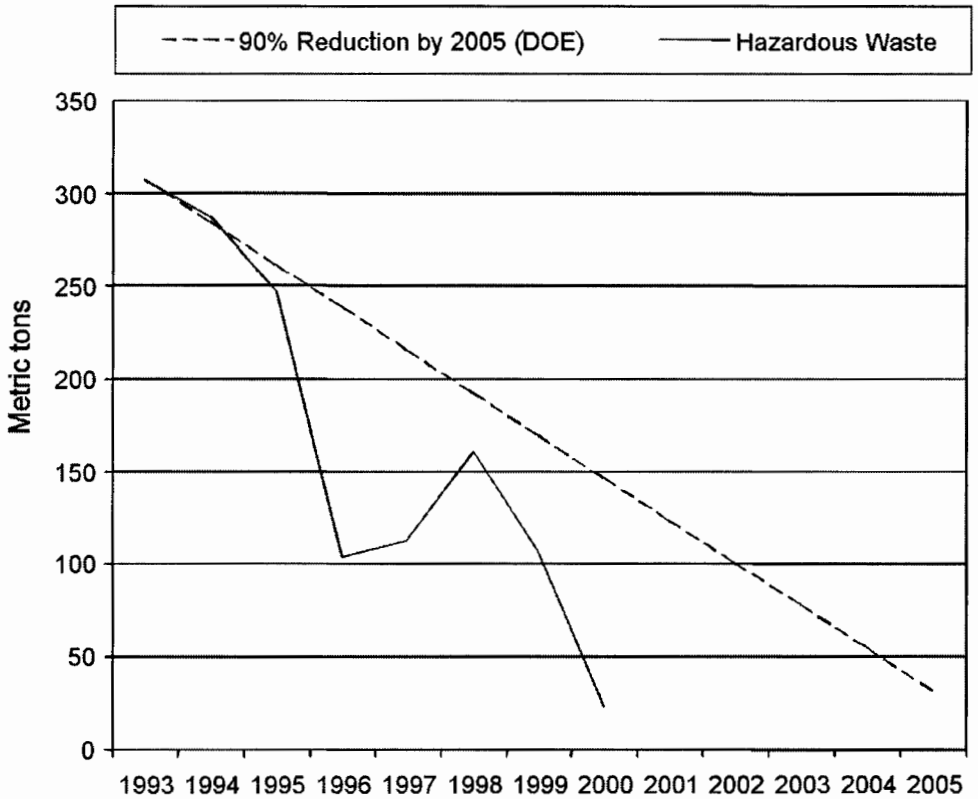

Fig. 5-6. Routine hazardous waste generation compared with the DOE's FY05 goal.

waste is currently higher than the cost to dispose of it. In addition, spent materials to be recycled frequently must be accumulated until there is a full truckload. Thus, disposal was chosen over recycling. This issue has been resolved, and wastes that can be recycked will be recycled in the future.

It is estimated that 15,000 kg of unused, unspent chemicals will be disposed of in FY01, as compared with 8000 kg in FY00. This increase is attributed to a continuing emphasis on reducing chemical inventories and to NMED interest in chemical stores during a recent RCRA audit. Also, a Green Zia tools analysis of chemical practices at TA-48, RC-1 stimulated over 3000 kg of additional unused/unspent chemical disposal.

5.3. Waste Stream Analysis

Hazardous waste is derived from hazardous materials/chemicals purchased, used, and disposed of; hazardous materials already resident at the Laboratory that are disposed of as part of equipment replacement, facility replacement, or facility decommissioning; and water contaminated with hazardous materials. After it is declared waste, hazardous waste is described (assayed if necessary), labeled, and collected at less-than-90-day storage areas. This waste then is either directly shipped to off-site TSDFs or transshipped to Area L, TA-54, from which it will be subsequently shipped to an off-site TSD. ER project waste typically is shipped directly from ER sites to commercial TSDFs.

Spent research and production chemicals make up the largest number of hazardous waste items; however, they account for only a small fraction of total hazardous waste volume. The ER project is the largest hazardous waste generator on-site, accounting for over 95% of all hazardous waste. The Laboratory spent a total of $6,500,000 managing newly generated hazardous waste in FY01.

The largest waste streams in the hazardous waste category for FY01 are described in the following list. These wastes are treated/disposed of off-site. This list includes both routine and nonroutine wastes but excludes EM-ER wastes. The Laboratory also has high explosives (HEs) and HE water wastes that are treated on site; these are not included below.

Sludge from the Sanitary Waste Plant (137,601 kg). In CY95, the Laboratory's grit screenings contained one sample that exceeded the regulatory limit for PCBs. Since then, sanitary sewage sludge has been disposed of as TSCA waste. The largest single constituent of the TSCA hazardous waste type is the PCB-contaminated sanitary sludge. In FY00, the Laboratory cleaned the PCB-contaminated drains and, because the Laboratory has not had another high-PCB event in the sanitary sludge, it received Environmental Protection Agency (EPA) approval to no longer treat the sludge as a TSCA waste. The EPA and NMED require that this waste be disposed of at an industrial landfill and that it not be allowed to be used as a soil amendment.

Cerro Grande Fire Debris (54,432 kg). This waste is contaminated debris from the Cerro Grande fire.

Oil, Petroleum, and Petroleum Contaminated Materials (42,762 kg). This waste stream is composed of both routine and nonroutine oil- or petroleum-contaminated materials. Approximately 91% of this waste stream is nonroutine legacy materials.

Asbestos (26,463 kg). All of the asbestos waste stream is TSCA waste and as such is nonroutine. The asbestos is almost exclusively in friable form.

Various Liquids (10,607 kg). This nonroutine waste stream is composed of contaminated rainwater and various unspecified contaminated liquids derived from EM-ER sites.

Unused/ Unspent Chemicals (14,850 kg). This waste stream is by far the largest routine waste stream for FY01 and constitutes more than 30% of the total routine hazardous waste disposed. It consists primarily of unopened or unused research and production chemicals, many in their original containers.

Ferric Chloride (4034 kg). This waste stream is composed of ferric chloride etchant used largely in production operations.

Corrosives (2905 kg). Large quantities of unneutralized acids and bases are disposed of each year at the Laboratory. These are primarily spent chemicals and consist mostly of sodium hydroxide and nitric acid.

Photochemicals (2233 kg). The Laboratory still operates several wet photographic processes. These processes generate waste in the form of spent fixers, developers, and silver-contaminated fluids or other items. Normally, these are recycled.

Commercial Products (1818 kg). The Laboratory routinely disposes of both used and unused industrial products, such as cleaners, strippers, rust inhibitors, and detergents.

Other (1784 kg). This waste stream consists primarily of laboratory trash, used glassware, other used containers, and spent equipment and components contaminated with hazardous materials, such as high-efficiency particulate air filter (HEPA) filters.

Ash (1739 kg). A persistent component of the hazardous waste stream is ash collected from the various Laboratory burn grounds.

Solvents (1170 kg). Solvents are widely used at the Laboratory in research, maintenance, and production operations. They constitute the single largest number of items sent for disposal each year and are persistent year-to-year.

Acetonitrile (1100 kg). This hazardous substance is used in the synthesis of nucleo-peptides. Because of program growth, the Laboratory expects to double the amount of waste generated next year.

Electoplating Fluids (888 kg). Electroplating is required, both for production and research operations. Most electroplating chemicals are continuously recycled; this waste constitutes the small residue that is disposed of.

Biomedical Waste (273 kg). This waste stream consists primarily of blood, blood-contaminated items, and used sharps.

Mercury (132 kg). Mercury waste is generated primarily from breakage of mercury-containing laboratory instruments and mercury spills. The 13 largest waste streams in the routine hazardous waste category for FY01 are shown in Fig. 5-7.

The waste streams are shown as a percent of total hazardous waste in Fig. 5-7. This chart excludes EM-ER waste and sanitary sludge with legacy contamination. Such wastes also were excluded from the calculation of percentages.

5.4. Improvement Projects

The following projects were identified as potential corrective measures for the hazardous waste type. These projects are divided into three categories: (1) projects completed in the last year, (2) projects currently funded and ongoing, and (3) proposed projects that are unfunded. Projects are characterized further by type: source reduction (SR), sort and segregate (SS), reuse/recycle (RR), treatment (T), or disposal (D).

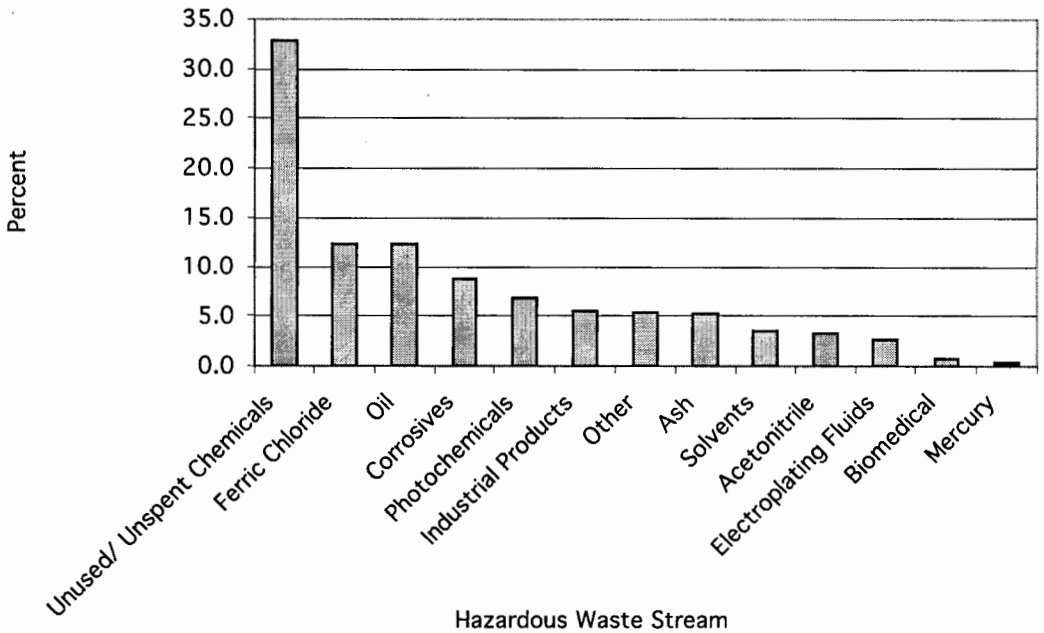

Fig. 5-7. FY01 routine hazardous waste streams.

5.4.1. Completed Projects

These projects have been completed and/or implemented in the last year.

Phosphor Scanner (SR). DX-3 has procured and is installing a large-format phosphor scanner that enables two large phosphor screens to replace photographic film in explosive hydrotest radiographs. By switching to the phosphor screens, DX-3 saves over $50,000 annually from reduced waste disposal, lower equipment costs, and labor. Approximately 450 gallons of spent photochemicals per year is no longer generated, and the administrative activities associated with storing, characterizing, documenting, and disposing of this waste have been eliminated. The film development area is being remodeled for other use.

Nonoperational Wastewater Sumps Eliminated (SR). Eight sumps at TA-9 (DX-1) have been capped and protected so that they no longer fill with rainwater that must be treated at the HE wastewater treatment plant. This process will avoid 40,000 gallons of HE wastewater. It also avoids the risk of sump overflow and release of contaminated water to the environment. This work was conducted by the IT Corporation under the direction of DX-1 and the ER Project.

Neutralize Radioactive Liquid Waste. Printed circuit fabrication at the detonator production facility generates 2000 kg of caustic hazardous waste annually. The Radioactive Liquid Waste Treatment Facility (RLWTF) will neutralize its acidic influent with the caustic stripper solution.

Sanitary Sewage Grit Screenings (SR). PCB-contaminated drains in the Sigma facility were cleaned to regulatorily prescribed levels as a corrective action for PCB contamination found in the SWSC plant screening grit.

Machine Coolant Recycle (RR). The MST-6 and ESA main machine shops have installed coolant filtration and management systems that achieve a tenfold-to-one-hundred-fold increase in coolant lifetime.

HE Waste Water Reduction (SR). DX-2 replaced handwashing of glassware with industrial dishwashers that use less water.

Nonhazardous Ink Plotter (SR). JCNNM replaced a plotter using hazardous inks with a dry-ink model.

Biowaste Autoclaving (T). B Division routinely autoclaves all biomedical waste so that it can be disposed of at the sanitary landfill.

5.4.2. Ongoing Projects

These projects have been funded and are currently being executed. In some cases, the remedies are administrative actions that have been taken to resolve conflicting goals. Hazardous waste reduction projects are funded by the Defense Programs (DP)-funded Pollution Prevention Program, Generator Set-Aside Fee (GSAF) Program, and mission programs.

Recycle vs Disposal (RR). As discussed in Section 5.2, Waste Minimization Performance, the major contributor to poor performance on the hazardous waste goal in FY01, arose out of the conflict between the waste minimization performance measure and the FWO-Division performance measure. This problem has now been rectified, and in the future, all recyclable waste will be recycled. The Laboratory will keep a record of increased costs resulting from recycling and report this to the DOE in the future. No additional action is required. This action will reduce hazardous waste disposal by ~10,000 kg.

Hydraulic Systems Improvements (SR). JCNNM is redesigning hydraulic couplings on backhoes and other machinery to reduce the likelihood of coupling failure and the resulting oil spills. Oil spill cleanup generates New Mexico State special waste. JCNNM is replacing the oldest Pakmaster (trash compacting truck), which has had frequent hydraulic line failures. (These improvements are based on a Green Zia Tools assessment conducted by JCNNM in FY00.)

Bio-Based Hydraulic Oil (SR). JCNNM is converting Laboratory heavy equipment to use bio-based hydraulic oils. These are not regulated as hazardous waste; consequently, oil spills and spill cleanup will become sanitary waste.

Non-RCRA Wastewater Pretreatment (T). The JCNNM-managed sanitary wastewater system (SWS) has configured a wastewater pretreatment trailer to process wastewaters that do not meet the SWS-plant waste acceptance criteria (WAC). These screenings are now disposed of as State special solid waste. Once treated, they can be sent to the SWS plant. Floor stripper (for removing wax) and mop water from some floor-cleaning

operations are examples of this kind of waste. Hazardous waste will be reduced by ~900 kg.

Ferric Chloride Recycle/Disposition (RR). Ferric chloride suppliers will pick up spent ferric chloride solution for recycle. This action will reduce hazardous waste by ~4000 kg.

5.4.3. Proposed Projects

These projects or actions have been proposed to (1) allow further reduction in the routine hazardous waste stream; (2) improve operational efficiency; and, in the case of fixing finely divided powders, (3) increase safety. Many projects currently are unfunded. If implemented, they will provide an additional margin against unexpected and unplanned increases in waste generation. The projects are presented in the order of the waste streams they are intended to reduce, with the largest streams first.

Distributed Chemical Pharmacy (SR). The Laboratory is in the process of procuring a new chemical management software system, which will create the opportunity for much more effective management of chemicals, both maintenance/production chemicals and research chemicals. This project will develop and implement site-wide procedures for (1) sharing and exchanging chemicals, (2) minimizing the amount of chemicals purchased, and (3) implementing an external chemical exchange system. The external exchange system will enable the Laboratory to share excess chemicals with other institutions. This will be a distributed system in that chemicals will not be stored or dispensed from a central facility. This project should have an impact on the unused chemical and the solvent waste streams, which are large and persistent.

Oil Waste Reduction (SR). The continuing expansion of ongoing programs is expected to reduce this waste stream significantly over the next 2 to 3 years.

Digital Photography Implementation (SR). The photochemical waste stream is one of the large components of FY01 hazardous waste. The Laboratory has been gradually making the transition from film and wet chemistry photodevelopment to digital photography. This project will complete that transition, including development of Laboratory photographic and x-ray photographic standards that would preclude future purchase of film photography and wet film development equipment, except where it is the only possible option. The project involves replacing wet chemistry systems (cameras, development, and printing) at low-volume activities, followed by a changeover in the Laboratory's production photographic services. This project, combined with recycle of photochemical waste, should virtually eliminate this waste stream.

Sitewide Process Neutralization (T). Currently, spent acidic or basic chemicals are disposed of as waste. Because of their corrosive nature, they are RCRA hazardous waste. By implementing a simple neutralization step at the end of the processing cycle, many kilograms of hazardous waste (in the form of corrosives) could be converted to less-hazardous New Mexico State special waste. Neutralized waste should be easier to recycle than the original corrosives.

Acetonitrile (RR). The Laboratory produces ~1 tonne of this waste material per year. The chemical is used in the production of nucleopeptides. The Laboratory expects programmatic growth, which would effectively double yearly production starting in FY02. The Laboratory has initiated an investigation of recycling options for this material, including both on- and off-site recycle. After evaluating these options, the Laboratory will pursue the selected option.

Fixing Finely Divided Powders (T). Many waste products that are not inherently hazardous are classified as hazardous waste because they are in the physical form of fine, respirable powders. By potting, melting, or otherwise immobilizing these powders, they can be removed from the hazardous waste stream.

Nonhazardous Fluorescent Light Bulbs (SR). Several Laboratory groups have switched to low-mercury (nonhazardous) fluorescent light bulbs that can be managed as salvage rather than as hazardous waste at the end of their useful life. These are cost competitive with high-mercury light bulbs and are available through the Laboratory's Just-in-Time (JIT) procurement system. Low-mercury bulbs are now available for almost all Laboratory light fixtures. Procurement group BUS-5 and Summit Electric (the Laboratory's fluorescent-bulb supplier) are working to update JIT to direct purchasers to the low-mercury bulbs. A Laboratory-wide conversion to low-mercury bulbs will simplify broken-bulb cleanup (which no longer must be treated as hazardous waste spills), eliminate the cost of managing bulbs as hazardous waste, and eliminate the risk of compliance failure from improper bulb management. This improvement does not reduce waste generation because high-mercury bulbs are already being recycled.

Paint Shop Waste Minimization (SR or RR). The JCNNM paint shop generates considerable hazardous waste. During FY02, JCNNM will be conducting a Green Zia tools analysis of lacquer and thinner waste streams to identify waste minimization options.

Heat-Exchanger-Cleaner Spent Solution (SR or RR). Chemical cleaning of cooling-tower heat exchangers leads to significant volumes of hazardous waste. The Laboratory is now completing a Green Zia tools analysis of this waste stream that identifies several waste minimization strategies that will be pursued in the coming year.

Mercury Elimination (SR). The use of mercury-containing devices (thermometers) is a frequent source of hazardous waste. When these break, they generate significant hazardous waste. The Laboratory's pollution prevention program has funded replacement of mercury thermometers with alcohol and electronic ones.

Recover and Recycle Silver from Photochemical Fluids (RR). A vendor will be identified and a contract will be placed to recover silver from photochemical fluids. This will allow recycling of the silver.

Initiate Puncture and Recycle of Aerosol Cans (RR). Aerosol propellants are normally hazardous substances. Aerosol cans cannot be recycled if they contain residual propellant. By puncturing the cans and recovering the propellant, the cans can be recycled.

If these projects are implemented, the Laboratory should see a significant reduction in hazardous waste. Because these projects address the routine hazardous waste stream components, the effects will be seen there. Figure 5-8 illustrates how the routine hazardous waste stream would be affected by implementation of these projects over the next few years.

Successful implementation of these projects will reduce the hazardous waste stream to a total value below the FY05 goal of 31 tonnes.

5.5. FY02 Performance Metrics

The Environmental Stewardship Office (ESO) has established performance metrics for the waste stream minimization project completion. These metrics will be used to measure performance throughout the year to assess progress. A score of 3 has been established for each completed project having a significant impact on a waste stream. Scores of 1 or 2 are assigned to projects with minimum waste stream impact or to the completion of major milestones. The metrics in Table 5-1 have been developed for the hazardous waste stream.

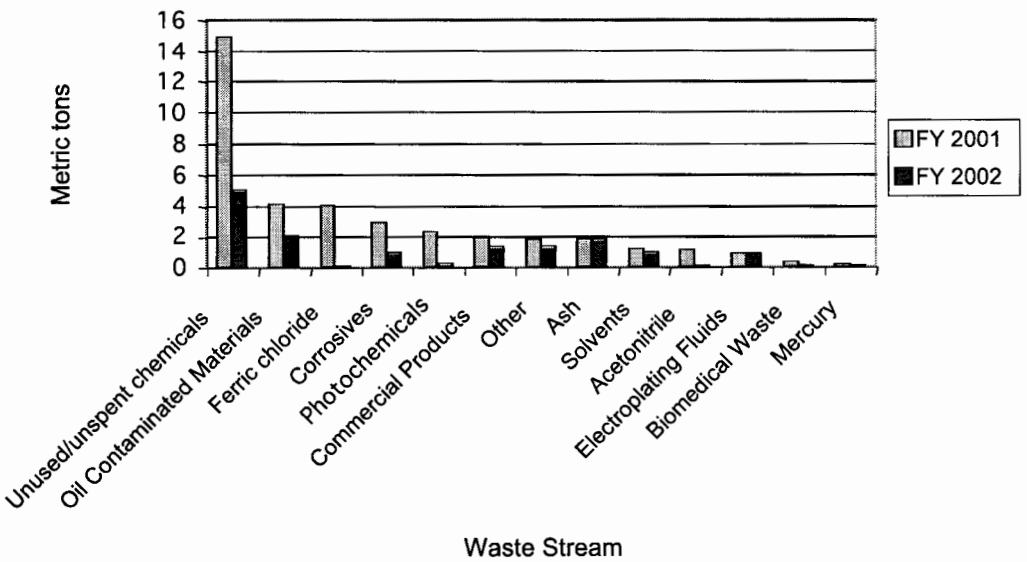

Fig. 5-8. Projected routine hazardous waste in FY02.

TABLE 5-1
HAZARDOUS WASTE METRICS

Initiative (Score)	Comments
Develop distributed chemical pharmacy protocol (1) Implement distributed chemical pharmacy (2)	This project will reduce the unused/unspent chemical waste stream significantly.
Implement digital photography (80% of Laboratory) (2)	
Perform sitewide conversion to bio-based hydraulic oils (2)	
Develop sitewide process neutralization protocol (1) Implement in 80% of possible processes (2)	
Identify and implement recycling options for acetonitrile (3)	This project will counter the expected growth of this waste stream and could eliminate all such waste being disposed of.
Recover and recycle silver from photochemicals (1)	
Initiate puncture of aerosol cans (1)	
Implement other proposed projects (2 each)	

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5-3. "General Waste Management Laboratory Implementing Requirement (LIR)," Laboratory Implementation Requirement LIR404-00-02.2 (Issue Date: November 1, 1998, Revised Date: October 6, 1999).

5-4. "Hazardous Waste Management LIR—Laboratory Implementation Requirements," LIR404-00-03.0 (Effective Date: December 16, 1996).

5-5. Los Alamos National Laboratory Hazardous Waste Permit NM0890010515-1 (1989).