LA-13868-PR
Progress Report

2000 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Section 313

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2000 Toxic Chemical Release Inventory Report for the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Section 313

ESH-17 Air Quality Group

Los Alamos
NATIONAL LABORATORY

Los Alamos NM 87545

2000 EPCRA Section 313 Report

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Title III, Section 313

ESH-17 Air Quality Group

Abstract

On April 21, 2000, President Clinton signed Executive Order (EO) 13148, which requires all federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act (EPCRA), or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986. Section 313 of EPCRA specifically requires facilities to submit a Toxic Chemical Release Inventory report (Form R) to the U.S. Environmental Protection Agency (EPA) and state agencies if the owners and operators manufacture, process, or otherwise use any of the listed toxic chemicals above listed threshold quantities. EPA compiles this data in the Toxic Release Inventory (TRI) database. A Form R must be submitted on or before July 1 each year and must cover activities that occurred at the facility during the previous year.

On October 19, 1999 EPA promulgated a final rule on persistent bioaccumulative toxics (PBTs). This rule added several chemicals to the EPCRA Section 313 list of toxic chemicals and established lower reporting thresholds for these and other PBT chemicals that were already reportable under EPCRA Section 313. These lower thresholds are applicable beginning with reporting year 2000.

For reporting year 2000, Los Alamos National Laboratory (LANL or the Laboratory) submitted a Form R for mercury. The new reporting threshold for mercury, one of the PBT chemicals, is 10 pounds per year. No other EPCRA Section 313 chemicals were used in 2000 above the reportable thresholds. This document was prepared to provide a description of the evaluation of EPCRA Section 313 chemical usage and threshold determinations for LANL for calendar year 2000 as well as provide background information about the data included on the Form R report.

1.0 INTRODUCTION

On April 21, 2000, President Clinton signed Executive Order (EO) 13148, which requires all federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act (EPCRA), or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986. EO 13148 supersedes EO 12856 of 1995. Section 313 of EPCRA specifically requires facilities to submit a Toxic Chemical Release Inventory report (Form R) to the U.S. Environmental Protection Agency (EPA) and state

agencies if the owners and operators manufacture, process, or otherwise use any of the listed toxic chemicals above listed threshold quantities. On October 19, 1999 EPA promulgated a final rule on Persistent Bioaccumulative Toxics (PBTs). This rule added several chemicals to the EPCRA Section 313 list of toxic chemicals and established lower reporting thresholds for these and other PBT chemicals that were already reportable under EPCRA Section 313. These lower thresholds are applicable beginning with reporting year 2000.

EPA compiles the data submitted on the Form R reports in a Toxic Release Inventory (TRI) database. The TRI database provides the public with information on the releases of EPCRA Section 313 chemicals in their communities as well as provides EPA with release information to assist in determining the need for future regulations. A Form R must be submitted on or before July 1 each year and must cover activities that occurred at the facility during the previous year. Even though federal facilities were not required to report under EPCRA Section 313 until 1995, Los Alamos National Laboratory (LANL) has been reporting under EPCRA Section 313 since 1987. For reporting year 2000, LANL submitted a Form R for mercury. No other EPCRA Section 313 chemicals were used in 2000 above the reportable thresholds. Toxic chemicals used in exempt activities, as defined by the regulation, are excluded from analysis. Descriptions of these exempt activities are included in Section 4.0 of this report.

This report summarizes the data evaluation, exemption analysis, activity determinations, and threshold determinations for toxic chemical use in 2000 at LANL and describes what was reported on the Form R report. Individual sections for certain toxic chemicals used at LANL are included in the report. Appendix A presents a summary table of EPCRA Section 313 chemicals procured at LANL. Appendix B includes a copy of the Form R submitted to EPA and the state agency. Appendix C provides more detailed information on the calculation of environmental releases of mercury, as reported on the Form R.

2.0 FACILITY INFORMATION AND CONTACTS

LANL is located at latitude of 35°49'51" and longitude of 106°14'15" in Los Alamos County, New Mexico. LANL is owned by the Department of Energy (DOE) and is operated by the University of California (UC). LANL's TRI facility ID number is 87545LSLMSLOSAL. The TRI facility number for the Los Alamos DOE complex is 87544SDLSL52835. The 2000 EPCRA Section 313 contacts are Douglas Stavert, UC technical contact at (505) 665-0235; George Van Tiem, UC public contact at (505) 667-6214; Gene Turner, DOE technical contact at (505) 667-5794; and Theodore Taylor, DOE public contact at (505) 665-7203.

3.0 ACTIVITY DETERMINATIONS AND ASSOCIATED THRESHOLDS

EPCRA Section 313 chemical usage is evaluated against three activity determinations. For listed chemicals that are not Persistent Bioaccumulative Toxics (PBTs) the thresholds are as follows.

Manufacture

The term “manufacture” means to produce, prepare, compound, or import an EPCRA Section 313 chemical. The term manufacture also includes coincidental production of an EPCRA Section 313 chemical as a result of the manufacture, processing, otherwise use, or treatment of other chemical substances. The threshold value for manufacture is 25,000 lb.

Process

The term “process” means the preparation of a listed EPCRA Section 313 chemical, after its manufacture, for distribution in commerce. Processing is usually the intentional incorporation of an EPCRA Section 313 chemical into a product. The threshold value for process is 25,000 lb.

Otherwise Use

The term “otherwise use” usually means any use of an EPCRA Section 313 chemical, including in a mixture or trade name product or waste, that is not covered by the terms “manufacture” or “process." The threshold value for otherwise use is 10,000 lb.

Persistent Bioaccumulative Toxics (PBTs)

For the subset of listed chemicals that are PBTs, separate, lower reporting thresholds have been established for individual chemicals ranging from 100 lb to 0.1 gram. Threshold determinations for PBTs are still evaluated separately against the manufacture, process, and otherwise use activities described above.

4.0 EXEMPTIONS AND QUALIFIERS

4.1 Exemptions

Exemptions from EPCRA Section 313 toxic chemical reporting applicable to LANL include the following.

Laboratory Activities Exemption

Listed EPCRA Section 313 chemicals that are manufactured, processed, or otherwise used in laboratory activities at a covered facility under the direct supervision of a technically qualified individual do not have to be considered for threshold determinations and release calculations. However, pilot plant scale, specialty chemical production, or the use of the chemicals for laboratory support activities, do not qualify for this laboratory activities exemption.

Otherwise Use Exemption

The following otherwise uses of listed EPCRA Section 313 chemicals are specifically exempted:

- Otherwise use as a structural component of the facility,
- Otherwise use in routine janitorial or facility grounds maintenance,
- Personal uses by employees or other persons,
- Otherwise use of products containing EPCRA Section 313 chemicals for the purpose of maintaining motor vehicles operated by the facility, and
- Otherwise use of EPCRA Section 313 chemicals contained in intake water (used for processing or noncontact cooling) or in intake air (used either as compressed air or for combustion).

Article Exemption

EPCRA Section 313 chemicals contained in articles that are processed or otherwise used are exempt from threshold determinations and release calculations. For an item to be exempt as part of an article, it must be a manufactured item that is formed to a specific shape or design during manufacture, have end use functions dependent in whole or in part upon its shape or design during end use, and must not release an EPCRA Section 313 chemical under normal circumstances of processing or otherwise use of the item at the facility. In addition, total releases from any item or like items qualifying as an article exemption must be equal to or less than 0.5 lb to remain exempt as articles.[1]

De Minimis Exemption

The *de minimis* exemption allows facilities to exempt certain minimal concentrations of EPCRA Section 313 chemicals contained in mixtures or other trade name products when making threshold determinations and release calculations. The *de minimis* concentrations are set by EPA at either 1% or 0.1% depending on whether the chemical is a carcinogen or suspected carcinogen.

EPA eliminated the *de minimis* exemption for the list of PBT chemicals. This means that facilities must include all amounts of PBTs in threshold determinations and release and other waste management calculations regardless of the concentration of the PBTs in mixtures or trade name products.

4.2 Qualifiers

In addition to exemptions, certain EPCRA Section 313 chemicals have parenthetic “qualifiers." These qualifiers indicate that these chemicals are subject to the reporting requirements only if manufactured, processed, or otherwise used in a specific form or when a certain activity is performed. Examples of qualifiers are shown in Table 4-1.

Table 4-1. Examples of EPCRA Section 313 Chemical Qualifiers

Chemical	CAS number	Qualifier
Aluminum	7429-90-5	Only if it is a fume or dust form.
Hydrochloric Acid	7647-01-0	Only if it is an aerosol form.
Isopropyl alcohol	67-63-0	Only if it is being manufactured by the strong acid process.
Sulfuric Acid	7664-93-9	Only if it is an aerosol form.
Nitrate Compounds	NA	Only when in aqueous solution.
Vanadium	7440-62-2	Except when contained in an alloy.

5.0 PROCESS OF ANALYSIS

There are several steps in determining if a Form R report and release calculations are required. Figure 5.1 is a flowchart that shows the steps that must be performed to determine if reporting under EPCRA Section 313 is required.

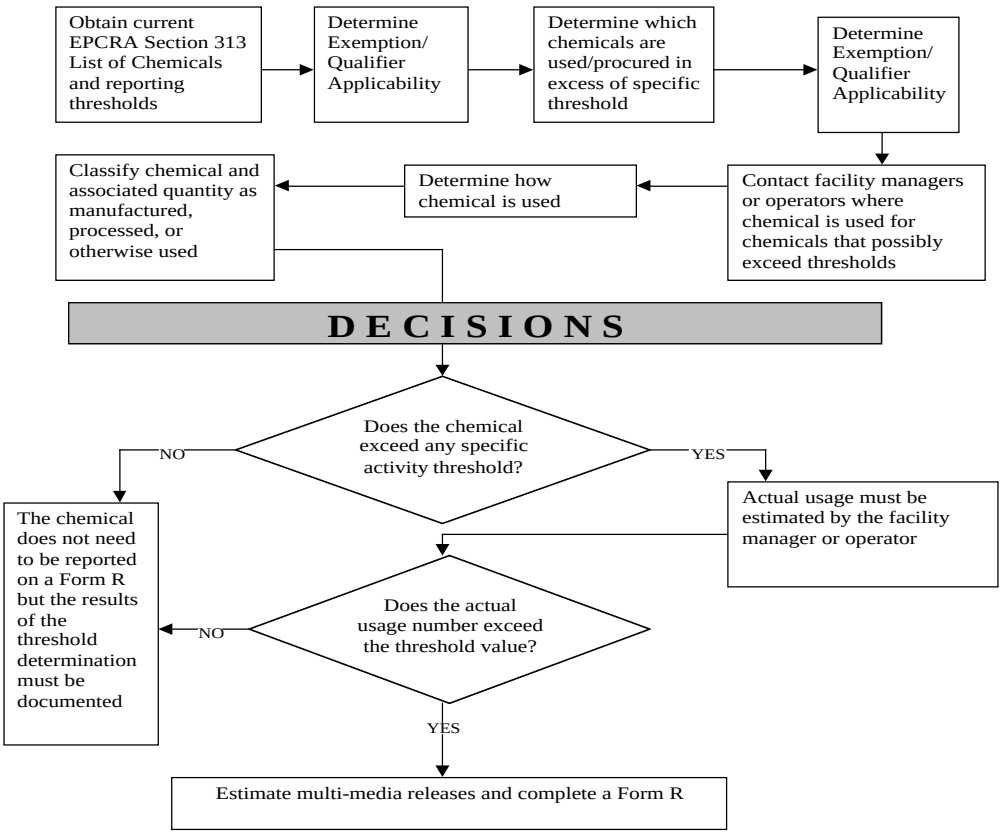

Figure 5.1 Flowchart of Process of Analysis for EPCRA Section 313 Reporting

6.0 THRESHOLD DETERMINATIONS

6.1 Chemical Analysis

Chemicals are purchased at the Laboratory through a variety of procurement systems. These systems include Just-In-Time (JIT), Purchase Orders (POs), Local Vendor Agreements (LVAs), and STOREs (on-site gas facility). An electronic tool called the Automated Chemical Inventory System (ACIS) is used to track chemicals brought on site at the Laboratory. The ACIS captures the majority of procured chemicals and provides relevant data (e.g. chemical name, CAS number, quantity, etc.) to assist in threshold determinations for EPCRA Section 313.

Inventory

For calendar year 2000, a total of 36,412 records were added to the ACIS and evaluated; 22,582 were pure chemicals and 13,830 were mixtures. Individual items with identifiable CAS numbers in the ACIS were considered pure chemicals. These items were matched by CAS number to the list of EPCRA Section 313 chemicals. The resulting records were summed in pounds for each pure chemical.

Individual items that did not have CAS numbers in the ACIS were considered mixtures. The exemptions discussed is Section 4.0 of this report were applied to the mixtures and each qualifying item was classified according to the applicable exemption. Material Safety Data Sheets for the remaining mixtures contributing greater than 84 lb were reviewed to determine the presence and amount of EPCRA Section 313 constituents. This was done to ensure that the EPCRA Section 313 chemicals with thresholds greater than 100 lb would be identified. EPCRA Section 313 chemicals with thresholds less than 100 lb were examined individually based on process knowledge and known potential sources. Each mixture that contained an EPCRA Section 313 chemical was further evaluated to determine the weight of each constituent. The totals for these amounts were then added to the quantities of pure EPCRA Section 313 chemicals.

Procurement

Chemical purchases are not always captured in the ACIS. Procurement data directly from JIT, STOREs, and POs were evaluated in order to assess materials that were procured at the Laboratory, but did not get tracked in the ACIS. This analysis was based on a chemical order report containing vouchered orders for calendar year 2000. Chemical purchases through LVAs were reviewed to determine if there were any EPCRA Section 313 chemicals. Additionally, subcontractors to the Laboratory were contacted to determine if any chemicals were brought on site that were not tracked in the ACIS. Several chemicals were identified through these avenues and were added to the sum of EPCRA Section 313 chemicals evaluated in the ACIS.

Certain high-usage chemicals, as well as chemicals with low thresholds (e.g., PBTs), were evaluated beyond inventory and procurement (e.g., operational processes) and are addressed in Sections 7.0 and 8.0 of this report.

6.2 Threshold Determination Results

Procurement Totals

The amounts of EPCRA Section 313 chemicals identified through inventory and procurement were all summed together to perform preliminary threshold determinations. The resulting totals for the top ten EPCRA Section 313 chemicals are summarized below in Table 6.1.

Table 6.1. Top Ten EPCRA Section 313 Chemicals Procured

CAS No	Chemical Name	Total Procured lb
7664-93-9	Sulfuric acid (liquid form)	135,818
7647-01-0	Hydrochloric acid (liquid form)	27,105
7439-92-1	Lead	10,081
7440-50-8	Copper	6,432
7697-37-2	Nitric acid	6,232
75-45-6	Chlorodifluoromethane	4,583
NA	Zinc compounds	2,703
107-21-1	Ethylene glycol	1,657
75-69-4	Trichlorofluoromethane	1,600
7440-66-6	Zinc	1,502

The total amount of mercury procured (not shown in Table 6.1) totaled 369 lb. Because mercury is a PBT, the threshold for reporting was lowered to 10 lb, effective for calendar year 2000. A detailed analysis of mercury and the Form R reporting is discussed in Section 7.0 of this report.

Sulfuric acid, hydrochloric acid, and lead were the only EPCRA Section 313 chemicals above the 10,000 lb otherwise used threshold and required further investigation. Copper and nitric acid were evaluated separately with additional operational information not available in the ACIS. Section 8.0 of this report provides individual analyses of these chemicals as well as information on other EPCRA Section 313 chemicals. Mercury was the only chemical requiring a Form R report.

7.0 MERCURY AND FORM R REPORTING

7.1 Threshold Determination

Mercury and mercury compounds are used in various places throughout LANL. Procurement records were evaluated and users of large quantities of mercury were interviewed to gain an understanding of how mercury was actually used in 2000. As part of the PBT rule, the threshold for EPCRA Section 313 reporting of mercury was reduced to 10 lb for calendar

year 2000. In 2000, mercury was used in four different areas at the Laboratory. Each is described below.

LANSCE Shutter System

The largest use of mercury at the Laboratory is in the LANSCE shutter system. Reservoirs of mercury are used as shields on the neutron beam shutter system. When the beam is operated, pressurized helium is forced into the mercury reservoir, pushing the mercury up into a head space and allowing the neutron beam to pass through the shutter. LANSCE maintains 12 neutron beam shutter systems, each with a reservoir of mercury. Figure 7-1 shows the mercury reservoirs at LANSCE. The total amount of mercury in these reservoirs is approximately 8,800 lb. These reservoirs are a closed system, and only opened occasionally when minor repairs or maintenance is done. In 2000 maintenance was conducted on one of the shutter system reservoirs and 10 lb of mercury was added. This 10 lb is considered otherwise used and equals the new threshold for EPCRA Section 313 reporting.

Figure 7-1. Mercury Shutter System at LANSCE. Storage tanks (4) and helium filtration (lower right), with piping system (blue pipes from four storage tanks). Tanks store mercury delivered through the blue pipes as the shutters for the neutron beam are opened by pressurized helium, which is filtered for residual mercury.

MST Equipment

In 2000, 5 lb of elemental mercury was added to a new piece of instrumentation at the Material Sciences and Technology (MST) division. This was a one time addition of mercury and this mercury will stay in an enclosed system within the instrument. This 5 lb amount is considered an otherwise use of mercury.

Oak Ridge Experiment

In 2000 a group of scientists from Oak Ridge National Laboratory conducted laboratory experiments at LANL using mercury. They brought 350 lb of mercury on site and when the experiments were completed, the mercury was returned to Oak Ridge, Tennessee. The use of

mercury in this experiment qualifies for the laboratory exemption and is not included in the threshold determination for EPCRA Section 313 reporting.

Miscellaneous Laboratory Usage

Based on procurement records an additional 15 lb of mercury was purchased and brought on site in 2000. The various owners of this mercury were contacted to determine how the mercury was used. Based on interviews with the various employees who purchased this mercury, it was determined to be used in laboratory settings and qualifies for the laboratory exemption.

Other activities at the Laboratory that involve mercury include fuel combustion, asphalt production, and remediation and cleanup activities. Each of these activities were evaluated. Very small quantities of mercury are otherwise used and produced from fuel combustion and asphalt production (less than 0.5 lb). These are discussed in Section 7.2 of this report under environmental releases. There were no remediation activities conducted at LANL in 2000 that involved mercury contamination. A one-time project involving mercury cleanup was conducted at LANSCE to clean the building piping and drain system. According to EPA guidance, this cleanup project should not be included in threshold determinations because it is not considered manufacturing, processing, or otherwise using a listed chemical. However, because the Laboratory exceeds the threshold for reporting mercury based on other activities, environmental releases from this cleanup project must be included in the facility's release calculations.

Table 7-1 summarizes the various uses of mercury at the Laboratory in 2000.

Table 7-1. Mercury Threshold Determinations

Description	Amount of Mercury (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
LANSCE Shutter System	10	Facility Representatives	Otherwise Used	10
MST Equipment	5	Facility Representatives		
Oak Ridge Experiment	350	Facility Representatives	Laboratory Exemption	NA
Misc. Laboratory Use	15	Procurement records and interviews	Laboratory Exemption	NA

Based on the threshold analysis it was determined that use of mercury at LANL was reportable under EPCRA Section 313 for calendar year 2000 and that a Form R report must be completed. The Form R requires estimates of releases of mercury to air, water, and on-site

and off-site disposal of mercury containing waste. The following sections describe the methods used to calculate the information that was reported on the Form R.

7.2 Environmental Releases and Off-Site Disposal

Air Emissions

Mercury emissions were calculated from three operations at the Laboratory: the LANSCE shutter system, fuel combustion, and asphalt production. A one-time project was conducted at LANSCE to clean the building piping and drain system. Monitoring for mercury was conducted both in the exhaust stack at LANSCE as well as ambient monitoring around the work space during this drain cleaning project. Total emissions of mercury from this project were calculated at 0.3 lb. Approximately half of these emissions were vented through the stack, and half were detected during ambient monitoring as a result of fugitive emissions.

Using EPA AP-42 emission factors, fuel use records, and asphalt production records for 2000, mercury emissions from these sources were calculated. Mercury emissions from fuel use totaled 0.3 lb, and mercury emissions from asphalt production totaled 0.001 lb.

Releases to Water

Releases to receiving streams are a result of run-off of storm water, and from treated wastewater released from various LANL sites through permitted National Pollutant Discharge Elimination System (NPDES) outfalls.

All permitted outfalls are sampled for mercury. Analytical data were extrapolated to estimate yearly releases from each outfall. Mercury concentrations ranged from undetectable to 1.34 parts per billion. The data were summed to obtain a total estimate of mercury discharged from all NPDES outfalls of 0.298 lb. One of the permitted outfalls, the Radioactive Liquid Waste Treatment Facility (RLWTF) conducts pretreatment of the influent to remove a large portion of the mercury (and other metals) prior to discharge. Analytical data for influent prior to treatment compared with analytical data after treatment indicate the facility is removing approximately 97% of mercury prior to discharge. Water is treated at the facility through precipitation, filtration, and reverse osmosis. The amount of mercury discharged from the RLWTF for reporting year 2000 was 0.004 lb.

Mercury concentrations for storm water released from LANL property during calendar year 2000 were obtained from the Water Quality Database Reports website (http://wqdbworld.lanl.gov). This query provided mercury concentrations, dates, and sites of measurement. These data were referenced by date to obtain total volume discharge per storm event at each site. Mercury concentrations in storm water ranged between undetectable levels to 1.333 parts per billion. Based on this analysis, the total weight of mercury released from LANL in storm water was 0.327 lb.

For Form R reporting, the total amount of mercury released to each receiving stream is reported. For both permitted outfall and storm water data, the receiving stream was

determined by finding the monitoring site on a map, and determining the nearest canyon. All canyons were assumed to be tributaries of the Rio Grande. Total mercury release to canyon tributaries from LANL property was 0.625 lb in calendar year 2000.

Off-Site Disposal of Waste

LANL performed no on-site waste disposal of mercury-contaminated wastes. All mercury-contaminated waste is sent off-site to EPA-approved facilities for disposal or recycling. Data including shipment weight and mercury concentration were obtained for all mercury-contaminated wastes sent off-site for disposal in 2000. Disposal of mercury containing items such as fluorescent light bulbs, thermometers, and switches were also evaluated. Unbroken light bulbs, switches, and thermometers are subject to the article exemption under EPCRA Section 313 reporting as discussed in Section 4.1. Mercury-contaminated waste generated exclusively from laboratory operations is also exempt from reporting under EPCRA Section 313. The waste disposal records were evaluated to determine any waste shipments that were exempt from reporting.

All remaining waste streams that did not readily meet one of the exemptions based on their description were considered reportable under EPCRA Section 313 as off-site transfers. This was a conservative approach as many of these waste streams are likely lab waste based on the research and development aspect of most of the activities that take place at LANL.

Total reportable mercury weight from all non-exempt waste disposal was calculated to be 20.23 lb. Table 7-2 provides a summary of the analysis conducted to determine the total amount of mercury waste disposal to report on the Form R. For the purposes of Form R reporting, each receiving facility was contacted to determine the disposition of the mercury in the waste that was shipped off-site.

Table 7-2. Summary of Mercury Waste Sent Off-Site from LANL

Waste Type	Description/Example	Reportable Weight of Mercury (lb)
General Waste	Elemental Mercury, Mercury Contaminated Items	19.53
Broken Waste Articles	Broken Thermometers	0.67
Waste—Articles	Thermometers, Barometers, and Mercury Switches (intact)	Exempt
Lab Waste	Waste from Various Analytical Procedures	Exempt
Broken Lamps	Broken Fluorescent Light Bulbs	0.03
Lamp—Articles	Fluorescent Light Bulbs (intact)	Exempt

Waste disposal was the most significant source of mercury releases with 20.23 lb. Releases to water and air were much lower in comparison with approximately 0.6 lb each. Figure 7-2 summarizes the mercury releases to the different media and off-site disposals in 2000.

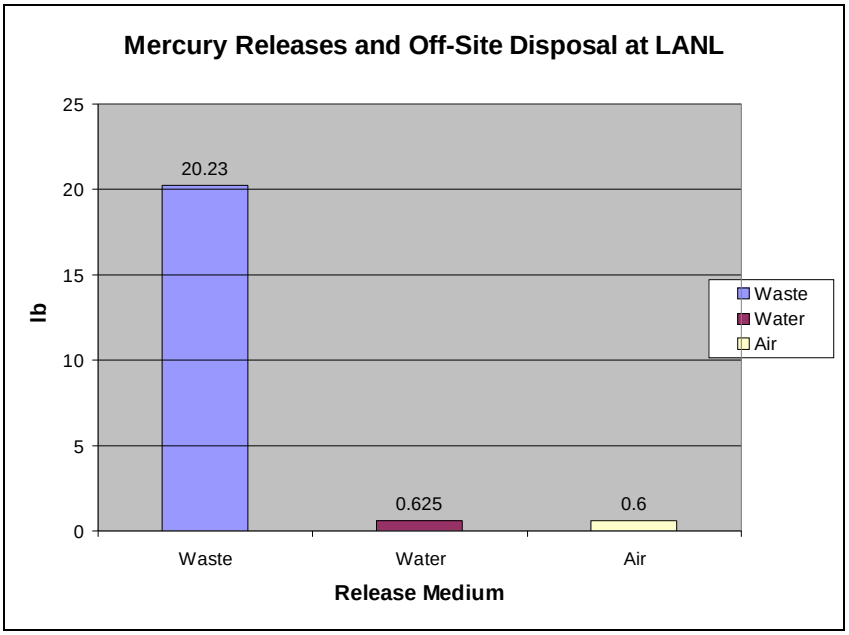

Figure 7-2. Mercury Releases and Off-Site Disposal from LANL

7.3 Form R Report

Mercury releases to surface water and air emissions, as discussed in Section 7.2 of this report, were each reported to be 0.6 lb in Section 5 of the Form R, *Quantity of the Toxic Chemical Entering each Environmental Medium Onsite*. A total of 20.23 lb of mercury, also discussed in Section 7.2, was reported in Section 6.2 of the Form R, *Transfers to Other Off-Site Locations.*

Methods of treating NPDES outfall mercury amounts, discussed in Section 7.1 of this report, applied to Section 7A of the Form R. This section details on-site waste treatment methods and efficiency. Section 7B and 7C relate to on-site energy recovery and recycling. LANL performed no processes applicable to this section for mercury in 2000.

Section 8 of the Form R refers to source reduction and recycling activities. The information given for this section again states that no energy recovery is possible for mercury, either on-site or off-site. LANL also reported no on-site recycling or treatment. Approximately 9.5 lb of the mercury shipped off-site was recycled. Estimates based on this year's values were given for the subsequent two reporting years.

Section 8.9 of the Form R reports the activity index, an estimated measure of the production of the reported chemical at the facility, as compared to the previous year. EPA guidance states that this activity index is "based on a variable other than production that is the primary influence on the quantity of the EPCRA Section 313 chemical recycled, used for energy

recovery, treated, or released." To determine this value (5.73), operation times at TA-53 (LANSCE) in calendar year 2000 and calendar year 1999 were compared, as this site is the largest user of mercury at LANL. The number of micro-amp-hours used in 2000 was divided by the number of micro-amp-hours in 1999 to determine the activity index.

8.0 ADDITIONAL EVALUATION OF CERTAIN TOXIC CHEMICALS

The toxic chemicals described below are either used in relatively high volumes at LANL, are of special interest, or have been reported in the past. Additional analyses were required to determine total usage of these chemicals. None of the chemicals presented in this section exceeded any of the applicable thresholds in 2000 and therefore no reporting was required.

8.1 Sulfuric Acid

EPCRA Section 313 reporting guidelines state that sulfuric acid must be reported only if it is in an aerosol form, including mists, vapors, gas, fog, and other airborne forms of any particle size. This would include acid aerosols generated in storage tanks and from the combustion of fuel oil. Descriptions of sulfuric acid usage and emissions at LANL are provided below. Table 8-1 provides a summary of sulfuric acid threshold determinations for 2000.

Demineralizer Regeneration

In 2000, LANL used 9,095 gallons (134,858 pounds) of 93.1% sulfuric acid for demineralizer regeneration of the water at the main steam plant. However, because the sulfuric acid used is in liquid form, it is not reportable under EPCRA Section 313.

Aerosol Tank Emissions

Sulfuric acid stored in tanks generates a small amount of sulfuric acid mist in the vapor space of the tank. Calculations on the amount of sulfuric acid mist generated are based on the amount of sulfuric acid stored, the size of the storage tank, and the number of tank turnovers. Using EPA's TANKS 4.0 software, an estimated 0.003 lb of sulfuric acid mist was generated in LANL's sulfuric acid tank in 2000. This quantity is considered manufactured and is subject to the 25,000 lb threshold.

Fuel Combustion Byproducts

In 2000, the large industrial fuel burning sources at LANL were fueled with both natural gas and No. 2 fuel oil. EPA guidance does not discuss, or provide emission factors for, sulfuric acid aerosol emissions from the combustion of natural gas. However, for No. 2 fuel oil, AP-42 states that

> "On average, more than 95 percent of the fuel sulfur is converted to SO_2; about 1 to 5 percent is further oxidized to sulfur trioxide (SO_3); and about 1 to 3 percent is

emitted as sulfate particulate. The SO_3 readily reacts with water vapor (both in air and in flue gases) to form a sulfuric acid mist."[2]

Based on the 2000 emissions inventory[3], 7,999 lb of sulfur oxides were released to the air from the combustion of natural gas and No. 2 fuel oil. Based on fuel records for 2000 and AP-42, LANL estimates that 847 lb of sulfuric acid mist was generated from fuel combustion. This quantity is considered manufactured and is subject to the 25,000 lb threshold.

Sample Analysis at the Sanitary Waste Systems Consolidation (SWSC) Plant

Approximately 100 lb of liquid sulfuric acid was used at the analytical laboratory at the SWSC plant for the analysis of water samples. None of the laboratory techniques used converted the liquid sulfuric acid to an aerosolized form. Therefore this quantity is not reportable under EPCRA Section 313.

Procurements

An additional 861 lb of sulfuric acid was procured at LANL at various locations for miscellaneous uses. To be conservative, this amount was assumed to be in the aerosol form and was evaluated against the 10,000 lb otherwise used threshold, which it does not exceed.

A summary of the threshold determinations for sulfuric acid is provided in Table 8-1.

Table 8-1. Sulfuric Acid Threshold Determinations

Description	Amount of Sulfuric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Demineralizer Regeneration	134,858	JCNNM	Not in aerosol form and not subject to EPCRA Section 313	NA
Water Analysis at the SWSC Plant	100	JCNNM		
Procurement	861*	Procurement Data	Otherwise Used	10,000
Storage Tank Air Emissions	0.003	EPA, TANKS 4.0 Software	Manufactured	25,000
Fuel Combustion Byproducts	847	2000 Emission Inventory Report[3]		

*Assumed to be in aerosol form.

8.2 Hydrochloric Acid

Hydrochloric acid is reportable under EPCRA Section 313 only in an aerosol form. In 1995, EPA added a modifier to the listing of hydrochloric acid to exclude non-aerosol forms. The listing now reads "Hydrochloric acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)"[4]. Therefore, if hydrochloric acid is present in the form of a gas, fog, vapor, mist or any other airborne form, then it is considered to be in the aerosol form and is covered by the EPCRA Section 313 hydrochloric acid aerosols listing.

The total amount of hydrochloric acid procured in calendar year 2000 was 27,105 lb. This was the second highest procurement amount for any listed toxic chemical and it exceeded the most conservative 10,000 lb otherwise used threshold. Therefore, further evaluation was performed to determine the amounts of reportable hydrochloric acid applicable to the 25,000 lb manufactured threshold and the 10,000 lb otherwise used threshold. There were no operations with hydrochloric acid at LANL in 2000 that were applicable to the process threshold.

Manufactured Hydrochloric Acid

The Radioactive Liquid Waste Treatment Facility (RLWTF) procured approximately 20,845 lb of aqueous hydrochloric acid. This hydrochloric acid was used for heat-exchanger scale cleaning and for the cleaning of electrodialysis reversal membranes. The amount of hydrochloric acid aerosol generated from these particular activities was calculated to be 1.04 lb based on specific process information and engineering calculations. This quantity of hydrochloric acid is considered manufactured, and is well below the 25,000 lb manufactured threshold.

Otherwise Used Hydrochloric Acid

The amount of hydrochloric acid evaluated against the 10,000 lb otherwise used threshold was the total amount of hydrochloric acid procured in calendar year 2000 (27,105 lb), minus the aqueous hydrochloric acid used by the RLWTF discussed above (20,845 lb), which figured to 6,259 lb. However, this quantity includes aqueous forms of hydrochloric acid, not just aerosol forms. To be conservative, the entire amount of 6,259 lb was assumed to be in an aerosol form and was evaluated against the 10,000 lb otherwise used threshold, which it does not exceed.

The threshold determinations for hydrochloric acid are summarized in Table 8-2.

Table 8-2. Hydrochloric Acid Threshold Determinations

Description	Amount of Hydrochloric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Waste Facility Management	1.04	Facility Representatives	Manufactured	25,000
Procurement	6,259*	Procurement Data	Otherwise Used	10,000

*Assumed to be in aerosol form.

8.3 Lead and Lead Compounds

Lead and lead compounds were identified in procurement records and in activities that take place at LANL. Over the past several years LANL has tracked three main uses of lead when evaluating EPCRA Section 313 thresholds. These activities include melting of lead, decontaminating of lead shielding, and firing of ammunition containing lead. These uses of lead are discussed below. A comparison of these uses of lead over the past four years is presented in Figure 8-1, which shows a general decrease in lead use over this time period.

Lead Melting

In 2000, only 100 lb of lead was melted and formed into specific shapes for glove box and exposure shielding. Lead melting as an activity is applied to the "process" threshold and subject to the 25,000 lb threshold.

Lead Shielding Decontamination

In 2000, LANL decontaminated 1,050 lb of lead shielding. This treatment of lead qualifies for the article exemption because the specific shape and design of the lead shielding is not changed. In addition, the amount of lead released to the environment from these decontamination activities was calculated to be 0.02 lb, which is less than the 0.5 lb qualifier for the article exemption.

Lead Shot at the Firing Range

Lead is a component in various types of bullets. LANL maintains an on-site firing range for training of security personnel. The firing range at LANL keeps detailed records of the amount and type of munitions expended. Using this data, it was determined that approximately 4,213 lb of lead contained in ammunition was shot at the firing range in 2000. This resulted in approximately 4 lb of lead air emissions. This is considered an otherwise used activity and subject to the 10,000 lb reporting threshold.

Figure 8-1 following represents a comparison of lead use at LANL since 1997.

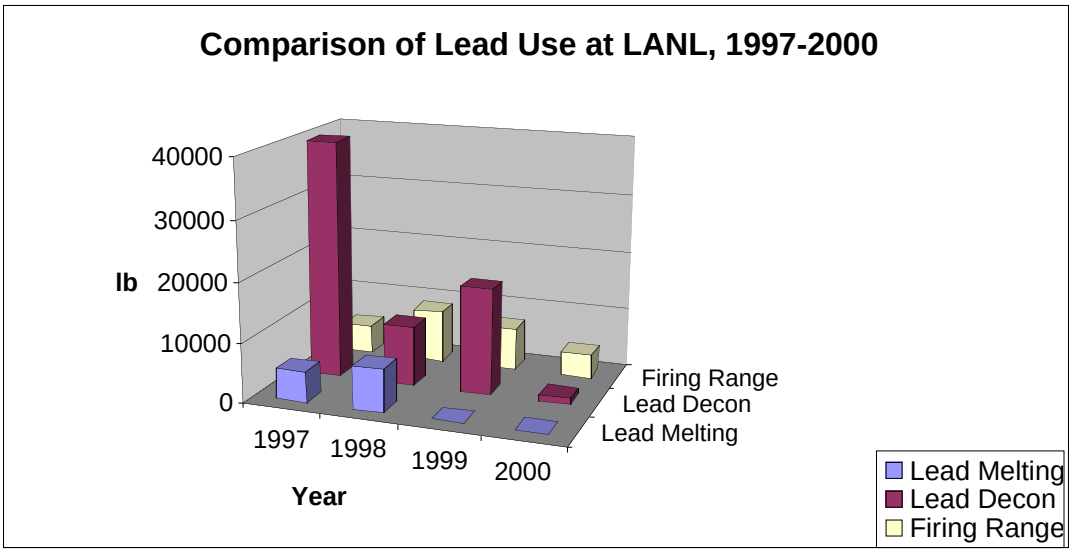

Figure 8-1. Comparison of Lead Use at LANL, 1997-2000

Additional Uses of Lead

The EPCRA Section 313 threshold for lead has been 25,000 lb for manufacturing or processing, and 10,000 lb of otherwise used. However, in April 2001 EPA promulgated a regulation lowering the threshold for EPCRA Section 313 reporting of lead to 100 lb, effective for calendar year 2001 reporting. To gain a better understanding of lead usage at LANL, additional evaluation of smaller quantity lead use was done for the 2000 reporting year. Additional activities that were evaluated include lead electroplating, a lead-bismuth test loop, fuel combustion, and asphalt production. These activities were evaluated to better understand the actual use of lead at various locations at the Laboratory. Lead electroplating and lead associated with fuel combustion and asphalt production totaled less than 1 lb. The lead-bismuth loop is described in more detail as follows.

Lead Bismuth Loop

Approximately 10,065 lb of lead-bismuth alloy was purchased for LANSCE in 2000. According to facility contacts there are two lead-bismuth test loops. The existing loop was not operated or opened and no new lead-bismuth was added or used in 2000. A new lead-bismuth test loop is under construction, but was not operational in 2000 and no lead-bismuth was added. The 10,065 lb of lead-bismuth that was purchased is being stored for future use in the new loop.

EPA provides guidance on the applicability of EPCRA Section 313 reporting to the storage of chemicals that are not processed or otherwise used during the reporting year. The guidance states

> "Storage, in itself, would not meet an activity threshold under EPCRA Section 313. However, if the facility exceeds the manufacturing, processing, or otherwise

use threshold for the same toxic chemical elsewhere at the facility, the facility must consider releases from the storage of the toxic chemical."[5]

The thresholds for the different activity determinations involving lead are listed in Table 8.3.

Table 8-3. Lead and Lead Compounds Threshold Determinations

Description	Amount of Lead (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Lead Melting	100	Facility Representatives	Processed	25,000
Lead Electroplating	0	Facility Representatives		
Fuel Combustion	0.9	Fuel Use Records and EPA AP-42	Manufactured	25,000
Asphalt Production	0.003	Asphalt Records and EPA-AP-42		
Firing Range	4,213	Facility Representatives	Otherwise Used	10,000
Procurement	17.1	Procurement Data		
Lead-bismuth Test Loop	10,065	Procurement and Facility Interviews	In storage. Not subject to threshold determination	NA
Decontamination of Lead Shielding	1,050	Facility Representatives	Article Exemption	NA

8.4 Copper and Copper Compounds

In 2000, over 6,000 lb of copper was procured at LANL. The large purchasers were contacted to verify the quantities of copper purchased and gain an understanding of how the copper is used. A description of how the large quantities of copper are used is provided below. In addition, copper that was still in storage from last year was reviewed.

Accelerator Components

Copper is machined, brazed, and used in various accelerator components. In 2000, approximately 8,000 lb of copper was maintained in storage for this purpose. However, only 200 lb of this copper was actually used in machining operations. Since the remaining 7,800 lb of copper has not yet been used and remains in its original shape and form, this copper qualifies for an article exemption and is not subject to EPCRA Section 313 reporting requirements.

Diagnostic Testing

Copper is used as a component for diagnostic testing at LANL. Approximately 6,423 pounds of copper was purchased in 2000 for this purpose. However, the copper is sent off-site for machining and sent back to LANL as an "article". These copper components are used at LANL in nondestructive diagnostics testing such as vacuum leak testing. Because the testing performed on-site is nondestructive, the use of the copper components qualifies as an article exemption and is not subject to EPCRA Section 313 reporting requirements. Because there is no cutting, grinding, or melting of the product, emissions from these activities will not result in a release greater than 0.5 lb.

Procurement

Additional copper purchases in 2000 totaled 110 lb. This amount was assumed to be otherwise used and is less than the 10,000 lb threshold.

Table 8-4 provides a summary of the copper threshold determinations for 2000.

Table 8-4. Copper Threshold Determinations

Description	Amount of Copper (lb)	Data Source	EPCRA Section313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Accelerator Components	200	Facility Representatives	Processed	25,000
Procurement	110	Procurement Data	Otherwise Used	10,000
Diagnostic Testing	6,423	Facility Representatives	Article Exemption	NA
Storage for Accelerator Components	7,800	Facility Representatives	Article Exemption	NA

8.5 Nitric Acid

In general, nitric acid is used in high volume at the Laboratory every reporting year. The main uses are in research and development (R&D) activities, sample preparation, and the Laboratory's bioassay program. Small amounts of nitric acid are also used for cleaning glassware. These activities are captured in nitric acid procurements. The other main use of nitric acid is for plutonium processing. Data is obtained for this activity by reviewing facility records. Each source is discussed as follows.

Nitric Acid Procurements

Nitric acid procured at the Laboratory in calendar year 2000 was evaluated to determine the amounts that could be applied to the EPCRA Section 313 laboratory activities exemption. According to EPCRA Section 313 guidance documents, and as discussed in Section 4.1 of this report, the laboratory activities exemption is applied to the quantity of an EPCRA Section 313 chemical that is manufactured, processed, or otherwise used in a laboratory under the supervision of a technically qualified person. However, quantities of an EPCRA Section 313 chemical used for cleaning glassware do not qualify for this exemption.

In calendar year 2000, a total of 6,232 lb of nitric acid was procured at the Laboratory. The large users of this quantity, totaling 5,381 lb, were contacted to determine how the nitric acid was used. Approximately half of the users contacted used the nitric acid for the bio-assay program (monitoring of employees for radioactive elements), totaling 2,577 lb. The other half, totaling 2,804 lb, was used for sample preparation. Both of these activities qualify for the laboratory exemption. However, it is assumed that approximately 10% of the amount used for sample preparation (280 lb) was used for cleaning glassware, and should therefore be applied to the EPCRA Section 313 otherwise used threshold.

The quantity of nitric acid used by persons who were not contacted totaled 851 lb. This amount was also assumed to be used in laboratory exempt activities, and that 10% of the amount was used for cleaning glassware (85 lb).

Based on procurement records and interviews, the quantity of nitric acid that falls under the laboratory exemption is 5,867 lb. The total amount of nitric acid that is nonexempt and must be applied to the otherwise used threshold is 365 lb.

Nitric Acid Use for Plutonium Processing

Historically the largest use of nitric acid at LANL is for plutonium processing. In previous years, this usage has exceeded EPCRA Section 313 reporting thresholds and a Form R has been submitted documenting the usage and releases associated with this activity. For calendar year 2000 nitric acid use for plutonium processing was much lower than previous years. The facility did not operate for several months in 2000 due to (1) the Cerro Grande fire, (2) facility upgrades and repairs to replace compression fittings, and (3) programmatic funding decreases. Additionally, a nitric acid recycle loop was installed in 2000 and will be operational in 2001. This recycle loop will decrease nitric acid use in future years. Total nitric acid use in 2000 was 642 lb. This is considered otherwise used and is well below the 10,000 lb threshold for reporting.

Table 8-5 summarizes nitric acid use at LANL for 2000.

Table 8-5. Nitric Acid Threshold Determinations

Description	Amount of Nitric Acid (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Laboratory Use	5,867	Procurement Records and Interviews	Laboratory Exempt	NA
Glassware Cleaning	365	Procurement Records and Interviews	Otherwise Used	10,000
Plutonium Processing	642	Facility Records		

8.6 Chlorodifluoromethane and Trichlorofluoromethane

Two refrigerants ranked in the top ten highest procured EPCRA Section 313 chemicals for calendar year 2000: chlorodifluoromethane (HCFC-22) and trichlorofluoromethane (CFC-11). Both chemicals are primarily used as a refrigerant in chillers, refrigerators, and HVAC systems throughout the Laboratory. For the reporting year 2000, HCFC-22 was the sixth highest procured chemical with a total of 4,583 lb. CFC-11 was the ninth highest procured chemical with a total of 1,600 lb. Of this amount, 200 lb was identified in the ACIS. The remaining 1,400 lb was identified through facility representatives as brought on-site by contractors for use in chiller operations. Neither HCFC-22 nor CFC-11 exceeded the 10,000 lb otherwise used threshold for reporting year 2000. Table 8-6 summarizes these threshold determinations.

Table 8-6. HCFC-22 and CFC-11 Threshold Determinations

Refrigerant	Amount (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
HCFC-22	4,583	Procurement Data	Otherwise Used	10,000
CFC-11	1,600	Procurement Data and Facility Representatives	Otherwise Used	10,000

8.7 Polycyclic Aromatic Compounds

Polycyclic aromatic compounds (PACs) are a new chemical category added to the EPCRA Section 313 list this year as part of the PBT rule. The threshold for reporting PACs is 100 lb. Benzo(g,h,i)perylene is a PAC that is given its own separate threshold. The threshold for benzo(g,h,i)perylene is 10 lb.

According to EPA's "EPCRA Section 313 Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category"[6], fuel oil and paving asphalt contain polycyclic aromatic compounds (PACs). In addition, PACs may be generated from the combustion of natural gas, fuel oil, wood, and the manufacture of asphalt. Each of these sources of PACs was evaluated. No prescribed burning was conducted by LANL in 2000. The burning of trees due to the Cerro Grande fire does not fall under the manufactured, processed, or otherwise used definitions, and therefore was not included in this analysis.

Asphalt Production

In 2000, LANL produced approximately 3,500 tons of asphalt and used 48,783 gallons (441,500 lb) of asphalt tar. The asphalt was used for minor road and parking lot patching and paving. Tar may contain 178 ppm of PACs[7]. This equates to 78.6 lb of PACs that applies to the otherwise used threshold. The concentration of benzo(g,h,i)perylene in asphalt tar is 1.2 ppm[8]. Therefore, 0.50 lb of benzo(g,h,i)perylene is reportable towards its 10 lb otherwise used threshold. Emissions of total PACs and benzo(g,h,i)perylene from asphalt production are applicable to the manufacture threshold. Using AP-42 emission factors[9], these amounts were calculated to be 6.65E-04 lb of PACs, and 1.75E-06 lb of benzo(g,h,i)perylene.

Diesel Fuel

Fuel oil may contain 10 ppm of PACs[7]. Based on fuel records 13.1 lb of PACs applies to the otherwise used threshold. The value for benzo(g,h,i)perylene is 0.05 ppm[8]. This equates to 0.065 lb of this particular PAC, applicable to the 10 lb otherwise used threshold. In addition, the combustion of fuel will generate emissions of PACs that apply to the manufacture threshold. Using AP-42 these amounts were calculated to be 0.003 lb for total PACs and 0.0004 lb for benzo(g,h,i)perylene.

Natural Gas

Using AP-42 and fuel records approximately 0.021 lb of PACs was produced from natural gas combustion, which is applied to the manufacture threshold. Approximately 0.001 lb of benzo(g,h,i)perylene applies toward the 10 lb manufacture threshold. Due to the absence of information regarding total PAC and benzo(g,h,i)perylene concentrations in natural gas in all referenced documents, it is assumed that these substances are nonexistent in natural gas before combustion.

Based on the aforementioned sources, 91.7 lb of total PACs qualifies as otherwise used, and 0.025 lb as manufactured. These values were below each threshold value of 100 lb and therefore reporting of PACs under EPCRA Section 313 was not necessary. For benzo(g,h,i)perylene, otherwise used accounted for 0.57 lb, while 0.001 lb was manufactured. These values are below the threshold of 10 lb and reporting was not necessary under EPCRA Section 313.

Table 8-7 Summarizes the PACs and benzo(g,h,i)perylene threshold determinations.

Table 8-7. PACs Threshold Determinations

Description	Used in / produced from:	Amount (lb)	TOTAL (lb)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Total PACs	Natural Gas	0	91.7	Otherwise Used	100
	Asphalt	78.6			
	Fuel Oil	13.1			
	Natural Gas	0.021	0.025	Manufactured	100
	Asphalt	6.65E-04			
	Fuel Oil	0.003			
Benzo(g,h,i) perylene	Natural Gas	0	0.57	Otherwise Used	10
	Asphalt	0.5			
	Fuel Oil	0.065			
	Natural Gas	0.001	0.0014	Manufactured	10
	Asphalt	1.75E-06			
	Fuel Oil	4.23E-04			

8.8 Other Chemicals

Additional chemicals that were evaluated for EPCRA Section 313 threshold determinations include beryllium, cyanides, nitrates, and chlorine. None of these chemicals exceed the most conservative 10,000 lb otherwise used threshold. However, to be thorough, each reporting year these chemicals are typically evaluated beyond procurement.

Beryllium and Beryllium Compounds

Less than 1,050 lb of beryllium was processed at LANL in 2000. Therefore, the use of beryllium at LANL did not exceed the "processed" threshold of 25,000 lb.

Cyanide and Cyanide Compounds

In addition to procurement, cyanides can be manufactured from the detonation and burning of explosives. Materials expended from the detonation of explosives have not been calculated for 2000 because the data were not available. However, facility personnel provided information that the quantities used in 2000 are similar or less than those seen during 1999 because the firing sites were shut down for as long as six months due to the Cerro Grande fire and the remedial activities following the fire. In 1999, the amount of cyanides calculated from the detonation of explosives was 20 lb. In 2000, the amount of cyanides calculated from the burning of explosives was 30.5 lb. An additional 24 lb of cyanides were identified from procurement data.

Threshold determinations for cyanides are summarized in Table 8-8.

Table 8-8. Cyanide Threshold Determinations

Description	Amount of Cyanide Compounds (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Explosives Expended	< 20	Facility Representatives	Manufactured	25,000
Explosives Burned	30.5	Facility Representatives		
Procurement	24	Procurement Data	Otherwise Used	10,000

Nitrate Compounds

Nitrate compounds are reportable only when in aqueous solutions based on the EPCRA Section 313 qualifier. The most significant source of nitrates is from plutonium processing. Nitric acid is used to recover plutonium through a multi-step desolution and ion exchange process. This process coincidentally manufactures nitrates as a byproduct. In calendar year 2000, 642 lb of nitric acid was used for plutonium processing. This is significantly less than the amount used in previous years (see section 8.5 for further explanation). Based on mass balance principles of nitrates produced from nitric acid, an estimated 925 lb of nitrates was manufactured.

Explosives are not a source of nitrates reportable under EPCRA Section 313 since they are not in the liquid form. The remaining source of nitrates is from procurement, which is considered otherwise used.

Threshold determinations for nitrates are summarized in Table 8-9.

Table 8-9. Nitrate Threshold Determinations

Description	Amount of Nitrates (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Procurement	88	Procurement Data	Otherwise Used	10,000
Explosives	NA	Facility Representatives	Not in liquid form and therefore not subject to threshold determination	NA
Plutonium Processing	925	Facility Representatives and Mass Balance	Manufactured	25,000

Chlorine

Chlorine use at the Laboratory was evaluated based on procurement data and known sources that manufacture chlorine. The Sanitary Waste Systems Consolidation (SWSC) Plant manufactures chlorine with a mixed oxide treatment system that converts sodium chloride into an oxidizing solution that contains chlorine and other chemicals. The remaining sources of manufactured chlorine are cooling towers at the power plant, at LANSCE, and at other sites around the Laboratory maintained by the subcontractor JCNNM. All of these cooling towers use a type of bromine/chlorine water treatment tablet that generates small amounts of chlorine.

Threshold determinations for chlorine, including procurements, are summarized in Table 8-10.

Table 8-10. Chlorine Threshold Determinations

Description	Amount of Chlorine (lb)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lb)
Procurement	315	Procurement Data	Otherwise Used	10,000
TA-46 SWSC	1,502	Facility Representatives	Manufactured	25,000
Cooling Towers	1,576	Facility Representatives		

8.9 Chemicals Used During the Cerro Grande Fire

The Cerro Grande fire burned 43,000 acres, of which approximately 7,650 acres was within LANL boundaries. The Forest Service used two fire retardant chemicals to fight the fire. One chemical was fire suppressant foam concentrate and the second was liquid slurry concentrate. According to the MSDS for the fire suppressant foam concentrate, none of the listed ingredients are EPCRA Section 313 listed chemicals. Therefore, there are no reporting requirements associated with the application of the foam concentrate. The liquid slurry concentrate was evaluated for two potential EPCRA Section 313 reporting issues: cyanide compounds and ammonia.

Figure 8-2 is a photograph of slurry being dropped on the Cerro Grande fire.

Figure 8-2. Slurry Being Dropped on the Cerro Grande Fire

Cyanide Compounds

Under controlled conditions to simulate exposure to sunlight, slurry contains up to 270 mg/l of free cyanide[10]. With a product density of 9.07 lb/gal, the concentration of free cyanide in the mixed slurry is no more than 0.025%. Therefore the *de minimis* exemption for cyanide compounds applies and the associated quantity does not apply toward EPCRA Section 313 thresholds.

Ammonia

Liquid slurry concentrate has a concentration of 0.246 lb ammonia per gallon of mixed slurry[11]. The EPCRA Section 313 qualifier for ammonia states that 10% of the total aqueous ammonia is reportable under the ammonia listing. Approximately 167,000 gallons of mixed fire retardant slurry was dropped by airplane. Based on review of maps of the aerial drops, approximately 23% of the slurry was applied to LANL property. The amount of ammonia in the slurry dropped on LANL property, with the applicable EPCRA Section 313 qualifier, was 945 lb. This quantity of ammonia (945 lb) summed with procurement amounts (53 lb) totals 998 lb, which does not exceed any EPCRA Section 313 thresholds.

In conclusion, neither the fire suppressant foam nor the liquid slurry concentrates dropped on LANL property during the Cerro Grande fire triggered any EPCRA Section 313 reporting. In the case of the foam, no listed chemicals were used. In the case of the slurry, no thresholds were exceeded.

REFERENCES

1. U.S. Environmental Protection Agency, "Toxic Chemical Release Inventory Reporting Form R and Instructions," Revised 1999 Version, EPA 745-B-00-001, February 2000.

2. U.S. Environmental Protection Agency, "Compilation of Air Pollutant Emission Factors", AP-42, Chapter 1.3—Fuel Oil Combustion, September 1998.

3. "2000 Emissions Inventory Report Summary," Los Alamos National Laboratory Report LA-13850-SR, 2001.

4. Emergency Planning and Community Right-to-Know Act, Section 313, Guidance for Reporting Hydrochloric Acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size), EPA document EPA-745-B-99-014, 1999.

5. U.S. Environmental Protection Agency, Revised 1998 EPCRA Section 313 Questions and Answers, EPA document EPA-745-B-98-004, December 1998.

6. Emergency Planning and Community Right-to-Know Act—Section 313: Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category, Section 1.4 (Polycyclic Aromatic Compounds—Their Structure and Formation), p. 9, EPA document EPA-260-B-01-03, 2001.

7. Emergency Planning and Community Right-to-Know Act—Section 313: Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category, Table 2-2: Quantity of PACs Required to Meet the Reporting Threshold in Fuels and Asphalt, EPA document EPA 260-B-01-03, 2001.

8. Emergency Planning and Community Right-to-Know Act—Section 313: Guidance for Reporting Toxic Chemicals: Pesticides and Other Persistent Bioaccumulative Toxic (PBT) Chemicals, Table 3-1: Quantity of Benzo(g,h,i)perylene Required to Meet the Reporting Threshold in Common Fuels, EPA document EPA 260-B-01-005, 2001.

9. U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors (AP-42), Vol. I, Stationary Point and Area Sources, Fifth Edition, Section 11.1 (Hot Mix Asphalt Plants), Table 11.1-9: Emission Factors for Organic Pollutant Emissions from Batch Mix Hot Mix Asphalt Plants, http:://www.epa.gov/ttn/chief/ap42/, 2000.

10. Edward E. Little and Robin D. Calfee, The Effects of UVB Radiation on the Toxicity of Fire-Fighting Chemicals, USGS Wildland Fire Science Workshop 2000, Los Alamos, New Mexico, 2000.

11. Toxic Chemical Release Inventory Reporting EPCRA Form R—Decision Process, Executive Order 12856, EPA document HO-6-11-B4-ARAU, 1995.

Appendix A:

EPCRA Section 313 Chemicals Procured in 2000

Table A-1. EPCRA Section 313 Chemicals Procured

Total (lb)	Chemical Name	CAS Number
135,818	Sulfuric acid	7664-93-9
27,105	Hydrochloric acid	7647-01-0
10,081	Lead	7439-92-1
6,432	Copper	7440-50-8
6,232	Nitric acid	7697-37-2
4,583	Chlorodifluoromethane (HCFC-22)	75-45-6
2,703	Zinc compounds	NA
1,657	Ethylene glycol	107-21-1
1,600	Trichlorofluoromethane (CFC-11)	75-69-4
1,502	Zinc	7440-66-6
1,420	Acetonitrile	75-05-8
1,394	Methanol	67-56-1
1,353	Dichloromethane	75-09-2
1,245	Isopropyl alcohol	67-63-0
1,076	Trichloroethylene	79-01-6
648	Glycol ethers	NA
464	Xylene (mixed isomers)	1330-20-7
464	Chloromethane	74-87-3
369	Mercury	7439-97-6
353	Aluminum oxide	1344-28-1
315	Chlorine	7782-50-5
290	N-Methyl-2-pyrrolidone	872-50-4
241	n-Hexane	110-54-3
157	Chloroform	67-66-3
138	Propylene	115-07-1
117	Sodium nitrite	7632-00-0
113	Acrylamide	79-06-1
106	Copper compounds	NA
102	N,N-Dimethylformamide	68-12-2
101	Phosphoric acid	7664-38-2
100	Dichlorodifluoromethane	75-71-8
88	Toluene	108-88-3
88	Nitrate compounds	NA
69	Benzene	71-43-2
53	Ammonia	7664-41-7
51	1,1,2-Trichloroethane	79-00-5
49	Hydrogen fluoride	7664-39-3
48	Chlorobenzene	108-90-7
46	1,2-Dichloroethane	107-06-2
43	Methyl ethyl ketone	78-93-3
42	Hexazinone	51235-04-2
41	Freon 113	76-13-1

Total (lb)	Chemical Name	CAS Number
31	Carbon tetrachloride	56-23-5
29	N-Methylolacrylamide	924-42-5
26	1,2,4-Trimethylbenzene	95-63-6
24	Cyanide compounds	NA
21	Ethylbenzene	100-41-4
17	Ethylene	74-85-1
17	Phenol	108-95-2
12	1,2-Butylene oxide	106-88-7
11	Aluminum	7429-90-5
11	Pyridine	110-86-1
9	Nickel compounds	NA
7	Methyl tert-butyl ether	1634-04-4
6	Formic acid	64-18-6
6	Chromium compounds	NA
6	Silver compounds	NA
6	n-Butyl alcohol	71-36-3
5	Dicyclopentadiene	77-73-6
5	Formaldehyde	50-00-0
5	Cobalt	7440-48-4
4	Thioacetamide	62-55-5
4	m-Cresol	108-39-4
4	2-Ethoxyethanol	110-80-5
4	Barium compounds	NA
4	Cobalt compounds	NA
3	tert-Butyl alcohol	75-65-0
3	Cyclohexane	110-82-7
3	Hydrogen sulfide	7783-06-4
3	Cadmium compounds	NA
3	Chlorine dioxide	10049-04-4
3	1,1,1-Trichloroethane	71-55-6
3	Naphthalene	91-20-3
3	Toluenediisocyanate (mixed isomers)	26471-62-5
3	Bromine	7726-95-6
3	Chromium	7440-47-3
3	1,4-Dioxane	123-91-1
3	Nickel	7440-02-0
2	Acetophenone	98-86-2
2	Aniline	62-53-3
2	Benzyl chloride	100-44-7
2	4-Nitrophenol	100-02-7
2	2-Nitrophenol	88-75-5
2	2-Methoxyethanol	109-86-4
2	Cyclohexanol	108-93-0

Total (lb)	Chemical Name	CAS Number
2	Beryllium	7440-41-7
2	Bromomethane	74-83-9
2	Antimony	7440-36-0
2	Chlorophenols	NA
2	Triethylamine	121-44-8
2	Acetaldehyde	75-07-0
2	Manganese	7439-96-5
1	1,2-Dichlorobenzene	95-50-1
1	Carbon disulfide	75-15-0
1	Selenium	7782-49-2
1	Arsenic	7440-38-2
1	Titanium tetrachloride	7550-45-0
1	Methyl methacrylate	80-62-6
1	Hexamethylphosphoramide	680-31-9
1	Lead compounds	NA
1	Cadmium	7440-43-9
1	Barium	7440-39-3
1	Styrene	100-42-5
1	Diisocyanates	NA
1	Arsenic compounds	NA
1	Dibutyl phthalate	84-74-2
1	Fluorine	7782-41-4
1	Propylene oxide	75-56-9
<1	Sodium azide (Na(N3))	26628-22-8
<1	Antimony compounds	NA
<1	Potassium bromate	7758-01-2
<1	Manganese compounds	NA
<1	Mercury compounds	NA
<1	Allylamine	107-11-9
<1	1,1-Dimethyl hydrazine	57-14-7
<1	Methyl iodide	74-88-4
<1	Beryllium compounds	NA
<1	Phosphine	7803-51-2
<1	Silver	7440-22-4
<1	Diphenylamine	122-39-4
<1	Lindane	58-89-9
<1	Nitrilotriacetic acid	139-13-9
<1	Catechol	120-80-9
<1	1,3-Butadiene	106-99-0
<1	Epichlorohydrin	106-89-8
<1	p-Cresol	106-44-5
<1	p-Nitroaniline	100-01-6
<1	Thiourea	62-56-6

Total (lb)	Chemical Name	CAS Number
<1	Selenium compounds	NA
<1	Butyraldehyde	123-72-8
<1	Vanadium	7440-62-2
<1	Bromoform	75-25-2
<1	Hydroquinone	123-31-9
<1	Methyl isobutyl ketone	108-10-1
<1	Maleic anhydride	108-31-6
<1	Molybdenum trioxide	1313-27-5
<1	o-Xylene	95-47-6
<1	3-Chloropropionitrile	542-76-7
<1	p-Xylene	106-42-3
<1	Osmium tetroxide	20816-12-0
<1	Dimethylcarbamyl chloride	79-44-7
<1	Hexachlorocyclopentadiene	77-47-4
<1	Thallium compounds	NA
<1	Isobutyraldehyde	78-84-2
<1	Malathion	121-75-5
<1	C.I. Basic Red 1	989-38-8
<1	Paraquat dichloride	1910-42-5
<1	Oxydemeton methyl	301-12-2
<1	2-Nitropropane	79-46-9

Appendix B:

Form R Report for Mercury

Form Approved OMB Number: 2070-0093
Approval Expires: 01/31/2003

(IMPORTANT: Type or print; read instructions before completing form)

EPA United States Environmental Protection Agency

FORM R

TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

WHERE TO SEND COMPLETED FORMS: 1. EPCRA Reporting Center, P.O Box 3348, Merrifield, VA 22116-3348, ATTN: TOXIC CHEMICAL RELEASE INVENTORY
2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision: [ ]

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR 2000

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; Attach substantiation forms) [X] No (Do not answer 2.2; Go to Section 3)	2.2	Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
JOSEPH C. VOZELLA — ASSISTANT AREA MANAGER FOR ENVIRONMENT		06/26/2001

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	87544SDLSL52835
Facility or Establishment Name	U.S. DEPARTMENT OF ENERGY, LOS ALAMOS NATIONAL LABORATORY	Facility or Establishment Name or Mailing Address(if different from street address)	
Street	528 35TH STREET	Mailing Address	
City/County/State/Zip Code	LOS ALAMOS — LOS ALAMOS — NM — 87544-	City/State/Zip Code / Country (Non-US)	

4.2	This report contains information for: (Important : check a or b; check c or d if applicable)	a. [X] An entire facility	b. [ ] Part of a facility	c. [X] A Federal facility	d. [ ] GOCO		
4.3	Technical Contact Name	GENE TURNER			Telephone Number (include area code) (505) 667-5794		
4.4	Public Contact Name	GENE TURNER			Telephone Number (include area code) (505) 667-5794		
4.5	SIC Code (s) (4 digits)	Primary a. 9711	b.	c.	d.	e.	f.

		Degrees	Minutes	Seconds		Degrees	Minutes	Seconds
4.6	Latitude	35	49	51	Longitude	106	14	15

4.7 Dun & Bradstreet Number(s) (9 digits)	4.8 EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9 Facility NPDES Permit Number(s) (9 characters)	4.10 Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a. NA	a. NM0890010515	a. NM0028355	a. NA
b.	b.	b. NM0028576	b.

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA [ ]	U.S. DEPARTMENT OF ENERGY
5.2	Parent Company's Dun & Bradstreet Number	NA [X]	

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number: 87544SDLSL52835

Toxic Chemical, Category or Generic Name: MERCURY

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1 CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical ca
7439976

1.2 Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
MERCURY

1.3 Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)
NA

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA.)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NA [X]																	

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1 Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)
NA

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:
- a. [ ] Produce b. [ ] Import

If produce or import:
- c. [ ] For on-site use/processing
- d. [ ] For sale/distribution
- e. [ ] As a byproduct
- f. [ ] As an impurity

3.2 Process the toxic chemical:
- a. [ ] As a reactant
- b. [ ] As a formulation component
- c. [ ] As an article component
- d. [ ] Repackaging
- e. [ ] As an impurity

3.3 Otherwise use the toxic chemical:
- a. [ ] As a chemical processing aid
- b. [ ] As a manufacturing aid
- c. [X] Ancillary or other use

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1 04 (Enter two-digit code from instruction package.)

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA [ ]	0.3	M	
5.2	Stack or point air emissions	NA [ ]	0.3	M	
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1	SANDIA CANYON TRIBUTARY TO RIO GRANDE		0.3	M	000.00
5.3.2	WATER CANYON TRIBUTARY TO RIO GRANDE		0.1	M	090.00
5.3.3	PAJARITO CANYON TRIBUTARY TO RIO GRANDE		0.2	M	100.00

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box: 1
and indicate the Part II, Section 5.3 page number in this box: 1 (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA form 9350-1(Rev. 01/2001) - Previous editions are obsolete.

** Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 87544SDLSL52835 Toxic Chemical, Category or Generic Name MERCURY

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	X	NA	
5.4.2	Underground Injection onsite to Class II-V Wells	X	NA	
5.5	Disposal to land onsite			
5.5.1A	RCRA Subtitle C landfills	X	NA	
5.5.1B	Other landfills	X	NA	
5.5.2	Land treatment/application farming	X	NA	
5.5.3	Surface Impoundment	X	NA	
5.5.4	Other disposal	X	NA	

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)
NA	

6.1.B.1	POTW Name	NA					
POTW Address							
City		State		County		Zip	-
6.1.B.2	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box [1] and indicate the Part II, Section 6.1 page number in this box [1] (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2.1 Off-Site EPA Identification Number (RCRA ID No.)	UTD981552177								
Off-Site Location Name	SAFETY KLEEN (ARAGONITE), INC.								
Off-Site Address	11600 NORTH APTUS ROAD								
City	ARAGONITE	State	UT	County	TOOELE	Zip	84029	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev.01/2001) - Previous editions are obsolete.

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
87544SDLSL52835
Toxic Chemical, Category or Generic Name
MERCURY

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 9.6	1. C	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

6.2.2 Off-Site EPA Identification Number (RCRA ID No.): COD980591184

Off-Site location Name: ONYX ENVIRONMENTAL SERVICES, L.L.C.

Off-Site Address: 9131 EAST 96TH AVENUE

City: HENDERSON | State: CO | County: DENVER | Zip: 80640- | Country (Non-US):

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 8.0	1. C	1. M24
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]							c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b	1	C09	2	P12			7A.1c	7A.1d	7A.1e
W	3 P31	4	NA	5		6	7	8	4	97 %	Yes [X] No [ ]
7A.2a	7A.2b	1		2		3	4	5	6	7	8	7A.2c	7A.2d	7A.2e
NA													%	Yes [ ] No [ ]
7A.3a	7A.3b	1		2		3	4	5	6	7	8	7A.3c	7A.3d	7A.3e
													%	Yes [ ] No [ ]
7A.4a	7A.4b	1		2		3	4	5	6	7	8	7A.4c	7A.4d	7A.4e
													%	Yes [ ] No [ ]
7A.5a	7A.5b	1		2		3	4	5	6	7	8	7A.5c	7A.5d	7A.5e
													%	Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box: 4

and indicate the Part II, Section 6.2/7A page number in this box: 1 (example: 1,2,3, etc)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 01/2001) - Previous editions are obsolete.

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
87544SDLSL52835
Toxic Chemical, Category or Generic Name
MERCURY

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2.3 Off-Site EPA Identification Number (RCRA ID No.)	AZ0000337360
Off-Site location Name	SUPERIOR SPECIAL SERVICES, INC
Off-Site Address	5752 W. JEFFERSON ST.

City	PHOENIX	State	AZ	County	MARICOPA	Zip	85043-	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 1.5	1. C	1. M93
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]								c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.6a	7A.6b	1		2		3		4		5		6		7		8		7A.6c	7A.6d	7A.6e
																			%	Yes [ ] No [ ]
7A.7a	7A.7b	1		2		3		4		5		6		7		8		7A.7c	7A.7d	7A.7e
																			%	Yes [ ] No [ ]
7A.8a	7A.8b	1		2		3		4		5		6		7		8		7A.8c	7A.8d	7A.8e
																			%	Yes [ ] No [ ]
7A.9a	7A.9b	1		2		3		4		5		6		7		8		7A.9c	7A.9d	7A.9e
																			%	Yes [ ] No [ ]
7A.10a	7A.10b	1		2		3		4		5		6		7		8		7A.10c	7A.10d	7A.10e
																			%	Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [4]
and indicate the Part II, Section 6.2/7A page number in this box : [2] (example: 1,2,3, etc)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 01/2001) - Previous editions are obsolete.

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
87544SDLSL52835
Toxic Chemical, Category or Generic Name
MERCURY

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2.4 Off-Site EPA Identification Number (RCRA ID No.)	TXD988088464
Off-Site location Name	WASTE CONTROL SPECIALISTS
Off-Site Address	9998 HIGHWAY 176 WEST

City	ANDREWS	State	TX	County	ANDREWS	Zip	79714-	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.5	1. C	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]								c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.11a	7A.11b	1		2		3		4	7A.11c	7A.11d	7A.11e
	5		6		7		8			%	Yes [ ] No [ ]
7A.12a	7A.12b	1		2		3		4	7A.12c	7A.12d	7A.12e
	5		6		7		8			%	Yes [ ] No [ ]
7A.13a	7A.13b	1		2		3		4	7A.13c	7A.13d	7A.13e
	5		6		7		8			%	Yes [ ] No [ ]
7A.14a	7A.14b	1		2		3		4	7A.14c	7A.14d	7A.14e
	5		6		7		8			%	Yes [ ] No [ ]
7A.15a	7A.15b	1		2		3		4	7A.15c	7A.15d	7A.15e
	5		6		7		8			%	Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [4]
and indicate the Part II, Section 6.2/7A page number in this box : [3] (example: 1,2,3, etc)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 01/2001) - Previous editions are obsolete.

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
87544SDLSL52835
Toxic Chemical, Category or Generic Name
MERCURY

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

6.2.5 Off-Site EPA Identification Number (RCRA ID No.)	CAT000646117
Off-Site location Name	CHEMICAL WASTE MANAGEMENT, INC
Off-Site Address	35251 OLD SKYLINE ROAD

City	KETTLEMAN CITY	State	CA	County	KINGS	Zip	93239-	Country (Non-US)	

Is location under control of reporting facility or parent company? [ ] Yes [X] No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1. 0.5	1. C	1. M99
2. NA	2.	2.
3.	3.	3.
4.	4.	4.

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

[ ] Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.16a	7A.16b 1 2 3 4 5 6 7 8	7A.16c	7A.16d %	7A.16e Yes [ ] No [ ]
7A.17a	7A.17b 1 2 3 4 5 6 7 8	7A.17c	7A.17d %	7A.17e Yes [ ] No [ ]
7A.18a	7A.18b 1 2 3 4 5 6 7 8	7A.18c	7A.18d %	7A.18e Yes [ ] No [ ]
7A.19a	7A.19b 1 2 3 4 5 6 7 8	7A.19c	7A.19d %	7A.19e Yes [ ] No [ ]
7A.20a	7A.20b 1 2 3 4 5 6 7 8	7A.20c	7A.20d %	7A.20e Yes [ ] No [ ]

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box [4]
and indicate the Part II, Section 6.2/7A page number in this box : [4] (example: 1,2,3, etc)

* For Dioxin or Dioxin-like compounds, report in grams/year

EPA Form 9350-1 (Rev. 01/2001) - Previous editions are obsolete.

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
87544SDLSL52835
Toxic Chemical, Category or Generic Name
MERCURY

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

[X] Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 NA 2 [ ] 3 [ ] 4 [ ]

SECTION 7C. ON-SITE RECYCLING PROCESSES

[X] Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1. NA 2. [ ] 3. [ ] 4. [ ] 5. [ ]

6. [ ] 7. [ ] 8. [ ] 9. [ ] 10. [ ]

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1	Quantity released ***	14.6	21.3	21.3	21.3
8.2	Quantity used for energy recovery onsite	NA	NA	NA	NA
8.3	Quantity used for energy recovery offsite	NA	NA	NA	NA
8.4	Quantity recycled onsite	NA	NA	NA	NA
8.5	Quantity recycled offsite	6.5	9.5	9.5	9.5
8.6	Quantity treated onsite	NA	NA	NA	NA
8.7	Quantity treated offsite	NA	NA	NA	NA
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)			0	
8.9	Production ratio or activity index			0000005.73	

8.10 Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1	NA	a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

		YES	NO
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one box)	[ ]	[X]

EPA Form 9350-1 (Rev. 01/2001) - Previous editions are obsolete.

* For Dioxin or Dioxin-like compounds, report in grams/year

*** Report releases pursuant to EPCRA Section 329(8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated onsite.

Appendix C:

Environmental Releases of Mercury

ENVIRONMENTAL RELEASES OF MERCURY

This appendix provides additional detail on calculation of environmental releases of mercury that were included on the Form R. More detailed information is provided specifically for air emissions, and releases to water.

Air Emissions

The largest source of potential mercury air emissions at the Laboratory is in the LANSCE shutter system. Additionally, in 2000 a one-time project was conducted to clean legacy waste and sludge that had accumulated in the pipes and drain system at LANSCE. Air monitoring was conducted during this project and data collected was used to estimate air emissions for the Form R report. The main exhaust stack from the shutter system was also monitored for mercury emissions. Table C-1 provides a summary of the air emissions monitoring data that was collected at LANSCE in 2000. Emissions detected during the days that monitoring was conducted were multiplied by the total number of days of operation to obtain an estimate of total annual emissions. A safety factor of 10 was then applied to account for any mercury releases that may not have been included in the monitoring program.

Table C-1. Summary of Air Emissions Monitoring for Mercury at LANSCE

Task	Total Hg Detected from Air Sampling (grams)	Number of days Monitored	Number of days of operations	Total Estimated Hg Emissions (grams)	Comment
JCNNM cleanup operations; direct readings	0.424	38	214	2	Ambient measurements at work areas
JCNNM cleanup; lapel samplers	0.175	10	214	4	Lapel samplers during JCNNM work on drains
Stack measurements during radioactive liquid waste (RLW) venting	0.391	5	122	10	Stack Hg measurements while RLW tanks vented to stack
Ambient measurements (RLW work)	0.403	10	122	5	RLW tank work; ambient readings
LANSCE shutter system	0.000	1	244	0	Sampled during pre-cycle performance test of entire shutter system; no mercury detected
			Total Hg	21	Grams
			Safety factor	10	Factor applied to account for any minor mercury operations not monitored; e.g., opening waste containers
				206	Grams
				0.5	Pounds

Release to Water

The Water Quality & Hydrology (ESH-18) group's monitoring stations, located throughout the Laboratory, monitor releases of mercury to receiving streams. The data from storm water monitoring, can be combined with permitted outfall data (from the water treatment plant) to determine total discharges of mercury to streams at LANL. The concentration data from both sources is combined with flow data and linked to the nearest stream site to determine the total amount of mercury released from LANL. Table C-2 provides a summary of mercury from storm water and from permitted outfalls at LANL and includes a detailed breakdown of the amount of mercury estimated to have been released to each receiving stream in 2000.

Table C-2. Summary of Mercury Releases to Water

Receiving Stream	Storm Water Totals (lb Hg)	Outfall Totals (lb Hg)	Total Mercury Discharges into Receiving Streams (lb)	% From Storm Water
Sandia Canyon Tributary to Rio Grande	0	0.268	0.268	0.0
Pajarito Canyon Tributary to Rio Grande	0.191		0.191	100.0
Water Canyon Tributary to Rio Grande	0.103	0.012	0.115	89.6
Canada del Buey Tributary to Rio Grande	0.030		0.030	100.0
Mortandad Canyon Tributary to Rio Grande		0.011	0.011	0.0
Los Alamos Canyon Tributary to Rio Grande	3.37E–03	6.588E–03	9.961E–03	33.9
Canon de Valle Tributary to Rio Grande		5.263E–04	5.263E–04	0.0
DP Canyon Tributary to Rio Grande	2.33E–04		2.330E–04	100.0
Ancho Canyon Tributary to Rio Grande	1.74E–04		1.742E–04	100.0
Potrillo Canyon Tributary to Rio Grande	7.77E–05		7.766E–05	100.0
Pueblo Canyon Tributary to Rio Grande	0		0	
Rendija Canyon Tributary to Rio Grande	0		0	
Two Mile Canyon Tributary to Rio Grande	0		0	
TOTAL			**0.625**	

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