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Emissions Inventory Report Summary for  
Los Alamos National Laboratory for  
Calendar Year 2004

Edited by Hector Hinojosa, Group IM-1

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LA-14256-SR  
Status Report  
Issued: October 2005

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Meteorology and Air Quality Group (ENV-MAQ)



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# **Emissions Inventory Report Summary for Los Alamos National Laboratory for Calendar Year 2004**

**by**

**Meteorology and Air Quality Group (ENV-MAQ)**

## **ABSTRACT**

Los Alamos National Laboratory (LANL) is subject to annual emissions reporting requirements for regulated air pollutants under Title 20 of the New Mexico Administrative Code, Chapter 2, Part 73 (20.2.73 NMAC), *Notice of Intent and Emissions Inventory Requirements*. The applicability of the requirements is based on the Laboratory's potential to emit 100 tons per year of suspended particulate matter, nitrogen oxides, carbon monoxide, sulfur oxides, or volatile organic compounds. Additionally, on April 30, 2004, LANL was issued a Title V Operating Permit from the New Mexico Environment Department, Air Quality Bureau, under 20.2.70 NMAC. This Title V Operating Permit (Permit No. P-100) includes emission limits and operating limits for all regulated sources of air pollution at LANL. The Title V Operating Permit also requires semi-annual emissions reporting for all sources included in the permit. This report summarizes both the annual emissions inventory reporting and the semi-annual emissions reporting for LANL for calendar year 2004. LANL's 2004 emissions are well below the emission limits in the Title V Operating Permit.

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## **1.0 INTRODUCTION**

### **1.1 REGULATORY BASIS**

Los Alamos National Laboratory (LANL or the Laboratory) has reported on air pollutants generated from its operations since the 1970s when Air Quality Control Regulation 703, *Registration of Air Contaminant Sources*, was promulgated. According to the regulation, the Laboratory was required to register air pollutant sources that emitted more than 2,000 lb per year of any air contaminant. This regulatory requirement later evolved into Title 20 of the New Mexico Administrative Code, Chapter 2, Part 73 (20.2.73 NMAC), *Notice of Intent and Emissions Inventory Requirements*. The objective of the reporting requirement is to provide emissions data to the New Mexico Environment Department (NMED)/Air Quality Bureau (AQB) so its staff can determine whether LANL meets state and federal air pollutant standards.

Annual emissions inventory reporting requirements under 20.2.73 NMAC apply to any stationary source which

- has been issued a construction permit under 20.2.72 NMAC;
- has been required to file a Notice of Intent under 20.2.73.200 NMAC; or
- emits in excess of
  - 1 ton per year of lead or
  - 10 tons per year of
    - total suspended particulates;
    - particulate matter (PM) with diameter less than 10 micrometers (PM<sub>10</sub>);
    - PM with diameter less than 2.5 micrometers (PM<sub>2.5</sub>);
    - sulfur dioxide;
    - nitrogen oxides (NO<sub>x</sub>);
    - carbon monoxide (CO); or
    - volatile organic compounds (VOCs).

The annual emissions inventory must be submitted to NMED/AQB by April 1 of each year. The NMED/AQB enters the data in the Aerometric Information Retrieval System (AIRS).<sup>1</sup> This nationwide system, administered by the U.S. Environmental Protection Agency (EPA), is used to help ensure ambient air quality standards are maintained and to track the state's air pollutant emissions. AIRS is a large air pollution database that contains information, requirements, and data on air pollution and air quality in the United States and various World Health Organization member countries. The program is operated by the EPA and state/local air pollution control agencies. The AIRS database tracks each state's progress towards achieving and maintaining National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The database is also used as a tool to help improve each state's air quality programs by enabling program members to access and compare past data and view data from other states. For 2004 emissions inventory reporting, NMED imported existing facility data from the AIRS database into spreadsheets and requested facilities to update the sheets with 2004 facility emissions information.

Additionally, on April 30, 2004, the Laboratory received their Title V Operating Permit (P-100) from the NMED/AQB<sup>2</sup> as required under 20.2.70 NMAC. A condition of the Title V Operating Permit is that LANL must submit semi-annual emissions reports to NMED documenting that emissions from all permitted sources are below permitted emission levels. Section 4.0 of the permit states:

*Reports of actual emissions from permitted sources in Section 2.0 of the permit shall be submitted on a 6 month basis. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of the permit. The reports shall be submitted within 90 days from the end of the reporting period. The reporting periods are January 1 through June 30, and July 1 through December 31. This condition is pursuant to 20.2.70.302.E.1 NMAC.*



Therefore, for the first time, in 2004 the Laboratory submitted the semi-annual emissions reports as well as the annual emission inventory. There are a few differences in which sources are included in the two emissions reports. These differences are explained in the following sections.

## **1.2 CONTENTS OF ANNUAL EMISSIONS INVENTORY SUBMITTAL**

NMED requested that LANL submit annual emissions inventory data for 2004 via electronic format for entry into AIRS. The information required for submittal includes the following:

- company name, address, and physical location for the facility;
- facility contact information;
- signed certification statement by a responsible facility official; and
- specific information for each emission unit such as stack and exhaust parameters, type and efficiency of control equipment, schedule of operation, annual process or fuel combustion rates, and estimated actual emissions for 2004.

This annual emissions inventory submittal includes air pollutant data for PM, PM<sub>10</sub>, CO, NO<sub>x</sub>, sulfur oxides (SO<sub>x</sub>), VOCs, beryllium, and aluminum. Additionally, at the request of NMED, the 2004 report provides data on emissions from hazardous air pollutants (HAPs), PM<sub>2.5</sub>, and ammonia.

The requirement to provide PM<sub>2.5</sub> and ammonia emissions data stems from recent developments by EPA on a NAAQS for PM<sub>2.5</sub>. States are developing a baseline for PM<sub>2.5</sub>. As such, for the 2004 emissions inventory, NMED requested emissions information on PM<sub>2.5</sub>. Further, ammonia is a precursor to PM<sub>2.5</sub> formation. It contributes to the secondary aerosol formation of PM<sub>2.5</sub> by combining with NO<sub>x</sub> and SO<sub>x</sub> to form ammonium nitrate and fine sulfate particles. Therefore, NMED also requested emissions information on ammonia.

In the 2004 annual emissions inventory submittal, LANL provided PM<sub>2.5</sub> emissions data for all combustion sources and other emission sources where PM<sub>2.5</sub> emission factors were readily available. In the absence of PM<sub>2.5</sub> emission factors, PM or PM<sub>10</sub> emissions were assumed to be equivalent to PM<sub>2.5</sub>. The Laboratory does not operate any emission units that are sources of ammonia emissions. Ammonia was included in the facility-wide emission estimates for chemical use.

### **1.3 Contents of the Semi-Annual Title V Operating Permit Emissions Reports**

The semi-annual Title V Operating Permit emissions reports include actual emissions for the reporting period for each emission source or source category included in the Title V Operating Permit. For each source category, the actual emissions are compared to emission limits listed in the permit. The emissions are calculated using operating data from logbooks and records maintained on-site. All emission calculations are consistent with calculation methods used for the annual emissions inventory.

The semi-annual emissions report includes a few source categories not included in the annual emissions inventory. The Laboratory requested emission limits in their Title V Operating Permit for two source categories that are considered insignificant sources for the annual emissions inventory. These source categories are (1) small boilers and heaters and (2) stationary standby generators. LANL requested emission limits for these source categories to obtain federally enforceable limits that would keep the Laboratory under the major source threshold for Prevention of Significant Deterioration (PSD) applicability (20.2.74 NMAC). LANL's actual emissions from these insignificant sources have historically been very low, however, without federally enforceable limits on their operation, the potential to emit from these sources was quite high. To demonstrate that LANL is below the PSD applicability and is in compliance with the emission limits placed on these emission sources, LANL now must include these emissions in the semi-annual Title V Operating Permit emissions reports.

## **2.0 REPORTED EMISSION SOURCES**

Table 2-1 shows the emission sources included in the Laboratory's 2004 Annual Emissions Inventory<sup>3</sup> and the 2004 Semi-Annual Emissions reports.<sup>4</sup> The source categories and the methodology used to calculate emissions are described in the following sections.

The following subsections describe emission sources included in the 2004 emissions inventory and semi-annual emissions reports and emission calculation methodology for each source type. A summary table of actual reported emissions by source is included at the end of this section (Section 2.13). Attachment A includes worksheets showing detailed emission calculations for individual emissions sources. A copy of the 2004 Emissions Inventory as submitted to NMED is presented in Attachment B. The semi-annual emissions reports are included as Attachment C.

### **2.1 STEAM PLANTS**

The Laboratory operates two steam plants, one located at TA-3 and the other at TA-21. The TA-3 steam plant produces steam for heating and electricity for much of the Laboratory when sufficient power from outside sources is not available. The steam plant at TA-21 provides steam for heating of buildings at this technical area. The heat produced from both steam plants is used for comfort heat and hot water and to support facility processes. Each steam plant has three boilers that are fueled primarily with natural gas with diesel fuel as a backup. The TA-3 steam plant was originally included in LANL's

**Table 2-1. Sources Included in LANL's 2004 Annual Emissions Inventory and Semi-Annual Emissions Reports**

<b>Included in Annual Emissions Inventory</b>	<b>Included in Semi-Annual Emissions Reports</b>	<b>Comment</b>
Steam Plants (Technical Area [TA] 3 & TA-21)	Steam Plants (TA-3 & TA-21)	
Boilers greater than 5 MMBTU/hr (14 units)	All small and large boilers and heaters (approximately 175 units)	Small boilers less than 5 MMBTU/hr are exempt from annual emission inventory requirements (see Section 3.1).
Asphalt Plant	Asphalt Plant	
Paper Shredder and Data Disintegrator	Paper Shredder and Data Disintegrator	
Rock Crusher (shut down)	Rock Crusher (shut down)	
Degreasers	Degreasers	
Air Curtain Destructors (shut down)	Not included	Air curtain destructors were shut down before issuance of the Title V Operating Permit.
Carpenter Shops	Carpenter Shops	
Oil Storage Tanks	No tanks included	Applicability of the New Source Performance Standard for storage tanks changed in 2004 and the LANL oil storage tanks were not required to be included in the Title V Operating Permit.
Permitted Beryllium Sources	Permitted Beryllium Sources	
Facility-wide Chemical Use	Facility-wide Chemical Use	
Process Generators (not yet operational)	Process Generators, and Stationary standby generators (approximately 45 units)	Stationary standby generators are exempt from annual emission inventory requirements (see Section 3.2).

emissions inventory as AIRS ID No. 002. When a modification to the plant was made in 2001, the TA-3 steam plant was separated into three AIRS ID numbers (032, 033, and 034) for emissions reporting purposes. The three boilers at the TA-21 steam plant are included in the emissions inventory as one AIRS ID number (004).

Actual emissions are calculated on the basis of metered fuel consumption and emission factors. The primary source of emission factors is AP-42, the U.S. Environmental Protection Agency's *Compilation of Air Pollutant Emission Factors*.<sup>5</sup> However, emission factors from stack tests conducted at the TA-3 steam plant when burning natural gas were also used, as appropriate.

The TA-3 steam plant has historically been the largest source of NO<sub>x</sub> emissions at the Laboratory. In 2002 a voluntary project to install pollution control equipment on the three boilers

at the TA-3 steam plant was completed. The three boilers were fitted with flue gas recirculation (FGR) equipment to reduce NO<sub>x</sub> emissions. Stack testing for NO<sub>x</sub> and CO was conducted before FGR equipment was installed and again after it was operational. Based on these stack test results, FGR reduced NO<sub>x</sub> emissions by approximately 64 percent. The FGR equipment was operational for all of 2004. Figure 2-1 shows a picture of the TA-3 steam plant building and stacks.



**Figure 2-1. Main steam plant at LANL TA-3.**

## **2.2 SMALL BOILERS AND HEATERS**

The Laboratory operates approximately 200 small boilers and heaters, used primarily for seasonal comfort heat. Most of the boilers are exempt from permitting requirements because of their small size and use as comfort boilers and are not included in the annual emissions inventory. The exemption analysis applied to boilers is discussed in Section 3.1 of this report.

The nonexempt boilers reported in the 2004 annual emissions inventory include the following:

- four boilers at TA-16 (AIRS ID Nos. 024 and 025);
- three boilers at TA-48 (AIRS ID Nos. 015, 016, and 017);
- two boilers at TA-53 (AIRS ID Nos. 018 and 019);
- two boilers at TA-59 (AIRS ID Nos. 020 and 021);
- two boilers at TA-55 (AIRS ID Nos. 037 and 038); and
- one process-related boiler at TA-50 (AIRS ID No. 044).

All of the reported boilers burn natural gas. Operating logs for the TA-55 and TA-50 boilers were used to quantify fuel use for these units. Fuel use for all other boilers was estimated based on the total amount of natural gas used by the Laboratory minus the amount supplied to metered sources. The amount of natural gas left after subtracting out metered sources was apportioned to

the various boilers based on their size. Since they are all seasonal boilers used for building heating, it was assumed they would all operate approximately the same amount of time over the course of the year. Some emission factors were available from stack tests (TA-55), some were provided by the boiler manufacturer (Sellers Engineering Company), and the rest were taken from AP-42.<sup>5</sup> Copies of spreadsheets showing fuel use and emission factors for each boiler are included in Attachment A.

For the semi-annual emissions reports, emissions from all small boilers and heaters are included as a source category. The Title V Operating Permit includes emissions limits for this group of emission sources. To estimate emissions all un-metered fuel use was multiplied by AP-42 emission factors for small boilers burning natural gas.<sup>5</sup> Total emissions of each pollutant from all boilers and heaters in this source category were then summed and reported on the semi-annual emissions reports.

### **2.3 ASPHALT PLANT**

For over 40 years LANL operated an asphalt plant to produce small amounts of asphalt for road repairs in and around the Laboratory. This unit is included in LANL's emissions inventory as AIRS ID No. 013. In June 2003 the asphalt plant was shut down in anticipation of a new asphalt plant being built. In September 2003 the old asphalt plant was dismantled and removed. The new asphalt plant will be located at TA-60; however, construction of the new plant has been delayed due to nesting of spotted owls. The new asphalt plant was not operational during 2004. When the new asphalt plant begins operation an AIRS ID number will be assigned and emissions will be reported in the annual emission inventory and the semi-annual emissions reports.

### **2.4 PAPER SHREDDER/DATA DISINTEGRATOR**

Shredding operations from the paper shredder at TA-52 are a source of PM emissions. This unit is included in LANL's emissions inventory as AIRS ID No. 027. Estimates of actual emissions are based on the number of boxes of material shredded and engineering estimates for controlled emissions. The unit is equipped with a cyclone separator and baghouse for abatement. The emission factor, which is the amount of particulate estimated to enter into the exhaust, was provided by the shredder equipment manufacturer. The air abatement system efficiencies were estimated based on information from EPA on cyclone and baghouse efficiencies and are documented in LANL's Title V Operating Permit application submitted to NMED in November 2002.<sup>6</sup>

In July 2004 this paper shredder was taken out of service and replaced with a new data disintegrator to shred paper and other media. The new data disintegrator is included in the emissions inventory at AIRS ID No. 045. Emissions are estimated in much the same way as described for the old paper shredder. For 2004 emissions from the old paper shredder are based on operating logs from January through June. Emissions from the new data disintegrator are calculated from operating logs from July through December.

These two sources are reported in both the annual emission inventory and the semi-annual emissions report.

## **2.5 ROCK CRUSHER**

In June 1999, NMED issued a 20.2.72 NMAC construction permit (Permit No. 2195) to LANL to operate an impact rock crusher to crush potentially radioactive contaminated concrete removed from buildings as part of the Laboratory's decontamination and decommissioning efforts. This unit is included in LANL's emissions inventory as AIRS ID No. 026. The rock crusher was not operated in 2004, and the permit was retired on June 10, 2004.

## **2.6 DEGREASERS**

The halogenated solvent cleaning machine at TA-55 has a capacity of 18 liters and is registered with NMED/AQB as required under the *National Emissions Standards for Hazardous Air Pollutants*, 40 CFR 63 Subpart T, "Halogenated Solvent Cleaning." The solvent used in the machine, trichloroethylene (Chemical Abstracts Service [CAS] No. 79-01-6), is a VOC and a HAP. This emission unit is included in the annual emissions inventory as AIRS ID No. 028. LANL uses a mass balance approach to estimate emissions. Logbooks are kept on the amount of solvent added and removed from the machine. Additionally, monthly tracking of solvent levels in the machine are logged. Using a mass balance approach, emissions are estimated. LANL has two additional halogenated solvent cleaning machines registered with NMED (AIRS ID Nos. 029 and 030); however, these two machines did not operate in 2004. This source category is reported in both the annual emissions inventory and the semi-annual emissions report.

## **2.7 AIR CURTAIN DESTRUCTORS**

Three air curtain destructors were used extensively during the period from 2001 through 2003 for controlled open burning of wood and brush generated from tree thinning activities at LANL. These units are included in LANL's emissions inventory as AIRS ID Nos. 039, 040, and 041. These units were retired and taken out of service in October 2003 and did not operate during 2004.

## **2.8 CARPENTER SHOP**

LANL operates a carpenter shop at TA-3-38. This carpenter shop was built before 1960 and is not subject to 20.2.72 NMAC construction permitting. However, LANL included carpenter shops in the Title V Operating Permit. Therefore, this source category is included in the annual emissions inventory as AIRS ID No. 042 and is included on the semi-annual emissions report. Additionally, a carpenter shop located at TA-15 is included in the Operating Permit. However, this carpenter shop is still under construction and operations have not started up yet. When this carpenter shop is operational, emissions will be included in both the annual emissions inventory and the semi-annual emissions reports.

PM emissions from the carpenter shop are estimated based on number of hours the exhaust system operated and an estimated control efficiency of the cyclone. Emission factors from AP-42, Section 10.4, "Woodworking Waste Collection Operations," were used to estimate PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions.<sup>7</sup>

## **2.9 OIL STORAGE TANKS**

Two large diesel storage tanks are located at the TA-3 steam plant for backup fuel to the boilers. These tanks are included in the annual emissions inventory as AIRS ID Nos. 035 and 036.

Emissions from these tanks are estimated using software developed by EPA for estimating emissions from storage tanks.<sup>8</sup> The TANKS 4.0 software requires inputs for tank parameters, site-specific meteorological conditions, and actual fuel throughputs.

The Laboratory included 14 smaller oil storage tanks in the November 2002 updated Title V Operating Permit application because they were subject to *New Source Performance Standards*, 40 CFR 60, Subpart Kb. These tanks store mineral oil, scintillation oil, or dielectric oil, which all have vapor pressures less than 0.01 mmHg. In 2003 EPA modified the applicability of Subpart Kb and these tanks are no longer subject to this regulation. Subsequently they were not included in the Laboratory's Title V Operating Permit (Permit No. P-100), and therefore are not included in the semi-annual emissions reports.

Emissions from these smaller oil storage tanks were included for the first time in the 2002 annual emissions inventory. With agreement from NMED, emissions from the 14 tanks were summed and listed as one stack entry in the emissions inventory report due to the small quantity of emissions (email correspondence with Jim Shively, NMED/AQB, dated February 3, 2003). This "composite" mineral oil tank was assigned AIRS ID No. 043. Because an AIRS ID number is now assigned, emissions from these tanks will continue to be included in the annual emissions inventory submittal. Based on the most conservative tank parameters and actual throughput from chemical inventory records, a unit emission rate was calculated. The TANKS 4.0 software was used to estimate emissions for both vertical and fixed roof tanks.<sup>8</sup> Unit emission rates in lb/yr were multiplied by the number of horizontal and vertical tanks to provide an estimate of total annual emissions from all of the tanks.

## **2.10 PERMITTED BERYLLIUM-MACHINING OPERATIONS**

The Laboratory operates under five 20.2.72 NMAC construction permits\*\* for beryllium-machining operations that are subject to 40 CFR 61, Subpart C, "National Emission Standards for Beryllium." Beryllium-machining operations are reported in the emissions inventory under AIRS ID Nos. 006, 007, 008, 010, and 011. AIRS ID No 008 for beryllium machining at TA-3, Building 102 was not operated in 2004, and the permit was retired on February 20, 2004. Emissions reported for the Beryllium Test Facility (AIRS ID No. 007) are from actual stack emissions measurements. Emissions for the Target Fabrication Facility (AIRS ID No. 006) are from initial compliance stack testing. Emissions from the plutonium facility (AIRS ID Nos. 010 and 011) are reported at permitted emission levels. Total emissions from all permitted beryllium operations are included in the semi-annual emissions reports.

## **2.11 STATIONARY STANDBY GENERATORS**

The Laboratory received a Construction Permit in October 2002 to install a process-related generator at TA-33. Due to a series of delays, this generator is not yet operational. The TA-33 generator is included in LANL's Title V Operating Permit. When this generator becomes operational emissions will be included in both the annual emissions inventory and the semi-annual emissions reports.

The Laboratory maintains approximately 45 stationary standby generators that are considered exempt sources under the Construction Permit regulations (20.2.72.202.b NMAC) and the annual

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\*\* Permit No. 632, issued December 26, 1985; Permit No. 632-M2, issued October 30, 1998; Permit No. 635, issued March 19, 1986; Permit No. 636, issued March 19, 1986; Permit No. 1080-M1-R2, issued March 11, 1998.

emission inventory requirements. However, these sources are included in LANL's Title V Operating Permit with operating limits and emission limits. Therefore these sources must be included in the semi-annual emissions reports. All stationary standby generators at LANL are exercised on a routine schedule to ensure they are operational and will function properly if needed. All units are equipped with hour meters to document how many hours they are used. The Laboratory maintains records on a semi-annual basis to document hour meter readings. The number of hours each generator is used in a reporting period is multiplied by AP-42 emission factors for diesel-fired internal combustion engines, or natural gas-fired internal combustion engines.<sup>9</sup> Emissions are then summed for each pollutant and reported on the semi-annual emissions reports for this source category.

## **2.12 EMISSIONS FROM CHEMICAL USE ACTIVITIES**

The majority of the Laboratory's work is devoted to research and development (R&D) activities. Varying operating parameters, as well as amounts and types of chemicals, are used in these activities. R&D activities occur at virtually all technical areas within the Laboratory, typically in small quantities in laboratory settings. Figure 2-2 shows a typical laboratory at LANL where chemicals are used.

For the purposes of annual emissions inventory reporting, one AIRS ID has been assigned for all R&D chemical use (AIRS ID No. 031). Facility-wide chemical use emissions are reported on both the annual emissions inventory and the semi-annual emissions report. The methods used to quantify emissions of VOC and HAPs from R&D activities are discussed below.

### **2.12.1 VOC Emissions**

The Laboratory tracks chemical purchases through a facility-wide chemical tracking system called ChemLog. A download from the ChemLog inventory system was created that included all chemical containers added to LANL's inventory between January 1, 2004, and December 31, 2004. This dataset included 37,179 separate line items of chemicals purchased. The volume of chemicals purchased is approximately 15 percent lower than previous years due to the Laboratory-wide shutdown in July 2004 when the Laboratory stopped operations to focus on evaluating and updating safety and security measures.





**Figure 2-2. Example of chemical use in laboratory hood at LANL.**

The dataset was reviewed electronically to identify all VOCs purchased and received at LANL in 2004. With the exception of specific listed chemicals, VOCs are any compounds of carbon that participate in atmospheric photochemical reactions. VOCs include commonly used chemicals such as ethanol, methanol, trichloroethylene, and isopropanol. The general assumption used in estimating VOC emissions from chemical use is

$$\text{Purchasing} = \text{Use} = \text{Emissions.}$$

From the dataset of chemicals purchased in 2004, certain categories of chemicals were separated and eliminated from the analysis. The classifications assigned and corresponding reasons (noted in parentheses) for exclusion of chemicals from inventory records are noted below.

- Solid materials (not a significant source of air emissions based on their low vapor pressure);
- Non-VOC materials as defined by 40 CFR 51.100 (specific chemicals in 40 CFR 51.100 are listed as having negligible photochemical reactivity and are exempt from the definition of VOC);
- Paints (paints were evaluated separately—see Section 3.5);
- Inorganic chemicals (inorganics are not compounds of carbon);
- Oils (not a significant source of air emissions based on low vapor pressure and primarily used for maintenance);
- Fuels used for combustion purposes (emissions from fuel combustion are reported for each combustion unit).

Furthermore, the following categories of chemicals were eliminated based on guidance from NMED (letter from Mary Uhl, NMED/AQB, dated January 30, 2001):

- Container sizes of 1 lb or less;
- Chemicals with vapor pressures less than 10 mmHg;
- Chemicals used to calibrate equipment;
- Maintenance chemicals;
- Use of office equipment and products;
- Chemicals used for boiler water treatment operations;
- Chemicals used for oxygen scavenging (deaeration) of water; and
- Chemicals used in bench-scale chemical analysis.\*

After elimination of chemicals and categories of chemicals listed above, the remaining chemical inventory records were matched with a list of known VOCs by CAS number. For mixtures (chemicals without CAS numbers) material safety data sheets (MSDSs) were reviewed to determine if any VOCs were present and, if so, to determine the associated percent volatile. As a conservative estimate, VOCs identified in ChemLog records were assumed to be 100 percent emitted to air. Estimated emissions of VOCs from chemical use in 2004 totaled 7.95 tons.

### **2.12.2 HAP Emissions**

Section 112(b) of the 1990 Clean Air Act Amendments listed 189 unique HAPs identified for potential regulation by EPA. In 1995, caprolactam was delisted as a HAP. Of the remaining 188 listed HAPs, 17 are classes of compounds (e.g., nickel compounds). Use of the 188 listed chemicals in activities at the Laboratory was evaluated and quantified for the annual emissions inventory submittal to NMED.

The ChemLog inventory system 2004 data set was analyzed to identify HAPs. The identification process was similar to that used for VOCs. Pure chemicals (i.e., chemicals with CAS numbers), classes of compounds, and mixtures were evaluated to determine if the chemicals themselves were HAPs or if they contained HAP constituents. For mixtures, MSDSs were reviewed to determine if any HAPs were present and, if so, to determine the associated HAP percentages. Listed below are certain chemical types or categories that were identified and removed from this analysis (refer to Section 2.12.1 and Table 3-1 for explanations on removal of these chemicals):

- Paints;
- Oils;
- Maintenance chemicals;
- Chemicals used to calibrate equipment;
- Container sizes of 1 lb or less;
- Chemicals used in bench-scale chemical analysis;
- Use of office equipment and products;
- Chemicals used for boiler water treatment operations; and
- Chemicals used for oxygen scavenging (deaeration) of water.

Total HAP emissions were estimated by summing (1) pure HAP chemicals, (2) classes of compounds that are HAPs, and (3) the HAP constituents from mixtures. The resulting total amount of HAPs from chemical use reported for 2004 was 5.71 tons.

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\* This exemption was applied only to biological research solutions. Otherwise, this exemption was not applied. See Table 3-1.

The HAP emissions reported generally reflect quantities procured in the calendar year. In a few cases procurement values and operational processes were further evaluated so that actual air emissions could be reported instead of procurement quantities. Additional analyses for certain metals and acids were performed and are described below.

### **HAP Metals**

Purchases of chromium, lead, manganese, mercury, and nickel compounds were evaluated to determine usage and potential air emissions. Several of the purchases were identified as laboratory calibration standards containing only parts per million quantities of the metals. These were exempt from emissions inventory requirements because of their use as standards for calibrating laboratory equipment. Other purchasers of relatively large quantities of metal compounds that were contacted confirmed that the material was still in use or in storage and had not resulted in air emissions.

### **Hydrochloric Acid**

Facility and Waste Operations Division purchased multiple 14-gallon carboys of hydrochloric acid (HCl) totaling approximately 1,592 lb. This HCl was used for heat exchanger scale cleaning and for cleaning of electro dialysis reversal membranes. Emissions from these particular activities were estimated to be less than one pound based on specific process information and engineering calculations. This is also considered a routine maintenance activity and exempt from emissions inventory reporting. The remaining procurements consisted of numerous small purchases from a variety of operating groups. Additional analysis of these numerous small purchases was not done. As a conservative assumption, all of this HCl was assumed to be emitted resulting in a reported total of 1.52 tons of HCl emissions.

### **2.13 EMISSIONS SUMMARY BY SOURCE**

Table 2-2 provides a summary of LANL's 2004 actual emissions, as submitted for the annual emissions inventory. The table presents emissions by pollutant and by source, with a facility total at the bottom of the table. Attachment A provides detailed information on how emissions were calculated for each emission unit.

**Table 2-2. Summary of LANL 2004 Reported Emissions for Annual Emissions Inventory**

	NO <sub>x</sub> (tons/yr)	SO <sub>x</sub> (tons/yr)	PM <sub>10</sub> (tons/yr)	PM <sub>2.5</sub> (tons/yr)	CO (tons/yr)	VOC (tons/yr)	HAPs (tons/yr)
TA-3 Steam Plant Boilers	16.34	0.29	2.16	2.15	11.26	1.54	0.53
TA-21 Steam Plant Boilers	1.58	0.01	0.12	0.12	1.33	0.09	0.03
Non-Exempt Boilers	6.55	0.04	0.61	0.61	4.5	0.38	0.13
Asphalt Plant <sup>(a)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paper Shredder/Data Disintegrator	NA*	NA	0.09	0.06	NA	NA	NA
Rock Crusher <sup>(a)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Degreaser	NA	NA	NA	NA	NA	0.01	0.01
Air Curtain Destructors <sup>(a)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carpenter Shop	NA	NA	0.02	0.01	NA	NA	NA
Oil Storage Tanks	NA	NA	NA	NA	NA	0.05	NA
R&D Chemical Use	NA	NA	NA	NA	NA	7.95	5.71
TOTAL	24.47	0.34	3.0	2.95	17.09	10.02	6.41

\*Not applicable.

Table 2-3 provides a summary of 2004 emissions as reported on the semi-annual emissions reports required by the Title V Operating Permit. Attachment A provides detailed information on how emissions were calculated for each emission source category.

**Table 2-3. Summary of LANL 2004 Semi-Annual Emissions as Reported Under Title V Operating Permit Requirements**

	NO <sub>x</sub> (tons/yr)	SO <sub>x</sub> (tons/yr)	PM <sub>10</sub> (tons/yr)	PM <sub>2.5</sub> (tons/yr)	CO (tons/yr)	VOC (tons/yr)	HAPs (tons/yr)
TA-3 Steam Plant Boilers	16.34	0.29	2.16	2.15	11.26	1.54	0.53
TA-21 Steam Plant Boilers	Emissions included in Small Boilers Source Category						
All Small Boilers and Heaters	28.30	0.18	2.23	2.23	22.75	1.61	0.50
Asphalt Plant <sup>(a)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paper Shredder/Data Disintegrator	NA*	NA	0.09	0.06	NA	NA	NA
Rock Crusher <sup>(a)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Degreaser	NA	NA	NA	NA	NA	0.01	0.01
Air Curtain Destructors <sup>(a)(b)</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carpenter Shop	NA	NA	0.02	0.01	NA	NA	NA
Oil Storage Tanks <sup>(b)</sup>	NA	NA	NA	NA	NA	NA	NA
R&D Chemical Use	NA	NA	NA	NA	NA	7.95	5.71
Stationary Standby Generators	5.87	1.10	0.3	0.3	1.36	0.32	0.003
TOTAL	50.5	1.57	4.8	4.75	35.4	11.4	6.75

\* NA = Not Applicable

(a) Source did not operate in 2004.

(b) Source category not included in Title V Operating Permit.

### 3.0 REPORTING EXEMPTIONS

Specific activities that are determined to be insignificant under NMED's Operating Permit program (20.2.70 NMAC) are exempt from reporting under the emissions inventory requirements (20.2.73.300 NMAC). NMED has designated exempt sources, activities, or thresholds in the following lists:

- "List of Insignificant Activities," September 29, 1995,<sup>10</sup> and
- "List of Trivial Activities," January 10, 1996.<sup>11</sup>

Laboratory sources and activities that qualify as insignificant or trivial as specified in these lists are not included in the annual emissions inventory. The following subsections of this report provide information and examples of the Laboratory's exempt activities as well as analyses performed to determine exempt status.

#### 3.1 BOILERS

The Laboratory's boiler inventory was evaluated against the "List of Insignificant Activities." Specifically, boilers were exempted from emissions inventory reporting requirements if they met one of the following requirements:

- Fuel burning equipment which uses gaseous fuel, has a design rate less than or equal to five (5) million BTU per hour, and is used solely for heating buildings for personal comfort or for producing hot water for personal use, or
- Any emissions unit...that has the potential to emit no more than **one (1) ton per year** of any regulated pollutant...

Any boiler that was not used exclusively for comfort heating or hot water was evaluated for the **one (1) ton per year** exemption. For purposes of determining exemptions, boiler design ratings were used to estimate potential to emit. Any boiler not qualifying for one of these two exemptions is included in the annual emissions inventory with its own unique AIRS ID number.

For the semi-annual emissions reports, emissions from all boilers and heaters were summed and reported for the entire source category.

#### 3.2 GENERATORS

The Laboratory maintains an inventory of approximately 125 portable generators. Portable generators are used at the Laboratory for temporary operations requiring remote power or to provide emergency backup power during power outages at various sites. The portable generators are fueled by gasoline and/or diesel fuel.

In addition to portable generators, the Laboratory maintains and operates approximately 45 stationary standby generators. Stationary generators are used on standby (emergency) status to provide power to critical systems at the Laboratory during power outages. The stationary generators are fueled by natural gas, gasoline, or diesel.

The insignificant activity exemptions applicable to the Laboratory's generators are the following:

- Portable engines and portable turbines that have a design capacity...less than or equal to

- 200-horsepower engine if fueled by diesel or natural gas, and
- 500-horsepower engine if fueled by gasoline.
- Emergency generators that comply with the definition of standby equipment.

Standby equipment is defined in NMED/AQB “List of Insignificant Activities”<sup>10</sup> as

“an emissions unit which on a temporary basis replaces equipment used in normal operation, and which either has an allowable emission rate or potential to emit for each fee pollutant that is equal to or less than the equipment replaced, or which does not operate for a period exceeding 500 hours per calendar year.”

On the basis of size, portable generators used for temporary power at remote locations are exempt from emissions inventory reporting requirements. Further, LANL’s small portable generators are considered trivial activities and are not included in the Title V Operating Permit or semi-annual emissions reports. All stationary generators are designated as standby equipment under the Operating Permit Program and are used solely to provide emergency backup power for less than 500 hours per year. Therefore they are considered insignificant sources and are also exempt from annual emissions inventory reporting requirements. However the stationary standby generators were voluntarily included as a source category in the Title V Operating Permit and are included in the semi-annual emissions reports.

The Laboratory is installing a process-related generator at TA-33 to support research activities. NMED issued a construction permit in October 2002 for installation of this generator (Permit No. 2195-F), and this unit is included in LANL’s Title V Operating Permit. However, installation is not yet complete and the generator did not operate in 2004. Therefore, this unit is not included in the 2004 emissions inventory.

### **3.3 VOC EMISSIONS**

A number of insignificant and trivial activities were applicable for exempting materials from the VOC chemical use total in the emissions inventory. The basis of the exemptions and corresponding insignificant or trivial activities are explained in Table 3-1.

Fuels such as propane, kerosene, and acetylene were analyzed separately and are not listed in Table 3-1. When fuels are burned in an open flame, almost all of the fuels are consumed and emissions are minimal. Emissions from fuel combustion are accounted for using emission factors for each fuel-burning unit.

### **3.4 HAP EMISSIONS**

The HAP chemical use exemption analysis, similar to the VOC chemical use exemption analysis, resulted in application of several of the same exemptions from NMED/AQB “List of Trivial Activities”<sup>10</sup> and “List of Insignificant Activities”<sup>11</sup> (refer to Table 3.1).

### **3.5 PAINTS**

An analysis of VOC and HAP emissions resulting from painting activities conducted at the Laboratory was performed to determine if certain exemptions apply. Paint information for 2004 was gathered from work control databases and the ChemLog chemical inventory system. These records were evaluated for applicability of exemptions for trivial and insignificant activities.

**Table 3-1. Exemptions Applied for Chemical Use Activities**

<b>Basis of Exemption</b>	<b>Activity Type</b>	<b>Activity</b>
Container sizes of 1 pound or less	Trivial	Paint or nonpaint materials dispensed from prepackaged aerosol cans of 16-oz. capacity or less.
Chemicals with vapor pressures less than 10 mmHg	Insignificant	Any emissions unit, operation, or activity that handles or stores a liquid with vapor pressure less than 10 mmHg or in quantities less than 500 gal.
Calibration chemicals	Trivial	Routine calibration and maintenance of laboratory equipment or other analytical instruments, including gases used as part of those processes.
Maintenance chemicals and oils	Trivial	<p>Activities that occur strictly for maintenance of grounds or buildings, including lawn care; pest control; grinding; cutting; welding; painting; woodworking; sweeping; general repairs; janitorial activities; plumbing; re-tarring roofs; installing insulation; steam-cleaning and water-washing activities; and paving of roads, parking lots, and other areas.</p> <p>Activities for maintenance and repair of equipment, pollution-control equipment, or motor vehicles either inside or outside of a building.</p>
Use of office equipment and products	Trivial	Use of office equipment and products, not including printers or businesses primarily involved in photographic reproduction.
Chemicals used for boiler water treatment	Trivial	Boiler water treatment operations, not including cooling towers.
Chemicals used for oxygen scavenging	Trivial	Oxygen scavenging (deaeration of water).
Chemicals used in bench-scale chemical analysis	Trivial	<p>Bench-scale laboratory equipment used for physical or chemical analysis but not lab fume hoods or vents.</p> <p><i>Note: This exemption was applied only to biological research solutions. Otherwise, this exemption was not applied.</i></p>

The following exemptions from NMED/AQB Operating Permit Program “List of Trivial Activities”<sup>11</sup> were used in the paint analysis:

- Activities that occur strictly for maintenance of grounds or buildings, including the following: lawn care; pest control; grinding; cutting; welding; painting; woodworking; sweeping; general repairs; janitorial activities; plumbing; re-tarring roofs; installing insulation; steam-cleaning and water-washing activities; and paving of roads, parking lots, and other areas.
- Activities for maintenance and repair of equipment, pollution control equipment, or motor vehicles either inside or outside of a building.
- Paint or nonpaint materials dispensed from prepackaged aerosol cans of 16 oz. or less capacity.

The corresponding amounts of paint were totaled for painting activities that did not qualify for one of the trivial activity exemptions listed above. The paint total for 2004 was determined to be 3,044 lb (1.52 tons), which further qualified for the following insignificant activity:

*Surface coating of equipment, including spray painting and roll coating, for sources with facility-wide total cleanup solvent and coating actual emissions of less than two (2) tons per year.*

All emissions from paints and painting activities were exempt as insignificant or trivial activities and therefore were not included in the 2004 emissions inventory.

## **4.0 EMISSIONS SUMMARY**

### **4.1 2004 EMISSIONS SUMMARY**

Table 4-1 presents facility-wide actual emissions of criteria pollutants for 2004 as reported in the annual emissions inventory and the semi-annual emissions reports. The Title V Operating Permit emissions limits are also included. Table 4-2 presents actual emissions for HAPs from chemical use. Emission unit information and detailed emissions calculations are included in Attachment A. The 2004 Emissions Inventory Report as submitted to NMED is presented in Attachment B. As mentioned, it is formatted to be compatible with AIRS. Attachment C includes semi-annual emissions reports for 2004.

There are two notable differences in reported emissions in 2004.

- The air curtain destructors, which were a large source of emissions of VOC, PM, CO, and HAPs in 2002 and 2003 were shut down resulting in much lower facility-wide emissions.

Operations for the entire Laboratory were shut down in July 2004 to assess safety and security measures. This shutdown resulted in decreased activities throughout the Laboratory and as a result emissions were also decreased.



**Table 4-1. LANL Facility-Wide Criteria Pollutant Emissions for 2004**

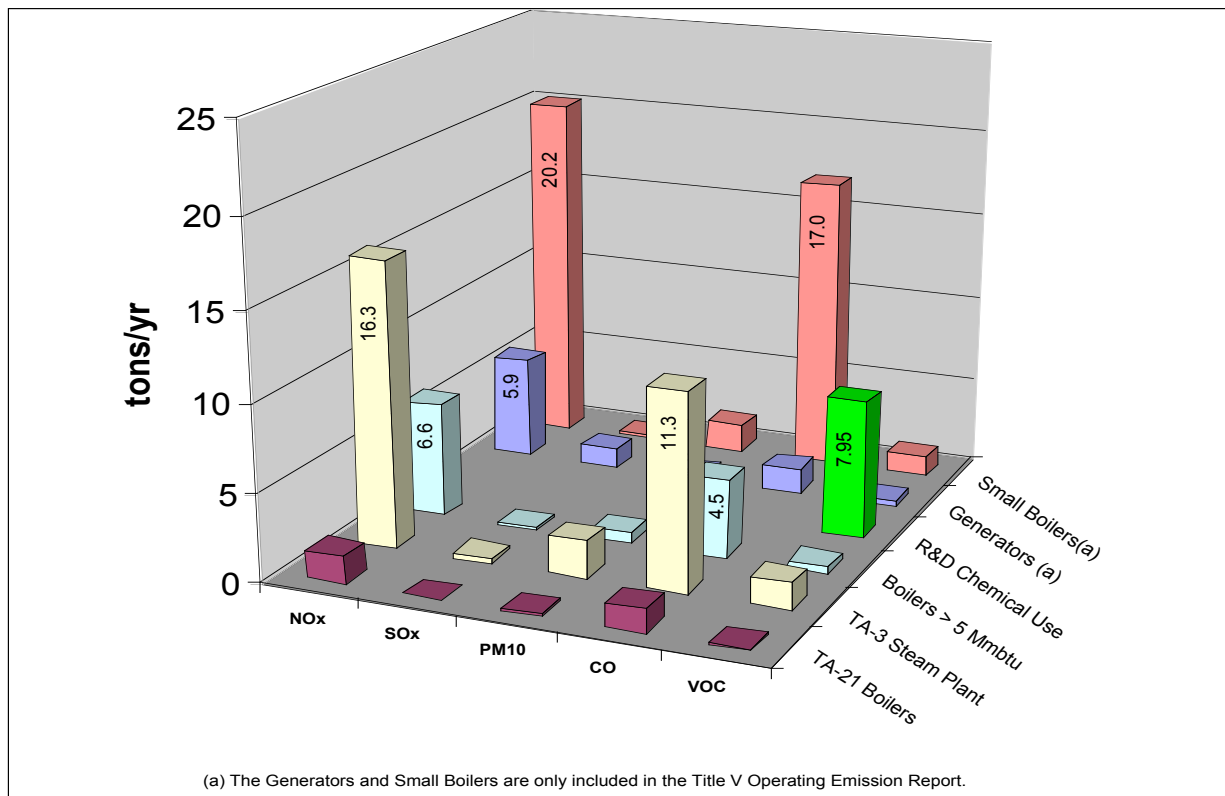
<b>Pollutant</b>	<b>Actual Emissions for Annual Emissions Reporting (tons/yr)</b>	<b>Actual Emissions for Semi-Annual Title V Operating Permit Reporting (tons/yr)</b>	<b>Title V Operating Permit Facility-Wide Emission Limits (tons/yr)</b>
NO <sub>x</sub>	24.5	50.5	245
SO <sub>x</sub>	0.34	1.5	150
CO	17.1	35.4	225
PM	3.0	4.8	120
PM <sub>10</sub>	3.0	4.8	120
PM <sub>2.5</sub>	2.95	4.75	--
VOC	10.0	11.4	200

**Table 4-2. LANL HAP Emissions from Chemical Use for 2004**

<b>Pollutant</b>	<b>Chemical Use HAP Emissions<sup>(a)</sup> (tons/yr)</b>
<b>Total HAPs</b>	5.7
<b>Top 5 HAPs</b>	
Hydrochloric Acid	1.52
Methanol	0.73
Acetonitrile	0.70
Methylene Chloride	0.63
Manganese	0.52

(a) HAP emissions from combustion sources are included in the emissions reports, however they are negligible and do not contribute significantly to facility-wide HAP emissions.

Figure 4-1 shows criteria air pollutant emissions by source for 2004, excluding the very small emissions sources such as the paper shredder, degreasers, and carpenter shop. As the figure shows, the TA-3 steam plant and the sum of emissions from all small boilers and heaters were the largest sources of CO and NO<sub>x</sub> emissions in 2004. R&D chemical use was the largest source of VOC emissions.



**Figure 4-1. Emissions of criteria pollutants by source in 2004.**

#### 4.2 EMISSION TRENDS AND TITLE V PERMIT LIMITS

A comparison of historical emissions to the facility-wide emission limits in the Title V Operating Permit is provided in the section below. It should be noted that the facility-wide emission limits in the Operating Permit include emissions from some sources that are not included in the annual emissions inventory, most notably small (insignificant) boilers and emergency standby generators. However, historical data are only available for emission sources that were included in the annual emissions inventory submittals.

Figure 4-2 provides a comparison of the past six years' facility-wide emissions for criteria air pollutants as reported to NMED on the annual emission inventory submittal. The facility-wide emission limits included in LANL's Title V Operating Permit are also shown on the graph.

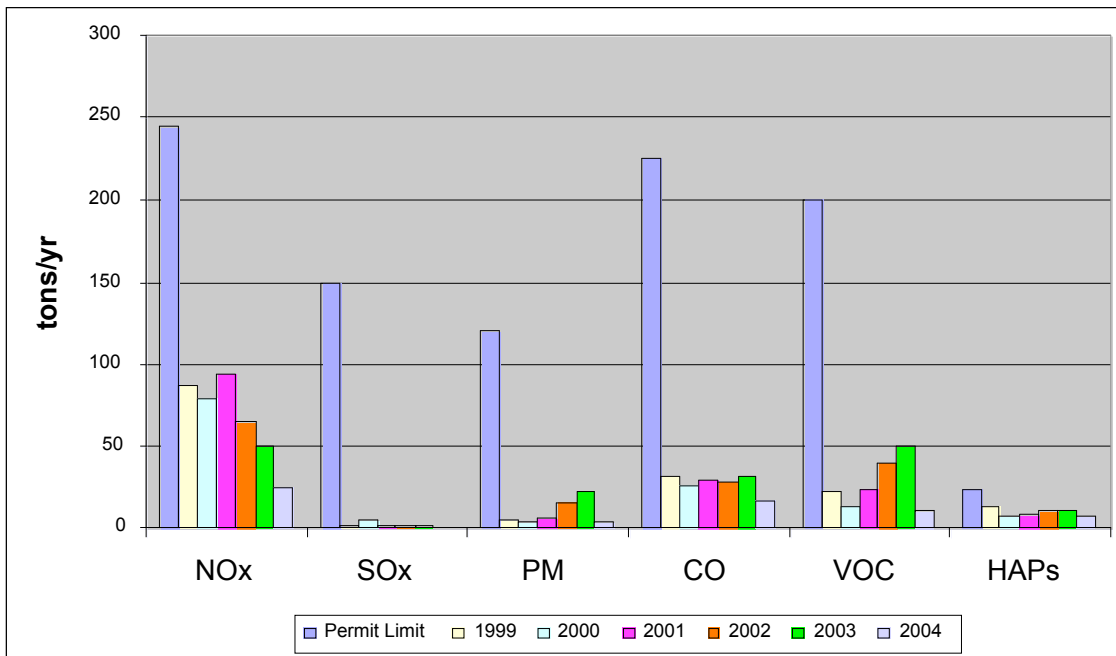


Figure 4-2. Comparison of facility-wide annual reported emissions from 1999–2004.

Figure 4-3 presents VOC and HAP emissions from chemical use activities. As shown, VOC emissions have declined steadily in recent years while HAP emissions from chemical use have remained relatively constant. The continued fluctuation in both VOC and HAP emissions is due to both variations in actual chemical purchases and improvements the Laboratory has made to the chemical tracking system. Emissions in 2004 are lower than previous years due to activities at the Laboratory shutting down in July 2004 as LANL conducted facility-wide security and safety assessments.

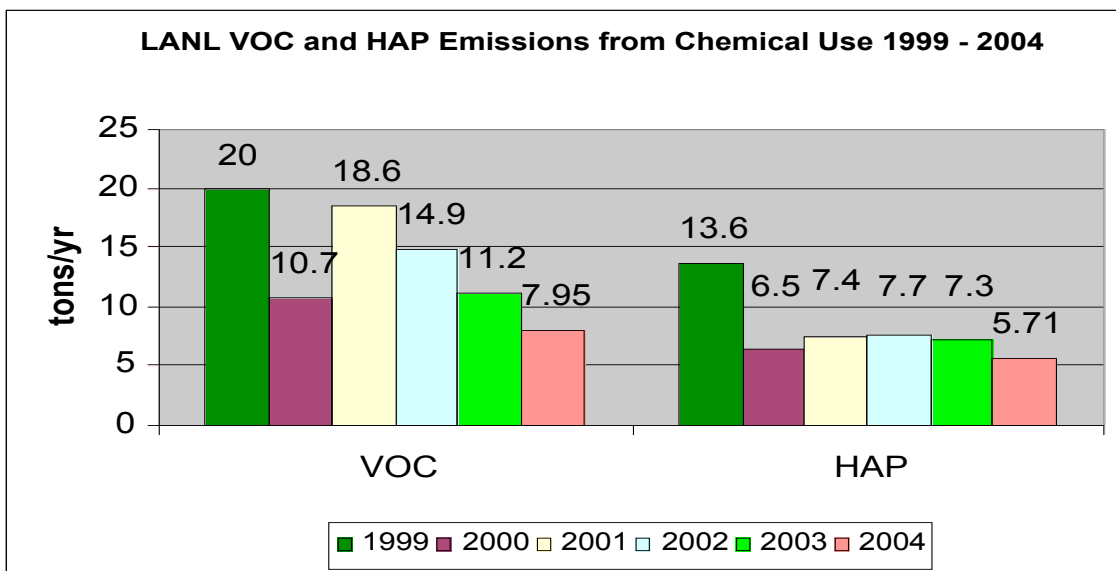


Figure 4-3. VOC and HAP emissions from chemical use, 1999–2004.

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11. New Mexico Environment Department, Air Quality Bureau, "List of Trivial Activities under Title V Operating Permits," January 10, 1996.

**ATTACHMENT A.  
EMISSION CALCULATION WORKSHEETS  
FOR INDIVIDUAL EMISSION UNITS**



**TA-3 Power Plant Fuel Use Totals 2004 (Data Entry)**

DATA ENTRY								
Month	TA-3-22 Steam Plant <sup>b</sup> Boiler # 1 (Edgemoor Iron Works, 210 MMBTU/hr)		TA-3-22 Steam Plant <sup>b</sup> Boiler # 2 (Edgemoor Iron Works, 210 MMBTU/hr)		TA-3-22 Steam Plant <sup>b</sup> Boiler # 3 (Union Iron Works, 210 MMBTU/hr)		Monthly Totals	
	Natural Gas (MCF) <sup>a</sup>	Fuel Oil (gallons) <sup>a</sup>	Natural Gas (MCF) <sup>a</sup>	Fuel Oil (gallons) <sup>a</sup>	Natural Gas (MCF) <sup>a</sup>	Fuel Oil (gallons) <sup>a</sup>	Natural Gas (MMCF) <sup>a</sup>	Fuel Oil (gallons) <sup>a</sup>
January	68707	4050	68	0	1922	3252	70.697	7302
February	59848	104	0	0	5189	834	65.037	938
March	9864	1299	0	0	44713	2098	54.577	3397
April	2052	0	0	0	43243	3578	45.295	3578
May	3448	0	3598	0	30862	0	37.908	0
June	12388	0	1327	0	15818	0	29.533	0
July	26025	10406	574	113	1516	0	28.115	10519
August	22080	4616	7068	0	0	0	29.148	4616
September	16814	0	11027	100	0	0	27.841	100
October	19720	815	19446	0	5083	124	44.249	939
November	6601	2449	0	0	50218	74	56.819	2523
December	5097	54	17	0	64158	0	69.272	54
<b>Annual Totals:</b>	<b>252644</b>	<b>23793</b>	<b>43125</b>	<b>213</b>	<b>262722</b>	<b>9960</b>	<b>558.491</b>	<b>33966</b>
<b>Jan. - June</b>	<b>156307</b>	<b>5453</b>	<b>4993</b>	<b>0</b>	<b>141747</b>	<b>9762</b>	<b>303.047</b>	<b>15215</b>
<b>July - Dec.</b>	<b>96337</b>	<b>18340</b>	<b>38132.00</b>	<b>213</b>	<b>120975</b>	<b>198</b>	<b>255.44</b>	<b>18751</b>

Month	12-Mo. Rolling Total Natural Gas (MMscf)	12-Mo. Rolling Total Fuel Oil (gallons)
January	587.6	29323
February	592.4	30261
March	579.6	31548
April	578.1	35126
May	574.3	35126
June	564.6	33726
July	566.3	44245
August	571.0	48861
September	565.3	38761
October	565.1	39300
November	561.1	35413
December	558.5	33966

	Totals by Fuel Type	
	Natural Gas (MMscf)	Fuel Oil (Gallons)
Annual Totals:	558.49	33966.00
Jan. - June	303.05	15215.00
July - Dec.	255.44	18751.00

For References, See "Emission Summary Sheet"

Data Reviewed By: \_\_\_\_\_

<b>Permit Limits:</b>	<b>2000 MMscf</b>	<b>500,000 gallons</b>
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The limit for Natural Gas is from NSR Permit # 2195BM2.

The limit for Fuel Oil is from the Title-V Operating Permit.

### Emissions by Boiler 2004

Pollutant Criteria	Emission Factor		Unit Emissions			Unit Emissions			Unit Emissions		
	Natural Gas (lb/MMscf) <sup>(a)</sup>	Fuel Oil <sup>(f)</sup> Pounds/ 1000 gal	Boiler #1, Stack 032			Boiler #2, Stack 033			Boiler #3, Stack 034		
			Annual (tons)	Jan-June (tons)	July-Dec (tons)	Annual (tons)	Jan-June (tons)	July-Dec (tons)	Annual (tons)	Jan-June (tons)	July-Dec (tons)
<b>Nox<sup>(c)</sup></b>	58	8.64	7.429	4.556	2.873	1.252	0.145	1.107	7.662	4.153	3.509
<b>Sox<sup>(g)</sup></b>	0.6	7.4	0.164	0.067	0.097	0.014	0.001	0.012	0.116	0.079	0.037
<b>PM<sup>(d)</sup></b>	7.6	3.3	0.999	0.603	0.396	0.164	0.019	0.145	1.015	0.555	0.460
<b>PM-10<sup>(d)</sup></b>	7.6	2.3	0.987	0.600	0.387	0.164	0.019	0.145	1.010	0.550	0.460
<b>PM-2.5<sup>(d)</sup></b>	7.6	1.55	0.978	0.598	0.380	0.164	0.019	0.145	1.006	0.546	0.460
<b>CO<sup>(e)</sup></b>	40	5.0	5.112	3.140	1.973	0.863	0.100	0.763	5.279	2.859	2.420
<b>VOC</b>	5.5	0.2	0.697	0.430	0.267	0.119	0.014	0.105	0.723	0.391	0.333
<b>HAPs<sup>(h)</sup></b>											
<b>Arsenic</b>	0.0002	0.00055	3.18E-05	1.71E-05	1.47E-05	4.37E-06	4.99E-07	3.87E-06	2.90E-05	1.68E-05	1.22E-05
<b>Benzene</b>	0.0021	-	2.65E-04	1.64E-04	1.01E-04	4.53E-05	5.24E-06	4.00E-05	2.76E-04	1.49E-04	1.27E-04
<b>Beryllium</b>	0.000012	0.00041	6.41E-06	2.06E-06	4.35E-06	3.03E-07	3.00E-08	2.73E-07	3.62E-06	2.86E-06	7.67E-07
<b>Cadmium</b>	0.0011	0.00041	1.44E-04	8.71E-05	5.68E-05	2.38E-05	2.75E-06	2.10E-05	1.47E-04	8.00E-05	6.66E-05
<b>Chromium</b>	0.0014	0.00041	1.82E-04	1.11E-04	7.12E-05	3.02E-05	3.50E-06	2.67E-05	1.86E-04	1.01E-04	8.47E-05
<b>Cobalt</b>	0.000084	-	1.06E-05	6.56E-06	4.05E-06	1.81E-06	2.10E-07	1.60E-06	1.10E-05	5.95E-06	5.08E-06
<b>Dichlorobenzene</b>	0.0012	-	1.52E-04	9.38E-05	5.78E-05	2.59E-05	3.00E-06	2.29E-05	1.58E-04	8.50E-05	7.26E-05
<b>Formaldehyde</b>	0.075	0.048	1.00E-02	5.99E-03	4.05E-03	1.62E-03	1.87E-04	1.44E-03	1.01E-02	5.55E-03	4.54E-03
<b>Hexane</b>	1.8	-	2.27E-01	1.41E-01	8.67E-02	3.88E-02	4.49E-03	3.43E-02	2.36E-01	1.28E-01	1.09E-01
<b>Lead</b>	0.0005	0.00123	7.78E-05	4.24E-05	3.54E-05	1.09E-05	1.25E-06	9.66E-06	7.18E-05	4.15E-05	3.04E-05
<b>Manganese</b>	0.00038	0.00082	5.78E-05	3.19E-05	2.58E-05	8.28E-06	9.49E-07	7.33E-06	5.40E-05	3.09E-05	2.31E-05
<b>Mercury<sup>(i)</sup></b>	0.00026	0.00041	3.77E-05	2.14E-05	1.63E-05	5.65E-06	6.49E-07	5.00E-06	3.62E-05	2.04E-05	1.58E-05
<b>Napthalene</b>	0.00061	-	7.71E-05	4.77E-05	2.94E-05	1.32E-05	1.52E-06	1.16E-05	8.01E-05	4.32E-05	3.69E-05
<b>Nickel</b>	0.0021	0.00041	2.70E-04	1.65E-04	1.05E-04	4.53E-05	5.24E-06	4.01E-05	2.78E-04	1.51E-04	1.27E-04
<b>POM</b>	0.000088	0.0033	5.04E-05	1.59E-05	3.45E-05	2.25E-06	2.20E-07	2.03E-06	2.80E-05	2.23E-05	5.65E-06
<b>Selenium</b>	0.000024	0.00206	2.75E-05	7.48E-06	2.00E-05	7.36E-07	5.99E-08	6.76E-07	1.34E-05	1.17E-05	1.66E-06
<b>Toluene</b>	0.0034	-	4.29E-04	2.66E-04	1.64E-04	7.33E-05	8.49E-06	6.48E-05	4.47E-04	2.41E-04	2.06E-04
<b>TOTAL HAPS</b>			2.39E-01	1.48E-01	9.15E-02	4.07E-02	4.71E-03	3.60E-02	2.48E-01	1.34E-01	1.14E-01

For References, see Emission Summary.

Data Reviewed By: \_\_\_\_\_



**\* 12 Month Rolling Emissions 2004 (Tons)**

Pollutant	TSP	PM10	NOx	CO	VOC	SO <sub>2</sub>
<b>Permit Limit (tons/yr) 12-Month Rolling Average</b>	<b>15.7</b>	<b>15.7</b>	<b>99.6</b>	<b>81.3</b>	<b>11.1</b>	<b>36.9</b>
January	2.281	2.267	17.168	11.826	1.619	0.285
February	2.301	2.286	17.311	11.924	1.632	0.290
March	2.255	2.239	16.945	11.671	1.597	0.290
April	2.255	2.237	16.916	11.649	1.593	0.303
May	2.240	2.223	16.806	11.574	1.583	0.302
June	2.201	2.184	16.519	11.376	1.556	0.294
July	2.225	2.203	16.613	11.436	1.562	0.333
August	2.250	2.226	16.769	11.541	1.575	0.352
September	2.212	2.193	16.560	11.402	1.558	0.313
October	2.212	2.193	16.559	11.401	1.558	0.315
November	2.191	2.173	16.425	11.311	1.547	0.299
December	2.178	2.161	16.343	11.255	1.539	0.293

**Monthly Emission Totals 2004 (Tons)**

Pollutant	TSP	PM10	NOx	CO	VOC	SO <sub>2</sub>
January	0.281	0.277	2.082	1.432	0.195	0.048
February	0.249	0.248	1.890	1.303	0.179	0.023
March	0.213	0.211	1.597	1.100	0.150	0.029
April	0.178	0.176	1.329	0.915	0.125	0.027
May	0.144	0.144	1.099	0.758	0.104	0.011
June	0.112	0.112	0.856	0.591	0.081	0.009
July	0.124	0.119	0.861	0.589	0.078	0.047
August	0.118	0.116	0.865	0.595	0.081	0.026
September	0.106	0.106	0.808	0.557	0.077	0.009
October	0.170	0.169	1.287	0.887	0.122	0.017
November	0.220	0.219	1.659	1.143	0.157	0.026
December	0.263	0.263	2.009	1.386	0.191	0.021
<b>Annual Totals</b>	<b>2.178</b>	<b>2.161</b>	<b>16.343</b>	<b>11.255</b>	<b>1.539</b>	<b>0.293</b>

Data Reviewed By: \_\_\_\_\_

### Emission Summary TA-3 Power Plant 2004

Pollutant Criteria	Emission Factor		Annual Emissions (Natural Gas + Fuel Oil) (tons)	Jan-June Emissions (Natural Gas + Fuel Oil) (tons)	July-Dec Emissions (Natural Gas + Fuel Oil) (tons)	Reference		Reference
	Natural Gas (lb/MMscf) <sup>a</sup>	Fuel Oil <sup>f</sup> (lb/1000 gal.)				Gas	Oil	
NOx	58	8.64	16.343	8.854	7.489	(c)	(c)	(a) AP-42, 7/98, Section. 1.4, <i>Natural Gas Combustion</i> , Tables 1.4-1, 1.4-2
SOx	0.6	7.39	0.293	0.147	0.146	(a)(j)	(g)(j)	(b) Fuel usage obtained from Jerry Gonzales (FWO-UI). Values are provided in a monthly data deliverable from KSL.
PM	7.6	3.3	2.178	1.177	1.002	(d)	(d)	(c) Average of source tests conducted on all 3 boilers September 2002 burning natural gas after FGR installed. Assumed FGR resulted in similar Nox reduction for oil.
PM-10	7.6	2.3	2.161	1.169	0.992	(d)	(d)	
PM-2.5	7.6	1.55	2.149	1.163	0.985	(d)	(d)	(d) All PM from natural gas is assumed <1μ, so PM-10, PM-2.5 and total PM have equal EFs, AP-42, <i>Natural Gas Combustion</i> , Table 1.4-2. The PM emission factor for fuel oil is the sum of filterable and condensable PM.
CO	40	5.0	11.255	6.099	5.156	(b)	(g)	
VOC	5.5	0.2	1.539	0.835	0.704	(b)	(i)	
<b>HAPs<sup>h</sup></b>								
Arsenic	0.0002	0.00055	6.52E-05	3.45E-05	3.07E-05	(a)	(k)	(e) AP-42, 1/95, Section. 1.4, <i>Natural Gas Combustion</i> , Table 1.4-2. Consistent with previous stack tests.
Benzene	0.0021	-	5.86E-04	3.18E-04	2.68E-04	(c)		
Beryllium	0.000012	0.00041	1.03E-05	4.94E-06	5.39E-06	(c)	(k)	
Cadmium	0.0011	0.00041	3.14E-04	1.70E-04	1.44E-04	(c)	(k)	(f) AP-42, 9/98, Section. 1.3, <i>Fuel Oil Combustion</i> , Table 1.3-1 with Errata, Table 1.3-3, and Table 1.3-6.
Chromium	0.0014	0.00041	3.98E-04	2.15E-04	1.83E-04	(c)	(k)	
Cobalt	0.000084	-	2.35E-05	1.27E-05	1.07E-05	(c)		
Dichlorobenzene	0.0012	-	3.35E-04	1.82E-04	1.53E-04	(c)		(g) Boilers >100 MMBtu/hr: SOx Emission Factor (SO <sub>2</sub> (142S) + SO <sub>3</sub> (5.7S)) = 147.7 * S (from AP-42, Table 1.3-1 w/Errata) (S = weight % sulfur in oil)(Sulfur content per analysis on oil in tanks in August 01', no new oil delivered in 02/03')
Formaldehyde	0.075	0.048	2.18E-02	1.17E-02	1.00E-02	(c)	(k)	
Hexane	1.8	-	5.03E-01	2.73E-01	2.30E-01	(c)		
Lead	0.0005	0.001233	1.61E-04	8.51E-05	7.54E-05	(c)	(k)	
Manganese	0.00038	0.000822	1.20E-04	6.38E-05	5.62E-05	(c)	(k)	
Mercury	0.00026	0.000411	7.96E-05	4.25E-05	3.71E-05	(i)(c)	(i)(k)	S(%)= 0.05
Napthalene	0.00061	-	1.70E-04	9.24E-05	7.79E-05	(c)		(h) HAP emission factors for natural gas from AP-42, Tables 1.4-3 an 1.4-4, for fuel oil from AP-42 Tables 1.3-8 and 1.3-10.
Nickel	0.0021	0.000411	5.93E-04	3.21E-04	2.72E-04	(c)	(k)	
POM	0.000088	0.0033	8.06E-05	3.84E-05	4.22E-05	(c)	(k)	
Selenium	0.000024	0.002055	4.16E-05	1.93E-05	2.23E-05	(c)	(k)	
Toluene	0.0034	-	9.49E-04	5.15E-04	4.34E-04	(c)		(i) AP-42, Table 1.4-2, 1.4-3, and 1.4-4, July 1998
<b>TOTAL HAPS</b>			5.28E-01	2.87E-01	2.42E-01			
<b>EPCRA 313</b>								
				<b>lbs./year</b>				
Lead	0.0005	0.00123	1.61E-04	0.321		(c)	(j)(k)	(j) Assume all SO <sub>3</sub> is converted to sulfuric acid.
Sulfuric Acid	0.60	0.285	1.72E-01	344.77		(e)(j)	(e)(h)	(k) AP-42, tables 1.3-9 and 1.3-10, September 1998.
Mercury	0.00026	0.00041	7.96E-05	0.159		(c)	(i)(k)	
PACs	8.69E-07	1.65E-05	5.23E-07	1.05E-03		(f)(l)	(f)(l)	(l) EPCRA PAC Guidance Document, Table 2-3.
Benzo(g,h,i) perylene	1.20E-06	2.26E-06	3.73E-07	7.47E-04		(i)(k)(c)	(f)	<b>Reviewed By/Date:</b>
Zinc	-	0.00055	9.31E-06	1.86E-02			(k)	

**2004 TA-21 Steam Plant Data Entry / Fuel Use**

<b>DATA ENTRY</b>						
<b>Monthly Fuel Use</b>						
<b>TA-21-357</b>			<b>Converted</b>			
<b>Month</b>	<b>Natural Gas (MCF)</b>	<b>Fuel Oil (gallons)</b>	<b>Natural Gas (MMscf)</b>	<b>Month</b>	<b>Natural Gas Use 12-Month Rolling Total (MMscf)</b>	<b>Fuel Oil Use 12-Month Rolling Total (Gallons)</b>
January	3954	14	3.954	January	32.13	151
February	3778	4	3.778	February	32.21	155
March	2903	4	2.903	March	31.61	159
April	2629	8	2.629	April	31.46	167
May	1966	4	1.966	May	31.22	98
June	1619	0	1.619	June	31.03	55
July	1627	0	1.627	July	31.03	55
August	1675	0	1.675	August	31.10	55
September	1728	0	1.728	September	31.06	55
October	2486	0	2.486	October	31.44	55
November	3166	0	3.166	November	31.47	48
December	4028	51	4.028	December	31.56	85
<b>Annual Totals:</b>	<b>31559</b>	<b>85</b>	<b>31.559</b>			
<b>Jan. - June</b>	<b>16849</b>	<b>34</b>	<b>16.849</b>			
<b>July - Dec.</b>	<b>14710</b>	<b>51</b>	<b>14.710</b>			

**Permit Limit = 60 MMScf/yr natural gas (12 month rolling total)  
and 10,000 gal/yr fuel oil (12 month rolling total)**

**2004 TA-21 Steam Plant Emission Summary**

<b>Pollutant Criteria</b>	<b>Annual Emissions (Natural Gas + Fuel Oil) (tons)</b>	<b>Jan-June Emissions (Natural Gas + Fuel Oil) (tons)</b>	<b>July-Dec Emissions (Natural Gas + Fuel Oil) (tons)</b>
NOx	1.579	0.843	0.736
SOx	0.012	0.006	0.006
PM	0.120	0.064	0.056
PM-10	0.120	0.064	0.056
PM-2.5	0.120	0.064	0.056
CO	1.326	0.708	0.618
VOC	0.087	0.046	0.040
<b>HAPs</b>			
Arsenic	3.18E-06	1.69E-06	1.48E-06
Benzene	3.31E-05	1.77E-05	1.54E-05
Beryllium	2.07E-07	1.08E-07	9.87E-08
Cadmium	1.74E-05	9.27E-06	8.10E-06
Chromium	2.21E-05	1.18E-05	1.03E-05
Cobalt	1.33E-06	7.08E-07	6.18E-07
Dichlorobenzene	1.89E-05	1.01E-05	8.83E-06
Formaldehyde	1.19E-03	6.33E-04	5.53E-04
Hexane	2.84E-02	1.52E-02	1.32E-02
Lead	7.94E-06	4.23E-06	3.71E-06
Mangnese	6.03E-06	3.22E-06	2.82E-06
Mercury	4.12E-06	2.20E-06	1.92E-06
Napthalene	9.63E-06	5.14E-06	4.49E-06
Nickel	3.32E-05	1.77E-05	1.55E-05
POM	1.53E-06	7.97E-07	7.31E-07
Selenium	4.66E-07	2.37E-07	2.29E-07
Toluene	5.37E-05	2.86E-05	2.50E-05
Zinc	#REF!	#REF!	#REF!
<b>TOTAL HAPS</b>	2.98E-02	#REF!	#REF!
<b>EPCRA 313</b>		<b>lbs./year</b>	
Lead	7.94E-06	0.016	
Sulfuric Acid	9.47E-03	18.94	
Mercury	4.12E-06	0.008	
PACs	1.44E-08	2.88E-05	
Benzo(g,h,i) perylene	1.90E-08	3.81E-05	

### 2004 TA-21 Steam Plant Emissions Calculations

Pollutant Criteria	Natural Gas					Fuel Oil					Reference	
	Emission Factor (lb/MMscf)	Annual Emission s (tons)	Emissions (tons) Jan-June	Emissions (tons) July-Dec	Ref.	Emission Factor (lb/1000 gal)	Annual Emissions (tons)	Emissions (tons) Jan-June	Emissions (tons) July-Dec	Ref.		
Nox	100	1.578	0.842	0.736	(b)	20	8.50E-04	3.40E-04	5.10E-04	(g)	(a) Fuel usage obtained from Jerry Gonzales, FWOU	
SOx	0.6	0.009	0.005	0.004	(b)	49.0	2.08E-03	8.32E-04	1.25E-03	(h)	(b) AP-42, 7/98, Section. 1.4, Natural Gas Combustion, Tables 1.4-1, 1.4-2.	
PM	7.6	0.120	0.064	0.056	(b)	3.3	1.40E-04	5.61E-05	8.42E-05	(g)		
PM-10	7.6	0.120	0.064	0.056	(d)	2.3	9.78E-05	3.91E-05	5.87E-05	(j)	(c) AP-42 7/98, Section 1.4, Natural Gas Combustion, Tables 1.4-3, 1.4-4.	
PM-2.5	7.6	0.120	0.064	0.056	(d)	1.55	6.59E-05	2.64E-05	3.95E-05	(j)		
CO	84	1.325	0.708	0.618	(b)	5.0	2.13E-04	8.50E-05	1.28E-04	(g)		
VOC	5.5	0.087	0.046	0.040	(b)	0.2	8.50E-06	3.40E-06	5.10E-06	(i)	(d) PM-10 and PM-2.5 for natural gas combustion roughly equal to PM, per AP-42, Natural Gas Combustion, Table 1.4-2.	
<b>HAPs</b>												
Arsenic	0.0002	3.16E-06	1.68E-06	1.47E-06	(c)	0.00055	2.33E-08	9.32E-09	1.40E-08	(k)		
Benzene	0.0021	3.31E-05	1.77E-05	1.54E-05	(c)							
Beryllium	0.000012	1.89E-07	1.01E-07	8.83E-08	(c)	0.00041	1.75E-08	6.99E-09	1.05E-08	(k)	(e) Assume all SOx is converted to sulfuric acid.	
Cadmium	0.0011	1.74E-05	9.27E-06	8.09E-06	(c)	0.00041	1.75E-08	6.99E-09	1.05E-08	(k)		
Chromium	0.0014	2.21E-05	1.18E-05	1.03E-05	(c)	0.00041	1.75E-08	6.99E-09	1.05E-08	(k)	(f) EPCRA PAC Guidance Document, Table 2-3.	
Cobalt	0.000084	1.33E-06	7.08E-07	6.18E-07	(c)							
Dichlorobenzene	0.0012	1.89E-05	1.01E-05	8.83E-06	(c)						(g) AP-42, 9/98, Section. 1.3, Fuel Oil Combustion, Table 1.3-1 with Errata. The PM emission factor is the sum of filterable and condensable PM.	
Formaldehyde	0.075	1.18E-03	6.32E-04	5.52E-04	(c)	0.048	2.04E-06	8.16E-07	1.22E-06	(k)		
Hexane	1.8	2.84E-02	1.52E-02	1.32E-02	(c)							
Lead	0.0005	7.89E-06	4.21E-06	3.68E-06	(c)	0.00123	5.24E-08	2.10E-08	3.14E-08	(k)		
Mangenes	0.00038	6.00E-06	3.20E-06	2.79E-06	(c)	0.00082	3.49E-08	1.40E-08	2.10E-08	(k)	(h) S = weight % sulfur in oil (Title V Application, December 1995)	
Mercury	0.00026	4.10E-06	2.19E-06	1.91E-06	(c)	0.00041	1.75E-08	6.99E-09	1.05E-08	(k)	Boilers <100 MMBtu/hr: SOx Emission Factor = 144 * S	
Napthalene	0.00061	9.63E-06	5.14E-06	4.49E-06	(c)						S(%)= 0.34	
Nickel	0.0021	3.31E-05	1.77E-05	1.54E-05	(c)	0.00041	1.75E-08	6.99E-09	1.05E-08	(k)		
POM	0.000088	1.39E-06	7.41E-07	6.47E-07	(c)	0.0033	1.40E-07	5.61E-08	8.42E-08	(k)		
Selenium	0.000024	3.79E-07	2.02E-07	1.77E-07	(c)	0.00206	8.73E-08	3.49E-08	5.24E-08	(k)	(i) AP-42, 9/98, Section 1.3, Fuel Oil Combustion, Table 1.3-3	
Toluene	0.0034	5.37E-05	2.86E-05	2.50E-05	(c)						NMTOC.	
<b>TOTAL HAPS</b>			2.98E-02	1.59E-02	1.39E-02			2.47E-06	9.86E-07	1.48E-06		
<b>EPCRA 313</b>			<b>lbs./year</b>				<b>lbs./year</b>					(j) AP-42 9/98, Section 1.3, Fuel Oil Combustion, Table 1.3-6. The PM emission factor is the sum of filterable and condensable PM.
Lead	0.0005	7.89E-06	0.016		(c)	0.00123	5.24E-08	1.05E-04		(k)		
Sulfuric Acid	0.60	9.47E-03	18.935		(e)	0.0	0.00E+00	0.000		(e)(h)		
Mercury	0.00026	4.10E-06	8.21E-03		(c)	0.00041	1.75E-08	3.49E-05		(k)		
PACs	8.69E-07	1.37E-08	2.74E-05		(f)	1.65E-05	7.01E-10	1.40E-06		(f)	(k) AP-42, 9/98, Section 1.3, Fuel Oil Combustion, Tables 1.3-8 - 1.3-10.	
Benzo(g,h,i) perylene	1.20E-06	1.89E-08	3.79E-05		(c)	2.26E-06	9.61E-11	1.92E-07		(f)		

**2004 Small Boilers Data Entry / Gas Use**

Month	Metered Boilers			Total Gas Use <sup>(a)</sup>		Non-Metered Gas Use	12-Month Rolling Total for all Small Boilers (MMSCF) <sup>(e)</sup>
	TA-55 Boiler Gas Use (MSCF) <sup>(c)</sup>		TA-50-2 <sup>(d)</sup> (MSCF)	(MSCF)	(MMSCF)	(MMSCF)	
	BHW-1B (B-602)	BHW-2B (B-603)	BS-1				
January	358	2617		74,257	74.26	71.28	500.10
February	1109	1940		73,379	73.38	70.33	508.32
March	1942	4		54,949	54.95	53.00	505.09
April	1420	542		48,948	48.95	46.99	511.02
May	208	1911		27,450	27.45	25.33	509.22
June	24	1860		16,156	16.16	14.27	505.06
July	2	1716		13,760	13.76	12.04	506.46
August	2	1900		13,746	13.75	11.84	501.74
September	2	2357		17,208	17.21	14.85	504.61
October	900	1194		45061	45.06	42.97	518.68
November	334	2152		71341	71.34	68.86	528.89
December	13	3268		81983	81.98	78.70	538.24
<b>TOTAL</b>	6314	21461	325.42	538238	538.24	510.46	Permit Limit : 870

2004 Non Metered Boiler Pool Capacity: **262.1** MMBTU/hr<sup>(f)</sup>

Estimated Gas-Use per MMBtu rating Jan-June: 1.07 MMscf/MMBtu/hr  
 Estimated Gas-Use per MMBtu rating July-Dec: 0.87 MMscf/MMBtu/hr  
 Estimated Gas-Use per MMBtu - Annual: 1.95 MMscf/MMBtu/hr

Definitions: MMSCF= Million Standard Cubic Feet  
 MSCF = Thousand Standard Cubic Feet  
 Metered/Non-metered: Metered boilers are those units that have unit specific volumetric flow meters for the boiler(s) only.

AIRS Stack #	Gas Use Non-Metered <sup>(g)</sup> (MMSCF)								Units <sup>(h)</sup>
	015	016	017	018	019	020	021	024	
Location:	TA-48-1	TA-48-1	TA-48-1	TA-53-365	TA-53-365	TA-59-1	TA-59-1	TA-16-1484	Lab Wide
ID:	BS-1	BS-2	BS-6	BHW-1	BHW-2	BHW-1	BHW-2	Plant 5	Various
Design Rate <sup>(i)</sup> (MMBTU/hr)	5.336	5.335	7.140	7.115	7.115	5.335	5.335	12.700	207
Calculated Gas Use-Jan-June	5.725	5.724	7.660	7.633	7.633	5.724	5.724	13.626	221.753
Calculated Gas Use-July-Dec	4.668	4.667	6.245	6.223	6.223	4.667	4.667	11.109	180.790
Calculated Gas Use-Annual	10.393	10.391	13.906	13.856	13.856	10.391	10.391	24.734	402.544

<b>Emission Factors (lb/MMscf)</b>			
<b>Criteria Pollutant</b>	<b>Small Uncontrolled Boilers<sup>1</sup></b>	<b>TA-16 Low NOx Boilers<sup>4</sup></b>	<b>TA-55-6 Boilers<sup>3</sup></b>
<b>NOx</b>	100	37.08	138
<b>SOx</b>	0.6	0.6	0.6
<b>PM<sup>2</sup></b>	7.6	7.6	14.2
<b>PM-10<sup>2</sup></b>	7.6	7.6	14.2
<b>PM-2.5<sup>2</sup></b>	7.6	7.6	14.2
<b>CO</b>	84	37.08	38.2
<b>VOC</b>	5.5	5.5	5.98
<b>HAPs<sup>5</sup></b>			
<b>Arsenic</b>	0.0002		
<b>Benzene</b>	0.0021		
<b>BE</b>	0.000012		
<b>Cadmium</b>	0.0011		
<b>Chromium</b>	0.0014		
<b>Cobalt</b>	0.000084		
<b>Dichlorobenzene</b>	0.0012		
<b>Formaldehyde</b>	0.075		
<b>Hexane</b>	1.8		
<b>Lead</b>	0.0005		
<b>Mangnese</b>	0.00038		
<b>Mercury</b>	0.00026		
<b>Napthalene</b>	0.00061		
<b>Nickel</b>	0.0021		
<b>POM</b>	0.000088		
<b>Selenium</b>	0.000024		
<b>Toluene</b>	0.0034		

<b>References for Emission Factors</b>
(1) AP-42, 7/98, Section 1.4, Natural Gas Combustion, Small Boilers.
(2) Emission factors for natural gas of PM-10 and PM-2.5 are roughly equal to those of PM, Natural Gas Combustion, Table 1.4-2
(3) AP-42, 7/98, Section 1.4, Natural Gas Combustion, Small Boilers for SOx. Stack test on 3/00 for NOx. Otherwise, Emission factors from Sellers Engineering Co.
(4) AP-42, 7/98, Section 1.4, Natural Gas Combustion, Small Boilers; Emission factors for NOx and CO from Sellers Engineering Co (low-NOx boilers).
(5) All HAP emission factors from AP-42 7/98, Section 1.4, Natural Gas Combustion, Tables 1.4-3, 1.4-4

<b>2004 Small Boilers Emission Summary</b>			
<b>Title V Semi-Annual Reporting</b>			
<b>Total Emissions (tons)</b>			
<b>Pollutant Criteria</b>	<b>Annual Emissions (Includes Insignificant Sources)</b>	<b>Jan-June (Includes Insignificant Sources)</b>	<b>July-Dec (Includes Insignificant Sources)</b>
<b>NOx</b>	26.678	14.601	12.077
<b>SOx</b>	0.162	0.089	0.073
<b>PM</b>	2.138	1.168	0.970
<b>PM-10</b>	2.138	1.168	0.970
<b>PM-2.5</b>	2.138	1.168	0.970
<b>CO</b>	21.403	11.764	9.639
<b>VOC</b>	1.488	0.815	0.672
<b>HAPs</b>			
<b>Arsenic</b>	5.39E-05	2.95E-05	2.43E-05
<b>Benzene</b>	5.65E-04	3.10E-04	2.55E-04
<b>BE</b>	3.23E-06	1.77E-06	1.46E-06
<b>Cadmium</b>	2.96E-04	1.62E-04	1.34E-04
<b>Chromium</b>	3.77E-04	2.07E-04	1.70E-04
<b>Cobalt</b>	2.26E-05	1.24E-05	1.02E-05
<b>Dichlorobenzene</b>	3.23E-04	1.77E-04	1.46E-04
<b>Formaldehyde</b>	2.02E-02	1.11E-02	9.12E-03
<b>Hexane</b>	4.85E-01	2.66E-01	2.19E-01
<b>Lead</b>	1.35E-04	7.38E-05	6.08E-05
<b>Mangnese</b>	1.02E-04	5.61E-05	4.62E-05
<b>Mercury</b>	7.00E-05	3.84E-05	3.16E-05
<b>Napthalene</b>	1.64E-04	9.01E-05	7.42E-05
<b>Nickel</b>	5.65E-04	3.10E-04	2.55E-04
<b>POM</b>	2.37E-05	1.30E-05	1.07E-05
<b>Selenium</b>	6.46E-06	3.54E-06	2.92E-06
<b>Toluene</b>	9.16E-04	5.02E-04	4.14E-04
<b>TOTAL HAPS</b>	0.509	0.279	0.230



## REFERENCES

(a) Information on non-metered boilers is provided as a data deliverable from KSL and contains all gas use at LANL minus those non-LANL sources which feed from the LANL main line and LANL sources that are individually metered. Total Gas use does not include TA-3 Power Plant and TA-21 Steam Plant. All other sources are included in this total.

(b) TA-16 Boilers include 2 boilers in plant 5. Gas use was difficult to obtain, so, the boilers were included in the "boiler pool" to determine gas use. Plant 6 has been taken off line and is not expected to be reused or boilers relocated. The removal of these boilers will be requested in the next operating permit revision.

(c) TA-55 has two boilers with separate AIRs numbers. Each boiler has a gas meter. The gas use information is provided monthly by the TA-55 facility personnel and is included in the KSL data deliverable.

(d) The TA-50-RLWTF boiler was added to EI as a new source in 2003. This boiler is owned and operated by a contractor and has been operated at LANL since mid-2000. Originally planned as a temporary source, but current plans are to keep operating for several more years. Therefore, decision was made to include in LANL's annual EI. Fuel use has not been tracked monthly. For 2004, the total gas use for the year (Dec. 04' - Dec. 03') was taken and used to calculate emissions.

(e) The 12-month rolling average includes all gas use from all boilers listed in this spreadsheet. Boilers not included in this report due to their large size or design are TA-21 boilers & powerplant boilers at TA-3. A gas use limit of 870 MMscf/yr, 12-month rolling average is a permit limit in Section 2.4 of the LANL operating permit.

(f) The non-metered boiler pool capacity is the sum of all active non-metered boilers design ratings in MMBTU. In 2004, the TA-16 boilers were added to the boiler pool. This increased the boiler pool from 249.4 to 262.1 MMBtu/Hr. This number is used to estimate the gas use rate (total non-metered gas use divided by the non-metered boiler pool capacity number).

(g) The non-metered boilers gas use section provides estimates of gas use for each boiler. This is calculated using the non-metered gas rate, as discussed in reference (f). The individual boiler design rating is multiplied by the gas use rate to provide the estimated gas used per reporting period (in MMSCF).

(h) NMED List of Insignificant Activities (9/95), Item (3.) exempts fuel burning equipment which uses gaseous fuel, has a design rate less than or equal to 5 MMBTU/hr, and is used for heating buildings for personal comfort or for producing hot water for personal use.

(i) The design rate for boilers includes a correction for elevation. LANL is at approximately 7,500 feet above sea level. Corrections are made for atmospheric boilers using 4% reduction (derated) for each 1,000 feet above sea level ( $4\% \times 7.5 = 30\%$ ). For forced draft and power burner boilers, the reduction is half that of atmospheric at 15%. The correction is made using the boiler plate input rating minus the appropriate percentage.

**2004 Small Boilers Emissions by Boiler for Annual EI Reporting (Tons/Year)**

Pollutant	AIRS 015 TA-48-1 BS-1	AIRS 016 TA-48-1 BS-2	AIRS 017 TA-48-1 BS-6	AIRS 018 TA-53-365 BHW-1	AIRS 019 TA-53-365 BHW-2	AIRS 020 TA-59-1 BHW-1	AIRS 021 TA-59-1 BHW-2	AIRS 024 TA-16 Plant 5	AIRS 037 TA-55-6 BHW-1B	AIRS 038 TA-55-6 BHW-2B	AIRS 044 TA-50-2 BS-1	Total for Small Boilers
<b>NOx</b>	0.520	0.520	0.695	0.693	0.693	0.520	0.520	0.459	0.436	1.481	1.63E-02	6.551
<b>SOx</b>	0.003	0.003	0.004	0.004	0.004	0.003	0.003	0.007	0.002	0.006	9.76E-05	0.041
<b>PM</b>	0.039	0.039	0.053	0.053	0.053	0.039	0.039	0.094	0.045	0.152	1.24E-03	0.609
<b>PM-10</b>	0.039	0.039	0.053	0.053	0.053	0.039	0.039	0.094	0.045	0.152	1.24E-03	0.609
<b>PM-2.5</b>	0.039	0.039	0.053	0.053	0.053	0.039	0.039	0.094	0.045	0.152	1.24E-03	0.609
<b>CO</b>	0.437	0.436	0.584	0.582	0.582	0.436	0.436	0.459	0.121	0.410	1.37E-02	4.497
<b>VOC</b>	0.029	0.029	0.038	0.038	0.038	0.029	0.029	0.068	0.019	0.064	8.95E-04	0.381
<b>HAPs</b>												
<b>Arsenic</b>	1.04E-06	1.04E-06	1.39E-06	1.39E-06	1.39E-06	1.04E-06	1.04E-06	2.47E-06	6.31E-07	2.15E-06	3.25E-08	1.36E-05
<b>Benzene</b>	1.09E-05	1.09E-05	1.46E-05	1.45E-05	1.45E-05	1.09E-05	1.09E-05	2.60E-05	6.63E-06	2.25E-05	3.42E-07	1.43E-04
<b>BE</b>	6.24E-08	6.23E-08	8.34E-08	8.31E-08	8.31E-08	6.23E-08	6.23E-08	1.48E-07	3.79E-08	1.29E-07	1.95E-09	8.16E-07
<b>Cadmium</b>	5.72E-06	5.72E-06	7.65E-06	7.62E-06	7.62E-06	5.72E-06	5.72E-06	1.36E-05	3.47E-06	1.18E-05	1.79E-07	7.48E-05
<b>Chromium</b>	7.28E-06	7.27E-06	9.73E-06	9.70E-06	9.70E-06	7.27E-06	7.27E-06	1.73E-05	4.42E-06	1.50E-05	2.28E-07	9.52E-05
<b>Cobalt</b>	4.37E-07	4.36E-07	5.84E-07	5.82E-07	5.82E-07	4.36E-07	4.36E-07	1.04E-06	2.65E-07	9.01E-07	1.37E-08	5.71E-06
<b>Dichlorobenzene</b>	6.24E-06	6.23E-06	8.34E-06	8.31E-06	8.31E-06	6.23E-06	6.23E-06	1.48E-05	3.79E-06	1.29E-05	1.95E-07	8.16E-05
<b>Formaldehyde</b>	3.90E-04	3.90E-04	5.21E-04	5.20E-04	5.20E-04	3.90E-04	3.90E-04	9.28E-04	2.37E-04	8.05E-04	1.22E-05	5.10E-03
<b>Hexane</b>	9.35E-03	9.35E-03	1.25E-02	1.25E-02	1.25E-02	9.35E-03	9.35E-03	2.23E-02	5.68E-03	1.93E-02	2.93E-04	1.22E-01
<b>Lead</b>	2.60E-06	2.60E-06	3.48E-06	3.46E-06	3.46E-06	2.60E-06	2.60E-06	6.18E-06	1.58E-06	5.37E-06	8.14E-08	3.40E-05
<b>Manganese</b>	1.97E-06	1.97E-06	2.64E-06	2.63E-06	2.63E-06	1.97E-06	1.97E-06	4.70E-06	1.20E-06	4.08E-06	6.18E-08	2.58E-05
<b>Mercury</b>	1.35E-06	1.35E-06	1.81E-06	1.80E-06	1.80E-06	1.35E-06	1.35E-06	3.22E-06	8.21E-07	2.79E-06	4.23E-08	1.77E-05
<b>Napthalene</b>	3.17E-06	3.17E-06	4.24E-06	4.23E-06	4.23E-06	3.17E-06	3.17E-06	7.54E-06	1.93E-06	6.55E-06	9.93E-08	4.15E-05
<b>Nickel</b>	1.09E-05	1.09E-05	1.46E-05	1.45E-05	1.45E-05	1.09E-05	1.09E-05	2.60E-05	6.63E-06	2.25E-05	3.42E-07	1.43E-04
<b>POM</b>	4.57E-07	4.57E-07	6.12E-07	6.10E-07	6.10E-07	4.57E-07	4.57E-07	1.09E-06	2.78E-07	9.44E-07	1.43E-08	5.98E-06
<b>Selenium</b>	1.25E-07	1.25E-07	1.67E-07	1.66E-07	1.66E-07	1.25E-07	1.25E-07	2.97E-07	7.58E-08	2.58E-07	3.91E-09	1.63E-06
<b>Toluene</b>	1.77E-05	1.77E-05	2.36E-05	2.36E-05	2.36E-05	1.77E-05	1.77E-05	4.20E-05	1.07E-05	3.65E-05	5.53E-07	2.31E-04
<b>TOTAL HAPS/Unit</b>	9.81E-03	9.81E-03	1.31E-02	1.31E-02	1.31E-02	9.81E-03	9.81E-03	2.34E-02	5.96E-03	2.03E-02	3.07E-04	0.13

**2004 TA-52 Paper Shredder**

	Data Entry
Month	Boxes Shredded
January	95
February	779
March	1022
April	1075
May	353
June	569
<b>6 mo. Total</b>	<b>3,893</b>

	Data Entry
Month	Boxes Shredded
July	25
August	0
September	
October	
November	
December	
<b>6 mo. Total:</b>	<b>25</b>

The Paper Shredder was taken off line in July 2004

<b>Annual Boxes (2004):</b>	<b>3,918</b>
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Maximum Annual emission rate is 13 tons of Total Suspended Particulate (TSP) per year.

Emissions	Boxes Shredded	Weight <sup>1</sup> per box	Amount <sup>3</sup> Processed (pounds)	Emission <sup>2</sup> Factor	Control <sup>4</sup> Efficiency (Cyclone)	Control <sup>4</sup> Efficiency (Bag house)	TSP Emissions (pounds)	PM-10 (pounds)	PM-2.5 (pounds)
<b>Annual</b>	3,918	60	235,080	1%	90%	99%	2.35	2.35	2.35
<b>January - June</b>	3,893	60	233,580	1%	90%	99%	2.34	2.34	2.34
<b>July - December</b>	25	60	1,500	1%	90%	99%	0.02	0.02	0.02

Reference			
<b>1.</b> Estimated box weight is 60 pounds. Information provided by shredding operations manager.	<b>2.</b> Emission Factor obtained from SEM, the shredder manufacturer.	<b>3.</b> Information provided by the shredder operator (KSL).	<b>4.</b> Information on control equipment efficiencies is based on engineering judgment.

**Degreasers TA-55  
2004 Usage Data**

Date Measured	Initial Solvent Level (inches)	Volume Added (liters)	Level Added (inches)	Volume Removed (liters)	Level Removed (inches)
Jan-05-2004	7.3	0	0	0	0
Feb-02-2004	7.1	0	0	0	0
Mar-01-2004	6.8	0	0	0	0
Apr-01-2004	6.5	0	0	0	0
May-03-2004	6.3	2.35	1.2	0	0
Jun-01-2004	6.9	0	0	0	0
Jun-09-2004	6.9	1.17	0.6	0	0
Jul-01-2004	7.3	0	0	0	0
Aug-02-2004	7	0	0	0	0
Sep-01-2004	6.8	0	0	0	0
Oct-04-2004	6.4	0	0	0	0
Nov-01-2004	6	0	0	0	0
Dec-01-2004	5.9	0	0	0	0
Dec-15-2004	5.9	3.14	1.6	0	0
Jan-03-2005	7.4	0	0	0	0
<b>TOTAL</b>		<b>6.66</b>		<b>0</b>	

**Conversions**

Kg/L	1.463
Lb/Kg	2.21
lb/ton	2000

Emissions = (Vol Added - L) - (Vol Removed - L) x (1.463 Kg/L) x (2.21 Lg/Kg) = 21.53 lbs  
0.01 tons

The Usage information for UT Bath" degreaser from "Jan-01-2004" through "Jan-24-2005". "

Type: Cold Batch

TA: 55

Bldg:

Solvent: Trichloroethylene

**2004 TA-52 Data Disintegrator**

Reviewed By / Date: \_\_\_\_\_

Data Entry			Data Entry		
Month	Boxes <sup>(c)</sup> Shredded	12-Month Rolling Total	Month	Boxes <sup>(c)</sup> Shredded	12-Month Rolling Total
January			July		
February			August	58	58
March			September	903	961
April			October	717	1678
May			November	451	2129
June			December	237	2366
6 mo. Total	0		6 mo. Total:	2,366	

Data Disintegrator Started up in August 2004

<b>Annual Boxes (2004):</b>	<b>2,366</b>
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Maximum Annual emission rate is: 9.9 tpy or 2.3 lb/hr of Total Suspended Particulate (TSP) per year.  
9.9 tpy or 2.3 lb/hr of Particulate Matter <10µm (PM-10) per year.

**Emission Calculations**

	Emission <sup>(b)</sup> Factor	% in <sup>(e)</sup> Exhaust	Control <sup>(d)</sup> Efficiency (Cyclone)	Control <sup>(d)</sup> Efficiency (Baghouse)
PM 2.5	15%	15%	0%	95.0%
PM 10	15%	90%	75%	95.0%
TSP	15%	100%	75%	95.0%

<b>Average Box Weight<sup>(a)</sup></b> 45 Pounds
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	Amount Processed (pounds)	PM-2.5 Emissions (pounds)	PM-2.5 Emissions (tons)	PM-10 Emissions (pounds)	PM-10 Emissions (tons)	TSP Emissions (pounds)	TSP Emissions (tons)
Annual	106,470	119.8	0.060	179.7	0.090	199.6	0.100
January - June	0	0.0	0.000	0.0	0.000	0.0	0.000
July - December	106,470	119.8	0.060	179.7	0.090	199.6	0.100

Reference				
<b>(a).</b> Estimated maximum box weight is 45 pounds. Information provided by shredding operations. Full box weight of tightly packed paper.	<b>(b).</b> Emission Factor (percentage of material shredded that will enter into the exhaust) obtained from the manufacturer of the air handling system, AGET Manufacturing Co. 15% is also listed in the construction permit.	<b>(c).</b> Information provided by the shredding operations personnel.	<b>(d).</b> Information on control equipment efficiencies was provided by the manufacturer of the Data Disintegrator (SEM). Those values not given were extrapolated using manufacturer data. Efficiencies of 75% for the Cyclone and 95% for the bag house are listed in the construction permit. (see cyclone efficiency tab for more info.)	<b>(e).</b> Manufacturer provided info that the dust into the exhaust would be in the size range of 5-20 um. Conservative assumption that 15% is PM2.5, and 90% is PM10.

**2004 TA-3 & TA-15 Carpenter Shops**

<b>TA-3</b>	
Data Entry	
Month	Hours of Operation <sup>1</sup>
Month	TA-3
January	11
February	10.5
March	3.5
April	12.5
May	5.5
June	6.5
<b>6 mo. Total</b>	<b>49.50</b>

Data Entry	
Month	Hours of Operation <sup>1</sup>
Month	TA-3
July	3.7
August	0
September	0.5
October	0.75
November	7
December	3.5
<b>6 mo. Total:</b>	<b>15.45</b>

<b>TA-15</b>	
Data Entry	
Month	Hours of Operation <sup>1</sup>
Month	TA-15
January	0
February	0
March	0
April	0
May	0
June	0
<b>6 mo. Total</b>	<b>0</b>

Data Entry	
Month	Hours of Operation <sup>1</sup>
Month	TA-15
July	0
August	0
September	0
October	0
November	0
December	0
<b>6 mo. Total:</b>	<b>0</b>

Saws, drills, shaping and sanding equipment shall each operate at a maximum of 4368 hours per year.

Reference
1. Based on information provided monthly by the shop foreman from each shop.

Allowable Emission Limits are:

3.07 tpy of PM10 for the TA-3-38 shop  
2.81 tpy of PM10 for the TA-15-563 shop

Reviewed By/Date: \_\_\_\_\_

## Carpenter Shop Emissions Calculations for 2004

ANNUAL EMISSIONS					PM Post Cyclone Emissions (tons/year)		
Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone				
Exhaust Flow (ft <sup>3</sup> /min)	Hours of <sup>(3)</sup> Operation (hr/yr)	(tons/year)	tons/yr	(PM (PM > 40µm)	(PM 10) (PM 5-20 µm)	(PM 2.5) (PM <2.5 µm)	
TA-3-38	2706	65	0.062	0.023	0.002	0.011	0.010
TA-15-563	2100	0	0.000	0.000	0.000	0.000	0.000
January through June Emissions					PM Post Cyclone Emissions (tons)		
Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone				
Exhaust Flow (ft <sup>3</sup> /min)	Hours of <sup>(3)</sup> Operation (hr/period)	tons	tons	(PM (PM > 40µm)	(PM 10) (PM 5-20 µm)	(PM 2.5) (PM <2.5 µm)	
TA-3-38	2706	50	0.047	0.017	0.001	0.008	0.008
TA-15-563	2100	0	0.000	0.000	0.000	0.000	0.000
July through December Emissions					PM Post Cyclone Emissions (tons)		
Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone				
Exhaust <sup>(1)</sup> Flow (ft <sup>3</sup> /min)	Hours of <sup>(3)</sup> Operation (hr/period)	tons	tons	(PM (PM > 40µm)	(PM 10) (PM 5-20 µm)	(PM 2.5) (PM <2.5 µm)	
TA-3-38	2706	15	0.015	0.005	0.000	0.003	0.002
TA-15-563	2100	0	0.000	0.000	0.000	0.000	0.000

**Conversions:**

lb/ton	lb/grain	min/hr	ton/lb
2000	0.000142857	60	0.0005

**Assumptions:**

	Cyclone <sup>(4)</sup> Efficiencies	% PM by size in Wood <sup>(5)</sup> Dust Prior to Cyclone
PM < 2.5	0.45	0.30
PM 5-20 microns	0.65	0.50
PM > 40 microns	0.95	0.50

**Post Cyclone Emission Factor:**

grain/ft <sup>3</sup> <sup>(2)</sup>
0.03

	Shop Location	Flow Rate
<b>Maximum permitted exhaust flow rate is:</b>	TA-3-38	5000 cfm
	TA-15-563	5471 cfm

**References:**

- 1.) Exhaust Rate calculated by Victor Martinez.
- 2.) Emission Factor obtained from AP-42, Section 10.4 Woodworking Waste Collection Operations, post cyclone emissions, Table 10.4.1, February 1980.
- 3.) Based on information provided monthly by the shop foreman.
- 4.) K. Wark & C.F. Warner, Air Pollution - Its Origin and Control, Table 5-9, pg 186 (1976).
- 5.) Emissions Inventory Improvement Program (EIIP) Uncontrolled Emission Factor Listing for Criteria Air Pollutants, Volume II: Chapter 14, July 2001 And AP-42 Appendix B, Section 10.5 Woodworking Waste Collection Operations: Belt Sander Hood Exhaust Cyclone.

Reviewed By/Date: \_\_\_\_\_

## 2004 Generator Emissions

TA	Bldg	Manufacturer	KW	Fuel Type	First 6 Month Readings 2004					Second 6 Month Readings 2004				
					6 Month Reading Date	6 mth. Reading	Hours Run	Days between readings	6 mth. Prorated Hours	12 Month Reading Date	6 mth. Reading	Hours Run	Days b/t readings	6 mth. Prorated Hours
3	40	Onan Sons	150	Diesel	05/01/2004	231	11.6	180	11.6	12/01/2004	545.0	314	210	269.1
3	223	Onan Sons	45	Nat. Gas	05/01/2004	446	7.8	180	7.8	12/01/2004	452.1	6.1	210	5.2
3	1404	Cummins	1250	Diesel	04/01/2004	60.5	22.5	120	33.8	11/01/2004	79.0	18.5	210	15.9
3	440	Cummins	150	Diesel	05/01/2004	92.8	6.6	180	6.6	12/01/2004	98.0	5.2	210	4.5
3	440	Cummins	500	Diesel	05/01/2004	38	6.8	180	6.8	12/01/2004	42.9	4.9	210	4.2
3	1076	Cummins	35	Diesel	N/R	-	-	-	0.0	01/01/2005	44.5	New	New	44.5
3	1498	Caterpillar	600	Diesel	05/01/2004	266	6	180	6.0	12/01/2004	269.0	3	210	2.6
3	2322	Onan Sons	80	Diesel	05/01/2004	20.2	20.2	180	20.2	12/01/2004	56.8	36.6	210	31.4
16	205	Onan Sons	250	Diesel	05/01/2004	983.5	20.7	180	20.7	11/01/2004	1008.7	25.2	180	25.2
16	980	Cummins	1100	Diesel	N/R	-	-	-	0.0	12/01/2004	10.4	New	New	10.4
16	1374	Onan Sons	60	Nat. Gas	05/01/2004	815.2	43.1	180	43.1	12/01/2004	865.2	50	210	42.9
18	31	Onan Sons	275	Diesel	05/01/2004	140.5	6	180	6.0	12/01/2004	147.6	7.1	210	6.1
21	155	Onan Sons	750	Diesel	05/01/2004	822.6	11.3	180	11.3	12/01/2004	825.6	3	210	2.6
21	257	Onan Sons	20	Diesel	05/01/2004	189	0	180	0.0	12/01/2004	189.0	0	210	0.0
21	357	Caterpillar	125	Diesel	05/01/2004	441	10.8	180	10.8	12/01/2004	445.0	4	210	3.4
21	1002	Onan Sons	175	Diesel	05/01/2004	2876.2	5.2	180	5.2	11/01/2004	2878.2	2	180	2.0
21	1002	Onan Sons	350	Diesel	05/01/2004	1695.1	15.1	180	15.1	12/01/2004	1770.9	75.8	210	65.0
21	1002	Cummins	150	Diesel	05/01/2004	1016	2.1	180	2.1	12/01/2004	1072.8	56.8	210	48.7
33	87	Kohler	30	Diesel	05/01/2004	822.8	439.9	180	439.9	12/01/2004	840.5	17.7	210	15.2
33	151	Caterpillar	225	Diesel	05/01/2004	-	-	-	0.0	12/01/2004	2944.0	0	New	0.0
33	208	Kohler	1600	Diesel	04/01/2004	4.9	0	120	0.0	12/01/2004	4.9	0	240	0.0
33	Point	Onan Sons	80	Diesel	05/01/2004	7643.1	0	150	0.0	12/01/2004	7643.1	0	210	0.0
35	2	Onan Sons	100	Diesel	05/01/2004	93.5	3.7	150	4.4	01/01/2005	95.3	1.8	240	1.4
43	1	Cummins	50	Diesel	05/01/2004	331.6	7.9	180	7.9	12/01/2004	344.6	13	210	11.1
43	1	Onan Sons	150	Diesel	05/01/2004	436.8	29.6	180	29.6	12/01/2004	455.3	18.5	210	15.9
46	335	Onan Sons	300	Diesel	05/01/2004	651.6	24.9	180	24.9	12/01/2004	717.3	65.7	210	56.3
48	45	Onan Sons	125	Diesel	05/01/2004	322	5.9	180	5.9	12/01/2004	328.5	6.5	210	5.6
50	37	Cummins	500	Diesel	05/01/2004	458.3	1.4	180	1.4	12/01/2004	463.8	5.5	210	4.7
50	184	Onan Sons	60	Nat. Gas	04/01/2004	809	39.5	150	47.4	01/01/2005	49.5	49.5	New	49.5
50	188	Onan Sons	1250	Diesel	05/01/2004	125.2	7.3	180	7.3	12/01/2004	131.2	6	210	5.1
53	1	Onan Sons	60	Nat. Gas	05/01/2004	917.1	44.6	180	44.6	12/01/2004	971.1	54	210	46.3
53	2	Kato Eng.	50	Diesel	05/01/2004	182.7	6.4	180	6.4	12/01/2004	189.0	6.3	210	5.4
53	M	Cummins	60	Diesel	04/01/2004	4440	0	180	0.0	12/01/2004	4440.0	0	240	0.0
53	M	Onan Sons	12.5	Nat. Gas	04/01/2004	581.5	0	180	0.0	12/01/2004	581.5	0	240	0.0
54	412	Olympian	500	Diesel	05/01/2004	223.7	9.3	150	11.2	12/01/2004	242.6	18.9	210	16.2
55	5		100	Nat. Gas	05/01/2004	34	9.2	180	9.2	12/01/2004	44.7	10.7	210	9.2



**2004 Generator Emissions**

55	8	Detroit	600	Diesel	05/01/2004	743	8.4	150	10.1	12/01/2004	760.6	17.6	210	15.1
55	28	Onan Sons	40	Diesel	05/01/2004	24	6.3	180	6.3	12/01/2004	31.4	7.4	210	6.3
55	47	Onan Sons	200	Diesel	05/01/2004	461	4.5	180	4.5	12/01/2004	480.6	19.6	210	16.8
55	142	Cummins	400	Diesel	05/01/2004	24.8	0.9	150	1.1	12/01/2004	24.8	0	210	0.0
59	1	Allis Chalmers	90	Diesel	05/01/2004	719.5	7.1	180	7.1	12/01/2004	725.5	6	210	5.1
61	23	Murphy	20	Diesel	05/01/2004	557	0	180	0.0	12/01/2004	569.9	12.9	210	11.1
64	1	Onan Sons	250	Diesel	05/01/2004	111.6	6	180	6.0	12/01/2004	114.6	3	210	2.6
69	33	Cummins	1250	Diesel	N/R	-	-	-	0.0	12/01/2004	16.5	New	New	16.5

**44 Generators in use**

**TOTAL 882.2**

**TOTAL 898.9**

N/R = Not Read

<b>First half average hours per unit</b>	<b>20.1</b>	<b>Second half average hours per unit</b>	<b>20.4</b>
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<b>Annual Average of hours per unit</b>	<b>20.24</b>
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Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

### 2004 Generator Emissions

EMISSION FACTORS	NOx	CO	SOx	PM	PM <sub>10</sub>	VOC
	lb/kw-hr	lb/kw-hr	lb/kw-hr	lb/kw-hr	lb/kw-hr	lb/kw-hr
Large Diesel fired <sup>(a)(b)</sup>	0.032	0.007	0.011	0.001	0.001	0.001
Small Diesel fired <sup>(a)(c)</sup>	0.042	0.009	0.003	0.003	0.003	0.003
Natural Gas Fired <sup>(d)</sup>	0.008	0.013	2.0E-06	3.4E-05	3.2E-05	1.0E-04

(a) Emission factors from AP-42, Table 3.4-1

(b) AP-42, Fifth Edition, Table 3.3-1

(c) Emission factors from AP-42, July 2000, Table 3.2-1 Natural Gas Fired Reciprocating Engines. These emission factors were used to reflect the same values as listed in the operating permit app.

**References:**

447	447 kw is the size limit for determining large vs. small diesel fired generator. This information was taken from the operating permit application.
<b>(a)</b> The AP-42 (fifth edition) emissions factor uses units of lb/hp-hr. There are 1.341 hp-hrs in a kwh. Therefore, take pounds/hp-hr x 1.341 hp-hr/kwh to obtain the emission factor in lb/kwh.	
<b>(b)</b> Emission factors for large diesel fired boilers were taken from AP-42 (fifth edition) Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4.	
<b>(c)</b> Emission factors for small diesel fired boilers were taken from AP-42 (fifth edition) Tables 3.3-1 and 3.3-2.	
<b>(d)</b> The AP-42 (fifth edition) emission factors for natural gas burning 4-stroke rich-burn engines (Table 3.2-3) provides units of lb/MMBtu. There are 3413 Btus in a kilowatt-hr (kwh) or $2.928 \times 10^{-4}$ kwh per btu. Therefore, take lb/MMBtu x 3413 / $1 \times 10^6$ or lb/MMbtu / $10^6 / 2.928 \times 10^{-4}$ to obtain the emissions factor in lb/kwh.	

## 2004 Generator Emissions

Location	First 6 Month Emissions of 2004						Second 6 Month Emissions of 2004					
	NOx (lb/yr)	CO (lb/yr)	SOx (lb/yr)	PM (lb/yr)	VOC (lb/yr)	HAPs (lb/yr)	NOx (lb/yr)	CO (lb/yr)	SOx (lb/yr)	PM (lb/yr)	VOC (lb/yr)	HAPs (lb/yr)
3-40	72.3	15.6	4.8	5.1	5.8	2.4E-02	1678.3	361.6	111.0	119.1	133.7	5.5E-01
3-223	2.6	4.5	0.0	0.0	0.0	4.0E-02	1.8	3.0	0.0	0.0	0.0	2.6E-02
3-1404	1357.8	311.2	457.7	39.6	39.9	2.5E-01	637.9	146.2	215.0	18.6	18.7	1.2E-01
3-440	41.2	8.9	2.7	2.9	3.3	1.3E-02	27.8	6.0	1.8	2.0	2.2	9.0E-03
3-440	109.4	25.1	36.9	3.2	3.2	2.0E-02	67.6	15.5	22.8	2.0	2.0	1.2E-02
3-1076	0.0	0.0	0.0	0.0	0.0	0.0E+00	64.7	14.0	4.3	4.6	5.2	2.1E-02
3-1498	115.9	26.6	39.1	3.4	3.4	2.1E-02	49.7	11.4	16.7	1.4	1.5	9.0E-03
3-2322	67.2	14.5	4.4	4.8	5.4	2.2E-02	104.3	22.5	6.9	7.4	8.3	3.4E-02
16-205	215.1	46.4	14.2	15.3	17.1	7.0E-02	261.9	56.4	17.3	18.6	20.9	8.5E-02
16-980	0.0	0.0	0.0	0.0	0.0	0.0E+00	368.2	84.4	124.1	10.7	10.8	6.7E-02
16-1374	19.5	32.8	0.0	0.1	0.3	2.9E-01	19.4	32.6	0.0	0.1	0.3	2.9E-01
18-31	68.6	14.8	4.5	4.9	5.5	2.2E-02	69.6	15.0	4.6	4.9	5.5	2.3E-02
21-155	272.8	62.5	91.9	8.0	8.0	4.9E-02	62.1	14.2	20.9	1.8	1.8	1.1E-02
21-257	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
21-357	56.1	12.1	3.7	4.0	4.5	1.8E-02	17.8	3.8	1.2	1.3	1.4	5.8E-03
21-1002	37.8	8.2	2.5	2.7	3.0	1.2E-02	14.5	3.1	1.0	1.0	1.2	4.7E-03
21-1002	219.7	47.3	14.5	15.6	17.5	7.1E-02	945.3	203.7	62.5	67.1	75.3	3.1E-01
21-1002	13.1	2.8	0.9	0.9	1.0	4.3E-03	303.6	65.4	20.1	21.5	24.2	9.9E-02
33-87	548.6	118.2	36.3	38.9	43.7	1.8E-01	18.9	4.1	1.3	1.3	1.5	6.2E-03
33-151	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
33-208	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
33-Point	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
35-2	18.5	4.0	1.2	1.3	1.5	6.0E-03	5.6	1.2	0.4	0.4	0.4	1.8E-03
43-1	16.4	3.5	1.1	1.2	1.3	5.3E-03	23.2	5.0	1.5	1.6	1.8	7.5E-03
43-1	184.6	39.8	12.2	13.1	14.7	6.0E-02	98.9	21.3	6.5	7.0	7.9	3.2E-02
46-335	310.5	66.9	20.5	22.0	24.7	1.0E-01	702.3	151.3	46.4	49.8	56.0	2.3E-01
48-45	30.7	6.6	2.0	2.2	2.4	1.0E-02	29.0	6.2	1.9	2.1	2.3	9.4E-03
50-37	22.5	5.2	7.6	0.7	0.7	4.1E-03	75.9	17.4	25.6	2.2	2.2	1.4E-02
50-184	21.5	36.1	0.0	0.1	0.3	3.2E-01	22.4	37.7	0.0	0.1	0.3	3.3E-01
50-188	293.7	67.3	99.0	8.6	8.6	5.3E-02	206.9	47.4	69.7	6.0	6.1	3.7E-02
53-1	20.2	34.0	0.0	0.1	0.3	3.0E-01	20.9	35.3	0.0	0.1	0.3	3.1E-01
53-2	13.3	2.9	0.9	0.9	1.1	4.3E-03	11.2	2.4	0.7	0.8	0.9	3.7E-03
53-M	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00

### 2004 Generator Emissions

<b>53-M</b>	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
<b>54-412</b>	179.6	41.2	60.5	5.2	5.3	3.2E-02	260.7	59.7	87.9	7.6	7.7	4.7E-02
<b>55-5</b>	6.9	11.7	0.0	0.0	0.1	1.0E-01	6.9	11.6	0.0	0.0	0.1	1.0E-01
<b>55-8</b>	194.6	44.6	65.6	5.7	5.7	3.5E-02	291.3	66.8	98.2	8.5	8.6	5.3E-02
<b>55-28</b>	10.5	2.3	0.7	0.7	0.8	3.4E-03	10.5	2.3	0.7	0.7	0.8	3.4E-03
<b>55-47</b>	37.4	8.1	2.5	2.7	3.0	1.2E-02	139.7	30.1	9.2	9.9	11.1	4.5E-02
<b>55-142</b>	18.0	3.9	1.2	1.3	1.4	5.8E-03	0.0	0.0	0.0	0.0	0.0	0.0E+00
<b>59-1</b>	26.6	5.7	1.8	1.9	2.1	8.6E-03	19.2	4.1	1.3	1.4	1.5	6.3E-03
<b>61-23</b>	0.0	0.0	0.0	0.0	0.0	0.0E+00	9.2	2.0	0.6	0.7	0.7	3.0E-03
<b>64-1</b>	62.4	13.4	4.1	4.4	5.0	2.0E-02	26.7	5.8	1.8	1.9	2.1	8.7E-03
<b>69-33</b>	0.0	0.0	0.0	0.0	0.0	0.0E+00	663.8	152.1	223.8	19.4	19.5	1.2E-01
<b>lbs/6 months</b>	4685.4	1148.3	995.1	221.4	240.6	2.2	7337.8	1722.7	1207.8	403.8	444.9	3.0
<b>Tons/6 months</b>	<b>2.3</b>	<b>0.6</b>	<b>0.5</b>	<b>0.1</b>	<b>0.1</b>	<b>1.1E-03</b>	<b>3.7</b>	<b>0.9</b>	<b>0.6</b>	<b>0.2</b>	<b>0.2</b>	<b>1.5E-03</b>

<b>YEARLY TOTAL</b>	<b>NOx</b>	<b>CO</b>	<b>SOx</b>	<b>PM</b>	<b>VOC</b>	<b>HAPs</b>
<b>Tons/Year</b>	<b>6.0</b>	<b>1.4</b>	<b>1.1</b>	<b>0.3</b>	<b>0.3</b>	<b>0.003</b>

**ATTACHMENT B.**  
**2004 ANNUAL EMISSIONS INVENTORY SUBMITTAL TO NMED**





*Associate Directorate for Technical Services*  
P.O. Box 1663, A104  
Los Alamos, New Mexico 87545  
505-667-0079/Fax 505-665-1812

*Date:* March 22, 2005  
*Refer To:* ADTS:05-022

Ms. Heather Lancour  
New Mexico Environment Department  
Air Quality Bureau  
2048 Galisteo Street  
Santa Fe, NM 87505

**IDEA ID NO.856 – LOS ALAMOS NATIONAL LABORATORY (LANL)  
ANNUAL EMISSION INVENTORY REPORT REQUIRED UNDER 20.2.73 NMAC**

Dear Ms. Lancour:

Enclosed is the 2004 Emissions Inventory Update for Los Alamos National Laboratory (LANL or Laboratory), required by Title 20, Chapter 2, Part 73 of the New Mexico Administrative Code (20.2.73 NMAC), Notice of Intent and Emissions Inventory Requirements.

We have updated the eight Excel worksheets that you provided, using the guidance in your instructions for the *2004 New Mexico Emissions Inventory Update*. All changes made to the worksheets are highlighted in yellow (additions) and green (deletions).

In general, criteria pollutant emissions from LANL sources in 2004 are slightly lower than reported in previous years. Additionally, please note the following changes to our inventory for 2004:

- The following emission units were removed from operation during 2004: beryllium-machining operation (AIRS #008) at TA-3, Building 102; Plant 6 boiler and backup (AIRS #025) at TA-16, Building 1485; rock crusher (AIRS #026); and paper shredder (AIRS #027).
- One emission unit is reported for the first time this year: a data disintegrator (AIRS #045) located at TA-52. This unit replaced the paper shredder that was removed in July, 2004.

For the first time, NMED has required the reporting of hazardous air pollutant (HAP) emissions, particulate matter in the size of 2.5 microns in diameter or less (PM<sub>2.5</sub>) emissions, and ammonia (NH<sub>3</sub>) emissions in the 2004 Emissions Inventory. As requested by NMED, LANL has voluntarily reported these emissions in the past. Therefore, this information, with the exception of the radionuclide emissions, is once again included in the 2004 Emissions Inventory.

Emissions of radionuclides other than radon from Laboratory operations, as reported to EPA under 40 CFR 61 Subpart H, resulted in a maximum offsite dose of 0.65 mrem during 2003. For 2004, this offsite dose is estimated to be approximately 2 mrem. A final dose for 2004 will be reported to EPA in June 2005.

This submittal includes print outs of the eight updated spreadsheets for LANL, as well as a diskette containing electronic copies of the updated spreadsheets. We have also included a summary report that was prepared at the completion of the Emissions Inventory submittal for 2003. We followed the same methodology in preparing the 2004 emissions inventory updates as described in this report.

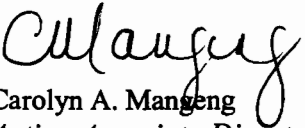
Ms. Heather Lancour  
ADTS:05-022  
LA-UR-05-2050

-2-

March 22, 2005

If you have any questions regarding this report, please contact Margie Stockton (667-9359) or Walt Whetham (665-8885), in the Laboratory's Meteorology and Air Quality Group.

Sincerely,



Carolyn A. Mangeng  
*Acting Associate Director*

CAM:alb

Cy:

S. Fong, DOE/OLASO, A316  
K. Hargis, ENV-DO, J591  
D. Stavert, ENV-DO, J591  
P. Wardwell, LC-ESH, A187  
J. Hurtle, ENV-MAQ, J978  
D. Wilburn, ENV -MAQ, J978  
S. Story, ENV -MAQ, J978  
J. Dewart, ENV-MAQ, J978  
W. Whetham, ENV -MAQ, J978  
M. Stockton, ENV-MAQ, J978  
20.2.73 NMAC Project File  
ENV-MAQ File



# LOS ALAMOS NATIONAL LABORATORY'S 2004 EMISSIONS INVENTORY

*Submitted as Required by:*

**Title 20, Chapter 2, Part 73 of the New Mexico Administrative Code**

*Prepared by:*

**The University of California**

*For:*

**The National Nuclear Security Administration of the  
United States Department of Energy**

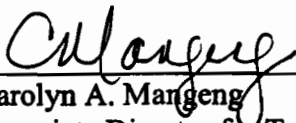
*Information Contacts:*

**Margie Stockton, (505) 667-9359**

**Jean Dewart, (505) 665-0239**

## **Certification Statement**

I, Carolyn A. Mangeng, hereby certify on behalf of Los Alamos National Laboratory and the University of California, that the information and statements contained in this Emissions Inventory report are true and accurate to the best of my knowledge and belief.



\_\_\_\_\_  
Carolyn A. Mangeng  
Associate Director for Technical Services (Acting)  
University of California  
Los Alamos National Laboratory  
(505) 667-0079

3/29/05  
Date

County	County FIPS	AFS/NEDS Plant ID	Inventory Year (YYYY)	Air Program Status	SIC	NAICS	Company Name	Facility Name	Facility Description	Street Line 1	Street Name 2	City	State	Zip Code
Los Alamos	028	0001	2004	O	9711		Los Alamos National Laboratory	Los Alamos National Laboratory	National Security	PO Box 1663, Air Quality Gro	Mail Stop J978	Los Alamos	NM	87545-

Contact Person Name	Contact Person Phone	Contact Person E-mail	UTM Zone	UTMH	UTMV	Elevation (ft)	Street Line 1	City	Permit Number	Permit Type	strClass	Facility Category Code
Jean Dewart	5056650239	<a href="mailto:dewart@lanl.gov">dewart@lanl.gov</a>	13	381.19	3970.3	7380	1 mi S of Los Alamos	Los Alamos	1081M1R3,2195,2195B,0632,0634M2,0635,0636,0632, 0634, 1081, 2195, 2195B, 2195F, 2195H,GCP-3-2195G, P100	Regular Permit	A	

County FIPS	AFS/NEDS Plant ID	Inventory Year (YYYY)	Facility Name	Emission Type	Pollutant Code	CAS Number	Emission Numeric Value	Emission Unit Numerator	strClass
028	0001	2004	Los Alamos National	12	100027	100027	2.50E-05	TY	B
028	0001	2004	Los Alamos National	12	100414	100414	0	TY	B
028	0001	2004	Los Alamos National	12	100425	100425	2.25E-03	TY	B
028	0001	2004	Los Alamos National	12	100447	100447	1.20E-04	TY	B
028	0001	2004	Los Alamos National	12	101688	101688	0	TY	B
028	0001	2004	Los Alamos National	12	106423	106423	2.08E-03	TY	B
028	0001	2004	Los Alamos National	12	106445		1.10E-04	TY	B
028	0001	2004	Los Alamos National	12	106467	106467	4.36E-04	TY	B
028	0001	2004	Los Alamos National	12	106503	106503	5.50E-04	TY	B
028	0001	2004	Los Alamos National	12	106514	106514	0	TY	B
028	0001	2004	Los Alamos National	12	106887	106887	1.75E-04	TY	B
028	0001	2004	Los Alamos National	12	106898	106898	0	TY	B
028	0001	2004	Los Alamos National	12	106934	106934	1.10E-04	TY	B
028	0001	2004	Los Alamos National	12	106990	106990	0	TY	B
028	0001	2004	Los Alamos National	12	107028	107028	0	TY	B
028	0001	2004	Los Alamos National	12	107062	107062	4.77E-03	TY	B
028	0001	2004	Los Alamos National	12	107131	107131	0	TY	B
028	0001	2004	Los Alamos National	12	107211	107211	2.56E-01	TY	B
028	0001	2004	Los Alamos National	12	107302	107302	0	TY	B
028	0001	2004	Los Alamos National	12	108054	108054	0	TY	B
028	0001	2004	Los Alamos National	12	108101	108101	0	TY	B
028	0001	2004	Los Alamos National	12	108383	108383	2.58E-03	TY	B
028	0001	2004	Los Alamos National	12	108394	108394	1.10E-04	TY	B
028	0001	2004	Los Alamos National	12	108394	108394	1.10E-04	TY	B
028	0001	2004	Los Alamos National	12	108907	108907	1.21E-02	TY	B
028	0001	2004	Los Alamos National	12	108952	108952	1.91E-03	TY	B
028	0001	2004	Los Alamos National	12	109	109	3.26E-04	TY	B
028	0001	2004	Los Alamos National	12	110543	110543	8.84E-01	TY	B
028	0001	2004	Los Alamos National	12	111422	111422	6.00E-04	TY	B
028	0001	2004	Los Alamos National	12	1120714	1120714	0	TY	B
028	0001	2004	Los Alamos National	12	117817	117817	5.00E-06	TY	B
028	0001	2004	Los Alamos National	12	120809	120809	5.50E-04	TY	B
028	0001	2004	Los Alamos National	12	120821	120821	0	TY	B
028	0001	2004	Los Alamos National	12	121448	121448	5.37E-03	TY	B
028	0001	2004	Los Alamos National	12	121697	121697	0	TY	B
028	0001	2004	Los Alamos National	12	122667		0	TY	B
028	0001	2004	Los Alamos National	12	123319	123319	1.05E-04	TY	B
028	0001	2004	Los Alamos National	12	123386	123386	0	TY	B
028	0001	2004	Los Alamos National	12	123911	123911	3.43E-03	TY	B
028	0001	2004	Los Alamos National	12	125	125	1.05E-03	TY	B
028	0001	2004	Los Alamos National	12	127184	127184	0	TY	B
028	0001	2004	Los Alamos National	12	136	136	4.24E-03	TY	B
028	0001	2004	Los Alamos National	12	139	139	2.69E-03	TY	B
028	0001	2004	Los Alamos National	12	140885	140885	0	TY	B
028	0001	2004	Los Alamos National	12	144	144	5.65E-02	TY	B
028	0001	2004	Los Alamos National	12	156627		0	TY	B
028	0001	2004	Los Alamos National	12	1634044	1634044	1.03E-02	TY	B
028	0001	2004	Los Alamos National	12	171	171	4.50E-02	TY	B
028	0001	2004	Los Alamos National	12	1746016	1746016	0	TY	B
028	0001	2004	Los Alamos National	12	18540299	18540299	0	TY	B
028	0001	2004	Los Alamos National	12	195	195	1.83E-03	TY	B
028	0001	2004	Los Alamos National	12	198	198	5.15E-01	TY	B
028	0001	2004	Los Alamos National	12	199	199	1.07E-03	TY	B
028	0001	2004	Los Alamos National	12	226	226	6.14E-03	TY	B
028	0001	2004	Los Alamos National	12	234	234	0	TY	B
028	0001	2004	Los Alamos National	12	246	246	4.89E-03	TY	B
028	0001	2004	Los Alamos National	12	253	253	1.01E-02	TY	B
028	0001	2004	Los Alamos National	12	302012	302012	1.10E-03	TY	B
028	0001	2004	Los Alamos National	12	3CLET	79016	1.10E-02	TY	B
028	0001	2004	Los Alamos National	12	463581	463581	0	TY	B
028	0001	2004	Los Alamos National	12	51207319	51207319	0	TY	B
028	0001	2004	Los Alamos National	12	51285	51285	0	TY	B
028	0001	2004	Los Alamos National	12	51796	51796	7.35E-04	TY	B
028	0001	2004	Los Alamos National	12	540841	540841	4.58E-03	TY	B
028	0001	2004	Los Alamos National	12	542881	542881	0	TY	B
028	0001	2004	Los Alamos National	12	56235	56235	8.79E-03	TY	B
028	0001	2004	Los Alamos National	12	57125	57125	0	TY	B
028	0001	2004	Los Alamos National	12	57147	57147	0	TY	B
028	0001	2004	Los Alamos National	12	584849	584849	0	TY	B
028	0001	2004	Los Alamos National	12	60344		0	TY	B
028	0001	2004	Los Alamos National	12	624	624	0	TY	B
028	0001	2004	Los Alamos National	12	62533	62533	6.45E-04	TY	B
028	0001	2004	Los Alamos National	12	67561	67561	7.29E-01	TY	B
028	0001	2004	Los Alamos National	12	67663	67663	1.25E-01	TY	B
028	0001	2004	Los Alamos National	12	680319	680319	0	TY	B
028	0001	2004	Los Alamos National	12	68122	68122	1.40E-01	TY	B

028	0001	2004	Los Alamos National	12	71556	71556	0	TY	B
028	0001	2004	Los Alamos National	12	7439921	7439921	0	TY	B
028	0001	2004	Los Alamos National	12	7439976	7439976	0	TY	B
028	0001	2004	Los Alamos National	12	7440020	7440020	0	TY	B
028	0001	2004	Los Alamos National	12	7440360	7440360	0	TY	B
028	0001	2004	Los Alamos National	12	7440382	7440382	0	TY	B
028	0001	2004	Los Alamos National	12	7440417	7440417	0	TY	B
028	0001	2004	Los Alamos National	12	7440439	7440439	0	TY	B
028	0001	2004	Los Alamos National	12	7440473	7440473	0	TY	B
028	0001	2004	Los Alamos National	12	7440484	7440484	0	TY	B
028	0001	2004	Los Alamos National	12	74839	74839	0	TY	B
028	0001	2004	Los Alamos National	12	74873	74873	0	TY	B
028	0001	2004	Los Alamos National	12	74884	74884	0	TY	B
028	0001	2004	Los Alamos National	12	75003	75003	0	TY	B
028	0001	2004	Los Alamos National	12	75014	75014	0	TY	B
028	0001	2004	Los Alamos National	12	75058	75058	7.03E-01	TY	B
028	0001	2004	Los Alamos National	12	75070	75070	0	TY	B
028	0001	2004	Los Alamos National	12	75092	75092	6.32E-01	TY	B
028	0001	2004	Los Alamos National	12	75150	75150	3.00E-05	TY	B
028	0001	2004	Los Alamos National	12	75252	75252	7.50E-05	TY	B
028	0001	2004	Los Alamos National	12	75343	75343	0	TY	B
028	0001	2004	Los Alamos National	12	75354	75354	0	TY	B
028	0001	2004	Los Alamos National	12	7550450	7550450	4.75E-04	TY	B
028	0001	2004	Los Alamos National	12	75569	75569	3.50E-05	TY	B
028	0001	2004	Los Alamos National	12	7664393	7664393	2.09E-02	TY	B
028	0001	2004	Los Alamos National	12	7723140	7723140	5.00E-04	TY	B
028	0001	2004	Los Alamos National	12	77474	77474	0	TY	B
028	0001	2004	Los Alamos National	12	77781	77781	1.00E-05	TY	B
028	0001	2004	Los Alamos National	12	7782492	7782492	0	TY	B
028	0001	2004	Los Alamos National	12	7803512	7803512	0	TY	B
028	0001	2004	Los Alamos National	12	78875	78875	0	TY	B
028	0001	2004	Los Alamos National	12	78933	78933	0	TY	B
028	0001	2004	Los Alamos National	12	79005	79005	0	TY	B
028	0001	2004	Los Alamos National	12	79016	79016	0	TY	B
028	0001	2004	Los Alamos National	12	79061	79061	5.45E-03	TY	B
028	0001	2004	Los Alamos National	12	79107	79107	0	TY	B
028	0001	2004	Los Alamos National	12	79118	79118	0	TY	B
028	0001	2004	Los Alamos National	12	79345	79345	0	TY	B
028	0001	2004	Los Alamos National	12	80626	80626	3.17E-03	TY	B
028	0001	2004	Los Alamos National	12	822060	822060	2.50E-05	TY	B
028	0001	2004	Los Alamos National	12	84742	84742	3.31E-03	TY	B
028	0001	2004	Los Alamos National	12	85449	85449	0	TY	B
028	0001	2004	Los Alamos National	12	87865	87865	0	TY	B
028	0001	2004	Los Alamos National	12	88062	88062	0	TY	B
028	0001	2004	Los Alamos National	12	91203	91203	5.02E-04	TY	B
028	0001	2004	Los Alamos National	12	91225	91225	1.15E-04	TY	B
028	0001	2004	Los Alamos National	12	92	92	6.60E-04	TY	B
028	0001	2004	Los Alamos National	12	92524	92524	0	TY	B
028	0001	2004	Los Alamos National	12	92671	92671	0	TY	B
028	0001	2004	Los Alamos National	12	93	93	1.58E-03	TY	B
028	0001	2004	Los Alamos National	12	95476	95476	5.82E-03	TY	B
028	0001	2004	Los Alamos National	12	98828	98828	0	TY	B
028	0001	2004	Los Alamos National	12	98862	98862	5.60E-04	TY	B
028	0001	2004	Los Alamos National	12	98953	98953	1.32E-03	TY	B
028	0001	2004	Los Alamos National	12	AB	AB	0	TY	B
028	0001	2004	Los Alamos National	12	AL-PT	7429905	3.30E-06	TY	B
028	0001	2004	Los Alamos National	12	BE	7440417	3.70E-06	TY	B
028	0001	2004	Los Alamos National	12	BZ	71432	1.19E-02	TY	B
028	0001	2004	Los Alamos National	12	CL	7782505	1.28E-02	TY	B
028	0001	2004	Los Alamos National	12	CO	630080	1.71E+01	TY	A
028	0001	2004	Los Alamos National	12	FORM	50000	9.38E-02	TY	B
028	0001	2004	Los Alamos National	12	HC36	78933	3.64E-01	TY	B
028	0001	2004	Los Alamos National	12	HC81	1330207	4.16E-03	TY	B
028	0001	2004	Los Alamos National	12	HCL	7647010	1.52E+00	TY	B
028	0001	2004	Los Alamos National	12	MN-PT	7439965	0	TY	B
028	0001	2004	Los Alamos National	12	NH3	7664417	5.91E-02	TY	B
028	0001	2004	Los Alamos National	12	NO2	10102440	2.45E+01	TY	A
028	0001	2004	Los Alamos National	12	PM10		2.95E+00	TY	B
028	0001	2004	Los Alamos National	12	PM25		2.93E+00	TY	B
028	0001	2004	Los Alamos National	12	PT		3.03E+00	TY	B
028	0001	2004	Los Alamos National	12	RD		0	TY	B
028	0001	2004	Los Alamos National	12	SO2	7446095	3.43E-01	TY	B
028	0001	2004	Los Alamos National	12	THAP		6.38E+00	TY	B
028	0001	2004	Los Alamos National	12	TOLU	108883	1.43E-01	TY	B
028	0001	2004	Los Alamos National	12	VOC		1.00E+01	TY	A

Facility Name	AIRS Point ID	Design Capacity	Design Capacity Unit Numerator	Design Capacity Unit	Max Nameplate Capacity	Description	Installation Date	Removal Date	Shut Down?
Los Alamos National	001	0	LB	YR	0	Be Machining TA-3 BLDG 39	01-Jan-85	22-Oct-02	TRUE
Los Alamos National	002	0	E6BTU	HR	0	TA3-22 Boilers (3 Each ) See Pt 32, 33, 34	01-Jan-50	27-Sep-00	TRUE
Los Alamos National	003	0	E6BTU	HR	0	TA16 Boiler (3 Each) - Removed	01-Jan-50	01-Jan-97	TRUE
Los Alamos National	004	30.6	E6BTU	HR	36	Steam Plant Boiler TA21 BLDG 357 (3)	01-Jan-83		FALSE
Los Alamos National	005	0	E6BTU	HR	0	TD Site Boiler (Not Built)			FALSE
Los Alamos National	006	10000	LB	YR	10000	Be Machining TA35 BLDG 213	26-Dec-85		FALSE
Los Alamos National	007	10000	LB	YR	10000	Be Machining TA3 BLDG 141	19-Mar-85		FALSE
Los Alamos National	008	0	LB	YR	0	Be Machining TA3 BLDG 102	19-Mar-86	20-Feb-04	TRUE
Los Alamos National	009	0	LB	YR	0	Be Shop TA3-35 (Not Built)		22-Oct-02	TRUE
Los Alamos National	010	1100	LB	YR	1100	Be Cutting & Beand Dressing TA-55-4	01-Jan-78		FALSE
Los Alamos National	011	1100	LB	YR	1100	Metallography TA55-4 North Stack	01-Jan-78		FALSE
Los Alamos National	012	0	E6BTU	HR	0	Solid Waste Fired Boiler (Not Built)			FALSE
Los Alamos National	013	60	TON	HR	60	Asphalt Plant TA-3-73	01-Jan-60	01-Jul-03	TRUE
Los Alamos National	014	700	HP	HR	700	Caterpillar HCR TA SI Pump Engine	01-Jan-82	01-Nov-01	TRUE
Los Alamos National	015	5.3	E6BTU	HR	6.3	Boiler (TA-48-1) BS-1	01-Aug-87		FALSE
Los Alamos National	016	5.3	E6BTU	HR	6.3	Boiler (TA-48-1) BS-2	01-Oct-76		FALSE
Los Alamos National	017	7.1	E6BTU	HR	8.4	Boiler (TA-48-1) BS-6	01-Oct-94		FALSE
Los Alamos National	018	7.1	E6BTU	HR	8.4	Boiler (TA-53-365) BHW-1	01-Jan-88		FALSE
Los Alamos National	019	7.1	E6BTU	HR	8.4	Boiler (TA-53-365) BHW-2	01-Jan-88		FALSE
Los Alamos National	020	5.3	E6BTU	HR	6.3	Boiler (TA-59-1) BHW-1	01-Sep-78		FALSE
Los Alamos National	021	5.3	E6BTU	HR	6.3	Boiler (TA-59-1) BHW-2	01-Oct-94		FALSE
Los Alamos National	022	7.1	E6BTU	HR	8.4	Boiler (TA-55-6) BHW-1	01-Jan-76	01-Oct-98	TRUE
Los Alamos National	023	7.1	E6BTU	HR	8.4	Boiler (TA-55-6) BHW-2	01-Jan-76	01-Oct-01	TRUE
Los Alamos National	024	12.7	E6BTU	HR	15	Boiler and backup, TA-16, Plant-5	01-Nov-96		FALSE
Los Alamos National	025	15.6	E6BTU	HR	18.4	Boiler and Backup, Plant 6 (TA-16-1485)	01-Nov-96	01-Jan-04	TRUE
Los Alamos National	026	150	TON	HR	150	Rock Crusher	01-Jun-98	10-Jun-04	TRUE
Los Alamos National	027	300	LB	HR	300	SEM-1424 Disintegrator paper shredder (TA-	01-Jan-91	06-Jul-04	TRUE
Los Alamos National	028	20	L	DAY	20	Degreaser - cold ultrasonic bath TA-55-4	01-Sep-98		FALSE
Los Alamos National	029	18	L	DAY	18	Degreaser - cold ultrasonic bath TA-46-24	03-Jun-00	06-Dec-01	TRUE
Los Alamos National	030	6	L	DAY	6	Degreaser - inhouse cold batch TA-55-4	01-Dec-99	29-Jan-01	TRUE
Los Alamos National	031	0	LB	YR	0	Research & Development Activities -	01-Jan-50		FALSE
Los Alamos National	032	189.5	E6BTU	HR	210	TA3-22 Edgemoor Iron Works Boiler w/FGR	01-Jan-50		FALSE
Los Alamos National	033	189.5	E6BTU	HR	210	TA3-22 Edgemoor Iron Works Boiler w/FGR	01-Jan-50		FALSE
Los Alamos National	034	189.5	E6BTU	HR	210	TA3-22 Edgemoor Iron Works Boiler w/FGR	01-Jan-50		FALSE
Los Alamos National	035	3770	BBL	DAY	3770	Tank TA-03-026 (No. 2 fuel oil)	01-Jan-52		FALSE
Los Alamos National	036	5455	BBL	DAY	5455	Tank TA-03-779 (No. 2 fuel oil)	01-Aug-98		FALSE
Los Alamos National	037	12.4	E6BTU	HR	14.6	Sellers Boiler BHW-1B(TA 55, Bldg. PF6)	01-Oct-98		FALSE
Los Alamos National	038	12.4	E6BTU	HR	14.6	Sellers Boiler BHW-2B(TA 55, Bldg. PF6)	06-Sep-01		FALSE
Los Alamos National	039	20	TON	HR	20	Air Curtain Destructor S-127	29-Oct-01	01-Oct-03	TRUE
Los Alamos National	040	20	TON	HR	20	Air Curtain Destructor T-350-1	26-Sep-01	01-Oct-03	TRUE
Los Alamos National	041	20	TON	HR	20	Air Curtain Destructor T-350-2	11-Oct-01	01-Oct-03	TRUE
Los Alamos National	042	5470	FT3	MIN	5470	Carpenter Shop TA-3-38	01-Jan-60		FALSE
Los Alamos National	043	21000	GAL	DAY	21000	Composite Mineral Oil Tank	01-Jan-86		FALSE
Los Alamos National	044	10.7	E6BTU	HR	12.6	Boiler TA-50 RLWTF	01-Feb-00		FALSE
Los Alamos National	045	1200	LB	HR	1200	Data Disintegrator TA-52	01-Aug-04		FALSE

Description	AIRS Point ID	AIRS Stack ID	State Local Stack ID	Emission Release Point Type	Stack Height	Stack Diameter	Exit Gas Temperature	Exit Gas Velocity	UTM Zone	X Coordinate	Y Coordinate
Be Machining TA-3 BLDG 39	001	001	001	02	54	1	70	38	13	380.48	3970.38
TA3-22 Boilers (3 Each ) See Pt 32, 33,	002	002	002	02	68	8	416	12	13	380.5	3971
TA16 Boiler (3 Each) - Removed	003	003	003	02	65	5	0	0	13	378	3968
Steam Plant Boiler TA21 BLDG 357 (3)	004	004	004	02	41	2	268	13	13	385	3970.7
TD Site Boiler (Not Built)	005	005	005	02	0	0	0	0	13	0	0
Be Machining TA35 BLDG 213	006	006	006	02	71	1	70	38	13	382.85	3969.39
Be Machining TA3 BLDG 141	007	007	007	02	50	5	70	47	13	381.2	3970.28
Be Machining TA3 BLDG 102	008	008	008	02	45	3	70	19	13	380.5	3970.16
Be Shop TA3-35 (Not Built)	009	009	009	02	0	0	0	0	13	0	0
Be Cutting & Beand Dressing TA-55-4	010	010	010	02	32	4	77	30	13	382	3969
Metallography TA55-4 North Stack	011	011	011	02	49	4	77	39	13	382	3969
Solid Waste Fired Boiler (Not Built)	012	012	012	02	0	0	0	0	13	0	0
Asphalt Plant TA-3-73	013	013	013	02	30	4	130	27	13	380	3970
Caterpillar HCR TA SI Pump Engine	014	014	014	02	17	1	977	75	13	386	3968
Boiler (TA-48-1) BS-1	015	015	015	02	50	2	300	10	13	382.13	3969.7
Boiler (TA-48-1) BS-2	016	016	016	02	50	2	300	10	13	382.13	3969.7
Boiler (TA-48-1) BS-6	017	017	017	02	50	2	300	13	13	382.13	3969.7
Boiler (TA-53-365) BHW-1	018	018	018	05	22	2	300	0.03	13	386	3969.9
Boiler (TA-53-365) BHW-2	019	019	019	05	22	2	300	0.03	13	386	3970
Boiler (TA-59-1) BHW-1	020	020	020	02	55	2	300	19	13	381	3970
Boiler (TA-59-1) BHW-2	021	021	021	02	55	2	300	19	13	381	3970
Boiler (TA-55-6) BHW-1	022	022	022	01	30	2	222	24	13	383	3970
Boiler (TA-55-6) BHW-2	023	023	023	01	30	2	333	29	13	383	3970
Boiler and backup, TA-16, Plant-5	024	024	024	05	21	2	341	0.03	13	379	3967.1
Boiler and Backup, Plant 6 (TA-16-	025	025	025	05	19	2	341	0.03	13	379.28	3967.4
Rock Crusher	026	026	026	02	15	0.25	70	0	13	384.8	3970.9
SEM-1424 Disintegrator paper	027	027	027	05	26	1	70	0.03	13	383.6	3969
Degreaser - cold ultrasonic bath TA-55-	028	028	028	02	32	4	77	30	13	382	3969
Degreaser - cold ultrasonic bath TA-46-	029	029	029	01	32	1	70	3	13	384	3968
Degreaser - inhouse cold batch TA-55-	030	030	030	01	32	1	70	3	13	384	3968
Research & Development Activities -	031	031	031	01	0	0	0	0	13	384	3968
TA3-22 Edgemoor Iron Works Boiler	032	032	001	02	68	7.7	416	57	13	380.84	3970.6
TA3-22 Edgemoor Iron Works Boiler	033	033	001	02	68	7.7	416	57	13	380.84	3970.6
TA3-22 Edgemoor Iron Works Boiler	034	034	001	02	68	7.7	416	29	13	380.86	3970.6
Tank TA-03-026 (No. 2 fuel oil)	035	035	035	02	0	0	0	0	13	381.19	3970.3
Tank TA-03-779 (No. 2 fuel oil)	036	036	036	02	0	0	0	0	13	381.19	3970.3
Sellers Boiler BHW-1B(TA 55, Bldg.	037	037	BWH-1B	05	30	2	334	0.03	13	382.5	3969.4
Sellers Boiler BHW-2B(TA 55, Bldg.	038	038	BWH-2B	05	30	2	334	0.03	13	382.5	3969.4
Air Curtain Destructor S-127	039	039	039	01	10	17	2500	1	13	378.10	3968.3
Air Curtain Destructor T-350-1	040	040	040	01	0	25	2500	1	13	378.1	3968.35
Air Curtain Destructor T-350-2	041	041	041	01	0	25	2500	1	13	378.1	3968.25
Carpenter Shop TA-3-38	042	042	042	05	20	3	75	0.03	13	380.26	3970.7
Composite Mineral Oil Tank	043	043	043	02	0	0	0	0	13	386.72	3969.92
Boiler TA-50 RLWTF	044	044	044	05	15	1.4	400	0.03	13	382.85	3969.2
Data Disintegrator - TA_52	045	045	045	03	26	0.6	70	71	13	383.6	3968.9

AIRS Stack ID	SCC AFS	Process MACT Code	Description	Winter Throughput PCT	Spring Throughput PCT	Summer Throughput PCT	Fall Throughput PCT	Annual Avg Days Per Week	Annual Avg Weeks Per Year	Annual Avg Hours Per Day	Annual Avg Hours Per Year	Heat Content	Sulfur Content	Ash Content	Process MACT Compliance Status
001	30903004		Be Machining TA-3 BLDG 39	0	0	0	0	0	0	0	0	0	0	0	
002	10100601		TA3-22 Boilers (3 Each ) See Pt 32, 33,	0	0	0	0	0	0	0	0	0	0	0	
003	10100602		TA16 Boiler (3 Each) - Removed	0	0	0	0	0	0	0	0	0	0	0	
004	10100602		Steam Plant Boiler TA21 BLDG 357 (3)	25	25	25	25	7	52	24	8760	1030	0	0	
005	10100602		TD Site Boiler (Not Built)	0	0	0	0	0	0	0	0	0	0	0	
006	30903004		Be Machining TA35 BLDG 213	15	20	30	35	7	52	5	1920	0	0	0	
007	30903004		Be Machining TA3 BLDG 141	25	25	25	25	7	52	24	8760	0	0	0	
008	30903004		Be Machining TA3 BLDG 102	0	0	0	0	0	0	0	0	0	0	0	
009	30903004		Be Shop TA3-35 (Not Built)	0	0	0	0	0	0	0	0	0	0	0	
010	30903004		Be Cutting & Beand Dressing TA-55-4	25	25	25	25	7	52	24	8760	0	0	0	
011	30900303		Metallography TA55-4 North Stack	25	25	25	25	7	52	24	8760	0	0	0	
012	10301202		Solid Waste Fired Boiler (Not Built)	0	0	0	0	0	0	0	0	0	0	0	
013	30500211		Asphalt Plant TA-3-73	0	0	0	0	0	0	0	0	0	0	0	
014	20200202		Caterpillar HCR TA SI Pump Engine	0	0	0	0	0	0	0	0	0	0	0	
015	10100602		Boiler (TA-48-1) BS-1	40	20	0	40	7	33	15	5500	1030	0	0	
016	10100602		Boiler (TA-48-1) BS-2	40	20	0	40	7	33	15	5500	1030	0	0	
017	10100602		Boiler (TA-48-1) BS-6	40	20	0	40	7	33	15	5500	1030	0	0	
018	10100602		Boiler (TA-53-365) BHW-1	40	20	0	40	7	33	15	5500	1030	0	0	
019	10100602		Boiler (TA-53-365) BHW-2	40	20	0	40	7	33	15	5500	1030	0	0	
020	10100602		Boiler (TA-59-1) BHW-1	40	20	0	40	7	33	15	5500	1030	0	0	
021	10100602		Boiler (TA-59-1) BHW-2	40	20	0	40	7	33	15	5500	1030	0	0	
022	10100602		Boiler (TA-55-6) BHW-1	0	0	0	0	0	0	0	0	0	0	0	
023	10100602		Boiler (TA-55-6) BHW-2	0	0	0	0	0	0	0	0	0	0	0	
024	10100602		Boiler and backup, TA-16, Plant-5	25	25	25	25	7	52	24	8760	1030	0	0	
025	10100602		Boiler and Backup, Plant 6 (TA-16-1485)	0	0	0	0	0	0	0	0	0	0	0	
026	30502501		Rock Crusher	0	0	0	0	0	0	0	0	0	0	0	
027	30701399		SEM-1424 Disintegrator paper shredder	25	25	25	25	5	52	4	1040	0	0	0	
028	40100336	1614	Degreaser - cold ultrasonic bath TA-55-4	25	25	25	25	1	52	4	208	0	0	0	03
029	40100336	1614	Degreaser - cold ultrasonic bath TA-46-	0	0	0	0	0	0	0	0	0	0	0	03
030	40100336	1614	Degreaser - inhouse cold batch TA-55-4	0	0	0	0	0	0	0	0	0	0	0	03
031	31503001		Research & Development Activities -	25	25	25	25	7	52	24	8760	0	0	0	
032	10100601		TA3-22 Edgemoor Iron Works Boiler	30	20	20	30	7	52	24	8760	1030	0	0	
033	10100601		TA3-22 Edgemoor Iron Works Boiler	30	20	20	30	7	52	24	8760	1030	0	0	
034	10100601		TA3-22 Edgemoor Iron Works Boiler	30	20	20	30	7	52	24	8760	1030	0	0	
035	39090004		Tank TA-03-026 (No. 2 fuel oil)	30	20	20	30	7	52	24	8760	137	0	0	
036	39090004		Tank TA-03-779 (No. 2 fuel oil)	30	20	20	30	7	52	24	8760	137	0	0	
037	10100602		Sellers Boiler BHW-1B(TA 55, Bldg. PF6)	40	20	0	40	7	33	15	5500	1030	0	0	
038	10100602		Sellers Boiler BHW-2B(TA 55, Bldg. PF6)	40	20	0	40	7	33	15	5500	1030	0	0	
039	30181001		Air Curtain Destructor S-127	0	0	0	0	0	0	0	0	0	0	0	
040	30181001		Air Curtain Destructor T-350-1	0	0	0	0	0	0	0	0	0	0	0	
041	30181001		Air Curtain Destructor T-350-2	0	0	0	0	0	0	0	0	0	0	0	
042	30700804		Carpenter Shop TA-3-38	20	30	30	20	7	52	12	4368	4500	0	0	
043	39090004		Composite Mineral Oil Tank	25	25	25	25	7	52	24	8760	0	0	0	
044	10100602		Boiler TA-50 RLWTF	25	25	25	25	2	12	12	192	1030	0	0	
NEW	30701399		Data Disintegrator - TA52	25	25	25	25	5	52	6.5	2000	0	0	0	



Facility Name	AIRS Point ID	AIRS Stack ID	Description	Actual Throughput	Throughput Unit Numerator	Max Operating Rate Per Hour	Material	Material I/O
Los Alamos	001	001	Be Machining TA-3 BLDG 39	0	LB	0	516	I
Los Alamos	002	002	TA3-22 Boilers (3 Each ) See Pt 32, 33, 34	0	E6FT3S	0	209	I
Los Alamos	003	003	TA16 Boiler (3 Each) - Removed	0	E6FT3S	0	209	I
Los Alamos	004	004	Steam Plant Boiler TA21 BLDG 357 (3)	31.6	E6FT3S	3.61E-03	209	I
Los Alamos	005	005	TD Site Boiler (Not Built)	0	E6FT3S	0	209	I
Los Alamos	006	006	Be Machining TA35 BLDG 213	0	LB	0	516	I
Los Alamos	007	007	Be Machining TA3 BLDG 141	10000	LB	1.142	516	I
Los Alamos	008	008	Be Machining TA3 BLDG 102	0	LB	0	516	I
Los Alamos	009	009	Be Shop TA3-35 (Not Built)	0	LB	0	516	I
Los Alamos	010	010	Be Cutting & Beand Dressing TA-55-4	1100	LB	0.126	516	I
Los Alamos	011	011	Metallography TA55-4 North Stack	1100	LB	0.126	516	I
Los Alamos	012	012	Solid Waste Fired Boiler (Not Built)	0	TON	0	567	I
Los Alamos	013	013	Asphalt Plant TA-3-73	0	TON	0	647	I
Los Alamos	014	014	Caterpillar HCR TA SI Pump Engine	0	E6FT3S	0	209	I
Los Alamos	015	015	Boiler (TA-48-1) BS-1	10.39	E6FT3S	1.89E-03	209	I
Los Alamos	016	016	Boiler (TA-48-1) BS-2	10.39	E6FT3S	1.89E-03	209	I
Los Alamos	017	017	Boiler (TA-48-1) BS-6	13.91	E6FT3S	2.53E-03	209	I
Los Alamos	018	018	Boiler (TA-53-365) BHW-1	13.86	E6FT3S	2.52E-03	209	I
Los Alamos	019	019	Boiler (TA-53-365) BHW-2	13.86	E6FT3S	2.52E-03	209	I
Los Alamos	020	020	Boiler (TA-59-1) BHW-1	10.39	E6FT3S	1.89E-03	209	I
Los Alamos	021	021	Boiler (TA-59-1) BHW-2	10.39	E6FT3S	1.89E-03	209	I
Los Alamos	022	022	Boiler (TA-55-6) BHW-1	0	E6FT3S	0	209	I
Los Alamos	023	023	Boiler (TA-55-6) BHW-2	0	E6FT3S	0	209	I
Los Alamos	024	024	Boiler and backup, TA-16, Plant-5	24.73	E6FT3S	2.82E-03	209	I
Los Alamos	025	025	Boiler and Backup, Plant 6 (TA-16-1485)	0	E6FT3S	0	209	I
Los Alamos	026	026	Rock Crusher	0	TON	0	284	I
Los Alamos	027	027	SEM-1424 Disintegrator paper shredder	235,080	LB	2.26E+02	226	I
Los Alamos	028	028	Degreaser - cold ultrasonic bath TA-55-4	6.7	L	3.22E-02	952	I
Los Alamos	029	029	Degreaser - cold ultrasonic bath TA-46-24	0	L	0	952	I
Los Alamos	030	030	Degreaser - inhouse cold batch TA-55-4	0	L	0	952	I
Los Alamos	031	031	Research & Development Activities -	0	TON	0	253	I
Los Alamos	032	032	TA3-22 Edgemoor Iron Works Boiler	252.6	E6FT3S	2.88E-02	209	I
Los Alamos	033	033	TA3-22 Edgemoor Iron Works Boiler	43.1	E6FT3S	4.92E-03	209	I
Los Alamos	034	034	TA3-22 Edgemoor Iron Works Boiler	262.7	E6FT3S	3.00E-02	209	I
Los Alamos	035	035	Tank TA-03-026 (No. 2 fuel oil)	33.97	E3GAL	2.69E-03	58	I
Los Alamos	036	036	Tank TA-03-779 (No. 2 fuel oil)	33.97	E3GAL	2.69E-03	58	I
Los Alamos	037	037	Sellers Boiler BHW-1B(TA 55, Bldg. PF6)	6.3	E6FT3S	1.15E-03	209	I
Los Alamos	038	038	Sellers Boiler BHW-2B(TA 55, Bldg. PF6)	21.5	E6FT3S	3.91E-03	209	I
Los Alamos	039	039	Air Curtain Destructor S-127	0	TON	0	15	I
Los Alamos	040	040	Air Curtain Destructor T-350-1	0	TON	0	15	I
Los Alamos	041	041	Air Curtain Destructor T-350-2	0	TON	0	15	I
Los Alamos	042	042	Carpenter Shop TA-3-38	2706	FT3	2706	15	I
Los Alamos	043	043	Composite Mineral Oil Tank	30	E3GAL	3.42E-03	216	I
Los Alamos	044	044	Boiler TA-50 RLWTF	0.325	E6FT3S	1.69E-03	209	I
Los Alamos	045	045	Data Disintegrator TA-52	106,470	LB	5.32E+01	226	I

AIRS Stack ID	Segment ID	Pollutant Code	CAS Number	Emission Numeric Value	Emission Unit Numerator	Emission Type	Calculation Method Code	Factor Numeric Value	Factor Unit Numerator	Factor Unit Denominator
001	01	100414	100414		0 TY	12	08			
001	01	110543	110543		0 TY	12	08			
001	01	75070	75070		0 TY	12	08			
001	01	7664393	7664393		0 TY	12	08			
001	01	BE	7440417		0 TY	12	08			
001	01	BZ	71432		0 TY	12	08			
001	01	FORM	50000		0 TY	12	08			
001	01	HC81	1330207		0 TY	12	08			
001	01	NH3	7664417		0 TY	12	08			
001	01	PM10			0 TY	12	08			
001	01	PM25			0 TY	12	08			
001	01	PT			0 TY	12	08			
001	01	TOLU	108883		0 TY	12	08			
002	01	CO	630080		0 TY	12	08			
002	01	NH3	7664417		0 TY	12	08			
002	01	NO2	10102440		0 TY	12	08			
002	01	PM10			0 TY	12	08			
002	01	PM25			0 TY	12	08			
002	01	PT			0 TY	12	08			
002	01	SO2	7446095		0 TY	12	08			
002	01	VOC			0 TY	12	08			
003	01	NO2	10102440		0 TY	12	00			
004	01	106467		1.89E-05	TY	12	08	0.0012 LB		E6FT3S
004	01	109		2.07E-07	TY	12	08	0.000012 LB		E6FT3S
004	01	110543	110543	2.84E-02	TY	12	08	1.8 LB		E6FT3S
004	01	125	10102440	1.74E-05	TY	12	08	0.0011 LB		E6FT3S
004	01	136	136	2.21E-05	TY	12	08	0.0014 LB		E6FT3S
004	01	139	139	1.33E-06	TY	12	08	0.000084 LB		E6FT3S
004	01	195	195	7.94E-06	TY	12	08	0.0005 LB		E6FT3S
004	01	198	198	6.03E-06	TY	12	08	0.00038 LB		E6FT3S
004	01	199	199	4.12E-06	TY	12	08	0.00026 LB		E6FT3S
004	01	226	226	3.32E-05	TY	12	08	0.0021 LB		E6FT3S
004	01	246		1.53E-06	TY	12	08	0.000088 LB		E6FT3S
004	01	253	253	4.66E-07	TY	12	08	0.000024 LB		E6FT3S
004	01	91203		9.63E-06	TY	12	08	0.00061 LB		E6FT3S
004	01	93		3.18E-06	TY	12	08	0.0002 LB		E6FT3S
004	01	BZ	71432	3.31E-05	TY	12	08	0.0021 LB		E6FT3S
004	01	CO	630080	1.33E+00	TY	12	08	84 LB		E6FT3S
004	01	FORM	50000	1.19E-03	TY	12	08	0.075 LB		E6FT3S
004	01	NH3	7664417		TY	12	00			
004	01	NO2	10102440	1.58E+00	TY	12	08	100 LB		E6FT3S
004	01	PM10		1.20E-01	TY	12	08	7.6 LB		E6FT3S
004	01	PM25		1.20E-01	TY	12	08	7.6 LB		E6FT3S
004	01	PT		1.20E-01	TY	12	08	7.6 LB		E6FT3S
004	01	SO2	7446095	1.20E-02	TY	12	08	0.6 LB		E6FT3S
004	01	TOLU	108883	5.37E-05	TY	12	08	0.0034 LB		E6FT3S
004	01	VOC		8.70E-02	TY	12	08	5.5 LB		E6FT3S
005	01	CO	630080		0 TY	12	08			
005	01	NH3	7664417		0 TY	12	08			
005	01	NO2	10102440		0 TY	12	08			
005	01	PM10			0 TY	12	08			
005	01	PM25			0 TY	12	08			
005	01	PT			0 TY	12	08			
005	01	VOC			0 TY	12	08			
006	01	BE	7440417	1.98E-08	TY	12	08			
006	01	NH3	7664417		TY	12	00			
006	01	PM10		1.98E-08	TY	12	08			
006	01	PM25		1.98E-08	TY	12	08			
006	01	PT		1.98E-08	TY	12	08			
007	01	BE	7440417	4.00E-09	TY	12	08			
007	01	NH3	7664417		TY	12	00			
007	01	PM10		4.00E-09	TY	12	08			
007	01	PM25		4.00E-09	TY	12	08			
007	01	PT		4.00E-09	TY	12	08			
008	01	BE	7440417		0 TY	12	08			
008	01	NH3	7664417		TY	12	00			
008	01	PM10			0 TY	12	08			
008	01	PM25			0 TY	12	08			
008	01	PT			0 TY	12	08			
009	01	BE	7440417		0 TY	12	08			
009	01	NH3	7664417		TY	12	00			
009	01	PM10			0 TY	12	08			
009	01	PM25			0 TY	12	08			
009	01	PT			0 TY	12	08			
010	01	AL-PT	7429905	1.56E-06	TY	12	08			
010	01	BE	7440417	1.56E-06	TY	12	08			
010	01	NH3	7664417		TY	12	00			

010	01	PM10		1.56E-06	TY	12	08			
010	01	PM25		1.56E-06	TY	12	08			
011	01	AL-PT	7440417	1.56E-06	TY	12	08			
011	01	BE	7440417	1.56E-06	TY	12	08			
011	01	NH3	7664417		TY	12	00			
011	01	PM10		1.56E-06	TY	12	08			
011	01	PM25		1.56E-06	TY	12	08			
012	01	PM10		0	TY	12	00			
013	01	100414	100414	0	TY	12	08			
013	01	106514	106514	0	TY	12	00			
013	01	110543	110543		TY	12	00			
013	01	246		0	TY	12	00			
013	01	75070	75070	0	TY	12	08			
013	01	7664393	7664393		TY	12	00			
013	01	91203	91203	0	TY	12	00			
013	01	BZ	71432	0	TY	12	08			
013	01	CO	630080	0	TY	12	08			
013	01	FORM	50000	0	TY	12	08			
013	01	HC81	1330207	0	TY	12	08			
013	01	NH3	7664417		TY	12	00			
013	01	NO2	10102440	0	TY	12	08			
013	01	PM10		0	TY	12	08			
013	01	PM25		0	TY	12	08			
013	01	PT		0	TY	12	08			
013	01	SO2	7446095	0	TY	12	08			
013	01	TOLU	108883	0	TY	12	08			
013	01	VOC		0	TY	12	08			
014	01	100414	100414	0	TY	12	08			
014	01	110543	110543	0	TY	12	08			
014	01	75070	75070	0	TY	12	08			
014	01	7664393	7664393	0	TY	12	08			
014	01	BZ	71432	0	TY	12	08			
014	01	CO	630080	0	TY	12	08			
014	01	FORM	50000	0	TY	12	08			
014	01	HC81	1330207	0	TY	12	08			
014	01	NH3	7664417	0	TY	12	08			
014	01	NO2	10102440	0	TY	12	08			
014	01	PM10		0	TY	12	08			
014	01	PM25		0	TY	12	08			
014	01	PT		0	TY	12	08			
014	01	SO2	7446095	0	TY	12	08			
014	01	TOLU	108883	0	TY	12	08			
014	01	VOC		0	TY	12	08			
015	01	100414	100414		TY	12	00			
015	01	106467		6.24E-06	TY	12	08	0.0012	LB	E6FT3S
015	01	109	630080	6.24E-08	TY	12	08	0.000012	LB	E6FT3S
015	01	110543	110543	9.35E-03	TY	12	08	1.8	LB	E6FT3S
015	01	125	630080	5.72E-06	TY	12	08	0.0011	LB	E6FT3S
015	01	136	136	7.28E-06	TY	12	08	0.0014	LB	E6FT3S
015	01	139	139	4.37E-07	TY	12	08	0.000084	LB	E6FT3S
015	01	195	195	2.60E-06	TY	12	08	0.0005	LB	E6FT3S
015	01	198	198	1.97E-06	TY	12	08	0.00038	LB	E6FT3S
015	01	199	199	1.35E-06	TY	12	08	0.00026	LB	E6FT3S
015	01	226	226	1.09E-05	TY	12	08	0.0021	LB	E6FT3S
015	01	246		4.57E-07	TY	12	08	0.000088	LB	E6FT3S
015	01	253	253	1.25E-07	TY	12	08	0.000024	LB	E6FT3S
015	01	75070	75070		TY	12	00			
015	01	7664393	7664393		TY	12	00			
015	01	91203		3.17E-06	TY	12	08	0.00061	LB	E6FT3S
015	01	93	630080	1.04E-06	TY	12	08	0.0002	LB	E6FT3S
015	01	BZ	71432	1.09E-05	TY	12	08	0.0021	LB	E6FT3S
015	01	CO	630080	4.37E-01	TY	12	08	84	LB	E6FT3S
015	01	FORM	50000	3.90E-04	TY	12	08	0.075	LB	E6FT3S
015	01	HC81	1330207		TY	12	00			
015	01	NH3	7664417		TY	12	00			
015	01	NO2	10102440	5.20E-01	TY	12	08	100	LB	E6FT3S
015	01	PM10		3.95E-02	TY	12	08	7.6	LB	E6FT3S
015	01	PM25		3.95E-02	TY	12	08	7.6	LB	E6FT3S
015	01	PT		3.95E-02	TY	12	08	7.6	LB	E6FT3S
015	01	SO2	7446095	3.12E-03	TY	12	08	0.6	LB	E6FT3S
015	01	TOLU	108883	1.77E-05	TY	12	08	0.0034	LB	E6FT3S
015	01	VOC		2.86E-02	TY	12	08	5.5	LB	E6FT3S
016	01	100414	100414		TY	12	00			
016	01	106467		6.23E-06	TY	12	08	0.0012	LB	E6FT3S
016	01	109		6.23E-08	TY	12	08	0.000012	LB	E6FT3S
016	01	110543	110543	9.35E-03	TY	12	08	1.8	LB	E6FT3S
016	01	125		5.72E-06	TY	12	08	0.0011	LB	E6FT3S
016	01	136	136	7.27E-06	TY	12	08	0.0014	LB	E6FT3S
016	01	139	139	4.36E-07	TY	12	08	0.000084	LB	E6FT3S
016	01	195	195	2.60E-06	TY	12	08	0.0005	LB	E6FT3S

016	01	198	198	1.97E-06	TY	12	08	0.00038 LB	E6FT3S
016	01	199	199	1.35E-06	TY	12	08	0.00026 LB	E6FT3S
016	01	226	226	1.09E-05	TY	12	08	0.0021 LB	E6FT3S
016	01	246		4.57E-07	TY	12	08	0.000088 LB	E6FT3S
016	01	253	253	1.25E-07	TY	12	08	0.000024 LB	E6FT3S
016	01	75070	75070		TY	12	00		
016	01	7664393	7664393		TY	12	00		
016	01	91203		3.17E-06	TY	12	08	0.00061 LB	E6FT3S
016	01	93		1.04E-06	TY	12	08	0.0002 LB	E6FT3S
016	01	BZ	71432	1.09E-05	TY	12	08	0.0021 LB	E6FT3S
016	01	CO	630080	4.36E-01	TY	12	08	84 LB	E6FT3S
016	01	FORM	50000	3.90E-04	TY	12	08	0.075 LB	E6FT3S
016	01	HC81	1330207		TY	12	00		
016	01	NH3	7664417		TY	12	00		
016	01	NO2	10102440	5.20E-01	TY	12	08	100 LB	E6FT3S
016	01	PM10		3.95E-02	TY	12	08	7.6 LB	E6FT3S
016	01	PM25		3.95E-02	TY	12	08	7.6 LB	E6FT3S
016	01	PT		3.95E-02	TY	12	08	7.6 LB	E6FT3S
016	01	SO2	7446095	3.12E-03	TY	12	08	0.6 LB	E6FT3S
016	01	TOLU	108883	1.77E-05	TY	12	08	0.0034 LB	E6FT3S
016	01	VOC		2.86E-02	TY	12	08	5.5 LB	E6FT3S
017	01	100414	100414		TY	12	00		
017	01	106467		8.34E-06	TY	12	08	0.0012 LB	E6FT3S
017	01	109		8.34E-08	TY	12	08	0.000012 LB	E6FT3S
017	01	110543	110543	1.25E-02	TY	12	08	1.8 LB	E6FT3S
017	01	125		7.65E-06	TY	12	08	0.0011 LB	E6FT3S
017	01	136	136	9.73E-06	TY	12	08	0.0014 LB	E6FT3S
017	01	139	139	5.84E-07	TY	12	08	0.000084 LB	E6FT3S
017	01	195	195	3.48E-06	TY	12	08	0.0005 LB	E6FT3S
017	01	198	198	2.64E-06	TY	12	08	0.00038 LB	E6FT3S
017	01	199	199	1.81E-06	TY	12	08	0.00026 LB	E6FT3S
017	01	226	226	1.46E-05	TY	12	08	0.0021 LB	E6FT3S
017	01	246		6.12E-07	TY	12	08	0.000088 LB	E6FT3S
017	01	253	253	1.67E-07	TY	12	08	0.000024 LB	E6FT3S
017	01	75070	75070		TY	12	00		
017	01	7664393	7664393		TY	12	00		
017	01	91203		4.24E-06	TY	12	08	0.00061 LB	E6FT3S
017	01	93		1.39E-06	TY	12	08	0.0002 LB	E6FT3S
017	01	BZ	71432	1.46E-05	TY	12	08	0.0021 LB	E6FT3S
017	01	CO	630080	5.84E-01	TY	12	08	84 LB	E6FT3S
017	01	FORM	50000	5.21E-04	TY	12	08	0.075 LB	E6FT3S
017	01	HC81	1330207		TY	12	00		
017	01	NH3	7664417		TY	12	00		
017	01	NO2	10102440	6.95E-01	TY	12	08	100 LB	E6FT3S
017	01	PM10		5.28E-02	TY	12	08	7.6 LB	E6FT3S
017	01	PM25		5.28E-02	TY	12	08	7.6 LB	E6FT3S
017	01	PT		5.28E-02	TY	12	08	7.6 LB	E6FT3S
017	01	SO2	7446095	4.17E-03	TY	12	08	0.6 LB	E6FT3S
017	01	TOLU	108883	2.36E-05	TY	12	08	0.0034 LB	E6FT3S
017	01	VOC		3.82E-02	TY	12	08	5.5 LB	E6FT3S
018	01	100414	100414		TY	12	00		
018	01	106467		8.31E-06	TY	12	08	0.0012 LB	E6FT3S
018	01	109		8.31E-08	TY	12	08	0.000012 LB	E6FT3S
018	01	110543	110543	1.25E-02	TY	12	08	1.8 LB	E6FT3S
018	01	125		7.62E-06	TY	12	08	0.0011 LB	E6FT3S
018	01	136	136	9.70E-06	TY	12	08	0.0014 LB	E6FT3S
018	01	139	139	5.82E-07	TY	12	08	0.000084 LB	E6FT3S
018	01	195	195	3.46E-06	TY	12	08	0.0005 LB	E6FT3S
018	01	198	198	2.63E-06	TY	12	08	0.00038 LB	E6FT3S
018	01	199	199	1.80E-06	TY	12	08	0.00026 LB	E6FT3S
018	01	226	226	1.45E-05	TY	12	08	0.0021 LB	E6FT3S
018	01	246		6.10E-07	TY	12	08	0.000088 LB	E6FT3S
018	01	253	253	1.66E-07	TY	12	08	0.000024 LB	E6FT3S
018	01	75070	75070		TY	12	00		
018	01	7664393	7664393		TY	12	00		
018	01	91203		4.23E-06	TY	12	08	0.00061 LB	E6FT3S
018	01	93		1.39E-06	TY	12	08	0.0002 LB	E6FT3S
018	01	BZ	71432	1.45E-05	TY	12	08	0.0021 LB	E6FT3S
018	01	CO	630080	5.82E-01	TY	12	08	84 LB	E6FT3S
018	01	FORM	50000	5.20E-04	TY	12	08	0.075 LB	E6FT3S
018	01	HC81	1330207		TY	12	00		
018	01	NH3	7664417		TY	12	00		
018	01	NO2	10102440	6.93E-01	TY	12	08	100 LB	E6FT3S
018	01	PM10		5.27E-02	TY	12	08	7.6 LB	E6FT3S
018	01	PM25		5.27E-02	TY	12	08	7.6 LB	E6FT3S
018	01	PT		5.27E-02	TY	12	08	7.6 LB	E6FT3S
018	01	SO2	7446095	4.16E-03	TY	12	08	0.6 LB	E6FT3S
018	01	TOLU	108883	2.36E-05	TY	12	08	0.0034 LB	E6FT3S
018	01	VOC		3.81E-02	TY	12	08	5.5 LB	E6FT3S
019	01	106467	10102440	8.31E-06	TY	12	08	0.0012 LB	E6FT3S

019	01	109	10102440	8.31E-08	TY	12	08	0.000012	LB	E6FT3S
019	01	110543	110543	1.25E-02	TY	12	08	1.8	LB	E6FT3S
019	01	125	10102440	7.62E-06	TY	12	08	0.0011	LB	E6FT3S
019	01	136	136	9.70E-06	TY	12	08	0.0014	LB	E6FT3S
019	01	139	139	5.82E-07	TY	12	08	0.000084	LB	E6FT3S
019	01	195	195	3.46E-06	TY	12	08	0.0005	LB	E6FT3S
019	01	198	198	2.63E-06	TY	12	08	0.00038	LB	E6FT3S
019	01	199	199	1.80E-06	TY	12	08	0.00026	LB	E6FT3S
019	01	226	226	1.45E-05	TY	12	08	0.0021	LB	E6FT3S
019	01	246	10102440	6.10E-07	TY	12	08	0.000088	LB	E6FT3S
019	01	253	253	1.66E-07	TY	12	08	0.000024	LB	E6FT3S
019	01	91203		4.23E-06	TY	12	08	0.00061	LB	E6FT3S
019	01	93	10102440	1.39E-06	TY	12	08	0.0002	LB	E6FT3S
019	01	BZ	71432	1.45E-05	TY	12	08	0.0021	LB	E6FT3S
019	01	CO	630080	5.82E-01	TY	12	08	84	LB	E6FT3S
019	01	FORM	50000	5.20E-04	TY	12	08	0.075	LB	E6FT3S
019	01	NH3	7664417		TY	12	00			
019	01	NO2	10102440	6.93E-01	TY	12	08	100	LB	E6FT3S
019	01	PM10		5.27E-02	TY	12	08	7.6	LB	E6FT3S
019	01	PM25		5.27E-02	TY	12	08	7.6	LB	E6FT3S
019	01	PT		5.27E-02	TY	12	08	7.6	LB	E6FT3S
019	01	SO2	7446095	4.16E-03	TY	12	08	0.6	LB	E6FT3S
019	01	TOLU	108883	2.36E-05	TY	12	08	0.0034	LB	E6FT3S
019	01	VOC		3.81E-02	TY	12	08	5.5	LB	E6FT3S
020	01	106467		6.23E-06	TY	12	08	0.0012	LB	E6FT3S
020	01	109		6.23E-08	TY	12	08	0.000012	LB	E6FT3S
020	01	110543	110543	9.35E-03	TY	12	08	1.8	LB	E6FT3S
020	01	125		5.72E-06	TY	12	08	0.0011	LB	E6FT3S
020	01	136	136	7.27E-06	TY	12	08	0.0014	LB	E6FT3S
020	01	139	139	4.36E-07	TY	12	08	0.000084	LB	E6FT3S
020	01	195	195	2.60E-06	TY	12	08	0.0005	LB	E6FT3S
020	01	198	198	1.97E-06	TY	12	08	0.00038	LB	E6FT3S
020	01	199	199	1.35E-06	TY	12	08	0.00026	LB	E6FT3S
020	01	226	226	1.09E-05	TY	12	08	0.0021	LB	E6FT3S
020	01	246		4.57E-07	TY	12	08	0.000088	LB	E6FT3S
020	01	253	253	1.25E-07	TY	12	08	0.000024	LB	E6FT3S
020	01	91203		3.17E-06	TY	12	08	0.00061	LB	E6FT3S
020	01	93		1.04E-06	TY	12	08	0.0002	LB	E6FT3S
020	01	BZ	71432	1.09E-05	TY	12	08	0.0021	LB	E6FT3S
020	01	CO	630080	4.36E-01	TY	12	08	84	LB	E6FT3S
020	01	FORM	50000	3.90E-04	TY	12	08	0.075	LB	E6FT3S
020	01	NH3	7664417		TY	12	00			
020	01	NO2	10102440	5.20E-01	TY	12	08	100	LB	E6FT3S
020	01	PM10		3.95E-02	TY	12	08	7.6	LB	E6FT3S
020	01	PM25		3.95E-02	TY	12	08	7.6	LB	E6FT3S
020	01	PT		3.95E-02	TY	12	08	7.6	LB	E6FT3S
020	01	SO2	7446095	3.12E-03	TY	12	08	0.6	LB	E6FT3S
020	01	TOLU	108883	1.77E-05	TY	12	08	0.0034	LB	E6FT3S
020	01	VOC		2.86E-02	TY	12	08	5.5	LB	E6FT3S
021	01	106467		6.23E-06	TY	12	08	0.0012	LB	E6FT3S
021	01	109		6.23E-08	TY	12	08	0.000012	LB	E6FT3S
021	01	110543	110543	9.35E-03	TY	12	08	1.8	LB	E6FT3S
021	01	125		5.72E-06	TY	12	08	0.0011	LB	E6FT3S
021	01	136	136	7.27E-06	TY	12	08	0.0014	LB	E6FT3S
021	01	139	139	4.36E-07	TY	12	08	0.000084	LB	E6FT3S
021	01	195	195	2.60E-06	TY	12	08	0.0005	LB	E6FT3S
021	01	198	198	1.97E-06	TY	12	08	0.00038	LB	E6FT3S
021	01	199	199	1.35E-06	TY	12	08	0.00026	LB	E6FT3S
021	01	226	226	1.09E-05	TY	12	08	0.0021	LB	E6FT3S
021	01	246		4.57E-07	TY	12	08	0.000088	LB	E6FT3S
021	01	253	253	1.25E-07	TY	12	08	0.000024	LB	E6FT3S
021	01	91203		3.17E-06	TY	12	08	0.00061	LB	E6FT3S
021	01	93		1.04E-06	TY	12	08	0.0002	LB	E6FT3S
021	01	BZ	71432	1.09E-05	TY	12	08	0.0021	LB	E6FT3S
021	01	CO	630080	4.36E-01	TY	12	08	84	LB	E6FT3S
021	01	FORM	50000	3.90E-04	TY	12	08	0.075	LB	E6FT3S
021	01	NH3	7664417		TY	12	00			
021	01	NO2	10102440	5.20E-01	TY	12	08	100	LB	E6FT3S
021	01	PM10		3.95E-02	TY	12	08	7.6	LB	E6FT3S
021	01	PM25		3.95E-02	TY	12	08	7.6	LB	E6FT3S
021	01	PT		3.95E-02	TY	12	08	7.6	LB	E6FT3S
021	01	SO2	7446095	3.12E-03	TY	12	08	0.6	LB	E6FT3S
021	01	TOLU	108883	1.77E-05	TY	12	08	0.0034	LB	E6FT3S
021	01	VOC		2.86E-02	TY	12	08	5.5	LB	E6FT3S
022	01	CO	630080	0	TY	12	08			
022	01	NH3	7664417	0	TY	12	08			
022	01	NO2	10102440	0	TY	12	08			
022	01	PM10		0	TY	12	08			
022	01	PM25		0	TY	12	08			
022	01	PT		0	TY	12	08			

022	01	SO2	7446095		0 TY	12	08		
022	01	VOC			0 TY	12	08		
023	01	CO	630080		0 TY	12	08		
023	01	NH3	7664417		0 TY	12	08		
023	01	NO2	10102440		0 TY	12	08		
023	01	PM10			0 TY	12	08		
023	01	PM25			0 TY	12	08		
023	01	PT			0 TY	12	08		
023	01	SO2	7446095		0 TY	12	08		
023	01	VOC			0 TY	12	08		
024	01	106467			1.48E-05 TY	12	08	0.0012 LB	E6FT3S
024	01	109	630080		1.48E-07 TY	12	08	0.000012 LB	E6FT3S
024	01	110543	110543		2.23E-02 TY	12	08	1.8 LB	E6FT3S
024	01	125	630080		1.36E-05 TY	12	08	0.0011 LB	E6FT3S
024	01	136	136		1.73E-05 TY	12	08	0.0014 LB	E6FT3S
024	01	139	139		1.04E-06 TY	12	08	0.000084 LB	E6FT3S
024	01	195	195		6.18E-06 TY	12	08	0.0005 LB	E6FT3S
024	01	198	198		4.70E-06 TY	12	08	0.00038 LB	E6FT3S
024	01	199	199		3.22E-06 TY	12	08	0.00026 LB	E6FT3S
024	01	226	226		2.60E-05 TY	12	08	0.0021 LB	E6FT3S
024	01	246	630080		1.09E-06 TY	12	08	0.000088 LB	E6FT3S
024	01	253	253		2.97E-07 TY	12	08	0.000024 LB	E6FT3S
024	01	91203	630080		7.54E-06 TY	12	08	0.00061 LB	E6FT3S
024	01	93			2.47E-06 TY	12	08	0.0002 LB	E6FT3S
024	01	BZ	71432		2.60E-05 TY	12	08	0.0021 LB	E6FT3S
024	01	CO	630080		4.59E-01 TY	12	07	37.08 LB	E6FT3S
024	01	FORM	50000		9.28E-04 TY	12	08	0.075 LB	E6FT3S
024	01	NH3	7664417		TY	12	00		
024	01	NO2	10102440		4.59E-01 TY	12	07	37.08 LB	E6FT3S
024	01	PM10			9.40E-02 TY	12	08	7.6 LB	E6FT3S
024	01	PM25			9.40E-02 TY	12	08	7.6 LB	E6FT3S
024	01	PT			9.40E-02 TY	12	08	7.6 LB	E6FT3S
024	01	SO2	7446095		7.42E-03 TY	12	08	0.6 LB	E6FT3S
024	01	TOLU	108883		4.20E-05 TY	12	08	0.0034 LB	E6FT3S
024	01	VOC			6.80E-02 TY	12	08	5.5 LB	E6FT3S
025	01	106467			0 TY	12	08		
025	01	109			0 TY	12	08		
025	01	110543	110543		0 TY	12	08		
025	01	125			0 TY	12	08		
025	01	136	136		0 TY	12	08		
025	01	139	139		0 TY	12	08		
025	01	195	195		0 TY	12	08		
025	01	198	198		0 TY	12	08		
025	01	199	199		0 TY	12	08		
025	01	226	226		0 TY	12	08		
025	01	246			0 TY	12	08		
025	01	253	253		0 TY	12	08		
025	01	91203			0 TY	12	08		
025	01	93			0 TY	12	08		
025	01	BZ	71432		0 TY	12	08		
025	01	CO	630080		0 TY	12	08		
025	01	FORM	50000		0 TY	12	08		
025	01	NH3	7664417		0 TY	12	08		
025	01	NO2	10102440		0 TY	12	08		
025	01	PM10			0 TY	12	08		
025	01	PM25			0 TY	12	08		
025	01	PT			0 TY	12	08		
025	01	SO2	7446095		0 TY	12	08		
025	01	TOLU	108883		0 TY	12	08		
025	01	VOC			0 TY	12	08		
026	01	CO	630080		0 TY	12	08		
026	01	NH3	7664417		0 TY	12	08		
026	01	NO2	10102440		0 TY	12	08		
026	01	PM10			0 TY	12	08		
026	01	PM25			0 TY	12	08		
026	01	PT			0 TY	12	08		
026	01	SO2	7446095		0 TY	12	08		
026	01	VOC			0 TY	12	08		
027	01	NH3	7664417		0 TY	12	00		
027	01	PM10			1.18E-03 TY	12	11		
027	01	PM25			1.18E-03 TY	12	11		
027	01	PT			1.18E-03 TY	12	11		
028	01	3CLET	79016		1.10E-02 TY	12	03		
028	01	NH3	7664417		0 TY	12	03		
028	01	PM10			0 TY	12	03		
028	01	PM25			0 TY	12	03		
029	01	3CLET	79016		0 TY	12	03		
029	01	NH3	7664417		0 TY	12	03		
029	01	PM10			0 TY	12	03		
029	01	PM25			0 TY	12	03		

030	01	3CLET	79016	0	TY	12	03
030	01	NH3	7664417	0	TY	12	03
030	01	PM10		0	TY	12	03
030	01	PM25		0	TY	12	03
031	01	100027	100027	2.50E-05	TY	12	03
031	01	100414	100414	0	TY	12	03
031	01	100425	100425	2.25E-03	TY	12	03
031	01	100447	100447	1.20E-04	TY	12	03
031	01	101688	101688	0	TY	12	03
031	01	106423		2.08E-03	TY	12	03
031	01	106445		1.10E-04	TY	12	03
031	01	106503	106503	5.50E-04	TY	12	03
031	01	106514		0	TY	12	03
031	01	106887	106887	1.75E-04	TY	12	03
031	01	106898	106898	0	TY	12	03
031	01	106934	106934	1.10E-04	TY	12	03
031	01	106990	106990	0	TY	12	03
031	01	107028	107028	0	TY	12	03
031	01	107062	107062	4.77E-03	TY	12	03
031	01	107131	107131	0	TY	12	03
031	01	107211	107211	2.56E-01	TY	12	03
031	01	107302		0	TY	12	03
031	01	108054	108054	0	TY	12	03
031	01	108101	108101	0	TY	12	03
031	01	108383		2.58E-03	TY	12	03
031	01	108394	108394	1.10E-04	TY	12	03
031	01	108907	108907	1.21E-02	TY	12	03
031	01	108952	108952	1.91E-03	TY	12	03
031	01	109		3.15E-04	TY	12	03
031	01	110543	110543	2.31E-01	TY	12	03
031	01	111422	111422	6.00E-04	TY	12	03
031	01	1120714	1120714	0	TY	12	03
031	01	117817	117817	5.00E-06	TY	12	03
031	01	120809	120809	5.50E-04	TY	12	03
031	01	120821	120821	0	TY	12	03
031	01	121448	121448	5.37E-03	TY	12	03
031	01	121697		0	TY	12	03
031	01	122667		0	TY	12	03
031	01	123319	123319	1.05E-04	TY	12	03
031	01	123386	123386	0	TY	12	03
031	01	123911	123911	3.43E-03	TY	12	03
031	01	125		6.40E-04	TY	12	03
031	01	127184	127184	0	TY	12	03
031	01	136	136	3.72E-03	TY	12	03
031	01	139	139	2.66E-03	TY	12	03
031	01	140885	140885	0	TY	12	03
031	01	144		5.65E-02	TY	12	03
031	01	156627		0	TY	12	03
031	01	1634044	1634044	1.03E-02	TY	12	03
031	01	171		4.50E-02	TY	12	03
031	01	195	195	1.63E-03	TY	12	03
031	01	198	198	5.15E-01	TY	12	03
031	01	199	199	9.70E-04	TY	12	03
031	01	226	226	5.37E-03	TY	12	03
031	01	234		0	TY	12	03
031	01	246		4.80E-03	TY	12	03
031	01	253	253	1.01E-02	TY	12	03
031	01	302012	302012	1.10E-03	TY	12	03
031		383		1.65E-03	TY	12	03
031	01	3CLET	79016	0	TY	12	03
031	01	463581	463581	0	TY	12	03
031	01	51285		0	TY	12	03
031		51796	51796	7.35E-04	TY	12	03
031	01	540841	540841	4.58E-03	TY	12	03
031	01	542881	542881	0	TY	12	03
031	01	56235	56235	8.79E-03	TY	12	03
031	01	57125	57125	0	TY	12	03
031	01	57147	57147	0	TY	12	03
031	01	584849	584849	0	TY	12	03
031	01	60344		0	TY	12	03
031	01	62533	62533	6.45E-04	TY	12	03
031	01	67561	67561	7.29E-01	TY	12	03
031	01	67663	67663	1.25E-01	TY	12	03
031	01	680319	680319	0	TY	12	03
031	01	68122	68122	1.40E-01	TY	12	03
031	01	71556	71556	0	TY	12	03
031	01	7439921	7439921	0	TY	12	03
031	01	7439976	7439976	0	TY	12	03
031	01	7440020	7440020	0	TY	12	03
031	01	7440360	7440360	0	TY	12	03

031	01	7440382	7440382	0	TY	12	03
031	01	7440417	7440417	0	TY	12	03
031	01	7440439	7440439	0	TY	12	03
031	01	7440473	7440473	0	TY	12	03
031	01	7440484	7440484	0	TY	12	03
031	01	74839	74839	0	TY	12	03
031	01	74873	74873	0	TY	12	03
031	01	74884	74884	0	TY	12	03
031	01	75003	75003	0	TY	12	03
031	01	75058	75058	7.03E-01	TY	12	03
031	01	75070	75070	0	TY	12	03
031	01	75092	75092	6.32E-01	TY	12	03
031	01	75150	75150	3.00E-05	TY	12	03
031	01	75252		7.50E-05	TY	12	03
031	01	75343	75343	0	TY	12	03
031	01	75354	75354	0	TY	12	03
031	01	7550450	7550450	4.75E-04	TY	12	03
031	01	75558		0	TY	12	03
031	01	75569	75569	3.50E-05	TY	12	03
031	01	7664393	7664393	2.09E-02	TY	12	03
031	01	7723140	7723140	5.00E-04	TY	12	03
031	01	77474	77474	0	TY	12	03
031	01	77781	77781	1.00E-05	TY	12	03
031	01	7782492	7782492	0	TY	12	03
031	01	7803512	7803512	0	TY	12	03
031	01	79005	79005	0	TY	12	03
031	01	79061	79061	5.45E-03	TY	12	03
031	01	79107	79107	0	TY	12	03
031	01	79118	79118	0	TY	12	03
031	01	79345	79345	0	TY	12	03
031	01	80626	80626	3.17E-03	TY	12	03
031	01	822060		2.50E-05	TY	12	03
031	01	84742	84742	3.31E-03	TY	12	03
031	01	85449	85449	0	TY	12	03
031	01	91203	91203	2.80E-04	TY	12	03
031		91225	91225	1.15E-04	TY	12	03
031		92		6.60E-04	TY	12	03
031	01	92671	92671	0	TY	12	03
031	01	93		1.50E-03	TY	12	03
031	01	95476	95476	5.82E-03	TY	12	03
031	01	98828		0	TY	12	03
031	01	98862	98862	5.60E-04	TY	12	03
031	01	98953	98953	1.32E-03	TY	12	03
031	01	BZ	71432	1.11E-02	TY	12	03
031	01	CL	7782505	1.28E-02	TY	12	03
031	01	FORM	50000	6.58E-02	TY	12	03
031	01	HC36	78933	3.64E-01	TY	12	03
031	01	HC81	1330207	4.16E-03	TY	12	03
031	01	HCL	7647010	1.52E+00	TY	12	03
031	01	MN-PT	7439965	0	TY	12	03
031	01	NH3	7664417	5.91E-02	TY	12	03
031	01	PM10		0	TY	12	03
031	01	PM25		0	TY	12	03
031	01	TOLU	108883	1.42E-01	TY	12	03
031	01	VOC		7.95E+00	TY	12	03
032	01	106467		1.52E-04	TY	12	08
032	01	109		6.41E-06	TY	12	08
032	01	110543	110543	2.27E-01	TY	12	08
032	01	125		1.44E-04	TY	12	08
032	01	136	136	1.82E-04	TY	12	08
032	01	139	139	1.06E-05	TY	12	08
032	01	195	195	7.78E-05	TY	12	08
032	01	198	198	5.78E-05	TY	12	08
032	01	199	199	3.77E-05	TY	12	08
032	01	226	226	2.70E-04	TY	12	08
032	01	246		5.04E-05	TY	12	08
032	01	253	253	2.75E-05	TY	12	08
032	01	91203	7446095	7.71E-05	TY	12	08
032	01	93		3.18E-05	TY	12	08
032	01	BZ	71432	2.65E-04	TY	12	08
032	01	CO	630080	5.11E+00	TY	12	08
032	01	FORM	50000	1.00E-02	TY	12	08
032	01	NH3	7664417		TY	12	00
032	01	NO2	10102440	7.43E+00	TY	12	04
032	01	PM10		9.90E-01	TY	12	08
032	01	PM25		9.80E-01	TY	12	08
032	01	PT		1.00E+00	TY	12	08
032	01	SO2	7446095	1.60E-01	TY	12	08
032	01	TOLU	108883	4.29E-04	TY	12	08
032	01	VOC		7.00E-01	TY	12	08

0.0012 LB	E6FT3S
0.000012 LB	E6FT3S
1.8 LB	E6FT3S
0.0011 LB	E6FT3S
0.0014 LB	E6FT3S
0.000084 LB	E6FT3S
0.0005 LB	E6FT3S
0.00038 LB	E6FT3S
0.00026 LB	E6FT3S
0.0021 LB	E6FT3S
0.000088 LB	E6FT3S
0.000024 LB	E6FT3S
0.00061 LB	E6FT3S
0.0002 LB	E6FT3S
0.0021 LB	E6FT3S
40 LB	E6FT3S
0.075 LB	E6FT3S
58 LB	E6FT3S
7.6 LB	E6FT3S
7.6 LB	E6FT3S
7.6 LB	E6FT3S
0.6 LB	E6FT3S
0.0034 LB	E6FT3S
5.5 LB	E6FT3S



033	01	106467	10102440	2.59E-05	TY	12	08	0.0012	LB	E6FT3S
033	01	109		3.03E-07	TY	12	08	0.000012	LB	E6FT3S
033	01	110543	110543	3.88E-02	TY	12	08	1.8	LB	E6FT3S
033	01	125	630080	2.38E-05	TY	12	08	0.0011	LB	E6FT3S
033	01	136	136	3.02E-05	TY	12	08	0.0014	LB	E6FT3S
033	01	139	139	1.81E-06	TY	12	08	0.000084	LB	E6FT3S
033	01	195	195	1.09E-05	TY	12	08	0.0005	LB	E6FT3S
033	01	198	198	8.28E-06	TY	12	08	0.00038	LB	E6FT3S
033	01	199	199	5.65E-06	TY	12	08	0.00026	LB	E6FT3S
033	01	226	226	4.53E-05	TY	12	08	0.0021	LB	E6FT3S
033	01	246	7446095	2.25E-06	TY	12	08	0.000088	LB	E6FT3S
033	01	253	253	7.36E-07	TY	12	08	0.000024	LB	E6FT3S
033	01	91203	7446095	1.32E-05	TY	12	08	0.00061	LB	E6FT3S
033	01	93		4.37E-06	TY	12	08	0.0002	LB	E6FT3S
033	01	BZ	71432	4.53E-05	TY	12	08	0.0021	LB	E6FT3S
033	01	CO	630080	8.60E-01	TY	12	08	40	LB	E6FT3S
033	01	FORM	50000	1.62E-03	TY	12	08	0.075	LB	E6FT3S
033	01	NH3	7664417		TY	12	00			
033	01	NO2	10102440	1.25E+00	TY	12	04	58	LB	E6FT3S
033	01	PM10		1.60E-01	TY	12	08	7.6	LB	E6FT3S
033	01	PM25		1.60E-01	TY	12	08	7.6	LB	E6FT3S
033	01	PT		1.60E-01	TY	12	08	7.6	LB	E6FT3S
033	01	SO2	7446095	1.00E-02	TY	12	08	0.6	LB	E6FT3S
033	01	TOLU	108883	7.33E-05	TY	12	08	0.0034	LB	E6FT3S
033	01	VOC		1.20E-01	TY	12	08	5.5	LB	E6FT3S
034	01	106467	10102440	1.58E-04	TY	12	08	0.0012	LB	E6FT3S
034	01	109	630080	3.62E-06	TY	12	08	0.000012	LB	E6FT3S
034	01	110543	110543	2.36E-01	TY	12	08	1.8	LB	E6FT3S
034	01	125	7446095	1.47E-04	TY	12	08	0.0011	LB	E6FT3S
034	01	136	136	1.86E-04	TY	12	08	0.0014	LB	E6FT3S
034	01	139	139	1.10E-05	TY	12	08	0.000084	LB	E6FT3S
034	01	195	195	7.18E-05	TY	12	08	0.0005	LB	E6FT3S
034	01	198	198	5.40E-05	TY	12	08	0.00038	LB	E6FT3S
034	01	199	199	3.62E-05	TY	12	08	0.00026	LB	E6FT3S
034	01	226	226	2.78E-04	TY	12	08	0.0021	LB	E6FT3S
034	01	246	7446095	2.80E-05	TY	12	08	0.000088	LB	E6FT3S
034	01	253	253	1.34E-05	TY	12	08	0.000024	LB	E6FT3S
034	01	91203	630080	8.01E-05	TY	12	08	0.00061	LB	E6FT3S
034	01	93	630080	2.90E-05	TY	12	08	0.0002	LB	E6FT3S
034	01	BZ	71432	2.76E-04	TY	12	08	0.0021	LB	E6FT3S
034	01	CO	630080	5.28E+00	TY	12	08	40	LB	E6FT3S
034	01	FORM	50000	1.01E-02	TY	12	08	0.075	LB	E6FT3S
034	01	NH3	7664417		TY	12	00			
034	01	NO2	10102440	7.66E+00	TY	12	04	58	LB	E6FT3S
034	01	PM10		1.01E+00	TY	12	08	7.6	LB	E6FT3S
034	01	PM25		1.01E+00	TY	12	08	7.6	LB	E6FT3S
034	01	PT		1.02E+00	TY	12	08	7.6	LB	E6FT3S
034	01	SO2	7446095	1.20E-01	TY	12	08	0.6	LB	E6FT3S
034	01	TOLU	108883	4.47E-04	TY	12	08	0.0034	LB	E6FT3S
034	01	VOC		7.20E-01	TY	12	08	5.5	LB	E6FT3S
035	01	VOC		6.94E-03	TY	12	08			
036	01	VOC		3.30E-02	TY	12	08			
037	01	106467		3.79E-06	TY	12	08	0.0012	LB	E6FT3S
037	01	109		3.79E-08	TY	12	08	0.000012	LB	E6FT3S
037	01	110543	110543	5.68E-03	TY	12	08	1.8	LB	E6FT3S
037	01	125	7446095	3.47E-06	TY	12	08	0.0011	LB	E6FT3S
037	01	136	136	4.42E-06	TY	12	08	0.0014	LB	E6FT3S
037	01	139	139	2.65E-07	TY	12	08	0.000084	LB	E6FT3S
037	01	195	195	1.58E-06	TY	12	08	0.0005	LB	E6FT3S
037	01	198	198	1.20E-06	TY	12	08	0.00038	LB	E6FT3S
037	01	199	199	8.21E-07	TY	12	08	0.00026	LB	E6FT3S
037	01	226	226	6.63E-06	TY	12	08	0.0021	LB	E6FT3S
037	01	246	7446095	2.78E-07	TY	12	08	0.000088	LB	E6FT3S
037	01	253	253	7.58E-08	TY	12	08	0.000024	LB	E6FT3S
037	01	91203	7446095	1.93E-06	TY	12	08	0.00061	LB	E6FT3S
037	01	93	7446095	6.31E-07	TY	12	08	0.0002	LB	E6FT3S
037	01	BZ	71432	6.63E-06	TY	12	08	0.0021	LB	E6FT3S
037	01	CO	630080	1.21E-01	TY	12	07	38.2	LB	E6FT3S
037	01	FORM	50000	2.37E-04	TY	12	08	0.075	LB	E6FT3S
037	01	NH3	7664417		TY	12	00			
037	01	NO2	10102440	4.36E-01	TY	12	04	138	LB	E6FT3S
037	01	PM10		4.48E-02	TY	12	07	14.2	LB	E6FT3S
037	01	PM25		4.48E-02	TY	12	07	14.2	LB	E6FT3S
037	01	PT		4.48E-02	TY	12	07	14.2	LB	E6FT3S
037	01	SO2	7446095	1.89E-03	TY	12	08	0.6	LB	E6FT3S
037	01	TOLU	108883	1.07E-05	TY	12	08	0.0034	LB	E6FT3S
037	01	VOC		1.89E-02	TY	12	07	5.98	LB	E6FT3S
038	01	106467	630080	1.29E-05	TY	12	08	0.0012	LB	E6FT3S
038	01	109	630080	1.29E-07	TY	12	08	0.000012	LB	E6FT3S
038	01	110543	110543	1.93E-02	TY	12	08	1.8	LB	E6FT3S

038	01	125		1.18E-05	TY	12	08	0.0011	LB	E6FT3S
038	01	136	136	1.50E-05	TY	12	08	0.0014	LB	E6FT3S
038	01	139	139	9.01E-07	TY	12	08	0.000084	LB	E6FT3S
038	01	195	195	5.37E-06	TY	12	08	0.0005	LB	E6FT3S
038	01	198	198	4.08E-06	TY	12	08	0.00038	LB	E6FT3S
038	01	199	199	2.79E-06	TY	12	08	0.00026	LB	E6FT3S
038	01	226	226	2.25E-05	TY	12	08	0.0021	LB	E6FT3S
038	01	246		9.44E-07	TY	12	08	0.000088	LB	E6FT3S
038	01	253	253	2.58E-07	TY	12	08	0.000024	LB	E6FT3S
038	01	91203		6.55E-06	TY	12	08	0.00061	LB	E6FT3S
038	01	93		2.15E-06	TY	12	08	0.0002	LB	E6FT3S
038	01	BZ	71432	2.25E-05	TY	12	08	0.0021	LB	E6FT3S
038	01	CO	630080	4.10E-01	TY	12	07	38.2	LB	E6FT3S
038	01	FORM	50000	8.05E-04	TY	12	08	0.075	LB	E6FT3S
038	01	NH3	7664417		TY	12	00			
038	01	NO2	10102440	1.48E+00	TY	12	04	138	LB	E6FT3S
038	01	PM10		1.52E-01	TY	12	07	14.2	LB	E6FT3S
038	01	PM25		1.52E-01	TY	12	07	14.2	LB	E6FT3S
038	01	PT		1.52E-01	TY	12	07	14.2	LB	E6FT3S
038	01	SO2	7446095	6.44E-03	TY	12	08	0.6	LB	E6FT3S
038	01	TOLU	108883	3.65E-05	TY	12	08	0.0034	LB	E6FT3S
038	01	VOC		6.42E-02	TY	12	07	5.98	LB	E6FT3S
039	01	100027		0	TY	12	07			
039	01	100414	100414	0	TY	12	07			
039	01	100425		0	TY	12	07			
039	01	106990		0	TY	12	07			
039	01	107028		0	TY	12	07			
039	01	107062		0	TY	12	07			
039	01	108907		0	TY	12	07			
039	01	108952	108952	0	TY	12	07			
039	01	109		0	TY	12	07			
039	01	117817		0	TY	12	07			
039	01	123386		0	TY	12	07			
039	01	125		0	TY	12	07			
039	01	127184		0	TY	12	07			
039	01	136	136	0	TY	12	07			
039	01	139	139	0	TY	12	07			
039	01	1746016		0	TY	12	07			
039	01	18540299		0	TY	12	07			
039	01	195	195	0	TY	12	07			
039	01	198	198	0	TY	12	07			
039	01	199	199	0	TY	12	07			
039	01	226	226	0	TY	12	07			
039	01	246		0	TY	12	07			
039	01	253	253	0	TY	12	07			
039	01	51285		0	TY	12	07			
039	01	56235	56235	0	TY	12	07			
039	01	624		0	TY	12	07			
039	01	67663		0	TY	12	07			
039	01	71556		0	TY	12	07			
039	01	74839		0	TY	12	07			
039	01	74873		0	TY	12	07			
039	01	75014		0	TY	12	07			
039	01	75070	75070	0	TY	12	07			
039	01	75092		0	TY	12	07			
039	01	7723140	7723140	0	TY	12	07			
039	01	78875		0	TY	12	07			
039	01	78933		0	TY	12	07			
039	01	79016		0	TY	12	07			
039	01	87865		0	TY	12	07			
039	01	88062		0	TY	12	07			
039	01	92		0	TY	12	07			
039	01	93		0	TY	12	07			
039	01	95476		0	TY	12	07			
039	01	98862		0	TY	12	07			
039	01	BZ	71432	0	TY	12	07			
039	01	CL	7782505	0	TY	12	07			
039	01	CO	630080	0	TY	12	07			
039	01	FORM	50000	0	TY	12	07			
039	01	HCL	7647010	0	TY	12	07			
039	01	NO2	10102440	0	TY	12	07			
039	01	PM10		0	TY	12	07			
039	01	PM25		0	TY	12	07			
039	01	PT		0	TY	12	07			
039	01	SO2	7446095	0	TY	12	07			
039	01	TOLU	108883	0	TY	12	07			
039	01	VOC		0	TY	12	07			
040	01	100027		0	TY	12	07			
040	01	100414	100414	0	TY	12	07			
040	01	100425		0	TY	12	07			

040	01	106990			0 TY	12	07
040	01	107028			0 TY	12	07
040	01	107062			0 TY	12	07
040	01	108907			0 TY	12	07
040	01	108952	108952		0 TY	12	07
040	01	109			0 TY	12	07
040	01	117817			0 TY	12	07
040	01	123386			0 TY	12	07
040	01	125			0 TY	12	07
040	01	127184			0 TY	12	07
040	01	136	136		0 TY	12	07
040	01	139	139		0 TY	12	07
040	01	1746016			0 TY	12	07
040	01	18540299			0 TY	12	07
040	01	195	195		0 TY	12	07
040	01	198	198		0 TY	12	07
040	01	199	199		0 TY	12	07
040	01	226	226		0 TY	12	07
040	01	246			0 TY	12	07
040	01	253	253		0 TY	12	07
040	01	51285			0 TY	12	07
040	01	56235	56235		0 TY	12	07
040	01	624			0 TY	12	07
040	01	67663			0 TY	12	07
040	01	71556			0 TY	12	07
040	01	74839			0 TY	12	07
040	01	74873			0 TY	12	07
040	01	75014			0 TY	12	07
040	01	75070	75070		0 TY	12	07
040	01	75092			0 TY	12	07
040	01	7723140	7723140		0 TY	12	07
040	01	78875			0 TY	12	07
040	01	78933			0 TY	12	07
040	01	79016			0 TY	12	07
040	01	87865			0 TY	12	07
040	01	88062			0 TY	12	07
040	01	92			0 TY	12	07
040	01	93			0 TY	12	07
040	01	95476			0 TY	12	07
040	01	98862			0 TY	12	07
040	01	BZ	71432		0 TY	12	07
040	01	CL	7782505		0 TY	12	07
040	01	CO	630080		0 TY	12	07
040	01	FORM	50000		0 TY	12	07
040	01	HCL	7647010		0 TY	12	07
040	01	NO2	10102440		0 TY	12	07
040	01	PM10			0 TY	12	07
040	01	PM25			0 TY	12	07
040	01	PT			0 TY	12	07
040	01	SO2	7446095		0 TY	12	07
040	01	TOLU	108883		0 TY	12	07
040	01	VOC			0 TY	12	07
041	01	100027			0 TY	12	07
041	01	100414	100414		0 TY	12	07
041	01	100425			0 TY	12	07
041	01	106990			0 TY	12	07
041	01	107028			0 TY	12	07
041	01	107062			0 TY	12	07
041	01	108907			0 TY	12	07
041	01	108952	108952		0 TY	12	07
041	01	109			0 TY	12	07
041	01	117817			0 TY	12	07
041	01	123386			0 TY	12	07
041	01	125			0 TY	12	07
041	01	127184			0 TY	12	07
041	01	136	136		0 TY	12	07
041	01	139	139		0 TY	12	07
041	01	1746016			0 TY	12	07
041	01	18540299			0 TY	12	07
041	01	195	195		0 TY	12	07
041	01	198	198		0 TY	12	07
041	01	199	199		0 TY	12	07
041	01	226	226		0 TY	12	07
041	01	246			0 TY	12	07
041	01	253	253		0 TY	12	07
041	01	51285			0 TY	12	07
041	01	56235	56235		0 TY	12	07
041	01	624			0 TY	12	07
041	01	67663			0 TY	12	07
041	01	71556			0 TY	12	07

041	01	74839		0 TY	12	07		
041	01	74873		0 TY	12	07		
041	01	75014		0 TY	12	07		
041	01	75070	75070	0 TY	12	07		
041	01	75092		0 TY	12	07		
041	01	7723140	7723140	0 TY	12	07		
041	01	78875		0 TY	12	07		
041	01	78933		0 TY	12	07		
041	01	79016		0 TY	12	07		
041	01	87865		0 TY	12	07		
041	01	88062		0 TY	12	07		
041	01	92		0 TY	12	07		
041	01	93		0 TY	12	07		
041	01	95476		0 TY	12	07		
041	01	98862		0 TY	12	07		
041	01	BZ	71432	0 TY	12	07		
041	01	CL	7782505	0 TY	12	07		
041	01	CO	630080	0 TY	12	07		
041	01	FORM	50000	0 TY	12	07		
041	01	HCL	7647010	0 TY	12	07		
041	01	NO2	10102440	0 TY	12	07		
041	01	PM10		0 TY	12	07		
041	01	PM25		0 TY	12	07		
041	01	PT		0 TY	12	07		
041	01	SO2	7446095	0 TY	12	07		
041	01	TOLU	108883	0 TY	12	07		
041	01	VOC		0 TY	12	07		
042	01	PM10		1.10E-02 TY	12	08	0.03 GR	FT3
042	01	PM25		1.00E-02 TY	12	08	0.03 GR	FT3
042	01	PT		2.30E-02 TY	12	08	0.03 GR	FT3
043	01	VOC		6.80E-03 TY	12	08		
044	01	106467	106467	1.95E-07 TY	12	08	0.0012 LB	E6FT3S
044	01	109	109	1.95E-09 TY	12	08	0.000012 LB	E6FT3S
044	01	110543	110543	2.93E-04 TY	12	08	1.8 LB	E6FT3S
044	01	125	7446095	1.79E-07 TY	12	08	0.0011 LB	E6FT3S
044	01	136	136	2.28E-07 TY	12	08	0.0014 LB	E6FT3S
044	01	139	139	1.37E-08 TY	12	08	0.000084 LB	E6FT3S
044	01	195	195	8.14E-08 TY	12	08	0.0005 LB	E6FT3S
044	01	198	198	6.18E-08 TY	12	08	0.00038 LB	E6FT3S
044	01	199	199	4.23E-08 TY	12	08	0.00026 LB	E6FT3S
044	01	226	226	3.42E-07 TY	12	08	0.0021 LB	E6FT3S
044	01	246	246	1.43E-08 TY	12	08	0.000088 LB	E6FT3S
044	01	253	253	3.91E-09 TY	12	08	0.000024 LB	E6FT3S
044	01	91203	91203	9.93E-08 TY	12	08	0.00061 LB	E6FT3S
044	01	93	93	3.25E-08 TY	12	08	0.0002 LB	E6FT3S
044	01	BZ	71432	3.42E-07 TY	12	08	0.0021 LB	E6FT3S
044	01	CO	630080	1.37E-02 TY	12	08	84 LB	E6FT3S
044	01	FORM	50000	1.22E-05 TY	12	08	0.0075 LB	E6FT3S
044	01	NO2	10102440	1.63E-02 TY	12	08	100 LB	E6FT3S
044	01	PM10		1.24E-03 TY	12	08	7.6 LB	E6FT3S
044	01	PM25		1.24E-03 TY	12	08	7.6 LB	E6FT3S
044	01	PT		1.24E-03 TY	12	08	7.6 LB	E6FT3S
044	01	SO2	7446095	9.76E-05 TY	12	08	0.6 LB	E6FT3S
044	01	TOLU	108883	5.53E-07 TY	12	08	0.0034 LB	E6FT3S
044	01	VOC		8.95E-04 TY	12	08	5.5 LB	E6FT3S
045	01	PM10		8.98E-02 TY	12	07		
045	01	PM25		5.99E-02 TY	12	07		
045	01	PT		1.00E-02 TY	12	07		

County	FIPs Code	AFS/NEDS Plant ID	Inventory Year (YYYY)	Company Name	Facility Name	AIRS Point ID	AIRS Stack ID	Segment ID	Pollutant Code	Primary PCT Control Efficiency	Primary Device Type	Secondary Device Type	Description	Secondary PCT Control Efficiency
028	0001		2004	Los Alamos	Los Alamos National	001	001	01	BE	99.9	101	101	HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	006	006	01	BE	99.9	101	101	HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	007	007	01	BE	99.95	101	101	HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	008	008	01	BE	99.97	101	101	HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	009	009	01	BE	99.96	101	101	HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	010	010	01	AL-PT	99.95	101		HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	010	010	01	BE	99.95	101	101	HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	011	011	01	BE	99.95	101	101	HIGH-EFFICIENCY PARTICULATE AIR FILTER (	
028	0001		2004	Los Alamos	Los Alamos National	013	013	01	PM10	93	008	002	CENTRIFUGAL COLLECTOR (CYCLONE) - MEDIUM	
028	0001		2004	Los Alamos	Los Alamos National	013	013	01	PT	93	008	002	CENTRIFUGAL COLLECTOR (CYCLONE) - MEDIUM	
028	0001		2004	Los Alamos	Los Alamos National	024	024	01	NO2	63	205		LOW NOX BURNERS	
028	0001		2004	Los Alamos	Los Alamos National	025	025	01	NO2	63	205		LOW NOX BURNERS	
028	0001		2004	Los Alamos	Los Alamos National	026	026	01	PM10	92	153		WATER SPRAYS	
028	0001		2004	Los Alamos	Los Alamos National	026	026	01	PT	92	153		WATER SPRAYS	
028	0001		2004	Los Alamos	Los Alamos National	027	027	01	PM10	90	075	100	SINGLE CYCLONE	
028	0001		2004	Los Alamos	Los Alamos National	027	027	01	PT	90	075	100	SINGLE CYCLONE	
028	0001		2004	Los Alamos	Los Alamos National	032	032	01	NO2	64	026		FLUE GAS RECIRCULATION	
028	0001		2004	Los Alamos	Los Alamos National	033	033	01	NO2	64	026		FLUE GAS RECIRCULATION	
028	0001		2004	Los Alamos	Los Alamos National	034	034	01	NO2	64	026		FLUE GAS RECIRCULATION	
028	0001		2004	Los Alamos	Los Alamos National	042	042	01	PM10	65	075		SINGLE CYCLONE	
028	0001		2004	Los Alamos	Los Alamos National	042	042	01	PM25	45	075		SINGLE CYCLONE	
028	0001		2004	Los Alamos	Los Alamos National	042	042	01	PT	95	075		SINGLE CYCLONE	
028	0001		2004	Los Alamos	Los Alamos National	045	045	01	PM10	85	075	18	SINGLE CYCLONE/FABRIC FILTER	95
028	0001		2004	Los Alamos	Los Alamos National	045	045	01	PM25	15	075	18	SINGLE CYCLONE/FABRIC FILTER	97.5
028	0001		2004	Los Alamos	Los Alamos National	045	045	01	PT	75	075	18	SINGLE CYCLONE/FABRIC FILTER	95



**ATTACHMENT C.**  
**2004 SEMI-ANNUAL EMISSIONS REPORTS SUBMITTED**  
**UNDER TITLE V OPERATING PERMIT REQUIREMENTS**





*Associate Director for Operations*  
P.O. Box 1663, A104  
Los Alamos, New Mexico 87545  
505-667-0079/Fax 505-665-1812

*Date:* September 24, 2004  
*Refer To:* AD-Ops:04-109

Dr. John Volkerding  
Program Manager, Compliance & Enforcement Section  
New Mexico Environment Department  
Air Quality Bureau  
2048 Galisteo Street  
Santa Fe, NM 87505

**SUBJECT: SEMI-ANNUAL EMISSIONS REPORT**

Dear Dr. Volkerding:

Attached you will find the semi-annual emission report for January through June of 2004. This report includes actual emissions from permitted sources included in section 2.0 of the Los Alamos National Laboratory (LANL) Operating Permit (Permit Number: P100). This submission satisfies permit condition 4.1., which requires submission of a semi-annual emissions report on a 6-month basis. Furthermore, this report is submitted within 90 days from the end of the reporting period as stipulated in permit condition 4.3.

In this report, actual emissions are listed along with the permit limits for ease in comparing and verifying compliance. No emission limits were exceeded during this reporting period. Emissions are also reported from boiler and generator insignificant sources. These sources are included to demonstrate that LANL has not exceeded Prevention of Significant Deterioration (PSD) applicability thresholds.

Should you have any questions or comments regarding the information provided in this report, please contact Steve Story at (505) 665-2169.

Sincerely,



Scott Gibbs  
Acting Associate Director for Operations

WSG/DLP:alb

Att: a/s

Cy:

S. Fong, DOE-LA-AO, A316  
B. Ramsey, RRES-DO, J591  
D. Stavert, RRES-EP, J591

V. George, RRES-DO, J591  
M. Reed, RRES-DO, J556  
J. Dewart, RRES-MAQ, J978  
D. Wilburn, RRES-MAQ, J978  
S. Story, RRES-MAQ, J978  
J. Hurtle, RRES-MAQ, J978  
D. Paulson, RRES-MAQ, J978  
P. Wardwell, LC-ESH, A187  
RRES-MAQ Title-V Reports File  
RRES-MAQ File, J978  
ADO-Ops File

**Los Alamos National Laboratory  
2004 Semi-Annual Emissions Report  
(January through June)**

This report is being provided to meet the requirement set forth in permit condition 4.1 of the Los Alamos National Laboratory (LANL) Operating Permit Number P100. The emissions included in this report were calculated using operating data recorded during the first six months of 2004.

**Facility Emissions**

The following table displays the actual facility-wide emissions compared with the Facility Wide Emission Limits specified in permit condition 2.11 of the Operating Permit. These emissions include insignificant sources, which are included to demonstrate that facility-wide emissions are below all PSD applicability threshold limits.

<b>Pollutant</b>	<b>January - June Emissions (tons)</b>	<b>July - December Emissions (tons)</b>	<b>2004 Annual Emissions (tons)</b>	<b>Facility Wide Emission Limits (Permit Condition 2.11) (tons per year)</b>
<b>Nitrogen Oxides (NOx)</b>	26.6			245
<b>Carbon Monoxide (CO)</b>	19.1			225
<b>Volatile Organic Compounds (VOCs)</b>	6.7			200
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>	0.7			150
<b>Particulate Matter (PM)</b>	2.5			120
<b>Hazardous Air Pollutants (HAPs)</b>	4.9			24 combined
<b>Jan-June Highest Individual HAP (Hydrochloric Acid)</b>	1.2			8 individual

**Los Alamos National Laboratory  
2004 Semi-Annual Emissions Report  
(January through June)**

**Source Emissions**

The following are the actual emissions from permitted sources listed in permit condition 2.0 of the operating permit for the six month reporting period. Included with these emissions are the source specific emission limits if applicable.

**Permit Condition/Source**

**2.1 Asphalt Production - Asphalt Plant located at TA-60**

<b>Pollutant</b>	<b>Jan-June Emissions (tons)</b>	<b>July-Dec Emissions (tons)</b>	<b>Annual Emissions (tons)</b>	<b>Permit Limits (Permit Condition 2.1.2) (tons per year)</b>
<b>NOx</b>	0.0			1.0
<b>SO<sub>2</sub></b>	0.0			1.0
<b>PM</b>	0.0			*35.4 lbs/hr
<b>CO</b>	0.0			2.6
<b>VOC</b>	0.0			1.0
<b>HAPs</b>	0.0			No Source Permit Limit

**Note:** The Asphalt Plant did not operate during the first 6 months of 2004.

\* The Asphalt Plant does not have a tons per year limit for PM. The lb/hr emissions will be demonstrated during the initial source compliance test.

**Los Alamos National Laboratory  
2004 Semi-Annual Emissions Report  
(January through June)**

**2.2 Beryllium Activities**

Source	Pollutant	Jan-June Emissions (grams)	July-Dec Emissions (grams)	Annual Emissions (grams)	Permit Limits (Permit Condition 2.2.2)
Beryllium Test Facility TA-3-141	Beryllium	3.30E-03			3.5 gm/yr
Target Fabrication Facility TA-35-213	Beryllium	0.04			0.36 gm/yr
Plutonium Facility TA-55-PF4					
	Machining Operation	Beryllium	1.495		2.99 gm/yr
		Aluminum	1.495		2.99 gm/yr
Foundry Operation		Beryllium	0		$8.73 \times 10^{-4}$ gm/yr
		Aluminum	0		$8.73 \times 10^{-4}$ gm/yr
<b>Jan-June Beryllium Total (tons) =</b>		<b>1.70E-06</b>	<b>Jan-June Aluminum Total (tons) =</b>		<b>1.65E-06</b>

**Note:** Emission values shown for the Beryllium Test Facility are from actual stack emission measurements. Emissions for the Target Fabrication Facility are from initial compliance testing of that source. Emissions for the Plutonium Facility are based on permitted limits. The Plutonium Facility foundry operations did not operate during the first six months of 2004. Other sources listed in section 2.2 of the permit do not require reporting in the Semi-Annual Emissions Report.

**2.3 Boilers and Heaters**

Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Permit Condition 2.3.2) (tons per year)
NOx	15.4			80
SO <sub>2</sub>	0.1			50
PM	1.2			50
PM-10	1.2			50
CO	12.5			80
VOC	0.9			50
HAPs	0.29			No Source Limit

**Note:** The emissions shown in this table include significant and insignificant sources. This section does not include the TA-3-22 Power Plant boilers. These can be found under 2.9. The TA-21 steam plant boilers are included in this table.

**Los Alamos National Laboratory  
2004 Semi-Annual Emissions Report  
(January through June)**

**2.4 Carpenter Shops**

Shop	Pollutant	January - June Emissions (tons)	July - December Emission (tons)	Annual Emissions (tons)	Permit Limit (Permit Condition 2.42) (tons per year)
TA-3-38	PM <sub>10</sub>	0.016			3.07
TA-15-563	PM <sub>10</sub>	0			2.81

Note: The TA-15-563 Carpenter Shop did not operate during the first 6 months of the year.

**2.5 Chemical Usage**

Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Permit Condition 2.5.3.1)
VOCs	4.9			Source limits refer to facility wide limits. (See Facility Emissions Table on Page 1)
HAPs	4.3			
Highest Individual HAP (Hydrochloric Acid)	1.2			

**2.6 Degreasers**

Degreaser TA-55-DG-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Permit Condition 2.6.2.1) (tons per year)
VOCs	0.004			Source limits refer to facility wide limits. (See Facility Emissions Table on Page 1)
HAPs	0.004			

Note: Degreasers TA-55-DG-2 and TA-55-DG-3 were not used in the first six months of 2004. These degreasers are not expected to be used in the near future and are in storage.

**Los Alamos National Laboratory  
2004 Semi-Annual Emissions Report  
(January through June)**

**2.7 Internal Combustion Sources**

Generator TA-33-G-1	Jan-June Emissions (tons)	July-Dec Emissions (tons)	Annual (tons)	Permit Limits (Permit Condition 2.7.2) (tons per year)
TSP	0.0			0.6
PM <sub>10</sub>	0.0			0.6
NO <sub>x</sub>	0.0			18.1
CO	0.0			15.2
VOC	0.0			0.3
SO <sub>x</sub>	0.0			2.5
HAPs	0.0			No Source Limit

Note: The TA-33-G-1 generator did not operate during the first six months of 2004.

Standby Generators	Jan-June Emissions (tons)	July-Dec Emissions (tons)	Annual (tons)	Permit Limits (Permit Condition 2.7.2)
TSP	0.1			No Source Specific Emission Limits for Standby Generators
PM <sub>10</sub>	0.1			
NO <sub>x</sub>	2.3			
CO	0.6			
VOC	0.1			
SO <sub>x</sub>	0.5			
HAPs	1.1E-03			

Note: Standby Generators are insignificant sources.

**2.8 Paper Shredder**

Emission Unit TA-52-11	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	TSP Emission Limit (Permit Condition 2.8.2.1) (tons per year)
TSP	0.0012			13

**Los Alamos National Laboratory  
2004 Semi-Annual Emissions Report  
(January through June)**

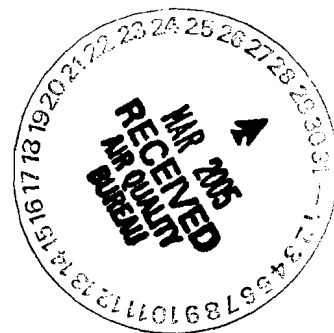
**2.9 Power Plant at Technical Area 3 (TA-3-22)**

<b>Pollutant</b>	<b>January - June Emissions (tons)</b>	<b>July - December Emissions (tons)</b>	<b>Annual Emissions (tons)</b>	<b>Permit Limit (Permit Condition 2.9.2) (tons per year)</b>
<b>NOx</b>	8.9			99.6
<b>SO<sub>2</sub></b>	0.1			36.9
<b>TSP</b>	1.2			15.7
<b>PM<sub>10</sub></b>	1.2			15.7
<b>CO</b>	6.1			81.3
<b>VOC</b>	0.8			11.1
<b>HAPs</b>	0.3			No Source Limit

**2.10 Rock Crusher**

The Rock Crusher was not used during this 6 month reporting period. The source was retired.





Associate Directorate for Technical Services  
P.O. Box 1663, A104  
Los Alamos, New Mexico 87545  
505-667-0079/Fax 505-665-1812

Date: March 23, 2005  
Refer To: ADTS:05-023

Mr. Edward L. Horst  
Environmental Compliance Specialist  
Compliance & Enforcement Section  
New Mexico Environment Department  
Air Quality Bureau  
2048 Galisteo Street  
Santa Fe, NM 87505

**IDEA ID NO. 856 – LOS ALAMOS NATIONAL LABORATORY (LANL)  
SEMI-ANNUAL EMISSIONS REPORT – OPERATING PERMIT NUMBER: P100**

Dear Mr. Horst:

Attached is the semi-annual emissions report for July through December of 2004. This report includes actual emissions from permitted sources included in section 2.0 of the Los Alamos National Laboratory (LANL) Operating Permit. This submission satisfies permit condition 4.1., which requires submission of a semi-annual emissions report on a 6-month basis. Furthermore, this report is submitted within 90 days from the end of the reporting period as stipulated in permit condition 4.3.

In this report, actual emissions are listed along with the emission limits for ease in comparing and verifying compliance. No emission limits were exceeded during this reporting period. Emissions are also reported from insignificant boiler and generator sources. These sources are included to demonstrate that LANL has not exceeded Prevention of Significant Deterioration (PSD) applicability thresholds.

Also included are the more restrictive emission limits for the TA-3 power plant boilers, from NSR Air Quality Permit 2195BM1. This permit was issued on July 30, 2004, to install a combustion turbine at the power plant, but installation is not yet complete. In addition, emissions from the data disintegrator, which replaced the paper shredder in 2004, are included in this report. The emission limits for this unit were taken from NSR Air Quality Permit 2195-H. Both of these units will be incorporated into the LANL Operating Permit modification to be submitted by July 29, 2005.

Should you have any questions or comments regarding the information provided in this report, please contact Steve Story at (505) 665-2169.

Sincerely,

Carolyn A. Mangeng  
Acting Associate Director

*Mr. Edward L. Horst*  
*ADTS:05-023*  
*LA-UR-05-2051*

-2-

*March 23, 2005*

CAM:alb

Cy:

S. Fong, DOE-LA-AO, A316

K. Hargis, ENV-DO, J591

D. Stavert, ENV-DO, J591

J. Dewart, ENV-MAQ, J978

D. Wilburn, ENV-MAQ, J978

S. Story, ENV-MAQ, J978

J. Hurtle, ENV-MAQ, J978

D. Paulson, ENV-MAQ, J978

M. Stockton, ENV-MAQ, J978

P. Wardwell, LC-ESH, A187

ENV-MAQ Title-V Reports File

ENV-MAQ File

# Title V Operating Permit Semi-Annual Emission Report

July 1 - December 31, 2004

## Identifying Information

Source Name: Los Alamos National Laboratory County: Los Alamos

Source Address:

City: Los Alamos State: NM Zip Code: 87545

Responsible Official: Carolyn A. Mangeng Ph No. (505) 667-0079 Fax No. (505) 665-1812

Technical Contact: Steven L. Story Ph No. (505) 665-2169 Fax No. (505) 665-8858

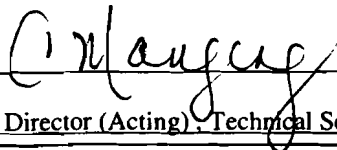
Principal Company Product or Business: National Security and Nuclear Weapons Research Primary SIC Code: 9711

Permit No. P100 {IDEA/Tempo ID No. 856} Permit Issued Date: April 30, 2004

## Certificate of Truth, Accuracy, and Completeness

I, Carolyn A. Mangeng certify that, based on information and belief formed after reasonable inquiry, the statements and information in the attached semi-annual emission report are true, accurate, and complete.

Signature



Date: 3/29/05

Title: Associate Director (Acting), Technical Services Directorate

**Los Alamos National Laboratory  
2004 Semi-Annual Emissions Report  
(July through December)**

This report is being provided to meet the requirement set forth in permit condition 4.1 of the Los Alamos National Laboratory (LANL) Operating Permit Number P100. The emissions were calculated using operating data recorded during the second six months of 2004. The emissions from the first six months of 2004 were submitted in the previous Semi-Annual Emissions Report, but are included here to calculate annual emissions.

**Facility Emissions**

The following table displays the actual facility-wide emissions compared with the facility wide emission limits specified in permit condition 2.11 of the Operating Permit. These emissions include insignificant sources, which are included to demonstrate that facility-wide emissions are below all PSD applicability threshold limits. Also, due to the method used for calculating Hazardous Air Pollutant (HAP) and Volatile Organic Compound (VOC) emissions from chemical use, fugitive emissions are included (see permit condition 4.1).

<b>Pollutant</b>	<b>January - June Emissions (ton)</b>	<b>July - December Emissions (ton)</b>	<b>2004 Annual Emissions (ton)</b>	<b>Facility Wide Emission Limits (Permit Condition 2.11) (ton per year)</b>
<b>Nitrogen Oxides (NOx)</b>	26.5	24.0	50.5	245
<b>Carbon Monoxide (CO)</b>	19.1	16.3	35.4	225
<b>Volatile Organic Compounds (VOCs)</b>	6.7	4.7	11.4	200
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>	0.7	0.8	1.5	150
<b>Particulate Matter (PM)</b>	2.5	2.3	4.8	120
<b>Hazardous Air Pollutants (HAPs)</b>	4.8	1.9	6.7	24 combined
<b>Highest Individual HAP (Hydrochloric Acid)</b>	1.2	0.3	1.5	8 individual

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**Source Emissions**

The following are the actual emissions from permitted sources listed in permit condition 2.0 of the operating permit for the six month reporting period. Included with these emissions are the source specific emission limits when applicable.

**Permit Condition/Source**

**2.1 Asphalt Production - Asphalt Plant located at TA-60**

Pollutant	Jan-June Emissions (ton)	July-Dec Emissions (ton)	Annual Emissions (ton)	Emission Limits (Permit Condition 2.1.2) (ton per year)
NO <sub>x</sub>	0.0	0.0	0.0	1.0
SO <sub>2</sub>	0.0	0.0	0.0	1.0
PM	0.0	0.0	0.0	*35.4 lb/hr
CO	0.0	0.0	0.0	2.6
VOC	0.0	0.0	0.0	1.0
HAPs	0.0	0.0	0.0	No Source Permit Limit

**Note:** The Asphalt Plant did not operate during 2004.

\* The Asphalt Plant does not have a ton per year limit for PM. The lb/hr emissions will be demonstrated during the initial source compliance test.

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**2.2 Beryllium Activities**

Source	Pollutant	Jan-June Emissions (gram)	July-Dec Emissions (gram)	Annual Emissions (gram)	Emission Limits (Permit Condition 2.2.2)	
Beryllium Test Facility TA-3-141	Beryllium	< 0.0033	< 0.0032	< 0.0065	3.5 gm/yr	
Target Fabrication Facility TA-35-213	Beryllium	< 0.04	< 0.009	< 0.049	0.36 gm/yr	
Plutonium Facility TA-55-PF4						
	Machining Operation	Beryllium	< 1.495	< 1.41	< 2.905	2.99 gm/yr
		Aluminum	< 1.495	< 1.41	< 2.905	2.99 gm/yr
	Foundry Operation	Beryllium	0	0	0	$8.73 \times 10^{-4}$ gm/yr
	Aluminum	0	0	0	$8.73 \times 10^{-4}$ gm/yr	
<b>Beryllium Total (tons) =</b>		<b>&lt; <math>1.70 \times 10^{-6}</math></b>	<b>&lt; <math>1.57 \times 10^{-6}</math></b>	<b>&lt; <math>3.27 \times 10^{-6}</math></b>		
<b>Aluminum Total (tons) =</b>		<b>&lt; <math>1.65 \times 10^{-6}</math></b>	<b>&lt; <math>1.55 \times 10^{-6}</math></b>	<b>&lt; <math>3.20 \times 10^{-6}</math></b>		

**Note:** Emission values shown for the Beryllium Test Facility are from actual stack emission measurements. Emissions for the Target Fabrication Facility are based on initial compliance testing of that source and a conservative use of maximum hours of operation. Emissions for the Plutonium Facility Machining Operation are based on initial compliance testing of the source and a conservative use of maximum throughput. The Plutonium Facility Foundry Operations did not operate during 2004. Other beryllium sources listed in section 2.2 of the permit do not require reporting in the Semi-Annual Emissions Report.

**2.3 Boilers and Heaters**

Pollutant	January - June Emissions (ton)	July - December Emissions (ton)	Annual Emissions (ton)	Emission Limits (Permit Condition 2.3.2) (ton per year)
<b>NOx</b>	15.50	12.80	28.30	80
<b>SO<sub>2</sub></b>	0.10	0.08	0.18	50
<b>PM</b>	1.20	1.03	2.23	50
<b>PM-10</b>	1.20	1.03	2.23	50
<b>CO</b>	12.50	10.25	22.75	80
<b>VOC</b>	0.90	0.71	1.61	50
<b>HAPs</b>	0.26	0.24	0.50	No Source Limit

**Note:** The emissions shown in this table include significant and insignificant sources. This section does not include the TA-3-22 Power Plant boilers (see section 2.9). The TA-21 steam plant boilers are included in this table.

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**2.4 Carpenter Shops**

Shop	Pollutant	January - June Emissions (ton)	July - December Emission (ton)	Annual Emissions (ton)	Emission Limits (Permit Condition 2.4.2) (ton per year)
TA-3-38	PM <sub>10</sub>	0.016	0.005	0.021	3.07
TA-15-563	PM <sub>10</sub>	0	0	0	2.81

Note: The TA-15-563 Carpenter Shop did not operate during 2004.

**2.5 Chemical Usage**

Pollutant	January - June Emissions (ton)	July - December Emissions (ton)	Annual Emissions (ton)	Emission Limits (Permit Condition 2.5.3.1)
VOCs	4.91	3.04	7.95	Source limits refer to facility wide limits. (See Facility Emissions Table on Page 1)
HAPs	4.28	1.44	5.72	
Highest Individual HAP (Hydrochloric Acid)	1.19	0.32	1.51	

**2.6 Degreasers**

Degreaser TA-55-DG-1	January - June Emissions (ton)	July - December Emissions (ton)	Annual Emissions (ton)	Emission Limits (Permit Condition 2.6.2.1) (ton per year)
VOCs	0.004	0.007	0.011	Source limits refer to facility wide limits. (See Facility Emissions Table on Page 1)
HAPs	0.004	0.007	0.011	

Note: Degreasers TA-55-DG-2 and TA-55-DG-3 were not used in 2004. These degreasers are not expected to be used in the near future and are in storage.

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**2.7 Internal Combustion Sources**

Generator TA-33-G-1	Jan-June Emissions (ton)	July-Dec Emissions (ton)	Annual (ton)	Emission Limits (Permit Condition 2.7.2) (ton per year)
TSP	0.0	0.0	0.0	0.6
PM <sub>10</sub>	0.0	0.0	0.0	0.6
NOx	0.0	0.0	0.0	18.1
CO	0.0	0.0	0.0	15.2
VOC	0.0	0.0	0.0	0.3
SO <sub>x</sub>	0.0	0.0	0.0	2.5
HAPs	0.0	0.0	0.0	No Source Limit

**Note:** The TA-33-G-1 generator did not operate during 2004.

Standby Generators	Jan-June Emissions (ton)	July-Dec Emissions (ton)	Annual (ton)	Emission Limits
TSP	0.10	0.20	0.30	No Source Specific Emission Limits for Standby Generators
PM <sub>10</sub>	0.10	0.20	0.30	
NOx	2.20	3.67	5.87	
CO	0.50	0.86	1.36	
VOC	0.10	0.22	0.32	
SO <sub>x</sub>	0.50	0.60	1.10	
HAPs	1.1E-03	1.5E-03	2.6E-03	

**Note:** Standby Generators are insignificant sources. Insignificant source information is provided to demonstrate compliance with PSD applicability thresholds.

**2.8.a Paper Shredder**

Emission Unit TA-52-11	January - June Emissions (ton)	July - December Emissions (ton)	Annual Emissions (ton)	Emission Limit (Permit Condition 2.8.2.1) (ton per year)
TSP	0.0012	0.0000	0.0012	13

**Note:** The paper shredder was shutdown in July 2004 and was replaced with a new data disintegrator (see data disintegrator - section 2.8.b).



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**2.8.b Data Disintegrator (Unit replaced paper shredder)**

Emission Unit TA-52-11	January - June Emissions (ton)	July - December Emissions (ton)	Annual Emissions (ton)	Emission Limits (NSR Permit No. 2195 H) (ton)
TSP	0.00	0.10	0.10	9.9
PM10	0.00	0.09	0.09	9.9

**Note:** The data disintegrator was started on August 18, 2004, and replaced the existing paper shredder. This unit and its allowable emissions will be included in the next LANL Title V operating permit modification. The data disintegrator was installed under Air Quality Permit No. 2195-H. The emissions from this unit are included in the facility wide total.

**2.9 Power Plant at Technical Area 3 (TA-3-22)**

Pollutant	January - June Emissions (ton)	July - December Emissions (ton)	Annual Emissions (ton)	Emission Limits (Permit Condition 2.9.2) 12 mo. rolling total (ton)	Emission Limits (NSR Permit No. 2195BM1) 12 mo. rolling total (ton)
NOx	8.85	7.49	16.34	99.6	60.2
SO <sub>2</sub>	0.15	0.15	0.30	36.9	7.9
TSP	1.18	1.00	2.18	15.7	8.4
PM <sub>10</sub>	1.17	0.99	2.16	15.7	8.2
CO	6.10	5.16	11.26	81.3	41.3
VOC	0.83	0.70	1.53	11.1	5.6
HAPs	0.29	0.24	0.53	No Source Limit	No Source Limit

**Note:** The allowable emission limits from Air Quality Permit No. 2195BM1 are included above. This permit was issued on July 30, 2004, for the installation of a combustion turbine. Installation of the turbine is not yet complete. These limits are the most current applicable limits for the power plant boilers. These new limits will be included in the next LANL Title V operating permit modification.

**2.10 Rock Crusher**

The Rock Crusher was not used in 2004. The unit was retired June 10, 2004.



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