LA-14450-PR
Progress Report

Emissions Inventory Report Summary for Los Alamos National Laboratory for Calendar Year 2010

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Emissions Inventory Report Summary for Los Alamos National Laboratory for Calendar Year 2010

Environmental Stewardship Group

Los Alamos
NATIONAL LABORATORY
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CONTENTS

ABSTRACT **1**

1.0 **INTRODUCTION** **1**

1.1 Regulatory Basis 1
1.2 Contents of Annual Emissions Inventory Submittal 3
1.3 Contents of the Semi-annual Title V Operating Permit Emissions Reports 3

2.0 **REPORTED EMISSION SOURCES** **4**

2.1 Power Plant 4
2.2 Small Boilers and Heaters 6
2.3 Asphalt Plant 7
2.4 Data Disintegrator 7
2.5 Degreasers 8
2.6 Carpenter Shop 8
2.7 Oil Storage Tanks 8
2.8 Permitted Beryllium-Machining Operations 9
2.9 Generators 9
2.10 Combustion Turbine 10
2.11 Emissions from Chemical Use Activities 10
2.11.1 VOC Emissions *11*
2.11.2 HAP Emissions *12*
2.12 Greenhouse Gas Emissions 13
2.12.1 Greenhouse Gas Emissions from Research and Development Activities 13
2.12.2 Greenhouse Gas Emissions from Electrical Use *13*
2.13 Emissions Summary by Source 13

3.0 **REPORTING EXEMPTIONS** **15**

3.1 Boilers 15
3.2 Generators 16
3.3 VOC Emissions 17
3.4 HAP Emissions 17
3.5 Paints 18

4.0 **EMISSIONS SUMMARY** **18**

4.1 2010 Emissions Summary 18
4.2 Emission Trends and Title V Permit Limits 20

REFERENCES **23**

Attachment A Emission Calculation Worksheets for Individual Emission Units 25

Attachment B 2010 Annual Emissions Inventory Submittal to NMED 57

Attachment C 2010 Semi-annual Emissions Reports Submitted Under Title V Operating Permit Requirements 117

Figures

Figure 2.1-1 TA-3 power plant. 6
Figure 2.11-1 Example of a laboratory fume hood at LANL. 11
Figure 4.1-1 Emissions of criteria pollutants by source in 2010. 20
Figure 4.1-2 Comparison of facility-wide annual reported emissions from 1999–2010. 21
Figure 4.1-3 VOC and HAP emissions from chemical use, 1999–2010. 22

Tables

Table 2.0-1 Sources Included in LANL's 2010 Annual Emissions Inventory and Semi-annual Emissions Reports 5
Table 2.6-1 Emissions for Carpenter Shops 8
Table 2.12-1 Summary of LANL 2010 Reported Emissions for Annual Emissions Inventory 14
Table 2.12-2 Summary of LANL 2010 Semi-annual Emissions as Reported Under Title V Operating Permit Requirements 15
Table 3.3-1 Exemptions Applied for Chemical Use Activities 17
Table 4.1-1 LANL Facility-Wide Criteria Pollutant Emissions for 2010 19
Table 4.1-2 LANL HAP Emissions from Top Five Chemicals Used in 2010 19

Acronyms

AIRS	Aerometric Information Retrieval System
AQB	Air Quality Bureau
CAS	Chemical Abstracts Service
CO	carbon monoxide
CO_2	carbon dioxide
EPA	U.S. Environmental Protection Agency
FGR	flue gas recirculation
HAP	hazardous air pollutant
HCl	hydrochloric acid
LANL	Los Alamos National Laboratory
MSDS	material safety data sheet
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NO_x	nitrogen oxides
PM	particulate matter
$PM_{2.5}$	particulate matter with diameter less than 2.5 micrometers
PM_{10}	particulate matter with diameter less than 10 micrometers
PSD	Prevention of Significant Deterioration
R&D	research and development
SO_x	sulfur oxides
SO_2	sulfur dioxide
TA	Technical Area
TSP	total suspended particulates
VOC	volatile organic compound

EMISSIONS INVENTORY REPORT SUMMARY FOR LOS ALAMOS NATIONAL LABORATORY FOR CALENDAR YEAR 2010

by

ENVIRONMENTAL STEWARDSHIP GROUP

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 permit was modified and renewed on August 7, 2009. This Title V Operating Permit (Permit No. P100R1) 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 2010. LANL's 2010 emissions are well below the emission limits in the Title V Operating Permit.

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 (TSP);
        - particulate matter (PM) with diameter less than 10 micrometers (PM_{10});
        - PM with diameter less than 2.5 micrometers ($PM_{2.5}$);
        - sulfur dioxide (SO_2);
        - nitrogen oxides (NO_x);
        - carbon monoxide (CO); or
        - volatile organic compounds (VOCs).

The annual emissions inventory must be submitted to NMED/AQB by April 1 of each year. However, for the 2010 reporting year, NMED extended the reporting deadline for LANL to April 15, 2011 because of technical problems with the online reporting tool. The NMED/AQB enters the data in the Aerometric Information Retrieval System (AIRS) (EPA 2008a). 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 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.

Additionally, on April 30, 2004, LANL was issued a Title V Operating Permit from the NMED/AQB, under 20.2.70 NMAC. This permit was modified and renewed on August 7, 2009 (P100R1) from the NMED/AQB (NMED 2009b). 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, in 2004 the Laboratory began submitting the semi-annual emissions reports as well as the annual emissions inventory. There are a few differences in which sources are included in the two emissions reports. These differences are explained in the following sections.

Furthermore, LANL submitted carbon dioxide (CO_2) and methane (CH_4) emissions from all stationary combustion sources in the Emissions Inventory Report as required by 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c), and in accordance with New Mexico's 2009 Greenhouse Mandatory Emissions Inventory Emissions Quantification Procedure. The estimated actual CO_2 and CH_4 emissions were reported for combustion sources, indirect sources (electricity use) and fugitive emissions from research and development activities in tons per year.

1.2 Contents of Annual Emissions Inventory Submittal

NMED requested that LANL submit annual emissions inventory data for 2010 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 2010.

This annual emissions inventory submittal includes air pollutant data for PM, PM_{10}, CO, NO_x, sulfur oxides (SO_x), VOCs, beryllium, hazardous air pollutants (HAPs), and aluminum.

For 2010, LANL is required to report $PM_{2.5}$ emissions. LANL previously reported $PM_{2.5}$ emissions at the request of NMED for 2006 and 2007. Further, ammonia is a precursor to $PM_{2.5}$ formation. It contributes to the secondary aerosol formation of $PM_{2.5}$ by combining with NO_x and SO_x to form ammonium nitrate and fine sulfate particles. LANL is also required to report emissions of ammonia for 2010.

In the 2010 annual emissions inventory submittal, LANL provided $PM_{2.5}$ emissions data for all combustion sources and other emission sources where $PM_{2.5}$ emission factors were readily available. In the absence of $PM_{2.5}$ emission factors, PM or PM_{10} emissions were assumed to be equivalent to $PM_{2.5}$. 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.

The Laboratory's 2010 Emissions Inventory Report also includes direct CO_2 and CH4 emissions from stationary combustion sources, fugitive emissions from research and development activities and indirect emissions from electricity use in tons per year. This satisfies the Laboratory's reporting requirement under 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c).

1.3 Contents of the Semi-annual Title V Operating Permit Emissions Reports

The semi-annual Title V Operating Permit emissions reports include actual estimated 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 with 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 reports include 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 2.0-1 shows the emission sources included in the Laboratory's 2010 annual emissions inventory (LANL 2010a) and the 2010 semi-annual emissions reports (LANL 2009 and 2010b). 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 2010 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 in Section 2.12. Attachment A includes worksheets showing detailed emission calculations for individual emissions sources. A copy of the 2010 emissions inventory as submitted to NMED is presented in Attachment B. The 2010 semi-annual emissions reports are included as Attachment C.

2.1 Power Plant

The Laboratory operates a power plant at TA-3. The power plant produces steam for heating and electricity for much of the Laboratory when sufficient power from outside sources is not available. The heat produced from the power plant is used for comfort heat and hot water and to support facility processes. The power plant has three boilers that are fueled primarily with natural gas with No. 2 fuel oil as a backup. In the past, the Laboratory operated a second power plant at TA-21 and it was shut down in 2007.

For the 2010 emissions inventory, NMED requested that emissions from natural gas and No. 2 fuel oil be reported separately for the boilers located at each of the power plants. The TA-3 power plant was originally included in LANL's emissions inventory as a single unit. When a modification to the plant was made in 2001, the TA-3 power plant was separated into three separate units for emissions reporting purposes. Because each of the three boilers has the capability of burning either natural gas or No. 2 fuel oil, the TA-3 power plant is now reported as six units (ID 24, ID 25, and ID 26 for the natural gas and ID 137, ID 138, and ID 141 for the No. 2 fuel).

Table 2.0-1
Sources Included in LANL's 2010 Annual Emissions Inventory and Semi-annual Emissions Reports

Included in Annual Emissions Inventory	Included in Semi-annual Emissions Reports	Comment
Power Plant (TA-3*)	Power Plant (TA-3)	n/a**
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 emissions inventory requirements (see Section 3.1), but are not exempt for greenhouse gas reporting
Asphalt Plant	Asphalt Plant	n/a
Degreasers	Degreasers	n/a
Carpenter Shops	Carpenter Shops	n/a
Permitted Beryllium Sources	Permitted Beryllium Sources	n/a
Facility-wide Chemical Use	Facility-wide Chemical Use	n/a
Process Generators	Process Generators and Stationary Standby Generators (approximately 45 units)	Stationary standby generators are exempt from annual emissions inventory requirements (see Section 3.2), but are not exempt for greenhouse gas reporting.
TA-3 Turbine	TA-3 Turbine	n/a

*TA = Technical Area **n/a = Not Applicable

The 2010 emissions inventory reporting year used the updated emission factors for fuel oil for PM, PM_{10}, and $PM_{2.5}$ as described for the TA-3 power plant boilers.

Actual estimated emissions are calculated on the basis of metered fuel consumption and emission factors. The primary source of emission factors is AP-42, the EPA's Compilation of Air Pollutant Emission Factors (EPA 1998). However, emission factors from stack tests conducted at the TA-3 power plant when burning natural gas were also used, as appropriate.

The TA-3 power plant has historically been the largest source of NO_x emissions at the Laboratory. In 2002, a voluntary project to install pollution control equipment on the three boilers at the TA-3 power plant was completed. The three boilers were fitted with flue gas recirculation (FGR) equipment to reduce NO_x emissions. Stack testing for NO_x and CO was conducted before FGR equipment was installed and again after it was operational. Based on these stack test results, FGR reduced NO_x emissions by approximately 64%. In 2010, there was no new fuel delivered to the TA-3 power plant. Figure 2.1-1 shows a picture of the TA-3 power plant building and stacks.

For the 2010 Emissions Inventory Report, the Laboratory reported direct CO_2 and CH_4 emissions from the TA-3 power plant in tons per year. This satisfies the Laboratory's reporting requirement under 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c).

Figure 2.1-1 TA-3 power plant.

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. While most boilers are exempt from the annual emissions inventory, 160 boilers are being reported for direct CO_2 and CH_4 emissions, as required under 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c).

The boilers that are not exempt and reported in the 2010 annual emissions inventory include the following:

- three boilers at TA-48 (ID 8, ID 9, and ID 10);
- two boilers at TA-53 (ID 11 and ID 12);
- two boilers at TA-59 (ID 13 and ID 14);
- two boilers at TA-55 (ID 29 and ID 30);
- one process-related boiler at TA-50 (ID 133);
- five boilers at CMRR (ID 90, ID 104, ID 105, ID 106, and ID 107);
- two boilers at TA-16 (ID 134 and ID 53); and
- 160 boilers at various locations for CO_2 emissions only (ID 140).

All of the reported boilers burn natural gas. Operating logs of actual fuel used for the TA-55 and TA-50 boilers were used to quantify emissions from 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 virtually all of the small boilers are 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 (EPA 1998). 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 unmetered fuel use was multiplied by AP-42 emission factors for small boilers burning natural gas (EPA 1998). 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

The TA-60 asphalt plant (ID 116) began operations in July 2005. This unit replaced the TA-3 asphalt plant, which has not operated since June 2003. The TA-3 asphalt plant was dismantled and removed in September 2003. Information on the amount of asphalt produced and the duration of daily operation at the TA-60 asphalt plant was provided as part of a monthly site support contractor data deliverable. The total asphalt produced in 2010 was 1,410 tons.

Per NMED request, direct CO_2 and CH_4 emissions from stationary combustion sources in tons per year are being reported for 2010. This satisfies the Laboratory's reporting requirement under 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c).

The emissions from the asphalt plant include criteria pollutants, HAPs and CO_2. None of the emissions were significant in regard to the overall Laboratory emissions. The largest pollutant emitted from the asphalt plant was CO at 1.6 tons per year.

2.4 Data Disintegrator

The data disintegrator is included in the 2010 emissions inventory as ID 89. Operation of this source started in August 2004. Emissions are calculated using the methodology described in the permit application dated June 23, 2003. Emissions of PM, PM_{10}, and $PM_{2.5}$ are calculated based on the number of boxes shredded, the amount of dust estimated to enter the exhaust (provided by the manufacturer), and the control efficiency of the cyclone and baghouse (also provided by the manufacturer). The permit application included $PM_{2.5}$ emission estimates. Therefore, an emission methodology had to be developed for the emission inventory reporting. No specific PM size distribution data were available. However, the manufacturer reported that dust into the exhaust would be in the size range of 5 to 20 μm. Based on visual observation and engineering judgment, a particle size distribution in the exhaust was estimated as follows:

- $PM_{2.5}$ 15%
- PM_{10} 90%
- TSP 100%

The number of boxes of material shredded is provided on a monthly data deliverable from the site support contractor. The total number of boxes shredded at the data disintegrator in 2010 was 1,054.

2.5 Degreasers

The halogenated solvent cleaning machine at TA-55 has a capacity of 18 l 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 ID 21. LANL uses a mass balance approach to estimate emissions. Logbooks are kept on the amount of solvent added and removed from the machine. Additionally, solvent levels in the machine are logged monthly. LANL has two additional halogenated solvent cleaning machines registered with NMED (ID 29 and ID 30). These units were not operational in 2010. The emissions from the TA-55 degreaser for this reporting period are 19.18 lbs or 0.01 tons per year. This source category is reported in both the annual emissions inventory and the semi-annual emissions reports.

2.6 Carpenter Shop

LANL operates a carpenter shop at TA-3 (ID 3) which was operated intermittently throughout the year. 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 Area 3 and is included on the semi-annual emissions reports. Additionally, a carpenter shop located at TA-15 (ID 4) is included in the Operating Permit and began operations in June 2005.

Emissions from the carpenter shops were calculated based on the flow rate out of the cyclone, the estimated concentration of particulate in the exhaust, AP-42 emission factors, and the hours of operation of the cyclones.

In 2010, total operation of the TA-3 carpenter shop was 124.6 hrs and the total operation of the TA-15 carpenter shop was 65.9 hrs. The emissions for both shops can be found in Table 2.6-1.

Table 2.6-1
Emissions for Carpenter Shops

Carpenter Shop	PM_{10} (tons)	$PM_{2.5}$ (tons)	TSP (tons)
TA-3	0.041	0.020	0.044
TA-15	0.017	0.008	0.018

2.7 Oil Storage Tanks

Two large diesel storage tanks are located at the TA-3 power plant for backup fuel to the boilers. Emissions from these tanks are estimated using software developed by EPA for estimating emissions from storage tanks (EPA 2008b). The TANKS 4.0 software requires inputs for tank parameters, site-specific meteorological conditions, and actual fuel throughputs.

The Laboratory included 15 storage tanks in its recently updated Title V permit application because they were subject to 40 CFR 60, Subpart Kb, New Source Performance Standards. Fourteen of the 15 tanks store mineral oil, scintillation oil, or dielectric oil, which all have vapor pressures of <0.01 mm

Hg. Applicability of Subpart Kb was modified by EPA in 2003 and these tanks are no longer subject to this regulation and were subsequently removed from the draft LANL Title V permit application.

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). In 2010, NMED did not require emissions from these tanks to be included in the annual emissions inventory submittal as the emissions were insignificant. These tanks are also not included in the Title V Operating Permit semi-annual emissions reports.

2.8 Permitted Beryllium-Machining Operations

The Laboratory operates four permitted beryllium-machining operations that are subject to 40 CFR 61, Subpart C, and National Emission Standards for Beryllium. Emissions reported for the Beryllium Test Facility (ID 3) are from actual stack emissions measurements. Emissions for the Target Fabrication Facility (ID 2) are from initial compliance stack testing and are reported as permitted emission levels. In addition, emissions from the Plutonium Facility (ID 6) are reported at permitted emission levels. Foundry operations within the Plutonium Facility did not occur during this reporting period. Total emissions from all permitted beryllium operations are included in the semi-annual emissions reports.

2.9 Generators

LANL has four permitted generators (ID 56, ID 119, ID 120, and ID 135) with internal combustion engines located at TA-33 to support research activities. NMED issued a construction permit (Permit No. 2195-F) in October 2002 for installing the initial generator, and this unit is included in LANL's Title V Operating Permit. The unit first operated in May 2006. The unit (ID 56) operated for 65 hrs in 2010. Three more units were permitted in August 2007 at TA-33 (Permit No. 2195-P); they operated for a total of 115 hrs in 2010.

The Laboratory maintains approximately 37 stationary standby generators that are considered exempt sources under the Construction Permit regulations (20.2.72.202.b NMAC) and the annual emissions inventory requirements. However, the generators were included in the 2010 Emissions Inventory report in order to report CO_2 and CH_4 emissions in accordance with greenhouse gas regulations. These sources are also 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 (EPA 1996). Emissions are then summed for each pollutant and reported on the semi-annual emissions reports for this source category. In addition, approximately 54 generators for CO_2 and CH_4 emissions are included in the Emissions Inventory report (ID 139).

2.10 Combustion Turbine

LANL has one combustion turbine located at the TA-3 power plant (ID 112). A revised construction permit was issued by NMED July 2004 to add the TA-3 combustion turbine as a new permitted source. This unit started operations in September 2007. Emission calculations are based on the initial stack compliance tests performed in 2007, AP-42, Tables 3.1-2a and 3.1-3, and information provided by the manufacturer. In 2010 this combustion turbine operated for 364.65 hours.

2.11 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 2.11-1 shows a typical laboratory at LANL where chemicals are used.

For the purposes of annual emissions inventory reporting, one equipment number has been assigned for all R&D chemical use (ID 7). Facility-wide chemical use emissions are reported on both the annual emissions inventory and the semi-annual emissions reports. The methods used to quantify emissions of VOC and HAPs from R&D activities are discussed below.

Figure 2.11-1 Example of a laboratory fume hood at LANL.

2.11.1 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, 2010, and December 31, 2010. This dataset included 41,254separate line items of chemicals purchased.

The dataset was reviewed electronically to identify all VOCs purchased and received at LANL in 2010. 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

Purchasing = Use = Emissions

From the dataset of chemicals purchased in 2010, 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.*

*This exemption was applied only to biological research solutions. Otherwise, this exemption was not applied (see Table 3.3-1).

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% emitted to air. Estimated emissions of VOCs from chemical use in 2010 totaled 6.66 tons.

2.11.2 HAP Emissions

Section 112(b) of the 1990 Clean Air Act Amendments listed 188 unique HAPs identified for potential regulation by EPA. In 1995, caprolactam was delisted as a HAP, and methyl ethyl ketone was delisted in 2005. Of the remaining 187 listed HAPs, 17 are classes of compounds (e.g., nickel compounds). Use of the 187 listed chemicals in activities at the Laboratory was evaluated and quantified for the annual emissions inventory submittal to NMED.

The ChemLog inventory system 2010 dataset 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 2.11.1 and Table 3.3-1 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 2010 was 3.76 tons.

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 beryllium, 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.

2.12 Greenhouse Gas Emissions

In order to satisfy the Laboratory's reporting requirement under 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c). The Laboratory's 2010 Emissions Inventory Report includes direct carbon dioxide and methane emissions from stationary combustion sources, fugitive emissions from research and development activities and indirect emissions from electricity use in tons per year. The carbon dioxide equivalents (CO_2e) for methane are also included. This means that the methane emissions are multiplied by 21 so it is equivalent to the emissions from carbon dioxide. Please view all the greenhouse gas emissions on Table 2.12-1.

2.12.1 Greenhouse Gas Emissions from Research and Development Activities

Vented and fugitive emissions were reported in the 2010 Annual Emissions Inventory for research and development activities around the Laboratory (ID 7). The emissions from chemical use were found by querying purchases of methane and carbon dioxide and assuming that they emitting 100% of their weight. This provides the very conservative estimates of 3.18 tons of carbon dioxide emissions and 1.27 tons (26.67 CO_2e)of methane emissions.

2.12.2 Greenhouse Gas Emissions from Electrical Use

Indirect emissions created from electrical use at LANL-owned properties and leased property were reported in the 2010 Annual Emissions Inventory. LANL makes up more than 2,000 individual facilities, including 47 technical areas with 8 million square feet under roof. The LANL owned properties released 254,356 tons of carbon dioxide. LANL also leases 396,623.6 sq ft of property, which emitted 4,477.84 tons of carbon dioxide.

2.13 Emissions Summary by Source

Table 2.12-1 provides a summary of LANL's 2010 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 2.12-1
Summary of LANL 2010 Reported Emissions for Annual Emissions Inventory

	NO_X (tons/yr)	SO_x (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CO (tons/yr)	VOC (tons/yr)	HAPs (tons/yr)	CO_2 (tons/yr)	CH_4 (tons/y)	CO_2e*** (tons/yr)
TA-3 Power Plant Boilers	13.210	0.139	1.731	1.731	9.110	1.252	0.430	24,776.33	0.047	0.987
Non-Exempt Boilers	6.60	0.042	0.593	0.593	4.834	0.386	0.13	7,544.9	0.142	2.982
Asphalt Plant	0.045	0.003	0.004	0.004	1.562	0.006	0.005	124.97	0.006	0.126
Data Disintegrator	n/a*	n/a	0.04	0.03	n/a	n/a	n/a	n/a	n/a	n/a
Degreaser	n/a	n/a	n/a	n/a	n/a	0.01	0.01	n/a	n/a	n/a
Carpenter Shops	n/a	n/a	0.058	0.028	n/a	n/a	n/a	n/a	n/a	n/a
R&D Chemical Use	n/a	n/a	n/a	n/a	n/a	6.66	3.76	n/a	n/a	n/a
TA-33 Generators	1.88	0.21	0.08	n/a	1.24	0.06	4.55E-04	114.12	0.005	0.105
TA-3 Turbine	1.972	0.137	0.265	0.265	0.410	0.086	0.054	4,246.94	0.080	1.68
Exempt Boilers (GHG** only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23,206.50	0.438	9.198
Stationary Standby Generators (GHG only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	278.97	0.011	0.231
Electricity Use on LANL Owned Property (GHG only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	253,211.07	3.370	70.77
Electricity Use on Leased Property (GHG only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4,457.68	0.059	1.239
R&D Fugitive/Venting (GHG only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3.18	1.27	26.67
TOTAL	**23.71**	**0.53**	**2.77**	**2.65**	**17.16**	**8.46**	**4.39**	**317,964.66**	**5.43**	**113.99**

* n/a = Not Applicable. ** GHG = greenhouse gas. ***CO_2e = Carbon Dioxide Equivalent from methane emissions

Table 2.12-2 provides a summary of 2010 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 2.12-2
Summary of LANL 2010 Semi-annual Emissions as Reported Under Title V Operating Permit Requirements

	NO_X (tons/yr)	SO_X (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CO (tons/yr)	VOC (tons/yr)	HAPs (tons/yr)
TA-3 Power Plant Boilers	13.210	0.139	1.731	1.731	9.110	1.252	0.430
All Small Boilers & Heaters	27.93	0.17	2.214	2.214	22.753	1.56	0.534
Asphalt Plant	0.045	0.003	0.004	0.004	1.562	0.006	0.005
Data Disintegrator	n/a*	n/a	0.04	0.03	n/a	n/a	n/a
Degreaser	n/a	n/a	n/a	n/a	n/a	0.01	0.01
Carpenter Shops	n/a	n/a	0.058	0.028	n/a	n/a	n/a
R&D Chemical Use	n/a	n/a	n/a	n/a	n/a	6.66	3.76
Stationary Standby Generators	6.00	0.25	0.30	0.30	1.39	0.30	0.002
TA-33 Generators	1.88	0.24	0.08	n/a	1.24	0.06	4.55E-04
TA-3 Turbine	1.972	0.137	0.265	0.265	0.410	0.086	0.054
TOTAL	**51.04**	**0.94**	**4.69**	**4.57**	**36.47**	**9.93**	**4.80**

* n/a = Not Applicable. ** 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, March 25, 2005 (NMED 2005), and
- List of Trivial Activities, January 10, 1996 (NMED 1996).

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 (NMED 2005). Specifically, boilers were exempted from emissions inventory reporting requirements if they met one of the following requirements:

- Fuel-burning equipment that uses gaseous fuel has a design rate less than or equal to 5M BTU/hr, 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 **1 ton/yr** of any regulated pollutant . . . .

Any boiler that was not used exclusively for comfort heating or hot water was evaluated for the one 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 equipment number.

Although these exempt boilers are not required on the Emissions Inventory report, they are required for the Greenhouse Gas Emissions reporting. Per NMED request, direct CO_2 and CH_4 emissions from stationary combustion sources in tons per year are being reported for in 2010. This satisfies LANL's reporting requirement under 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c).

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 73 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, propane, 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 which on a temporary basis replace equipment used in normal operation, and which either have an allowable emission rate or potential to emit for each pollutant that is equal to or less than the equipment replaced, or which do not operate for a period exceeding 500 hr 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.

Direct CO_2 and CH_4 emissions from stationary combustion sources are being reported in 2010. Therefore, generators that are exempt for the Emissions Inventory report are now being declared in the Greenhouse Gas Emissions report, as required by 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c).

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 3.3-1.

Fuels such as propane, kerosene, and acetylene were analyzed separately and are not listed in Table 3.3-1. When fuels are burned in an open flame, almost all of the fuels are consumed and VOC emissions are minimal. Emissions from fuel combustion are accounted for using emission factors for each fuel-burning unit.

Table 3.3-1
Exemptions Applied for Chemical Use Activities

Basis of Exemption	Activity Type	Activity
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	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.
		Activities for maintenance and repair of equipment, pollution-control equipment, or motor vehicles either inside or outside of a building.
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	Bench-scale laboratory equipment used for physical or chemical analysis but not lab fume hoods or vents. *Note: This exemption was applied only to biological research solutions. Otherwise, this exemption was not applied.*

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 Insignificant Activities (NMED 2005) and List of Trivial Activities (NMED 1996) (refer to Table 3.3-1).

3.5 Paints

An analysis of VOC and HAP emissions resulting from painting activities at the Laboratory was performed to determine if certain exemptions apply. Paint information for 2010 was gathered from the ChemLog chemical inventory system. These records were evaluated for applicability of exemptions for trivial and insignificant activities.

The following exemptions from NMED/AQB Operating Permit Program List of Trivial Activities (NMED 1996) 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 amount of paint that did not qualify for a Trivial Activity totaled to 13,220 pounds (6.6 tons) which is above the two-ton emission limit for insignificant activities:

- 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 tons per year.

In conclusion, painting materials that were used in the construction project at RLUOB were reported in the Semi-Annual Emissions Inventory Report for July through December 2010. The reported paint emissions for 2010 were 440.11 lbs (0.22 tons) of VOCs and 181.53 lbs (0.09 tons) of HAPs. After those paints were reported, there were 3,832 pounds (1.9 tons) of unclassified paint leftover, which then falls under the 2 ton limit, shown above.

4.0 EMISSIONS SUMMARY

4.1 2010 Emissions Summary

Table 4.1-1 presents facility-wide estimated actual emissions of criteria pollutants for 2010 as reported in the annual emissions inventory and the semi-annual emissions reports. In addition, the Title V Operating Permit emissions limits are included. Table 4.1-2 presents estimated actual emissions for HAPs from chemical use. Emission unit information and detailed emissions calculations are included in Attachment A. The 2010 emissions inventory report as submitted to NMED is presented in Attachment B. Attachment C includes semi-annual emissions reports for 2010.

Table 4.1-1
LANL Facility-Wide Criteria Pollutant Emissions for 2010

Pollutant	Estimated actual Emissions for Annual Emissions Reporting (tons/yr)	Estimated actual Emissions for Semi-annual Title V Operating Permit Reporting (tons/yr)	Title V Operating Permit Facility-Wide Emission Limits (tons/yr)
NO_x	17.1	51.0	245
SO_x	0.5	1.0	150
CO	12.4	36.5	225
PM	2.2	4.7	120
PM_{10}	2.2	4.7	120
$PM_{2.5}$	2.2	4.7	—*
VOC	8.1	9.9	200
CO_2	317,964.66	n/a	—**

*No Title V Operating Permit facility-wide emission limits on $PM_{2.5}$.**No greenhouse gas emission limit and CO_2 values are in metric tonnes per year.

Table 4.1-2
LANL HAP Emissions from Top Five Chemicals Used in 2010

Pollutant	Chemical Use HAP Emissions* (tons/yr)
Top 5 HAPs	
Methyl chloroform (1,1,1-Trichloroethane)	1.44
Glycol ethers	0.41
Methanol	0.29
Methylene chloride (Dichloromethane)	0.23
HexaneAll other HAPs from Chemical Use	0.22
	2.21
Total HAPs	**4.8**

*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.

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 4.1-1 shows criteria air pollutant emissions by source for 2010, excluding the very small emissions sources such as the data disintegrator, asphalt plant, degreasers, and carpenter shop. As the figure shows, the TA-3 power plant and the sum of emissions from all small boilers and heaters were the largest sources of CO and NO_x emissions in 2010. R&D chemical use was the largest source of VOC emissions.

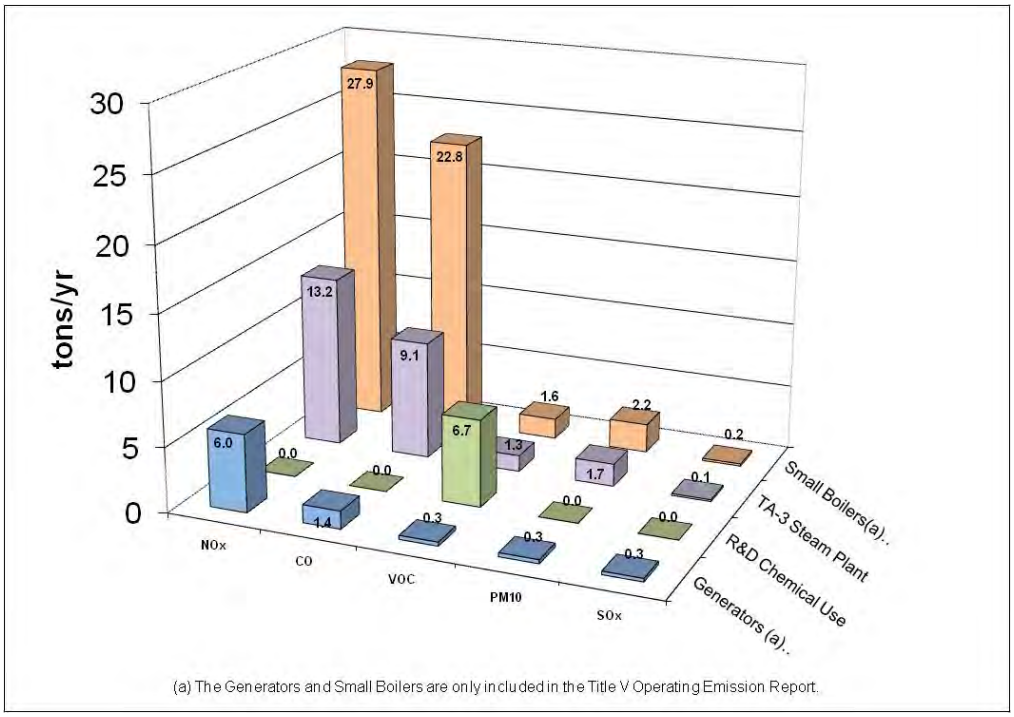

Figure 4.1-1 Emissions of criteria pollutants by source in 2010.

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 this section. 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 4.1-2 provides a comparison of the past 10 years' facility-wide emissions for criteria air pollutants as reported to NMED on the annual emissions inventory submittal. The facility-wide emission limits included in LANL's Title V Operating Permit are also shown on the graph.

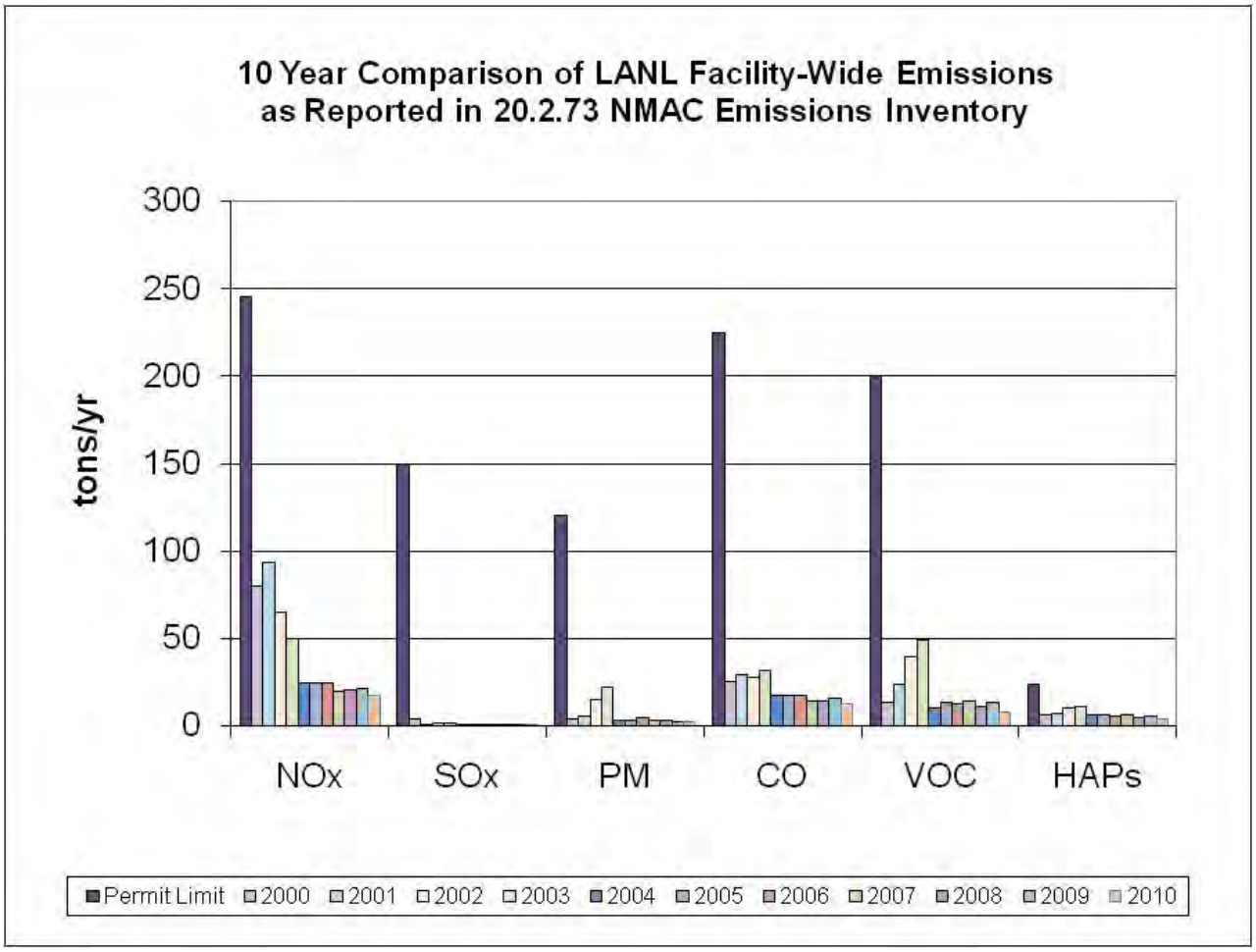

Figure 4.1-2 Comparison of facility-wide annual reported emissions from 1999–2010.

Figure 4.1-3 presents VOC and HAP emissions from chemical use activities for the last 10 years. 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.

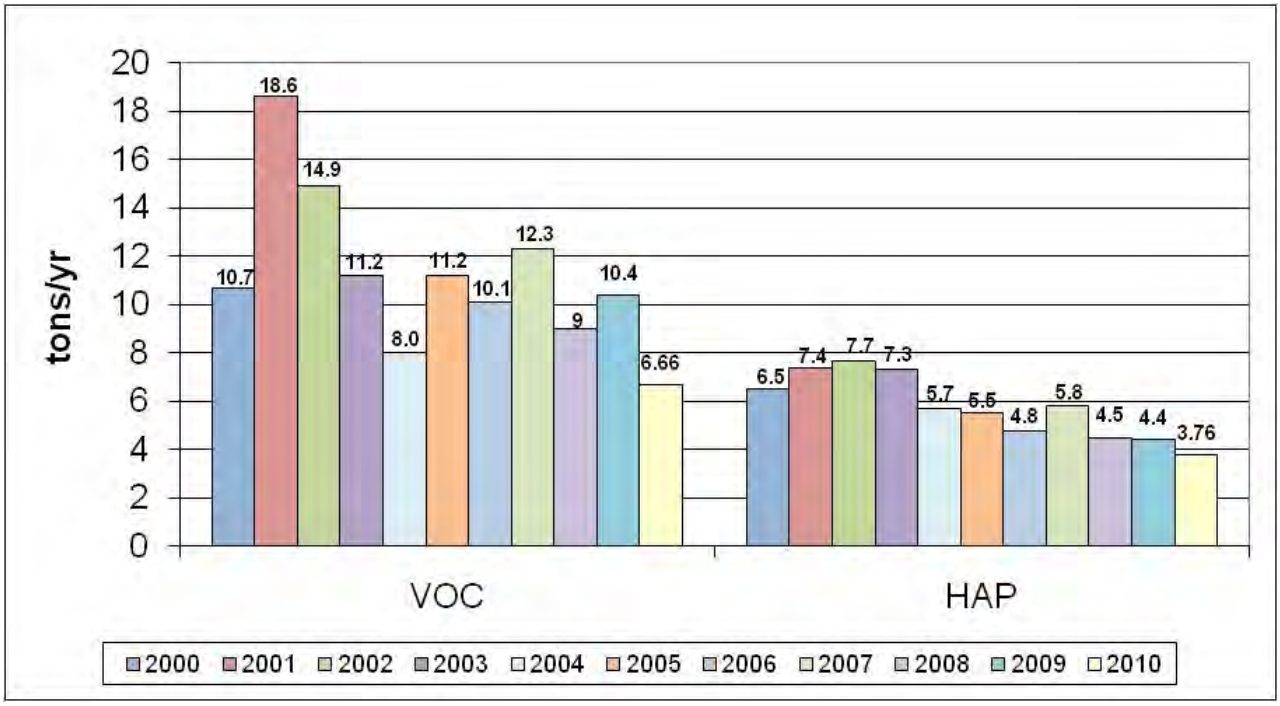

Figure 4.1-3 VOC and HAP emissions from chemical use, 1999–2010.

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Attachment A

Emission Calculation Worksheets
For Individual Emission Unit

2010 Greenhouse Gas Emissions Summary

Source		Greenhouse Gases (in Metric Tons)			
		Carbon Dioxide (CO_2) Emissions	Methane (CH_4) Emissions	Nitrous Oxide (N_2O) Emissions	CO_2e
Combustion:	Asphalt Plant	124.97	0.0061	0.0012	125.48
	Boilers (all except Power Plant)	30,751.40	0.5800	0.0580	30,781.56
	Combustion Turbine	4,246.94	0.0801	0.0080	4,251.10
	Generators - Permitted	114.12	0.0046	0.0009	114.50
	- Stationary Standby	278.97	0.0111	0.0022	279.89
	- Portable	143.70	0.0058	0.0012	144.19
	Power Plant	24,776.33	0.4675	0.0468	24,800.65
Total GHG Emissions from Combustion:		60,436.44	1.1552	0.1183	
CO_2 Equivalents (CO_2e) from Combustion per gas:		60,436.44	24.2598	36.6725	
Total CO_2 Equivalents (CO_2e) from Combustion:		**60,497.37**			
Electricity Use:	LANL Owned Properties	253,211.07	3.3704	3.4650	254,356.00
	Leased Properties	4,457.68	0.0593	0.0610	4,477.84
Total GHG Emissions from Electricity Use:		257,668.76	3.4297	3.5260	
CO_2 Equivalents (CO_2e) from Electricity per gas:		257,668.76	72.0234	1,093.0580	
Total CO_2 Equivalents (CO_2e) from Electricity Use:		**258,833.84**			
Vented & Fugitive:	Sanitary Wastewater Treatment Facility				0.00
	Vented & Fugitive (R&D)				0.00
Total GHG Emissions from Venting/Fugitive:		0.00	0.0000	0.0000	
CO_2 Equivalents (CO_2e) from Venting/Fugitive per gas:		0.00	0.0000	0.0000	
Total CO_2 Equivalents (CO_2e) fromVenting/Fugitive:		**0.00**			
CO_2 Equivalents (CO_2e) per gas at LANL:		318,105.20	96.28	1,129.73	
Total CO_2 Equivalents (CO_2e) at LANL:		**319,331.21**			

2010 TA-60 BDM Asphalt Plant

Data Reviewed By / Date: _____

Month	Data Entry Asphalt Produced (Tons)	12-Month Rolling Total	Month	Data Entry Asphalt Produced (Tons)	12-Month Rolling Total
January	16	1,278	July	146	1,385
February	89	1,305	August	47	1,372
March	92	1,272	September	55	1,286
April	246	1,452	October	158	1,412
May	202	1,487	November	70	1,424
June	280	1,273	December	9	1,410
6 mo. Total	925		6 mo. Total:	485	

Annual Hours			
Month	Hours	Month	Hours
Jan	0.0	Jul	19.57
Feb	15.6	Aug	4.83
Mar	11.8	Sep	7
Apr	21.8	Oct	16.17
May	26.5	Nov	11.4
Jun	23.6	Dec	1.8
Total:	99.2	Total:	60.8

Tons/Asphalt Produced: 1,410

12-Month Rolling Permit Limit is 13,000 Tons

Annual Total (to date): 160 Hours

Hours are Limited to 4380 per Year.

Emission Calculations

Pollutant	Emission Factor (lbs/hr)	Annual Emissions (tons)	Emissions (tons) Jan-June	Emissions July-Dec (tons)	Reference
NOx	0.56	0.045	0.028	0.017	(b)
CO	19.53	1.562	0.968	0.594	(b)
PM	0.33	0.026	0.016	0.010	(b)
Pollutant	**Emission Factor (lb/ton)**	**Annual Emissions (tons)**	**Emissions (tons) Jan-June**	**Emissions (tons) July-Dec**	**Reference**
PM-10	0.006	0.004	0.003	0.001	(c)
PM-2.5	0.006	0.004	0.003	0.001	(c)
SOx	0.0046	0.003	0.002	0.001	(a)
VOC	0.0082	0.006	0.004	0.002	(a)
HAPs					
Acetaldehyde	0.00032	0.000	0.000	0.000	(d)
Benzene	0.00028	0.000	0.000	0.000	(d)
EthylBenzene	0.0022	0.002	0.001	0.001	(d)
Formaldehyde	0.00074	0.001	0.000	0.000	(d)
Napthalene	0.000036	0.0000	0.000	0.000	(d)
POM	0.00011	0.0001	0.000	0.000	(d)
Quinone	0.00027	0.000	0.000	0.000	(d)
Toluene	0.001	0.001	0.000	0.000	(d)
Xylene	0.0027	0.002	0.001	0.001	(d)
TOTAL HAPS		0.005	0.004	0.002	
EPCRA 313		tons	lbs./year		
Lead	8.90E-07	6.27E-07	0.0013		(e)
Sulfuric Acid	0.0046	3.24E-03	6.49		(f)
Mercury	4.10E-07	2.89E-07	0.0006		(e)
PACs	2.70E-08	1.90E-08	3.81E-05		(d)
Benzo(g,h,i) perylene	5.00E-10	3.53E-10	7.05E-07		(g)

Reference
(a) AP-42, Sec. 11.1, *Hot Mix Asphalt Plants* , Table 11.1-5 & 11.1-6, Updated 4/2004
(b) Calculated using stack test results performed on May 18, 2009 by TRC Air Mesurements. Pound per hour values were determined at a throughput rate of 45 tons/hour (the highest achievable rate during the test).
(c) PM-10 emission factor is calculated as 64% of the PM emission factor, using the same ratio of PM to PM-10 as provided in AP-42 Table 11.1-1. No data provided for PM-2.5, assume same as PM-10.
(d) AP-42, Table 11.1-9, *Hot Mix Asphalt Plants,* Updated 4/2004
(e) AP-42, Table 11.1-11, *Hot Mix Asphalt Plants,* Updated 4/2004
(f) Assume all SOx is converted to sulfuric acid
(g) EPCRA PAC Guidance Document, EPA-260-B-01-03, June 2001, Table 2-3

2010 TA-3 & TA-15 Carpenter Shops

NMED ID -- TA-3 (AREA 3) and TA-15 (AREA 4)

TA-3	Data Entry	TA-3	Data Entry
	Hours of Operation[1]		Hours of Operation[1]
Month	**TA-3**	**Month**	**TA-3**
January	5.3	**July**	4.2
February	4.3	**August**	28.2
March	17.6	**September**	13.0
April	11.1	**October**	13.1
May	12.0	**November**	1.1
June	9.5	**December**	5.2
6 mo. Total	59.8	**6 mo. Total:**	64.8

TA-15	Data Entry	TA-15	Data Entry
	Hours of Operation[1]		Hours of Operation[1]
Month	**TA-15**	**Month**	**TA-15**
January	5.4	**July**	7.0
February	2.4	**August**	5.2
March	4.0	**September**	6.6
April	8.1	**October**	8.1
May	7.8	**November**	6.3
June	3.3	**December**	1.7
6 mo. Total	31.0	**6 mo. Total:**	34.9

Saws, drills, shaping and sanding equipment shall each not operate in excess of 4368 hours per year.

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

Reviewed By/Date: _____

Carpenter Shop Emissions Calculations for 2010

ANNUAL EMISSIONS

	Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone	PM Post Cyclone Emissions (tons/year)		
	Exhaust Flow (ft3/min)	Hours of[3] 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	125	0.119	0.043	0.003	0.021	0.020
TA-15-563	2100	66	0.049	0.018	0.001	0.009	0.008

January through June Emissions

	Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone	PM Post Cyclone Emissions (tons)		
	Exhaust Flow (ft3/min)	Hours of[3] 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	60	0.057	0.021	0.001	0.010	0.009
TA-15-563	2100	31	0.023	0.008	0.001	0.004	0.004

July through December Emissions

	Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone	PM Post Cyclone Emissions (tons)		
	Exhaust[1] Flow (ft3/min)	Hours of[3] 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	65	0.062	0.023	0.002	0.011	0.010
TA-15-563	2100	35	0.026	0.009	0.001	0.005	0.004

Conversions:

lb/ton	lb/grain	min/hr	ton/lb
2000	0.00014	60	0.0005

Assumptions:

	Cyclone[4] Efficiencies	% PM in Wood Dust Prior[5] 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^3 [2]
0.03

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

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

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: _____

2010 TA-52 Data Disintegrator (EQPT 89)

Reviewed By / Date: _____

Month	Data Entry Boxes[c] Shredded	Month	Data Entry Boxes[c] Shredded
January	73	**July**	20
February	57	**August**	146
March	166	**September**	49
April	135	**October**	63
May	123	**November**	89
June	43	**December**	90
6 mo. Total:	597	**6 mo. Total:**	457

Annual Boxes:	**1,054**

Emission Calculations

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

Average Box Weight[a]	
45	Pounds

	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	47,430	53.4	0.03	80.0	0.04	88.9	0.04
January - June	26,865	30.2	0.02	45.3	0.02	50.4	0.03
July - December	20,565	23.1	0.01	34.7	0.02	38.6	0.02

Reference

(a). Estimated maximum box weight is 45 pounds. Information provided by shredding operations. Full box weight of tightly packed paper.

(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 application.

(c). Information provided by the shredding operations personnel.

(d). Information on control equipment efficiencies was provided by the manufacturer (SEM) of the Data Disintegrator. 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 application. (see cyclone efficiency tab for more info.)

(e). 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.

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.

TA-55-DG-1 Degreaser Emissions
Jan-01-2010 through Dec-20-2010

Month Year	Emissions (lbs)
Jan-10	0.82
Feb-10	0
Mar-10	6.33
Apr-10	0.63
May-10	0
Jun-10	3.16
Jul-10	0
Aug-10	1.27
Sep-10	1.27
Oct-10	1.27
Nov-10	2.53
Dec-10	1.9
Total Emissions:	**19.18**

*NA is displayed if data for the month is not available

Type: Cold Batch
TA: 55
Building:
Solvent: Trichloroethylene

Permitted Generators

TA	Bldg	ID #	Manufacturer	Serial #	MODEL	KW	Fuel Type	Reading 2nd half of previous year		First Half 2010 6 Month Reading Date	First Half 2010 Reading	First Half 2010 Hours Run	Second Half 2010 12 Month Reading Date	Second Half 2010 Reading	Second Half 2010 Hours Run	* Total Run Hours
33	290	G-0012	Kohler	375801	1600ROZD	1600	Diesel	Dec. 09	34.3	Jun-10	87.5	53.2	Dec-10	99.0	11.5	64.7
33	151	G-0007	Caterpillar	6PK01065	XQ225	225	Diesel	Dec. 09	3307.0	Jun-10	3393.0	86.0	Dec-10	3407.0	14	100.0
33	209	G-0008	Kohler	2025460	20EORZ	20	Diesel	Dec. 09	384.1	Jun-10	387.1	3.0	Dec-10	393.0	5.9	8.9
33	280	G-0010	Kohler	2025461	20EORZ	20	Diesel	Dec. 09	175.9	Jun-10	176.8	0.9	Dec-10	182.0	5.2	6.1

*** The 225 kW and the two 20 kW generators have a limit of 500 hours of operation per year. The 1600 kW unit is limited to 900 hours per year.**

Permit ID	ID #	Unit	First 6 Month Emissions of 2010 NOx (lbs)	CO (lbs)	SOx (lbs)	PM (lbs)	VOC (lbs)	HAPs (lbs)	Second 6 Month Emissions of 2010 NOx (lbs)	CO (lbs)	SOx (lbs)	PM (lbs)	VOC (lbs)	HAPs (lbs)
TA-33-G-1	G-0012	33-290	2298.2	1872.6	340.5	76.6	42.6	5.0E-01	496.8	404.8	73.6	16.6	9.2	1.1E-01
TA-33-G-4	G-0007	33-151	812.7	174.2	58.1	58.1	58.1	2.6E-01	132.3	28.4	9.5	9.5	9.5	4.3E-02
TA-33-G-2	G-0008	33-209	2.5	0.5	0.2	0.2	0.2	8.1E-04	5.0	1.1	0.4	0.4	0.4	1.6E-03
TA-33-G-3	G-0010	33-280	0.8	0.2	0.1	0.1	0.1	2.4E-04	4.4	0.9	0.3	0.3	0.3	1.4E-03
Permit ID	**ID #**	***Unit***	***NOx (tons)***	***CO (tons)***	***SOx (tons)***	***PM (tons)***	***VOC (tons)***	***HAPs (tons)***	***NOx (tons)***	***CO (tons)***	***SOx (tons)***	***PM (tons)***	***VOC (tons)***	***HAPs (tons)***
TA-33-G-1	G-0012	33-290	1.149	0.936	0.170	0.038	0.021	2.48E-04	0.248	0.202	0.037	0.008	0.005	5.35E-05
TA-33-G-4	G-0007	33-151	0.406	0.087	0.029	0.029	0.029	1.31E-04	0.066	0.014	0.005	0.005	0.005	2.13E-05
TA-33-G-2	G-0008	33-209	0.001	0.000	0.000	0.000	0.000	4.06E-07	0.002	0.001	0.000	0.000	0.000	7.98E-07
TA-33-G-3	G-0010	33-280	0.000	0.000	0.000	0.000	0.000	1.22E-07	0.002	0.000	0.000	0.000	0.000	7.03E-07

ANNUAL TOTALS (tons)

Pollutant	NOx	CO	SOx	PM	VOC	HAPs
TA-33-G-1	1.398	1.139	0.207	0.047	0.026	3.0E-04
TA-33-G-4	0.473	0.101	0.034	0.034	0.034	1.5E-04
TA-33-G-2	0.004	0.001	0.000	0.000	0.000	1.2E-06
TA-33-G-3	0.003	0.001	0.000	0.000	0.000	8.2E-07
Tons/Year	**1.88**	**1.24**	**0.24**	**0.08**	**0.06**	**4.55E-04**

Reviewed by / Date: _____

EMISSION FACTORS	NOx lb/kw-hr	CO lb/kw-hr	SOx lb/kw-hr	PM lb/kw-hr	PM_{10} lb/kw-hr	VOC lb/kw-hr
1600kw Generator [a]	0.027	0.022	0.004	0.0009	0.0009	0.0005
Small Diesel fired [b]	0.042	0.009	0.003	0.003	0.003	0.003

References:

447 kw is the size limit for determining large vs. small diesel fired generator. This information was taken from the operating permit application.

(a) Manufacturer supplied emission factors for NOx, CO, and VOCs. Emission factors for SOx, PM, and PM10 from AP-42, Table 3.3-1 & Table 3.4-1. 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) Emission factors for small diesel fired boilers were taken from AP-42 (fifth edition) Tables 3.3-1 and 3.3-2.

Emission Factors (lb/kwh)
Diesel (small)
Diesel (large)
Location
33-290
33-151
33-209
33-280
Total Emissions (lbs)
Tons/Half/HAP
Tons/year/HAP
Tons/Year Total

Emission Factors frc

TA-33-G-1
(1600 kW Generator, 1500 kW Derated for Altitude)
12-Month Rolling kilowatt-hours

Month	Hour Meter Reading	Hours Operated	Rolling Total kw-hr	Month	Hour Meter Reading	Hours Operated	Rolling Total kw-hr
January	85.0	0.0	**75,600**	**July**	87.5	0.0	**74,850**
February	85.6	0.6	**75,750**	**August**	88.1	0.6	**75,750**
March	85.8	0.2	**76,050**	**September**	88.1	0.0	**39,600**
April	86.2	0.4	**76,650**	**October**	88.6	0.5	**18,150**
May	87.5	1.3	**78,600**	**November**	99.3	10.7	**27,300**
June	87.5	0.0	**78,150**	**December**	101.0	1.7	**24,000**

Generator is limited to 1,350,000 kWh/year

HAPS (lbs)														HAPS (lbs)
Benzene		Toluene		Xylenes		1,3-Butadiene		Formaldehyde		Acetaldehyde		Acrolein		Naphth
3.19E-06		1.40E-06		9.73E-07		1.34E-07		4.03E-06		2.62E-06		3.16E-07		2.90E
2.65E-06		9.60E-07		6.59E-07				2.69E-07		8.61E-08		2.69E-08		4.44E
1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half
2.26E-01	4.88E-02	8.17E-02	1.77E-02	5.61E-02	1.21E-02	0.00E+00	0.00E+00	2.29E-02	4.96E-03	7.33E-03	1.58E-03	2.29E-03	4.95E-04	3.78E-02
6.17E-02	1.00E-02	2.70E-02	4.40E-03	1.88E-02	3.07E-03	2.58E-03	4.21E-04	7.80E-02	1.27E-02	5.07E-02	8.25E-03	6.11E-03	9.95E-04	5.60E-03
1.91E-04	3.76E-04	8.38E-05	1.65E-04	5.84E-05	1.15E-04	8.01E-06	1.58E-05	2.42E-04	4.76E-04	1.57E-04	3.09E-04	1.90E-05	3.73E-05	1.74E-05
5.74E-05	3.31E-04	2.51E-05	1.45E-04	1.75E-05	1.01E-04	2.40E-06	1.39E-05	7.25E-05	4.19E-04	4.72E-05	2.72E-04	5.69E-06	3.29E-05	5.21E-06
2.87E-01	**5.95E-02**	**1.09E-01**	**2.24E-02**	**7.50E-02**	**1.54E-02**	**2.59E-03**	**4.50E-04**	**1.01E-01**	**1.85E-02**	**5.82E-02**	**1.04E-02**	**8.43E-03**	**1.56E-03**	**4.34E-02**
1.44E-04	**2.98E-05**	**5.44E-05**	**1.12E-05**	**3.75E-05**	**7.71E-06**	**1.30E-06**	**2.25E-07**	**5.06E-05**	**9.27E-06**	**2.91E-05**	**5.21E-06**	**4.21E-06**	**7.80E-07**	**2.17E-05**
1.74E-04		**6.56E-05**		**4.52E-05**		**1.52E-06**		**5.99E-05**		**3.43E-05**		**4.99E-06**		**2.63E**
4.55E-04														

)m AP-42, Volume 1, Fifth Edition (Small Diesel Engines Table 3.3-2, Large Diesel Engines Table 3.4-4, Natural Gas 4-Stroke Engines Table 3.2-3)

			Individual Generator HAP Emissions (lbs)	
nalene	PAH			
E-07	5.74E-07			
E-07	7.24E-07			
2nd Half	1st Half	2nd Half	1st Half	2nd Half
8.17E-03	6.16E-02	1.33E-02	4.95E-01	1.07E-01
9.12E-04	1.11E-02	1.81E-03	2.62E-01	4.26E-02
3.42E-05	3.44E-05	6.77E-05	8.11E-04	1.60E-03
3.01E-05	1.03E-05	5.97E-05	2.43E-04	1.41E-03
9.15E-03	**7.28E-02**	**1.53E-02**	**7.58E-01**	**1.53E-01**
4.57E-06	**3.64E-05**	**7.63E-06**		
E-05	**4.40E-05**			

									First 6 Month Readings			Second 6 Month Readings		
TA	*Bldg*	*ID #*	*Manufacturer*	*MODEL*	*KW*	*Fuel Type*	*Previous Reading Date*	*Previous Reading*	*6 Month Reading Date*	*Reading*	*Hours Run*	*Month Reading Date*	*Reading*	*Hours Run*
3	40	G-0013	Onan Sons	1500DVE15R31374B	150	Diesel	Nov-09	17.2	Jun-10	26.0	8.8	Dec-10	32.0	6.0
3	440	G-0019	Cummins	500FDR5051	260	Diesel	Dec-09	121.8	Jun-10	121.8	0.0	Dec-10	121.8	0.0
3	440	G-0020	Cummins	DFGA-5005210	500	Diesel	Nov-09	113	Jun-10	121.0	8.0	Dec-10	126.7	5.7
3	1076	G-0022	Cummins	DGBB-5601289	35	Diesel	Nov-09	209.2	Jun-10	226.0	16.8	Dec-10	232.6	6.6
3	1400	G-0024	Cummins	DFEH-5699616	400	Diesel	Nov-09	68	Jun-10	159.0	91.0	Dec-10	164.0	5.0
3	1404	G-0023	Cummins	DFLC-5554001	1250	Diesel	Dec-09	440.4	Jun-10	466.0	25.6	Dec-10	503.0	37.0
3	1498	G-0017	Caterpillar	SR-4	600	Diesel	Nov-09	354	Jun-10	361.0	7.0	Dec-10	367.0	6.0
3	2322	G-0021	Onan Sons	DGDA-5005757	80	Diesel	Nov-09	373	Jun-10	379.0	6.0	Dec-10	389.3	10.3
16	980	G-0033	Cummins	KTA50-G2	1100	Diesel	Dec-09	350.4	Jun-10	362.7	12.3	Dec-10	383.0	20.3
16	1374	G-0032	Onan Sons	60ENA	60	Nat. Gas	Dec-09	1196	Jun-10	1230.0	34.0	Dec-10	1265.0	35.0
35	2	G-0034	Onan Sons	100DGDB	100	Diesel	Nov-09	115.5	Jun-10	115.5	0.0	Dec-10	115.5	0.0
35	402	G-0037	Cummins	DGCB-5674244	60	Diesel	Dec-09	240	Jun-10	267.0	27.0	Dec-10	289.0	22.0
43	1	G-0031	Cummins	4BT3.9-GC	50	Diesel	Nov-09	406.3	Jun-10	412.0	5.7	Dec-10	419.5	7.5
43	1	G-0030	Onan Sons	DVE	150	Diesel	Nov-09	727	Jun-10	764.0	37.0	Dec-10	795.0	31.0
46	335	G-0036	Onan Sons	300DEFCB	300	Diesel	Nov-09	1063.1	Jun-10	1154.0	90.9	Dec-10	1187.0	33.0
48	45	G-0043	Onan Sons	DFCB-5740130	300	Diesel	Nov-09	116.3	Jun-10	131.0	14.7	Dec-10	158.0	27.0
50	37	G-0039	Cummins	680FDR5059FF	500	Diesel	Nov-09	502.8	Jun-10	502.8	0.0	Dec-10	502.8	0.0
50	69	G-0040	Onan	DGDB4487482	100	Diesel	Dec-09	295.9	Jun-10	317.0	21.1	Dec-10	327.0	10.0
50	184	G-0044	Onan Sons	DGFA-568741	150	Diesel	Nov-09	306	Jun-10	353.0	47.0	Dec-10	376.0	23.0
50	188	G-0038	Onan Sons	L940563879	1250	Diesel	Nov-09	149	Jun-10	149.0	0.0	Dec-10	149.0	0.0
53	1	G-0004	Onan Sons	60ENA	60	Nat. Gas	Nov-09	1495	Jun-10	1561.0	66.0	Dec-10	1646.0	85.0
53	2	G-0005	Kato Eng.	Kamag-14	50	Diesel	Nov-09	194.6	Jun-10	194.6	0.0	Dec-10	194.7	0.1
53	3N	G-0011	Onan	15.0JC-18R	15	Propane	Nov-09	362.6	Jun-10	371.0	8.4	Dec-10	384.9	13.9
54	412	G-0045	Olympian	95M-07874-F	500	Diesel	Nov-09	348.9	Jun-10	349.1	0.2	Dec-10	349.1	0.0
55	5	G-0049	Kohler	100RZ71	100	Propane	Dec-09	121.7	Jun-10	130.5	8.8	Dec-10	137.0	6.5
55	8	G-0050	Delco/Detroit	E7014DD	600	Diesel	Dec-09	856.9	Jun-10	869.3	12.4	Dec-10	875.8	6.5
55	364	G-0051	Onan Sons	1250DFLC-4987	1250	Diesel	Dec-09	165.8	Jun-10	182.0	16.2	Dec-10	195.0	13.0
55	28	G-0047	Onan Sons	40DL6T	40	Diesel	Dec-09	94.8	Jun-10	102.1	7.3	Dec-10	112.0	9.9
55	47	G-0048	Onan Sons	1465	200	Diesel	Dec-09	592	Jun-10	599.9	7.9	Dec-10	603.2	3.3
55	142	G-0046	Cummins	DFEB-4963414	400	Diesel	Dec-09	143.7	Jun-10	150.7	7.0	Dec-10	158.0	7.3
55	440	G-0058	Cummins	DFLE-5754172	1500	Diesel	Dec-09	0	Jun-10	0.0	0.0	Dec-10	15.8	15.8
55	440	G-0059	Cummins	DFLE-5754172	1500	Diesel	Dec-09	0	Jun-10	0.0	0.0	Dec-10	15.0	15.0
55	440	G-0060	Cummins	DFLE-5754172	1500	Diesel	Dec-09	0	Jun-10	0.0	0.0	Dec-10	15.8	15.8
60	yard	G-0053	Cummins	DFHD-4964979	1000	Diesel	Nov-09	659	Jun-10	662.0	3.0	Dec-10	667.0	5.0
63	93	G-0054	Murphy	3166-0084	30	Diesel	Nov-09	716	Jun-10	716.0	0.0	Dec-10	716.0	0.0
64	1	G-0041	Onan Sons	250DVG	250	Diesel	Nov-09	191.4	Jun-10	198.3	6.9	Dec-10	204.0	5.7
69	33	G-0055	Cummins	DFLC-5568730	1250	Diesel	Nov-09	112.9	Jun-10	119.5	6.6	Dec-10	124.0	4.5
	37	**Generators**								**TOTAL**	603.6		**TOTAL**	492.7

N/R = Not Read

First half average hours per unit	**16.3**
Second half average hours per unit	**13.3**

Reviewed By / Date: _____

Annual Average of hours per unit	**14.8**

EMISSION FACTORS	NOx lb/kw-hr	CO lb/kw-hr	Sox[e] lb/kw-hr	PM lb/kw-hr	PM10 lb/kw-hr	VOC lb/kw-hr
Large Diesel fired [a][b]	0.032	0.007	5.4E-04	0.001	0.001	0.001
Small Diesel fired [a][c]	0.042	0.009	0.003	0.003	0.003	0.003
Natural Gas Fired[d]	0.008	0.013	2.0E-06	3.4E-05	3.2E-05	1.0E-04

References:

447	447 kw (600 hp) is the size limit for determining large vs. small diesel fired generator. This information was taken from the operating permit application and is also found in AP-42.

(a) The AP-42 (fifth edition), table 3.4-1,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) Emission factors for **large diesel fired engines** were taken from AP-42 (fifth edition) Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4.

(c) Emission factors for **small diesel fired engines** were taken from AP-42 (fifth edition) Tables 3.3-1 and 3.3-2.

(d) 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 x 10-4 kwh per BTU. Therefore, take lb/MMBTU x 3413 / 1 x 10^{6} or lb/MMbtu /106/2.928 x 10^{-4} to obtain the emissions factor in lb/kwh. The differences between the Title V application emission factors and those listed here, are that the application used the 2-stroke table, and the above emission factors are for rich burn 4-stroke engines. Most generator engines have been verified with the KSL generator crew to be 4-stroke.

(e) The Sulfur Oxide (SOx) emission factor for large diesel engines was calculated using AP-42 Table 3.4-1(fifth edition). The calculation requires the sulfur percent found in the fuel. It was verified in March of 2007, that future fuel supplied to the generators around LANL will be Ultra Low Sulfur Diesel (ULSD) (Sulfur <=15 ppm). Due to the low hours (and associated low fuel use) of most generators, the previous LANL tested fuel sulfur concentration of 0.05% will continue to be used for the rest of 2007 to allow for refueling of generators and use of the new ULSD. Calculation is 0.00809 * 0.05 * 0.608 * 2.2 = **5.4×10^{-4}**

F

Location	*NOx (lb/yr)*	*CO (lb/yr)*
3-40	55.4	11.9
3-440	0.0	0.0
3-440	128.0	28.0
3-1076	24.7	5.3
3-1400	1528.8	327.6
3-1404	1024.0	224.0
3-1498	134.4	29.4
3-2322	20.2	4.3
16-980	433.0	94.7
16-1374	16.3	26.5
35-2	0.0	0.0
35-402	68.0	14.6
43-1	12.0	2.6
43-1	233.1	50.0
46-335	1145.3	245.4
48-45	185.2	39.7
50-37	0.0	0.0
50-69	88.6	19.0
50-184	296.1	63.5
50-188	0.0	0.0
53-1	31.7	51.5
53-2	0.0	0.0
53-3N	1.0	1.6
54-412	3.2	0.7
55-5	7.0	11.4
55-8	238.1	52.1
55-364	648.0	141.8
55-28	12.3	2.6
55-47	66.4	14.2
55-142	117.6	25.2
60-yard	96.0	21.0
63-93	0.0	0.0
64-1	72.5	15.5
69-33	264.0	57.8
lbs/6 months	6950.8	1581.8
Tons/6 months	**3.48**	**0.79**

YEARLY TOTAL	**NOx**	**CO**
Tons/Year	**6.00**	**1.39**

First 6 Month Emissions				Second 6 Month Emissions					
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)*
4.0	4.0	4.0	1.9E-02	37.8	8.1	2.7	2.7	2.7	1.2E-02
0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
2.2	4.0	4.0	2.7E-02	91.2	20.0	1.5	2.9	2.9	1.7E-02
1.8	1.8	1.8	8.2E-03	9.7	2.1	0.7	0.7	0.7	3.1E-03
109.2	109.2	109.2	5.1E-01	84.0	18.0	6.0	6.0	6.0	2.7E-02
17.3	32.0	32.0	2.2E-01	1480.0	323.8	25.0	46.3	46.3	2.7E-01
2.3	4.2	4.2	2.8E-02	115.2	25.2	1.9	3.6	3.6	2.1E-02
1.4	1.4	1.4	6.7E-03	34.6	7.4	2.5	2.5	2.5	1.1E-02
7.3	13.5	13.5	9.2E-02	714.6	156.3	12.1	22.3	22.3	1.3E-01
0.0	0.1	0.2	2.3E-01	16.8	27.3	0.0	0.1	0.2	2.4E-01
0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
4.9	4.9	4.9	2.3E-02	55.4	11.9	4.0	4.0	4.0	1.8E-02
0.9	0.9	0.9	4.0E-03	15.8	3.4	1.1	1.1	1.1	5.1E-03
16.7	16.7	16.7	7.8E-02	195.3	41.9	14.0	14.0	14.0	6.3E-02
81.8	81.8	81.8	3.8E-01	415.8	89.1	29.7	29.7	29.7	1.3E-01
13.2	13.2	13.2	6.2E-02	340.2	72.9	24.3	24.3	24.3	1.1E-01
0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
6.3	6.3	6.3	3.0E-02	42.0	9.0	3.0	3.0	3.0	1.4E-02
21.2	21.2	21.2	9.9E-02	144.9	31.1	10.4	10.4	10.4	4.7E-02
0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
0.0	0.1	0.4	4.5E-01	40.8	66.3	0.0	0.2	0.5	5.7E-01
0.0	0.0	0.0	0.0E+00	0.2	0.0	0.0	0.0	0.0	6.8E-05
0.0	0.0	0.0	1.3E-02	1.7	2.7	0.0	0.0	0.0	2.1E-02
0.1	0.1	0.1	6.8E-04	0.0	0.0	0.0	0.0	0.0	0.0E+00
0.0	0.0	0.1	8.8E-02	5.2	8.5	0.0	0.0	0.1	6.5E-02
4.0	7.4	7.4	5.0E-02	124.8	27.3	2.1	3.9	3.9	2.3E-02
10.9	20.3	20.3	1.4E-01	520.0	113.8	8.8	16.3	16.3	9.5E-02
0.9	0.9	0.9	4.1E-03	16.6	3.6	1.2	1.2	1.2	5.4E-03
4.7	4.7	4.7	2.2E-02	27.7	5.9	2.0	2.0	2.0	8.9E-03
8.4	8.4	8.4	3.9E-02	122.6	26.3	8.8	8.8	8.8	3.9E-02
1.6	3.0	3.0	2.0E-02	160.0	35.0	2.7	5.0	5.0	2.9E-02
0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
5.2	5.2	5.2	2.4E-02	59.8	12.8	4.3	4.3	4.3	1.9E-02
4.5	8.2	8.2	5.6E-02	180.0	39.4	3.0	5.6	5.6	3.3E-02
330.5	373.4	373.9	2.7	5052.8	1188.8	171.6	220.5	221.1	2.0
0.17	**0.19**	**0.19**	**1.36E-03**	**2.53**	**0.59**	**0.09**	**0.11**	**0.11**	**1.01E-03**

SOx	PM	VOC	HAPs
0.25	**0.30**	**0.30**	**0.002**

Emission Factors (lb/kwh)	Benzene		Tolu
Natural Gas	5.40E-06		1.91
Diesel (small)	3.19E-06		1.40
Diesel (large)	2.65E-06		9.60
Location	1st Half	2nd Half	1st Half
3-40	4.21E-03	2.87E-03	2.52E-03
3-440	0.00E+00	0.00E+00	0.00E+00
3-440	1.06E-02	7.55E-03	7.62E-03
3-1076	1.87E-03	7.36E-04	1.12E-03
3-1400	1.16E-01	6.37E-03	6.94E-02
3-1404	8.48E-02	1.23E-01	6.10E-02
3-1498	1.11E-02	9.54E-03	8.00E-03
3-2322	1.53E-03	2.63E-03	9.15E-04
16-980	3.59E-02	5.92E-02	2.58E-02
16-1374	1.10E-02	1.13E-02	3.89E-03
35-2	0.00E+00	0.00E+00	0.00E+00
35-402	5.16E-03	4.21E-03	3.09E-03
43-1	9.08E-04	1.19E-03	5.43E-04
43-1	1.77E-02	1.48E-02	1.06E-02
46-335	8.69E-02	3.15E-02	5.20E-02
48-45	1.41E-02	2.58E-02	8.40E-03
50-37	0.00E+00	0.00E+00	0.00E+00
50-69	6.72E-03	3.19E-03	4.02E-03
50-184	2.25E-02	1.10E-02	1.34E-02
50-188	0.00E+00	0.00E+00	0.00E+00
53-1	2.14E-02	2.75E-02	7.55E-03
53-2	0.00E+00	1.59E-05	0.00E+00
53-3N	6.80E-04	1.13E-03	2.40E-04
54-412	2.65E-04	0.00E+00	1.91E-04
55-5	4.75E-03	3.51E-03	1.68E-03
55-8	1.97E-02	1.03E-02	1.42E-02
55-364	5.37E-02	4.31E-02	3.86E-02
55-28	9.30E-04	1.26E-03	5.56E-04
55-47	5.03E-03	2.10E-03	3.01E-03
55-142	8.92E-03	9.30E-03	5.34E-03
60-yard	7.95E-03	1.33E-02	5.72E-03
63-93	0.00E+00	0.00E+00	0.00E+00
64-1	5.50E-03	4.54E-03	3.29E-03
69-33	2.19E-02	1.49E-02	1.57E-02
lbs	**5.82E-01**	**4.45E-01**	**3.68E-01**
Tons/Half/HAP	**2.91E-04**	**2.23E-04**	**1.84E-04**
Tons/year/HAP	**5.14E-04**		**2.69**
Tons/Year Total	**2.37E-03**		

Emission Factors from AP-42, Volume 1, Fifth Edition (Sr

HAPS (lbs)													HAPS (lbs)		
ıene	Xylenes		1,3-Butadiene		Formaldehyde		Acetaldehyde		Acrolein		Naphthalene		1,1,2,2-Tetrachloroethane		1,1,2-Trich
E-06	6.66E-07		2.26E-06		7.00E-05		9.53E-06		8.98E-06		3.32E-07		8.64E-08		5.23
E-06	9.73E-07		1.34E-07		4.03E-06		2.62E-06		3.16E-07		2.90E-07				
E-07	6.59E-07				2.69E-07		8.61E-08		2.69E-08		4.44E-07				
2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half
1.26E-03	1.28E-03	8.76E-04	1.76E-04	1.20E-04	5.32E-03	3.63E-03	3.46E-03	2.36E-03	4.17E-04	2.84E-04	3.82E-04	2.61E-04			
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
2.74E-03	2.64E-03	1.88E-03	0.00E+00	0.00E+00	1.08E-03	7.68E-04	3.44E-04	2.45E-04	1.08E-04	7.67E-05	1.78E-03	1.27E-03			
3.23E-04	5.72E-04	2.25E-04	7.85E-05	3.08E-05	2.37E-03	9.31E-04	1.54E-03	6.05E-04	1.86E-04	7.30E-05	1.70E-04	6.69E-05			
2.79E-03	3.54E-02	1.95E-03	4.86E-03	2.67E-04	1.47E-01	8.06E-03	9.54E-02	5.24E-03	1.15E-02	6.32E-04	1.05E-02	5.79E-04			
4.44E-02	2.11E-02	3.05E-02	0.00E+00	0.00E+00	8.62E-03	1.25E-02	2.75E-03	3.98E-03	8.61E-04	1.24E-03	1.42E-02	2.05E-02			
3.45E-03	2.77E-03	2.37E-03	0.00E+00	0.00E+00	1.13E-03	9.70E-04	3.61E-04	3.10E-04	1.13E-04	9.69E-05	1.86E-03	1.60E-03			
1.15E-03	4.67E-04	8.02E-04	6.41E-05	1.10E-04	1.93E-03	3.32E-03	1.26E-03	2.16E-03	1.52E-04	2.60E-04	1.39E-04	2.39E-04			
2.14E-02	8.92E-03	1.47E-02	0.00E+00	0.00E+00	3.65E-03	6.02E-03	1.16E-03	1.92E-03	3.64E-04	6.01E-04	6.01E-03	9.91E-03			
4.00E-03	1.36E-03	1.40E-03	4.62E-03	4.76E-03	1.43E-01	1.47E-01	1.94E-02	2.00E-02	1.83E-02	1.89E-02	6.77E-04	6.96E-04	1.76E-04	1.81E-04	1.07E-04
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
1.84E-03	1.58E-03	1.28E-03	2.16E-04	1.76E-04	6.53E-03	5.32E-03	4.24E-03	3.46E-03	5.12E-04	4.17E-04	4.69E-04	3.82E-04			
5.24E-04	2.77E-04	3.65E-04	3.81E-05	5.01E-05	1.15E-03	1.51E-03	7.47E-04	9.82E-04	9.00E-05	1.18E-04	8.25E-05	1.09E-04			
6.50E-03	5.40E-03	4.53E-03	7.41E-04	6.21E-04	2.24E-02	1.87E-02	1.45E-02	1.22E-02	1.75E-03	1.47E-03	1.61E-03	1.35E-03			
1.38E-02	2.65E-02	9.64E-03	3.64E-03	1.32E-03	1.10E-01	3.99E-02	7.14E-02	2.59E-02	8.62E-03	3.13E-03	7.90E-03	2.87E-03			
1.13E-02	4.29E-03	7.88E-03	5.89E-04	1.08E-03	1.78E-02	3.26E-02	1.16E-02	2.12E-02	1.39E-03	2.56E-03	1.28E-03	2.35E-03			
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
1.40E-03	2.05E-03	9.73E-04	2.82E-04	1.34E-04	8.50E-03	4.03E-03	5.53E-03	2.62E-03	6.67E-04	3.16E-04	6.11E-04	2.90E-04			
4.82E-03	6.86E-03	3.36E-03	9.41E-04	4.61E-04	2.84E-02	1.39E-02	1.85E-02	9.04E-03	2.23E-03	1.09E-03	2.04E-03	9.99E-04			
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
9.72E-03	2.64E-03	3.40E-03	8.97E-03	1.15E-02	2.77E-01	3.57E-01	3.77E-02	4.86E-02	3.56E-02	4.58E-02	1.31E-03	1.69E-03	3.42E-04	4.41E-04	2.07E-04
6.98E-06	0.00E+00	4.87E-06	0.00E+00	6.68E-07	0.00E+00	2.02E-05	0.00E+00	1.31E-05	0.00E+00	1.58E-06	0.00E+00	1.45E-06			
3.97E-04	8.39E-05	1.39E-04	2.85E-04	4.72E-04	8.82E-03	1.46E-02	1.20E-03	1.99E-03	1.13E-03	1.87E-03	4.18E-05	6.91E-05			
0.00E+00	6.59E-05	0.00E+00	0.00E+00	0.00E+00	2.69E-05	0.00E+00	8.61E-06	0.00E+00	2.69E-06	0.00E+00	4.44E-05	0.00E+00			
1.24E-03	5.86E-04	4.33E-04	1.99E-03	1.47E-03	6.16E-02	4.55E-02	8.39E-03	6.19E-03	7.90E-03	5.84E-03	2.92E-04	2.16E-04			
3.74E-03	4.90E-03	2.57E-03	0.00E+00	0.00E+00	2.00E-03	1.05E-03	6.40E-04	3.36E-04	2.00E-04	1.05E-04	3.30E-03	1.73E-03			
1.56E-02	1.33E-02	1.07E-02	0.00E+00	0.00E+00	5.46E-03	4.38E-03	1.74E-03	1.40E-03	5.45E-04	4.37E-04	8.99E-03	7.21E-03			
5.53E-04	2.84E-04	3.85E-04	3.90E-05	5.29E-05	1.18E-03	1.60E-03	7.65E-04	1.04E-03	9.22E-05	1.25E-04	8.46E-05	1.15E-04			
9.22E-04	1.54E-03	6.42E-04	2.11E-04	8.81E-05	6.37E-03	2.66E-03	4.14E-03	1.73E-03	4.99E-04	2.09E-04	4.58E-04	1.91E-04			
4.08E-03	2.73E-03	2.84E-03	3.74E-04	3.90E-04	1.13E-02	1.18E-02	7.33E-03	7.65E-03	8.85E-04	9.22E-04	8.11E-04	8.46E-04			
4.80E-03	1.98E-03	3.30E-03	0.00E+00	0.00E+00	8.08E-04	1.35E-03	2.58E-04	4.30E-04	8.07E-05	1.35E-04	1.33E-03	2.22E-03			
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
1.99E-03	1.68E-03	1.39E-03	2.30E-04	1.90E-04	6.95E-03	5.74E-03	4.52E-03	3.73E-03	5.45E-04	4.50E-04	5.00E-04	4.13E-04			
5.40E-03	5.44E-03	3.71E-03	0.00E+00	0.00E+00	2.22E-03	1.52E-03	7.10E-04	4.84E-04	2.22E-04	1.51E-04	3.66E-03	2.50E-03			
1.70E-01	**1.57E-01**	**1.12E-01**	**2.83E-02**	**2.33E-02**	**8.92E-01**	**7.46E-01**	**3.20E-01**	**1.86E-01**	**9.50E-02**	**8.73E-02**	**7.06E-02**	**6.07E-02**	**5.18E-04**	**6.22E-04**	**3.14E-04**
8.51E-05	**7.84E-05**	**5.61E-05**	**1.42E-05**	**1.17E-05**	**4.46E-04**	**3.73E-04**	**1.60E-04**	**9.29E-05**	**4.75E-05**	**4.36E-05**	**3.53E-05**	**3.03E-05**	**2.59E-07**	**3.11E-07**	**1.57E-07**
E-04	**1.35E-04**		**2.58E-05**		**8.19E-04**		**2.53E-04**		**9.11E-05**		**6.56E-05**		**5.70E-07**		**3.45**

nall Diesel Engines Table 3.3-2, Large Diesel Engines Table 3.4-4, Natural Gas 4-Stroke Engines Table 3.2-3)

HAPS (lbs)															
loroethane	1,3-Dichloropropene		Carbon Tetrachloride		Chlorobenzene		Chloroform		Ethylbenzene		Ethylene Dibromide		Methanol		Methylene
E-08	4.34E-08		6.05E-08		4.41E-08		4.68E-08		8.47E-08		7.27E-08		1.05E-05		1.41
2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half
1.10E-04	8.85E-05	9.11E-05	1.23E-04	1.27E-04	8.99E-05	9.25E-05	9.55E-05	9.83E-05	1.73E-04	1.78E-04	1.48E-04	1.53E-04	2.13E-02	2.19E-02	2.87E-04
2.66E-04	1.72E-04	2.21E-04	2.39E-04	3.08E-04	1.74E-04	2.25E-04	1.85E-04	2.39E-04	3.35E-04	4.32E-04	2.88E-04	3.71E-04	4.14E-02	5.33E-02	5.57E-04
3.76E-04	**2.60E-04**	**3.12E-04**	**3.63E-04**	**4.35E-04**	**2.64E-04**	**3.17E-04**	**2.81E-04**	**3.37E-04**	**5.08E-04**	**6.10E-04**	**4.36E-04**	**5.24E-04**	**6.27E-02**	**7.52E-02**	**8.44E-04**
1.88E-07	**1.30E-07**	**1.56E-07**	**1.81E-07**	**2.18E-07**	**1.32E-07**	**1.59E-07**	**1.40E-07**	**1.68E-07**	**2.54E-07**		**2.18E-07**	**2.62E-07**	**3.14E-05**	**3.76E-05**	**4.22E-07**
E-07	**2.86E-07**		**3.99E-07**		**2.91E-07**		**3.09E-07**		**2.54E-07**		**4.80E-07**		**6.90E-05**		**9.29**

HAPS (lbs)										
e Chloride	PAH		Styrene		Toluene		Vinyl Chloride		Individual Generator HAP Emissions (lbs)	
E-07	4.82E-07		4.06E-08		1.91E-06		2.45E-08			
	5.74E-07									
	7.24E-07									
2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
	7.57E-04	5.16E-04							1.85E-02	1.22E-02
	0.00E+00	0.00E+00							0.00E+00	0.00E+00
	2.90E-03	2.06E-03							2.71E-02	1.66E-02
	3.37E-04	1.33E-04							8.25E-03	3.12E-03
	2.09E-02	1.15E-03							5.11E-01	2.70E-02
	2.32E-02	3.35E-02							2.17E-01	2.69E-01
	3.04E-03	2.61E-03							2.84E-02	2.10E-02
	2.75E-04	4.73E-04							6.73E-03	1.11E-02
	9.80E-03	1.62E-02							9.15E-02	1.30E-01
2.95E-04	9.82E-04	1.01E-03	8.29E-05	8.53E-05	3.89E-03	4.00E-03	5.00E-05	5.15E-05	2.30E-01	2.37E-01
	0.00E+00	0.00E+00							0.00E+00	0.00E+00
	9.30E-04	7.57E-04							2.27E-02	1.78E-02
	1.64E-04	2.15E-04							4.00E-03	5.07E-03
	3.18E-03	2.67E-03							7.79E-02	6.29E-02
	1.56E-02	5.68E-03							3.83E-01	1.34E-01
	2.53E-03	4.65E-03							6.19E-02	1.10E-01
	0.00E+00	0.00E+00							0.00E+00	0.00E+00
	1.21E-03	5.74E-04							2.96E-02	1.35E-02
	4.05E-03	1.98E-03							9.89E-02	4.66E-02
	0.00E+00	0.00E+00							0.00E+00	0.00E+00
7.18E-04	1.91E-03	2.46E-03	1.61E-04	2.07E-04	7.55E-03	9.72E-03	9.71E-05	1.25E-04	4.46E-01	5.74E-01
	0.00E+00	2.87E-06							0.00E+00	6.76E-05
	6.07E-05	1.00E-04							1.25E-02	2.08E-02
	7.24E-05	0.00E+00							6.77E-04	0.00E+00
	4.24E-04	3.13E-04							8.76E-02	6.47E-02
	5.39E-03	2.82E-03							5.03E-02	2.27E-02
	1.47E-02	1.18E-02							1.37E-01	9.46E-02
	1.68E-04	2.27E-04							4.10E-03	5.35E-03
	9.07E-04	3.79E-04							2.22E-02	8.92E-03
	1.61E-03	1.68E-03							3.93E-02	3.95E-02
	2.17E-03	3.62E-03							2.03E-02	2.91E-02
	0.00E+00	0.00E+00							0.00E+00	0.00E+00
	9.90E-04	8.18E-04							2.42E-02	1.93E-02
	5.97E-03	4.07E-03							5.58E-02	3.27E-02
1.01E-03	**1.24E-01**	**1.02E-01**	**2.44E-04**	**2.93E-04**	**1.14E-02**	**1.37E-02**	**1.47E-04**	**1.77E-04**	**2.71E+00**	**2.03E+00**
5.07E-07	**6.21E-05**	**5.12E-05**	**1.22E-07**	**1.46E-07**	**5.72E-06**	**6.86E-06**	**7.36E-08**	**8.83E-08**		
E-07	**1.13E-04**		**2.68E-07**		**1.26E-05**		**1.62E-07**			

2010 Small Boilers Data Entry / Gas Use

	Month	Metered Boilers: TA-55 Boiler Gas Use (MSCF)[c] BHW-1B (B-602) ID (B-0016)	Metered Boilers: TA-55 Boiler Gas Use (MSCF)[c] BHW-2B (B-603) ID (B-0017)	Total Gas Use[a] (MSCF)	Total Gas Use[a] (MMSCF)	Non-Metered Gas Use (MMSCF)	12-Month Rolling Total for all Small Boilers (MMSCF)[e]
Data Entry	January	1	1817	80,919	80.92	79.10	517.19
	February	0	2287	71,735	71.74	69.45	523.62
	March	795	996	67,008	67.01	65.22	529.31
	April	1682	0	50,387	50.39	48.71	529.96
	May	1614	0	37,176	37.18	35.56	556.88
	June	1548	0	30,050	30.05	28.50	567.63
	July	1278	0	24,420	24.42	23.14	576.61
	August	1244	0	12,779	12.78	11.54	575.24
	September	525	0	12,619	12.62	12.09	567.67
	October	1598	561	43,896	43.90	41.74	569.69
	November	0	2401	67,458	67.46	65.06	581.72
	December	0	1622	66,925	66.93	65.30	565.37
	TOTAL	10285	9684	565,372	565.37	545.40	Permit Limit = **870**

2010 Non Metered Boiler Pool Capacity:	**303.5**	MMBTU/hr[f]
Estimated Gas-Use per MMBtu rating Jan-June:	1.08	MMscf/MMBtu/hr
Estimated Gas-Use per MMBtu rating July-Dec:	0.72	MMscf/MMBtu/hr
Estimated Gas-Use per MMBtu - Annual	1.80	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.

Gas Use Non-Metered[g] (MMSCF)

AIRS Stack #	015	016	017	018	019	020	021	024	New	Insignificant Units[h]
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	TA-50-2[d]	Lab Wide
Equipment ID:	BS-1	BS-2	BS-6	BHW-1	BHW-2	BHW-1	BHW-2	Plant 5	BS-1	Various
Database ID:	B-0023	B-0024	B-0022	B-0042	B-0043	B-0006	B-0007	B-0093 & B-0092	B-0152	
Design Rate[i] (MMBTU/hr)	**5.336**	**5.335**	**7.140**	**7.115**	**7.115**	**5.335**	**5.335**	**12.700**	**10.670**	**237**
Calculated Gas Use-Jan-June	5.741	5.740	7.682	7.654	7.654	5.740	5.740	13.664	11.480	255.438
Calculated Gas Use-July-Dec	3.848	3.848	5.149	5.131	5.131	3.848	3.848	9.159	7.695	171.213
Calculated Gas Use-Annual	9.590	9.588	12.831	12.785	12.785	9.588	9.588	22.822	19.175	426.651

Reviewed By / Date: _____

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

References for Emission Factors
(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

2010 Small Boilers Emission Summary			
	Total Emissions (tons)		
Pollutant Criteria	Annual Emissions (Includes Insignificant Sources)	Jan-June (Includes Insignificant Sources)	July-Dec (Includes Insignificant Sources)
NOx	27.930	16.638	11.292
SOx	0.170	0.101	0.068
PM	2.214	1.317	0.897
PM-10	2.214	1.317	0.897
PM-2.5	2.214	1.317	0.897
CO	22.753	13.599	9.154
VOC	1.560	0.930	0.629
HAPs			
Arsenic	5.65E-05	3.37E-05	2.28E-05
Benzene	5.94E-04	3.54E-04	2.40E-04
BE	3.39E-06	2.02E-06	1.37E-06
Cadmium	3.11E-04	1.86E-04	1.25E-04
Chromium	3.96E-04	2.36E-04	1.60E-04
Cobalt	2.37E-05	1.42E-05	9.58E-06
Dichlorobenzene	3.39E-04	2.02E-04	1.37E-04
Formaldehyde	2.12E-02	1.26E-02	8.55E-03
Hexane	5.09E-01	3.04E-01	2.05E-01
Lead	1.41E-04	8.43E-05	5.70E-05
Mangenese	1.07E-04	6.41E-05	4.33E-05
Mercury	7.35E-05	4.38E-05	2.97E-05
Napthalene	1.72E-04	1.03E-04	6.96E-05
Nickel	5.94E-04	3.54E-04	2.40E-04
POM	2.49E-05	1.48E-05	1.00E-05
Selenium	6.78E-06	4.05E-06	2.74E-06
Toluene	9.61E-04	5.73E-04	3.88E-04
TOTAL HAPS	0.534	0.318	0.215

The totals in this table include exempt, non-exempt, metered, and non-metered boilers (all boilers except Power Plant boilers).

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 individiually 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. In 2010, the metered gas use was removed for the boiler and changed to non-metered. This was due to an evaporator system being added to the same gas line so usage would not be only for the boiler anymore.

(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 (derated value, called design rating in boiler data base) in MMBTU. This number is used to estimate the gas use rate (total non-metered gas use divided by the non-metered boiler pool capacity number). This value is taken from the boilers database (Access) on the database drive on the cleanair server within ENV-EAQ.

(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 mutiplied 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. This value contains natural gas fired HVAC units as well as some NG heating units.

(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% x 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.

2010 Non-Exempt Boiler Emissions for Annual EI Reporting (Tons/Year)

Pollutant Criteria	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- 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 BS-1	AIRS 024 TA-16 BS-2	AIRS 037 TA-55-6 BHW-1B	AIRS 038 TA-55-6 BHW-2B	AIRS TA-50-2 BS-1	Total
NOx	0.479	0.479	0.642	0.639	0.639	0.479	0.479	0.212	0.212	0.710	0.668	0.959	6.597
SOx	0.003	0.003	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.006	0.042
PM	0.036	0.036	0.049	0.049	0.049	0.036	0.036	0.043	0.043	0.073	0.069	0.073	0.593
PM-10	0.036	0.036	0.049	0.049	0.049	0.036	0.036	0.043	0.043	0.073	0.069	0.073	0.593
PM-2.5	0.036	0.036	0.049	0.049	0.049	0.036	0.036	0.043	0.043	0.073	0.069	0.073	0.593
CO	0.403	0.403	0.539	0.537	0.537	0.403	0.403	0.212	0.212	0.196	0.185	0.805	4.834
VOC	0.026	0.026	0.035	0.035	0.035	0.026	0.026	0.031	0.031	0.031	0.029	0.053	0.386
HAPs													
Arsenic	9.59E-07	9.59E-07	1.28E-06	1.28E-06	1.28E-06	9.59E-07	9.59E-07	1.14E-06	1.14E-06	1.03E-06	9.68E-07	1.92E-06	1.39E-05
Benzene	1.01E-05	1.01E-05	1.35E-05	1.34E-05	1.34E-05	1.01E-05	1.01E-05	1.20E-05	1.20E-05	1.08E-05	1.02E-05	2.01E-05	1.46E-04
BE	5.75E-08	5.75E-08	7.70E-08	7.67E-08	7.67E-08	5.75E-08	5.75E-08	6.85E-08	6.85E-08	6.17E-08	5.81E-08	1.15E-07	8.32E-07
Cadmium	5.27E-06	5.27E-06	7.06E-06	7.03E-06	7.03E-06	5.27E-06	5.27E-06	6.28E-06	6.28E-06	5.66E-06	5.33E-06	1.05E-05	7.63E-05
Chromium	6.71E-06	6.71E-06	8.98E-06	8.95E-06	8.95E-06	6.71E-06	6.71E-06	7.99E-06	7.99E-06	7.20E-06	6.78E-06	1.34E-05	9.71E-05
Cobalt	4.03E-07	4.03E-07	5.39E-07	5.37E-07	5.37E-07	4.03E-07	4.03E-07	4.79E-07	4.79E-07	4.32E-07	4.07E-07	8.05E-07	5.83E-06
Dichlorobenzene	5.75E-06	5.75E-06	7.70E-06	7.67E-06	7.67E-06	5.75E-06	5.75E-06	6.85E-06	6.85E-06	6.17E-06	5.81E-06	1.15E-05	8.32E-05
Formaldehyde	3.60E-04	3.60E-04	4.81E-04	4.79E-04	4.79E-04	3.60E-04	3.60E-04	4.28E-04	4.28E-04	3.86E-04	3.63E-04	7.19E-04	5.20E-03
Hexane	8.63E-03	8.63E-03	1.15E-02	1.15E-02	1.15E-02	8.63E-03	8.63E-03	1.03E-02	1.03E-02	9.26E-03	8.72E-03	1.73E-02	1.25E-01
Lead	2.40E-06	2.40E-06	3.21E-06	3.20E-06	3.20E-06	2.40E-06	2.40E-06	2.85E-06	2.85E-06	2.57E-06	2.42E-06	4.79E-06	3.47E-05
Mangenese	1.82E-06	1.82E-06	2.44E-06	2.43E-06	2.43E-06	1.82E-06	1.82E-06	2.17E-06	2.17E-06	1.95E-06	1.84E-06	3.64E-06	2.64E-05
Mercury	1.25E-06	1.25E-06	1.67E-06	1.66E-06	1.66E-06	1.25E-06	1.25E-06	1.48E-06	1.48E-06	1.34E-06	1.26E-06	2.49E-06	1.80E-05
Napthalene	2.92E-06	2.92E-06	3.91E-06	3.90E-06	3.90E-06	2.92E-06	2.92E-06	3.48E-06	3.48E-06	3.14E-06	2.95E-06	5.85E-06	4.23E-05
Nickel	1.01E-05	1.01E-05	1.35E-05	1.34E-05	1.34E-05	1.01E-05	1.01E-05	1.20E-05	1.20E-05	1.08E-05	1.02E-05	2.01E-05	1.46E-04
POM	4.22E-07	4.22E-07	5.65E-07	5.63E-07	5.63E-07	4.22E-07	4.22E-07	5.02E-07	5.02E-07	4.53E-07	4.26E-07	8.44E-07	6.10E-06
Selenium	1.15E-07	1.15E-07	1.54E-07	1.53E-07	1.53E-07	1.15E-07	1.15E-07	1.37E-07	1.37E-07	1.23E-07	1.16E-07	2.30E-07	1.66E-06
Toluene	1.63E-05	1.63E-05	2.18E-05	2.17E-05	2.17E-05	1.63E-05	1.63E-05	1.94E-05	1.94E-05	1.75E-05	1.65E-05	3.26E-05	2.36E-04
TOTAL HAPS/Unit	9.05E-03	9.05E-03	1.21E-02	1.21E-02	1.21E-02	9.05E-03	9.05E-03	1.08E-02	1.08E-02	9.71E-03	9.14E-03	1.81E-02	0.13

EPCRA 313

Chemical	Amount in Fuel[a]		Emissions from all Small Boilers[b]	
	Conc.	Pounds	Emission Factor (lbs/MMscf)	Emission (lbs)
Lead[c]			5.0E-04	0.29
Sulfuric Acid[d]			0.6	351.20
Mercury[c]			2.6E-04	0.15
PACs[e]			8.69E-07	5.09E-04
Benzo(g,h,i) perylene[c]			1.20E-06	7.02E-04

(a) Amount of EPCRA chemical in fuel is considered "otherwise used" for EPCRA 313 threshold determination	
(b) Combustion compounds emitted are considered "manufactured" for EPCRA 313 threshold deteminations. Lead and mercury are lead compounds and mercury compounds.	
(c) Emission Factors from AP-42, Section 1.4, Natural Gas Combustion, Tables 1.4-2, 1.4-3 and 1.4-4, July 1998	
(d) Assume all SOx emissions are converted to sulfuric acid in the stack.	
(e) EPCRA PAC Guidance Document, Table 2-3	

2010 Daily Turbine Gas Use (MCF), 12 Month Rolling Total Gas Use, & Hours of Operation

Day	Jan		Feb		Mar		Apr		May		Jun		July		Aug		Sept		Oct		Nov		Dec	
	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs
1	0	0	0	0	0	0	577	4.75	6	0	0	0	1083	5.1	0	0	0	0	0	0	981	4.3	7318	24
2	0	0	1	0	0	0	0	0	0	0	0	0	1097	5.6	0	0	0	0	0	0	0	0	6043	24
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253	4.2
4	0	0	0	0	0	0	0	0	7	0	36	0.3	0	0	1	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	62	0.6	36	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	9	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	1141	5.6	0	0	0	0	26	0	0	0	0	0
8	0	0	0	0	0	0	278	4.2	0	0	0	0	1147	5.7	0	0	0	0	80	0	0	0	0	0
9	0	0	0	0	30	0.7	894	5.2	0	0	0	0	42	0	46	0	0	0	0	0	0	0	278	1.8
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1018	6.2	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	17	0	0	0	0	0	1018	5.1	48	0	0	0	0	0.7	0	0	0	0
13	0	0	1	0	0	0	1428	6.3	0	0	0	0	1096	5.6	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	946	0.75	1128	5.62	982	5.6	0	0	2	0	0	4.2	0	0	0	0
15	0	0	0	0	32	0.4	20	0	0	0	1115	5.38	187	1.5	0	0	15	0	940	4.5	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	1086	5.42	1316	6.4	0	0	6	0	0	0	0	0	2196	9.2
17	0	0	0	0	0	0	0	0	96	0.5	1044	5.47	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	32	0.25	0	0	8	0	1050	5.17	0	0	0	0	0	0	1902	11.6	1233	5.6	0	0
19	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	5877	24	0	0	0	0
20	0	0	0	0	0	0	110	0.2	16	0	0	0	1099	5.6	0	0	0	0	5738	24	0	0	0	0
21	0	0	0	0	0	0	0	0	11	0	1039	5.25	0	0	0	0	0	0	5651	22	0	0	0	0
22	0	0	0	0	1387	4.7	0	0	0	0	1065	5.57	14	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	5	0	0	0	0	0	1080	5.5	14	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	16	0	0	0	1438	7.37	0	0	2	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	1103	5.65	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	901	4.4	0	0	1015	5.6	4	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	881	4.25	1148	5.42	926	4.3	0	0	5	0	0	1.2	0	0	0	0
29	0	0			0	0	0	0	0	0	1111	5.4	20	0	0	0	12	0	0	0	0	0	0	0
30	0	0			0	0	0	0	0	0	1198	5.95	0	0	0	0	18	0	0	0	3622	20.7	0	0
31	0	0			18	0			0	0			0	0	0	0			0	0			0	0
SUM	0	0	2	0	1504	6.05	3340	20.7	2964	10.5	14677	73.5	12240	61.7	140	0	58	0	20214	92.2	6854	36.8	16088	63.2
12-Mo. Rolling Gas Use (MCF)	13827		13622		14142		16990		19840		34306		46462		46584		44441		59232		61996		78081	

First Half Gas Use: 22487 MCF | **Second Half Gas Use: 55594 MCF** | **Annual Gas Use: 78,081 MCF**

Permit Limit (12 mo rolling): 646 MMscf or **646,000 MCF** Reviewed by/date: _____

2010 Combustion Turbine Emissions (Actual)

Pollutant Criteria	Factors	Unit Emissions (Tons) TA-3-2422 Combustion Turbine Annual	Jan-June	July-Dec	Reference
NOx	50.5	1.972	0.568	1.404	a
SOx	3.5	0.137	0.039	0.097	b
PM	6.8	0.265	0.076	0.189	c
PM_{10}	6.8	0.265	0.076	0.189	c
CO	10.5	0.410	0.118	0.292	a
VOC	2.2	0.086	0.025	0.061	d
HAPs / TRI					
Acetaldehyde	4.12E-02	1.61E-03	4.63E-04	1.15E-03	e, f, g
Acrolein	6.59E-03	2.57E-04	7.41E-05	1.83E-04	e, f, g
Benzene	1.24E-02	4.83E-04	1.39E-04	3.44E-04	e, f,g
Benzo (a) anthracene	3.09E-03	1.21E-04	3.47E-05	8.59E-05	f, h
1,3-Butadiene	4.43E-04	1.73E-05	4.98E-06	1.23E-05	e, f, g
Cadmium	7.11E-03	2.77E-04	7.99E-05	1.98E-04	f, h
Chromium	1.34E-02	5.23E-04	1.51E-04	3.72E-04	f, h
Copper	7.11E-02	2.77E-03	7.99E-04	1.98E-03	f, h
Ethylbenzene	3.30E-02	1.29E-03	3.71E-04	9.16E-04	e, f, g
Fluoranthene	1.24E-03	4.83E-05	1.39E-05	3.44E-05	f, h
Formaldehyde	7.31E-01	2.86E-02	8.22E-03	2.03E-02	e, f, g
Manganese	8.24E-02	3.22E-03	9.26E-04	2.29E-03	f, h
Mercury	6.80E-03	2.65E-04	7.64E-05	1.89E-04	f, h
Napthalene	1.34E-03	5.23E-05	1.51E-05	3.72E-05	e, f, g
Nickel	1.18E-01	4.62E-03	1.33E-03	3.29E-03	f, h
PAH	2.27E-03	8.85E-05	2.55E-05	6.30E-05	e, f, g
Phenol	1.34E-02	5.23E-04	1.51E-04	3.72E-04	e, f, h
Propylene Oxide	2.99E-02	1.17E-03	3.36E-04	8.30E-04	e, f, g
Toluene	1.34E-01	5.23E-03	1.51E-03	3.72E-03	e, f, g
Xylenes (isomers)	6.59E-02	2.57E-03	7.41E-04	1.83E-03	e, f, g
TOTAL HAPS		5.37E-02	1.55E-02	3.82E-02	

References:

(a) Values are from the initial compliance test (TRC - October 22, 2007). Test shows average NOx as 11.29 lbs/hr and CO as 2.35 lbs/hr. These were divided by the gas flow rate of 0.223620 MMscf/hr to get 50.48 lb/MMscf (rounded to 50.5) for NOx and 10.5 lb/MMscf for CO.

(b) The SOx emission factor was taken from AP-42 Table 3.1-2a. The default value is used when percent sulfur is unknown (0.0034 lb/mmbtu). This is equivilant to converting the 2 grains per 100 scf to percent. The 0.0034 lb/mmbtu was converted to lb/mmscf by multiplying by 1030 btu/scf (the heat value of natural gas), to provide 3.5 lb/mmscf.

(c) PM was calculated by taking the AP-42, Table 3.1-2a, EF of 6.6E-3 lb/MMBtu and multiplying it by 1030 BTU/scf to get 6.8 lb/MMscf. PM10 was calculated the same as PM, as most PM from natural gas combustion is less than 1 micrometer.

(d) The VOC emission factor was taken from AP-42 Table 3.1-2a. The factor, 2.1 E-03 lb/mmbtu, was converted to lb/mmscf by multiplying by 1030 giving 2.2

(e) These chemicals are HAPs

(f) These chemicals are EPCRA 313 listed chemicals.

(g) Emission factor from AP-42, table 3.1-3 (lb/mmbtu). This was multiplied by 1030 Btu/scf to provide the lb./mmscf factor.

(h) Emission factors from EPA FIRE database (SCC: 20300202 & 20200201). These values were also converted from lb/mmbtu to lb/mmscf.

The SCFH value (fuel flow rate) from the compliance test report (223620 SCFH or 223.6 MSCFH)

Reviewed by/date: _____

TA-3 Power Plant Fuel Use Totals 2010 (Data Entry)

	DATA ENTRY							
	TA-3-22 Power Plant[b] Boiler # 1 (Edgemoor Iron Works, 210 MMBTU/hr)		TA-3-22 Power Plant[b] Boiler # 2 (Edgemoor Iron Works, 210 MMBTU/hr)		TA-3-22 Power Plant[b] Boiler # 3 (Union Iron Works, 210 MMBTU/hr)		Monthly Totals	
Month	Natural Gas (Mcf)[a]	Fuel Oil (gallons)[a]	Natural Gas (Mcf)[a]	Fuel Oil (gallons)[a]	Natural Gas (Mcf)[a]	Fuel Oil (gallons)[a]	Natural Gas (MMscf)[a]	Fuel Oil (gallons)[a]
January	11,939	0	4,790	0	51,052	0	67.781	0
February	16,120	0	19,450	110	23,763	0	59.333	110
March	25,227	0	4,946	137	22,591	0	52.764	137
April	1	0	433	164	37,552	0	37.986	164
May	0	0	626	0	28,445	0	29.071	0
June	0	0	430	0	17,192	0	17.622	0
July	0	0	10,536	0	3,839	0	14.375	0
August	0	0	18,340	0	1	278	18.341	278
September	0	0	16,683	0	67	0	16.750	0
October	20,214	0	9,901	0	2,230	0	32.345	0
November	48,198	0	0	0	3,458	0	51.656	0
December	27,746	0	15,258	0	14,376	0	57.380	0
Annual Totals:	149,445	0	101,392	411	204,566	278	455.403	689
Jan. - June	53,287	0	30,675	411	180,595	0	264.557	411
July - Dec.	96,158	0	70,718	0	23,971	278	190.847	278

Month	12-Mo. Rolling Total Natural Gas (MMscf)	12-Mo. Rolling Total Fuel Oil (gallons)
January	493.4	1225
February	496.6	1335
March	496.9	979
April	490.8	869
May	489.5	814
June	483.5	814
July	476.4	704
August	478.4	927
September	472.9	927
October	465.7	927
November	467.1	927
December	455.4	689

Permit Limits:	2000 MMscf	500,000 gallons

For References, See "Emission Summary Sheet"

Data Reviewed By: _____

12 Month Rolling Total for each Individual Boiler

	Boiler 1		Boiler 2		Boiler 3	
Month	Natural Gas (MMscf)	Fuel Oil (gal.)	Natural Gas (MMscf)	Fuel Oil (gal.)	Natural Gas (MMscf)	Fuel Oil (gal.)
January	164	329	146	238	183	658
February	150	329	140	348	207	658
March	156	329	115	485	226	165
April	155	55	73	649	263	165
May	155	55	44	649	291	110
June	148	55	33	649	303	110
July	127	55	43	649	306	0
August	112	0	60	649	306	278
September	106	0	77	649	291	278
October	125	0	87	649	254	278
November	170	0	87	649	211	278
December	149	0	101	411	205	278

Individual Unit Permit Limits:	**1200 mmscf Natural Gas**	**170,00 gallons Fuel Oil**

Emissions by Boiler 2010

Pollutant Criteria	Emission Factor		Unit Emissions				Unit Emissions				Unit Emissions			
			Boiler #1, Stack 032				Boiler #2, Stack 033				Boiler #3, Stack 034			
	Natural Gas (lb/MMscf)[a]	Fuel Oil[f] Pounds/ 1000 gal	Annual Natl Gas (tons)	Annual Fuel Oil (tons)	Jan-June (gas&oil) (tons)	July-Dec (gas&oil) (tons)	Annual Natl Gas (tons)	Annual Fuel Oil (tons)	Jan-June (gas&oil) (tons)	July-Dec (gas&oil) (tons)	Annual Natl Gas (tons)	Annual Fuel Oil (tons)	Jan-June (gas&oil) (tons)	July-Dec (gas&oil) (tons)
NOx[c]	58	8.64	4.334	0.000	1.545	2.789	2.940	0.002	0.891	2.051	5.932	0.001	5.237	0.696
SOx[g]	0.6	7.4	0.045	0.000	0.016	0.029	0.030	0.002	0.011	0.021	0.061	0.001	0.054	0.008
PM[d]	7.6	3.3	0.568	0.000	0.202	0.365	0.385	0.001	0.117	0.269	0.777	0.000	0.686	0.092
PM-10[d]	7.6	2.3	0.568	0.000	0.202	0.365	0.385	0.000	0.117	0.269	0.777	0.000	0.686	0.091
PM-2.5[d]	7.6	1.55	0.568	0.000	0.202	0.365	0.385	0.000	0.117	0.269	0.777	0.000	0.686	0.091
CO[e]	40	5.0	2.989	0.000	1.066	1.923	2.028	0.001	0.615	1.414	4.091	0.001	3.612	0.480
VOC	5.5	0.2	0.411	0.0000	0.147	0.264	0.279	0.0000	0.084	0.194	0.563	0.000	0.497	0.066
HAPs[h]														
Arsenic	0.0002	0.00055	1.49E-05	0.00E+00	5.33E-06	9.62E-06	1.01E-05	1.13E-07	3.18E-06	7.07E-06	2.05E-05	7.62E-08	1.81E-05	2.47E-06
Benzene	0.0021	-	1.57E-04	0.0	5.60E-05	1.01E-04	1.06E-04	0.0	3.22E-05	7.43E-05	2.15E-04	0.0	1.90E-04	2.52E-05
Beryllium	0.000012	0.00041	8.97E-07	0.00E+00	3.20E-07	5.77E-07	6.08E-07	8.45E-08	2.69E-07	4.24E-07	1.23E-06	5.71E-08	1.08E-06	2.01E-07
Cadmium	0.0011	0.00041	8.22E-05	0.00E+00	2.93E-05	5.29E-05	5.58E-05	8.45E-08	1.70E-05	3.89E-05	1.13E-04	5.71E-08	9.93E-05	1.32E-05
Chromium	0.0014	0.00041	1.05E-04	0.00E+00	3.73E-05	6.73E-05	7.10E-05	8.45E-08	2.16E-05	4.95E-05	1.43E-04	5.71E-08	1.26E-04	1.68E-05
Cobalt	0.000084	-	6.28E-06	0.0	2.24E-06	4.04E-06	4.26E-06	0.0	1.29E-06	2.97E-06	8.59E-06	0.0	7.58E-06	1.01E-06
Dichlorobenzene	0.0012	-	8.97E-05	0.0	3.20E-05	5.77E-05	6.08E-05	0.0	1.84E-05	4.24E-05	1.23E-04	0.0	1.08E-04	1.44E-05
Formaldehyde	0.075	0.048	5.60E-03	0.00E+00	2.00E-03	3.61E-03	3.80E-03	9.86E-06	1.16E-03	2.65E-03	7.67E-03	6.67E-06	6.77E-03	9.06E-04
Hexane	1.8	-	1.35E-01	0.0	4.80E-02	8.65E-02	9.13E-02	0.0	2.76E-02	6.36E-02	1.84E-01	0.0	1.63E-01	2.16E-02
Lead	0.0005	0.00123	3.74E-05	0.00E+00	1.33E-05	2.40E-05	2.53E-05	2.53E-07	7.92E-06	1.77E-05	5.11E-05	1.71E-07	4.51E-05	6.16E-06
Mangenese	0.00038	0.00082	2.84E-05	0.00E+00	1.01E-05	1.83E-05	1.93E-05	1.69E-07	6.00E-06	1.34E-05	3.89E-05	1.14E-07	3.43E-05	4.67E-06
Mercury[i]	0.00026	0.00041	1.94E-05	0.00E+00	6.93E-06	1.25E-05	1.32E-05	8.45E-08	4.07E-06	9.19E-06	2.66E-05	5.71E-08	2.35E-05	3.17E-06
Napthalene	0.00061	-	4.56E-05	0.0	1.63E-05	2.93E-05	3.09E-05	0.0	9.36E-06	2.16E-05	6.24E-05	0.0	5.51E-05	7.31E-06
Nickel	0.0021	0.00041	1.57E-04	0.00E+00	5.60E-05	1.01E-04	1.06E-04	8.45E-08	3.23E-05	7.43E-05	2.15E-04	5.71E-08	1.90E-04	2.52E-05
POM	0.000088	0.0033	6.58E-06	0.00E+00	2.34E-06	4.23E-06	4.46E-06	6.78E-07	2.03E-06	3.11E-06	9.00E-06	4.59E-07	7.95E-06	1.51E-06
Selenium	0.000024	0.00206	1.79E-06	0.00E+00	6.39E-07	1.15E-06	1.22E-06	4.22E-07	7.90E-07	8.49E-07	2.45E-06	2.86E-07	2.17E-06	5.73E-07
Toluene	0.0034	-	2.54E-04	0.0	9.06E-05	1.63E-04	1.72E-04	0.0	5.21E-05	1.20E-04	3.48E-04	0.0	3.07E-04	4.08E-05
TOTAL HAPS			1.41E-01	0.00E+00	5.03E-02	9.08E-02	9.57E-02	1.19E-05	2.90E-02	6.68E-02	1.93E-01	8.06E-06	1.71E-01	2.26E-02

For References, see Emission Summary.

Data Reviewed By: _____

12 Month Rolling Emissions 2010 (Tons)

Pollutant	TSP	PM10	NOx	CO	VOC	SO_2
Permit Limit (tons/yr) 12-Month Rolling Total	**8.4**	**8.2**	**60.2**	**41.3**	**5.6**	**7.9**
January	1.877	1.876	14.312	9.870	1.357	0.153
February	1.889	1.889	14.406	9.935	1.366	0.154
March	1.890	1.889	14.413	9.939	1.366	0.153
April	1.866	1.866	14.236	9.817	1.350	0.150
May	1.862	1.861	14.200	9.793	1.346	0.150
June	1.839	1.838	14.026	9.673	1.330	0.148
July	1.811	1.811	13.817	9.529	1.310	0.146
August	1.819	1.819	13.878	9.570	1.316	0.147
September	1.799	1.798	13.719	9.461	1.301	0.145
October	1.771	1.771	13.510	9.317	1.281	0.143
November	1.777	1.776	13.550	9.345	1.285	0.144
December	1.732	1.731	13.210	9.110	1.252	0.139

Monthly Emission Totals (Tons)

Pollutant	TSP	PM10	NOx	CO	VOC	SO_2
January	0.258	0.258	1.966	1.356	0.186	0.020
February	0.226	0.226	1.721	1.187	0.163	0.018
March	0.201	0.201	1.531	1.056	0.145	0.016
April	0.145	0.145	1.102	0.760	0.104	0.012
May	0.110	0.110	0.843	0.581	0.080	0.009
June	0.067	0.067	0.511	0.352	0.048	0.005
July	0.055	0.055	0.417	0.288	0.040	0.004
August	0.070	0.070	0.533	0.368	0.050	0.007
September	0.064	0.064	0.486	0.335	0.046	0.005
October	0.123	0.123	0.938	0.647	0.089	0.010
November	0.196	0.196	1.498	1.033	0.142	0.015
December	0.218	0.218	1.664	1.148	0.158	0.017
Annual Totals	1.732	1.731	13.210	9.110	1.252	0.139

Data Reviewed By: _____

Emission Summary TA-3 Power Plant 2010

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	
	Natural Gas (lb/MMscf)[a]	Fuel Oil[f] (lb/1000 gal.)				Gas	Oil
NOx	58	8.64	13.210	7.674	5.536	(c)	(c)
SOx	0.6	7.4	0.139	0.081	0.058	(a)(j)	(g)(j)
PM	7.6	3.3	1.732	1.006	0.726	(d)	(d)
PM-10	7.6	2.3	1.731	1.006	0.726	(d)	(d)
PM-2.5	7.6	1.55	1.731	1.006	0.725	(d)	(d)
CO	40	5.0	9.110	5.292	3.818	(b)	(g)
VOC	5.5	0.2	1.252	0.728	0.525	(b)	(i)
HAPs[h]							
Arsenic	0.0002	0.00055	4.57E-05	2.66E-05	1.92E-05	(a)	(k)
Benzene	0.0021	-	4.78E-04	2.78E-04	2.00E-04	(c)	
Beryllium	0.000012	0.00041	2.87E-06	1.67E-06	1.20E-06	(c)	(k)
Cadmium	0.0011	0.00041	2.51E-04	1.46E-04	1.05E-04	(c)	(k)
Chromium	0.0014	0.00041	3.19E-04	1.85E-04	1.34E-04	(c)	(k)
Cobalt	0.000084	-	1.91E-05	1.11E-05	8.02E-06	(c)	
Dichlorobenzene	0.0012	-	2.73E-04	1.59E-04	1.15E-04	(c)	
Formaldehyde	0.075	0.048	1.71E-02	9.93E-03	7.16E-03	(c)	(k)
Hexane	1.8	-	4.10E-01	2.38E-01	1.72E-01	(c)	
Lead	0.0005	0.001233	1.14E-04	6.64E-05	4.79E-05	(c)	(k)
Manganese	0.00038	0.000822	8.68E-05	5.04E-05	3.64E-05	(c)	(k)
Mercury	0.00026	0.000411	5.93E-05	3.45E-05	2.49E-05	(i)(c)	(i)(k)
Napthalene	0.00061	-	1.39E-04	8.07E-05	5.82E-05	(c)	
Nickel	0.0021	0.000411	4.78E-04	2.78E-04	2.00E-04	(c)	(k)
POM	0.000088	0.0033	2.12E-05	1.23E-05	8.86E-06	(c)	(k)
Selenium	0.000024	0.002055	6.17E-06	3.60E-06	2.58E-06	(c)	(k)
Toluene	0.0034	-	7.74E-04	4.50E-04	3.24E-04	(c)	
TOTAL HAPS			4.30E-01	2.50E-01	1.80E-01		
EPCRA 313				**lbs./year**			
Lead	0.0005	0.00123	1.14E-04	0.229		(c)	(i)(k)
Sulfuric Acid	0.60	0.285	1.37E-01	273.44		(e)(j)	(e)(h)
Mercury	0.00026	0.00041	5.93E-05	0.119		(c)	(i)(k)
PACs	8.69E-07	1.65E-05	2.04E-07	4.07E-04		(f)(l)	(f)(l)
Benzo(g,h,i) perylene	1.20E-06	2.26E-06	2.74E-07	5.48E-04		(i)(k)(c)	(f)
Zinc	-	0.00055	1.89E-07	3.78E-04			(k)

(a) AP-42, 7/98, Section. 1.4, *Natural Gas Combustion*, Tables 1.4-1, 1.4-2

(b) Fuel usage obtained from Jerry Gonzales (FWO-UI). Values are provided in a monthly data deliverable from KSL.

(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.

(d) All PM from natural gas is assumed <1µ, so PM-10, PM-2.5 and total PM have equal EFs, AP-42, Natural Gas Combustion, Table 1.4-2. The PM emission factor for fuel oil is the sum of filterable and condensable PM.

(e) AP-42, 1/95, Section. 1.4, Natural Gas Combustion, Table 1.4-2. Consistent with previous stack tests.

(f) AP-42, 9/98, Section. 1.3, *Fuel Oil Combustion*, Table 1.3-1 with Errata, Table 1.3-3, and Table 1.3-6.

(g) Boilers>100 MMBtu/hr: SOx Emission Factor (SO_2 {142S} + SO_3 {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')

S(%)= 0.05

(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.

(i) AP-42, Table 1.4-2, 1.4-3, and 1.4-4, July 1998

(j) Assume all SO_3 is converted to sulfuric acid.

(k) AP-42, tables 1.3-9 and 1.3-10, September 1998.

(l) EPCRA PAC Guidance Document, Table 2-3.

Reviewed By/Date:

Attachment B

2010 Annual Emissions Inventory Submittal to NMED

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 116
Designation: TA-60-BDM
Description: Asphalt Plant Dryer - Propane
Type: Asphalt Drum/Burner
SCC: Industrial Processes, Mineral Products, Asphalt Concrete, Drum Mix Plant: Rotary Drum Dryer / Mixer, Natural Gas - Fired

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Propane	
Input Materials Processed:	Asphalt (OUTPUT)	
Materials Consumed:	22212.0	gal/y
Fuel Heating Value:	91547.0	BTU/gal
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	8
Operating Time in Days per Week:	5
Operating Time in Weeks per Year:	26
Operating Time in Hours per Year:	1040
Percent of Operation During Winter:	10
Percent of Operation During Spring:	30
Percent of Operation During Summer:	30
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	124.97	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	1.6	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.006	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.004	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.004	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.027	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.006 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 2
Designation: TA-35-213
Description: Be Target Fabrication Facility - Machining TA-35-213
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Machining Operations, Specify Material**

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	5
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	1920
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	Estimate
Particulate Matter (total suspended):	0.0	tons/y	Estimate

Subject Item Comments

For both beryllium and particulate emissions, the actual number reported is <1.98E-8 tons/year. However, the AEIR tool rounds the number to zero.

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 3
Designation: TA-3-141
Description: Be Test Facility - Machining TA-3-141
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Machining Operations, Specify Material**

Supplemental Parameters

Input Materials Processed: Metal (OUTPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	Engineer Calculation
Particulate Matter (total suspended):	0.0	tons/y	Engineer Calculation

Subject Item Comments

For both beryllium and particulate emissions, the actual number reported is <7.71 E-9 tons/year. However, the AEIR tool rounds the number to zero.

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 6
Designation: TA-55-PF4 (a)
Description: Plutonium Facility Beryllium machining, weld cutting / dressing and metallography
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Machining Operations, Specify Material**

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	5
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	1920
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

For beryllium emissions, the actual number reported is <3.21E-6 tons/year. However, the AEIR tool rounds the number to zero.

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 41
Designation: TA-3-66
Description: Sigma Facility-electroplating/metallography
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Abrasive Cleaning of Metal Parts, Polishing

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	8
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	2912
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	Design calculation

Subject Item Comments

Polishing/milling operations are conducted in an aqueous solution and melting/casting are exhausted through a HEPA filter. Emissions are negligible.

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 8
Designation: TA-48-1-BS-1
Description: Boiler TA-48-1-BS-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.59	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	521.6	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.403	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.01	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.479	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 9
Designation: TA-48-1-BS-2
Description: Boiler TA-48-1-BS-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.588	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	521.5	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.403	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.01	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.479	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 10
Designation: TA-48-1-BS-6
Description: Boiler TA-48-1-BS-6
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	12.831	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	697.9	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.539	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.012	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.013	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.642	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.004	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.035 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 11
Designation: TA-53-365-BHW-1
Description: Boiler TA-53-365-BHW-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	12.785	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	695.4	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.537	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.012	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.013	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.639	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.004	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.035 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 12
Designation: TA-53-365-BHW-2
Description: Boiler TA-53-365-BHW-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	12.785	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	695.4	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.537	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.012	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.013	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.639	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.049	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.004	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.035 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 13
Designation: TA-59-1-BHW-1
Description: Boiler TA-59-1-BHW-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.588	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	521.5	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.403	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.01	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.479	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 14
Designation: TA-59-1-BHW-2
Description: Boiler 59-1-BHW-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.588	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	521.5	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.403	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.01	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.479	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 24
Designation: TA-3-22-1
Description: Power Plant Boiler (pph, Natural Gas)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	149.4	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	8128.5	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	2.99	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.006	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.14	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.15	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	4.33	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.57	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.57	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.57	tons/y	EPA emission factors (e.g., AP-42)

Sulfur Dioxide:	0.05	tons/y	EPA emission factors (e.g., AP-42)
Toluene; (Methyl benzene):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.411	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 25
Designation: TA-3-22-2
Description: Power Plant Boiler (pph, Natural Gas)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	101.4	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	5519.1	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	2.03	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.004	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.09	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.1	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	2.94	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.39	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.39	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.39	tons/y	EPA emission factors (e.g., AP-42)

Sulfur Dioxide:	0.03	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.28	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 26
Designation: TA-3-22-3
Description: Power Plant Boiler (pph, Natural Gas)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	204.6	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	11128.7	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	4.09	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.18	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.21	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	5.93	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.78	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.78	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.78	tons/y	EPA emission factors (e.g., AP-42)

Sulfur Dioxide:	0.061	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.56	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 29
Designation: TA-55-6-BHW-1
Description: Sellers Boiler TA-55-6-BHW-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	10.285	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	559.4	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.196	tons/y	Manufacturer Specification
Hexane:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.011	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.71	tons/y	Actual stack test
Particulate Matter (10 microns or less):	0.073	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.073	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.073	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.031	tons/y	Manufacturer Specification

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 30
Designation: TA-55-6-BHW-2
Description: Sellers Boiler TA-55-6-BHW-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.684	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	526.7	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.185	tons/y	Manufacturer Specification
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	Manufacturer Specification
Methane (from combustion):	0.01	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.668	tons/y	Actual stack test
Particulate Matter (10 microns or less):	0.069	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.069	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.069	tons/y	Manufacturer Specification

Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.029	tons/y	Manufacturer Specification

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 53
Designation: TA-16-1484-BS-2
Description: Low NOx Boiler TA-16-1484-BS-2
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	11.41	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	620.7	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.212	tons/y	Design calculation
Lead:	0.0	tons/y	Design calculation
Methane (from combustion):	0.012	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.212	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.043	tons/y	Design calculation
Particulate Matter (2.5 microns or less):	0.043	tons/y	Design calculation
Particulate Matter (total suspended):	0.043	tons/y	Design calculation
Sulfur Dioxide:	0.003	tons/y	Design calculation
Volatile Organic Compounds (VOC):	0.031	tons/y	Design calculation

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 90
Designation: B-1
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.0	tons/y	Design calculation
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.0	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.0	tons/y	Design calculation
Particulate Matter (total suspended):	0.0	tons/y	Design calculation
Sulfur Dioxide:	0.0	tons/y	Design calculation
Volatile Organic Compounds (VOC):	0.0	tons/y	Design calculation

Subject Item Comments

This unit has not started operating.

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 104
Designation: B-2
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

This unit has not started operating.

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 105
Designation: B-3
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

This unit has not started operating.

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 106
Designation: B-4
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

This unit has not started operating.

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 107
Designation: B-5
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

This unit has not started operating.

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 133
Designation: TA-50-2-BS-1
Description: Superior Model M56-5-1500-S260
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	19.2	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	2
Operating Time in Weeks per Year:	12
Operating Time in Hours per Year:	576
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	1042.9	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.81	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.02	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.959	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.07	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.073	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.006	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.053	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 134
Designation: TA-16-1484-BS-1
Description: Low NOx Boiler TA-16-1484-BS-1
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	11.41	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	620.7	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.212	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.012	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.212	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.043	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.043	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.043	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.031	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 137
Designation: TA-3-22-2
Description: Power Plant Boiler (pph, No. 2 fuel oil)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Distillate Oil, Grades 1 and 2 Oil

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	411.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.05	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	4.2	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.002	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.002	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 138
Designation: TA-3-22-3
Description: Power Plant Boiler (pph, No. 2 fuel oil)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Distillate Oil, Grades 1 and 2 Oil

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	278.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.05	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	2.1	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.001	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 140
Designation: BOILERS
Description: Boilers - GHG only
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	426.7	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8736
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	23206.2	metric tons/y	40 CFR 98 Subpart C
Methane (from combustion):	0.438	metric tons/y	Other publication reference

Subject Item Comments

This SI ID accounts for all of the CO2 and CH4 emissions from small boilers except for those that have their own SI ID.

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 141
Designation: TA-3-22-1
Description: Power Plant Boiler (pph, No. 2 fuel oil)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	0.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.05	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 56
Designation: TA-33-G-1
Description: Kohler Diesel Generator TA-33-G-1
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	9575.6	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	4
Operating Time in Days per Week:	1
Operating Time in Weeks per Year:	16
Operating Time in Hours per Year:	64
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	97.73	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	1.14	tons/y	Design calculation
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.004	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	1.4	tons/y	Design capacity
Particulate Matter (10 microns or less):	0.047	tons/y	Design calculation
Particulate Matter (2.5 microns or less):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.21	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 119
Designation: TA-33-G-2
Description: Kohler Diesel Generator TA-33-G-2
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	15.1	gal/y
Fuel Heating Value:	138.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	1
Operating Time in Days per Week:	3
Operating Time in Weeks per Year:	3
Operating Time in Hours per Year:	9
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.15	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.001	tons/y	Design calculation
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.004	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 120
Designation: TA-33-G-3
Description: Kohler Diesel Generator TA-33-G-3
Type: Internal combustion engine
SCC: Internal Combustion Engines, Industrial, Natural Gas, Reciprocating

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	10.4	gal/y
Fuel Heating Value:	138.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	1
Operating Time in Days per Week:	2
Operating Time in Weeks per Year:	3
Operating Time in Hours per Year:	6
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	0.11	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.001	tons/y	Design calculation
Methane (from combustion):	0.0	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.003	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 135
Designation: TA-33-G-4
Description: Caterpillar Diesel Generator TA-33-G-4
Type: Internal combustion engine
SCC: Internal Combustion Engines, Industrial, Natural Gas, 4-cycle Rich Burn

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	1580.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	5
Operating Time in Days per Week:	2
Operating Time in Weeks per Year:	10
Operating Time in Hours per Year:	100
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	16.13	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.1	tons/y	Design calculation
Methane (from combustion):	0.001	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	0.47	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.034	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.034	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.034	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.034	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 139
Designation: GENERATORS
Description: Generators - GHG only
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	40248.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8736
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	424.08	metric tons/y	40 CFR 98 Subpart C
Methane (from combustion):	0.017	metric tons/y	Other publication reference

Subject Item Comments

This SI ID accounts for all CO2 and CH4 emissions from generators except for those generators that have their own SI ID.

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 21
Designation: TA-55-DG-1
Description: Degreaser - Ultrasonic Cold Batch TA-55-4
Type: Parts Washer
SCC: Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Degreasing, Trichloroethylene: General Degreasing Units

Supplemental Parameters

Input Materials Processed: Solvents: All (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	4
Operating Time in Days per Week:	1
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	208
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
TCE; (Trichloroethylene); (Trichloroethene):	0.01	tons/y	Material balance

Subject Item Comments

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 3
Designation: TA-3-38
Description: Carpenter Shop - General Construction
Type: Processing
SCC: Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Wood Working Operations, Sanding/Planning Operations: Specify

Supplemental Parameters

Input Materials Processed: Wood (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	12
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	4368
Percent of Operation During Winter:	20
Percent of Operation During Spring:	30
Percent of Operation During Summer:	30
Percent of Operation During Fall:	20

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Particulate Matter (10 microns or less):	0.041	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.02	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.044	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 4
Designation: TA-15-563
Description: Carpenter Shop - Test Stands
Type: Processing
SCC: Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Wood Working Operations, Sanding/Planning Operations: Specify

Supplemental Parameters

Input Materials Processed: Wood (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	12
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	4368
Percent of Operation During Winter:	20
Percent of Operation During Spring:	30
Percent of Operation During Summer:	30
Percent of Operation During Fall:	20

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Particulate Matter (10 microns or less):	0.017	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.008	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.018	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 7
Designation: LANL-FW-CHEM
Description: R & D Activities - Labwide (031)
Type: Research/Testing
SCC: Industrial Processes, Photographic Equipment/Health Care/Laboratories, Laboratories, Bench Scale Reagents: Research

Supplemental Parameters

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Acetaldehyde; (Ethyl aldehyde):	0.0	tons/y	Material balance
Acetonitrile; (Methyl cyanide):	0.0	tons/y	Material balance
Acetophenone:	0.0	tons/y	Material balance
Acrylamide:	0.0	tons/y	Material balance
Acrylic acid:	0.0	tons/y	Material balance
Acrylonitrile:	0.0	tons/y	Material balance
Ammonia:	0.0	tons/y	Material balance
Aniline:	0.0	tons/y	Material balance
Antimony:	0.0	tons/y	Material balance
Antimony compounds:	0.0	tons/y	Material balance
Arsenic Compounds:	0.0	tons/y	Material balance
Benzene:	0.0	tons/y	Material balance
Benzyl Chloride:	0.0	tons/y	Material balance
Biphenyl:	0.0	tons/y	Material balance
Bromoform; (Tribromomethane):	0.0	tons/y	Material balance
Butadiene(1,3-):	0.0	tons/y	Material balance
Cadmium:	0.0	tons/y	Material balance
Cadmium compounds:	0.0	tons/y	Material balance
Carbon Dioxide (fugitives):	3.18	metric tons/y	40 CFR 98 Subpart C
Carbon Disulfide:	0.0	tons/y	Material balance
Carbon tetrachloride; (Tetrachoromethane):	0.0	tons/y	Material balance
Carbonyl sulfide:	0.0	tons/y	Material balance
Catechol (Pyrocatechol):	0.0	tons/y	Material balance
Chlorine:	0.0	tons/y	Material balance
Chloroacetic Acid:	0.0	tons/y	Material balance

Chlorobenzene(Phenyl Chloride):	0.0	tons/y	Material balance
Chloroform; (Trichloromethane):	0.0	tons/y	Material balance
Chromium:	0.0	tons/y	Material balance
Cobalt Compounds:	0.0	tons/y	Material balance
Cresol(m-); (Methylphenol, 3-):	0.0	tons/y	Material balance
Cumene:	0.0	tons/y	Material balance
Cyanide compounds:	0.0	tons/y	Material balance
Dibutylphthalate; (Di-n-butyl phthalate):	0.0	tons/y	Material balance
Diethanolamine:	0.0	tons/y	Material balance
Dimethyl Sulfate:	0.0	tons/y	Material balance
Dimethyl formamide:	0.0	tons/y	Material balance
Dimethylhydrazine(1,1-):	0.0	tons/y	Material balance
Dioxane(1,4-) (1,4-Diethyleneoxide):	0.0	tons/y	Material balance
Epichlorohydrin; (1-Chloro-2,3-epoxypropane):	0.0	tons/y	Material balance
Epoxybutane(1,2-) (1,2-Butylene oxide):	0.0	tons/y	Material balance
Ethyl Acrylate:	0.0	tons/y	Material balance
Ethyl chloride; (Chloroethane):	0.0	tons/y	Material balance
Ethylene Glycol:	0.0	tons/y	Material balance
Ethylene dibromide; (EDB); (1.2-Dibromoethane):	0.0	tons/y	Material balance
Formaldehyde:	0.0	tons/y	Material balance
Glycol Ethers:	0.0	tons/y	Material balance
Hexachlorocyclopentadiene:	0.0	tons/y	Material balance
Hexamethylphosphoramide:	0.0	tons/y	Material balance
Hexane:	0.0	tons/y	Material balance
Hydrazine:	0.0	tons/y	Material balance
Hydrochloric acid (HCl):	0.0	tons/y	Material balance
Hydrofluoric Acid; (Hydrogen fluoride):	0.0	tons/y	Material balance
Hydroquinone:	0.0	tons/y	Material balance
Iodomethane (Methyl iodide):	0.0	tons/y	Material balance
Lead Compounds:	0.0	tons/y	Material balance
Manganese:	0.0	tons/y	Material balance
Manganese compounds:	0.0	tons/y	Material balance
Mercury compounds:	0.0	tons/y	Material balance
Methane (fugitives):	1.27	metric tons/y	40 CFR 98 Subpart C
Methanol; (Methyl alcohol):	0.0	tons/y	Material balance
Methyl Ethyl Ketone; (MEK); (2-Butanone):	0.0	tons/y	Material balance
Methyl Methacrylate:	0.0	tons/y	Material balance
Methyl bromide; (Bromomethane):	0.0	tons/y	Material balance
Methyl chloride; (Chloromethane):	0.0	tons/y	Material balance
Methyl isobutyl ketone; (Hexone); (4-Methyl-2-pentanone):	0.0	tons/y	Material balance
Methyl tert butyl ether:	0.0	tons/y	Material balance
Methylene chloride; (Dichloromethane):	0.0	tons/y	Material balance
Methylenebiphenyl isocyanate; (MDI); (Diphenylmethane diisocyanate):	0.0	tons/y	Material balance
Naphthalene:	0.0	tons/y	Material balance
Nickel:	0.0	tons/y	Material balance
Nickel compounds:	0.0	tons/y	Material balance
Nitrobenzene; (nitro-Benzene):	0.0	tons/y	Material balance
Nitrophenol(4-); (p-Nitrophenol):	0.0	tons/y	Material balance
PCE; (Perchloroethylene); (Tetrachloroethylene); (Tetrachloroethene):	0.0	tons/y	Material balance
Phenol:	0.0	tons/y	Material balance
Phenylenediamine(p-); (Phenylenediamine):	0.0	tons/y	Material balance
Phosphine:	0.0	tons/y	Material balance
Phosphorus:	0.0	tons/y	Material balance
Phthalic anhydride:	0.0	tons/y	Material balance

Polycylic Organic Matter:	0.0	tons/y	Material balance
Propylene oxide:	0.0	tons/y	Material balance
Selenium:	0.0	tons/y	Material balance
Selenium compounds:	0.0	tons/y	Material balance
Styrene:	0.0	tons/y	Material balance
TCE; (Trichloroethylene); (Trichloroethene):	0.0	tons/y	Material balance
Tetrachloroethane(1,1,2,2-):	0.0	tons/y	Material balance
Titanium tetrachloride:	0.0	tons/y	Material balance
Toluene diisocyanate(2,4-):	0.0	tons/y	Material balance
Toluene; (Methyl benzene):	0.0	tons/y	Material balance
Total HAP:	3.73	tons/y	Material balance
Trichloroethane(1,1,1-) (Methyl Chloroform):	1.44	tons/y	Material balance
Trichloroethane(1,1,2-):	0.0	tons/y	Material balance
Triethylamine:	0.0	tons/y	Material balance
Trimethylpentane(2,2,4-):	0.0	tons/y	Material balance
Urethane; (Ethyl carbamate):	0.0	tons/y	Material balance
Vinyl acetate; (Vinyl acetate monomer):	0.0	tons/y	Material balance
Volatile Organic Compounds (VOC):	6.66	tons/y	Material balance
Xylene(m-); (1,3-Dimethylbenzene); (meta-Xylene):	0.0	tons/y	Material balance
Xylene(o-); (1,2-Dimethylbenzene); (ortho-Xylene):	0.0	tons/y	Material balance
Xylenes (total); (Xylol):	0.0	tons/y	Material balance
bis(2-ethylhexyl) phthalate; (Di-2-ethylhexyl phthalate); (DEHP):	0.0	tons/y	Material balance

Subject Item Comments

The calculation method for Methane and Carbon Dioxide should be "Material Balance". However, the AEIR tool currently does not have that option for GHG pollutants.

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 89
Designation: TA-52-11
Description: Data Disintegrator/industrial Shredder
Type: Shredder
SCC: Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Paper Products, Other Not Classified

Supplemental Parameters

Input Materials Processed: Paper (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	7
Operating Time in Days per Week:	5
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	1820
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Particulate Matter (10 microns or less):	0.04	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.03	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.04	tons/y	Manufacturer Specification

Subject Item Comments

Print | Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 15, 2011

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2010 Submittal (In Process)

Facility ID: 112
Designation: TA-3-22-CT-1
Description: Combustion Turbine
Type: Turbine
SCC: Internal Combustion Engines, Electric Generation, Natural Gas, Turbine

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	78.1	MM SCF/y
Fuel Heating Value:	1026.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.006	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	5
Operating Time in Days per Week:	4
Operating Time in Weeks per Year:	12
Operating Time in Hours per Year:	240
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Dioxide (from combustion):	4246.9	metric tons/y	40 CFR 98 Subpart C
Carbon Monoxide:	0.41	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Methane (from combustion):	0.08	metric tons/y	40 CFR 98 Subpart C
Nitrogen Dioxide:	1.97	tons/y	Actual stack test
Particulate Matter (10 microns or less):	0.27	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.27	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.27	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.14	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.09	tons/y	EPA emission factors (e.g., AP-42)

Los Alamos National Laboratory's 2010 Greenhouse Gas Emissions Totals

Facility Greenhouse Emissions Totals in CO_2e	322,502.7 metric tons
Total for Combustion Sources in CO_2e	60,497.4 metric tons
Carbon Dioxide Vented emisions (process and fugitive emissions) in CO_2e	3.2 metric tons
Methane Vented emisions (process and fugitive emissions) in CO_2e	26.7 metric tons

Los Alamos National Laboratory's 2010 Example Equations for Greenhouse Gas Calculations

Asphalt Plant

CO_2 Example

Fuel Use (gal/yr) * Heat Content (BTU/gal) * Emission Factor (kg CO_2/MMBTU) * (1 MMBTU/1000000 BTU) * (1 metric ton / 1000 kg) = metric ton CO_2/year

ID 116 (22,212 gal) * (91,547 BTU/gal) * (61.46 kg CO_2/MMBTU) * (1 MMBTU/1000000 BTU) * (1 metric ton / 1000 kg) = **124.97 metric tons of CO_2**

CH_4 Example

Fuel Use (gal/yr) * Heat Content (BTU/gal) * Emission Factor (kg CH_4/MMBTU) * (1 MMBTU/1000000 BTU) * (1 metric ton / 1000 kg) = metric ton CH_4/year

ID 116 (22,212 gal) * (91,547 BTU/gal) * (0.003 kg CH_4/MMBTU) * (1 MMBTU/1000000 BTU) * (1 metric ton / 1000 kg) = **0.006 metric tons of CH_4**

Power Plant/Boiler

CO_2 Example

Natural gas use (MMSCF/ year) * High Heat Value of nat. gas (MMBTU/MMSCF) * Emission Factor (kg CO_2/MMBTU) * 1 metric ton/1000 kg = metric tons CO_2 / year

ID 24 (149.4 MMSCF/yr) * (1026 MMBTU/MMSCF) * (53.02 kgCO_2/MMBTU) * (1 metric ton/1000 kg) = **8,128.5 metric tons of CO_2 / year**

Fuel Oil Use (gallons/year) * MMBTU/gallon * Emission Factor (kg CO_2/MMBTU) * 1 metric ton/1000 kg = metric tons CO_2 / year

ID 137 (411 gallons/yr) * (0.138 MMBTU/gal) * (73.96 kg CO_2/MMBTU) * (1 metric ton/1000 kg) = 4.2 **metric tons CO_2 / year**

CH_4 Example

Natural gas use (MMSCF/ year) * High Heat Value of nat. gas (MMBTU/MMSCF) * Emission Factor (kg CH_4/MMBTU) * 1 metric ton/1000 kg = metric tons CH_4 / year

ID 24 (149.4 MMSCF/yr) * (1026 MMBTU/MMSCF) * (0.001 kg CH_4/MMBTU) * (1 metric ton/1000 kg) = **0.153 metric tons of CH_4 / year**

Fuel Oil Use (gallons/year) * MMBTU/gallon * Emission Factor (kg CH_4/MMBTU) * 1 metric ton/1000 kg = metric tons CH_4/ year

ID 137 (411 gallons/yr) * (0.138 MMBTU/gal) * (0.003 kg CH_4/MMBTU) * (1 metric ton/1000 kg) = **1.7E-04 metric tons CH_4 / year**

Combustion Turbine

CO^2 Example

Natural gas use (MMSCF/year) * High Heat Value of nat. gas (MMBTU/MMSCF) * Emission Factor (kg CO_2/MMBTU) * metric ton/1000 kg = metric tons CO_2 / year

ID 112 (78.081 MMSCF/year) * (1026 MMBTU/MMSCF) * (53.02 kg CO_2/MMBTU) * (1 metric ton/1000 kg) = **4246.9 metric tons CO_2 / year**

CH_4 Example

Natural gas use (MMSCF/year) * High Heat Value of nat. gas (MMBTU/MMSCF) * Emission Factor (kg CH_4/MMBTU) * 1 metric ton/1000 kg = metric tons CH_4 / year

ID 112 (78.081 MMSCF/year) * (1026 MMBTU/MMCF) * (0.001 kg CH_4/MMBTU) * (1 metric ton/1000 kg) = **0.08 metric tons CH_4 / year**

Generator

CO_2 Example

Fuel Use (gal./year) * High Heat Value (MMBTU/gal) * Emission Factor (kg CO_2/gal.) * (1 metric ton /1000 kg) = metric tons CO_2 / year

ID 56 (9,575.6 gal./year) * (0.138 MMBTU/gal) * (73.96 kg CO_2/MMBTU) * (1 metric ton/1000 kg) = **97.73 metric tons CO_2 / year**

CH_4 Example

Fuel Use (gal./year) * High Heat Value (MMBTU/gal) * Emission Factor (kg CH_4/gal.) * (1 metric ton/1000 kg) = metric tons CH_4/ year

ID 56 (9,575.6 gal./year) * (0.138 MMBTU/gal) * (0.003 kg CH_4/MMBTU) * (1 metric ton/1000 kg) = **0.004 metric tons CH_4 / year**

Vented and Fugitive Emissions

Research and Development Activities	metric tons	CO_2e metric tons
CO_2 Fugitive Emissions	3.18	3.18
CH_4 Fugitive Emissions	1.27	26.67

Indirect Emissions

Electricity Use	CO_2e metric tons
LANL Property	254,356.00
Leased Space	4,477.84
Total	**261,975.54**

Attachment C

2010 Semi-Annual Emissions Reports Submitted Under Title V Operating Permit Requirements

Los Alamos
NATIONAL LABORATORY
EST.1943

Associate Directorate for ESH&Q
P.O. Box 1663, MS K491
Los Alamos, New Mexico 87545
505-667-4218/Fax 505-665-3811

Date: September 16, 2010
Refer To: ESH&Q-10-048

Compliance Reporting Manager
Compliance & Enforcement Section
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, NM 87507

IDEA ID NO. 856 – LOS ALAMOS NATIONAL LABORATORY (LANL)
OPERATING PERMIT NO: P100R1
SEMI-ANNUAL EMISSIONS REPORT – JANUARY 1, 2010 TO JUNE 30, 2010

Dear Compliance Reporting Manager:

Enclosed is Los Alamos National Laboratory's (LANL) Semi-Annual Emissions report for the period January 1, 2010 through June 30, 2010. This report is required by permit condition 4.1 and is submitted within 90 days from the end of the reporting period as required by permit condition 4.3.

The semi-annual emissions report includes actual emissions from permitted sources included in section 2.0 of LANL's Operating Permit. 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. In this report, actual emissions are listed along with the emission limits for ease in comparing and verifying compliance. No annual emission limits were exceeded during this reporting period.

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

Sincerely,

J. Chris Cantwell

Associate Director, ESH&Q

Title V Semi-Annual Emissions Report for Permit P100R1
January 1, 2010 - June 30, 2010

Emission Reporting Requirements

4.0 Reporting

Conditions of 4.0 are pursuant to 20.2.70.302.E NMAC.

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

4.3 The report required by Condition 4.1 shall be submitted within 90 days from the end of the reporting period. The semiannual report required by Condition 4.2 shall be submitted within 45 days from the end of the reporting period. The reporting periods are January 1st to June 30th and July 1st to December 31st. This condition is pursuant to 20.2.70.302.E.1 NMAC.

Specific Emissions Reports:

2.1 Asphalt Production

2.1.2 Emission Limits

Emission Unit	Allowable Emission Limits				
	NO_x	SO_2	PM	CO	VOC
TA-60-BDM	95.0 tpy	50.0 tpy	0.04 gr/dscf 33.8 lbs/hr 95.0 tpy	95.0 tpy	95.0 tpy

Reporting Requirement

2.1.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Asphalt Plant TA-60-BDM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.1.2) (tons per year)
NOx	0.029			95.0
SO_2	0.002			50.0
PM	0.017			95.0
CO	1.005			95.0
VOC	0.004			95.0
HAPs	0.004			No Source Permit Limit

2.2 Beryllium Activities

2.2.2 Emission Limits

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Sigma Facility TA-3-66	10 gm/24 hr	Not Applicable
Beryllium Technology Facility TA-3-141	0.35 gm/24 hr 3.5 gm/yr	Not Applicable

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Target Fabrication Facility TA-35-213	1.8×10^{-04} gm/hr 0.36 gm/yr	Not Applicable
Plutonium Facility TA-55-PF4		
Machining Operation	0.12 gm/24 hr 2.99 gm/yr	0.12 gm/24 hr 2.99 gm/yr
Foundry Operation	3.49×10^{-5} gm/24 hr 8.73×10^{-4} gm/yr	3.49×10^{-5} gm/24 hr 8.73×10^{-4} gm/yr

Reporting Requirement

2.2.6 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

2.2 Beryllium Activities - continued

Comments:

Source	Pollutant	January - June Emissions	July - December Emissions	Annual Emissions	Permit Limits (Condition 2.2.2)
Beryllium Test Facility TA-3-141[(1)]	Beryllium (grams)	< 0.0033			3.5 gm/yr
Target Fabrication Facility TA-35-213[(2)]	Beryllium (grams)	< 0.00944			0.36 gm/yr
Plutonium Facility TA-55-PF4 Machining Operation[(3)]	Beryllium (grams)	< 1.495			2.99 gm/yr
	Aluminum (grams)	< 1.495			2.99 gm/yr
Plutonium Facility TA-55-PF4 Foundry Operation[(4)]	Beryllium (grams)	0			8.73×10^{-4} gm/yr
	Aluminum (grams)	0			8.73×10^{-4} gm/yr
Beryllium Total[(5)] (tons) =		**< 1.66E-06**			
Aluminum Total (tons) =		**< 1.65E-06**			

Notes: [(1)] Emission values shown for the Beryllium Test Facility are from actual stack emission measurements which are submitted to NMED quarterly. [(2)] Emissions for the Target Fabrication Facility are from initial compliance testing of that source and calculated based on a conservative assumption of 8 hour work days. Log books were checked to verify that work days were much less than 8 hours. [(3)] Emissions for the Plutonium Facility are calculated based on permitted throughputs. Log books were checked to verify that throughputs were much less than permitted values. [(4)] The Plutonium Facility foundry operations did not operate in the first 6 months of 2010. [(5)] The Sigma Facility listed in section 2.2 of the permit does not require reporting in the Semi-Annual Emissions Report.

2.3 Boilers and Heaters

2.3.2 Emission Limits

Source	Allowable Emission Limits				
All Boilers and Heaters[1]	NO_x (tpy)	CO (tpy)	PM or PM_{10} (tpy)	SO_2 (tpy)	VOC (tpy)
	80	80	50	50	50

[1] Excludes TA-3-22 Power Plant addressed in Condition 2.9

Reporting Requirement

2.3.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Boilers and Heaters	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.3.2) (tons per year)
NOx	16.62			80
SO_2	0.10			50
PM	1.32			50
PM-10	1.32			50
CO	13.59			80
VOCs	0.93			50
HAPs	0.32			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 Section 2.9 of this report.

2.4 Carpenter Shops

2.4.2 Emission Limits

Source	Allowable Emission Limits
	PM_{10} (tpy)
TA-15-563	2.81
TA-3-38	3.07

Reporting Requirement

2.4.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Shop	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.4.2) (tons per year)
TA-3-38	**PM_{10}**	0.019			3.07
TA-15-563	**PM_{10}**	0.008			2.81

2.5 Chemical Usage

2.5.2 Emission Limits

2.5.3.1 The contribution of VOC and/or HAPs emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOCs
8 tons per year of individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.5.5.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Chemical Usage LANL-FW-CHEM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.5.3.1)
VOCs	3.3			Source limits refer to facility-wide limits.
HAPs	2.4			
Highest Individual HAP for the first 6 months of 2010 (Methyl Chloroform)	1.4			

2.6 Degreasers

2.6.2 Emission Limits

2.6.2.1 The contribution of VOC and/or HAP emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOCs
8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.6.6.3 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Degreaser TA-55-DG-1	**January - June Emissions (tons)**	**July - December Emissions (tons)**	**Annual Emissions (tons)**	**Permit Limits (Condition 2.6.2.1) (tons per year)**
VOCs	0.005			Source limits refer to facility-wide limits. (See Facility Emissions Table on Page 1)
HAPs	0.005			

2.7 Internal Combustion Sources

2.7.2 Emission Limits

Source	Allowable Emission Limits											
	NO_x[1]		CO		VOC		SO_x[2]		TSP		PM_{10}	
	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
TA-33-G-1	40.3	18.1	33.7	15.2	0.7	0.3	5.5	2.5	1.4	0.6	1.4	0.6
TA-33-G-2	0.83	0.21	0.2	0.1	0.1	- -[3]	- -	- -	- -	- -	- -	- -
TA-33-G-3	0.83	0.21	0.2	0.1	0.1	- -	- -	- -	- -	- -	- -	- -
TA-33-G-4	9.33	2.33	5.7	1.4	0.75	0.2	0.62	0.16	- -	- -	- -	- -

1 Nitrogen dioxide emissions include all oxides of nitrogen expressed as NO_2.
2 Sulfur dioxide emissions include all oxides of sulfur expressed as SO_2
3 "- -" indicates the emission rate is less than 0.05 pph or 0.05 tpy and limits are not required for this permit.

Reporting Requirement

2.7.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Generator TA-33-G-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	1.149			18.1
SO_X	0.170			2.5
TSP	0.038			0.6
PM_{10}	0.038			0.6
CO	0.936			15.2
VOC	0.021			0.3
HAPs	2.48E-04			No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Generator TA-33-G-2	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.001			0.21
SO_X	0.000			Not Required
TSP	0.000			Not Required
PM_{10}	0.000			Not Required
CO	0.000			0.1
VOC	0.000			Not Required
HAPs	4.06E-07			No Source Limit

Note: This generator only ran for 3.0 hours during the first six months of 2010.

Generator TA-33-G-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.000			0.21
SO_X	0.000			Not Required
TSP	0.000			Not Required
PM_{10}	0.000			Not Required
CO	0.000			0.1
VOC	0.000			Not Required
HAPs	1.22E-07			No Source Limit

Note: This generator ran less than an hour during the first 6 months of 2010.

Generator TA-33-G-4	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.406			2.33
SO_X	0.029			0.16
TSP	0.029			Not Required
PM_{10}	0.029			Not Required
CO	0.087			1.4
VOC	0.029			0.2
HAPs	1.31E-04			No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Stationary Standby Generators	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	3.48			No Source Specific Emission Limits for Standby Generators
SOx	0.17			
TSP	0.19			
PM_{10}	0.19			
CO	0.79			
VOC	0.19			
HAPs	0.001			

Note: Standby Generators are insignificant sources.

2.8 Data Disintegrator

2.8.2 Emission Limits

Source	Allowable Emission Limits			
TA-52-11	TSP (pph)	TSP (tpy)	PM10 (pph)	PM10 (tpy)
	2.3	9.9	2.3	9.9

PM10 and TSP emissions limits shown in above Table are after controls.

Reporting Requirement

2.8.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Data Disintegrator TA-52-11	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.8.2) (tons per year)
TSP	0.03			9.9
PM10	0.02			9.9

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

2.9.2 Emission Limits

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22-1 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-2 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-3 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
Boilers Individually (tpy)	35.9		N/A		N/A		N/A		N/A		N/A	
Boilers Combined[1] (tpy)	60.2		41.3		7.9		8.4		8.2		5.6	

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22 CT-1 (lb/hr)	23.8		170.9		1.4		1.6		1.6		1.0	
TA-3-22 CT-1 (tpy)[1,2]	33.2		19.8		1.9		2.3		2.3		-	
TA-3-22 CT-1 (ppm)	25 ppmv @ 15% O_2		N/A		N/A		N/A		N/A		N/A	

[1] Annual emission limits are 12-month rolling totals. This is pursuant to NSR Permit 2195B-M1R2, Table 2.1, Note 7.

[2] "-" notation implies emission rates less than or equal to 0.5 tpy.

* N/A means not applicable.

Reporting Requirement

2.9.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on July 29, 2010, Tracking Number SBR20100009.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

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

Comments:

Boilers TA-3-22-1, TA-3-22-2, TA-3-22-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	7.67			60.2
SO_2	0.08			7.9
TSP	1.01			8.4
PM_{10}	1.01			8.2
CO	5.29			41.3
VOC	0.73			5.6
HAPs	0.25			No Source Limit

Boiler	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
TA-3-22-1	**NOx**	1.55			35.9
TA-3-22-2	**NOx**	0.89			35.9
TA-3-22-3	**NOx**	5.24			35.9

Combustion Turbine TA-3-22 CT-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	0.57			33.2
SO_2	0.04			1.9
TSP	0.08			2.3
PM_{10}	0.08			2.3
CO	0.12			19.8
VOC	0.03			No TPY Limit
HAPs	0.02			No Source Limit

2.10 Open Burning

2.10.2 Emission Limits

2.10.2.1 The contribution of HAP emissions from open burning shall not cause the exceedance of the corresponding facility-wide limit listed below:

8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.10.5.1 Reports shall be submitted in accordance with conditions 4.1.

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

No open burning activities took place in the first 6 months of 2010.

2.11 Facility Wide Emission Limits

2.11.1 Emission Limits

Total Allowable Criteria Pollutant and HAP Emission Limits

Pollutant	Emission Limit (tons per year)
Nitrogen Oxides (NO_x)	245
Carbon Monoxide (CO)	225
Volatile Organic Compounds (VOCs)	200
Sulfur Dioxide (SO_2)	150
Particulate Matter (PM)	120
Hazardous Air Pollutants (HAPs)	24 combined / 8 individual

Reporting Requirement

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	2009 Annual Emissions (tons)	Facility Wide Permit Limits (Condition 2.11.1) (tons per year)
Nitrogen Oxides	29.9			245
Sulfur Dioxide	0.6			150
Particulate Matter	2.7			120
Carbon Monoxide	21.8			225
Volatile Organic Compounds	5.2			200
Hazardous Air Pollutants	3.0			24 combined
Highest Individual HAP (Methyl Chloroform)	1.4			8 individual

Title V Semi-Annual Emissions Report for Permit P100R1
July 1, 2010 - December 31, 2010

Emission Reporting Requirements

4.0 Reporting

Conditions of 4.0 are pursuant to 20.2.70.302.E NMAC.

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

4.3 The report required by Condition 4.1 shall be submitted within 90 days from the end of the reporting period. The semiannual report required by Condition 4.2 shall be submitted within 45 days from the end of the reporting period. The reporting periods are January 1st to June 30th and July 1st to December 31st. This condition is pursuant to 20.2.70.302.E.1 NMAC.

Specific Emissions Reports:

2.1 Asphalt Production

2.1.2 Emission Limits

Emission Unit	Allowable Emission Limits				
	NO_x	SO_2	PM	CO	VOC
TA-60-BDM	95.0 tpy	50.0 tpy	0.04 gr/dscf 33.8 lbs/hr 95.0 tpy	95.0 tpy	95.0 tpy

Reporting Requirement

2.1.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Asphalt Plant TA-60-BDM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.1.2) (tons per year)
NOx	0.029	0.017	0.046	95.0
SO_2	0.002	0.001	0.003	50.0
PM	0.017	0.010	0.027	95.0
CO	1.005	0.594	1.599	95.0
VOC	0.004	0.002	0.006	95.0
HAPs	0.004	0.002	0.006	No Source Permit Limit

2.2 Beryllium Activities

2.2.2 Emission Limits

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Sigma Facility TA-3-66	10 gm/24 hr	Not Applicable
Beryllium Technology Facility TA-3-141	0.35 gm/24 hr 3.5 gm/yr	Not Applicable

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Target Fabrication Facility TA-35-213	1.8×10^{-04} gm/hr 0.36 gm/yr	Not Applicable
Plutonium Facility TA-55-PF4		
Machining Operation	0.12 gm/24 hr 2.99 gm/yr	0.12 gm/24 hr 2.99 gm/yr
Foundry Operation	3.49×10^{-5} gm/24 hr 8.73×10^{-4} gm/yr	3.49×10^{-5} gm/24 hr 8.73×10^{-4} gm/yr

Reporting Requirement

2.2.6 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

2.2 Beryllium Activities - continued

Comments:

Source	Pollutant	January - June Emissions	July - December Emissions	Annual Emissions	Permit Limits (Condition 2.2.2)
Beryllium Test Facility TA-3-141[1]	Beryllium (grams)	< 0.0033	< 0.0033	< 0.007	3.5 gm/yr
Target Fabrication Facility TA-35-213[2]	Beryllium (grams)	< 0.00944	< 0.009	< 0.018	0.36 gm/yr
Plutonium Facility TA-55-PF4 Machining Operation[3]	Beryllium (grams)	< 1.495	< 1.41	< 2.91	2.99 gm/yr
	Aluminum (grams)	< 1.495	< 1.41	< 2.91	2.99 gm/yr
Plutonium Facility TA-55-PF4 Foundry Operation[4]	Beryllium (grams)	0	0	0.00	8.73×10^{-4} gm/yr
	Aluminum (grams)	0	0	0.00	8.73×10^{-4} gm/yr
Beryllium Total[5] (tons) =		**< 1.66E-06**	**< 1.57E-06**	**< 3.23E-06**	
Aluminum Total (tons) =		**< 1.65E-06**	**< 1.55E-06**	**< 3.30E-06**	

Notes: [1] Emission values shown for the Beryllium Test Facility are from actual stack emission measurements which are submitted to NMED quarterly. [2] Emissions for the Target Fabrication Facility are from initial compliance testing of that source and calculated based on a conservative assumption of 8 hour work days. Log books were checked to verify that work days were much less than 8 hours. [3] Emissions for the Plutonium Facility are calculated based on permitted throughputs. Log books were checked to verify that throughputs were much less than permitted values. [4] The Plutonium Facility foundry operations did not operate in 2010. [5] The Sigma Facility listed in section 2.2 of the permit does not require reporting in the Semi-Annual Emissions Report.

2.3 Boilers and Heaters

2.3.2 Emission Limits

Source	Allowable Emission Limits				
All Boilers and Heaters[1]	NO_x (tpy)	CO (tpy)	PM or PM_{10} (tpy)	SO_2 (tpy)	VOC (tpy)
	80	80	50	50	50

[1] Excludes TA-3-22 Power Plant addressed in Condition 2.9

Reporting Requirement

2.3.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Boilers and Heaters	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.3.2) (tons per year)
NOx	16.64	11.29	27.93	80
SO_2	0.10	0.07	0.17	50
PM	1.32	0.90	2.22	50
PM-10	1.32	0.90	2.22	50
CO	13.60	9.15	22.75	80
VOCs	0.93	0.63	1.56	50
HAPs	0.32	0.22	0.54	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 Section 2.9 of this report.

2.4 Carpenter Shops

2.4.2 Emission Limits

Source	Allowable Emission Limits
	PM_{10} (tpy)
TA-15-563	2.81
TA-3-38	3.07

Reporting Requirement

2.4.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Shop	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.4.2) (tons per year)
TA-3-38	**PM_{10}**	0.019	0.021	0.040	3.07
TA-15-563	**PM_{10}**	0.008	0.009	0.017	2.81

2.5 Chemical Usage

2.5.2 Emission Limits

2.5.3.1 The contribution of VOC and/or HAPs emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOCs
8 tons per year of individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.5.5.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003..

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Chemical Usage LANL-FW-CHEM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.5.3.1)
VOCs	3.3	3.4	6.7	Source limits refer to facility-wide limits.
HAPs	2.4	1.3	3.7	
Highest Individual HAP for the first 6 months of 2010 (Methyl Chloroform)	1.4	0.0	1.4	
Highest Individual HAP for the second 6 months of 2010 (Glycol Ethers)	0.1	0.3	0.4	

2.6 Degreasers

2.6.2 Emission Limits

2.6.2.1 The contribution of VOC and/or HAP emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOCs
8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.6.6.3 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Degreaser TA-55-DG-1	**January - June Emissions (tons)**	**July - December Emissions (tons)**	**Annual Emissions (tons)**	**Permit Limits (Condition 2.6.2.1) (tons per year)**
VOCs	0.005	0.004	0.009	Source limits refer to facility-wide limits. (See Facility Emissions Table on Page 1)
HAPs	0.005	0.004	0.009	

2.7 Internal Combustion Sources

2.7.2 Emission Limits

Source	Allowable Emission Limits											
	NO_x[1]		CO		VOC		SO_x[2]		TSP		PM_{10}	
	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
TA-33-G-1	40.3	18.1	33.7	15.2	0.7	0.3	5.5	2.5	1.4	0.6	1.4	0.6
TA-33-G-2	0.83	0.21	0.2	0.1	0.1	--[3]	--	--	--	--	--	--
TA-33-G-3	0.83	0.21	0.2	0.1	0.1	--	--	--	--	--	--	--
TA-33-G-4	9.33	2.33	5.7	1.4	0.75	0.2	0.62	0.16	--	--	--	--

1 Nitrogen dioxide emissions include all oxides of nitrogen expressed as NO_2.
2 Sulfur dioxide emissions include all oxides of sulfur expressed as SO_2
3 "- -" indicates the emission rate is less than 0.05 pph or 0.05 tpy and limits are not required for this permit.

Reporting Requirement

2.7.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Generator TA-33-G-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	1.149	0.248	1.398	18.1
SO_x	0.170	0.037	0.207	2.5
TSP	0.038	0.008	0.047	0.6
PM_{10}	0.038	0.008	0.047	0.6
CO	0.936	0.202	1.139	15.2
VOC	0.021	0.005	0.026	0.3
HAPs	2.48E-04	5.35E-05	3.01E-04	No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Generator TA-33-G-2	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.001	0.002	0.003	0.21
SO_X	0.000	0.000	0.000	Not Required
TSP	0.000	0.000	0.000	Not Required
PM_{10}	0.000	0.000	0.000	Not Required
CO	0.000	0.001	0.001	0.1
VOC	0.000	0.000	0.000	Not Required
HAPs	4.06E-07	7.98E-07	1.20E-06	No Source Limit

Note: This generator only ran for 3.0 hours during the first six months of 2010 and 5.9 hours during the second six months.

Generator TA-33-G-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.000	0.002	0.002	0.21
SO_X	0.000	0.000	0.000	Not Required
TSP	0.000	0.000	0.000	Not Required
PM_{10}	0.000	0.000	0.000	Not Required
CO	0.000	0.000	0.000	0.1
VOC	0.000	0.000	0.000	Not Required
HAPs	1.22E-07	7.03E-07	8.25E-07	No Source Limit

Note: This generator ran less than an hour during the first 6 months of 2010 and 5.2 hours during the second six months.

Generator TA-33-G-4	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.406	0.066	0.472	2.33
SO_X	0.029	0.005	0.034	0.16
TSP	0.029	0.005	0.034	Not Required
PM_{10}	0.029	0.005	0.034	Not Required
CO	0.087	0.014	0.101	1.4
VOC	0.029	0.005	0.034	0.2
HAPs	1.31E-04	2.13E-05	1.52E-04	No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Stationary Standby Generators	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	3.48	2.53	6.01	No Source Specific Emission Limits for Standby Generators
SOx	0.17	0.09	0.26	
TSP	0.19	0.11	0.30	
PM_{10}	0.19	0.11	0.30	
CO	0.79	0.59	1.38	
VOC	0.19	0.11	0.30	
HAPs	0.001	0.001	0.002	

Note: Standby Generators are insignificant sources.

2.8 Data Disintegrator

2.8.2 Emission Limits

Source	Allowable Emission Limits			
TA-52-11	TSP (pph)	TSP (tpy)	PM10 (pph)	PM10 (tpy)
	2.3	9.9	2.3	9.9

PM10 and TSP emissions limits shown in above Table are after controls.

Reporting Requirement

2.8.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Data Disintegrator TA-52-11	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.8.2) (tons per year)
TSP	0.03	0.02	0.05	9.9
PM10	0.02	0.02	0.04	9.9

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

2.9.2 Emission Limits

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22-1 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-2 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-3 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
Boilers Individually (tpy)	35.9		N/A		N/A		N/A		N/A		N/A	
Boilers Combined[1] (tpy)	60.2		41.3		7.9		8.4		8.2		5.6	

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22 CT-1 (lb/hr)	23.8		170.9		1.4		1.6		1.6		1.0	
TA-3-22 CT-1 (tpy)[1,2]	33.2		19.8		1.9		2.3		2.3		-	
TA-3-22 CT-1 (ppm)	25 ppmv @ 15% O_2		N/A		N/A		N/A		N/A		N/A	

[1] Annual emission limits are 12-month rolling totals. This is pursuant to NSR Permit 2195B-M1R2, Table 2.1, Note 7.

[2] "-" notation implies emission rates less than or equal to 0.5 tpy.

* N/A means not applicable.

Reporting Requirement

2.9.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 11, 2011, Tracking Number SBR20110003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

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

Comments:

Boilers TA-3-22-1, TA-3-22-2, TA-3-22-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	7.67	5.54	13.21	60.2
SO_2	0.08	0.06	0.14	7.9
TSP	1.01	0.73	1.74	8.4
PM_{10}	1.01	0.73	1.74	8.2
CO	5.29	3.82	9.11	41.3
VOC	0.73	0.52	1.25	5.6
HAPs	0.25	0.18	0.43	No Source Limit

Boiler	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
TA-3-22-1	NOx	1.55	2.79	4.34	35.9
TA-3-22-2	NOx	0.89	2.05	2.94	35.9
TA-3-22-3	NOx	5.24	0.70	5.94	35.9

Combustion Turbine TA-3-22 CT-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	0.57	1.40	1.97	33.2
SO_2	0.04	0.10	0.14	1.9
TSP	0.08	0.19	0.27	2.3
PM_{10}	0.08	0.19	0.27	2.3
CO	0.12	0.29	0.41	19.8
VOC	0.03	0.06	0.09	No TPY Limit
HAPs	0.02	0.04	0.06	No Source Limit

2.10 Open Burning

2.10.2 Emission Limits

2.10.2.1 The contribution of HAP emissions from open burning shall not cause the exceedance of the corresponding facility-wide limit listed below:

8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.10.5.1 Reports shall be submitted in accordance with conditions 4.1.

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:
No open burning activities took place in 2010.

2.11 Facility Wide Emission Limits

2.11.1 Emission Limits

Total Allowable Criteria Pollutant and HAP Emission Limits

Pollutant	Emission Limit (tons per year)
Nitrogen Oxides (NO_x)	245
Carbon Monoxide (CO)	225
Volatile Organic Compounds (VOCs)	200
Sulfur Dioxide (SO_2)	150
Particulate Matter (PM)	120
Hazardous Air Pollutants (HAPs)	24 combined / 8 individual

Reporting Requirement

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. 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 this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	2010 Annual Emissions (tons)	Facility Wide Permit Limits (Condition 2.11.1) (tons per year)
Nitrogen Oxides	29.9	21.1	51.0	245
Sulfur Dioxide	0.6	0.4	1.0	150
Particulate Matter	2.7	2.0	4.7	120
Carbon Monoxide	21.8	14.7	36.5	225
Volatile Organic Compounds	5.2	4.7	9.9	200
Hazardous Air Pollutants	3.0	1.8	4.8	24 combined
Highest Individual HAP (Methyl Chloroform)	1.4	0.0	1.4	8 individual


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