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Emissions Inventory Report Summary for Los Alamos National Laboratory for Calendar Year 2014

Prepared by the Environmental Protection Division

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Acronyms

AIRS	Aerometric Information Retrieval System
AQB	Air Quality Bureau
CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
CMRR	Chemistry and Metallurgy Research Replacement (Facility)
CO	carbon monoxide
EPA	United States Environmental Protection Agency
FGR	flue gas recirculation
gal.	gallon
HAP	hazardous air pollutant
hr	hour
LANL	Los Alamos National Laboratory
lb	pound
mmHg	millimeter of mercury
MSDS	material safety data sheet
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NO_x	nitrogen oxides
oz.	ounce
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
RLUOB	Radiological Laboratory/Utility/Office Building
SO_x	sulfur oxides
SO_2	sulfur dioxide
TA	Technical Area
TSP	total suspended particulates
µm	micrometer
VOC	volatile organic compound
yr	year

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EMISSIONS INVENTORY REPORT SUMMARY FOR LOS ALAMOS NATIONAL LABORATORY FOR CALENDAR YEAR 2014

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 LANL'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 and the permit was modified on April 26, 2013. This Title V Operating Permit (Permit No. P100-R1-M3) 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 2014. LANL's 2014 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 lbs 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 that

- 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. The NMED/AQB enters the data into the Aerometric Information Retrieval System (AIRS) (EPA 2014). This nationwide system, administered by the United States 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. The NMED/ABQ issued a modified permit (P100-R1-M3; NMED 2013) on April 26, 2013 (NMED 2013a). 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 A109.B of the permit states:

> "A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NO_x, CO, SO_2, VOC, TSP, PM_{10}, and $PM_{2.5}$ shall not include fugitive emissions. Emissions estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits at Table106.B."

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.

1.2 Contents of Annual Emissions Inventory Submittal

NMED requested that LANL submit annual emissions inventory data for 2014 via electronic format for entry into AIRS. The information required for submittal includes the following:

- facility name, organization name, and agency ID;
- facility contact information;
- signed certification statement by a responsible facility official; and
- specific information for each emission unit such as fuel type, materials processed, materials consumed, fuel heating value, percent sulfur of fuel, percent ash of fuel, percent carbon content, and details of operating schedule.

This annual emissions inventory submittal includes air pollutant data for PM, PM_{10}, $PM_{2.5}$, CO, NO_x, sulfur oxides (SO_x), VOCs, beryllium, and hazardous air pollutants (HAPs).

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 2014 annual emissions inventory (LANL 2015a) and the 2014 semi-annual emissions reports (LANL 2015b and 2014). 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 2014 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 2014 emissions inventory as submitted to NMED is presented in Attachment B. The 2014 semi-annual emissions reports are included as Attachment C.

Table 2.0-1. Sources Included in LANL's 2014 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[a]
Boilers greater than 5 MMBTU/hr[b] (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).
Asphalt Plant	Asphalt Plant	n/a
Degreasers	Degreasers	n/a
Data Disintegrator	Data Disintegrator	n/a
Permitted Beryllium Sources	Permitted Beryllium Sources	n/a
Facility-wide Chemical Use	Facility-wide Chemical Use	The semi-annual emissions reports also include separate emission data for the CMRR-RLUOB building.
Process Generators	Process Generators and Stationary Standby Generators	Stationary standby generators are exempt from annual emissions inventory requirements (see Section 3.2).
TA-3 Turbine	TA-3 Turbine	n/a

a: n/a = Not Applicable. b: one million British thermals units per hour.

2.1 Power Plant

The Laboratory operates a power plant at Technical Area (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. The Laboratory operated a second power plant at TA-21 that was shut down in 2007.

For the 2014 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 (EQPT-24, EQPT-25, and EQPT-26 for the natural gas and EQPT-137, EQPT-138, and EQPT-141 for the No. 2 fuel oil).

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%. Figure 2.1-1 shows a picture of the TA-3 power plant building and stacks.

Figure 2.1-1. TA-3 power plant.

2.2 Small Boilers and Heaters

The Laboratory operates approximately 175 small boilers and heaters, used primarily for seasonal comfort heat. Most of the boilers are exempt from permitting requirements because of their small size and use as comfort boilers and are not included in the annual emissions inventory. The exemption analysis applied to boilers is discussed in Section 3.1 of this report.

The boilers that are not exempt and reported in the 2014 annual emissions inventory include the following:

- two boilers at TA-53 (EQPT-11 and EQPT-12),
- two boilers at TA-55 (EQPT-29 and EQPT-30),
- five boilers at the Chemistry and Metallurgy Research Replacement (CMRR) Facility (EQPT-90, EQPT-104, EQPT-105, EQPT-106, and EQPT-107), and
- two boilers at TA-16 (EQPT-53 and EQPT-134).

All of the reported boilers burn natural gas. Operating logs of actual fuel used for the TA-55 and the CMRR 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 small boilers are included as a source category. These boilers include TA-16-1484-BS-1, TA-16-1484-BS-2, TA-53-365-BHW-1, TA-53-365-BHW-2, TA-55-6-BHW-1, TA-55-6-BHW-2, CMRR-BWH-1, CMRR-BWH-2, CMRR-BWH-3, and CMRR-BWH-4. Additionally, emissions from each of the CMRR boilers are included as separate source categories. 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 (EQPT-116) began operations in July 2005. This unit replaced the TA-3 asphalt plant, which 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 2014 was 541 tons.

The emissions from the asphalt plant include criteria pollutants, NO_x, and CO. None of the emissions were significant in regard to the overall Laboratory emissions. The largest pollutant emitted from the asphalt plant was CO at 0.12 tons per year.

2.4 Data Disintegrator

The data disintegrator is included in the 2014 emissions inventory as EQPT-89. Operation of this source started in August 2004. Emissions are calculated using the methodology described in the original 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 in a monthly data deliverable from the site support contractor. The total number of boxes shredded at the data disintegrator in 2014 was 1,711.

2.5 Degreasers

The halogenated solvent cleaning machine at TA-55 has a capacity of 18 liters and is registered with NMED/AQB as required under the National Emissions Standards for Hazardous Air Pollutants, 40 Code of Federal Regulations (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 EQPT-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. These units were not operational in 2014. The emissions from the TA-55 degreaser for this reporting period are 9.5 lbs or 0.005 tons per year. This source category is reported in both the annual emissions inventory and the semi-annual emissions reports.

2.6 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 (ACT-3) are from actual stack emissions measurements. Emissions for the Target Fabrication Facility (ACT-2) are from initial compliance stack testing and are reported as permitted emission levels. In addition, emissions from the Plutonium Facility (ACT-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.

2.7 Generators

LANL has five permitted generators (EQPT-119, EQPT-120, EQPT-128, EQPT-135, and EQPT-146) including four internal combustion engines located at TA-33 to support research activities. The original TA-33 generator was installed in May 2006 and it was replaced in December 2014 by a Cummins Portable Diesel Generator. The new generator (EQPT-146) operated for 2.5 hours in 2014. Three more units were permitted in August 2007 at TA-33 (Permit No. 2195-P); they operated for a total of 48.4 hours in 2014.

LANL also has three permitted generators with internal combustion engines located at the CMRR Radiological Laboratory/Utility/Office Building (RLUOB), TA-55-400, which began operating in 2012. The generators were added to the newest Title V Operating Permit and are included in the semi-annual emissions report as three separate units. However, they are listed in the emissions inventory report as one unit. The three generators operated for a total of 41.3 hours in 2014.

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. These sources are included in LANL's Title V Operating Permit with operating limits and emission limits. Therefore, these sources must be included in the semi-annual emissions reports. All stationary standby generators at LANL are tested 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.

2.8 Combustion Turbine

LANL has one combustion turbine located at the TA-3 power plant (EQPT-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 2014, this combustion turbine operated for 189.9 hours.

2.9 Emissions from Chemical Use Activities

A significant amount 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 2.9-1 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 (ACT-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 2.9-1. Example of a laboratory fume hood at LANL.

2.9.1 VOC Emissions

The Laboratory tracks chemical purchases through a facility-wide chemical tracking system called ChemDB. A download from the ChemDB inventory system was created that included all chemical containers added to LANL's inventory between January 1, 2014, and December 31, 2014. This dataset included 42,562 separate line items of chemicals purchased.

The dataset was reviewed electronically to identify all VOCs purchased and received at LANL in 2014. 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 2014, 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)

The following categories of chemicals were eliminated based on guidance from NMED (NMED 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
- Chemicals used in bench-scale chemical analysis[1]

After the 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 ChemDB records were assumed to be 100% emitted to air. Estimated emissions of VOCs from chemical use in 2014 totaled 10.86 tons.

2.9.2 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.

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

The ChemDB inventory system 2014 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 2.9.1 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
- 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 2014 was 5.06 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.

2.9.3 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.

2.10 Emissions Summary by Source

Table 2.10-1 provides a summary of LANL's 2014 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 2.10-1. Summary of LANL 2014 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)
TA-3 Power Plant Boilers	11.0	0.12	1.44	1.44	7.59	1.04	0.36
Non-Exempt Boilers	3.13	0.02	0.33	0.33	1.75	0.186	0.07
CMRR Boilers	0.051	0.0009	0.009	n/a*	0.066	0.045	0.003
Asphalt Plant	0.003	0.001	0.002	n/a	0.117	0.002	0.002
Data Disintegrator	n/a	n/a	0.07	n/a	n/a	n/a	n/a
Degreaser	n/a	n/a	n/a	n/a	n/a	0.005	0.005
R&D Chemical Use	n/a	n/a	n/a	n/a	n/a	10.86	5.06
TA-33 Generators	0.14	0.01	0.01	n/a	0.03	0.01	0.0001
TA-3 Turbine	0.99	0.07	0.13	0.13	0.21	0.04	0.03
TOTAL	**15.31**	**0.22**	**1.99**	**1.90**	**9.76**	**12.19**	**5.53**

* n/a = Not Applicable.

Table 2.12-2 provides a summary of 2014 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 2014 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	11.0	0.12	1.44	1.44	7.59	1.04	0.36
Small Boilers	21.83	0.14	1.76	n/a*	17.48	1.25	0.42
CMRR Boilers	0.051	0.0009	0.009	n/a	0.066	0.045	0.001
Asphalt Plant	0.002	0.001	0.002	n/a	0.117	0.002	0.002
Data Disintegrator	n/a	n/a	0.07	n/a	n/a	n/a	n/a
Degreaser	n/a	n/a	n/a	n/a	n/a	0.005	0.005
R&D Chemical Use	n/a	n/a	n/a	n/a	n/a	10.86	5.06
CMRR Generators	0.99	0.017	0.03	n/a	0.22	0.03	0.0002
Stationary Standby Generators	3.44	0.14	0.18	0.18	0.78	0.18	0.001
TA-33 Generators	0.14	0.01	0.01	n/a	0.03	0.01	0.0001
TA-3 Turbine	0.99	0.07	0.13	0.13	0.21	0.04	0.03
TOTAL	**38.44**	**0.50**	**3.63**	**1.75**	**26.49**	**13.46**	**5.88**

* n/a = Not Applicable.

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)
- 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 5 MMBTU/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.

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 that 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 hours per calendar year.

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

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 lb 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 2014 was gathered from the ChemDB 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 3,960 lbs (1.98 tons) which is less than 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.

4.0 EMISSIONS SUMMARY

4.1 2014 Emissions Summary

Table 4.1-1 presents facility-wide estimated actual emissions of criteria pollutants for 2014 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 2014 emissions inventory report as submitted to NMED is presented in Attachment B. Attachment C includes semi-annual emissions reports for 2014.

Table 4.1-1. LANL Facility-Wide Criteria Pollutant Emissions for 2014

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	15.31	38.44	245
SO_x	0.22	0.50	150
CO	9.76	26.49	225
PM	1.99	3.63	120
PM_{10}	1.99	3.63	120
$PM_{2.5}$	1.90	1.75	120
VOC	12.19	13.46	200

Table 4.1-2. LANL HAP Emissions from Top Five Chemicals Used in 2014

Pollutant	Chemical Use HAP Emissions (tons/yr)
Hydrochloric Acid	1.41
Methylene Chloride	0.66
Methanol	0.56
Chlorine	0.55
Hexane	0.38
All other HAPs from Chemical Use	1.50
Total HAPs	**5.06**

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 2014, 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 small boilers and were the largest sources of CO and NO_x emissions in 2014. R&D chemical use was the largest source of VOC emissions.

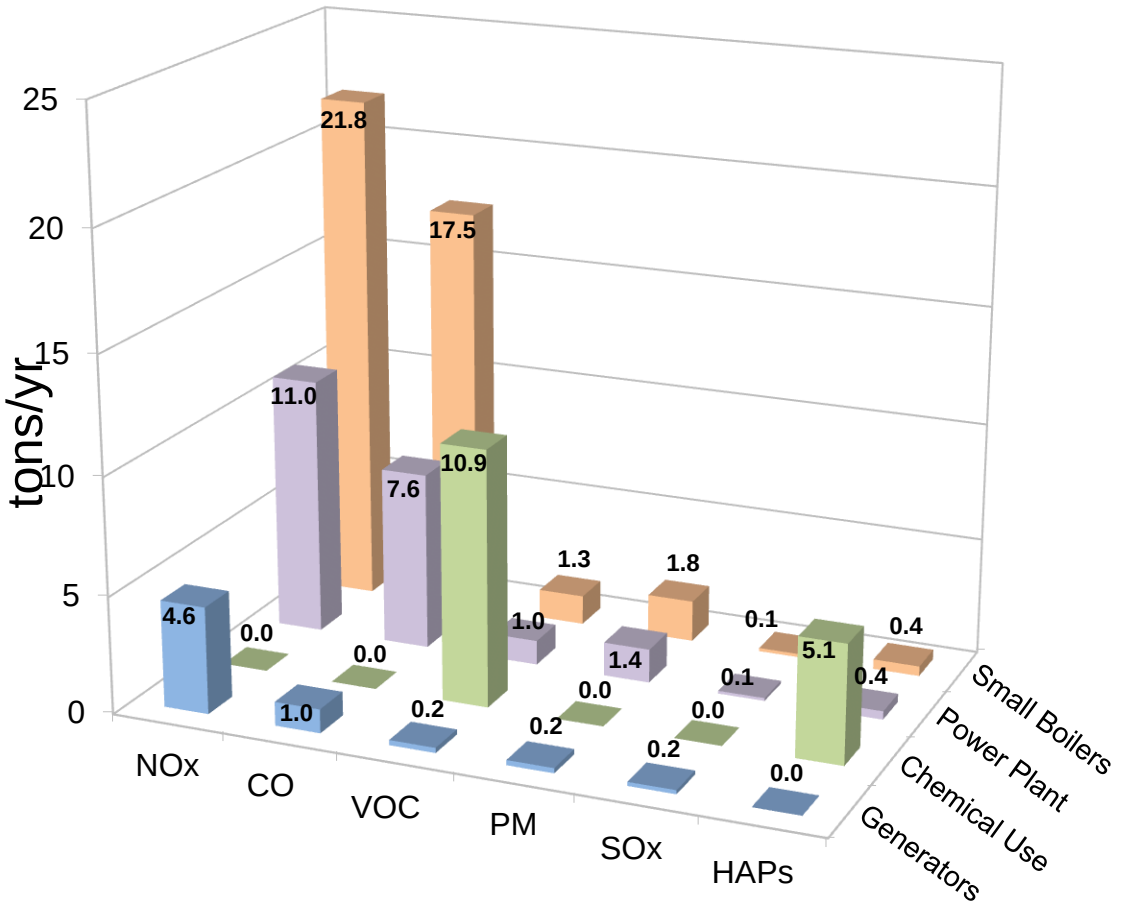

Figure 4.1-1. Emissions of criteria pollutants by source in 2014.

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 in the annual emissions inventory submittal. The facility-wide emission limits included in LANL's Title V Operating Permit are also shown on the graph.

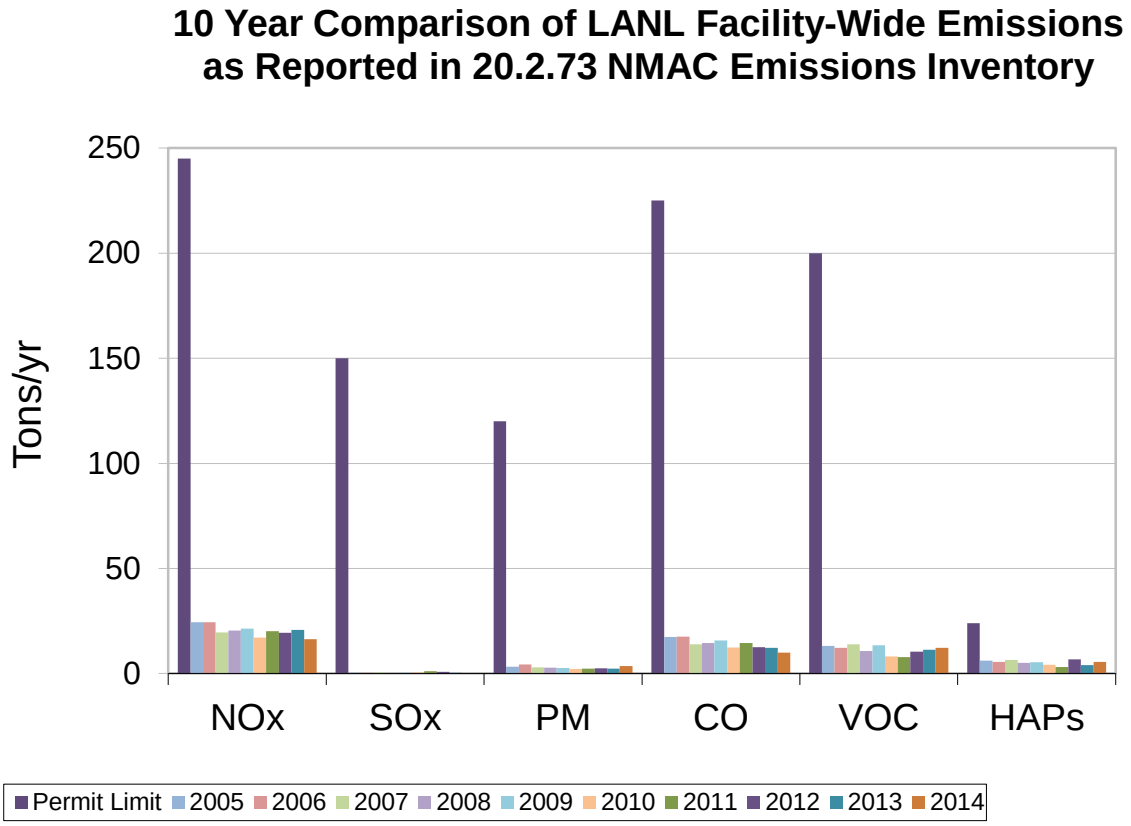

Figure 4.1-2. Comparison of facility-wide annual reported emissions from 2005 to 2014.

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.

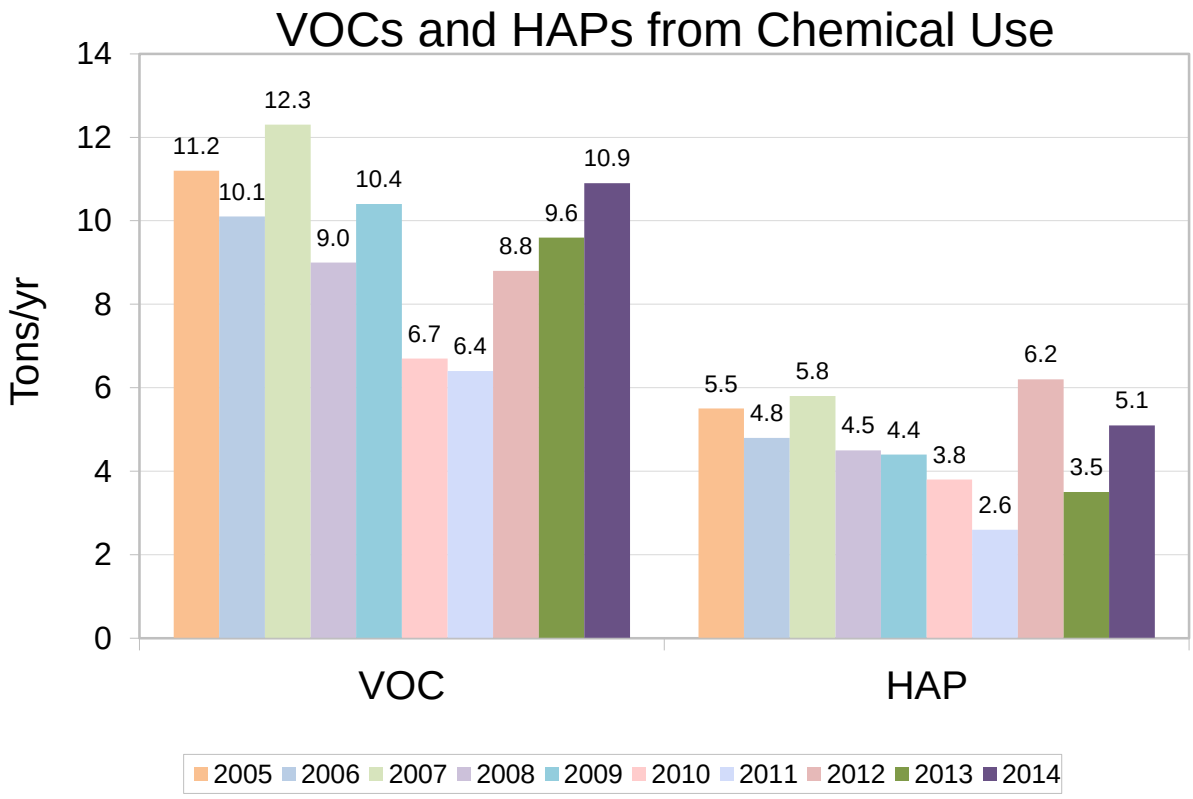

Figure 4.1-3. VOC and HAP emissions from chemical use from 2005 to 2014.

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NMED (New Mexico Environment Department, Air Quality Bureau), 2001. Letter from Mary Uhl, NMED/AQB to LANL, dated January 30, 2001.

NMED (New Mexico Environment Department, Air Quality Bureau, Operating Permit Program), 1996. "List of Trivial Activities under Title V Operating Permits," http://www.nmenv.state.nm.us/aqb/forms/TrivialListTitleV.pdf (January 1996).

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ATTACHMENT A:

Emission Calculation Worksheets for Individual Emission Units

2014 TA-60 BDM Asphalt Plant

Data Reviewed By / Date: Margie Stockton, 1/9/2015

Month	Data Entry Asphalt Produced (Tons)	12-Month Rolling Total	Month	Data Entry Asphalt Produced (Tons)	12-Month Rolling Total
January	39	370	July	0	419
February	108	454	August	22	441
March	44	498	September	61	502
April	79	450	October	72.5	502
May	69	475	November	18	520
June	7	463	December	21	541
6 mo. Total	346		6 mo. Total:	195	
2014 Asphalt Produced (Tons):	541				

12-Month Rolling Permit Limit is 13,000 Tons

Annual Hours			
Month	Hours	Month	Hours
Jan	11.0	Jul	0.0
Feb	11.4	Aug	2.4
Mar	10.4	Sep	7.1
Apr	12.3	Oct	15.7
May	11.7	Nov	6.3
Jun	1.3	Dec	3.6
Total:	58.0	Total:	35.1

Annual Total (to date): 93.11 Hours

Hours are Limited to 4380 per Year

Emission Calculations

Pollutant	Emission Factor (lbs/ton)	Annual Emissions (tons)	Emissions (tons) Jan-June	Emissions July-Dec (tons)	Reference
NOx	0.012	0.0034	0.0022	0.001	(b)
CO	0.434	0.1173	0.0751	0.042	(b)
PM	0.007	0.0020	0.0013	0.001	(b)
Pollutant	**Emission Factor (lb/ton)**	**Annual Emissions (tons)**	**Emissions (tons) Jan-June**	**Emissions (tons) July-Dec**	**Reference**
PM-10	0.006	0.002	0.001	0.001	(c)
PM-2.5	0.006	0.002	0.001	0.001	(c)
SOx	0.0046	0.001	0.001	0.000	(a)
VOC	0.0082	0.002	0.001	0.001	(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	0.001	0.000	0.000	(d)
Formaldehyde	0.00074	0.000	0.000	0.000	(d)
Napthalene	0.000036	0.0000	0.000	0.000	(d)
POM	0.00011	0.0000	0.000	0.000	(d)
Quinone	0.00027	0.000	0.000	0.000	(d)
Toluene	0.001	0.000	0.000	0.000	(d)
Xylene	0.0027	0.001	0.000	0.000	(d)
TOTAL HAPS		0.002	0.001	0.001	

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 ton values were determined from lb/hr 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 (from stack test), 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. Convert to lb/ton by dividing by 45 tons/hr (test rate).
(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
(h) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel." (Federal

2015 TA-52 Data Disintegrator (EQPT 89)

Reviewed By / Date: _____

Month	Data Entry Boxes[c] Shredded	Month	Data Entry Boxes[c] Shredded
January	185	July	110
February	138	August	89
March	137	September	206
April	105	October	145
May	108	November	
June	123	December	
6 mo. Total:	796	6 mo. Total:	550

Annual Boxes: [g]	1,346

Emission Calculations

	Percent Material in Exhaust[b]	% 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)
CY Annual Total	60,570	68.1	0.03	102.2	0.05	113.6	0.06
January - June	35,820	40.3	0.02	60.4	0.03	67.2	0.03
July - December	24,750	27.8	0.01	41.8	0.02	46.4	0.02
July - Dec 2014			0.02		0.03		0.03
Mid-Year Annual Rolling Total [f] [g]			0.04		0.06		0.06

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	(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.	(f). Emissions calculated by summing the emissions from January-June of current year plus July-December of previous year.	(g). Cannot exceed 25,000 boxes or 565 tons of uncontrolled potential PM emissions per year.

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.
Cannot exceed 565 tons of uncontrolled potential PM emissions per year.

2014 Hours of Operation for Permitted Generators

2014 Permitted Generators

TA	Bldg	ID #	Make	Serial #	MODEL	KW	Fuel Type	Reading 2nd half of previous year		First Half 6 Month Reading Date	First Half Reading	First Half Hours Run	Second Half 12 Month Reading Date	Second Half Reading	Second Half Hours Run	* Total Run Hours
33	290	G-0012	Kohler	375801	1600ROZD	1600	Diesel	Dec. 13	355.0	Jun-14	355.0	0.0	Dec-14	355.0	0.0	0.0
33	151	G-0007	Caterpillar	6PK01065	XQ225	225	Diesel	Dec. 13	3434.0	Jun-14	3445.0	11.0	Dec-14	3453.0	8.0	19.0
33	209	G-0008	Kohler	2025460	20EORZ	20	Diesel	Dec. 13	427.6	Jun-14	439.2	11.6	Dec-14	440.3	1.1	12.7
33	280	G-0010	Kohler	2025461	20EORZ	20	Diesel	Dec. 13	213.6	Jun-14	227.8	14.2	Dec-14	230.3	2.5	16.7
33	Port	G-0053	Cummins	37199764	QST30-G5	1000	Diesel	Dec. 13	673.0	Jun-14	675.5	2.5	Dec-14	675.5	0.0	2.5
55	440	G-0058	Cummins	106970810	DFLE-5754172	1500	Diesel	Dec. 13	143.6	Jun-14	157.2	13.6	Dec-14	170.3	13.1	26.7
55	440	G-0059	Cummins	106970811	DFLE-5754172	1500	Diesel	Dec. 13	103.3	Jun-14	112.6	9.3	Dec-14	116.4	3.8	13.1
55	440	G-0060	Cummins	106970812	DFLE-5754172	1500	Diesel	Dec. 13	108.5	Jun-14	109.0	0.5	Dec-14	110.0	1.0	1.5

*** The TA-33 225 kW & two 20 kW generators have limits of 500 hrs/yr. The 1600 kW was taken out of service Dec. 2013. The 1000 kw portable was moved to TA-33 in May 2014.**

Permit ID	ID #	Unit	First 6 Month Emissions NOx (lbs)	CO (lbs)	SOx (lbs)	PM (lbs)	VOC (lbs)	HAPs (lbs)	Second 6 Month Emissions NOx (lbs)	CO (lbs)	SOx (lbs)	PM (lbs)	VOC (lbs)	HAPs (lbs)
TA-33-G-1	G-0012	33-290	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
TA-33-G-4	G-0007	33-151	104.0	22.3	7.4	7.4	7.4	3.3E-02	75.6	16.2	5.4	5.4	5.4	2.4E-02
TA-33-G-2	G-0008	33-209	9.7	2.1	0.7	0.7	0.7	3.1E-03	0.9	0.2	0.1	0.1	0.1	3.0E-04
TA-33-G-3	G-0010	33-280	11.9	2.6	0.9	0.9	0.9	3.8E-03	2.1	0.5	0.2	0.2	0.2	6.8E-04
TA-33-G-1P	G-0053	33-Port	80.0	17.5	1.4	2.5	2.5	1.2E-01	0.0	0.0	0.0	0.0	0.0	1.1E-01
CMRR-GEN-1		55-440	652.8	142.8	11.0	20.4	20.4	1.2E-01	628.8	137.6	10.6	19.7	19.7	1.1E-01
CMRR-GEN-2		55-440	446.4	97.7	7.5	14.0	14.0	8.1E-02	182.4	39.9	3.1	5.7	5.7	3.3E-02
CMRR-GEN-3		55-440	24.0	5.3	0.4	0.8	0.8	4.4E-03	48.0	10.5	0.8	1.5	1.5	8.7E-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	0.000	0.000	0.000	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.000	0.000	0.00E+00
TA-33-G-4	G-0007	33-151	0.052	0.011	0.004	0.004	0.004	1.67E-05	0.038	0.008	0.003	0.003	0.003	1.22E-05
TA-33-G-2	G-0008	33-209	0.005	0.001	0.000	0.000	0.000	1.57E-06	0.000	0.000	0.000	0.000	0.000	1.49E-07
TA-33-G-3	G-0010	33-280	0.006	0.001	0.000	0.000	0.000	1.92E-06	0.001	0.000	0.000	0.000	0.000	3.38E-07
TA-33-G-1P	G-0053	33-Port	0.040	0.009	0.001	0.001	0.001	5.94E-05	0.000	0.000	0.000	0.000	0.000	5.72E-05
CMRR-GEN-1		55-440	0.326	0.071	0.006	0.010	0.010	5.94E-05	0.314	0.069	0.005	0.010	0.010	5.72E-05
CMRR-GEN-2		55-440	0.223	0.049	0.004	0.007	0.007	4.06E-05	0.091	0.020	0.002	0.003	0.003	1.66E-05
CMRR-GEN-3		55-440	0.012	0.003	0.000	0.000	0.000	2.18E-06	0.024	0.005	0.000	0.001	0.001	4.36E-06

	Permit ID	NOx	CO	SOx	PM	VOC	HAPs	Permit ID	NOx	CO	SOx	PM	VOC	HAPs
ANNUAL TOTALS (tons)	TA-33-G-1	0.000	0.000	0.000	0.000	0.000	0.0E+00	CMRR-GEN-1	0.641	0.140	0.011	0.020	0.020	1.2E-04
	TA-33-G-4	0.090	0.019	0.006	0.006	0.006	2.9E-05	CMRR-GEN-2	0.314	0.069	0.005	0.010	0.010	5.7E-05
	TA-33-G-2	0.005	0.001	0.000	0.000	0.000	1.7E-06	CMRR-GEN-3	0.036	0.008	0.001	0.001	0.001	6.5E-06
	TA-33-G-3	0.007	0.002	0.001	0.001	0.001	2.3E-06	CMRR Gen Total	0.991	0.217	0.017	0.031	0.031	1.80E-04
	TA-33-G-1P	0.040	0.009	0.001	0.001	0.001	1.2E-04							
	TPY	**0.14**	**0.03**	**0.01**	**0.01**	**0.01**	**0.00**							

Reviewed by / Date: _____

2014 Hours of Operation for Permitted Generators

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
TA-33 1600kW [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
Large Diesel fired [c]	0.032	0.007	5.4E-04	0.001	0.001	0.001

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) TA-33-290 1600kw generator uses 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.

(c) TA-55 (RLUOB) & TA-33-G-1P generators emission factors were taken from AP-42 (fifth edition) Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4.

TA-33-G-1 - 2014
(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				July			
February				August			
March				September			
April				October			
May				November			
June				December			

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

TA-33-G-1P - 2014 Monthly Hours of Operation and 12-Month Rolling Total

Month	Hour Meter Reading	Hours Operated	Rolling Total Hrs		Month	Hour Meter Reading	Hours Operated	Rolling Total Hrs	
January					July				
February					August				
March					September				
April					October				
May					November				
June					December				

2014 Hours of Operation for Permitted Generators

	HAPS (lbs)																		Individual Generator HAP Emissions (lbs)	
Emission Factors (lb/kwh)	Benzene		Toluene		Xylenes		1,3-Butadiene		Formaldehyde		Acetaldehyde		Acrolein		Naphthalene		PAH			
Diesel (small)	3.19E-06		1.40E-06		9.73E-07		1.34E-07		4.03E-06		2.62E-06		3.16E-07		2.90E-07		5.74E-07			
Diesel (large)	2.65E-06		9.60E-07		6.59E-07				2.69E-07		8.61E-08		2.69E-08		4.44E-07		7.24E-07			
Location	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	2nd Half	1st Half	2nd Half	1st Half	2nd Half
33-290	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
33-151	7.89E-03	5.74E-03	3.46E-03	2.51E-03	2.41E-03	1.75E-03	3.31E-04	2.40E-04	9.97E-03	7.25E-03	6.48E-03	4.72E-03	7.82E-04	5.69E-04	7.17E-04	5.21E-04	1.42E-03	1.03E-03	3.35E-02	2.43E-02
33-209	7.39E-04	7.01E-05	3.24E-04	3.07E-05	2.26E-04	2.14E-05	3.10E-05	2.94E-06	9.35E-04	8.87E-05	6.08E-04	5.76E-05	7.33E-05	6.95E-06	6.72E-05	6.37E-06	1.33E-04	1.26E-05	3.14E-03	2.97E-04
33-280	9.05E-04	1.59E-04	3.97E-04	6.98E-05	2.76E-04	4.87E-05	3.79E-05	6.68E-06	1.14E-03	2.02E-04	7.44E-04	1.31E-04	8.97E-05	1.58E-05	8.23E-05	1.45E-05	1.63E-04	2.87E-05	3.84E-03	6.76E-04
33-Port	6.63E-03	0.00E+00	2.40E-03	0.00E+00	1.65E-03	0.00E+00	0.00E+00	0.00E+00	6.74E-04	0.00E+00	2.15E-04	0.00E+00	6.73E-05	0.00E+00	1.11E-03	0.00E+00	1.81E-03	0.00E+00	1.45E-02	0.00E+00
55-440	5.41E-02	5.21E-02	1.96E-02	1.89E-02	1.34E-02	1.30E-02	0.00E+00	0.00E+00	5.50E-03	5.30E-03	1.76E-03	1.69E-03	5.49E-04	5.29E-04	9.06E-03	8.72E-03	1.48E-02	1.42E-02	1.19E-01	1.14E-01
55-440	3.70E-02	1.51E-02	1.34E-02	5.47E-03	9.20E-03	3.76E-03	0.00E+00	0.00E+00	3.76E-03	1.54E-03	1.20E-03	4.91E-04	3.75E-04	1.53E-04	6.19E-03	2.53E-03	1.01E-02	4.13E-03	8.12E-02	3.32E-02
55-440	1.99E-03	3.96E-03	7.20E-04	1.44E-03	4.94E-04	9.89E-04	0.00E+00	0.00E+00	2.02E-04	4.04E-04	6.45E-05	1.29E-04	2.02E-05	4.04E-05	3.33E-04	6.66E-04	5.43E-04	1.09E-03	4.36E-03	8.73E-03
(lbs)	**1.09E-01**	**7.71E-02**	**4.03E-02**	**2.64E-02**	**2.77E-02**	**1.95E-02**	**3.99E-04**	**2.50E-04**	**2.22E-02**	**1.48E-02**	**1.11E-02**	**7.21E-03**	**1.96E-03**	**1.31E-03**	**1.76E-02**	**1.25E-02**	**2.89E-02**	**2.05E-02**	**2.59E-01**	**1.82E-01**
Tons/Half/HAP	**5.46E-05**	**3.86E-05**	**2.01E-05**	**1.42E-05**	**1.38E-05**	**9.76E-06**	**2.00E-07**	**1.25E-07**	**1.11E-05**	**7.39E-06**	**5.54E-06**	**3.61E-06**	**9.78E-07**	**6.57E-07**	**8.78E-06**	**6.23E-06**	**1.45E-05**	**1.03E-05**		
Tons/year/HAP	**9.32E-05**		**3.43E-05**		**2.36E-05**		**3.25E-07**		**1.85E-05**		**9.14E-06**		**1.64E-06**		**1.50E-05**		**2.47E-05**			
Tons/Year Total	**2.20E-04**																			

Emission Factors from 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)

Greenhouse Gas Emission Calculations

Unit		Fuel Use		Calendar Year			Fiscal Year[e]		
Permit ID	**Unit**	**Fuel Use Rate[d] (GPH)**	**Annual Fuel Use (Gal.)**	**CO2 (metric tons)**	**CH4 (metric tons)**	**N2O (metric tons)**	**CO2 (metric tons)**	**CH4 (metric tons)**	**N2O (metric tons)**
TA-33-G-1	TA-33-290	148	0	0.00	0.00E+00	0.00E+00	14.95	6.07E-04	1.21E-04
TA-33-G-4	TA-33-151	15.8	300.2	3.06	1.24E-04	2.49E-05	2.42	9.81E-05	1.96E-05
TA-33-G-2	TA-33-209	1.7	21.59	0.22	8.94E-06	1.79E-06	0.42	1.72E-05	3.43E-06
TA-33-G-3	TA-33-114	1.7	28.39	0.29	1.18E-05	2.35E-06	0.51	2.06E-05	4.11E-06
TA-33-G-1P	TA-33-Port	19	47.5	0.48	1.97E-05	3.93E-06	0.51	2.06E-05	4.11E-06
CMRR-Gen-1	TA-55-440	103.6	2766.12	28.23	1.15E-03	2.29E-04	0.51	2.06E-05	4.11E-06
CMRR-Gen-2	TA-55-440	103.6	1357.16	13.85	5.62E-04	1.12E-04	0.51	2.06E-05	4.11E-06
CMRR-Gen-3	TA-55-440	103.6	155.4	1.59	6.43E-05	1.29E-05	0.51	2.06E-05	4.11E-06
			Totals:	**47.73**	**1.94E-03**	**3.87E-04**	**20.33**	**0.001**	**0.000**
			Total CO_2 Equivalent:	**47.89**			**20.40**		
			Annual Fuel Use:	4676.36					

References:

(a) Emission Factor/High Heat Value is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009)

(b) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH_4 and N_2O Emission Factors for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009).

(c) Hour readings for each of the generators listed are collected twice a year by ENV-ES.

(d) Fuel use rates were taken from manufacturer literature. Data for some units may not be available due to age, but data for a similar unit was used when unit specific data was not available.

(e) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

Emission Factors

Fuel Oil Heat Value[a] (mmBtu/Gal)		CO_2[a] (kg/mmBtu)		CH_4[b] (kg/mmBtu)		N_2O[b] (kg/mmBtu)	
0.138		73.96		0.003		0.0006	

TESTING BY BR

Unit		Fuel Use		Calendar Year			Fiscal Year[e]			
Permit ID	**Unit Location**	**Fuel Use Rate[d] (GPH)**	**Annual Fuel Use (Gal.)**	**CO2 (metric tons)**	**CH4 (metric tons)**	**N2O (metric tons)**	**Fiscal yr fuel use (gal)**	**CO2 (metric tons)**	**CH4 (metric tons)**	**N2O (metric tons)**
TA-33-G-1	TA-33-290	148	0	0.00	0.00E+00	0.00E+00	1465	14.95	6.07E-04	1.21E-04
TA-33-G-4	TA-33-151	15.8	300.2	3.06	1.24E-04	2.49E-05	237	2.42	9.81E-05	1.96E-05
TA-33-G-2	TA-33-209	1.7	21.59	0.22	8.94E-06	1.79E-06	41	0.42	1.72E-05	3.43E-06
TA-33-G-3	TA-33-114	1.7	28.39	0.29	1.18E-05	2.35E-06	50	0.51	2.06E-05	4.11E-06
TA-33-G-1P	TA-33-Port	19	47.5	0.48	1.97E-05	3.93E-06	180	1.83	2.06E-05	4.11E-06
CMRR-Gen-1	TA-55-440	103.6	2766.12	28.23	1.15E-03	2.29E-04	3087	31.51	2.06E-05	4.11E-06
CMRR-Gen-2	TA-55-440	103.6	1357.16	13.85	5.62E-04	1.12E-04	2046	20.88	2.06E-05	4.11E-06
CMRR-Gen-3	TA-55-440	103.6	155.4	1.59	6.43E-05	1.29E-05	104	1.06	2.06E-05	4.11E-06
			Totals:	**47.73**	**1.94E-03**	**3.87E-04**		**73.59**	**0.001**	**0.000**
			Total CO_2 Equivalent:	**47.89**			**73.66**			
			Annual Fuel Use:	4676.36						

Stationary Stand-by Generators - Hour Meter Readings, 2014

									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	12 Month Reading Date	Reading	Hours Run	Annual Total Hours
3	40	G-0013	Onan Sons	1500DVE15R31374B	150	Diesel	Dec-13	58.0	May-14	64.0	6.0	Dec-14	72.0	8.0	14.0
3	440	G-0020	Cummins	DFGA-5005210	500	Diesel	Dec-13	215.1	May-14	221.8	6.7	Dec-14	229.0	7.2	13.9
3	1076	G-0022	Cummins	DGBB-5601289	35	Diesel	Dec-13	236.2	Jun-14	236.2	0.0	Dec-14	236.2	0.0	0.0
3	1400	G-0024	Cummins	DFEH-5699616	400	Diesel	Dec-13	200.0	Jun-14	202.0	2.0	Dec-14	210.0	8.0	10.0
3	1404	G-0023	Cummins	DFLC-5554001	1250	Diesel	Dec-13	595.2	Jun-14	597.9	2.7	Dec-14	600.0	2.1	4.8
3	1498	G-0017	Caterpillar	SR-4	600	Diesel	Dec-13	411.0	May-14	416.0	5.0	Dec-14	424.0	8.0	13.0
3	2322	G-0021	Onan Sons	DGDA-5005757	80	Diesel	Dec-13	424.0	May-14	428.4	4.4	Dec-14	435.0	6.6	11.0
16	980	G-0033	Cummins	KTA50-G2	1100	Diesel	Dec-13	432.6	May-14	433.7	1.1	Dec-14	435.5	1.8	2.9
16	1374	G-0032	Onan Sons	60ENA	60	Nat. Gas	Dec-13	1479.0	Jun-14	1504.0	25.0	Dec-14	1536.0	32.0	57.0
35	2	G-0034	Onan Sons	100DGDB	100	Diesel	Dec-13	115.5	Jun-14	115.5	0.0	Dec-14	115.5	0.0	0.0
35	402	G-0037	Cummins	DGCB-5674244	60	Diesel	Dec-13	423.4	Jun-14	437.2	13.8	Dec-14	460.9	23.7	37.5
43	1	G-0031	Cummins	4BT3.9-GC	50	Diesel	Dec-13	478.0	Jun-14	484.6	6.6	Dec-14	490.6	6.0	12.6
43	1	G-0030	Onan Sons	DVE	150	Diesel	Dec-13	967.0	Jun-14	994.2	27.2	Dec-14	1022.2	28.0	55.2
46	335	G-0036	Onan Sons	300DEFCB	300	Diesel	Dec-13	1411.0	Jun-14	1462.6	51.6	Dec-14	1500.2	37.6	89.2
48	45	G-0043	Onan Sons	DFCB-5740130	300	Diesel	Dec-13	238.0	Jun-14	254.0	16.0	Dec-14	260.2	6.2	22.2
50	37	G-0039	Cummins	680FDR5059FF	500	Diesel	Dec-13	502.8	Jun-14	502.8	0.0	Dec-14	502.8	0.0	0.0
50	69	G-0040	Onan	DGDB4487482	100	Diesel	Dec-13	367.9	Jun-14	373.4	5.5	Dec-14	387.7	14.3	19.8
50	184	G-0044	Onan Sons	DGFA-568741	150	Diesel	Dec-13	523.0	Jun-14	528.0	5.0	Dec-14	546.0	18.0	23.0
50	188	G-0038	Onan Sons	L940563879	1250	Diesel	Dec-13	149.0	Jun-14	149.0	0.0	Dec-14	149.0	0.0	0.0
53	1	G-0004	Onan Sons	60ENA	60	Nat. Gas	Dec-13	1859.0	Jun-14	1870.0	11.0	Dec-14	1876.0	6.0	17.0
53	2	G-0005	Kato Eng.	Kamag-14	50	Diesel	Dec-13	196.5	Jun-14	196.5	0.0	Dec-14	196.5	0.0	0.0
53	3N	G-0011	Onan	15.0JC-18R	15	Propane	Dec-13	409.9	Jun-14	410.9	1.0	Dec-14	410.9	0.0	1.0
54	412	G-0045	Olympian	95M-07874-F	500	Diesel	Dec-13	Out of service	Jun-14	Out of service	0.0	Dec-14	Out of service	0.0	0.0
55	5	G-0049	Kohler	100RZ71	100	Propane	Dec-13	182.4	Jun-14	182.4	0.0	Dec-14	182.4	0.0	0.0
55	8	G-0050	Delco/Detroit	E7014DD	600	Diesel	Dec-13	896.0	Jun-14	896.0	0.0	Dec-14	895.8	0.0	0.0
55	PF-10	G-0065	Whisper Watt	DCA-25SSi U4F	30	Diesel	Dec-13	0.0	Jun-14	12.8	12.8	Dec-14	12.8	0.0	12.8
55	PF-11	G-0066	Whisper Watt	DCA-25SSi U4F	30	Diesel	Dec-13	0.0	Jun-14	12.7	12.7	Dec-14	12.7	0.0	12.7
55	364	G-0051	Onan Sons	1250DFLC-4987	1250	Diesel	Dec-13	278.0	Jun-14	293.4	15.4	Dec-14	315.9	22.5	37.9
55	28	G-0047	Onan Sons	40DL6T	40	Diesel	Dec-13	145.2	Jun-14	145.2	0.0	Dec-14	145.2	0.0	0.0
55	47	G-0048	Onan Sons	1465	200	Diesel	Dec-13	619.3	Jun-14	621.5	2.2	Dec-14	621.5	0.0	2.2
55	142	G-0046	Cummins	DFEB-4963414	400	Diesel	Dec-13	186.3	Jun-14	193.8	7.5	Dec-14	199.4	5.6	13.1
55	371	G-0064	Caterpillar	SR4B-GD	900	Diesel	Dec-13	22.5	Jun-14	32.2	9.7	Dec-14	47.4	15.2	24.9
60	yard	G-0053	Cummins	DFHD-4964979	1000	Diesel	Dec-13	673.0	May-14	673.7	0.7	Dec-14	Moved to TA-33	0.0	0.7
64	1	G-0041	Onan Sons	250DVG	250	Diesel	Dec-13	253.0	Jun-14	260.0	7.0	Dec-14	266.0	6.0	13.0
69	33	G-0055	Cummins	DFLC-5568730	1250	Diesel	Dec-13	185.3	May-14	191.3	6.0	Dec-14	198.5	7.2	13.2
	35	**Generators**								**TOTAL**	264.6		**TOTAL**	270.0	

N/R = Not Read

First half average hours per unit	7.6	Second half average hours per unit	7.7

Reviewed By / Date: M. Stockton 1/8/2015

Annual Average of hours per unit	7.6

Stationary Stand-by Generators - Hour Meter Readings, 2014

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}**

Stationary Stand-by Generators - Hour Meter Readings, 2014

	First 6 Month Emissions						Second 6 Month Emissions					
Location	NOx (lb)	CO (lb)	SOx (lb)	PM (lb)	VOC (lb)	HAPs (lb)	NOx (lb)	CO (lb)	SOx (lb)	PM (lb)	VOC (lb)	HAPs (lb)
3-40	37.8	8.1	2.7	2.7	2.7	1.3E-02	50.4	10.8	3.6	3.6	3.6	1.6E-02
3-440	107.2	23.5	1.8	3.4	3.4	2.3E-02	115.2	25.2	1.9	3.6	3.6	2.1E-02
3-1076	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
3-1400	33.6	7.2	2.4	2.4	2.4	1.1E-02	134.4	28.8	9.6	9.6	9.6	4.3E-02
3-1404	108.0	23.6	1.8	3.4	3.4	2.3E-02	84.0	18.4	1.4	2.6	2.6	1.5E-02
3-1498	96.0	21.0	1.6	3.0	3.0	2.0E-02	153.6	33.6	2.6	4.8	4.8	2.8E-02
3-2322	14.8	3.2	1.1	1.1	1.1	4.9E-03	22.2	4.8	1.6	1.6	1.6	7.1E-03
16-980	38.7	8.5	0.7	1.2	1.2	8.2E-03	63.4	13.9	1.1	2.0	2.0	1.2E-02
16-1374	12.0	19.5	0.0	0.1	0.2	1.7E-01	15.4	25.0	0.0	0.1	0.2	2.2E-01
35-2	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
35-402	34.8	7.5	2.5	2.5	2.5	1.2E-02	59.7	12.8	4.3	4.3	4.3	1.9E-02
43-1	13.9	3.0	1.0	1.0	1.0	4.6E-03	12.6	2.7	0.9	0.9	0.9	4.1E-03
43-1	171.4	36.7	12.2	12.2	12.2	5.7E-02	176.4	37.8	12.6	12.6	12.6	5.7E-02
46-335	650.2	139.3	46.4	46.4	46.4	2.2E-01	473.8	101.5	33.8	33.8	33.8	1.5E-01
48-45	201.6	43.2	14.4	14.4	14.4	6.7E-02	78.1	16.7	5.6	5.6	5.6	2.5E-02
50-37	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
50-69	23.1	5.0	1.7	1.7	1.7	7.7E-03	60.1	12.9	4.3	4.3	4.3	1.9E-02
50-184	31.5	6.8	2.3	2.3	2.3	1.1E-02	113.4	24.3	8.1	8.1	8.1	3.7E-02
50-188	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
53-1	5.3	8.6	0.0	0.0	0.1	7.4E-02	2.9	4.7	0.0	0.0	0.0	4.1E-02
53-2	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
53-3N	0.1	0.2	0.0	0.0	0.0	1.5E-03	0.0	0.0	0.0	0.0	0.0	0.0E+00
54-412	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
55-5	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
55-8	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
55-PF-10	16.1	3.5	1.2	1.2	1.2	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
55-PF-11	16.0	3.4	1.1	1.1	1.1	5.4E-03	0.0	0.0	0.0	0.0	0.0	0.0E+00
55-364	616.0	134.8	10.4	19.3	19.3	1.3E-01	900.0	196.9	15.2	28.1	28.1	1.6E-01
55-28	0.0	0.0	0.0	0.0	0.0	0.0E+00	0.0	0.0	0.0	0.0	0.0	0.0E+00
55-47	18.5	4.0	1.3	1.3	1.3	6.2E-03	0.0	0.0	0.0	0.0	0.0	0.0E+00
55-142	126.0	27.0	9.0	9.0	9.0	4.2E-02	94.1	20.2	6.7	6.7	6.7	3.0E-02
55-371	279.4	61.1	4.7	8.7	8.7	4.7E-03	437.8	95.8	7.4	13.7	13.7	0.0E+00
60-yard	22.4	4.9	0.4	0.7	0.7	4.7E-03	0.0	0.0	0.0	0.0	0.0	0.0E+00
64-1	73.5	15.8	5.3	5.3	5.3	2.5E-02	63.0	13.5	4.5	4.5	4.5	2.0E-02
69-33	240.0	52.5	4.1	7.5	7.5	5.1E-02	288.0	63.0	4.9	9.0	9.0	5.2E-02
Total Emissions lbs/6 months	2987.7	671.5	129.9	151.7	151.8	1.0	3398.3	763.1	130.0	159.5	159.6	1.0
Tons/6 months	**1.49**	**0.34**	**0.06**	**0.08**	**0.08**	**4.96E-04**	**1.70**	**0.38**	**0.07**	**0.08**	**0.08**	**4.90E-04**

YEARLY TOTAL	NOx	CO	SOx	PM	VOC	HAPs
Tons/Year	3.19	0.72	0.13	0.16	0.16	0.001

Greenhouse Gas Emissions

Stationary Stand-by Generators - Hour Meter Readings, 2014

Unit Data				Calendar Year			Fiscal Year [e]			References
Location	ID #	Fuel Use Rate [d][e] (GPH)(SCFH)	Annual Fuel Use (Gal. or MMSCF)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	
3-40	G-0013	12.3	171.5	1.8	7.1E-05	1.4E-05	1.6	6.3E-05	1.3E-05	**(a)** Emission Factor/High Heat Value is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel."
3-440	G-0020	21.8	303.2	3.1	1.3E-04	2.5E-05	2.9	1.2E-04	2.3E-05	
3-1076	G-0022	2.9	0.0	0.0	0.0E+00	0.0E+00	0.7	3.0E-05	6.0E-06	
3-1400	G-0024	27.3	273.0	2.8	1.1E-04	2.3E-05	2.2	9.0E-05	1.8E-05	
3-1404	G-0023	87.3	419.0	4.3	1.7E-04	3.5E-05	3.9	1.6E-04	3.1E-05	
3-1498	G-0017	42.7	555.1	5.7	2.3E-04	4.6E-05	5.4	2.2E-04	4.4E-05	
3-2322	G-0021	6.3	69.3	0.7	2.9E-05	5.7E-06	0.7	2.9E-05	5.8E-06	**(b)** Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH4 and N2O Emission Factors for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009).
16-980	G-0033	79.4	230.3	2.4	9.5E-05	1.9E-05	2.3	9.2E-05	1.8E-05	
16-1374	G-0032	850.1	0.0485	2.6	4.9E-05	4.9E-06	0.0	1.3E-08	2.5E-09	
35-2	G-0034	7.5	0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
35-402	G-0037	4.7	176.3	1.8	7.3E-05	1.5E-05	1.8	7.3E-05	1.5E-05	**(c)** Hour readings were taken from the criteria pollutant emission calculation spreadsheet for standby generators. Hours are collected twice a year.
43-1	G-0031	4.2	52.9	0.5	2.2E-05	4.4E-06	0.5	2.1E-05	4.3E-06	
43-1	G-0030	12.3	676.2	6.9	2.8E-04	5.6E-05	6.7	2.7E-04	5.4E-05	
46-335	G-0036	22.5	2007.0	20.5	8.3E-04	1.7E-04	20.4	8.3E-04	1.7E-04	
48-45	G-0043	22.5	499.5	5.1	2.1E-04	4.1E-05	5.2	2.1E-04	4.2E-05	**(d)** Fuel use rates were taken from manufacturer literature. Data for some units may not be available due to age, but data for a similar unit was used when unit specific data was not available.
50-37	G-0039	34.4	0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
50-69	G-0040	7.5	148.5	1.5	6.1E-05	1.2E-05	1.1	4.3E-05	8.6E-06	
50-184	G-0044	11.1	255.3	2.6	1.1E-04	2.1E-05	1.6	6.4E-05	1.3E-05	
50-188	G-0038	87.3	0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
53-1	G-0004	850.1	0.0145	0.8	1.5E-05	1.5E-06	0.0	4.0E-09	1.5E-06	**(e)** High Heat Value (HHV) for natural gas is taken from the monthly "Plant Quantities Report". Natural gas HHV is determined using a gas chromatagraph located at the TA-3 Power Plant
53-2	G-0005	4.2	0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
53-3N	G-0011	116.6	3.2042	0.02	0.0	0.0	0.0	2.0E-07	2.0E-08	
54-412	G-0045	36.6	0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
55-5	G-0049	511.0	0.0000	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	**(f)** The Btu value for propane vapor was from EPA default values to calculate GHG emissions = 0.091 mmbtu/gallon; also 1 gallon propane = 36.39 cubic feet according to Kohler (manufacturer)
55-8	G-0050	42.7	0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
55-PF-10	G-00xx		0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
55-PF-11	G-00xx		0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
55-364	G-0051	87.3	3308.7	33.8	1.4E-03	2.7E-04	31.1	1.3E-03	2.5E-04	
55-28	G-0047	4.5	0.0	0.0	0.0E+00	0.0E+00	0.0	1.0E-06	2.0E-07	
55-47	G-0048	16.4	36.1	0.4	1.5E-05	3.0E-06	0.4	1.6E-05	3.2E-06	**(e)** Fiscal year begins on October 1st of the prior year and ends on September 30th of the current year.
55-142	G-0046	27.3	357.6	3.7	1.5E-04	3.0E-05	3.0	1.2E-04	2.4E-05	
55-371			0.0	0.0	0.0E+00	0.0E+00	0.0	0.0E+00	0.0E+00	
60-yard	G-0053	87.3	61.1	0.6	2.5E-05	5.1E-06	10.6	4.3E-04	8.6E-05	
64-1	G-0041	89.3	1160.9	11.8	4.8E-04	9.6E-05	9.1	3.7E-04	7.4E-05	
69-33	G-0055	90.3	1192.0	12.2	4.9E-04	9.9E-05	10.7	4.3E-04	8.7E-05	
			Totals:	125.42	5.0E-03	1.0E-03	121.91	4.9E-03	9.9E-04	
			Total CO_2 Equivalent:	125.85			122.32			
			Emissions From Diesel:	122.00	4.95E-03	9.90E-04				
			Emissions From Natural Gas:	3.4046	0.0001	0.0000				
			Emissions From Propane:	0.0183	0.0000	0.0000				

Total Fuel Oil Use: 11953.4 Gallons

Fuel Type	HHV [a][e][f]	Emission Factors (kg/mmBtu)		
		CO_2 [a] (kg/mmBtu)	CH_4 [b] (kg/mmBtu)	N_2O [b] (kg/mmBtu)
Diesel	0.138	73.96	0.003	0.0006
Propane	0.091	62.87	0.003	0.0006
Nat Gas	1020	53.06	0.001	0.0001

HHV is in units of mmbtu/gal for liquids and mmbtu/mmscf for gases.

ple propane GHG emissions

Propane use gal/yr	=	3.2	gal/hr
HHV for propane	=	0.091	mmbtu/gallon

Stationary Stand-by Generators - Hour Meter Readings, 2014

Emission Factors (lb/kwh)	HAPS (lbs)															HAP
	Benzene		Toluene		Xylenes		1,3-Butadiene		Formaldehyde		Acetaldehyde		Acrolein		Naphthalene	
Natural Gas	5.40E-06		1.91E-06		6.66E-07		2.26E-06		7.00E-05		9.53E-06		8.98E-06		3.32E-07	
Diesel (small)	3.19E-06		1.40E-06		9.73E-07		1.34E-07		4.03E-06		2.62E-06		3.16E-07		2.90E-07	
Diesel (large)	2.65E-06		9.60E-07		6.59E-07				2.69E-07		8.61E-08		2.69E-08		4.44E-07	
Location	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	2nd Half
3-40	2.87E-03	3.82E-03	1.72E-03	1.68E-03	8.76E-04	1.17E-03	1.20E-04	1.60E-04	3.63E-03	4.84E-03	2.36E-03	3.14E-03	2.84E-04	3.79E-04	2.61E-04	3.48E-04
3-440	8.88E-03	9.54E-03	6.38E-03	3.45E-03	2.21E-03	2.37E-03	0.00E+00	0.00E+00	9.03E-04	9.70E-04	2.88E-04	3.10E-04	9.02E-05	9.69E-05	1.49E-03	1.60E-03
3-1076	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	0.00E+00	0.00E+00	0.00E+00
3-1400	2.55E-03	1.02E-02	1.52E-03	4.47E-03	7.79E-04	3.11E-03	1.07E-04	4.27E-04	3.22E-03	1.29E-02	2.10E-03	8.38E-03	2.53E-04	1.01E-03	2.32E-04	9.27E-04
3-1404	8.94E-03	6.96E-03	6.43E-03	2.52E-03	2.22E-03	1.73E-03	0.00E+00	0.00E+00	9.09E-04	7.07E-04	2.90E-04	2.26E-04	9.08E-05	7.06E-05	1.50E-03	1.17E-03
3-1498	7.95E-03	1.27E-02	5.72E-03	4.61E-03	1.98E-03	3.16E-03	0.00E+00	0.00E+00	8.08E-04	1.29E-03	2.58E-04	4.13E-04	8.07E-05	1.29E-04	1.33E-03	2.13E-03
3-2322	1.12E-03	1.68E-03	6.71E-04	7.38E-04	3.43E-04	5.14E-04	4.70E-05	7.05E-05	1.42E-03	2.13E-03	9.22E-04	1.38E-03	1.11E-04	1.67E-04	1.02E-04	1.53E-04
16-980	3.21E-03	5.25E-03	2.31E-03	1.90E-03	7.98E-04	1.31E-03	0.00E+00	0.00E+00	3.26E-04	5.34E-04	1.04E-04	1.70E-04	3.26E-05	5.33E-05	5.37E-04	8.79E-04
16-1374	8.09E-03	1.04E-02	2.86E-03	3.66E-03	9.99E-04	1.28E-03	3.40E-03	4.35E-03	1.05E-01	1.34E-01	1.43E-02	1.83E-02	1.35E-02	1.72E-02	4.97E-04	6.37E-04
35-2	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	0.00E+00	0.00E+00	0.00E+00
35-402	2.64E-03	4.53E-03	1.58E-03	1.99E-03	8.06E-04	1.38E-03	1.11E-04	1.90E-04	3.34E-03	5.73E-03	2.17E-03	3.72E-03	2.62E-04	4.49E-04	2.40E-04	4.12E-04
43-1	1.05E-03	9.56E-04	6.29E-04	4.19E-04	3.21E-04	2.92E-04	4.41E-05	4.01E-05	1.33E-03	1.21E-03	8.64E-04	7.86E-04	1.04E-04	9.48E-05	9.56E-05	8.69E-05
43-1	1.30E-02	1.34E-02	7.78E-03	5.87E-03	3.97E-03	4.09E-03	5.45E-04	5.61E-04	1.64E-02	1.69E-02	1.07E-02	1.10E-02	1.29E-03	1.33E-03	1.18E-03	1.22E-03
46-335	4.93E-02	3.59E-02	2.95E-02	1.58E-02	1.51E-02	1.10E-02	2.07E-03	1.51E-03	6.24E-02	4.55E-02	4.06E-02	2.95E-02	4.89E-03	3.56E-03	4.48E-03	3.27E-03
48-45	1.53E-02	5.93E-03	9.15E-03	2.60E-03	4.67E-03	1.81E-03	6.41E-04	2.48E-04	1.93E-02	7.50E-03	1.26E-02	4.87E-03	1.52E-03	5.88E-04	1.39E-03	5.39E-04
50-37	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	0.00E+00	0.00E+00	0.00E+00
50-69	1.75E-03	4.56E-03	1.05E-03	2.00E-03	5.35E-04	1.39E-03	7.34E-05	1.91E-04	2.22E-03	5.76E-03	1.44E-03	3.75E-03	1.74E-04	4.52E-04	1.59E-04	4.14E-04
50-184	2.39E-03	8.60E-03	1.43E-03	3.77E-03	7.30E-04	2.63E-03	1.00E-04	3.61E-04	3.02E-03	1.09E-02	1.96E-03	7.07E-03	2.37E-04	8.53E-04	2.17E-04	7.82E-04
50-188	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	0.00E+00	0.00E+00	0.00E+00
53-1	3.56E-03	1.94E-03	1.26E-03	6.86E-04	4.40E-04	2.40E-04	1.49E-03	8.15E-04	4.62E-02	2.52E-02	6.29E-03	3.43E-03	5.93E-03	3.23E-03	2.19E-04	1.19E-04
53-2	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	0.00E+00	0.00E+00	0.00E+00
53-3N	8.09E-05	0.00E+00	2.86E-05	0.00E+00	9.99E-06	0.00E+00	3.40E-05	0.00E+00	1.05E-03	0.00E+00	1.43E-04	0.00E+00	1.35E-04	0.00E+00	4.97E-06	0.00E+00
54-412	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	0.00E+00	0.00E+00	0.00E+00
55-5	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	0.00E+00	0.00E+00	0.00E+00
55-8	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	0.00E+00	0.00E+00	0.00E+00
55-PF-10	1.22E-03	0.00E+00	7.32E-04	0.00E+00	3.74E-04	0.00E+00	5.13E-05	0.00E+00	1.55E-03	0.00E+00	1.01E-03	0.00E+00	1.21E-04	0.00E+00	1.11E-04	0.00E+00
55-PF-11	1.21E-03	0.00E+00	7.26E-04	0.00E+00	3.71E-04	0.00E+00	5.09E-05	0.00E+00	1.54E-03	0.00E+00	9.98E-04	0.00E+00	1.20E-04	0.00E+00	1.10E-04	0.00E+00
55-364	5.10E-02	7.45E-02	3.67E-02	2.70E-02	1.27E-02	1.85E-02	0.00E+00	0.00E+00	5.19E-03	7.58E-03	1.66E-03	2.42E-03	5.18E-04	7.57E-04	8.55E-03	1.25E-02
55-28	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	0.00E+00	0.00E+00	0.00E+00
55-47	1.40E-03	0.00E+00	8.39E-04	0.00E+00	4.28E-04	0.00E+00	5.88E-05	0.00E+00	1.77E-03	0.00E+00	1.15E-03	0.00E+00	1.39E-04	0.00E+00	1.27E-04	0.00E+00
55-142	9.56E-03	7.14E-03	5.72E-03	3.13E-03	2.92E-03	2.18E-03	4.01E-04	2.99E-04	1.21E-02	9.03E-03	7.86E-03	5.87E-03	9.48E-04	7.08E-04	8.69E-04	6.49E-04
55-371	2.31E-02	3.63E-02	1.66E-02	1.31E-02	5.75E-03	9.02E-03	0.00E+00	0.00E+00	2.35E-03	3.69E-03	7.51E-04	1.18E-03	2.35E-04	3.68E-04	3.88E-03	6.07E-03
60-yard	1.86E-03	0.00E+00	1.33E-03	0.00E+00	4.61E-04	0.00E+00	0.00E+00	0.00E+00	1.89E-04	0.00E+00	6.02E-05	0.00E+00	1.88E-05	0.00E+00	3.11E-04	0.00E+00
64-1	5.58E-03	4.78E-03	3.34E-03	2.10E-03	1.70E-03	1.46E-03	2.34E-04	2.00E-04	7.05E-03	6.05E-03	4.58E-03	3.93E-03	5.53E-04	4.74E-04	5.07E-04	4.34E-04
69-33	1.99E-02	2.39E-02	1.43E-02	8.64E-03	4.94E-03	5.93E-03	0.00E+00	0.00E+00	2.02E-03	2.43E-03	6.45E-04	7.75E-04	2.02E-04	2.42E-04	3.33E-03	4.00E-03
Total Emissions lbs	**2.48E-01**	**2.83E-01**	**1.60E-01**	**1.10E-01**	**6.64E-02**	**7.46E-02**	**9.58E-03**	**9.42E-03**	**3.05E-01**	**3.05E-01**	**1.16E-01**	**1.11E-01**	**3.18E-02**	**3.23E-02**	**3.17E-02**	**3.83E-02**
Tons/Half/HAP	**1.24E-04**	**1.41E-04**	**8.02E-05**	**5.50E-05**	**3.32E-05**	**3.73E-05**	**4.79E-06**	**4.71E-06**	**1.53E-04**	**1.53E-04**	**5.80E-05**	**5.53E-05**	**1.59E-05**	**1.61E-05**	**1.59E-05**	**1.92E-05**
Tons/year/HAP	**2.65E-04**		**1.35E-04**		**7.05E-05**		**9.50E-06**		**3.05E-04**		**1.13E-04**		**3.20E-05**		**3.50E-05**	
Tons/Year Total	**1.06E-03**															

Stationary Stand-by Generators - Hour Meter Readings, 2014

'S (lbs)																
										HAPS (lbs)						
1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane		1,3-Dichloropropene		Carbon Tetrachloride		Chlorobenzene		Chloroform		Ethylbenzene		Ethylene Dibromide		Meth
8.64E-08		5.23E-08		4.34E-08		6.05E-08		4.41E-08		4.68E-08		8.47E-08		7.27E-08		1.05
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	2nd Half	1st Half
1.30E-04	1.66E-04	7.84E-05	1.00E-04	6.51E-05	8.33E-05	9.07E-05	1.16E-04	6.61E-05	8.46E-05	7.02E-05	8.98E-05	1.27E-04	1.63E-04	1.09E-04	1.40E-04	1.57E-02
5.70E-05	3.11E-05	3.45E-05	1.88E-05	2.86E-05	1.56E-05	3.99E-05	2.18E-05	2.91E-05	1.59E-05	3.09E-05	1.68E-05	5.59E-05	3.05E-05	4.80E-05	2.62E-05	6.90E-03
1.87E-04	**1.97E-04**	**1.13E-04**	**1.19E-04**	**9.37E-05**	**9.89E-05**	**1.31E-04**	**1.38E-04**	**9.52E-05**	**1.00E-04**	**1.01E-04**	**1.07E-04**	**1.83E-04**	**1.93E-04**	**1.57E-04**	**1.66E-04**	**2.26E-02**
9.33E-08	**9.85E-08**	**5.64E-08**	**5.96E-08**	**4.68E-08**	**4.94E-08**	**6.53E-08**	**6.89E-08**	**4.76E-08**	**5.02E-08**	**5.05E-08**	**5.33E-08**	**9.15E-08**		**7.86E-08**	**8.29E-08**	**1.13E-05**
1.92E-07		**1.16E-07**		**9.63E-08**		**1.34E-07**		**9.78E-08**		**1.04E-07**		**9.15E-08**		**1.61E-07**		**2.32E-05**

Stationary Stand-by Generators - Hour Meter Readings, 2014

HAPS (lbs)												
ıanol	Methylene Chloride		PAH		Styrene		Toluene		Vinyl Chloride		Individual Generator HAP Emissions (lbs)	
E-05	1.41E-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	1st Half	2nd Half
			5.16E-04	6.89E-04							1.26E-02	1.62E-02
			2.43E-03	2.61E-03							2.27E-02	2.10E-02
			0.00E+00	0.00E+00							0.00E+00	0.00E+00
			4.59E-04	1.84E-03							1.12E-02	4.33E-02
			2.44E-03	1.90E-03							2.28E-02	1.53E-02
			2.17E-03	3.48E-03							2.03E-02	2.79E-02
			2.02E-04	3.03E-04							4.94E-03	7.14E-03
			8.76E-04	1.43E-03							8.19E-03	1.15E-02
2.01E-02	2.11E-04	2.70E-04	7.22E-04	9.25E-04	6.10E-05	7.80E-05	2.86E-03	3.66E-03	3.68E-05	4.71E-05	1.69E-01	2.16E-01
			0.00E+00	0.00E+00							0.00E+00	0.00E+00
			4.75E-04	8.16E-04							1.16E-02	1.92E-02
			1.89E-04	1.72E-04							4.63E-03	4.06E-03
			2.34E-03	2.41E-03							5.72E-02	5.68E-02
			8.88E-03	6.47E-03							2.17E-01	1.52E-01
			2.75E-03	1.07E-03							6.73E-02	2.51E-02
			0.00E+00	0.00E+00							0.00E+00	0.00E+00
			3.16E-04	8.20E-04							7.72E-03	1.93E-02
			4.30E-04	1.55E-03							1.05E-02	3.65E-02
			0.00E+00	0.00E+00							0.00E+00	0.00E+00
3.76E-03	9.29E-05	5.07E-05	3.18E-04	1.73E-04	2.68E-05	1.46E-05	1.26E-03	6.86E-04	1.62E-05	8.83E-06	7.43E-02	4.05E-02
			0.00E+00	0.00E+00							0.00E+00	0.00E+00
			7.22E-06	0.00E+00							1.49E-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
			2.20E-04	0.00E+00							5.39E-03	0.00E+00
			2.19E-04	0.00E+00							5.34E-03	0.00E+00
			1.39E-02	2.04E-02							1.30E-01	1.64E-01
			0.00E+00	0.00E+00							0.00E+00	0.00E+00
			2.52E-04	0.00E+00							6.17E-03	0.00E+00
			1.72E-03	1.29E-03							4.21E-02	3.03E-02
			6.32E-03	9.90E-03							5.91E-02	7.96E-02
			5.07E-04	0.00E+00							4.74E-03	0.00E+00
			1.00E-03	8.61E-04							2.45E-02	2.03E-02
			5.43E-03	6.52E-03							5.07E-02	5.24E-02
2.38E-02	**3.04E-04**	**3.21E-04**	**5.51E-02**	**6.56E-02**	**8.78E-05**	**9.27E-05**	**4.12E-03**	**4.35E-03**	**5.30E-05**	**5.59E-05**	**1.05E+00**	**1.06E+00**
1.19E-05	**1.52E-07**	**1.60E-07**	**2.76E-05**	**3.28E-05**	**4.39E-08**	**4.63E-08**	**2.06E-06**	**2.17E-06**	**2.65E-08**	**2.80E-08**		
	3.12E-07		**6.04E-05**		**9.02E-08**		**4.23E-06**		**5.44E-08**			

2014 Small Boilers Data Entry / Gas Use

	Month	Metered Boilers: TA-55 Boiler Gas Use (Mscf)[b] BHW-1B (B-602) ID (B-0016)	Metered Boilers: TA-55 Boiler Gas Use (Mscf)[b] BHW-2B (B-603) ID (B-0017)	Metered Boilers: CMRR-RLUOB Gas Use (Mscf) All 3 Boilers NMED IDs 90, 104, and 105	Total Gas Use for all Small Boilers[a] (Mscf)	Total Gas Use for all Small Boilers[a] (MMscf)	Non-Metered Gas Use (MMscf)	12-Month Rolling Total for all Small Boilers (MMscf)[c]
Data Entry	January	485	2467	680	68,258	68.26	64.63	471.88
	February	1753	79	432	50,646	50.65	48.38	455.34
	March	1978	2	416	53,894	53.89	51.50	454.44
	April	2074	2	307	41,712	41.71	39.33	453.09
	May	2180	2	198	28,281	28.28	25.90	456.08
	June	1792	2	153	11,376	11.38	9.43	455.97
	July	639	1015	158	9,158	9.16	7.35	453.81
	August	4	1638	150	10,944	10.94	9.15	453.36
	September	1318	441	178	12,595	12.60	10.66	455.58
	October	1418	470	172	26,805	26.81	24.75	443.45
	November	1201	877	315	55,256	55.26	52.86	441.90
	December	1123	1128	319	73,276	73.28	70.71	442.20
	TOTAL	15965	8123	3478	442,201	442.20	414.63	
							12 Month Limit (MMscf) =	870

2014 Non Metered Boiler Pool Capacity:	267.8	MMBTU/hr[d]	
Estimated Gas-Use per MMBtu rating Jan-June:		0.89	MMscf/MMBtu/hr
Estimated Gas-Use per MMBtu rating July-Dec:		0.66	MMscf/MMBtu/hr
Estimated Gas-Use per MMBtu - Annual		1.55	MMscf/MMBtu/hr
Estimated Gas-Use per MMBtu - Fiscal Year		1.60	MMscf/MMBtu/hr

Gas Use Non-Metered[e] (MMSCF)				
NMED ID:	11	12	53 &134	Insignificant Units[f]
Location:	TA-53-365	TA-53-365	TA-16-1484	Lab Wide
Equipment ID:	BHW-1	BHW-2	Plant 5	Various
Database ID:	B-0042	B-0043	B-0093/0092	
Design Rate[g] (MMBTU/hr)	7.115	7.115	12.700	241
Calculated Gas Use-Jan-June	6.354	6.354	11.342	215.115
Calculated Gas Use-July-Dec	4.662	4.662	8.321	157.825
Calculated Gas Use-Annual	11.015	11.015	19.663	372.941

Reviewed By / Date: _____

Definitions:
MMSCF= Million Standard Cubic Feet
MSCF = Thousand Standard Cubic Feet

Emission Factors (lb/MMscf)				
Criteria Pollutant	Small Uncontrolled Boilers[1]	TA-16 Low NOx Boilers[4]	TA-55-6 Boilers[3]	RLUOB Boilers
NOx	100	37.08	138	29.9
SOx	0.6	0.6	0.6	0.6
PM[2]	7.6	7.6	14.2	4.9
PM-10[2]	7.6	7.6	14.2	4.9
PM-2.5[2]	7.6	7.6	14.2	4.9
CO	84	37.08	38.2	38.1
VOC	5.5	5.5	5.98	25.8
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.

CMRR Boiler Fuel Oil Use (2014):

Date \ Boiler	BHW-1 (gal.)	BHW-2 (gal.)	BHW-3 (gal.)
No additional fuel oil burned in these units since January 10, 2013			
Confirmed 6/11/2014 - Fuel oil tank still empty and undergoing repairs			

CMRR Boiler Hours of Operation on Fuel Oil (2014):

Date \ Boiler	BHW-1 (hr.)	BHW-2 (hr.)	BHW-3 (gal.)	
1/8/2013	1.0	1.0	2.0	Estimate provided by Randy Johnson
1/9/2013	1.0	1.0	3.0	Estimate provided by Randy Johnson
1/10/2013	1.0	3.0	1.0	Estimate provided by Randy Johnson

2014 Small Boilers Emission Summary

Total Emissions (tons)

Pollutant Criteria	Annual* Emissions (Includes Insignificant Sources)	Jan-June* (Includes Insignificant Sources)	July-Dec* (Includes Insignificant Sources)	Jan-June CMRR-RLUOB Boilers	July-Dec CMRR-RLUOB Boilers
NOx	21.827	12.518	9.309	0.033	0.019
SOx	0.133	0.076	0.056	0.001	0.000
PM	1.755	1.005	0.750	0.005	0.003
PM-10	1.755	1.005	0.750	0.005	0.003
PM-2.5	1.755	1.005	0.750	0.005	0.003
CO	17.480	10.065	7.414	0.042	0.025
VOC	1.257	0.724	0.533	0.028	0.017
HAPs					
Arsenic	4.42E-05	2.54E-05	1.88E-05	2.19E-07	1.29E-07
Benzene	4.64E-04	2.67E-04	1.97E-04	2.30E-06	1.36E-06
BE	2.65E-06	1.53E-06	1.13E-06	1.31E-08	7.75E-09
Cadmium	2.43E-04	1.40E-04	1.03E-04	1.20E-06	7.11E-07
Chromium	3.10E-04	1.78E-04	1.32E-04	1.53E-06	9.04E-07
Cobalt	1.86E-05	1.07E-05	7.90E-06	9.18E-08	5.43E-08
Dichlorobenzene	2.65E-04	1.53E-04	1.13E-04	1.31E-06	7.75E-07
Formaldehyde	1.66E-02	9.53E-03	7.05E-03	8.20E-05	4.85E-05
Hexane	3.98E-01	2.29E-01	1.69E-01	1.97E-03	1.16E-03
Lead	1.11E-04	6.35E-05	4.70E-05	5.47E-07	3.23E-07
Mangenese	8.40E-05	4.83E-05	3.57E-05	4.15E-07	2.45E-07
Mercury	5.75E-05	3.30E-05	2.44E-05	2.84E-07	1.68E-07
Napthalene	1.35E-04	7.75E-05	5.74E-05	6.67E-07	3.94E-07
Nickel	4.64E-04	2.67E-04	1.97E-04	2.30E-06	1.36E-06
POM	1.95E-05	1.12E-05	8.27E-06	9.62E-08	5.68E-08
Selenium	5.31E-06	3.05E-06	2.26E-06	2.62E-08	1.55E-08
Toluene	7.52E-04	4.32E-04	3.20E-04	3.72E-06	2.20E-06
TOTAL HAPS	0.418	0.240	0.178	0.002	0.001

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

REFERENCES for SMALL BOILERS
(a) Information on non-metered boilers is provided in the facility wide gas use report by Utilities and Infrastructure 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 the TA-3 Power Plant. All other sources are included in this total.
(b) TA-55 has two boilers with separate AIRs numbers. Each boiler has a gas meter. The gas use information is provided monthly by the Utility and Infrastruction personnel and is included in the facility wide gas report.
(c) 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 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.
(d) 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-CP.
(e) 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). Boilers previously included at TA-48 and TA-59 were replaced with smaller exempt boilers an removed from these calcs on 10-15-12.
(f) 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.
(g) 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.

2014 Non-Exempt Boiler Emissions for Annual EI Reporting (Tons)

Pollutant	NMED 11 TA-53-365 BHW-1	NMED 12 TA-53-365 BHW-2	NMED 134 TA-16 BS-1	NMED 53 TA-16 BS-2	NMED 29 TA-55-6 BHW-1B	NMED 30 TA-55-6 BHW-2B	NMED 90 TA-55-440 B-1	NMED 104 TA-55-440 B-2	NMED 105 TA-55-440 B-3	Total
NOx	0.551	0.551	0.182	0.182	1.102	0.560	0.017	0.017	0.017	3.180
SOx	0.003	0.003	0.003	0.003	0.005	0.002	0.0003	0.0003	0.0003	0.021
PM	0.042	0.042	0.037	0.037	0.113	0.058	0.003	0.003	0.003	0.338
PM-10	0.042	0.042	0.037	0.037	0.113	0.058	0.003	0.003	0.003	0.338
PM-2.5	0.042	0.042	0.037	0.037	0.113	0.058	0.003	0.003	0.003	0.338
CO	0.463	0.463	0.182	0.182	0.305	0.155	0.022	0.022	0.022	1.816
VOC	0.030	0.030	0.027	0.027	0.048	0.024	0.015	0.015	0.015	0.231
HAPs										
Arsenic	1.10E-06	1.10E-06	9.83E-07	9.83E-07	1.60E-06	8.12E-07	1.16E-07	1.16E-07	1.16E-07	6.93E-06
Benzene	1.16E-05	1.16E-05	1.03E-05	1.03E-05	1.68E-05	8.53E-06	1.22E-06	1.22E-06	1.22E-06	7.27E-05
BE	6.61E-08	6.61E-08	5.90E-08	5.90E-08	9.58E-08	4.87E-08	6.96E-09	6.96E-09	6.96E-09	4.16E-07
Cadmium	6.06E-06	6.06E-06	5.41E-06	5.41E-06	8.78E-06	4.47E-06	6.38E-07	6.38E-07	6.38E-07	3.81E-05
Chromium	7.71E-06	7.71E-06	6.88E-06	6.88E-06	1.12E-05	5.69E-06	8.12E-07	8.12E-07	8.12E-07	4.85E-05
Cobalt	4.63E-07	4.63E-07	4.13E-07	4.13E-07	6.71E-07	3.41E-07	4.87E-08	4.87E-08	4.87E-08	2.91E-06
Dichlorobenzene	6.61E-06	6.61E-06	5.90E-06	5.90E-06	9.58E-06	4.87E-06	6.96E-07	6.96E-07	6.96E-07	4.16E-05
Formaldehyde	4.13E-04	4.13E-04	3.69E-04	3.69E-04	5.99E-04	3.05E-04	4.35E-05	4.35E-05	4.35E-05	2.60E-03
Hexane	9.91E-03	9.91E-03	8.85E-03	8.85E-03	1.44E-02	7.31E-03	1.04E-03	1.04E-03	1.04E-03	6.23E-02
Lead	2.75E-06	2.75E-06	2.46E-06	2.46E-06	3.99E-06	2.03E-06	2.90E-07	2.90E-07	2.90E-07	1.73E-05
Mangenese	2.09E-06	2.09E-06	1.87E-06	1.87E-06	3.03E-06	1.54E-06	2.20E-07	2.20E-07	2.20E-07	1.32E-05
Mercury	1.43E-06	1.43E-06	1.28E-06	1.28E-06	2.08E-06	1.06E-06	1.51E-07	1.51E-07	1.51E-07	9.00E-06
Napthalene	3.36E-06	3.36E-06	3.00E-06	3.00E-06	4.87E-06	2.48E-06	3.54E-07	3.54E-07	3.54E-07	2.11E-05
Nickel	1.16E-05	1.16E-05	1.03E-05	1.03E-05	1.68E-05	8.53E-06	1.22E-06	1.22E-06	1.22E-06	7.27E-05
POM	4.85E-07	4.85E-07	4.33E-07	4.33E-07	7.02E-07	3.57E-07	5.10E-08	5.10E-08	5.10E-08	3.05E-06
Selenium	1.32E-07	1.32E-07	1.18E-07	1.18E-07	1.92E-07	9.75E-08	1.39E-08	1.39E-08	1.39E-08	8.31E-07
Toluene	1.87E-05	1.87E-05	1.67E-05	1.67E-05	2.71E-05	1.38E-05	1.97E-06	1.97E-06	1.97E-06	1.18E-04
TOTAL HAPS	1.04E-02	1.04E-02	9.28E-03	9.28E-03	1.51E-02	7.67E-03	1.09E-03	1.09E-03	1.09E-03	0.07

EPCRA 313 Chemical[a]	Emissions from all Small Boilers[b]	
	Emission Factor (lbs/MMscf)	Emission (lbs)
Lead[c]	5.0E-04	2.35E-01
Sulfuric Acid[d]	0.6	281.86
Mercury[c]	2.6E-04	1.22E-01
PACs[e]	8.69E-07	4.08E-04
Benzo(g,h,i) perylene[c]	1.20E-06	5.64E-04

References
(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 deleminations. Lead and mercury are included with lead compounds and mercury compounds respectively.
(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

Greenhouse Gas Emissions

Emission Factors		
CO_2 [(a)]	53.02	kg/mmBtu
CH_4 [(b)]	0.001	kg/mmBtu
N_2O [(b)]	0.0001	kg/mmBtu
LANL Natural Gas High Heat Value[(c)] 1020.5	mmBtu/mmSCF	

References
(a) From 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel."
(b) From 40 CFR Part 98, Subpart C, Table C-2, "Default CH4 and N2O Emission Factors for Various Types of Fuel."
(c) The average high heat value (HHV) is shown. Initial HHV is provided in Btu/SCF. HHV is taken from the monthly "Totalizer Report".
(d) Boiler Pool Capacity and Design Ratings were determined using the EAQ boilers data base.
(e) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

Equation: Fuel Use MMscf/year * Nat. Gas MMBTU/MMscf * Emission Factor kg/MMBTU * metric ton/1000 kg

Metered Boilers			Calender Year				Fiscal Year[(e)]			
Location	Unit No.	NMED ID	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)
TA-55-6	BHW-1	29	863.80	0.016	0.002	864.7	831.53	0.016	0.002	832.4
TA-55-6	BHW-2	30	439.50	0.008	0.001	440.0	463.69	0.009	0.001	464.2
TA-55-440	B-1thru3		188.18	0.004	0.0004	188.4	214.96	0.004	0.000	215.2
		Metered Total	1491.48	0.028	0.003	1304.7	1510.2	0.028	0.003	1296.6

Non-Metered Boilers			Calender Year				Fiscal Year[(e)]			
Location	Unit No.	NMED ID	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)
TA-53-365	BHW-1	11	596.00	0.011	0.001	596.6	614.73	0.012	0.001	615.4
TA-53-365	BHW-2	12	596.00	0.011	0.001	596.6	614.73	0.012	0.001	615.4
TA-16-1484	Plant 5	53	1063.91	0.020	0.002	1065.0	1097.35	0.021	0.002	1098.5
Lab Wide	Various	None	20178.30	0.381	0.038	20199.2	20812.67	0.393	0.039	20834.2
		Non-Metered Total	22434.20	0.423	0.042	22457.4	23139.5	0.436	0.044	23163.4
		Total CO2 Equivalents (metric tons)	23925.69	0.45	0.05	23762.0			Total CO2 Equivalents (metric tons)	24460.0

CY2014 Daily Turbine Gas Use (Mscf), 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	0	0.0	0	0.0	1065	5.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
3	0	0.0	0	0.0	0	0.0	1049	4.2	0	0.0	0	0.0	493	3.0	0	0.0	0	0.0	0	0.0	2	0.0	0	0.0
4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	900	5.0	0	0.0	0	0.0	1092	5.2
5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	226	1.5	0	0.0
6	0	0.0	44	1.5	1067	4.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	728	3.0	0	0.0
7	15	0.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	885	4.2	0	0.0	0	0.0	0	0.0	0	0.0
8	0	0.0	0	0.0	0	0.0	0	0.0	875	4.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	31	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10	1175	5.5	0	0.0	0	0.0	20	0.3	0	0.0	23	0.5	883	4.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	0	0.0	18	0.3	0	0.0	0	0.0	0	0.0	846	4.1	0	0.0	0	0.0	902	4.2	0	0.0	0	0.0	1053	4.1
12	0	0.0	92	0.3	0	0.0	0	0.0	0	0.0	8	0.3	0	0.0	11	0.2	1	0.0	0	0.0	4	0.0	0	0.0
13	0	0.0	955	4.8	989	5.0	0	0.0	0	0.0	0	0.0	0	0.0	32	0.2	0	0.0	0	0.0	0	0.0	0	0.0
14	0	0.0	0	0.0	0	0.0	0	0.0	901	4.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
16	1013	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
17	0	0.0	0	0.0	44	2.0	1031	4.2	0	0.0	0	0.0	907	4.2	0	0.0	17	0.4	0	0.0	13	0.0	0	0.0
18	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	859	4.1	0	0.0	0	0.0	0	0.0
19	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1086	5.2	0	0.0	0	0.0	0	0.0	0	0.0	976	4.0	0	0.0
20	0	0.0	1067	5.1	1040	4.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
21	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	13	0.2	0	0.0	0	0.0	0	0.0	0	0.0
22	0	0.0	0	0.0	0	0.0	0	0.0	858	4.1	0	0.0	0	0.0	21	0.4	0	0.0	0	0.0	0	0.0	0	0.0
23	48	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.0	0	0.0	0	0.0
24	0	0.0	0	0.0	0	0.0	1019	4.1	0	0.0	0	0.0	5	1.8	0	0.0	3737	16.1	0	0.0	0	0.0	0	0.0
25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	0	0.0	0	0.0	3306	16.2	0	0.0	0	0.0	0	0.0
26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
27	15	0.0	1057	5.1	1081	5.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	23	0.3	0	0.0	0	0.0
28	17	0.6	0	0.0	0	0.0	0	0.0	3	0.1	0	0.0	0	0.0	973	5.1	0	0.0	0	0.0	0	0.0	0	0.0
29	0	0.0			0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
30	16	1.3			0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
31	0	0.0			0	0.0			0	0.0			12	0.2	0	0.0			0	0.0			0	0.0
SUM	2299	13	3233	17	4221	20.5	3119	12.7	3702	18.3	1997	10.6	2300	13.3	1935	10.3	9722	46	910	4.35	1949	8.5	3593	15.4
12 Mo. Rolling Gas Hours Mscf	81,775		80,690		82,882		83,014		82,086		76,718		46,619		36,451		39,179		37,049		36,363		38,980	
MMscf	81.8		80.7		82.9		83.0		82.1		76.7		46.6		36.5		39.2		37.0		36.4		39.0	
Hrs.	411		405		415		412		406		378		231		182		194		184		180		190	

First Half Gas Use: 18.6 MMscf | **Second Half Gas Use:** 20.4 MMscf | **Annual Gas Use:** 39.0 MMscf

Permit Limit (12 mo rolling): 1400 MMscf

Total Annual Hours: 189.9 Hour

High Heat Value (HHV) for natural gas[K] = **1020** MMBtu/MMscf

Reviewed by/date: _____

2014 Combustion Turbine Emissions (Actual)

Pollutant Criteria	Emission Factors (lb/MMscf)	Unit Emissions (Tons) TA-3-2422 Combustion Turbine Annual (tons)	Jan-June (tons)	July-Dec (tons)	Reference
NOx	50.5	0.984	0.469	0.515	a
SOx	3.5	0.068	0.032	0.036	b
PM	6.8	0.133	0.063	0.069	c
PM_{10}	6.8	0.133	0.063	0.069	c
$PM_{2.5}$	6.8	0.133	0.063	0.069	c
CO	10.5	0.205	0.097	0.107	a
VOC	2.2	0.043	0.020	0.022	d
HAPs / TRI					
Acetaldehyde	4.12E-02	8.03E-04	3.83E-04	4.20E-04	e, f, g
Acrolein	6.59E-03	1.28E-04	6.12E-05	6.73E-05	e, f, g
Benzene	1.24E-02	2.41E-04	1.15E-04	1.26E-04	e, f,g
Benzo (a) anthracene	3.09E-03	6.02E-05	2.87E-05	3.15E-05	f, h
1,3-Butadiene	4.43E-04	8.63E-06	4.11E-06	4.52E-06	e, f, g
Cadmium	7.11E-03	1.39E-04	6.60E-05	7.25E-05	f, h
Chromium	1.34E-02	2.61E-04	1.24E-04	1.37E-04	f, h
Copper	7.11E-02	1.39E-03	6.60E-04	7.25E-04	f, h
Ethylbenzene	3.30E-02	6.42E-04	3.06E-04	3.36E-04	e, f, g
Fluoranthene	1.24E-03	2.41E-05	1.15E-05	1.26E-05	f, h
Formaldehyde	7.31E-01	1.43E-02	6.79E-03	7.46E-03	e, f, g
Manganese	8.24E-02	1.61E-03	7.65E-04	8.41E-04	f, h
Mercury	6.80E-03	1.32E-04	6.31E-05	6.94E-05	f, h
Napthalene	1.34E-03	2.61E-05	1.24E-05	1.37E-05	e, f, g
Nickel	1.18E-01	2.31E-03	1.10E-03	1.21E-03	f, h
PAH	2.27E-03	4.42E-05	2.10E-05	2.31E-05	e, f, g
Phenol	1.34E-02	2.61E-04	1.24E-04	1.37E-04	e, f, h
Propylene Oxide	2.99E-02	5.82E-04	2.77E-04	3.05E-04	e, f, g
Toluene	1.34E-01	2.61E-03	1.24E-03	1.37E-03	e, f, g
Xylenes (isomers)	6.59E-02	1.28E-03	6.12E-04	6.73E-04	e, f, g
TOTAL HAPS		**2.68E-02**	**1.28E-02**	**1.40E-02**	

Greenhouse Gases	Emission Factors (kg/mmBtu)	Calender Yr (metric tons)	Fiscal Yr (metric tons)	Reference
CO_2	53.02	2109.0	2119.8	i, l
CH_4	0.001	0.040	0.040	j, l
N_2O	0.0001	0.004	0.004	j, l
CO_2 Equivalent Emissions (metric tons):		2111.2	2122.0	

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

(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 lbs/mmscf.

(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. Retrieved 4-14-08.

(i) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel." Units are kg/mmBtu.

(j) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH4 and N2O Emission Factors for Various Types of Fuel." Units are kg/mmBtu.

(k) Average high heat values for natural gas used at LANL were calculated each month. The average was taken from the monthly "TA-3 Power Plant Totalizer Report."

(l) Fiscal year begins on October 1st and ends on September 30th of the following year.

Reviewed by/date: _____

2014 Monthly Emission Calculation
Unit TA-3-22-CT-1
(Required by Condition A1307.A of Title V Permit P100-R1-M1)

Monthly Average Hourly Emissions Rate (pph)

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Allowable
NOx	8.97	9.60	10.40	12.40	10.22	9.56	8.73	9.49	10.67	10.56	11.58	11.78	23.8
SOx	0.62	0.67	0.72	0.86	0.71	0.66	0.61	0.66	0.74	0.73	0.80	0.82	1.7
PM	1.21	1.29	1.40	1.67	1.38	1.29	1.18	1.28	1.44	1.42	1.56	1.59	1.9
PM-10	1.21	1.29	1.40	1.67	1.38	1.29	1.18	1.28	1.44	1.42	1.56	1.59	1.9
PM-2.5	1.21	1.29	1.40	1.67	1.38	1.29	1.18	1.28	1.44	1.42	1.56	1.59	1.9
CO	1.86	2.00	2.16	2.58	2.12	1.99	1.82	1.97	2.22	2.20	2.41	2.45	29
VOC	0.39	0.42	0.45	0.54	0.45	0.42	0.38	0.41	0.46	0.46	0.50	0.51	0.6

12-Month Rolling Emission Rate* (TPY)

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Allowable
NOx	2.065	2.037	2.093	2.096	2.073	1.937	1.177	0.920	0.989	0.935	0.918	0.984	59.4
SOx	0.143	0.141	0.145	0.145	0.144	0.134	0.082	0.064	0.069	0.065	0.064	0.068	4.2
PM	0.278	0.274	0.282	0.282	0.279	0.261	0.159	0.124	0.133	0.126	0.124	0.133	4.8
PM-10	0.278	0.274	0.282	0.282	0.279	0.261	0.159	0.124	0.133	0.126	0.124	0.133	4.8
PM-2.5	0.278	0.274	0.282	0.282	0.279	0.261	0.159	0.124	0.133	0.126	0.124	0.133	4.8
CO	0.429	0.424	0.435	0.436	0.431	0.403	0.245	0.191	0.206	0.195	0.191	0.205	72.3
VOC	0.090	0.089	0.091	0.091	0.090	0.084	0.051	0.040	0.043	0.041	0.040	0.043	1.5

* Using rolling fuel use

TA-3 Power Plant Fuel Use Totals 2014 (Data Entry)

DATA ENTRY

Month	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	
	Natural Gas (mscf)[a]	Fuel Oil (gallons)[a]	Natural Gas (mscf)[a]	Fuel Oil (gallons)[a]	Natural Gas (mscf)[a]	Fuel Oil (gallons)[a]	Natural Gas (mmscf)[a]	Fuel Oil (gallons)[a]
January	55,002	0	0	0	103	0	55.104	0
February	39,265	0	4,732	0	355	0	44.352	0
March	273	0	42,296	0	434	0	43.004	0
April	1	0	10,903	0	23,846	0	34.750	0
May	10	0	10,701	0	14,684	0	25.395	0
June	4	0	14,871	0	1	0	14.876	0
July	0	0	14,982	0	0	0	14.982	0
August	313	0	15,061	0	0	0	15.375	0
September	233	0	10,572	0	4,293	0	15.098	0
October	0.4	0	23,887	0	86	0	23.974	0
November	65	0	41,441	0	181	0	41.686	0
December	36	0	38,791	0	11,816	0	50.643	0
Annual Totals:	95,201	0	228,237	0	55,798	0	379.236	0
Jan. - June	94,554	0	83,503	0	39,423	0	217.480	0
July - Dec.	647	0	144,734	0	16,376	0	161.757	0

Month	12-Mo. Rolling Total Natural Gas (mmscf)	12-Mo. Rolling Total Fuel Oil (gallons)	Hours of Operation Nat Gas Boiler 1	Hours of Operation Nat Gas Boiler 2	Hours of Operation Nat Gas Boiler 3	Hours of Operation Fuel Oil Boiler 1	Hours of Operation Fuel Oil Boiler 2	Hours of Operation Fuel Oil Boiler 3	*12-Month Rolling Total Hours (All Boilers)
January	421.8	0	742.9	0.0	1.6	0.0	0.0	0.0	8658.7
February	416.4	0	587.6	79.6	5.5	0.0	0.0	0.0	8638.5
March	416.1	0	5.0	731.4	9.0	0.0	0.0	0.0	8630.7
April	413.7	0	0.0	198.6	522.2	0.0	0.0	0.0	8622.4
May	411.7	0	0.1	396.2	347.9	0.0	0.0	0.0	8619.9
June	409.8	0	0.0	719.7	0.0	0.0	0.0	0.0	8619.9
July	407.9	0	0.0	743.9	0.0	0.0	0.0	0.0	8620.2
August	409.8	0	5.1	731.7	0.0	0.0	0.0	0.0	8758.9
September	406.7	0	6.7	524.2	189.1	0.0	0.0	0.0	8759.5
October	395.1	0	0.0	741.2	2.6	0.0	0.0	0.0	8758.8
November	388.2	0	0.0	718.6	3.8	0.0	0.0	0.0	8758.6
December	379.2	0	0.0	561.3	187.3	0.0	0.0	0.0	8762.8
Permit Limits:	1000 MMscf	500,000 gal							

* The requirement to calculate a 12 month rolling total of hours became effective on June 15, 2012.

Data Reviewed By: _____

12 Month Rolling Fuel Totals For Each Individual Boiler - 2014

Month	Boiler 1		Boiler 2		Boiler 3	
	Natural Gas (mmscf)	Fuel Oil (gal.)	Natural Gas (mmscf)	Fuel Oil (gal.)	Natural Gas (mmscf)	Fuel Oil (gal.)
January	249	0	76	0	97	0
February	282	0	39	0	95	0
March	282	0	48	0	86	0
April	282	0	58	0	74	0
May	275	0	69	0	68	0
June	259	0	84	0	68	0
July	242	0	98	0	67	0
August	242	0	114	0	54	0
September	233	0	124	0	50	0
October	202	0	148	0	45	0
November	154	0	189	0	44	0
December	95	0	228	0	56	0

Emissions by Boiler 2014

Pollutant Criteria	Emission Factor		Unit Emissions				Unit Emissions				Unit Emissions			
			Boiler #1, Stack 032				Boiler #2, Stack 033				Boiler #3, Stack 034			
	Natural[a] Gas (lb/mmscf)	Fuel Oil[f] lbs/ 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	2.761	0.000	2.742	0.019	6.619	0.000	2.422	4.197	1.618	0.000	1.143	0.475
SOx[g]	0.6	7.4	0.029	0.000	0.028	0.000	0.068	0.000	0.025	0.043	0.017	0.000	0.012	0.005
PM[d]	7.6	3.3	0.362	0.000	0.359	0.002	0.867	0.000	0.317	0.550	0.212	0.000	0.150	0.062
PM-10[d]	7.6	2.3	0.362	0.000	0.359	0.002	0.867	0.000	0.317	0.550	0.212	0.000	0.150	0.062
PM-2.5[d]	7.6	1.55	0.362	0.000	0.359	0.002	0.867	0.000	0.317	0.550	0.212	0.000	0.150	0.062
CO[c]	40	5.0	1.904	0.000	1.891	0.013	4.565	0.000	1.670	2.895	1.116	0.000	0.788	0.328
VOC	5.5	0.2	0.262	0.0000	0.260	0.002	0.628	0.0000	0.230	0.398	0.153	0.000	0.108	0.045
HAPs[h]														
Arsenic	0.0002	0.00055	9.52E-06	0.00E+00	9.46E-06	6.47E-08	2.28E-05	0.00E+00	8.35E-06	1.45E-05	5.58E-06	0.00E+00	3.94E-06	1.64E-06
Benzene	0.0021	-	1.00E-04	0.0	9.93E-05	6.79E-07	2.40E-04	0.0	8.77E-05	1.52E-04	5.86E-05	0.0	4.14E-05	1.72E-05
Beryllium	0.000012	0.00041	5.71E-07	0.00E+00	5.67E-07	3.88E-09	1.37E-06	0.00E+00	5.01E-07	8.68E-07	3.35E-07	0.00E+00	2.37E-07	9.83E-08
Cadmium	0.0011	0.00041	5.24E-05	0.00E+00	5.20E-05	3.56E-07	1.26E-04	0.00E+00	4.59E-05	7.96E-05	3.07E-05	0.00E+00	2.17E-05	9.01E-06
Chromium	0.0014	0.00041	6.66E-05	0.00E+00	6.62E-05	4.53E-07	1.60E-04	0.00E+00	5.85E-05	1.01E-04	3.91E-05	0.00E+00	2.76E-05	1.15E-05
Cobalt	0.000084	-	4.00E-06	0.0	3.97E-06	2.72E-08	9.59E-06	0.0	3.51E-06	6.08E-06	2.34E-06	0.0	1.66E-06	6.88E-07
Dichlorobe	0.0012	-	5.71E-05	0.0	5.67E-05	3.88E-07	1.37E-04	0.0	5.01E-05	8.68E-05	3.35E-05	0.0	2.37E-05	9.83E-06
Formaldehy	0.075	0.048	3.57E-03	0.00E+00	3.55E-03	2.43E-05	8.56E-03	0.00E+00	3.13E-03	5.43E-03	2.09E-03	0.00E+00	1.48E-03	6.14E-04
Hexane	1.8	-	8.57E-02	0.0	8.51E-02	5.82E-04	2.05E-01	0.0	7.52E-02	1.30E-01	5.02E-02	0.0	3.55E-02	1.47E-02
Lead	0.0005	0.00123	2.38E-05	0.00E+00	2.36E-05	1.62E-07	5.71E-05	0.00E+00	2.09E-05	3.62E-05	1.39E-05	0.00E+00	9.86E-06	4.09E-06
Mangenese	0.00038	0.00082	1.81E-05	0.00E+00	1.80E-05	1.23E-07	4.34E-05	0.00E+00	1.59E-05	2.75E-05	1.06E-05	0.00E+00	7.49E-06	3.11E-06
Mercury[i]	0.00026	0.00041	1.24E-05	0.00E+00	1.23E-05	8.41E-08	2.97E-05	0.00E+00	1.09E-05	1.88E-05	7.25E-06	0.00E+00	5.12E-06	2.13E-06
Napthalene	0.00061	-	2.90E-05	0.0	2.88E-05	1.97E-07	6.96E-05	0.0	2.55E-05	4.41E-05	1.70E-05	0.0	1.20E-05	4.99E-06
Nickel	0.0021	0.00041	1.00E-04	0.00E+00	9.93E-05	6.79E-07	2.40E-04	0.00E+00	8.77E-05	1.52E-04	5.86E-05	0.00E+00	4.14E-05	1.72E-05
POM	0.000088	0.0033	4.19E-06	0.00E+00	4.16E-06	2.85E-08	1.00E-05	0.00E+00	3.67E-06	6.37E-06	2.46E-06	0.00E+00	1.73E-06	7.21E-07
Selenium	0.000024	0.00206	1.14E-06	0.00E+00	1.13E-06	7.76E-09	2.74E-06	0.00E+00	1.00E-06	1.74E-06	6.70E-07	0.00E+00	4.73E-07	1.97E-07
Toluene	0.0034	-	1.62E-04	0.0	1.61E-04	1.10E-06	3.88E-04	0.0	1.42E-04	2.46E-04	9.49E-05	0.0	6.70E-05	2.78E-05
TOTAL HAPS			8.99E-02	0.00E+00	8.93E-02	6.11E-04	2.16E-01	0.00E+00	7.88E-02	1.37E-01	5.27E-02	0.00E+00	3.72E-02	1.55E-02

Data Reviewed By: _____

For References, see Emission Summary.

2014 Greenhouse Gas Emissions TA-3 Power Plant

CALENDER YEAR

Emission Unit Number	Natural Gas Emissions			Fuel Oil Emissions			Total Emissions		
	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons
TA-3-22-1	5148.5	0.097	0.010	0.00	0.000	0.000	5148.5	0.097	0.010
TA-3-22-2	12343.2	0.233	0.023	0.00	0.000	0.000	12343.2	0.233	0.023
TA-3-22-3	3017.6	0.057	0.006	0.00	0.000	0.000	3017.6	0.057	0.006
Totals:	20509.3	0.387	0.039	0.00	0.000	0.000			
						Plant Totals (metric tons):	**20509.3**	**0.387**	**0.039**
						CO_2 Equivalent Total Emissions (metric tons):	**20530.5**		

FISCAL YEAR [e]

Emission Unit Number	Natural Gas Emissions			Fuel Oil Emissions			Total Emissions		
	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons
TA-3-22-1	12595.9	0.238	0.024	0.00	0.000	0.000	12595.9	0.238	0.024
TA-3-22-2	6712.4	0.127	0.013	0.00	0.000	0.000	6712.4	0.127	0.013
TA-3-22-3	2687.2	0.051	0.005	0.00	0.000	0.000	2687.2	0.051	0.005
Totals:	21995.5	0.415	0.041	0.00	0.000	0.000			
						Plant Totals (metric tons):	**21995.5**	**0.415**	**0.041**
						CO_2 Equivalent Total Emissions (metric tons):	**22018.2**		

LANL Natural Gas High Heat Value[c]: **1020.0** mmBtu/mmscf

Fuel Oil Default High Heat Value[a]: **0.138** mmBtu/gallon

GHG Emission Factors

Pollutant	Natural Gas		Fuel Oil	
CO_2 [a]	53.02	kg/mmBtu	73.96	kg/mmBtu
CH_4 [b]	0.001	kg/mmBtu	0.003	kg/mmBtu
N_2O [b]	0.0001	kg/mmBtu	0.0006	kg/mmBtu

References

(a) Emission Factor/High Heat Value is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel."

(b) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH_4 and N_2O Emission Factors for Various Types of Fuel."

(c) Natural gas was analyzed and averaged for each month for many years by UI. Although HHV varies up to 10% throughout the year, the annual average is always close to 1020 mmBtu/mmscf so this value is used for 2014

(d) Fuel use values for natural gas and fuel oil are taken from the monthly "TA-3 Power Plant Totalizer Report".

(e) Fiscal year begins on October 1st and ends on September 30th of the following year.

12 Month Rolling Emissions 2014 (Tons)
All Three Boilers Combined

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	1.603	1.603	12.231	8.435	1.160	0.127
February	1.582	1.582	12.076	8.328	1.145	0.125
March	1.581	1.581	12.067	8.322	1.144	0.125
April	1.572	1.572	11.998	8.274	1.138	0.124
May	1.565	1.565	11.940	8.235	1.132	0.124
June	1.557	1.557	11.885	8.197	1.127	0.123
July	1.550	1.550	11.828	8.157	1.122	0.122
August	1.557	1.557	11.884	8.196	1.127	0.123
September	1.546	1.546	11.795	8.134	1.118	0.122
October	1.501	1.501	11.458	7.902	1.087	0.119
November	1.475	1.475	11.257	7.763	1.067	0.116
December	1.441	1.441	10.998	7.585	1.043	0.114

Meets permit condition A1307.A, Monitoring Condition 2.

Monthly Emission Totals (Tons)

Pollutant	TSP	PM10	NOx	CO	VOC	SO_2
January	0.209	0.209	1.598	1.102	0.152	0.017
February	0.169	0.169	1.286	0.887	0.122	0.013
March	0.163	0.163	1.247	0.860	0.118	0.013
April	0.132	0.132	1.008	0.695	0.096	0.010
May	0.097	0.097	0.736	0.508	0.070	0.008
June	0.057	0.057	0.431	0.298	0.041	0.004
July	0.057	0.057	0.434	0.300	0.041	0.004
August	0.058	0.058	0.446	0.307	0.042	0.005
September	0.057	0.057	0.438	0.302	0.042	0.005
October	0.091	0.091	0.695	0.479	0.066	0.007
November	0.158	0.158	1.209	0.834	0.115	0.013
December	0.192	0.192	1.469	1.013	0.139	0.015
Annual Totals	1.441	1.441	10.998	7.585	1.043	0.114

Data Reviewed By: _____

Monthly Emission Calculation (Natural Gas) 2014

Average Hourly Emissions Rates (pph) for each Emission Unit
(Meets condition A1307.A, monitoring condition 1, of Title V Permit P100-R1-M3)

Unit TA-3-22-1 (Boiler 1) pph

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Allowable Emissions[a]
NOx	4.29	3.88	3.17	0.00	6.03	0.00	0.00	3.56	2.02	0.00	0.00	0.00	10.2
SOx	0.04	0.04	0.03	0.00	0.06	0.00	0.00	0.04	0.02	0.00	0.00	0.00	1.1
PM	0.56	0.51	0.42	0.00	0.79	0.00	0.00	0.47	0.26	0.00	0.00	0.00	1.3
PM-10	0.56	0.51	0.42	0.00	0.79	0.00	0.00	0.47	0.26	0.00	0.00	0.00	1.3
PM-2.5	0.56	0.51	0.42	0.00	0.79	0.00	0.00	0.47	0.26	0.00	0.00	0.00	1.3
CO	2.96	2.67	2.19	0.00	4.16	0.00	0.00	2.46	1.39	0.00	0.00	0.00	7.0
VOC	0.41	0.37	0.30	0.00	0.57	0.00	0.00	0.34	0.19	0.00	0.00	0.00	1.0

Unit TA-3-22-2 (Boiler 2) pph

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Allowable Emissions[a]
NOx	0.00	3.45	3.35	3.18	1.57	1.20	1.17	1.19	1.17	1.87	3.34	4.01	10.2
SOx	0.00	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.02	0.03	0.04	1.1
PM	0.00	0.45	0.44	0.42	0.21	0.16	0.15	0.16	0.15	0.24	0.44	0.53	1.3
PM-10	0.00	0.45	0.44	0.42	0.21	0.16	0.15	0.16	0.15	0.24	0.44	0.53	1.3
PM-2.5	0.00	0.45	0.44	0.42	0.21	0.16	0.15	0.16	0.15	0.24	0.44	0.53	1.3
CO	0.00	2.38	2.31	2.20	1.08	0.83	0.81	0.82	0.81	1.29	2.31	2.76	7.0
VOC	0.00	0.33	0.32	0.30	0.15	0.11	0.11	0.11	0.11	0.18	0.32	0.38	1.0

Unit TA-3-22-3 (Boiler 3) pph

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Allowable Emissions[a]
NOx	3.72	3.74	2.80	2.65	2.45	0.00	0.00	0.00	1.32	1.93	2.76	3.66	10.2
SOx	0.04	0.04	0.03	0.03	0.03	0.00	0.00	0.00	0.01	0.02	0.03	0.04	1.1
PM	0.49	0.49	0.37	0.35	0.32	0.00	0.00	0.00	0.17	0.25	0.36	0.48	1.3
PM-10	0.49	0.49	0.37	0.35	0.32	0.00	0.00	0.00	0.17	0.25	0.36	0.48	1.3
PM-2.5	0.49	0.49	0.37	0.35	0.32	0.00	0.00	0.00	0.17	0.25	0.36	0.48	1.3
CO	2.56	2.58	1.93	1.83	1.69	0.00	0.00	0.00	0.91	1.33	1.90	2.52	7.0
VOC	0.35	0.36	0.27	0.25	0.23	0.00	0.00	0.00	0.12	0.18	0.26	0.35	1.0

(a) Allowable Emissions are from table A1302A of permit P100-R1-M3
Condition A1307.A, monitoring condition 3, can't be calculated because the units are based on the emission factor. The emission factor for NOx is in lbs/MMscf, which is converted to lbs/MMBtu by dividing by 1020 (standard number of MMBtu in a MMscf). The NOx emission rate will always be 0.057 lbs/MMBtu unless the Btu value of the fuel changes significantly. The average Btu value for natural gas can be found in the GHG emission calculations in this spreadsheet.

Monthly Emission Calculation (Fuel Oil) 2014

Average Hourly Emissions Rates (pph) for each Emission Unit
(Meets condition A1307.A, monitoring condition 1, of Title V Permit P100-R1-M3)

Unit TA-3-22-1 (Boiler 1)

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Allowable Emissions[a] Oil
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.3
SOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.6
PM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.3
PM-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.0
PM-2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.0
CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.5
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.3

Unit TA-3-22-2 (Boiler 2)

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Allowable Emissions[a] Oil
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.3
SOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.6
PM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.3
PM-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.0
PM-2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.0
CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.5
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.3

Unit TA-3-22-3 (Boiler 3)

	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**Allowable Emissions[a]** Oil
NOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.3
SOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.6
PM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.3
PM-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.0
PM-2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.0
CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.5
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.3

Each boilers uses 1303 gallons per hour at 110% or 178 MMbtu input (provided by Paul Parker on 9-12-12). Hour calculation uses 1184 gph as 100%.

(a) Allowable Emissions are from table A1302A of permit P100-R1-M3

Emission Summary TA-3 Power Plant 2014

Pollutant Criteria	Emission Factor Natural Gas (lb/MMscf)	Emission Factor Fuel Oil[f] (lb/1000 gal.)	Annual Emissions (Natural Gas + Fuel Oil) (tons)	Jan-June Emissions (Natural Gas + Fuel Oil) (tons)	July-Dec Emissions (Natural Gas + Fuel Oil) (tons)	Reference Gas	Reference Oil
NOx	58	8.64	10.998	6.307	4.691	(c)	(c)
SOx	0.6	7.4	0.114	0.065	0.049	(a)(i)	(g)(j)
PM	7.6	3.3	1.441	0.826	0.615	(d)	(d)
PM-10	7.6	2.3	1.441	0.826	0.615	(d)	(d)
PM-2.5	7.6	1.55	1.441	0.826	0.615	(d)	(d)
CO	40	5.0	7.585	4.350	3.235	(b)	(g)
VOC	5.5	0.2	1.043	0.598	0.445	(b)	(i)
HAPs[a]							
Arsenic	0.0002	0.00055	3.79E-05	2.17E-05	1.62E-05	(a)	(k)
Benzene	0.0021	-	3.98E-04	2.28E-04	1.70E-04	(c)	
Beryllium	0.000012	0.00041	2.28E-06	1.30E-06	9.71E-07	(c)	(k)
Cadmium	0.0011	0.00041	2.09E-04	1.20E-04	8.90E-05	(c)	(k)
Chromium	0.0014	0.00041	2.65E-04	1.52E-04	1.13E-04	(c)	(k)
Cobalt	0.000084	-	1.59E-05	9.13E-06	6.79E-06	(c)	
Dichlorobenzene	0.0012	-	2.28E-04	1.30E-04	9.71E-05	(c)	
Formaldehyde	0.075	0.048	1.42E-02	8.16E-03	6.07E-03	(c)	(k)
Hexane	1.8	-	3.41E-01	1.96E-01	1.46E-01	(c)	
Lead	0.0005	0.001233	9.48E-05	5.44E-05	4.04E-05	(c)	(k)
Manganese	0.00038	0.000822	7.21E-05	4.13E-05	3.07E-05	(c)	(k)
Mercury	0.00026	0.000411	4.93E-05	2.83E-05	2.10E-05	(i)(c)	(i)(k)
Napthalene	0.00061	-	1.16E-04	6.63E-05	4.93E-05	(c)	
Nickel	0.0021	0.000411	3.98E-04	2.28E-04	1.70E-04	(c)	(k)
POM	0.000088	0.0033	1.67E-05	9.57E-06	7.12E-06	(c)	(k)
Selenium	0.000024	0.002055	4.55E-06	2.61E-06	1.94E-06	(c)	(k)
Toluene	0.0034	-	6.45E-04	3.70E-04	2.75E-04	(c)	
TOTAL HAPS			3.58E-01	2.05E-01	1.53E-01		
EPCRA 313				lbs./year			
Lead	0.0005	0.00123	9.48E-05	0.190		(c)	(i)(k)
Sulfuric Acid	0.60	0.285	1.14E-01	227.54		(e)(j)	(e)(h)
Mercury	0.00026	0.00041	4.93E-05	0.099		(c)	(i)(k)
PACs	8.69E-07	1.65E-05	1.65E-07	3.30E-04		(f)(l)	(f)(l)
Benzo(g,h,i) perylene	1.20E-06	2.26E-06	2.28E-07	4.55E-04		(i)(k)(c)	(f)
Zinc	-	0.00055	0.00E+00	0.00E+00			(k)

Reference

(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.

(l) 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:

2014 Annual Emissions Inventory Submittal to NMED

Los Alamos
NATIONAL LABORATORY
EST. 1943

memorandum

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)

To/MS: 2014 Emissions Inventory File
From/MS: Alison M. Dorries, ENV-DO, (E-File)
From/MS: Steven L. Story, ENV-CP, (E-File)
Phone/Fax: 7-2211/7-0731
LA-UR: 15-21793
Symbol: ENV-DO-15-0077
Date: MAR 2 3 2015

Subject: 2014 Emissions Inventory Electronic Submittal

Los Alamos National Laboratory (LANL) submitted their 2014 Emissions Inventory Report to New Mexico Environmental Department (NMED) via online reporting tool, AEIR. This report is required by Title 20, Chapter 2, Part 73 of the New Mexico Administrative Code (20.2.73 NMAC), Notice of Intent and Emissions Inventory Requirements. The report was submitted on March 24, 2015, and meets New Mexico Environmental Department's deadline of April 1st.

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

AMD:SLS/LM

Cy: Kirsten Laskey, NA-LA, (E-File)
Hai Shen, NA-LA, (E-File)
Michael A. Lansing, PADOPS, (E-File)
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Enclosure

2014 Emissions Inventory Report

ENV-DO-15-0077

Electronic Submittal

Date: March 23, 2015

LA-UR-13-22031

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 17, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-116
Designation: TA-60-BDM
Description: Asphalt Plant Dryer - Natural Gas
Type: Asphalt Drum/Burner
SCC: Industrial Processes, Mineral Products, Asphalt Concrete, Drum Mix Plant: Rotary Drum Dryer / Mixer, Natural Gas - Fired
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Asphalt (OUTPUT)	
Materials Consumed:	0.921	MM SCF
Fuel Heating Value:	1020.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	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 Monoxide:	0.117	tons/y	EPA emission factors (e.g., AP-42)
Ethylbenzene:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.002	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.002	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.002	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.001	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.002 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: ACT -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**
GHG Reporting: Reports GHG to EPA

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:	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
Beryllium:	0.0	tons/y	Estimate
Particulate Matter (total suspended):	0.0	tons/y	Estimate

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: ACT -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**
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

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	Sample testing
Particulate Matter (total suspended):	0.0	tons/y	Sample testing

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: ACT -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**
GHG Reporting: Reports GHG to EPA

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:	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
Beryllium:	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: ACT -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
GHG Reporting: Reports GHG to EPA

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:	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	Design calculation

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	11.02	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	0.463	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.01	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.551	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.042	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.042	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.042	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):	0.03	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	11.015	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	0.463	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.01	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.551	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.042	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.042	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.042	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):	0.03	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	95.201	MM SCF
Fuel Heating Value:	1020.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	1.904	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.004	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.086	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	2.761	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.362	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.362	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.362	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.029	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):	0.262	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	228.237	MM SCF
Fuel Heating Value:	1020.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	4.565	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.205	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	6.619	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.867	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.867	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.867	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.068	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.628 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	55.798	MM SCF
Fuel Heating Value:	1020.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	1.116	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.002	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.05	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	1.618	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.212	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.212	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.212	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.017	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.153 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	15.965	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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:	35
Percent of Operation During Spring:	20
Percent of Operation During Summer:	10
Percent of Operation During Fall:	35

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.305	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.014	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	1.102	tons/y	Actual stack test
Particulate Matter (10 microns or less):	0.113	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.113	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.113	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.005	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.048	tons/y	Manufacturer Specification

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	8.123	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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:	10
Percent of Operation During Summer:	10
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.155	tons/y	Manufacturer Specification
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.007	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	Manufacturer Specification
Nitrogen Dioxide:	0.56	tons/y	Actual stack test
Particulate Matter (10 microns or less):	0.058	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.058	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.058	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.002	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.024	tons/y	Manufacturer Specification

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.832	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Ash of Fuel:	0.0	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 Monoxide:	0.182	tons/y	Design calculation
Hexane:	0.009	tons/y	Design calculation
Lead:	0.0	tons/y	Design calculation
Nitrogen Dioxide:	0.182	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.037	tons/y	Design calculation
Particulate Matter (2.5 microns or less):	0.037	tons/y	Design calculation
Particulate Matter (total suspended):	0.037	tons/y	Design calculation
Sulfur Dioxide:	0.003	tons/y	Design calculation
Volatile Organic Compounds (VOC):	0.027	tons/y	Design calculation

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-90
Designation: B-1
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	1.159	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	0.022	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.017	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.003	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.003	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):	0.015	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-104
Designation: B-2
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	1.159	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	0.022	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.017	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.003	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.003	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):	0.015	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-105
Designation: B-3
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	1.159	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	0.022	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.017	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.003	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.003	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):	0.015	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

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Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-106
Designation: B-4
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF
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 Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
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 been built.

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-107
Designation: B-5
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF
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 Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
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 been built.

Facility Annual Emissions - Subject Item Submittal Review
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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.832	MM SCF
Fuel Heating Value:	1021.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	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 Monoxide:	0.182	tons/y	Design calculation
Hexane:	0.009	tons/y	Design calculation
Lead:	0.0	tons/y	Design calculation
Nitrogen Dioxide:	0.182	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.037	tons/y	Design calculation
Particulate Matter (2.5 microns or less):	0.037	tons/y	Design calculation
Particulate Matter (total suspended):	0.037	tons/y	Design calculation
Sulfur Dioxide:	0.003	tons/y	Design calculation
Volatile Organic Compounds (VOC):	0.027	tons/y	Design calculation

Subject Item Comments

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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	0.0	gal
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:	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 Monoxide:	0.0	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)
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 (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:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	0.0	gal
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:	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 Monoxide:	0.0	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)
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 (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:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	0.0	gal
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:	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 Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
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 (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:	0.0	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

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Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-144
Designation: All Boilers
Description: Natural Gas and No. 2 Fuel Boilers (cap)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF
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 Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
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 (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:	0.0	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 Facility ID represents the total from the power plant boilers for both natural gas and fuel oil. However, these emissions are already captured with Facility IDs 24, 25, and 26 for natural gas and Facility IDs 137, 138, and 141 for fuel oil. In order to avoid counting the emissions twice, NMED has asked us to enter zeros for this Facility ID.

Print Close

Facility Annual Emissions - Subject Item Submittal Review

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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-119
Designation: TA-33-G-2
Description: Kohler Diesel Generator TA-33-G-2 (temp located to TA-39)
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	21.59	gal
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:	2
Operating Time in Days per Week:	2
Operating Time in Weeks per Year:	10
Operating Time in Hours per Year:	13
Percent of Operation During Winter:	50
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	50

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.001	tons/y	Design calculation
Nitrogen Dioxide:	0.005	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 17, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-120
Designation: TA-33-G-3
Description: Kohler Diesel Generator TA-33-G-3 (temp located to TA-39)
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	28.4	gal
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:	2
Operating Time in Days per Week:	2
Operating Time in Weeks per Year:	10
Operating Time in Hours per Year:	17
Percent of Operation During Winter:	50
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	50

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.002	tons/y	Design calculation
Nitrogen Dioxide:	0.007	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.001	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:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.001	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-128
Designation: 3 Generators
Description: 3 Cummins Diesel Powered Generators, CMRR-GEN-1, CMRR-GEN-2, and CMRR-GEN-3
Type: Internal combustion engine
SCC: Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating: Cogeneration
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Distillate Oil (Diesel)	
Materials Consumed:	4278.7	gal

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 Monoxide:	0.217	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.991	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.031	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.031	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.031	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.017	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.031	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-135
Designation: TA-33-G-4
Description: Caterpillar Diesel Generator TA-33-G-4
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	300.2	gal
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:	19
Percent of Operation During Winter:	50
Percent of Operation During Spring:	50
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.019	tons/y	Design calculation
Nitrogen Dioxide:	0.09	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.007	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.007	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.007	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.007	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-146
Designation: TA-33-G-1P
Description: Cummins Portable Diesel Generator
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Materials Consumed:	47.5	gal
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent

Operating Detail

	Value
Operating Time in Hours per Day:	1
Operating Time in Days per Week:	1
Operating Time in Weeks per Year:	1
Operating Time in Hours per Year:	3
Percent of Operation During Winter:	50
Percent of Operation During Spring:	50
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.009	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.04	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.001	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:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.001	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Solvent (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):	0.005	tons/y	Material balance

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 17, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: ACT -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
GHG Reporting: Reports GHG to EPA

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):	0.199	tons/y	Material balance
Acetophenone:	0.0	tons/y	Material balance
Acrylamide:	0.001	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:	0.003	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:	0.014	tons/y	Material balance
Benzyl Chloride:	0.001	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:	0.007	tons/y	Material balance
Carbon Disulfide:	0.0	tons/y	Material balance

Carbon tetrachloride; (Tetrachoromethane):	0.004	tons/y	Material balance
Carbonyl sulfide:	0.0	tons/y	Material balance
Catechol (Pyrocatechol):	0.0	tons/y	Material balance
Chlorine:	0.546	tons/y	Material balance
Chloroacetic Acid:	0.0	tons/y	Material balance
Chlorobenzene(Phenyl Chloride):	0.003	tons/y	Material balance
Chloroform; (Trichloromethane):	0.168	tons/y	Material balance
Chromium:	0.0	tons/y	Material balance
Chromium VI compounds:	0.011	tons/y	Material balance
Cobalt Compounds:	0.017	tons/y	Material balance
Cresol(m-); (Methylphenol, 3-):	0.0	tons/y	Material balance
Cumene:	0.0	tons/y	Material balance
Cyanide compounds:	0.004	tons/y	Material balance
Dibutylphthalate; (Di-n-butyl phthalate):	0.003	tons/y	Material balance
Dichloroethane (1,2-); (EDC); (Ethylene dichloride):	0.003	tons/y	Material balance
Diethanolamine:	0.0	tons/y	Material balance
Dimethyl Sulfate:	0.0	tons/y	Material balance
Dimethyl formamide:	0.012	tons/y	Material balance
Dimethylhydrazine(1,1-):	0.0	tons/y	Material balance
Dioxane(1,4-) (1,4-Diethyleneoxide):	0.001	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
Ethylbenzene:	0.016	tons/y	Material balance
Ethylene Glycol:	0.139	tons/y	Material balance
Ethylene dibromide; (EDB); (1.2-Dibromoethane):	0.0	tons/y	Material balance
Formaldehyde:	0.001	tons/y	Material balance
Glycol Ethers:	0.219	tons/y	Material balance
Hexachlorocyclopentadiene:	0.0	tons/y	Material balance
Hexamethylphosphoramide:	0.001	tons/y	Material balance
Hexane:	0.378	tons/y	Material balance
Hydrazine:	0.001	tons/y	Material balance
Hydrochloric acid (HCl):	1.411	tons/y	Material balance
Hydrofluoric Acid; (Hydrogen fluoride):	0.048	tons/y	Material balance
Hydroquinone:	0.066	tons/y	Material balance
Iodomethane (Methyl iodide):	0.001	tons/y	Material balance
Lead Compounds:	0.002	tons/y	Material balance
Maleic anhydride:	0.001	tons/y	Material balance
Manganese:	0.0	tons/y	Material balance
Manganese compounds:	0.008	tons/y	Material balance
Mercury compounds:	0.0	tons/y	Material balance
Methanol; (Methyl alcohol):	0.558	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):	0.001	tons/y	Material balance
Methyl isobutyl ketone; (Hexone); (4-Methyl-2-pentanone):	0.0	tons/y	Material balance
Methyl tert butyl ether:	0.008	tons/y	Material balance

Methylene chloride; (Dichloromethane):	0.662	tons/y	Material balance
Methylenebiphenyl isocyanate; (MDI); (Diphenylmethane diisocyanate):	0.133	tons/y	Material balance
Naphthalene:	0.0	tons/y	Material balance
Nickel:	0.0	tons/y	Material balance
Nickel compounds:	0.017	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):	0.011	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:	0.001	tons/y	Material balance
Propylene Dichloride (1,2-Dichloropropane):	0.159	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:	0.001	tons/y	Material balance
TCE; (Trichloroethylene); (Trichloroethene):	0.012	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):	0.17	tons/y	Material balance
Total HAP:	5.06	tons/y	Material balance
Trichloroethane(1,1,1-) (Methyl Chloroform):	0.006	tons/y	Material balance
Trichloroethane(1,1,2-):	0.0	tons/y	Material balance
Triethylamine:	0.001	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):	0.005	tons/y	Material balance
Volatile Organic Compounds (VOC):	10.86	tons/y	Material balance
Xylene(o-); (1,2-Dimethylbenzene); (ortho-Xylene):	0.001	tons/y	Material balance
Xylene(p-); (1,4-Dimethylbenzene); (para-Xylene):	0.001	tons/y	Material balance
Xylenes (total); (Xylol):	0.017	tons/y	Material balance
bis(2-ethylhexyl) phthalate; (Di-2-ethylhexyl phthalate); (DEHP):	0.0	tons/y	Material balance

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-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
GHG Reporting: Reports GHG to EPA

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):	0.06	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.04	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.07	tons/y	Manufacturer Specification

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Thursday, March 05, 2015

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2014 Submittal (In Process)

Subject Item ID: EQPT-112
Designation: TA-3-22-CT-1
Description: Combustion Turbine
Type: Turbine
SCC: Internal Combustion Engines, Electric Generation, Natural Gas, Turbine
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	39.0	MM SCF
Fuel Heating Value:	1020.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	7
Operating Time in Days per Week:	4
Operating Time in Weeks per Year:	12
Operating Time in Hours per Year:	500
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):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Carbon Monoxide:	0.205	tons/y	EPA emission factors (e.g., AP-42)
Copper:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Ethylbenzene:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.014	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Manganese:	0.002	tons/y	EPA emission factors (e.g., AP-42)
Nickel:	0.002	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.984	tons/y	EPA emission factors (e.g., AP-42)

Particulate Matter (10 microns or less):	0.133	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.133	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.133	tons/y	EPA emission factors (e.g., AP-42)
Propylene oxide:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.068	tons/y	EPA emission factors (e.g., AP-42)
Toluene; (Methyl benzene):	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.043	tons/y	EPA emission factors (e.g., AP-42)
Xylenes (total); (Xylol):	0.001	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

ATTACHMENT C:

2014 Semi-annual Emissions Reports

Submitted Under Title V Operating Permit Requirements

Los Alamos
NATIONAL LABORATORY
EST.1943

Environment Safety & Health
PO Box 1663, MS K491
Los Alamos, New Mexico 87545
(505)667-4218/Fax (505) 665-3811

Date: AUG 2 8 2014
Symbol: ADESH-14-045
LAUR: 14-26467

Compliance Reporting Manager
Compliance & Enforcement Section
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113

Dear Compliance Reporting Manager:

SUBJECT: Title V Semi-Annual Emissions Report for Permit P100-R1-M3, January 1, 2014 – June 30, 2014 AI No. 856 – Los Alamos National Laboratory (LANL)

Enclosed is Los Alamos National Laboratory's (LANL) Semi-Annual Emissions report for the period January 1, 2014 through June 30, 2014. This report is required by permit condition A109 B and is submitted within 90 days from the end of the reporting period as required by that condition.

The semi-annual emissions report includes actual emissions from permitted sources included in 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 Steven L. Story at (505) 665-2169 or story@lanl.gov .

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety & Health

Title V Semi-Annual Emission Report for Permit P100-R1-M3

January 1, 2014 – June 30, 2014

Identifying Information

Source Name: Los Alamos National Laboratory County: Los Alamos

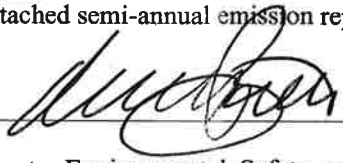
Source Address:
City: Los Alamos State: NM Zip Code: 87545

Responsible Official: Michael T. Brandt Ph No. (505) 667-4218 Fax No. (505) 665-3811
Technical Contact: Steven L. Story Ph No. (505) 665-2169 Fax No. (505) 665-8858
Principal Company Product or Business: National Security and Nuclear Weapons Research Primary SIC Code: 8733

Permit No. P100-R1-M3 {IDEA/Tempo ID No. 856} Permit Issued Date: April 26, 2013

Certification of Truth, Accuracy, and Completeness

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

Signature  Date: 8/25/14

Title: Associate Director Environmental, Safety, and Health

ENCLOSURE 1

Title V Semi-Annual Emissions Report for Permit
P100-R1-M3
January 1, 2014 – June 30, 2014

ADESH-14-045

LAUR-14-26467

Date: AUG 2 8 2014

Title V Semi-Annual Emissions Report for Permit P100-R1-M3
January 1, 2014 - June 30, 2014

Emission Reporting Requirements

A109 Facility: Reporting Schedules

A. A Semi-Annual Report of monitoring activities is due within 45 days following the end of every 6-month reporting period. The six month reporting periods start on January 1st and July 1st of each year.

B. A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

A700 Beryllium Activities

A702 Emission Limits - Beryllium Activities

Source	Beryllium Particulate Matter	Aluminum Particulate Matter
Sigma Facility TA-3-66	10 gm/24 hr	N/A
Beryllium Technology Facility TA-3-141	0.35 gm/24 hr 3.5 gm/yr	N/A
Target Fabrication Facility TA-35-213	1.8×10^{-03} gm/hr 0.36 gm/yr	N/A
Plutonium Facility TA-55-PF-4 Machining Operation	0.12 gm/24 hr 2.99 gm/yr	0.12 gm/24 hr 2.99 gm/y
Plutonium Facility TA-55-PF-4 Foundry Operation	3.49×10^{-03} gm/24 hr 8.73×10^{-04} gm/yr	3.49×10^{-03} gm/24 hr 8.73×10^{-04} gm/y

Reporting Requirement

A707 D The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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

A800 External Combustion

A802 Emission Limits - External Combustion

Unit No.	[1]NO_x tpy	CO tpy	VOC tpy	SO_2 tpy	TSP tpy	PM_{10} tpy
Combined annual emissions for all units listed in Table 800.A [2]	80.0	80.0	50.0	50.0	50.0	50.0

Unit No.	[1]NO_x pph	NO_x tpy	CO pph	CO tpy	VOC pph	VOC tpy	SO_2 pph	SO_2 tpy	TSP pph	TSP tpy	PM_{10} pph	PM_{10} tpy	$PM_{2.5}$ pph	$PM_{2.5}$ tpy
CMRR-BHW-1 (GAS)	0.7	2.9	1.1	4.8	--[2]	--	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.4
CMRR-BHW-1 (OIL)	1.6		0.5		--	--	5.8		0.3		0.2		0.2	
CMRR-BHW-2 (GAS)	0.7	2.9	1.1	4.8	--	--	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.4
CMRR-BHW-2 (OIL)	1.6		0.5		--	--	5.8		0.3		0.2		0.2	
CMRR-BHW-3 (GAS)	0.7	2.9	1.1	4.8	--	--	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.4
CMRR-BHW-3 (OIL)	1.6		0.5		--	--	5.8		0.3		0.2		0.2	
CMRR-BHW-4 (GAS)	0.7	2.9	1.1	4.8	--	--	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.4
CMRR-BHW-4 (OIL)	1.6		0.5		--	--	5.8		0.3		0.2		0.2	
All boilers - Oil[4]	N/A	2.9	N/A	0.9	--	--	N/A	10.4	N/A	0.5	N/A	0.3	N/A	0.3
Combined Total[3]		14.5		20.1		--		11.6		2.1		1.9		1.9

Reporting Requirement

A807 B The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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

A800 External Combustion - continued

CMRR-BHW-4 (Gas)	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A802 B) (tons per year)
NOx	0.000			2.9
SO_2	0.000			0.3
TSP	0.000			0.4
PM-10	0.000			0.4
PM-2.5	0.000			0.4
CO	0.000			4.8
VOCs	0.000			No Source Limit
HAPs	0.000			No Source Limit

Note: The CMRR-BHW-4 boiler has not been installed.

CMRR Boilers Totals (Oil)	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A802 B) (tons per year)
NOx	0.000			2.9
SO_2	0.000			10.4
TSP	0.000			0.5
PM-10	0.000			0.3
PM-2.5	0.000			0.3
CO	0.000			0.9
VOCs	0.000			No Source Limit
HAPs	0.000			No Source Limit

Note: The CMRR boilers did not operate on fuel oil during the first 6 months of 2014.

CMRR Boilers Totals (Gas and Oil)	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A802 B) (tons per year)
NOx	0.033			14.5
SO_2	0.001			11.6
TSP	0.005			2.1
PM-10	0.005			1.9
PM-2.5	0.005			1.9
CO	0.042			20.1
VOCs	0.028			No Source Limit
HAPs	0.002			No Source Limit

A1000 Degreasers

A1002 Emission Limits - Degreasers

Unit No.	VOC/HAPs tpy
TA-55-DG-1	

1 The VOC emissions from this source category are included in the facility-wide allowable emissions limit established in Table 106.B: 200 tpy VOC, 8.0 tpy per individual HAP, and 24.0 tpy of combined total HAPs. Any VHAPs that are also defined as a VOC shall be included in the VOC total.

Reporting Requirement

A1007 A The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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 A1002 A) (tons per year)
VOCs	0.005			Source limits refer to facility-wide limits.
HAPs	0.005			

A1100 Internal Combustion- continued

Generator TA-33-G-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A1102 A) (tons per year)
NOx	0.006			0.21
SO_2	0.000			Not Required
TSP	0.000			Not Required
PM_{10}	0.000			Not Required
CO	0.001			0.1
VOC	0.000			Not Required
HAPs	2.40E-06			No Source Limit

Note: The TA-33-G-3 generator only operated for a 14.2 hours during the first 6 months of 2014.

Generator TA-33-G-4	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A1102 A) (tons per year)
NOx	0.051			2.33
SO_2	0.003			0.16
TSP	0.004			Not Required
PM_{10}	0.004			Not Required
CO	0.011			1.4
VOC	0.004			0.2
HAPs	2.09E-05			No Source Limit

Note: The TA-33-G-4 generator only operated for 11.0 hours during the first 6 months of 2014.

Stationary Standby Generators	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	1.49			No Source Specific Emission Limits for Standby Generators
SO_2	0.06			
TSP	0.08			
PM_{10}	0.08			
CO	0.34			
VOC	0.08			
HAPs	4.96E-04			

Note: Standby Generators are insignificant sources.

Generator CMRR-GEN-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	0.218			No Source Specific Emission Limits for the CMRR Generators
SO_2	0.006			
TSP	0.013			
PM_{10}	0.013			
CO	0.269			
VOC	0.013			
HAPs	6.55E-05			

Continued on the next page.

A1200 Data Disintegrator

A1202 Emission Limits - Data Disintegrator

Unit No.	TSP pph	TSP tpy	PM10 pph	PM10 tpy
TA-52-11	2.3	9.9	2.3	9.9

Reporting Requirement

A1207 A The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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 A1202 A) (tons per year)
TSP	0.04			9.9
PM10	0.04			9.9

A1300 TA-3 Power Plant

Comments:

Combustion Turbine TA-3-22 CT-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition A1302 A) (tons per year)
NOx	0.47			59.4
SOx	0.03			4.2
TSP	0.06			4.8
PM_{10}	0.06			4.8
$PM_{2.5}$	0.06			4.8
CO	0.10			72.3
VOC	0.02			1.5
HAPs	0.01			No Source Limit

A102 Facility Wide Emission Limits

Table 102.A: Total Potential Criteria Pollutant Emissions from Entire Facility

Pollutant	Emissions (tons per year)
Nitrogen Oxides (NOx)	245.0
Carbon Monoxide (CO)	225.0
Volatile Organic Compounds (VOC)	200.0
Sulfur Dioxide (SO_2)	150.0
Total Particulate Matter (TSP)	120.0
Particulate Matter less than 10 microns (PM_{10})	120.0
Particulate Matter less than 2.5 microns ($PM_{2.5}$)	120.0

Table 102.B: Total Potential HAPs that exceed 1.0 tons per year

Pollutant	Emissions (tons per year)
Individual HAP	8.0
Total HAPs	24.0

Reporting Requirement

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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)	2014 Annual Emissions (tons)	Facility Wide Permit Limits (Condition A102) (tons per year)
Nitrogen Oxides	21.3			245
Carbon Monoxide	15.4			225
Volatile Organic Carbons	6.6			200
Sulfur Dioxide	0.3			150
Total Particulate Matter	2.1			120
Particulate Matter less than 10 microns	2.1			120
Particulate Matter less than 2.5 microns	0.9			120
Hazardous Air Pollutants	3.3			24

Los Alamos
NATIONAL LABORATORY
EST 1943

Environment Safety & Health
PO Box 1663, MS K491
Los Alamos, New Mexico 87545
(505)667-4218/Fax (505) 665-3811

Date: MAR 2 4 2015
Symbol: ADESH-15-050
LA-UR: 15-21792
Locates Action No.: N/A

Compliance Reporting Manager
Compliance & Enforcement Section
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507-3113

Dear Compliance Reporting Manager:

SUBJECT: Title V Semi-Annual Emissions Report for Permit P100-R1-M3, July 1, 2014 – December 31, 2014 AI No. 856 – Los Alamos National Laboratory (LANL)

Enclosed is Los Alamos National Laboratory's (LANL) Semi-Annual Emissions report for the period July 1, 2014 through December 31, 2014. This report is required by permit condition A109 B and is submitted within 90 days from the end of the reporting period as required by that condition.

The semi-annual emissions report includes actual emissions from permitted sources included in 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 Steven L. Story at (505) 665-2169 or story@lanl.gov .

Sincerely,

Michael T. Brandt, DrPH, CIH
Associate Director
Environment, Safety & Health

MTB:WW/lm

Enclosure: 1. Title V Semi-Annual Emissions Report for Permit P100-R1-M3
July 1, 2014 – December 31, 2014

Cy: Hai Shen, NA-LA, (E-File)
Kirsten Laskey, NA-LA, (E-File)
Michael A. Lansing, PADOPS, (E-File)
Amy E. De Palma, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Steve L. Story, ENV-CP, (E-File)
Walter Whetham, ENV-CP, (E-File)
Tim Dolan, LC-ESH, (E-File)
LASOmailbox@nnsa.doe.gov, w/enc., (E-File)
locateteam@lanl.gov, w/enc., (E-File)
ENV-CP Title V Emissions Report File
Env-correspondence@lanl.gov

Title V Semi-Annual Emission Report for Permit P100-R1-M3

July 1, 2014 – December 31, 2014

Identifying Information

Source Name: Los Alamos National Laboratory County: Los Alamos

Source Address:
City: Los Alamos State: NM Zip Code: 87545

Responsible Official: Michael T. Brandt Ph No. (505) 667-4218 Fax No. (505) 665-3811
Technical Contact: Steven L. Story Ph No. (505) 665-2169 Fax No. (505) 665-8858
Principal Company Product or Business: National Security and Nuclear Weapons Research Primary SIC Code: 8733

Permit No. P100-R1-M3 {IDEA/Tempo ID No. 856} Permit Issued Date: April 26, 2013

Certification of Truth, Accuracy, and Completeness

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

Signature _____ Date: 3/23/15

Title: Associate Director Environmental, Safety, and Health

ENCLOSURE 1

Title V Semi-Annual Emissions Report for Permit
P100-R1-M3
July 1, 2014 – December 31, 2014

ADESH-15-050

LA-UR-15-21792

Date: MAR 2 4 2015

Title V Semi-Annual Emissions Report for Permit P100-R1-M3
July 1, 2014 - December 31, 2014

Emission Reporting Requirements

A109 Facility: Reporting Schedules

A. A Semi-Annual Report of monitoring activities is due within 45 days following the end of every 6-month reporting period. The six month reporting periods start on January 1st and July 1st of each year.

B. A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

A700 Beryllium Activities

A702 Emission Limits - Beryllium Activities

Source	Beryllium Particulate Matter	Aluminum Particulate Matter
Sigma Facility TA-3-66	10 gm/24 hr	N/A
Beryllium Technology Facility TA-3-141	3.5 gm/yr	N/A
Target Fabrication Facility TA-35-213	0.36 gm/yr	N/A
Plutonium Facility TA-55-PF-4 Machining Operation	2.99 gm/yr	2.99 gm/yr
Plutonium Facility TA-55-PF-4 Foundry Operation	$8.73X10^{-04}$ gm/yr	$8.73X10^{-04}$ gm/yr

Reporting Requirement

A707 D The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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

A800 External Combustion

A802 Emission Limits - External Combustion

Unit No.	NOx tpy	CO tpy	VOC tpy	SO_2 tpy	TSP tpy	PM_{10} tpy
All Boilers	80.0	80.0	50.0	50.0	50.0	50.0

Unit No.	NOx tpy	CO tpy	SO_2 tpy	TSP tpy	PM_{10} tpy	$PM_{2.5}$ tpy
CMRR-BHW-1 (gas)	2.9	4.8	0.3	0.4	0.4	0.4
CMRR-BHW-2 (gas)	2.9	4.8	0.3	0.4	0.4	0.4
CMRR-BHW-3 (gas)	2.9	4.8	0.3	0.4	0.4	0.4
CMRR-BHW-4 (gas)	2.9	4.8	0.3	0.4	0.4	0.4
CMRR Boilers (oil)	2.9	0.9	10.4	0.5	0.3	0.3
CMRR Boilers Total	14.5	20.1	11.6	2.1	1.9	1.9

Reporting Requirement

A807 B The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A802 A) (tons per year)
NOx	12.52	9.31	21.83	80
SO_2	0.08	0.06	0.14	50
TSP	1.01	0.75	1.76	50
PM-10	1.01	0.75	1.76	50
CO	10.07	7.41	17.48	80
VOCs	0.72	0.53	1.25	50
HAPs	0.24	0.18	0.42	No Source Limit

Note: The emissions shown in this table includes all exempt, non-exempt, metered, and non-metered boilers at LANL except for the TA-3-22 Power Plant boilers. The Power Plant boilers can be found under Section A1300 of this report.

Continued on the next page

A800 External Combustion - continued

CMRR Boilers Totals (Oil)	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A802 B) (tons per year)
NOx	0.000	0.000	0.000	2.9
SO_2	0.000	0.000	0.000	10.4
TSP	0.000	0.000	0.000	0.5
PM-10	0.000	0.000	0.000	0.3
PM-2.5	0.000	0.000	0.000	0.3
CO	0.000	0.000	0.000	0.9
VOCs	0.000	0.000	0.000	No Source Limit
HAPs	0.000	0.000	0.000	No Source Limit

Note: The CMRR boilers did not operate on fuel oil during 2014.

CMRR Boilers Totals (Gas and Oil)	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A802 B) (tons per year)
NOx	0.033	0.019	0.052	14.5
SO_2	0.001	0.000	0.001	11.6
TSP	0.005	0.003	0.008	2.1
PM-10	0.005	0.003	0.008	1.9
PM-2.5	0.005	0.003	0.008	1.9
CO	0.042	0.025	0.067	20.1
VOCs	0.028	0.017	0.045	No Source Limit
HAPs	0.002	0.001	0.003	No Source Limit

A1000 Degreasers

A1002 Emission Limits - Degreasers

Unit No.	VOC/HAPs tpy
TA-55-DG-1	-- [1]

1 The VOC emissions from this source category are included in the facility-wide allowable emissions limit established in Table 106.B: 200 tpy VOC, 8.0 tpy per individual HAP, and 24.0 tpy of combined total HAPs. Any VHAPs that are also defined as a VOC shall be included in the VOC total.

Reporting Requirement

A1007 A The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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 A1002 A) (tons per year)
VOCs	0.005	0.000	0.005	Source limits refer to facility-wide limits.
HAPs	0.005	0.000	0.005	

A1100 Internal Combustion- continued

Generator TA-33-G-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A1102 A) (tons per year)
NOx	0.006	0.001	0.007	0.21
SO_2	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	0.001	0.000	0.001	0.1
VOC	0.000	0.000	0.000	Not Required
HAPs	1.92E-06	3.38E-07	2.26E-06	No Source Limit

Note: The TA-33-G-3 generator only operated for a 16.7 hours in 2014.

Generator TA-33-G-4	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition A1102 A) (tons per year)
NOx	0.052	0.038	0.090	2.33
SO_2	0.004	0.003	0.007	0.16
TSP	0.004	0.003	0.007	Not Required
PM_{10}	0.004	0.003	0.007	Not Required
CO	0.011	0.008	0.019	1.4
VOC	0.004	0.003	0.007	0.2
HAPs	1.67E-05	1.22E-05	2.89E-05	No Source Limit

Note: The TA-33-G-4 generator only operated for 19.0 hours in 2014.

Stationary Standby Generators	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	1.49	1.95	3.44	No Source Specific Emission Limits for Standby Generators
SO_2	0.06	0.08	0.14	
TSP	0.08	0.10	0.18	
PM_{10}	0.08	0.10	0.18	
CO	0.34	0.44	0.78	
VOC	0.08	0.10	0.18	
HAPs	4.96E-04	5.70E-04	1.07E-03	

Note: Standby Generators are insignificant sources.

Generator CMRR-GEN-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	0.326	0.314	0.641	No Source Specific Emission Limits for the CMRR Generators
SO_2	0.006	0.005	0.011	
TSP	0.010	0.010	0.020	
PM_{10}	0.010	0.010	0.020	
CO	0.071	0.069	0.140	
VOC	0.010	0.010	0.020	
HAPs	5.94E-05	5.72E-05	1.17E-04	

Continued on the next page.

A1200 Data Disintegrator

A1202 Emission Limits - Data Disintegrator

Unit No.	TSP tpy	PM10 tpy
TA-52-11	9.9	9.9

Reporting Requirement

A1207 A The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

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 A1202 A) (tons per year)
TSP	0.04	0.03	0.07	9.9
PM10	0.04	0.03	0.07	9.9

A1400 Open Burning

A1402 Emission Limits - Open Burning

Unit No.	Individual HAP[1] (tpy)	Total HAPs[1] (tpy)
Facility-Wide Open Burning	8.0	24.0

1 Individual and Total HAPs emitted by Open Burning are included in facility-wide HAP emission limits at Table 106.B.

Reporting Requirement

A1407 A The permittee shall submit reports described in Section A109 and in accordance with B110.

A109 B A Semi-Annual Report of actual emissions from all permitted sources unless otherwise specified in this permit is due within 90 days following the end of every 6-month reporting period as defined at Condition A109.A. Emission estimates of criteria pollutants NOx, CO, SO2, VOC, TSP, PM10, and PM2.5 shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. Emission estimates shall not include Insignificant or Trivial Activities, except that facility-wide emissions from all natural gas combustion sources shall be estimated. The reports shall include a comparison of actual emissions that occured during the reporting period with the facility-wide allowable emission limits at Table 106.B.

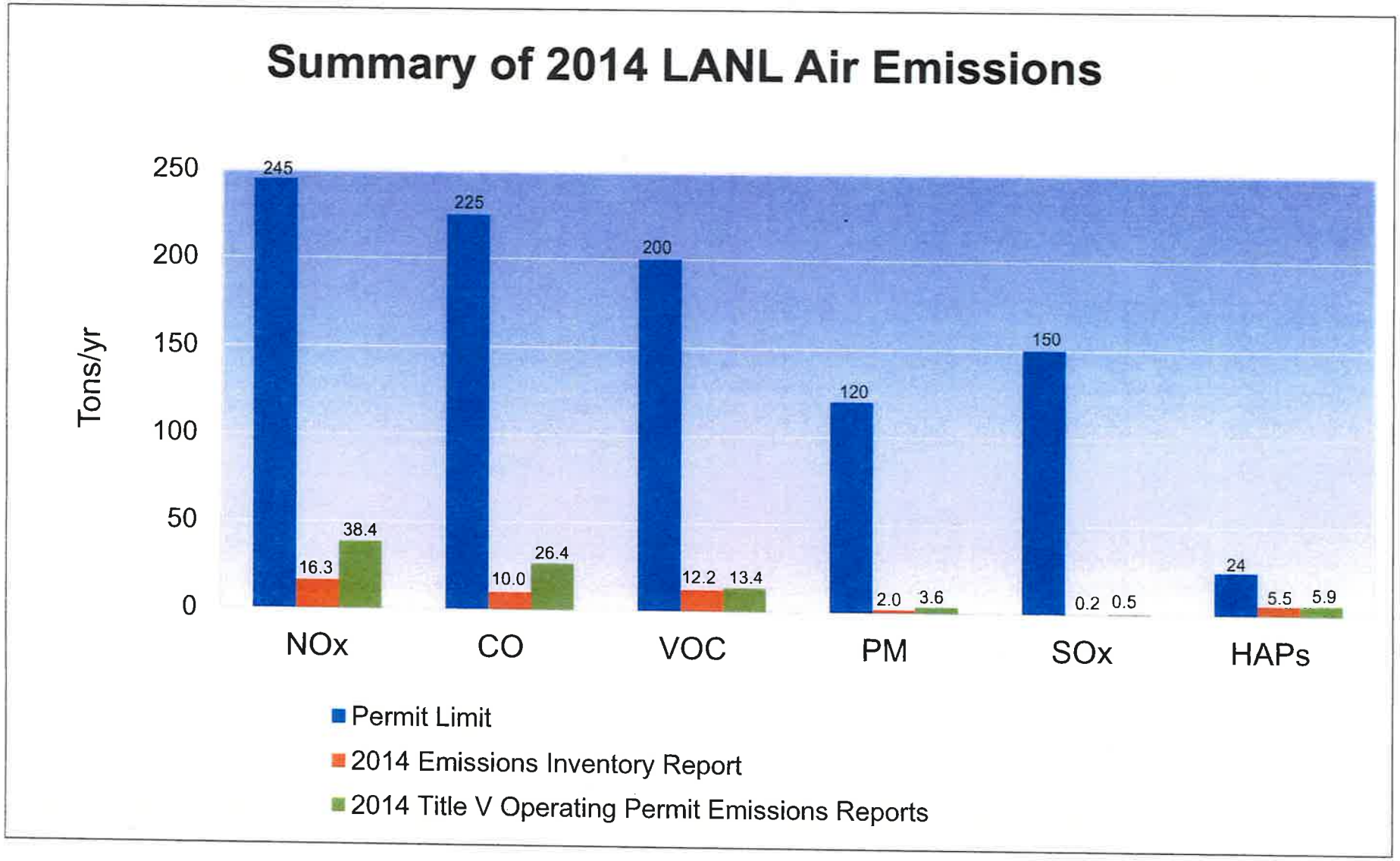
Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

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

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

Comments:

No open burning activities took place during 2014.


Summary of 2014 LANL Air Emissions
Tons/yr
250
200
150
100
50
0
245
16.3
38.4
225
10.0
26.4
200
12.2
13.4
120
2.0
3.6
150
0.2
0.5
24
5.5
5.9
NOx
CO
VOC
PM
SOx
HAPs
Permit Limit
2014 Emissions Inventory Report
2014 Title V Operating Permit Emissions Reports

10 Year Comparison of LANL Facility-Wide Emissions as Reported in 20.2.73 NMAC Emissions Inventory