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ENVIRONMENTAL HEALTH  
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Lovelace Respiratory Research Institute  
2425 Ridgecrest Drive SE  
Albuquerque, NM 87108-5127  
voice 505.348.9400  
fax 505.348.8567  
[www.LRRI.org](http://www.LRRI.org)



June 13, 2019

Air Quality Program (AQP)  
Environmental Health Department  
P.O. Box 1293  
Albuquerque, NM 87103  
Attention: Isreal Tavaréz, Air Quality Permitting

RE: Permit Modification Application – LRRI South Facility  
NAME: Lovelace Respiratory Research Institute  
PERMIT: 0917-M4

Dear Mr. Tavaréz

Enclosed is a permit application package to modify Construction Permit number 0917-M4 issued to Lovelace Respiratory Research Institute's (LRRI's) South Facility. The main purpose of this permit modification application is to remove the annual compliance testing requirement for 3 emergency generators, GS-004, GS-005, and GS-006, from the current Construction Permit #0917-M4. This was agreed upon during a settlement agreement meeting held on 23 May 2019 with Angelique Maldonado, Andrew Daffern and LRRI. Additionally, update the emission rates and emissions from the existing emission units at this facility.

LRRI's South Facility is located on a unique parcel of private land positioned deep inside of Kirtland Air Force Base (KAFB). The KAFB location address for the remote South Facility is Bldg. 9217, Area Y, Kirtland AFB-East, Albuquerque, NM 87115. LRRI's main mailing address is outside KAFB at 2425 Ridgecrest Drive SE, Albuquerque, New Mexico 87108. Please refer to the enclosed Google Earth aerial photos and UTM coordinates in the application for the precise South Facility location.

LRRI's South Facility has existed inside KAFB since 1964. All the significant boilers in this application is located in the main boiler room which is positioned near the middle of the South Facility campus. All three of the emergency generators are located inside of a separate emergency generator building located towards the northern middle of the South Facility campus. The thermal oxidizer is located on the roof of the main research building.

There are no additional emissions units mentioned in this application that are not in the existing Construction Permit #0917-M4. The vast majority of air emissions are from the comfort



heating boilers and emergency generators at the LRRI South Facility. The 3 emergency generators are only used for emergency purposes only (i.e. electrical power bump or loss). During electrical power failure, the emergency generators are in full operation up until the electrical power is restored. No air dispersion modeling was anticipated as being needed for this permit modification application. No air dispersion modeling has been required for any of the several previous LRRI South Facility Construction Permit number 0917 applications.

A \$3438.00 LRRI check submitted for the required 2019 AQP review fees is sufficient to cover the emissions between 25 to 50 tons per year which accommodates the proposed highest single pollutant (NO<sub>x</sub>).

### **EMISSIONS CALCULATIONS**

The emissions in the application are based primarily from the 2018 air emissions inventory. LRRI referred to a third party contractor, Trinity Consultants, who collected the data and created a table showing emissions for each piece of equipment shown in the application. The data was calculated against EPA AP-42 factors Section 3.4 Large Diesel Stationary Diesel for the emergency generator diesel engines all >600 hp, small boiler natural gas external combustion (primarily Tables 1.4-1 & 1.4-2) for all the boilers & thermal oxidizer, and GRI HAPCalc for natural gas HAPs emissions. All emissions are based on the total number of hours the equipment was operating in 2018.

Four out of the six boilers can be dual-fueled with backup ultra-low sulfur diesel (ULSD). It was assumed the weight percent of sulfur in distillate oil is 0.05% to calculate the SO<sub>2</sub> emission factor. EPA emission factors for distillate fuel (the most similar to #2 diesel) were used from AP-42 Table 1.3-1 to calculate SO<sub>x</sub>, NO<sub>x</sub>, CO and PM. To also be conservatively over-predictive on the uncontrolled emissions, the emissions was calculated under physical/operational limitations during an 8,760 hours per year. Since it is not physically possible to simultaneously burn both dual fuels at the heat input capacity of the boilers, the higher of the one individual fuel ton per year emission rates was used in the application. The Worst-Case Grand Totals of uncontrolled and controlled emission in the calculations include both the tons per year natural gas and diesel emission together.

### **MAINTENANCE TO EQUIPMENT**

The standard operating procedures (SOPs) ensure equipment listed in this application operate reliably when required. Servicing is performed to eliminate potential problems. If equipment is not operating properly, or power bump occurs; employees are instructed to notify Facilities by radio and/or phone, then submit a Facilities service request. LRRI Facilities or Central

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Engineering (CEM) maintains two SOPs for the equipment listed in the application. LRRRI SOP CEM-1668 Facility Steam Boiler / Hot Water Boiler Preventative Maintenance and CEM-1747 Servicing Standby Generators. Both SOPs address what to do for unscheduled maintenance.

To clarify any information submitted, please contact Carin Kelley at 505-348-9166 or by email at [ckelley@lrri.org](mailto:ckelley@lrri.org).

Respectfully,

A handwritten signature in black ink, appearing to read 'Dr. Robert Rubin'.

Dr. Robert Rubin (Authorized Representative)  
President/CEO/Sr. Scientist

Enclosures



# City of Albuquerque

## Environmental Health Department

### Air Quality Program



### Permit Application Checklist

Any person seeking a permit under 20.11.41 NMAC, Authority-to-Construct Permits, shall do so by filing a written application with the Department. Prior to ruling a submitted application complete each application submitted shall contain the required items listed below. **This checklist must be returned with the application.**

Applications that are ruled incomplete because of missing information will delay any determination or the issuance of the permit. The Department reserves the right to request additional relevant information prior to ruling the application complete in accordance with 20.11.41 NMAC.

All applicants shall:

1.  Fill out and submit the *Pre-permit Application Meeting Request* form
  - a.  Attach a copy to this application
  
2.  Attend the pre-permit application meeting
  - a.  Attach a copy of the completed *Pre-permit Application Meeting Checklist* to this application
  
3.  Provide public notice to the appropriate parties
  - a.  Attach a copy of the completed *Notice of Intent to Construct* form to this form
    - i. Neighborhood Association(s): *Within a half mile radius of LRRRI South Facility there are no neighbor association(s) besides Isleta Pueblo. Permitting Division to notify Isleta Pueblo.*
    - ii. Coalition(s): *Same as above*
  - b.  Attach a copy of the completed *Public Sign Notice Guideline* form
  
4. Fill out and submit the *Permit Application*. All applications shall:
  - A.  be made on a form provided by the Department. Additional text, tables, calculations or clarifying information may also be attached to the form.
  - B.  at the time of application, include documentary proof that all applicable permit application review fees have been paid as required by 20 NMAC 11.02. Please refer to the attached permit application worksheet.
  - C.  contain the applicant's name, address, and the names and addresses of all other owners or operators of the emission sources.

- D. X contain the name, address, and phone number of a person to contact regarding questions about the facility.
- E. X indicate the date the application was completed and submitted
- F. X contain the company name, which identifies this particular site.
- G. X contain a written description of the facility and/or modification including all operations affecting air emissions.
- H. X contain the maximum and standard operating schedules for the source after completion of construction or modification in terms of hours per day, days per week, and weeks per year.
- I. X provide sufficient information to describe the quantities and nature of any regulated air contaminant (including any amount of a hazardous air pollutant) that the source will emit during:
- Normal operation
  - Maximum operation
  - Abnormal emissions from malfunction, start-up and shutdown
- J. X include anticipated operational needs to allow for reasonable operational scenarios to avoid delays from needing additional permitting in the future.
- K. X contain a map, such as a 7.5-minute USGS topographic quadrangle, showing the exact location of the source; and include physical address of the proposed source.
- L. X contain an aerial photograph showing the proposed location of each process equipment unit involved in the proposed construction, modification, relocation, or technical revision of the source except for federal agencies or departments involved in national defense or national security as confirmed and agreed to by the department in writing.
- M. X contain the UTM zone and UTM coordinates.
- N. X include the four digit Standard Industrialized Code (SIC) and the North American Industrial Classification System (NAICS).
- O. X contain the types and **potential emission rate** amounts of any regulated air contaminants the new source or modification will emit. Complete appropriate sections of the application; attachments can be used to supplement the application, but not replace it.
- P. X contain the types and **controlled** amounts of any regulated air contaminants the new source or modification will emit. Complete appropriate sections of the application; attachments can be used to supplement the application, but not replace it.

- Q. X contain the basis or source for each emission rate (include the manufacturer's specification sheets, AP-42 Section sheets, test data, or other data when used as the source).  
*Referred to 2018 emissions data for emergency generators, boilers, steam boilers, and thermal oxidizer. AP-42 emissions factors were considered.*
- R. X contain all calculations used to estimate **potential emission rate** and **controlled** emissions.
- S. X contain the basis for the estimated control efficiencies and sufficient engineering data for verification of the control equipment operation, including if necessary, design drawings, test reports, and factors which affect the normal operation (e.g. limits to normal operation).
- T. X contain fuel data for each existing and/or proposed piece of fuel burning equipment.  
*Pipeline quality natural gas and ultra-low sulfur diesel for boiler backup fuel and for emergency generators.*
- U. N/A contain the anticipated maximum production capacity of the entire facility and the requested production capacity after construction and/or modification.  
*Research facility.*
- V. X contain the stack and exhaust gas parameters for all existing and proposed emission stacks.
- W. N/A provide an ambient impact analysis using a atmospheric dispersion model approved by the US Environmental Protection Agency (EPA), and the Department to demonstrate compliance with the ambient air quality standards for the City of Albuquerque and Bernalillo County (See 20.11.01 NMAC). If you are modifying an existing source, the modeling must include the emissions of the entire source to demonstrate the impact the new or modified source(s) will have on existing plant emissions.  
*Modeling is not anticipated since emission sources are primarily pipeline natural gas-fired comfort heating boilers and diesel emergency generators.*
- X. X contain a preliminary operational plan defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown.
- Y. N/A contain a process flow sheet, including a material balance, of all components of the facility that would be involved in routine operations. Indicate all emission points, including fugitive points.  
*Backup emergency generators, boilers and thermal oxidizer are all simple processes.*
- Z. N/A contain a full description, including all calculations and the basis for all control efficiencies presented, of the equipment to be used for air pollution control. This shall include a process flow sheet or, if the Department so requires, layout and assembly drawings, design plans, test reports and factors which affect the normal equipment operation, including control and/or process equipment operating limitations.

- AA. N/A contain description of the equipment or methods proposed by the applicant to be used for emission measurement.  
*LRRRI has submitted emissions inventory and performed compliance testing on emergency generators per previous and current LRRRI South Facility Construction Permit number 0917 applications.*
- BB. X be signed under oath or affirmation by a corporate officer, authorized to bind the company into legal agreements, certifying to the best of his or her knowledge the truth of all information submitted.



# Pre-Permit Application Meeting Request Form

## Air Quality Program- Environmental Health Department

Please complete appropriate boxes and email to [aqd@cabq.gov](mailto:aqd@cabq.gov) or mail to:

Environmental Health Department  
 Air Quality Program  
 P.O. Box 1293  
 Room 3047  
 Albuquerque, NM 87103

<b>Name:</b>	<b>Carin Kelley</b>
<b>Company/Organization:</b>	Lovelace Respiratory Research Institute (LRRI)
<b>Point of Contact:</b> <b>(phone number and email):</b> <b>Preferred form of contact (circle one):</b> Phone            E-mail	Phone: 505-348-9166  Email: <a href="mailto:ckelley@lrri.org">ckelley@lrri.org</a>
<b>Preferred meeting date/times:</b>	Thursday, 06Jun2019 at 3:00pm
<b>Description of Project:</b>	Review air quality permit and discuss permit modifications according to settlement agreement. LRRI's current Air Quality Construction permit, #0917-M4, at the South Facility location, Bldg 9217, Area Y Kirtland AFB-East Albuquerque, NM 87115

City of Albuquerque- Environmental Health Department  
 Air Quality Program- Permitting Section  
 Phone: (505) 768-1972            Email: [aqd@cabq.gov](mailto:aqd@cabq.gov)





# Pre-Permit Application Meeting Request Form

## Air Quality Program- Environmental Health Department

Please complete appropriate boxes and email to [agd@cabq.gov](mailto:agd@cabq.gov) or mail to:

Environmental Health Department  
 Air Quality Program  
 P.O. Box 1293  
 Room 3047  
 Albuquerque, NM 87103

<b>Name:</b>	<b>Carin Kelley</b>
<b>Company/Organization:</b>	Lovelace Respiratory Research Institute (LRRI)
<b>Point of Contact:</b> <b>(phone number and email):</b> <b>Preferred form of contact (circle one):</b> Phone      E-mail	Phone: 505-348-9166  Email: <a href="mailto:ckelley@lrri.org">ckelley@lrri.org</a>
<b>Preferred meeting date/times:</b>	Friday, 14Jun2019 at 9:00am
<b>Description of Project:</b>	Review if two generators are considered "reconstructed" and subject to NSPS IIII requirements.  LRRI's current Air Quality Construction permit, #0917-M4, at the South Facility location, Bldg 9217, Area Y Kirtland AFB-East Albuquerque, NM 87115

City of Albuquerque- Environmental Health Department  
 Air Quality Program- Permitting Section  
 Phone: (505) 768-1972      Email: [agd@cabq.gov](mailto:agd@cabq.gov)



# Notice of Intent to Construct

Under 20.11.41.13B NMAC, the owner/operator is required to *provide public notice by certified mail or electronic mail to the designated representative(s) of the recognized neighborhood associations and recognized coalitions that are within one-half mile of the exterior boundaries of the property on which the source is or is proposed to be located* if they propose to construct or establish a new facility or make modifications to an existing facility that is subject to 20.11.41 NMAC – Construction Permits. **A copy of this form must be included with the application.**

Applicant's Name and Address: Lovelace Respiratory Research Institute (LRRI)

Owner / Operator's Name and Address: 2425 Ridgecrest Drive SE, Albuquerque, New Mexico 87108

Actual or Estimated Date the Application will be submitted to the Department: 14 Jun 2019

Exact Location of the Source or Proposed Source: LRRI South Facility, Bldg. 9217, Area Y Kirtland AFB-East, Albuquerque, NM 87115

Description of the Source: Three (3) emergency generators, six (6) boilers including four (4) dual-fuel, and one (1) thermal oxidizer.

Nature of the Business: Research especially respiratory health related.

Process or Change for which the permit is requested: Update emission rates and remove compliance testing requirements for Generators; GS-004, GS-005, and GS-006.

Preliminary Estimate of the Maximum Quantities of each regulated air contaminant the source will emit:

### Net Changes In Emissions

#### Initial Construction Permit

(Only for permit Modifications or Technical Revisions)

	Pounds Per Hour (lbs/hr)	Tons Per Year (tpy)
CO	39.2	28.8
NOx	115	51.2
NOx + NMHC	--	--
VOC	3.38	2.13
SO <sub>2</sub>	13.0	1.21
TSP	3.52	2.66
PM10	3.52	2.66
PM2.5	1.76	1.33
VHAP	--	--

	lbs/hr	tpy	Estimated Total TPY
CO	-12.1	-4.1	24.7
NOx	+2.4	-1.2	50.0
NOx + NMHC	--	--	--
VOC	-0.08	-0.03	2.1
SO <sub>2</sub>	-11.6	+2.09	3.3
TSP	+0.18	-0.46	2.2
PM10	+0.18	-0.46	2.2
PM2.5	+1.94	+0.87	2.2
VHAP	+0.13	+1.2	1.2

Last Revised 10/25/2018

City of Albuquerque- Environmental Health Department  
Air Quality Program- Permitting Division  
Phone: (505) 768-1972 Email: aqd@cabq.gov

Maximum Operating Schedule: If there is a power bump or loss of power on Kirtland AFB, then all 3 emergency generators up to 500 hrs/yr. 4 boilers can burn up to 7,560 gallons/yr of backup diesel and the thermal oxidizer up to 2,000 hrs/yr.

Normal Operating Schedule: If there are no power bumps or loss of power on Kirtland AFB, then normal operating schedule as shown as the estimated total ton per year.

Current Contact Information for Comments and Inquires:

Name: Carin Kelley, EHS Manager

Address: 2425 Ridgecrest Drive SE, Albuquerque, New Mexico 87108

Phone Number: 505-348-9166

E-Mail Address: ckelley@lrri.org

If you have any comments about the construction or operation of the above facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to the address below:

Environmental Health Manager

Permitting Division

Albuquerque Environmental Health Department

Air Quality Program

PO Box 1293

Albuquerque, New Mexico 87103

(505) 768-1972

Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, as used in this notice or send a copy of this notice along with your comments, since the Department may not have received the permit application at the time of this notice. Please include a legible mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, if required, the Department's notice will be published on the City of Albuquerque's website, <https://www.cabq.gov/airquality/air-quality-permits> and mailed to neighborhood associations and neighborhood coalitions near the facility location or near the facility proposed location.

Last Revised 10/25/2018

City of Albuquerque- Environmental Health Department

Air Quality Program- Permitting Division

Phone: (505) 768-1972

Email: aqd@cabq.gov



# City of Albuquerque

## Environmental Health Department

### Air Quality Program



### Public Notice Sign Guidelines

Any person seeking a permit under 20.11.41 NMAC, Authority-to-Construct Permits, shall do so by filing a written application with the Department. *Prior to submitting an application, the applicant shall post and maintain a weather-proof sign provided by the department. The applicant shall keep the sign posted until the department takes final action on the permit application; if an applicant can establish to the department's satisfaction that the applicant is prohibited by law from posting, at either location required, the department may waive the posting requirement and may impose different notification requirements. A copy of this form must be submitted with your application.*

Applications that are ruled incomplete because of missing information will delay any determination or the issuance of the permit. The Department reserves the right to request additional relevant information prior to ruling the application complete in accordance with 20.11.41 NMAC.

Name: Lovelace Respiratory Research Institute, South Facility, Bldg 9217, Area Y Kirtland AFB-East, Albuquerque, NM 87115

Contact: Carin Kelley

Company/Business: Lovelace Respiratory Research Institute

The sign must be posted at the more visible of either the proposed or existing facility entrance (or, if approved in advance and in writing by the department, at another location on the property that is accessible to the public)

The sign shall be installed and maintained in a condition such that members of the public can easily view, access, and read the sign at all times.

The lower edge of the sign board should be mounted a minimum of 2' above the existing ground surface to facilitate ease of viewing

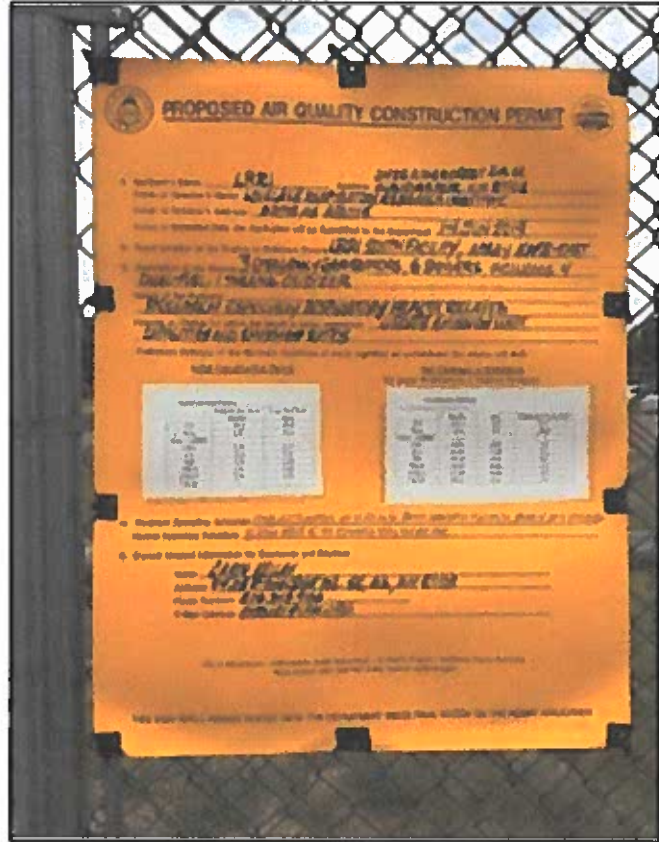
Attach a picture of the completed, properly posted sign to this document

Check here if the department has waived the sign posting requirement.

Alternative public notice details:

**Public Notice Sign – Corrected with AE Data**

Photos of properly posted sign at the entrance of LRR South Facility – east gate. Information is according to the Notice of Intent to Construct form. Corrections are included to the Emissions Data.





**Albuquerque Environmental Health Department - Air Quality Program**

Please mail this application to P.O. Box 1293, Albuquerque, NM 87103  
or hand deliver between 8:00am - 5:00pm Monday - Friday to:  
3rd Floor, Suite 3023 - One Civic Plaza NW, Albuquerque, New Mexico 87103  
(505) 768 - 1972 aqd@cabq.gov (505) 768 - 1977 (Fax)



**Application for Air Pollutant Sources in Bernalillo County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

Clearly handwrite or type

Corporate Information

Submittal Date: 06/14/2019

- 1. Company Name: Lovelace Respiratory Research Institute \_\_\_\_\_
- 2. Street Address: 2425 Ridgecrest Drive SE \_\_\_\_\_ Zip: 87108
- 3. Company City: Albuquerque \_\_\_\_\_ 4. Company State: NM \_\_\_\_\_ 5. Company Phone: 505-348-9400 \_\_\_\_\_ 6. Company Fax: 505-348-9702 \_\_\_\_\_
- 7. Company Mailing Address: same as above \_\_\_\_\_ Zip: 87108 \_\_\_\_\_
- 8. Company Contact and Title: Carin Kelley, EHS Manager \_\_\_\_\_ 9. Phone: 505-348-9166 \_\_\_\_\_
- 10. E-mail: ckelley@lrri.org \_\_\_\_\_

**Stationary Source (Facility) Information: [Provide a plot plan (legal description/drawing of facility property) with overlay sketch of facility processes; Location of emission points; Pollutant type and distances to property boundaries]**

- 1. Facility Name: Lovelace Respiratory Research Institute \_\_\_\_\_ 2. Street Address: Bldg 9217 , Area Y Kirtland AFB-East \_\_\_\_\_
- 3. City: Albuquerque \_\_\_\_\_ 4. State: NM \_\_\_\_\_ 5. Facility Phone (505) 348-9600 \_\_\_\_\_ 6. Facility Fax (505) 348-9702 \_\_\_\_\_
- 7. Facility Mailing Address (Local): 2425 Ridgecrest Drive SE \_\_\_\_\_ Zip: 87108 \_\_\_\_\_
- 8. Latitude - Longitude or UTM Coordinates of Facility: UTM Zone 13S, 363101.91 mE, 3,868,505.50 mN \_\_\_\_\_
- 9. Facility Contact and Title: Carin Kelley, EHS Manager \_\_\_\_\_ 10. Phone: 505-348-9166 \_\_\_\_\_ 11. E-mail: ckelley@lrri.org \_\_\_\_\_

**General Operation Information (if any further information request does not pertain to your facility, write N/A on the line or in the box)**

- 1. Facility Type (description of your facility operations): Research, esp. respiratory health related \_\_\_\_\_
- 2. Standard Industrial Classification (SIC 4 digit #): 8733 \_\_\_\_\_
- 3. North American Industry Classification System (NAICS Code #): 541710 \_\_\_\_\_
- 4. Is facility currently operating in Bernalillo County. Yes \_\_\_\_\_ If yes, date of original construction 01 / 01 / 1964 \_\_\_\_\_  
If no, planned startup is  / /  \_\_\_\_\_
- 5. Is facility permanent Yes \_\_\_\_\_ If no, give dates for requested temporary operation - from  / /  through  / /  \_\_\_\_\_
- 6. Is facility process equipment new No \_\_\_\_\_ If no, give actual or estimated manufacture or installation dates in the Process Equipment Table.
- 7. Is application for a modification, expansion, or reconstruction (altering process, or adding, or replacing process equipment, etc.) to an existing facility which will result in a change in emissions No \_\_\_\_\_. If yes, give the manufacture date of modified, added, or replacement equipment in the Process Equipment Table modification date column, or the operation changes to existing process/equipment which cause an emission increase.
- 8. Is facility operation (circle one) Continuous Intermittent Batch]

9. Estimated % of production Jan-Mar 25% Apr-Jun 25% Jul-Sep 25% Oct-Dec 25%

10. Current or requested operating times of facility 24 hrs/day 7 days/wk 52 wks/mo 24 mos/yr

11. Business hrs 8:00 am to 5:00 pm

12. Will there be special or seasonal operating times other than shown above No If yes, explain N/A

13. Raw materials processed N/A - Research

14. Saleable item(s) produced N/A - Research

15. Permitting Action Being Requested

New Permit  Permit Modification  Technical Permit Revision  Administrative Permit Revision  
Current Permit #: 0917-M4 Current Permit #: \_\_\_\_\_ Current Permit #: \_\_\_\_\_

**Application for Air Pollutant Sources in Bernardo County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**PROCESS EQUIPMENT TABLE**

**(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).**

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp,kW;Btu;ft <sup>3</sup> ;lbs; tons;yd <sup>3</sup> ;etc.)	Fuel Type
Example 1. Generator	Unigen	B-2500	A56732195C-222	7/96	7/97	N/A	250 Hp - HR. YR.	Diesel
Example 2. Spray Gun	HVLP Systems	Spra -N-Stay 1100	k26-56-95	01/97	11/97	N/A	0.25 gal. - HR. YR.	Electric Compressor
1. GS-004 Emergency Generator	Cummins	KTA-2300-GS	33101785	1/1979	4/4/1980	NA	1,211 hp	Diesel
2. GS-005 Emergency Generator	Cummins	KTA-2300-GS	33100903	6/1977	4/4/1980	N/A	1,211 hp	Diesel
3. GS-006 Emergency Generator	Catepillar	3516-STD	25Z01465	12/16/1988	~1989	N/A	2,307 hp	Diesel
4. BH-003 Boiler	Continental	13799	F9C150LWB-6024-3436	1968	1968	N/A	8.0 MMBtu/hr	Natural Gas
5. BH-005 Boiler	Kewanee	L3W-350-GO2-LE	KF16.1GO-150/AJ4708 6-2	1997	1997	N/A	14.645 MMBtu/hr	Natural Gas
6. BS-005 Steam Boiler	Sellers	SY-125-S	103344A	11/21/2005	8/2005	N/A	5.2 MMBtu/hr	Natural Gas Diesel
7. BS-006 Steam Boiler	Sellers	SY-125-S	103344B	11/21/2005	8/2005	N/A	5.2 MMBtu/hr	Natural Gas Diesel
8. BS-007 Steam Boiler	Sellers	SY-150-S	104097	5/11/2009	2010	N/A	6.277 MMBtu/hr	Natural Gas Diesel
9. BH-009 Steam Boiler	Hurst	1200511	S1250-125W-8	2012	2012	N/A	10 MMBtu/hr	Natural Gas Diesel
10. Thermal Oxidizer	Moco	none	6571-T100	1990	1990	N/A	2.0 MMBtu/hr	Natural Gas

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.). Submit information for each unit as an attachment  
*Field observation*

**NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)**



**Application for Air Pollutant Sources in Bernardo County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**TABLE EXEMPTED SOURCES AND EXEMPTED ACTIVITIES**

**(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).**

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp;kW;Btu;ft <sup>3</sup> ;lbs; tons;yd <sup>3</sup> ;etc.)	Fuel Type
Example 1. Generator	Unigen	B-2500	A56732195C-222	7/96	7/97	N/A	250 Hp - HR. <del>YR.</del>	Diesel
Example 2. Spray Gun	HVLP Systems	Spra -N- Stay 1100	k26-56-95	01/97	11/97	N/A	0.25 gal. - HR. <del>YR.</del>	Electric Compressor
1. N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A HR. YR.	

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.) Submit information for each unit as an attachment *Field Observation*.

**NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)**

**Application for Air Pollutant Sources in Bernardo County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES**

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOCs)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
<b>Example</b>	1. 9.1 lbs/hr	27.7 lbs/hr	1.3 lbs/hr	0.5 lbs/hr	2.0 lbs/hr	AP-42
<b>1. Generator</b>	1a. 39.9 tons/yr	121.3 tons/yr	5.7 tons/yr	2.2 tons/yr	8.8 tons/yr	
<b>1. GS-004 Emergency Generator (Diesel)</b>	1. 6.7 lbs/hr	29.2 lbs/hr	0.85 lbs/hr	0.015 lbs/hr	0.85 lbs/hr	AP-42 Table 3.4-1, Diesel Fuel
	1a. 29.3 tons/yr	127.5 tons/yr	3.7 tons/yr	0.066 tons/yr	3.7 tons/yr	
<b>2. GS-005 Emergency Generator (Diesel)</b>	2. 6.7 lbs/hr	29.2 lbs/hr	0.85 lbs/hr	0.015 lbs/hr	0.85 lbs/hr	AP-42 Table 3.4-1, Diesel Fuel
	2a. 29.3 tons/yr	127.5 tons/yr	3.7 tons/yr	0.066 tons/yr	3.7 tons/yr	
<b>3. GS-006 Emergency Generator (Diesel)</b>	3. 12.7 lbs/hr	55.4 lbs/hr	1.63 lbs/hr	0.028 lbs/hr	1.61 lbs/hr	AP-42 Table 3.4-1, Diesel Fuel
	3a. 55.6 tons/yr	242.7 tons/yr	7.1 tons/yr	0.12 tons/yr	7.1 tons/yr	
<b>4. BH-003 Boiler (Natural Gas)</b>	4. 0.66 lbs/hr	0.78 lbs/hr	0.043 lbs/hr	0.11 lbs/hr	0.06 lbs/hr	AP-42
	4a. 2.9 tons/yr	3.4 tons/yr	0.19 tons/yr	0.5 tons/yr	0.26 tons/yr	
<b>5. BH-005 Boiler (Natural Gas)</b>	5. 1.21 lbs/hr	1.44 lbs/hr	0.079 lbs/hr	0.21 lbs/hr	0.11 lbs/hr	AP-42
	5a. 5.3 tons/yr	6.3 tons/yr	0.35 tons/yr	0.92 tons/yr	0.48 tons/yr	
<b>6. BS-005 Steam Boiler (Natural Gas)</b>	6. 0.43 lbs/hr	0.51 lbs/hr	0.028 lbs/hr	0.074 lbs/hr	0.039 lbs/hr	AP-42
	6a. 1.9 tons/yr	2.2 tons/yr	0.12 tons/yr	0.32 tons/yr	0.17 tons/yr	
<b>6. BS-005 Steam Boiler (Diesel)</b>	6. 0.19 lbs/hr	0.75 lbs/hr	0.013 lbs/hr	0.27 lbs/hr	0.075 lbs/hr	AP-42 Table 3.4-1, Diesel Fuel
	6a. 0.019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr	
<b>7. BS-006 Steam Boiler (Natural Gas)</b>	7. 0.43 lbs/hr	0.51 lbs/hr	0.028 lbs/hr	0.074 lbs/hr	0.039 lbs/hr	AP-42
	7a. 1.9 tons/yr	2.2 tons/yr	0.12 tons/yr	0.32 tons/yr	0.17 tons/yr	
<b>7. BS-006 Steam Boiler (Diesel)</b>	7. 0.19 lbs/hr	0.75 lbs/hr	0.013 lbs/hr	0.27 lbs/hr	0.075 lbs/hr	AP-42 Table 3.4-1, Diesel Fuel
	7a. 0.0019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr	
<b>8. BS-007 Steam Boiler (Natural Gas)</b>	8. 0.52 lbs/hr	0.62 lbs/hr	0.034 lbs/hr	0.09 lbs/hr	0.047 lbs/hr	AP-42
	8a. 2.3 tons/yr	2.7 tons/yr	0.15 tons/yr	0.39 tons/yr	0.21 tons/yr	
<b>8. BS-007 Steam Boiler (Diesel)</b>	8. 0.23 lbs/hr	0.9 lbs/hr	0.015 lbs/hr	0.32 lbs/hr	0.09 lbs/hr	AP-42 Table 3.4-1, Diesel Fuel
	8a. 0.0019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr	
<b>9. BH-009 Steam Boiler (Natural Gas)</b>	9. 0.82 lbs/hr	0.98 lbs/hr	0.054 lbs/hr	0.14 lbs/hr	0.075 lbs/hr	AP-42
	9a. 3.6 tons/yr	4.3 tons/yr	0.24 tons/yr	0.61 tons/yr	0.33 tons/yr	
<b>9. BH-009 Steam Boiler (Diesel)</b>	9. 0.36 lbs/hr	1.44 lbs/hr	0.024 lbs/hr	0.51 lbs/hr	0.14 lbs/hr	AP-42 Table 3.4-1, Diesel Fuel
	9a. 0.0019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr	
<b>10. Thermal Oxidizer (Natural Gas)</b>	9. 0.16 lbs/hr	0.2 lbs/hr	0.011 lbs/hr	0.029 lbs/hr	0.015 lbs/hr	AP-42
	9a. 0.7 tons/yr	0.88 tons/yr	0.048 tons/yr	0.13 tons/yr	0.07 tons/yr	
<b>Sub-Total: Natural Gas</b>	4.2 lbs/hr	5.0 lbs/hr	0.28 lbs/hr	0.73 lbs/hr	0.39 lbs/hr	
	18.5 tons/yr	22.1 tons/yr	1.2 tons/yr	3.2 tons/yr	1.7 tons/yr	
<b>Sub-Total: Diesel</b>	27.07 lbs/hr	117.44 lbs/hr	3.40 lbs/hr	1.4 lbs/hr	3.7 lbs/hr	
	118.6 tons/yr	514.4 tons/yr	14.9 tons/yr	6.3 tons/yr	16.2 tons/yr	
<b>Worse-Case Grand Total</b>	(Use Diesel) N/A lbs/hr	N/A lbs/hr	N/A lbs/hr	N/A lbs/hr	N/A lbs/hr	
	137.1 tons/yr	536.5 tons/yr	16.1 tons/yr	9.4 tons/yr	17.8 tons/yr	

Note: Since both dual fuels in boilers cannot be burned simultaneously at full load, the worst case lb/hr emissions are not additive. Worst-case tpy emissions from dual fuels could be at least partially additive, so we have added those for use in the application.

\* If any one (1) of these process units, or combination of units, has an uncontrolled emission greater than ( $>$ ) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)

\* If all of these process units, individually and in combination, have an uncontrolled emission less than or equal to ( $\leq$ ) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but  $> 1$  ton/yr for any of the above pollutants - then a source registration is required.

If your facility does not require a registration or permit, based on above emissions, complete the remainder of this application to determine if a registration or permit would be required for Toxic or Hazardous air pollutants used at your facility.

**Application for Air Pollutant Sources in Bernardo County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES**

**(Based on current operations with emission controls OR requested operations with emission controls)**

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOCs)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
Example 1. Generator	1. 9.1 lbs/hr	27.7 lbs/hr	1.3 lbs/hr	0.5 lbs/hr	2.0 lbs/hr	Operating Hours	N/A
	1a. 18.2 tons/yr	55.4 tons/yr	2.6 tons/yr	1.0 tons/yr	4.0 tons/yr		
1. GS-004 Emergency Generator (Diesel)	1. 6.7 lbs/hr	29.1 lbs/hr	0.85 lbs/hr	0.015 lbs/hr	0.85 lbs/hr	Operating Hours	N/A
	1a. 1.7 tons/yr	7.3 tons/yr	0.23 tons/yr	0.13 tons/yr	0.21 tons/yr		
2. GS-005 Emergency Generator (Diesel)	2. 6.7 lbs/hr	29.1 lbs/hr	0.85 lbs/hr	0.015 lbs/hr	0.85 lbs/hr	Operating Hours	N/A
	2a. 1.7 tons/yr	7.3 tons/yr	0.23 tons/yr	0.13 tons/yr	0.21 tons/yr		
3. GS-006 Emergency Generator (Diesel)	3. 12.7 lbs/hr	55.4 lbs/hr	1.6 lbs/hr	0.028 lbs/hr	1.6 lbs/hr	Operating Hours	N/A
	3a. 3.2 tons/yr	13.8 tons/yr	0.41 tons/yr	0.007 tons/yr	0.40 tons/yr		
4. BH-003 Boiler (Natural Gas)	4. 0.66 lbs/hr	0.78 lbs/hr	0.043 lbs/hr	0.11 lbs/hr	0.06 lbs/hr	Operating Hours	N/A
	4a. 2.9 tons/yr	3.4 tons/yr	0.19 tons/yr	0.50 tons/yr	0.26 tons/yr		
5. BH-005 Boiler (Natural Gas)	5. 1.2 lbs/hr	1.4 lbs/hr	0.079 lbs/hr	0.21 lbs/hr	0.11 lbs/hr	Operating Hours	N/A
	5a. 5.3 tons/yr	6.3 tons/yr	0.35 tons/yr	0.92 tons/yr	0.48 tons/yr		
6. BS-005 Steam Boiler (Natural Gas)	6. 0.43 lbs/hr	0.51 lbs/hr	0.028 lbs/hr	0.074 lbs/hr	0.039 lbs/hr	Operating Hours	N/A
	6a. 1.9 tons/yr	2.2 tons/yr	0.12 tons/yr	0.33 tons/yr	0.17 tons/yr		
6. BS-005 Steam Boiler (Diesel)	6. 0.19 lbs/hr	0.75 lbs/hr	0.013 lbs/hr	0.27 lbs/hr	0.075 lbs/hr	Operating Hours	N/A
	6a. 0.019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr		
7. BS-006 Steam Boiler (Natural Gas)	7. 0.43 lbs/hr	0.51 lbs/hr	0.028 lbs/hr	0.074 lbs/hr	0.039 lbs/hr	Operating Hours	N/A
	7a. 1.9 tons/yr	2.2 tons/yr	0.12 tons/yr	0.33 tons/yr	0.17 tons/yr		
7. BS-006 Steam Boiler (Diesel)	7. 0.19 lbs/hr	0.75 lbs/hr	0.013 lbs/hr	0.27 lbs/hr	0.075 lbs/hr	Operating Hours	N/A
	7a. 0.019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr		
8. BS-007 Steam Boiler (Natural Gas)	8. 0.52 lbs/hr	0.62 lbs/hr	0.034 lbs/hr	0.09 lbs/hr	0.047 lbs/hr	Operating Hours	N/A
	8a. 2.3 tons/yr	2.7 tons/yr	0.15 tons/yr	0.39 tons/yr	0.20 tons/yr		
8. BS-007 Steam Boiler (Diesel)	8. 0.23 lbs/hr	0.90 lbs/hr	0.015 lbs/hr	0.32 lbs/hr	0.09 lbs/hr	Operating Hours	N/A
	8a. 0.019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr		
9. BH-009 Steam Boiler (Natural Gas)	9. 0.82 lbs/hr	0.98 lbs/hr	0.054 lbs/hr	0.14 lbs/hr	0.075 lbs/hr	Operating Hours	N/A
	9a. 3.6 tons/yr	4.3 tons/yr	0.24 tons/yr	0.63 tons/yr	0.33 tons/yr		
9. BH-009 Steam Boiler (Diesel)	9. 0.36 lbs/hr	1.4 lbs/hr	0.024 lbs/hr	0.51 lbs/hr	0.14 lbs/hr	Operating Hours	N/A
	9a. 0.019 tons/yr	0.076 tons/yr	0.0013 tons/yr	0.027 tons/yr	0.0076 tons/yr		
10. Thermal Oxidizer (Natural Gas)	10. 0.16 lbs/hr	0.20 lbs/hr	0.011 lbs/hr	0.029 lbs/hr	0.015 lbs/hr	Operating Hours	N/A
	10a. 0.16 tons/yr	0.20 tons/yr	0.011 tons/yr	0.029 tons/yr	0.015 tons/yr		
Sub-Total: Natural Gas	4.22 lbs/hr	5.00 lbs/hr	0.28 lbs/hr	0.73 lbs/hr	0.39 lbs/hr		
	18.1 tons/yr	21.3 tons/yr	1.18 tons/yr	3.13 tons/yr	1.37 tons/yr		

Sub-Total: Diesel	27.1 lbs/hr	117.4 lbs/hr	3.3 lbs/hr	1.4 lbs/hr	3.7 lbs/hr		
	6.6 tons/yr	28.7 tons/yr	0.88 tons/yr	0.15 tons/yr	0.87 tons/yr		
Worst Case	(Use Diesel) N/A lbs/hr	N/A lbs/hr	N/A lbs/hr	N/A lbs/hr	N/A lbs/hr		
Grand Total	24.7 tons/yr	50.0 tons/yr	2.1 tons/yr	3.3 tons/yr	2.2 tons/yr		

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.). Submit information for each unit as an attachment. *Field Observation and operating limits inherent to emergency generators.*

2. Explain and give estimated amounts of any Fugitive Emission associated with facility processes: *This process does not have fugitive emissions.*

*Since both dual fuels in boilers cannot be burned simultaneously at full load, the worst case lb/hr emissions are not additive. Worst-case tpy emissions from dual fuels could be at least partially additive, so we have added those for use in the application.*

**NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)**

### **CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES**

**(Based on current operations with emission controls OR requested operations with emission controls)**

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Hazardous Air Pollutant					Control Method	% Efficiency
Example 1. Generator	1. 9.1 lbs/hr					Operating Hours	N/A
	1a. 18.2 tons/yr						
1. GS-004 Emergency Generator (Diesel)	1. 0.012 lbs/hr					Operating Hours	N/A
	1a. 0.0029 tons/yr						
2. GS-005 Emergency Generator (Diesel)	2. 0.012 lbs/hr					Operating Hours	N/A
	2a. 0.0029 tons/yr						
3. GS-006 Emergency Generator (Diesel)	3. 0.022 lbs/hr					Operating Hours	N/A
	3a. 0.0055 tons/yr						
4. BH-003 Boiler (Natural Gas)	4. 0.021 lbs/hr					Operating Hours	N/A
	4a. 0.091 tons/yr						
5. BH-005 Boiler (Natural Gas)	5. 0.038 lbs/hr					Operating Hours	N/A
	5a. 0.17 tons/yr						
6. BS-005 Steam Boiler (Natural Gas)	6. 0.014 lbs/hr					Operating Hours	N/A
	6a. 0.059 tons/yr						
6. BS-005 Steam Boiler (Diesel)	6. 0.0015 lbs/hr					Operating Hours	N/A
	6a. 0.15 tons/yr						
7. BS-006 Steam Boiler (Natural Gas)	7. 0.014 lbs/hr					Operating Hours	N/A
	7a. 0.059 tons/yr						
7. BS-006 Steam Boiler (Diesel)	7. 0.0015 lbs/hr					Operating Hours	N/A
	7a. 0.15 tons/yr						
8. BS-007 Steam Boiler (Natural Gas)	8. 0.016 lbs/hr					Operating Hours	N/A
	8a. 0.072 tons/yr						
8. BS-007	8. 0.0018 lbs/hr					Operating	N/A

Steam Boiler (Diesel)	8a.	0.15 tons/yr				Hours	
9. BH-009 Steam Boiler (Natural Gas)	9.	0.026 lbs/hr				Operating Hours	N/A
	9a.	0.11 tons/yr					
9. BH-009 Steam Boiler (Diesel)	9.	0.0029 lbs/hr				Operating Hours	N/A
	9a.	0.15 tons/yr					
10. Thermal Oxidizer (Natural Gas)	10.	0.0012 lbs/hr				Operating Hours	N/A
	10a.	0.0052 tons/yr					
Sub-Total: Natural Gas		0.13 lbs/hr					
		0.57 tons/yr					
Sub-Total: Diesel		0.34 lbs/hr					
		0.61 tons/yr					
Worst Case	(Use Diesel) N/A lbs/hr						
Grand Total		1.2 tons/yr					

**Application for Air Pollutant Sources in Bernando County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**\*\*TOXIC EMISSIONS**

**VOLATILE, HAZARDOUS, & VOLATILE HAZARDOUS AIR POLLUTANT EMISSION TABLE**

Product Categories (Coatings, Solvents, Thinners, etc.)	Volatile Organic Compound (VOC), Hazardous Air Pollutant (HAP), or Volatile Hazardous Air Pollutant (VHAP) Primary To The Representative As Purchased Product	Chemical Abstract Service Number (CAS) Of VOC, HAP, Or VHAP From Representative As Purchased Product	VOC, HAP, Or VHAP Concentration Of Representative As Purchased Product (pounds/gallon, or %)	1. How were Concentrations Determined (CPDS, MSDS, etc.)	Total Product Purchases For Category	(-)	Quantity Of Product Recovered & Disposed For Category	(=)	Total Product Usage For Category
EXAMPLE 1. Surface Coatings	XYLENE	1330207	4.0 LBS./GAL	MSDS	lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					100 gal/yr		- 0 - gal/yr		100 gal/yr
EXAMPLE 2. Cleaning Solvents	TOLUENE	108883	70%	PRODUCT LABEL	lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					200 gal/yr		50 gal/yr		150 gal/yr
I.	N/A	N/A	N/A	N/A	lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
II.	N/A	N/A	N/A	N/A	lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
TOTAL >>>>>>>					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr

1. Basis for percent (%) determinations (Certified Product Data Sheets, Material Safety Data Sheets, etc.). Submit, as an attachment, information on one (1) product from each Category listed above which best represents the average of all the products purchased in that Category. Copy this Table if additional space is needed (begin numbering with XI., XII., etc.) N/A

**\*\*NOTE: A REGISTRATION IS REQUIRED, AT MINIMUM, FOR ANY AMOUNT OF HAP OR VHAP EMISSION. A PERMIT MAY BE REQUIRED FOR THESE EMISSIONS, DETERMINED BY A CASE-BY-CASE EVALUATION.**

**Application for Air Pollutant Sources in Bernalillo County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**MATERIAL AND FUEL STORAGE TABLE**

(Tanks, barrels, silos, stockpiles, etc.) Copy this table if additional space is needed (begin numbering with 6., 7., etc.)

Storage Equipment	Product Stored	Capacity (bbls - tons gal - acres, etc)	Above or Below Ground	Construction (welded, riveted) & Color	Install Date	Loading Rate	Offloading Rate	True Vapor Pressure	Control Equipment	Seal Type	% Eff.
Example 1. Tank	diesel fuel	5,000 gal.	Below	welded/ brown	3/93	3000gal HR. <del>YR.</del>	500 gal. - HR. <del>YR.</del>	N/A Psia	N/A	N/A	N/A
Example 2. Barrels	Solvent	55 gal Drum	Above - in storage room	welded - green	N/A	N/A HR. YR.	N/A HR. YR.	N/A Psia	N/A	N/A	N/A
1.	N/A	N/A	N/A	N/A	N/A	N/A HR. YR.	N/A HR. YR.	N/A Psia	N/A	N/A	N/A

1. Basis for Loading/Offloading Rate (Manufacturers data, Field Observation/Test, etc.) Submit information for each unit as an attachment  
  N/A  

2. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.) Submit information for each unit as an attachment  
  N/A



**Application for Air Pollutant Sources in Berna' County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**STACK AND EMISSION MEASUREMENT TABLE**

If any equipment from the Process Equipment Table (Page 2) is also listed in this Stack Table, use the same numbered line for the Process Equipment unit on both Tables to show the association between the Process Equipment and its Stack. Copy this table if additional space is needed (begin numbering with 6., 7., etc.).

Process Equipment	Pollutant (CO,NOx,TSP, Toluene,etc)	Control Equipment	Control Efficiency	Stack Height & Diameter in feet	Stack Temp.	Stack Velocity & Exit Direction	Emission Measurement Equipment Type	Range-Sensitivity-Accuracy-
Example 1. Generator	CO, NOx, TSP, SO <sub>2</sub> , NMHC	N/A	N/A	18 ft. - H 0.8 ft. - D	225 °F	6,000 ft <sup>3</sup> /min - V Exit - upward	N/A	N/A
Example 2. Spray Gun	TSP, xylene, toluene, MIBK	Paint Booth	99% for TSP	9 ft. - H 0.5 ft. -D	ambient	10,000 ft <sup>3</sup> /min - V Exit - horizontal	N/A	N/A
1. GS-004 Emergency Generator	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~25 ft-H ~8 inches -D	~950 °F	~6,520 scfm - V Exit - upward	N/A	N/A
2. GS-005 Emergency Generator	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~25 ft-H ~8 inches -D	~950 °F	~6,520 scfm - V Exit - upward	N/A	N/A
3. GS-006 Emergency Generator	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~25 ft-H ~10 inches -D	~950 °F	13,840 scfm - V Exit - upward	N/A	N/A
4. BH-003 Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~1.33 inches -D	~450 °F	~1,415 scfm - V Exit - upward	N/A	N/A
5. BH-005 Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~20 inches -D	~450 °F	~2,590 scfm - V Exit - upward	N/A	N/A
6. BS-005 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~16 inches -D	~450 °F	~920 scfm - V Exit - upward	N/A	N/A
7. BS-006 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~16 inches -D	~450 °F	~920 scfm - V Exit - upward	N/A	N/A
8. BS-007 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~16 inches -D	~450 °F	~1,110 scfm - V Exit - upward	N/A	N/A
9. BH-009 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~18 inches -D	~450 °F	1,768 scfm - V Exit - upward	N/A	N/A
10. Thermal Oxidizer	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 45 ft-H ~16 inches -D	~1400 °F	~360 scfm - V Exit - upward	N/A	N/A

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test,AP-42, etc.) Submit information for each unit as an attachment  
Field estimations on stack dimensions, hp proportions to Cat. manufacturer data for generators exhaust flows and boilers exhaust flows estimated on 10,610 wscf per MMBtu/hr natural gas heat input rating conversion.

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting registration or permit.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 2019 \_\_\_\_\_

*SIGNATURE NEXT PAGE*

\_\_\_\_\_  
Print Name Print Title

\_\_\_\_\_  
Signature

**Application for Air Pollutant Sources in Bernalillo County  
Source Registration (20.11.40 NMAC) and Construction Permits (20.11.41 NMAC)**

**STACK AND EMISSION MEASUREMENT TABLE**

If any equipment from the Process Equipment Table (Page 2) is also listed in this Stack Table, use the same numbered line for the Process Equipment unit on both Tables to show the association between the Process Equipment and its Stack. Copy this table if additional space is needed (begin numbering with 6., 7., etc.).

Process Equipment	Pollutant (CO,NOx,TSP, Toluene,etc)	Control Equipment	Control Efficiency	Stack Height & Diameter in feet	Stack Temp.	Stack Velocity & Exit Direction	Emission Measurement Equipment Type	Range-Sensitivity-Accuracy-
Example 1. Generator	CO, NOx, TSP, SO <sub>2</sub> , NMHC	N/A	N/A	18 ft. - H 0.8 ft. - D	225 °F	6,000 ft <sup>3</sup> /min - V Exit - upward	N/A	N/A
Example 2. Spray Gun	TSP, xylene, toluene, MIBK	Paint Booth	99% for TSP	9 ft. - H 0.5 ft. -D	ambient	10,000 ft <sup>3</sup> /min - V Exit - horizontal	N/A	N/A
1. GS-004 Emergency Generator	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~25 ft-H ~8 inches -D	~950 °F	~6,520 scfm - V Exit - upward	N/A	N/A
2. GS-005 Emergency Generator	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~25 ft-H ~8 inches -D	~950 °F	~6,520 scfm - V Exit - upward	N/A	N/A
3. GS-006 Emergency Generator	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~25 ft-H ~10 inches -D	~950 °F	13,840 scfm - V Exit - upward	N/A	N/A
4. BH-003 Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~1.33 inches -D	~450 °F	~1,415 scfm - V Exit - upward	N/A	N/A
5. BH-005 Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~20 inches -D	~450 °F	~2,590 scfm - V Exit - upward	N/A	N/A
6. BS-005 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~16 inches -D	~450 °F	~920 scfm - V Exit - upward	N/A	N/A
7. BS-006 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~16 inches -D	~450 °F	~920 scfm - V Exit - upward	N/A	N/A
8. BS-007 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~16 inches -D	~450 °F	~1,110 scfm - V Exit - upward	N/A	N/A
9. BH-009 Steam Boiler	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 25 ft-H ~18 inches -D	~450 °F	1,768 scfm - V Exit - upward	N/A	N/A
10. Thermal Oxidizer	CO, NOX, TSP, SO <sub>2</sub> ,NMHC,TSP, HAP	N/A	N/A	~ 45 ft-H ~16 inches -D	~1400 °F	~360 scfm - V Exit - upward	N/A	N/A

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.) Submit information for each unit as an attachment  
Field estimations on stack dimensions, hp proportions to Cat. manufacturer data for generators exhaust flows and boilers exhaust flows estimated on 10,610 wscf per MMBtu/hr natural gas heat input rating conversion.

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting registration or permit.

Signed this 15<sup>th</sup> day of August, 2019

Robert W. Rubin  
Print Name

President and CEO  
Print Title

Robert W. Rubin  
Signature



# City of Albuquerque

## Environmental Health Department

### Air Quality Program



## Permit Application Review Fee Instructions

All source registration, authority-to-construct, and operating permit applications for stationary or portable sources shall be charged an application review fee according to the fee schedule in 20.11.2 NMAC. These filing fees are required for both new construction, reconstruction, and permit modifications applications. Qualified small businesses as defined in 20.11.2 NMAC may be eligible to pay one-half of the application review fees and 100% of all applicable federal program review fees.

Please fill out the permit application review fee checklist and submit with a check or money order payable to the "City of Albuquerque Fund 242" and either:

1. be delivered in person to the Albuquerque Environmental Health Department, 3<sup>rd</sup> floor, Suite 3023 or Suite 3027, Albuquerque-Bernalillo County Government Center, south building, One Civic Plaza NW, Albuquerque, NM or,
2. mailed to Attn: Air Quality Program, Albuquerque Environmental Health Department, P.O. Box 1293, Albuquerque, NM 87103.

The department will provide a receipt of payment to the applicant. The person delivering or filing a submittal shall attach a copy of the receipt of payment to the submittal as proof of payment. Application review fees shall not be refunded without the written approval of the manager. If a refund is requested, a reasonable professional service fee to cover the costs of staff time involved in processing such requests shall be assessed. Please refer to 20.11.2 NMAC (effective January 10, 2011) for more detail concerning the "Fees" regulation as this checklist does not relieve the applicant from any applicable requirement of the regulation.



# City of Albuquerque

## Environmental Health Department

### Air Quality Program



## Permit Application Review Fee Checklist

Please completely fill out the information in each section. Incompleteness of this checklist may result in the Albuquerque Environmental Health Department not accepting the application review fees. If you should have any questions concerning this checklist, please call 768-1972.

### I. COMPANY INFORMATION:

Company Name	Lovlace Respiratory Research Institute		
Company Address	2425 Ridgecrest Drive SE		
Facility Name	Lovlace Respiratory Research Institute		
Facility Address	Bldg 9217, Area Y, Kirtland AFB-East		
Contact Person	Carin Kelley, EHS Manager		
Contact Person Phone Number	505-348-9166		
Are these application review fees for an existing permitted source located within the City of Albuquerque or Bernalillo County?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
If yes, what is the permit number associated with this modification?	Permit # 0917-M4		
Is this application review fee for a Qualified Small Business as defined in 20.11.2 NMAC? (See Definition of Qualified Small Business on Page 4)	<input type="radio"/> Yes	<input checked="" type="radio"/> No	

### II. STATIONARY SOURCE APPLICATION REVIEW FEES:

If the application is for a new stationary source facility, please check all that apply. If this application is for a modification to an existing permit please see Section III.

Check All That Apply	Stationary Sources	Review Fee	Program Element
<b>Air Quality Notifications</b>			
	AQN New Application	\$562.00	2801
	AQN Technical Amendment	\$307.00	2802
	AQN Transfer of a Prior Authorization	\$307.00	2803
x	<i>Not Applicable</i>	<i>See Sections Below</i>	
<b>Stationary Source Review Fees (Not Based on Proposed Allowable Emission Rate)</b>			
	Source Registration required by 20.11.40 NMAC	\$ 573.00	2401
	A Stationary Source that requires a permit pursuant to 20.11.41 NMAC or other board regulations and are not subject to the below proposed allowable emission rates	\$ 1,146.00	2301
x	<i>Not Applicable</i>	<i>See Sections Below</i>	
<b>Stationary Source Review Fees (Based on the Proposed Allowable Emission Rate for the single highest fee pollutant)</b>			
	Proposed Allowable Emission Rate Equal to or greater than 1 tpy and less than 5 tpy	\$ 859.00	2302
	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	\$ 1,719.00	2303
	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	\$ 3,438.00	2304
	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	\$ 5,157.00	2305
	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	\$ 6,876.00	2306
	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	\$8,594.00	2307
x	<i>Not Applicable</i>	<i>See Section Above</i>	

<b>Federal Program Review Fees (In addition to the Stationary Source Application Review Fees above)</b>			
	40 CFR 60 - "New Source Performance Standards" (NSPS)	\$ 1,146.00	2308
	40 CFR 61 - "Emission Standards for Hazardous Air Pollutants (NESHAPs)	\$ 1,146.00	2309
	40 CFR 63 - (NESHAPs) Promulgated Standards	\$ 1,146.00	2310
	40 CFR 63 - (NESHAPs) Case-by-Case MACT Review	\$ 11,459.00	2311
	20.11.61 NMAC, Prevention of Significant Deterioration (PSD) Permit	\$ 5,730.00	2312
	20.11.60 NMAC, Non-Attainment Area Permit	\$ 5,730.00	2313
x	<i>Not Applicable</i>	<i>Not Applicable</i>	

### III. MODIFICATION TO EXISTING PERMIT APPLICATION REVIEW FEES:

If the permit application is for a modification to an existing permit, please check all that apply. If this application is for a new stationary source facility, please see Section II.

Check All That Apply	Modifications	Review Fee	Program Element
<b>Modification Application Review Fees (Not Based on Proposed Allowable Emission Rate)</b>			
	Proposed modification to an existing stationary source that requires a permit pursuant to 20.11.41 NMAC or other board regulations and are not subject to the below proposed allowable emission rates	\$ 1,146.00	2321
x	<i>Not Applicable</i>	<i>See Sections Below</i>	
<b>Modification Application Review Fees (Based on the Proposed Allowable Emission Rate for the single highest fee pollutant)</b>			
	Proposed Allowable Emission Rate Equal to or greater than 1 tpy and less than 5 tpy	\$ 859.00	2322
	Proposed Allowable Emission Rate Equal to or greater than 5 tpy and less than 25 tpy	\$ 1,719.00	2323
x	Proposed Allowable Emission Rate Equal to or greater than 25 tpy and less than 50 tpy	\$ 3,438.00	2324
	Proposed Allowable Emission Rate Equal to or greater than 50 tpy and less than 75 tpy	\$ 5,157.00	2325
	Proposed Allowable Emission Rate Equal to or greater than 75 tpy and less than 100 tpy	\$ 6,876.00	2326
	Proposed Allowable Emission Rate Equal to or greater than 100 tpy	\$ 8,594.00	2327
	<i>Not Applicable</i>	<i>See Section Above</i>	
<b>Major Modifications Review Fees (In addition to the Modification Application Review Fees above)</b>			
	20.11.60 NMAC, Permitting in Non-Attainment Areas	\$ 5,730.00	2333
	20.11.61 NMAC, Prevention of Significant Deterioration	\$ 5,730.00	2334
x	<i>Not Applicable</i>	<i>Not Applicable</i>	
<b>Federal Program Review Fees (This section applies only if a Federal Program Review is triggered by the proposed modification) (These fees are in addition to the Modification and Major Modification Application Review Fees above)</b>			
	40 CFR 60 - "New Source Performance Standards" (NSPS)	\$ 1,146.00	2328
	40 CFR 61 - "Emission Standards for Hazardous Air Pollutants (NESHAPs)	\$ 1,146.00	2329
	40 CFR 63 - (NESHAPs) Promulgated Standards	\$ 1,146.00	2330
	40 CFR 63 - (NESHAPs) Case-by-Case MACT Review	\$ 11,459.00	2331
	20.11.61 NMAC, Prevention of Significant Deterioration (PSD) Permit	\$ 5,730.00	2332
	20.11.60 NMAC, Non-Attainment Area Permit	\$ 5,730.00	2333
x	<i>Not Applicable</i>	<i>Not Applicable</i>	

**IV. ADMINISTRATIVE AND TECHNICAL REVISION APPLICATION REVIEW FEES:**

If the permit application is for an administrative or technical revision of an existing permit issued pursuant to 20.11.41 NMAC, please check one that applies.

Check One	Revision Type	Review Fee	Program Element
	Administrative Revisions	\$ 250.00	2340
	Technical Revisions	\$ 500.00	2341
x	Not Applicable	See Sections II, III or V	

**V. PORTABLE STATIONARY SOURCE RELOCATION FEES:**

If the permit application is for a portable stationary source relocation of an existing permit, please check one that applies.

Check One	Portable Stationary Source Relocation Type	Review Fee	Program Element
	No New Air Dispersion Modeling Required	\$ 500.00	2501
	New Air Dispersion Modeling Required	\$ 750.00	2502
x	Not Applicable	See Sections II, III or V	

**VI. Please submit a check or money order in the amount shown for the total application review fee.**

Section Totals	Review Fee Amount
Section II Total	\$ 0.00
Section III Total	\$ 3438.00
Section IV Total	\$ 0.00
Section V Total	\$ 0.00
<b>Total Application Review Fee</b>	<b>\$ 3438.00</b>

I, the undersigned, a responsible official of the applicant company, certify that to the best of my knowledge, the information stated on this checklist, give a true and complete representation of the permit application review fees which are being submitted. I also understand that an incorrect submittal of permit application reviews may cause an incompleteness determination of the submitted permit application and that the balance of the appropriate permit application review fees shall be paid in full prior to further processing of the application.

Signed this \_\_\_\_\_ day of \_\_\_\_\_ 2019 \_\_\_\_\_

*SIGNATURE NEXT PAGE*

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Title

\_\_\_\_\_  
Signature

**Definition of Qualified Small Business as defined in 20.11.2 NMAC:**

“Qualified small business” means a business that meets all of the following requirements:

- (1) a business that has 100 or fewer employees;
- (2) a small business concern as defined by the federal Small Business Act;
- (3) a source that emits less than 50 tons per year of any individual regulated air pollutant, or less than 75 tons per year of all regulated air pollutants combined; and
- (4) a source that is not a major source or major stationary source.

**Note:** Beginning January 1, 2011, and every January 1 thereafter, an increase based on the consumer price index shall be added to the application review fees. The application review fees established in Subsection A through D of 20.11.2.18 NMAC shall be adjusted by an amount equal to the increase in the consumer price index for the immediately-preceding year. Application review fee adjustments equal to or greater than fifty cents (\$0.50) shall be rounded up to the next highest whole dollar. Application review fee adjustments totaling less than fifty cents (\$0.50) shall be rounded down to the next lowest whole dollar. The department shall post the application review fees on the city of Albuquerque environmental health department air quality program website.



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If the permit application is for an administrative or technical revision of an existing permit issued pursuant to 20.11.41 NMAC, please check one that applies.

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	Technical Revisions	\$ 500.00	2341
x	Not Applicable	See Sections II, III or V	

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	No New Air Dispersion Modeling Required	\$ 500.00	2501
	New Air Dispersion Modeling Required	\$ 750.00	2502
x	Not Applicable	See Sections II, III or V	

VI. Please submit a check or money order in the amount shown for the total application review fee.

Section Totals	Review Fee Amount
Section II Total	\$ 0.00
Section III Total	\$ 859.00
Section IV Total	\$ 0.00
Section V Total	\$ 0.00
<b>Total Application Review Fee</b>	<b>\$ 859.00 + \$ 2579.00</b>

I, the undersigned, a responsible official of the applicant company, certify that to the best of my knowledge, the information stated on this checklist, give a true and complete representation of the permit application review fees which are being submitted. I also understand that an incorrect submittal of permit application reviews may cause an incompleteness determination of the submitted permit application and that the balance of the appropriate permit application review fees shall be paid in full prior to further processing of the application.

Signed this 15<sup>th</sup> day of August 2019  
Robert W. Rubin President and CEO  
 Print Name Print Title  
Robert W. Rubin  
 Signature

**Definition of Qualified Small Business as defined in 20.11.2 NMAC:**

"Qualified small business" means a business that meets all of the following requirements:

- (1) a business that has 100 or fewer employees;
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- (3) a source that emits less than 50 tons per year of any individual regulated air pollutant, or less than 75 tons per year of all regulated air pollutants combined; and
- (4) a source that is not a major source or major stationary source.

**Note:** Beginning January 1, 2011, and every January 1 thereafter, an increase based on the consumer price index shall be added to the application review fees. The application review fees established in Subsection A through D of 20.11.2.18 NMAC shall be adjusted by an amount equal to the increase in the consumer price index for the immediately-preceding year. Application review fee adjustments equal to or greater than fifty cents (\$0.50) shall be rounded up to the next highest whole dollar. Application review fee adjustments totaling less than fifty cents (\$0.50) shall be rounded down to the next lowest whole dollar. The department shall post the application review fees on the city of Albuquerque environmental health department air quality program website.

## **Air Emissions Calculations**



Lovelace Respiratory Research Institute (LRRRI) - South Facility

Uncontrolled Emission Source Summary - Using 2018 Emissions data

Emission Unit	CO		NOx		VOC		SOx		PM	
	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
1. GS-004 - Diesel	6.7	29.3	29.1	127.5	0.85	3.7	0.015	0.066	0.85	3.7
2. GS-005 - Diesel	6.7	29.3	29.1	127.5	0.85	3.7	0.015	0.066	0.85	3.7
3. GS-006 - Diesel	12.7	55.6	55.4	242.7	1.63	7.1	0.028	0.12	1.61	7.1
4. BH-003 - Natural Gas	0.66	2.9	0.78	3.4	0.043	0.19	0.11	0.5	0.06	0.26
5. BH-005 - Natural Gas	1.21	5.3	1.44	6.3	0.079	0.35	0.21	0.92	0.11	0.48
6. BS-005 - Natural Gas	0.43	1.9	0.51	2.2	0.028	0.12	0.074	0.32	0.039	0.17
6. BS-005 - Diesel	0.19	0.019	0.75	0.076	0.013	0.0013	0.27	0.027	0.075	0.0076
7. BS-006 - Natural Gas	0.43	1.9	0.51	2.2	0.028	0.12	0.074	0.32	0.039	0.17
7. BS-006 - Diesel	0.19	0.019	0.75	0.076	0.013	0.0013	0.27	0.027	0.075	0.0076
8. BS-007 - Natural Gas	0.52	2.3	0.62	2.7	0.034	0.15	0.09	0.39	0.047	0.21
8. BS-007 - Diesel	0.23	0.019	0.9	0.076	0.015	0.0013	0.32	0.027	0.09	0.0076
9. BH-009 - Natural Gas	0.82	3.6	0.98	4.300	0.054	0.24	0.14	0.61	0.075	0.33
9. BH-009 - Diesel	0.36	0.019	1.44	0.076	0.024	0.0013	0.51	0.027	0.14	0.0076
10. Thermal Oxidizer - Natural Gas	0.16	0.70	0.20	0.88	0.011	0.048	0.029	0.13	0.015	0.07
Subtotal from Natural Gas	4.2	18.5	5.0	22.1	0.28	1.2	0.73	3.2	0.39	1.7
Subtotal from Diesel	27.07	118.6	117.44	514.4	3.40	14.9	1.4	6.3	3.7	16.2
Worst Case Grand Total	N/A	137.1	N/A	536.5	N/A	16.1	N/A	9.4	N/A	17.8

Note: Since both dual fuels in boilers cannot be burned simultaneously at full load, the worst case lb/hr emissions are not additive. Worst-case type emissions from dual fuels could be at least partially additive, so we have added those for use in the application

Controlled Emission Source Summary - Using 2018 Emissions data

Emission Unit	CO		NOx		VOC		SOx		PM	
	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
1. GS-004 - Diesel	6.7	1.7	29.1	7.3	0.85	0.21	0.015	0.13	0.85	0.21
2. GS-005 - Diesel	6.7	1.7	29.1	7.3	0.85	0.21	0.015	0.13	0.85	0.21
3. GS-006 - Diesel	12.7	3.2	55.4	13.9	1.6	0.41	0.028	0.007	1.6	0.40
4. BH-003 - Natural Gas	0.66	2.9	0.78	3.4	0.043	0.19	0.11	0.48	0.06	0.26
5. BH-005 - Natural Gas	1.2	5.3	1.4	6.3	0.079	0.35	0.21	0.92	0.11	0.48
6. BS-005 - Natural Gas	0.43	1.9	0.51	2.2	0.028	0.12	0.074	0.33	0.039	0.17
6. BS-005 - Diesel	0.19	0.019	0.75	0.076	0.013	0.0013	0.27	0.027	0.075	0.0076
7. BS-006 - Natural Gas	0.43	1.9	0.51	2.2	0.028	0.12	0.074	0.33	0.039	0.17
7. BS-006 - Diesel	0.19	0.019	0.75	0.076	0.013	0.0013	0.27	0.027	0.075	0.0076
8. BS-007 - Natural Gas	0.52	2.3	0.62	2.7	0.034	0.15	0.09	0.39	0.047	0.20
8. BS-007 - Diesel	0.23	0.019	0.90	0.076	0.015	0.0013	0.32	0.027	0.09	0.0076
9. BH-009 - Natural Gas	0.82	3.6	0.98	4.3	0.054	0.24	0.14	0.63	0.075	0.33
9. BH-009 - Diesel	0.36	0.019	1.4	0.076	0.024	0.0013	0.51	0.027	0.14	0.0076
10. Thermal Oxidizer - Natural Gas	0.16	0.16	0.20	0.20	0.011	0.011	0.029	0.029	0.015	0.015
Subtotal from Natural Gas	4.2	18.1	5.0	21.3	0.28	1.18	0.73	3.13	0.39	1.37
Subtotal from Diesel	27.1	6.6	117.4	28.7	3.3	0.88	1.4	0.2	3.7	0.87
Worst Case Grand Total	N/A	24.7	N/A	50.0	N/A	2.1	N/A	3.3	N/A	2.2

Note: Since both dual fuels in boilers cannot be burned simultaneously at full load, the worst case lb/hr emissions are not additive. Worst-case tpy emissions from dual fuels could be at least partially additive, so we have added those for use in the application

Lovellace Respiratory Research Institute (LRRRI) - South Facility

Controlled Emission Source Summary - Using 2018 Emissions data

Emission Unit	HAPs	
	lbs/hr	tons/yr
1. GS-004 - Diesel	0.012	0.0029
2. GS-005 - Diesel	0.012	0.0029
3. GS-006 - Diesel	0.022	0.0055
4. BH-003 - Natural Gas	0.021	0.0910
5. BH-005 - Natural Gas	0.038	0.1700
6. BS-005 - Natural Gas	0.014	0.0590
6. BS-005 - Diesel	0.0015	0.1500
7. BS-006 - Natural Gas	0.014	0.0590
7. BS-006 - Diesel	0.0015	0.1500
8. BS-007 - Natural Gas	0.016	0.0720
8. BS-007 - Diesel	0.0018	0.1500
9. BH-009 - Natural Gas	0.026	0.1100
9. BH-009 - Diesel	0.0029	0.1500
10. Thermal Oxidizer - Natural Gas	0.0012	0.0052
Subtotal from Natural Gas	0.13	0.57
Subtotal from Diesel	0.34	0.61
Worst Case Grand Total	N/A	1.2

Lovelace Respiratory Research Institute (LRTI) South

Unit: GS-004  
 Maker: Cummins  
 Model: KIA-2300-GS  
 Description: 1979 PRE-NSPS Engine  
 Fuel Type: Diesel

Generator  
 1,211.0 hp engine

Criteria Air Pollutants	EPA AP-42		NSPS Nonroad Limits	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor <sup>1</sup>			Emission Factor (g/HP-hr)	Hourly Emissions		Annual Emissions <sup>2</sup>		Potential	
	(lb/HP-hr)	(g/HP-hr)			g/hr	lb/hr	lb/yr	ton/yr		
Nitrogen Oxides	0.024			29.1	14,532.0	7.3	127.3			
Carbon Monoxide	5.50E-03			6.7	3,330.3	1.7	29.2			AP-42 Table 3.4-1, Diesel Fuel
Sulfur Oxides <sup>3</sup>	1.21E-05	0.0055	Pre-NSPS	0.015	7.3	0.0037	0.064			
Particulate Matter <sup>4</sup>	7.00E-04	0.32	Pre-NSPS	0.85	423.9	0.21	3.7			
Volatiles Organic Compounds	7.05E-04	0.32	Pre-NSPS	0.85	426.9	0.21	3.7			
	lb/MMBtu	lb/HP-hr <sup>5</sup>	(g/HP-hr)							
Benzene	7.76E-04	5.43E-06	Pre-NSPS	0.0066	3.3	1.6E-03	2.9E-02			
Toluene	2.81E-04	1.97E-06	Pre-NSPS	0.0024	1.2	6.0E-04	1.0E-02			
Xylenes	1.93E-04	1.35E-06	Pre-NSPS	0.0016	0.8	4.1E-04	7.2E-03			
Formaldehyde	7.89E-05	5.52E-07	Pre-NSPS	0.0007	0.3	1.7E-04	2.9E-03			
Acetaldehyde	2.52E-05	1.76E-07	Pre-NSPS	0.00021	0.1	5.3E-05	9.4E-04			
Acrolein	7.88E-06	5.52E-08	Pre-NSPS	0.00007	0.03	1.7E-05	2.9E-04			
				Σ = 0.012		Σ = 0.0029	0.051			

The generator operates a maximum of: 500.0 hours per year and must be powered by ultra low sulfur (ULS) diesel fuel.

<sup>1</sup> Emission factors from EPA AP-42 Section 3.4 Large Diesel Stationary Diesel..... Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp. AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

<sup>2</sup> The following equation was used to calculate annual emissions for each pollutant:  
 Annual emissions (lb/yr) = Hourly emissions (lb/hr) \* 500 (hrs/yr)  
 Annual emissions (ton/yr) = Hourly emissions (lb/hr) \* 500 (hrs/yr) / 2000 (lb/ton)

<sup>3</sup> SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form. Per: Regan Eyerman's 5/1/13 email, the AP-42 SOx factor should be 3.67'S where S (% sulfur in fuel) = 0.0015 for 15ppm max sulfur allowed in required ULS diesel fuel in Illl diesel engines.

<sup>4</sup> Particulate matter emissions are considered to be < 10 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM<sub>10</sub>) and particulate matter less than 2.5 µm (PM<sub>2.5</sub>).

<sup>5</sup> AP-42 (10/96) Table 3.3-1, footnote "a" says 7,000 Btu = 1 hp-hr ( 007mmBtu = 1hp-hr)

130

770



330106X02

3101708

by Caterpillar Engine Company Ltd. Great Britain

Engine	Family	CPL
Certification		
Application	1001	0221
Part. No.		
Model	1112246-11	

2011

307

Lovlace Respiratory Research Institute (LRII) South

Unit: GS-005  
 Maker: Cummins  
 Model: KTA-2300-G5  
 Description: 1977 PRE-NSPS Engine  
 Fuel Type: Diesel

Generator  
 1,211.0 hp engine

Criteria Air Pollutants	EPA AP-42		NSPS Nonroad Limits	Values for Permit Application Forms					Emission Factor Reference	
	Emission Factor <sup>1</sup>			Emission Factor (g/hp-hr)	Hourly Emissions		Annual Emissions <sup>2</sup>			Potential
	(lb/hp-hr)	(g/hp-hr)			g/hr	lb/hr	lb/yr	ton/yr		
Nitrogen Oxides	0.024			29.1	14,532.0	7.3	127.3			
Carbon Monoxide	5.50E-03			6.7	3,330.3	1.7	29.2		AP-42 Table 3.4-1, Diesel Fuel	
Sulfur Oxides <sup>3</sup>	1.21E-05	0.0055	Pre-NSPS	0.015	7.3	0.0037	0.064			
Particulate Matter <sup>4</sup>	7.00E-04	0.32	Pre-NSPS	0.85	423.9	0.21	3.7			
Volatlie Organic Compounds	7.05E-04	0.32	Pre-NSPS	387.3	426.9	0.21	3.7			
Benzene	7.76E-04	5.43E-06	Pre-NSPS	0.0066	3.3	1.6E-03	2.9E-02			
Toluene	2.81E-04	1.97E-06	Pre-NSPS	0.0024	1.2	6.0E-04	1.0E-02			
Xylenes	1.93E-04	1.35E-06	Pre-NSPS	0.0016	0.8	4.1E-04	7.2E-03			
Formaldehyde	7.89E-05	5.52E-07	Pre-NSPS	0.0007	0.3	1.7E-04	2.9E-03			
Acetaldehyde	2.52E-05	1.76E-07	Pre-NSPS	0.00021	0.1	5.3E-05	9.4E-04			
Acroline	7.88E-06	5.52E-08	Pre-NSPS	0.00007	0.03	1.7E-05	2.9E-04			
				$\Sigma =$ 0.012		$\Sigma =$ 0.0029	0.051			

The generator operates a maximum of: 500.0 hours per year and must be powered by ultra low sulfur (ULS) diesel fuel.

<sup>1</sup> Emission factors from EPA AP-42 Section 3.4 Large Diesel Stationary Diesel..... Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp. AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

<sup>2</sup> The following equation was used to calculate annual emissions for each pollutant:  
 Annual emissions (lb/yr) = Hourly emissions (lb/hr) \* 500 (hrs/yr)  
 Annual emissions (ton/yr) = Hourly emissions (lb/hr) \* 500 (hrs/yr) / 2000 (lb/ton)

<sup>3</sup> SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form. Per Regan Eyerma's 5/1/13 email, the AP-42 SOx factor should be 3.67\*S where S (% sulfur in fuel) = 0.0015 for 15ppm max sulfur allowed in required ULS diesel fuel in Illi diesel engines.

<sup>4</sup> Particulate matter emissions are considered to be < 10 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM<sub>10</sub>) and particulate matter less than 2.5 µm (PM<sub>2.5</sub>)

<sup>5</sup> AP-42 (10/96) Table 3.3-1, footnote "a" says 7,000 Btu = 1 hp-hr (0.07mmBtu = 1hp-hr)





Spl. Cert.

Engine  
Certification  
Identification

Family

SP

6123V

6177

0123 0223

Ref. No.

9230918232

Model

300A-2300--68

Caterpillar Engine Company, Ltd., Great Britain

300A303

Lovell Respiratory Research Institute (LRII) South

Unit: GS-006  
 Maker: Caterpillar  
 Model: 3516 STD  
 Description: 1988 PRE-NSPS ENGINE  
 Fuel Type: Diesel

Generator  
 2,307.0 hp engine

Criteria Air Pollutants	EPA AP-42		NSPS Nonroad Limits		Values for Permit Application Forms					Emission Factor Reference
	Emission Factor <sup>1</sup>		Emission Limit		Hourly Emissions		Annual Emissions <sup>2</sup>		Potential	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Nitrogen Oxides	0.024					55.4	27,684.0	13.8	242.5	
Carbon Monoxide	5.50E-03					12.7	6,344.3	3.2	55.6	AP-42 Table 3.4-1, Diesel Fuel
Sulfur Oxides <sup>3</sup>	1.21E-05	0.0055	Pre-NSPS	0.0055	12.7	0.028	14.0	0.0070	0.123	
Particulate Matter <sup>4</sup>	7.00E-04	0.32	Pre-NSPS	0.32	732.5	1.61	807.5	0.40	7.1	
Volatile Organic Compounds	7.05E-04	0.32	Pre-NSPS	0.32	737.8	1.63	813.2	0.41	7.1	
	lb/MMBtu	lb/hp-hr <sup>5</sup>								
Benzene	7.76E-04	5.43E-06	Pre-NSPS	Pre-NSPS		0.0125	6.3	3.1E-03	5.5E-02	
Toluene	2.81E-04	1.97E-06	Pre-NSPS	Pre-NSPS		0.0045	2.3	1.1E-03	2.0E-02	
Xylenes	1.93E-04	1.35E-06	Pre-NSPS	Pre-NSPS		0.0031	1.6	7.8E-04	1.4E-02	
Formaldehyde	7.89E-05	5.52E-07	Pre-NSPS	Pre-NSPS		0.0013	0.64	3.2E-04	5.6E-03	
Acetaldehyde	2.52E-05	1.76E-07	Pre-NSPS	Pre-NSPS		0.00041	0.20	1.0E-04	1.8E-03	
Acrolein	7.88E-06	5.52E-08	Pre-NSPS	Pre-NSPS		0.00013	0.064	3.2E-05	5.6E-04	
								$\Sigma =$	$\Sigma =$	
						0.022	0.064	0.0055	0.096	

The generator operates a maximum of: 500.0 hours per year and must be powered by ultra low sulfur (ULS) diesel fuel.

<sup>1</sup> Emission factors from EPA AP-42 Section 3.4 Large Diesel Stationary Diesel Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

<sup>2</sup> The following equation was used to calculate annual emissions for each pollutant:

Annual emissions (lb/yr) = Hourly emissions (lb/hr) \* 500 (hrs/yr)  
 Annual emissions (ton/yr) = Hourly emissions (lb/hr) \* 500 (hrs/yr) / 2000 (lb/ton)

<sup>3</sup> SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form. Per Regan Eyerman's 5/1/13 email, the AP-42 SOx factor should be 3.67\*S where S (% sulfur in fuel) = 0.0015 for 15ppm max sulfur allowed in required ULS diesel fuel in III diesel engines.

<sup>4</sup> Particulate matter emissions are considered to be < 10 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM<sub>10</sub>) and particulate matter less than 2.5 µm (PM<sub>2.5</sub>).

<sup>5</sup> AP-42 (10/96) Table 3.3-1, footnote "a" says 7,000 Btu = 1 hp-hr (7,000 Btu = 1 hp-hr)



**CAT**

10911

SER. NO. 25Z01465 DATE DELIVERED

MODIFICATION NO. DLR CODE

AR NO. 2W8404 PERF SPEC 0T691 MAX ALT 1000

OEM NO. FULL TORQ. STATIC FUEL

FULL LOAD 15.90 A/F RATIO

STATIC FUEL 1870 DYNAMIC FUEL

POWER 2307 HP 1800 RPM TIMING

BARE ENG. 1818 FULL LOAD RPM

HI IDLE RPM

9L5531 14

LoveLace Respiratory Research Institute (LRRRI) South

Unit: BH-003  
 Maker: Continental  
 Model: 13799  
 Description: Boiler, natural gas and diesel fuel fired  
 Serial Number: F9CJ50LV.B-6024-3436

Natural Gas

Fuel Consumption 8.00 MMBtu/hr Input heat rate  
 Fuel heat value 1000 Btu/scf Nominal LHV of fuel gas  
 Hourly fuel usage 8.0 Mscf/hr Fuel usage  
 Annual fuel usage 70.1 MMBtu/yr  
 Operating hours 8760.0 hr/yr

therefore uncontrolled and controlled emissions are the same

Based on AP-42 Emission Factors

NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	PM
100	84	5.5	7.6	lb/MMscf
98.0	82.4	5.4	7.5	lb/MMscf
0.8	0.7	0.043	0.06	lb/hr
Total				0.066
Total				0.11
Total				0.50
Total				0.26
Total				tpy

Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)  
 Adjusted emission factor: EFF X (Fuel Heat Value/1,020 Btu/scf)  
 lb/MMscf \* (Mscf/hr / 1000 Mscf/1 MMBtu)  
 Pipeline specification

<sup>1</sup>SO<sub>2</sub> emissions are calculated based on fuel consumption and fuel H<sub>2</sub>S concentration of 50 gr/Mscf.  
 SO<sub>2</sub> calculation assumes 100% conversion of fuel elemental sulfur to SO<sub>2</sub>.

HCOH	Benzene	Toluene	n-Hexane	Naphthalene	Total HAPs
0.00059	2.28E-05	0.0141	0.00E+00	0.021	lb/hr
0.00260	1.00E-04	0.0618	0.00E+00	0.091	tpy

GR-HAPC6k  
 GR-HAPC6k

~~Diesel Fuel~~ NO LONGER IN USE OR CONNECTED

Fuel Consumption 7,550 gal/yr (Worst Case Scenario: the maximum permitted 7,560 gal/yr of diesel use consumed by this boiler, i.e all the other four (4) are offline.)  
 Diesel Energy Content 139,000 Btu/gal  
 Boiler Heat Input 5.0 MMBtu/hr  
 Diesel Consumption Rate 58 gal/hr  
 Max Hours per year 131 hr

Boiler Heat Input (MMBtu/hr) / by Diesel Energy Content (Btu/gal)  
 Fuel Consumption (gal/yr) / Diesel Consumption Rate (gal/hr)

Based on AP-42 Emission Factors

NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>3</sup>	Tsp <sup>4</sup>	PM <sup>4</sup>
20	5	0.34	7.1	2	2
1.2	0.29	0.020	0.41	0.12	0.12
151.2	37.8	2.6	53.7	15.1	15.1
0.076	0.019	0.0013	0.027	0.0076	0.0076
Total					

Unit emission rates from AP-42 Table 1.3-1 & 1.3-3  
 lb/Mgal \* Diesel Fuel Rate (gal/hr) / 1000  
 lb/Mgal \* Fuel Consumption (gal/yr) / 1,000  
 Divide ( ) by 2,000

<sup>3</sup> Assumed the weight % of sulfur in distillate oil is 0.05% to calculate the SO<sub>2</sub> emission factor.  
<sup>4</sup> Assumed the emission factors to be the same for PM10 and TSP emissions.

Based on AP-42 Emission Factors

HCOH	Benzene	Toluene	Naphthalene	Xylene	Ethylbenzene	Total HAPs
3.30E-02	2.14E-04	6.20E-03	1.13E-03	1.09E-04	6.36E-05	-
1.9E-03	1.2E-05	3.6E-04	6.5E-05	6.3E-06	3.7E-06	2.3E-03
1.2E-01	8.1E-04	2.3E-02	4.3E-03	4.1E-04	2.4E-04	1.5E-01
Total						2.3E-03
Total						1.5E-01

lb/Mgal  
 lb/hr  
 ton/yr



# Continental

## AUTOMATIC BOILER

SERIAL NUMBER

F9C150LWB-6024-3436

RATED OUTPUT (MBTU/HR.)

5021

EDR SQ. FT.

33470

BOILER NO.

13799

NATIONAL BOARD

10134



WP

125

HS

750

SH

5/8

HD

9/16

YEAR

1968

BOILER ENGINEERING & SUPPLY CO. INC.

PHOENIXVILLE PENNSYLVANIA

PATENTS PENDING

NP-24

1013.K.32



425,000

WATER 125118

7000000 BTU/HR

750 30 FT

1811 D. 9/16 FLA

RS. 13799

968

D 7055

Lovelace Respiratory Research Institute (LRRRI) South

Unit: BH-005  
 Maker: Kewanee  
 Model: L3W-350-G02-LE  
 Description: Boiler, natural gas fired  
 Serial Number: KE16.1-GO-150/AJ4708 6-2

Reboiler Fuel Usage

Fuel Consumption 14.65 MMBtu/hr Input heat rate  
 Fuel heat value 1000 Btu/scf Nominal LHV of fuel gas  
 Hourly fuel usage 14.6 Mscf/hr Fuel usage  
 Annual fuel usage 128.3 MMsfc/yr Annual usage  
 Operating hours 8760.0 hr/yr therefore uncontrolled and controlled emissions are the same

Based on AP-42 Emission Factors

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	PM
	100	84	5.5		7.6
	98.0	82.4	5.4		7.5
	1.4	1.2	0.079		0.11
<b>Total</b>	<b>1.4</b>	<b>1.2</b>	<b>0.079</b>	<b>50</b>	<b>0.11</b>
	<b>6.3</b>	<b>5.3</b>	<b>0.35</b>		<b>0.48</b>

Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)  
 Adjusted emission factor: EFF X [Fuel Heat Value/1,020 Btu/scf]  
 lb/MMscf \* (Mscf/hr / 1000 Mscf/1 MMsfc)  
 Pipeline specification

<sup>1</sup>SO<sub>2</sub> emissions are calculated based on fuel consumption and fuel H<sub>2</sub>S concentration of 50 gr/Mscf.  
 SO<sub>2</sub> calculation assumes 100% conversion of fuel elemental sulfur to SO<sub>2</sub>.

HCOH	Benzene	Toluene	n-Hexane	Naphthalene	Total HAPs
0.00107	2.28E-05	4.57E-05	0.0258	0.0000	0.038
0.00470	1.00E-04	2.00E-04	0.113	0.000	0.17

lb/hr  
 tpy  
 GRI-HAPCalc  
 GRI-HAPCalc





# KEWANEE™

BOILER MANUFACTURING CO., INC.

## READ INSTRUCTION MANUAL BEFORE START-UP

RATING	11716	MBH	350	HORSEPOWER
MAX. WORKING PRESSURE-STEAM		PSIG	WATER	125 PSIG
HEATING SURFACE	1750	SQ. FT.	CATALOG	130-350-500
MAX. FIRING RATE	14040	MBH	ORDER	32000
VALVE CAPACITY	14000	LB. PER HR		

101 FRANKLIN STREET, KEWANEE, ILLINOIS 61443

INSTALLATION CLEARANCES TO  
 UNPROTECTED COMBUSTIBLE MATERIAL

18 INCHES AT TOP  
 18 INCHES AT SIDES AND REAR  
 4 FEET AT FRONT

MEASURE FROM BLUE PIPE

LoveLace Respiratory Research Institute (LRII) South

Unit: BS-005  
 Maker: Sellers  
 Model: SY-125-S  
 Description: Boiler, natural gas and diesel fuel fired  
 Serial Number: 103344A

Natural Gas

Fuel Consumption 5.20 MMBtu/hr  
 Fuel heat value 1000 Btu/scf  
 Hourly fuel usage 5.2 Mscf/hr  
 Annual fuel usage 45.6 MMBtu/yr  
 Operating hours 8760.0 hr/yr

therefore uncontrolled and controlled emissions are the same.

Based on AP-42 Emission Factors

NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	PM
100	84	5.5	7.6	7.6
98.0	82.4	5.4	7.5	7.5
0.5	0.4	0.028	0.04	0.04
<b>Total</b>	<b>0.51</b>	<b>0.43</b>	<b>0.074</b>	<b>0.039</b>
	<b>2.2</b>	<b>1.9</b>	<b>0.33</b>	<b>0.37</b>

Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)

Adjusted emission factor:  $EF \times (\text{Fuel Heat Value} / 1,020 \text{ Btu/scf})$   
 Pipeline specification:  $\text{lb/MMscf} \times (\text{Mscf/hr} / 1,000 \text{ Mscf/1 MMscf})$

<sup>1</sup>SO<sub>2</sub> emissions are calculated based on fuel consumption and fuel H<sub>2</sub>S concentration of 50 gr/Mscf. SO<sub>2</sub> calculation assumes 100% conversion of elemental sulfur to SO<sub>2</sub>.

HCOH	Benzene	Toluene	n-Hexane	Naphthalene	Total HAPs
0.00039	0.00E+00	2.28E-04	0.0092	0.00E+00	0.0135
0.00170	0.00E+00	1.00E-03	0.0402	0.00E+00	0.059

GR-HAPCalc  
 GR-HAPCalc

Fuel Consumption 2,560 gal/yr (Worst Case Scenario: the maximum permitted 7,560 gal/yr of diesel use consumed by this boiler, i.e. all the other four (4) are offline.)  
 Diesel Energy Content 139,000 Btu/gal = 0.139 MMBtu/gal Engineering estimate  
 Boiler Heat Input 5.2 MMBtu/hr  
 Diesel Consumption Rate 37 gal/hr Boiler Heat Input (MMBtu/hr) / by Diesel Energy Content (Btu/gal)  
 Max Hours per year 202 hr Fuel Consumption (gal/yr) / Diesel Consumption Rate (gal/hr)

Based on AP-42 Emission Factors

NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	TSP <sup>2</sup>	PM <sup>4</sup>
20	5	0.34	7.1	2	2
<b>Total</b>	<b>0.75</b>	<b>0.19</b>	<b>0.27</b>	<b>0.075</b>	<b>0.075</b>
	151.2	37.8	2.6	53.7	15.1
	0.076	0.019	0.0013	0.0076	0.0076

Unit emission rates from AP-42 Table 1.3-1 & 1.3-3

lb/Mgal \* Diesel Fuel Rate (gal/hr) / 1,000  
 lb/Mgal \* Fuel Consumption (gal/yr) / 1,000  
 Divide (3) by 2,000

<sup>3</sup> Assumed the weight % of sulfur in distillate oil is 0.05% to calculate the SO<sub>2</sub> emission factor.

<sup>4</sup> Assumed the emission factors to be the same for PM10 and TSP emissions.

Based on AP-42 Emission Factors

HCOH	Benzene	Toluene	Naphthalene	Xylene	Ethylbenzene	Total HAPs
3.30E-02	2.14E-04	6.20E-03	1.13E-03	1.09E-04	6.36E-05	
1.2E-03	8.0E-06	2.3E-04	4.2E-05	4.1E-06	2.4E-06	1.5E-03
1.2E-01	8.1E-04	2.3E-02	4.3E-03	4.1E-04	2.4E-04	1.5E-01

AP-42 Table 1.3-9

lb/Mgal  
 lb/hr  
 ton/yr



# Sellers ENGINEERING

DANVILLE, KY.

## Sellers BOILER

MODEL NUMBER	SY-125-S	MAX. DESIGN PRESSURE	150 PSI
SERIAL NUMBER	103344A	A.S.M.E. NUMBER	12717
INPUT - BTU/HR	5,231,000	NATIONAL SAFETY COUNCIL	10583
OUTPUT - BTU/HR	4,185,000	FUEL SUPPLY PRESSURE	2 PSI
MOTORS	7.5 H.P.	KIND OF FUEL	Natural Gas - No. 2 Oil
		CAPACITY	4312
		ELECTRICAL CHARACTERISTICS	
		VOLTS	480
		HERTZ	60
		PHASES	3
		WINDING CONNECTION	ON-153825-4
		TYPE OF MOTOR	TEFC
		WARRANTY PERIOD	
		WARRANTY TYPE	
		WARRANTY TERMS	
		WARRANTY CONDITIONS	
		WARRANTY EXCLUSIONS	
		WARRANTY LIMITATIONS	
		WARRANTY NOTES	
		WARRANTY CONTACT INFORMATION	
		WARRANTY SIGNATURE	
		WARRANTY DATE	



**Lovecave Respiratory Research Institute (LRII) South**

Unit: BS-006  
 Sellers: SY-125-S  
 Model: Boiler, natural gas and diesel fuel fired  
 Description: 103344b  
 Serial Number:

**Natural Gas**

Fuel Consumption 5.20 MMBtu/hr Input heat rate  
 Fuel heat value 1000 Btu/scf Nominal LHV of fuel gas  
 Hourly fuel usage 5.2 Mscf/hr Fuel usage  
 Annual fuel usage 45.6 MMBtu/yr  
 Operating hours 8760.0 hr/yr  
 therefore uncontrolled and controlled emissions are the same.

**Based on AP-42 Emission Factors**

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	PM
	100	84	5.5	7.6	7.6
	98.0	82.4	5.4	7.5	7.5
	0.5	0.4	0.028	0.04	0.04
				SO	
Total	0.51	0.43	0.028	0.074	0.039
	2.2	1.9	0.12	0.33	0.17
					tpy

Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)

Adjusted emission factor: EFF x (Fuel Heat Value) / 1,020 Btu/scf  
 lb/MMscf \* (Mscf/hr / 1000 Mscf/1 MMscf)

gr Total Sulfur / Pipeline specification

<sup>1</sup>SO<sub>2</sub> emissions are calculated based on fuel consumption and fuel H<sub>2</sub>S concentration of 50 gr/Mscf.  
 SO<sub>2</sub> calculation assumes 100% conversion of fuel elemental sulfur to SO<sub>2</sub>.

HCHOH	Benzene	Toluene	n-Hexane	Naphthalene	Total HAPs
0.00039	0.00E+00	2.28E-05	0.0092	0.00E+00	0.0135
0.0017	0.00E+00	1.00E-04	0.0402	0.00E+00	0.053
					tpy

GR-HAPCalc  
 GR-HAPCalc

**Diesel Fuel**

Fuel Consumption 7,560 gal/yr (Worst Case Scenario: the maximum permitted 7,560 gal/yr of diesel is consumed by this boiler, i.e. all the other four (4) are offline)  
 Diesel Energy Content 139,000 Btu/gal = 0.139 MMBtu/gal Engineering estimate  
 Boiler Heat Input 5.2 MMBtu/hr  
 Diesel Consumption Rate 37 gal/hr  
 Max Hours per year 202 hr

Boiler Heat Input (MMBtu/hr) / by Diesel Energy Content (Btu/gal)  
 Fuel Consumption (gal/yr) / Diesel Consumption Rate (gal/hr)

**Based on AP-42 Emission Factors**

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	TSP <sup>4</sup>	PM <sup>1</sup>
	20	5	0.34	7.1	2	2
	0.75	0.19	0.013	0.27	0.075	0.075
	151.2	37.8	2.6	53.7	15.1	15.1
	0.076	0.019	0.0013	0.027	0.0076	0.0076
						tpy
Total						

Unit emission rates from AP-42 Table 1.3-1 & 1.3-3  
 lb/Mgal \* Diesel Fuel Rate (gal/hr) / 1,000  
 lb/Mgal \* Fuel Consumption (gal/yr) / 1,000  
 Divide ( ) by 2,000

<sup>3</sup> Assumed the weight % of sulfur in distillate oil is 0.05% to calculate the SO<sub>2</sub> emission factor.  
<sup>4</sup> Assumed the emission factors to be the same for PM10 and TSP emissions.

**Based on AP-42 Emission Factors**

HCHOH	Benzene	Toluene	Naphthalene	Xylene	Ethylbenzene	Total HAPs
3.30E-02	2.14E-04	6.20E-03	1.09E-03	1.09E-04	6.36E-05	
1.2E-03	8.0E-06	2.3E-04	4.2E-05	4.1E-06	2.4E-06	1.5E-03
1.2E-01	8.1E-04	2.3E-02	4.3E-03	4.1E-04	2.4E-04	1.5E-01
						ton/yr

AP-42 Table 1.3.9  
 lb/hr  
 ton/yr

# Sellers

PARVILLI

## Sellers BOILER

MODEL NUMBER	SY-125-S	MAX. DESIGN PRESS.	150 PSI
SERIAL NUMBER	103344b	NATIONAL BOARD NO.	10594
INPUT - BTU/HR.	5,231,000	FUEL SUPPLY PRESSURE	2 PSI
OUTPUT - BTU/HR.	4,185,000	KIND OF FUEL	Natural Gas - No. 2 Oil
MOTOR	7.5 H.P.	CAPACITY	4312
ELECTRICAL CHARACTERISTICS		LBS. STEAM/HR FROM AND AT 2 1/2 P	
VOLTS	460	ASSEMBLY TOTAL MAX. AMPS	
HERTZ	60	WIRING DIAGRAM NUMBER	Go-15396L-4
PHASE	3	MINIMUM CIRCUIT AMPACITY	
CONTROL CIRCUIT IS 120V., 60HZ., 1PH.		MEG DATE	11-21-05
MINIMUM CIRCUIT AMPACITY		ENCLOSURE TYPE	1
Flame Control Panel			

LoveLace Respiratory Research Institute (LRII) South

Unit: BS-00Z  
 Maker: SELLERS  
 Model: 3X-150-S  
 Description: Boiler, natural gas and diesel fuel fired  
 Serial Number: 10409Z

**Natural Gas**

Fuel Consumption	5.277 MMBtu/hr	Input heat rate	
Fuel heat value	1000 Btu/scf	Nominal LHV of fuel gas	
Hourly fuel usage	6.3 Mscf/hr	Fuel usage	
Annual fuel usage	55.0 MMsct/yr	Annual usage	
Operating hours	8760.0 hr/yr	therefore uncontrolled and controlled emissions are the same	

Based on AP-42 Emission Factors

NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	PM
100	84	5.5		7.6
	82.4	5.4		7.5
0.62	0.52	0.034	50	0.05
<b>Total</b>	<b>0.62</b>	<b>0.034</b>	<b>0.090</b>	<b>0.047</b>
	2.3	0.15	0.39	0.20

Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)  
 Adjusted emission factor: EFF X (Fuel Heat Value/1,020 Btu/scf)  
 lb/MMscf \* (Mscf/hr / 1000 Mscf/1 MMsct)  
 Pipeline specification

<sup>1</sup>SO<sub>x</sub> emissions are calculated based on fuel consumption and fuel H<sub>2</sub>S concentration of 50 gr/Mscf.  
 SO<sub>2</sub> calculation assumes 100% conversion of fuel elemental sulfur to SO<sub>2</sub>.

HCOH	Benzene	Toluene	n-Hexane	Naphthalene	Total HAPs
0.00046	2.28E-05	0.0111	0.00E+00	0.0163	lb/hr
0.00200	1.00E-04	0.0485	0.00E+00	0.072	tpy

GRI-HAPCalc  
 GRI-HAPCalc

**Diesel Fuel**

Fuel Consumption	7.560 gal/yr (West Coast Scenario; the maximum permitted; 560 gal/yr of diesel is consumed by this boiler. i.e all the other four (4) are offline.)
Diesel Energy Content	139,000 Btu/gal = 0.139 MMBtu/gal Engineering estimate
Boiler Heat Input	6.3 MMBtu/hr
Diesel Consumption Rate	45 gal/hr Boiler Heat Input (MMBtu/hr) / by Diesel Energy Content (Btu/gal)
Max Hours per year	167 hr Fuel Consumption (gal/yr) / Diesel Consumption Rate (gal/hr)

Based on AP-42 Emission Factors

NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	TSP <sup>4</sup>	PM <sup>4</sup>
20	5	0.34	7.1	2	2
<b>Total</b>	<b>0.90</b>	<b>0.015</b>	<b>0.32</b>	<b>0.050</b>	<b>0.090</b>
151.2	37.8	2.6	53.7	15.1	15.1
0.076	0.019	0.0013	0.027	0.0076	0.0076

Unit emission rates from AP-42 Table 1.3-1 & 1.3-3  
 lb/Mgal \* Diesel Fuel Rate (gal/hr) / 1,000  
 lb/Mgal \* Fuel Consumption (gal/yr) / 1,000  
 Divide ( ) by 2,000

<sup>3</sup> Assumed the weight % of sulfur in distillate oil is 0.05% to calculate the SO<sub>2</sub> emission factor.  
<sup>4</sup> Assumed the emission factors to be the same for PM10 and TSP emissions.

Based on AP-42 Emission Factors

HCOH	Benzene	Toluene	Naphthalene	Xylene	Ethylbenzene	Total HAPs
3.30E-02	2.14E-04	6.20E-03	1.11E-03	1.09E-04	6.36E-05	lb/Mgal
1.5E-03	9.7E-06	2.8E-04	5.1E-05	4.9E-06	2.9E-06	lb/hr
1.2E-01	8.1E-04	2.3E-02	4.3E-03	4.1E-04	2.4E-04	ton/yr

AP-42 Table 1.3-9



# Sellers ENGINEERING CO.

DANVILLE, KY.

## Sellers BOILER

MODEL NUMBER

SY-150-S

MAX. DESIGN PRESS.

150 PSI

SERIAL NUMBER

104097

A.S.M.E. NUMBER

13575

NATIONAL BOARD NO.

11390

INPUT - BTU/HR.

6,277,000

KIND OF FUEL

NATURAL GAS

FUEL SUPPLY PRESSURE

2 PSI

OUTPUT - BTU/HR.

5,022,000

CAPACITY

LBS. STEAM/HR  
FROM AND AT 212° F

MOTOR

10 H.P.

ELECTRICAL CHARACTERISTICS

VOLTS

460

HERTZ

60

PHASE

3

ASSEMBLY TOTAL MAX. AMPS

20.4

WIRING DIAGRAM NUMBER

GO-J050361

CONTROL CIRCUIT IS 120V, 60HZ, 1PH

MINIMUM CIRCUIT CAPACITY

Flame Control Panel

MFG DATE

5-11-09

Short Circuit      kva rms sym  
     volts max

ENCLOSURE TYPE

1

Lovlace Respiratory Research Institute (LRR) South

Unit: BH-009  
 Maker: Hurst  
 Model: 1200511  
 Description: Boiler, natural gas and diesel fuel fired  
 Serial Number: 51250-125W-2

Natural Gas

Fuel Consumption 10.00 MMBtu/hr Input heat rate  
 Fuel heat value 1000 Btu/scf Nominal LHV of fuel gas  
 Hourly fuel usage 10.0 Mscf/hr Fuel usage  
 Annual fuel usage 872.6 MMBtu/yr  
 Operating hours 8760.0 hr/yr therefore uncontrolled and controlled emissions are the same

Based on AP-42 Emission Factors

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	PM
	100	84	5.5	7.6	7.6
	98.0	82.4	5.4	7.5	7.5
	1.0	0.8	0.054	0.07	0.07
<b>Total</b>	<b>0.98</b>	<b>0.82</b>	<b>0.054</b>	<b>0.14</b>	<b>0.075</b>
	4.3	3.6	0.24	0.63	0.33

Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)  
 Adjusted emission factor: EFF X (Fuel Heat Value/1,020 Btu/scf)  
 lb/MMscf \* (Mscf/hr / 1000 Mscf/1 MMscf)  
 Pipe line specification

<sup>1</sup>SO<sub>2</sub> emissions are calculated based on fuel consumption and fuel H<sub>2</sub>S concentration of 50 gr/Miscd.  
 SO<sub>2</sub> calculation assumes 100% conversion of fuel elemental sulfur to SO<sub>2</sub>.

HCOH	Benzene	Toluene	n-Hexane	Naphthalene	Total HAPs
0.00073	2.28E-05	0.0176	0.00E+00	0.0260	lb/hr
0.00320	1.00E-04	0.0773	0.00E+00	0.114	tpy

GRI-HAPCalc  
 GRI-HAPCalc

Diesel Fuel

Fuel Consumption 7.560 gal/yr (Worst Case Scenario: the maximum permitted 7,560 gal/yr of diesel is consumed by this boiler, i.e. all the other four (4) are offline.)  
 Diesel Energy Content 139,000 Btu/gal = 0.139 MMBtu/gal Engineering estimate  
 Boiler Heat Input 10.0 MMBtu/hr  
 Diesel Consumption Rate 72 gal/hr Boiler Heat Input (MMBtu/hr) / by Diesel Energy Content (Btu/gal)  
 Max Hours per year 105 hr Fuel Consumption (gal/yr) / Diesel Consumption Rate (gal/hr)

Based on AP-42 Emission Factors

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	TSP <sup>4</sup>	PM <sup>4</sup>
	20	5	0.34	7.1	2	2
<b>Total</b>	<b>1.4</b>	<b>0.36</b>	<b>0.024</b>	<b>0.51</b>	<b>0.14</b>	<b>0.14</b>
	151.2	37.8	2.6	53.7	15.1	15.1
	0.075	0.019	0.0013	0.027	0.0076	0.0076

Unit emission rates from AP-42 Table 1.3-1 & 1.3-3  
 lb/Mgal \* Diesel Fuel Rate (gal/hr) / 1,000  
 lb/Mgal \* Fuel Consumption (gal/yr) / 1,000  
 Divide (1) by 2,000

<sup>3</sup> Assumed the weight % of sulfur in distillate oil is 0.05% to calculate the SO<sub>2</sub> emission factor.  
<sup>4</sup> Assumed the emission factors to be the same for PM10 and TSP emissions.

Based on AP-42 Emission Factors

HCOH	Benzene	Toluene	Naphthalene	Xylene	Ethylbenzene	Total HAPs
3.30E-02	2.14E-04	6.20E-03	1.13E-03	1.09E-04	6.36E-05	-
2.4E-03	1.5E-05	4.5E-04	8.1E-05	7.8E-06	4.6E-06	2.9E-03
1.2E-01	8.1E-04	2.3E-02	4.3E-03	4.1E-04	2.4E-04	1.5E-01

AP-42 Table 1.3-9



1915

CERTIFIED BY



1200511

JOB NUMBER

PO. DRAWER 530 - 21971 US HWY 319 N.  
COOLIDGE, GEORGIA 31738  
[www.hurstboiler.com](http://www.hurstboiler.com)

125 WATER

MAX. W.P. P.S.I.

10000MBH

MIN. SAFETY VALVE/HR

S1250-125W-8

MFG. SERIAL NO.

NA

STEAM LBS./HR.

1250

HTG. SURF. SQ. FT.

2012

YEAR BUILT

MAX. WATER TEMP. 250° F.

Lovelace Respiratory Research Institute (LRRRI) South

Unit: Thermal Oxidizer  
 Maker: Moco  
 Model: IBD  
 Description: Thermal Oxidizer with maximum yearly rate of 2,000 hrs.  
 Serial Number: 6571-T100

**Reboiler Fuel Usage**  
 Fuel Consumption 2.00 MMBtu/hr Input heat rate  
 Fuel heat value 1000 Btu/scf Nominal LHV of fuel gas  
 Hourly fuel usage 2.0 Mscf/hr Fuel usage  
 Annual fuel usage 4.0 MMsfc/yr Annual usage  
 Uncontrolled Operating hrs 8760.0 hr/yr LRRRI process knowledge  
 Controlled Operating hrs 2000.0 hr/yr

Based on AP-42 Emission Factors

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub> <sup>1</sup>	PM
	100	84	5.5		7.6
	98.0	82.4	5.4		7.5
	0.20	0.16	0.011		0.01
				50	
<b>Total</b>	<b>0.20</b>	<b>0.16</b>	<b>0.011</b>	<b>0.029</b>	<b>0.015</b>
	<b>0.86</b>	<b>0.72</b>	<b>0.047</b>	<b>0.13</b>	<b>0.065</b>
	<b>0.20</b>	<b>0.16</b>	<b>0.011</b>	<b>0.029</b>	<b>0.015</b>

Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)  
 Adjusted emission factor: EFF X (Fuel Heat Value/1,020 Btu/scf)  
 lb/MMscf \* (Mscf/hr / 1000 Mscf/1 MMsfc)

gr Total Sulfur Pipeline specification

Uncontrolled  
 Controlled

<sup>1</sup>SO<sub>2</sub> emissions are calculated based on fuel consumption and fuel H<sub>2</sub>S concentration of 50 gr/Mscf.  
 SO<sub>2</sub> calculation assumes 100% conversion of fuel elemental sulfur to SO<sub>2</sub>.

HCOH	Benzene	Toluene	n-Hexane	Total HAPs
0.000023	0.00E+00	0.00E+00	0.00080	0.0012
0.000044	0.00E+00	0.00E+00	0.015	0.023
0.000010	0.00E+00	0.00E+00	0.0035	0.0052

GRI-HAPCalc

GRI-HAPCalc

Uncontrolled  
 Controlled



**AUTOMATIC  
EQUIPMENT MAY OPERATE  
WITHOUT WARNING**

QSS3025 © Elned Co., 8160, NY 14240

**ZMOCO** THERMAL INDUSTRIES

MICHIGAN OVEN DIVISION  
DRYING SYSTEMS DIVISION

ROMULUS, MICHIGAN 48174-0336

SERIAL NO. 6571-T1100

V. 480 PH. 3 HZ. 60

GAS PRESSURE 100 PSIG TEMP. MAX. 1500

MAX. GAS DEMAND 640 CFH

INSURANCE CARRIER  IRI  FM  OTHER  
 NONE  GAL/BATCH  GAL/HOUR



**CAUTION**



## **Supporting Information**

Table 3.4-1. GASEOUS EMISSION FACTORS FOR LARGE STATIONARY DIESEL AND ALL STATIONARY DUAL-FUEL ENGINES<sup>a</sup>

Pollutant	Diesel Fuel <sup>b</sup> (SCC 2-02-004-01)			Dual Fuel <sup>b</sup> (SCC 2-02-004-02)		
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING
NO <sub>x</sub>						
Uncontrolled	0.024	3.2	B	0.018	2.7	D
Controlled	0.013 <sup>c</sup>	1.9 <sup>c</sup>	B	ND	ND	NA
CO	5.5 E-03	0.85	C	7.5 E-03	1.16	D
SO <sub>x</sub> <sup>d</sup>	8.09 E-03S <sub>1</sub>	1.01S <sub>1</sub>	B	4.06 E-04S <sub>1</sub> + 9.57 E-03S <sub>2</sub>	0.05S <sub>1</sub> + 0.895S <sub>2</sub>	B
CO <sub>2</sub> <sup>e</sup>	1.16	165	B	0.772	110	B
PM	0.0007 <sup>c</sup>	0.1 <sup>c</sup>	B	ND	ND	NA
TOC (as CH <sub>4</sub> )	7.05 E-04	0.09	C	5.29 E-03	0.8	D
Methane	f	f	E	3.97 E-03	0.6	E
Nonmethane	f	f	E	1.32 E-03	0.2 <sup>g</sup>	E

<sup>a</sup> Based on uncontrolled levels for each fuel, from References 2.6-7. When necessary, the average heating value of diesel was assumed to be 19,300 Btu/lb with a density of 7.1 lb/gallon. The power output and fuel input values were averaged independently from each other, because of the use of actual brake-specific fuel consumption (BSFC) values for each data point and of the use of data possibly sufficient to calculate only 1 of the 2 emission factors (e. g., enough information to calculate lb/MMBtu, but not lb/hp-hr). Factors are based on averages across all manufacturers and duty cycles. The actual emissions from a particular engine or manufacturer could vary considerably from these levels. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/l, multiply by 430. SCC = Source Classification Code.

<sup>b</sup> Dual fuel assumes 95% natural gas and 5% diesel fuel.

<sup>c</sup> References 8-26. Controlled NO<sub>x</sub> is by ignition timing retard.

<sup>d</sup> Assumes that all sulfur in the fuel is converted to SO<sub>2</sub>. S<sub>1</sub> = % sulfur in fuel oil; S<sub>2</sub> = % sulfur in natural gas. For example, if sulfur content is 1.5%, then S = 1.5.

<sup>e</sup> Assumes 100% conversion of carbon in fuel to CO<sub>2</sub> with 87 weight % carbon in diesel, 70 weight % carbon in natural gas, dual-fuel mixture of 5% diesel with 95% natural gas, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and natural gas heating value of 1050 Btu/scf.

<sup>f</sup> Based on data from 1 engine, TOC is by weight 9% methane and 91% nonmethane.

<sup>g</sup> Assumes that nonmethane organic compounds are 25% of TOC emissions from dual-fuel engines. Molecular weight of nonmethane gas stream is assumed to be that of methane.

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO<sub>x</sub>) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION<sup>a</sup>

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO <sub>x</sub> <sup>b</sup>		CO	
	Emission Factor (lb/10 <sup>6</sup> scf)	Emission Factor Rating	Emission Factor (lb/10 <sup>6</sup> scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS) <sup>c</sup>	280	A	84	B
Uncontrolled (Post-NSPS) <sup>c</sup>	190	A	84	B
Controlled - Low NO <sub>x</sub> burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO <sub>x</sub> burners	50	D	84	B
Controlled - Low NO <sub>x</sub> burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

<sup>a</sup> Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from lb/10<sup>6</sup> scf to kg/10<sup>6</sup> m<sup>3</sup>, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from lb/10<sup>6</sup> scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

<sup>b</sup> Expressed as NO<sub>x</sub>. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO<sub>x</sub> emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO<sub>x</sub> emission factor.

<sup>c</sup> NSPS = New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION<sup>a</sup>

Pollutant	Emission Factor (lb/10 <sup>6</sup> scf)	Emission Factor Rating
CO <sub>2</sub> <sup>b</sup>	120,000	A
Lead	0.0005	D
N <sub>2</sub> O (Uncontrolled)	2.2	E
N <sub>2</sub> O (Controlled-low-NO <sub>x</sub> burner)	0.64	E
PM (Total) <sup>c</sup>	7.6	D
PM (Condensable) <sup>c</sup>	5.7	D
PM (Filterable) <sup>c</sup>	1.9	B
SO <sub>2</sub> <sup>d</sup>	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

<sup>a</sup> Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from lb/10<sup>6</sup> scf to kg/10<sup>6</sup> m<sup>3</sup>, multiply by 16. To convert from lb/10<sup>6</sup> scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

<sup>b</sup> Based on approximately 100% conversion of fuel carbon to CO<sub>2</sub>. CO<sub>2</sub>[lb/10<sup>6</sup> scf] = (3.67) (CON) (C)(D), where CON = fractional conversion of fuel carbon to CO<sub>2</sub>, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2x10<sup>-4</sup> lb/10<sup>6</sup> scf.

<sup>c</sup> All PM (total, condensable, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM<sub>10</sub>, PM<sub>2.5</sub> or PM<sub>1</sub> emissions. Total PM is the sum of the filterable PM and condensable PM. Condensable PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

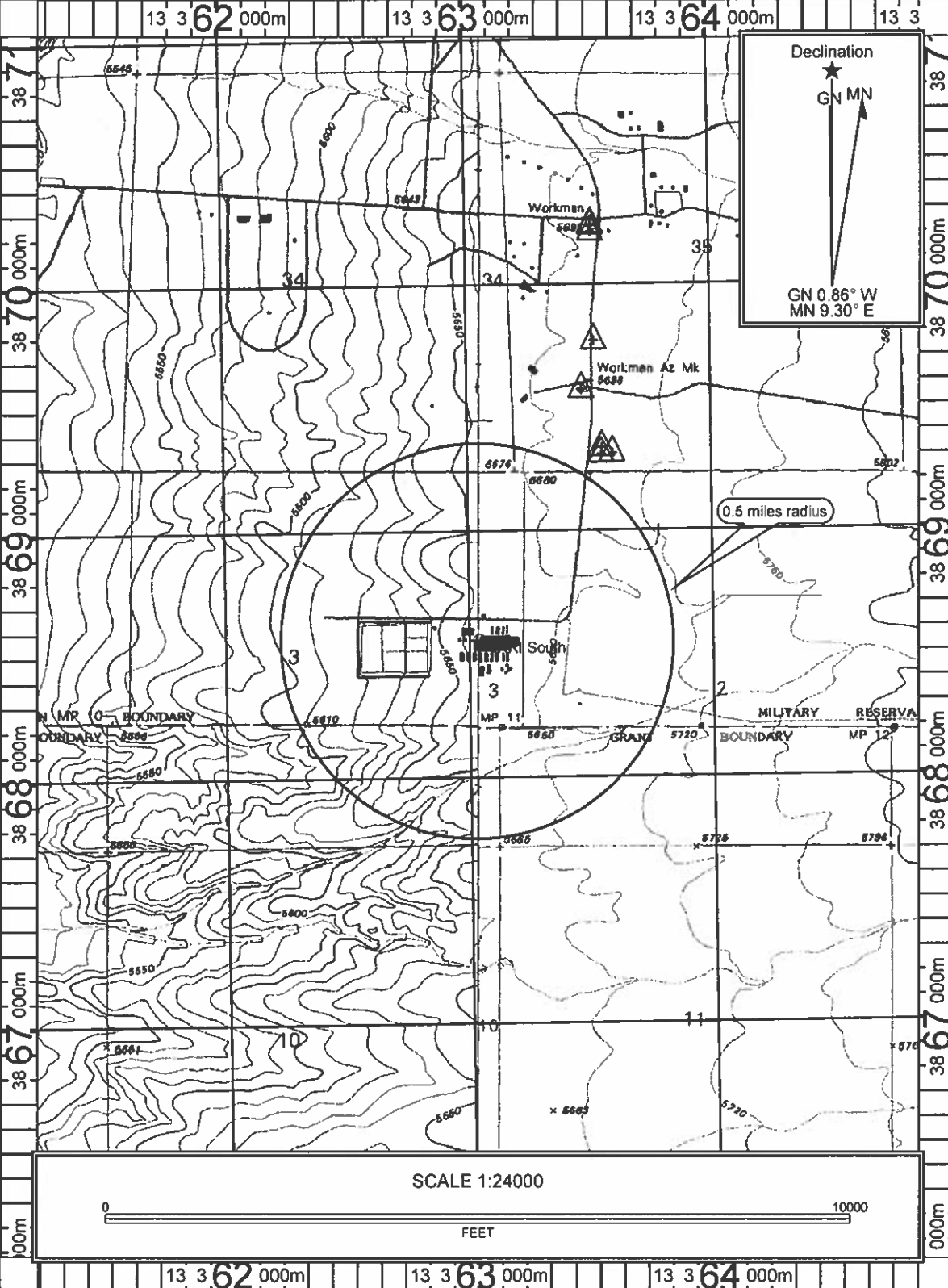
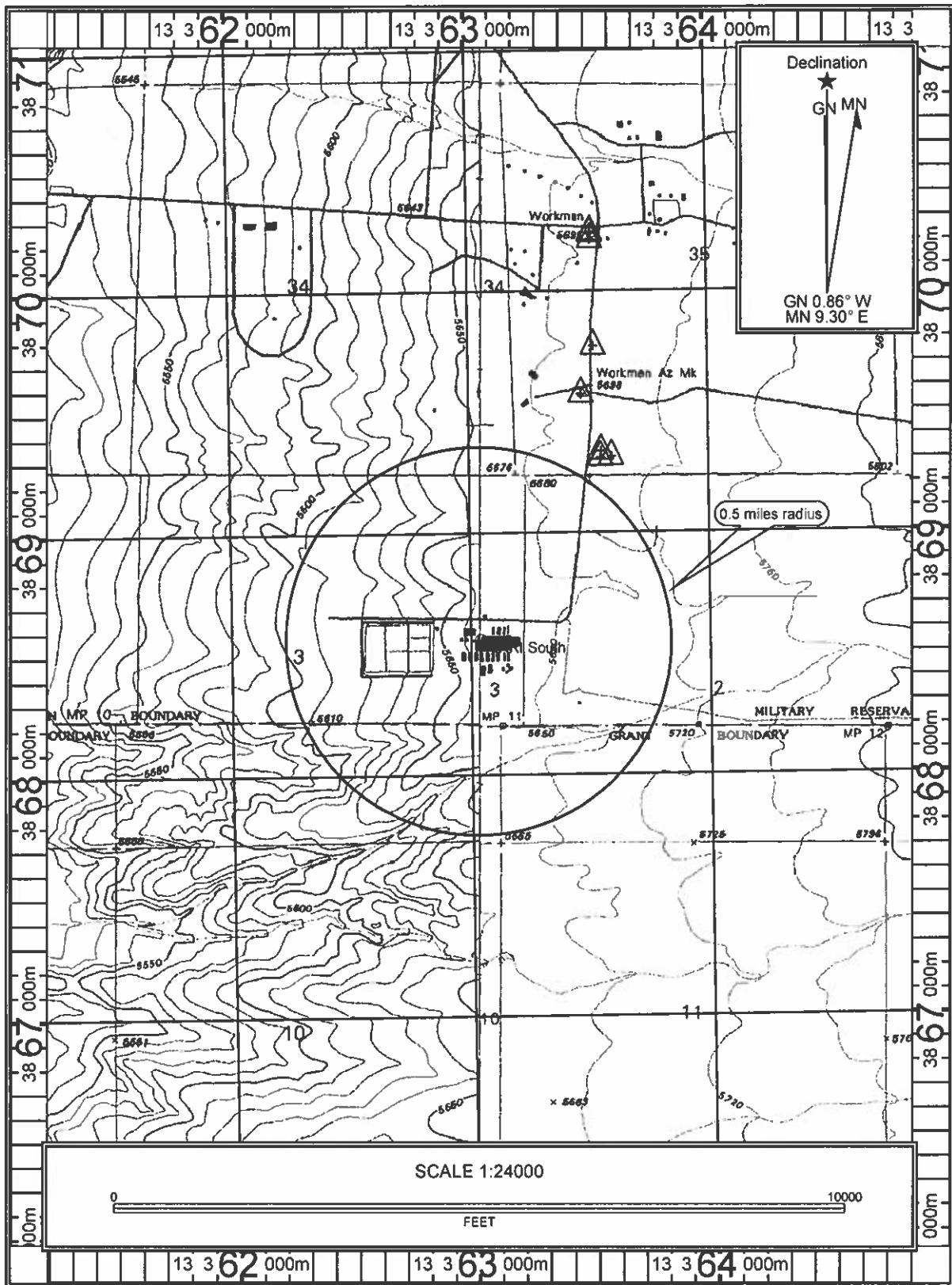
<sup>d</sup> Based on 100% conversion of fuel sulfur to SO<sub>2</sub>.

Assumes sulfur content is natural gas of 2,000 grains/10<sup>6</sup> scf. The SO<sub>2</sub> emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO<sub>2</sub> emission factor by the ratio of the site-specific sulfur content (grains/10<sup>6</sup> scf) to 2,000 grains/10<sup>6</sup> scf.

Table 1.3-1. (cont.)

Firing Configuration (SCC) <sup>a</sup>	SO <sub>2</sub> <sup>b</sup>		SO <sub>x</sub> <sup>c</sup>		NO <sub>x</sub> <sup>d</sup>		CO <sup>e</sup>		Filterable PM <sup>f</sup>	
	Emission Factor (lb/10 <sup>3</sup> gal)	EMISSION FACTOR RATING	Emission Factor (lb/10 <sup>3</sup> gal)	EMISSION FACTOR RATING	Emission Factor (lb/10 <sup>3</sup> gal)	EMISSION FACTOR RATING	Emission Factor (lb/10 <sup>3</sup> gal)	EMISSION FACTOR RATING	Emission Factor (lb/10 <sup>3</sup> gal)	EMISSION FACTOR RATING
<b>Boilers &lt; 100 Million Btu/hr</b>										
No. 6 oil fired (1-02-004-02/03) (1-03-004-02/03)	157S	A	2S	A	55	A	5	A	9.19(S)+3.22 <sup>g</sup>	B
No. 5 oil fired (1-03-004-04)	157S	A	2S	A	55	A	5	A	10 <sup>h</sup>	A
No. 4 oil fired (1-03-005-04)	150S	A	2S	A	20	A	5	A	7	B
<b>Distillate oil fired</b> (1-02-005-02/03) (1-03-005-02/03)	142S	A	2S	A	20	A	5	A	2	A
Residential furnace (A2104004/A2104011)	142S	A	2S	A	18	A	5	A	0.4 <sup>i</sup>	B

- a To convert from lb/103 gal to kg/103 L, multiply by 0.120. SCC = Source Classification Code.
- b References 1-2,6-9,14,56-60. S indicates that the weight % of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S = 1.
- c References 1-2,6-8,16,57-60. S indicates that the weight % of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S = 1.
- d References 6-7,15,19,22,56-62. Test results indicate that at least 95% by weight of NO<sub>x</sub> is NO for all boiler types except residential furnaces, where about 75% is NO. For utility vertical fired boilers use 105 lb/103 gal at full load and normal (>15%) excess air. Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are related to fuel nitrogen content, estimated by the following empirical relationship: lb NO<sub>2</sub>/103 gal = 20.54 + 104.39(N), where N is the weight % of nitrogen in the oil. For example, if the fuel is 1% nitrogen, then N = 1.
- e References 6-8,14,17-19,56-61. CO emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.
- f References 6-8,10,13-15,56-60,62-63. Filterable PM is that particulate collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train. Particulate emission factors for residual oil combustion are, on average, a function of fuel oil sulfur content where S is the weight % of sulfur in oil. For example, if fuel oil is 1% sulfur, then S = 1.
- g Based on data from new burner designs. Pre-1970's burner designs may emit filterable PM as high as 3.0 lb/103 gal.
- h The SO<sub>2</sub> emission factor for both no. 2 oil fired and for no. 2 oil fired with LNB/FGR is 142S, not 157S. Errata dated April 28, 2000. Section corrected May 2010.
- i The PM factors for No.6 and No. 5 fuel were reversed. Errata dated April 28, 2000. Section corrected May 2010.



Map Name: MT WASHINGTON  
 Scale: 1 inch = 2,000 ft.  
 Horizontal Datum: WGS84  
 Print Date: 11/09/16  
 Map Center: 13 0363034 E 38685

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Access Rd, Albuquerque, NM 87115

Type your notes here.LRRI South Facility, Bldg  
9217 Kirtland AFB - East  
34.949829, -106.499252



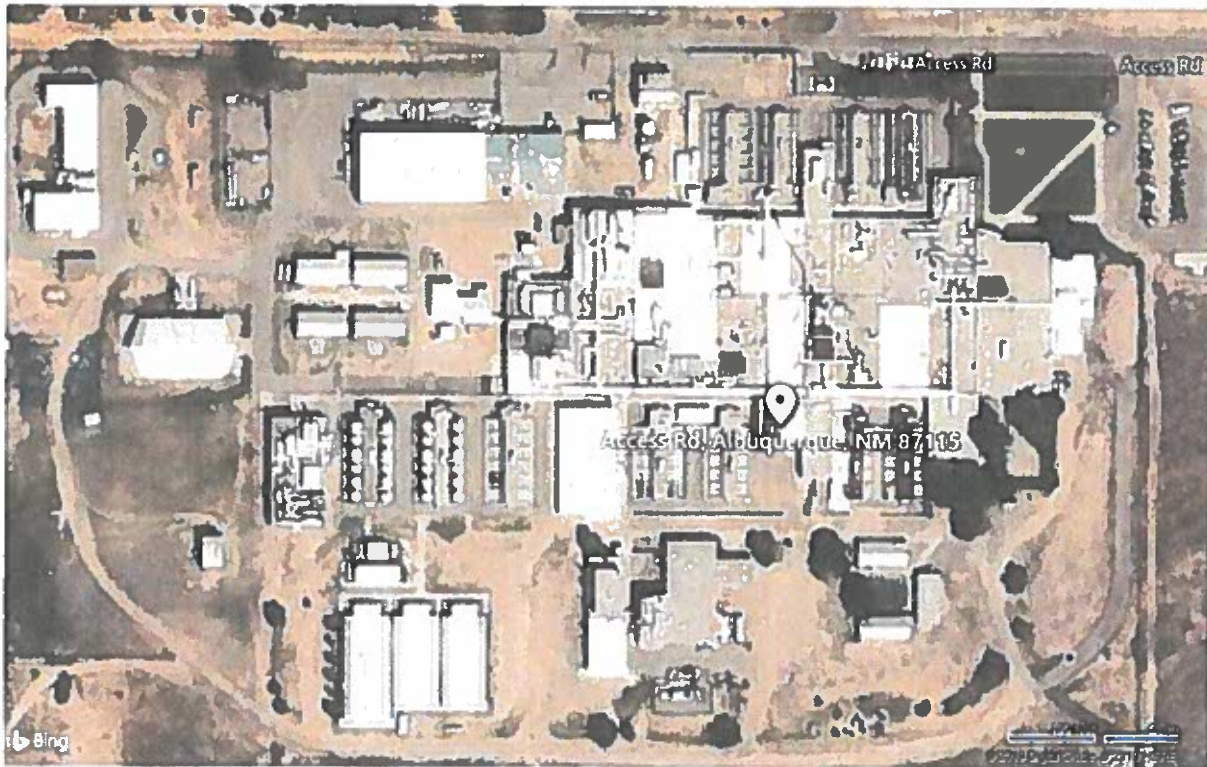


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34.949829, -106.499252





## LOVELACE RESPIRATORY RESEARCH INSTITUTE

SOP No.: CEM-1668.5

Page 1 of 9

Title: **Facility Steam Boiler/Hot Water Boiler Preventive Maintenance**

### 1 Purpose

This standard operating procedure (SOP) describes Central Engineering (CE) requirements for servicing steam boilers (BS or BSN; the "N" signifies North Campus) and hot water boilers (BH or BHN) in both north and south campuses. Steam boilers are used to provide steam for humidification to animal rooms, steam to autoclaves, and steam to the hot water generators that supply the cage wash with hot water.

Hot water boilers are used to supply the building with hot water.

During normal operation, the equipment should be routinely checked for proper and efficient operation, leaks, vibrations, correct steam pressures on steam boilers and correct water temperatures on hot water boilers, and unclean surfaces.

### 2 Responsibilities

#### 2.1 Facilities Management (Lead Technician's Director and Associate Director)

- Ensures that preventive maintenance is completed on each boiler once per year. Consult the PM chart in the Central Engineering Department for the schedule.
- Sends a Utility Shutdown Notice to effected areas prior to work and another notice that the service has been completed and the equipment has been returned to service.
- Ensures that certain boilers at the South Facility are started on diesel quarterly. Consult the PM chart in the Central Engineering Department for the schedule.
- Supervises Steam Boiler preventive maintenance (PM) servicing activities.
- Reviews the completed Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist (available on LRRINET).
- Updates this SOP as required.
- Sends the completed Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist and Service request to the Facilities Supervisors who then files it in the Central Engineering File 2.3.4.7, Facility Steam Boiler/Hot Water Boiler Preventive Maintenance.

#### 2.2 Maintenance Technician

- A Qualified Technician holds a New Mexico Boiler Operators license, BO2 as a minimum.
- Obtains a current copy of the Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist from LRRINET.
- Obtains a current copy of the boiler equipment list from the Facilities Supervisors.
- Schedules the boiler PM services with the Facilities Supervisor before performing any work
- Performs the boiler PM services work.

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SOP No.: CEM-1668.5

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**Title: Facility Steam Boiler/Hot Water Boiler Preventive Maintenance**

- Provides completed Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist and service request to the Facilities Supervisor.
- Submits a Facilities Work Request for any extra work on the boilers outside of the PM work.
- Discusses any SOP discrepancies noted with the Facilities Supervisor.
- Follows applicable EHS procedures.

### **2.3 Facilities Management (Lead Technician's Director and Associate Director) initiates a service request for the preventive maintenance using the Facilities Work Request system.**

- Initiates a service request for the diesel startup using the Facilities Work Request system.
- Updates the steam boiler Equipment List and Facility Steam Boiler/Hot Water Boiler Preventive Checklist after servicing has been completed.

**NOTE:** Updates must be approved by the Facilities Supervisor.

- Files the completed Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist and service request in the Central Engineering file 2.3.4.7, Facility Steam Boiler/Hot Water Boiler Preventive Maintenance.

### **3 Scope**

This SOP applies to all the steam and hot water boilers in the north and south campuses of LRRRI (reference BS, BH, BSN, and BHN equipment list for locations). The "N" signifies North campus.

### **4 Precautions**

Precautions for the fire tube and water tube boilers include the following:

- Receive LRRRI Environmental, Health and Safety (EHS) lockout/tagout training (if you have not completed this training or your training is not current). Follow LRRRI EHS Manual, Chapter 13, Lockout/Tagout Program.
- Perform lockout/tagout on all energy sources as documented on the Multiple Energy Source Equipment Lockout Template found on each piece of equipment. If no template is found, perform lockout/tagout on electrical sources.
- Relieve steam boiler of any latent steam pressure.
- If entry into a boiler is required, an EHS service request is required. Contact EHS for assistance with an assessment for confined space and the associated hazards.

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Title: **Facility Steam Boiler/Hot Water Boiler Preventive Maintenance**

### **5 Materials**

- Current printout of the PM checklist for the boiler being serviced-
- Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist.
- Repair parts (as needed).

### **6 Preventive Maintenance Procedures**

#### **6.1 Hot Water Fire Tube Boiler and Fire Tube Steam Boiler Procedures (these are located at the South Campus rooms 325A, B & C only BH-003, Bh-005, BH-009, BS-005, BS-006, BS-007)**

- Lock out tag out (LOTO) all energy supplies: electric, fuel, steam or water, in or out and chemical supply.
- For steam boiler, release all steam pressure and allow the boiler to cool down. Drain vessel completely of water.
- For hot water boiler, allow the boiler to cool down and drain vessel completely of water.
- Remove all hand holes and manhole plates and flush out the boiler vessel thoroughly using a high-pressure hose. Place the hose through the top and the bottom openings to make sure all loose scale and sediment are washed out of the shell.
- Remove plug from cross section below the water column and clean out the line into the boiler. Clean out bowl of float-type, low-water cutoff assemblies.
- After washing out the boiler vessel, examine the heating surface thoroughly for signs of corrosion, pitting, or scale. Record condition on PM Checklist and submit a service request if needed.
- Install new hand hole and manhole gaskets when closing up the boiler vessel.
- Remove and clean all electrodes. Fuel lines are marked RED for supply and WHITE for return. If the fuel lines are disturbed in this work, reconnection must be verified by a Facilities manager.
- Examine all electric motors and circuits, tighten loose connections, clean cooling vents on motors and ensure the control cabinets close properly.
- Check the boiler tubes and remove heat extractors and punch the tubes with a flue brush, then vacuum.
- Examine burner nose cone insulation on continental boiler. If any flaking or cracking has caused loose spots, the insulation should be serviced by an outside boiler contractor and document on check list and submit a Facilities Work Request.

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Title: **Facility Steam Boiler/Hot Water Boiler Preventive Maintenance**

**NOTE:** If there is soot build up in the boiler tubes, this is evidence of improper combustion. Note this on the checklist and enter a Service Request for air/fuel mixture adjustment by a contractor.

- Refill the boiler with water, return chemical feed lines to normal operation
- Remove all lockout Tag out devices once all PM procedures are completed and restart Boiler to normal operation

### 6.2 North Facility Water Tube Steam Boiler Procedures

- Allow hot water boiler to cool down.
- Drain boiler.
- Examine the venting system and check all joints and pipe connections for tightness, corrosion, or deterioration.
- Remove inspection ports located at both ends of the boiler to examine the tubes for scale or sediment accumulation.
- Remove external side panels to access copper tubes.
- Check external sides of the copper tubes, should be free of any soot deposits. Remove any abnormal deposits and correct the cause.

**NOTE:** If there is soot build up on the boiler tubes, this is evidence of improper combustion. Submit a work request, document the work request number on the checklist and contact contractor for repair.

- Clean burner heads of any foreign matter inspect ignition system for pitting and wear.
- Check float low water cutoff contacts and float ball for proper operation.
- Check low water probe and clean if needed.
- Clean sight glass replace sight glass seals. Reinstall sight glass.
- Start up boiler using final checks (see below).

### 6.3 Lochinvar Heating Hot Water Boilers, North Facility, Building 14

- Lockout/tagout gas and electrical, and water valves to boiler.
- Allow boiler to cool down.
- Check for water leaks; check combustion air openings.
- Check all wiring and connections.
- Inspect and clean hex if needed, inspect and clean burners.
- Inspect HEX (heat exchanger) water ways; check fire brick and fire box insulation replace if needed.
- Check burner patterns.

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Title: **Facility Steam Boiler/Hot Water Boiler Preventive Maintenance**

- Check for proper operation.
- Start up boiler (see Section 6.5 below).

### 6.4 Ajax Boiler North Facility, Building 20

- Lockout/tagout boiler and circulation pump.
- Allow boiler to cool.
- Close water isolation valves to boiler.
- Drain boiler
- Remove front and rear head plates and inspect tubes.
- Inspect water columns, brush tubes clean of any build up. Reinstall head plates and replace gaskets if needed.
- Check and clean burners.
- Inspect refractory; repair if needed.
- Inspect ignition system for pitting and wear.
- Tighten all electrical connections.
- Clean burner heads and orifices of foreign matter by brushing with a steel brush.
- Remove all lockout /tag out devices
- Start boiler. Check boiler for proper operation

### 6.5 Building 9218 Electric Steam Boiler

- Lockout/tagout electrical and water to steam boiler.
- Allow steam boiler to cool.
- Open boiler drain valve; drain boiler of water.
- Remove shell wrapper and end caps. Disconnect wires from elements; label wires for reinstallation.
- Remove elements after removing the (8) retaining bolts.
- Using a steel wire brush, remove scale and foreign matter from elements.
- Clean/remove scale deposited inside boiler.
- When cleaning is complete, replace flange gaskets reinstall elements and reinstall wiring.
- Reinstall caps and shell wrapper.
- Check all electrical connections for loose or weak connections. Tighten and/or replace if needed.

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Title: **Facility Steam Boiler/Hot Water Boiler Preventive Maintenance**

- Replace sight glass seals.
- Inspect pump control and low water cut off for proper operation. Adjust or repair if needed.
- Close boiler drain.
- Open hand valve on the boiler; allow water to fill to the lower nut on the sight glass and close valve.
- Check for water leaks
- Turn on main disconnect first.
- Remove lockout/tagouts from equipment.
- Start Boiler Turn low voltage power on. Turn on boiler switch.
- Check for proper operation.

### 6.6 Final Checks for Fire Tube Boilers, Water Tube Boilers, and Electric Steam Boiler

- To put the boiler back into service, install new manhole covers and hand hole gaskets as needed when closing up the boiler.
- Remove lockout/tagout from equipment.
- Turn on all power and all water to the steam boiler supply and to the hot water boiler supply.
- Refill the unit to proper water level.
- Raise steam pressure slowly on steam boilers; on hot water boilers, bring up to temperature slowly, and tighten up on all man hole and hand hole plates with a wrench while the boiler is warming up.
- Conduct a post-maintenance check on the boiler by turning on the system and observing it for any abnormalities.
- On water tube boilers, remove the pilot shield and visually check the main burner and pilot burner flames for normal flame color (blue) without yellow tips. The flame should have a well-defined inner cone and with no flame lifting.
- Document problems by submitting a separate Facilities Work Request and document the work request number on the checklist.
- Document the completion of service by signing your initials and the service date at the end of the Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist.
- Submit the completed Facilities Work Request and checklist to the Facilities Supervisors for review.

### 6.7 Unscheduled Maintenance or Repairs

For unscheduled maintenance repairs, perform the following:

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Title: **Facility Steam Boiler/Hot Water Boiler Preventive Maintenance**

- The Maintenance Crafts Person submits a Facilities Work Request for the extra repairs. Document the service request number on the checklist under the "Comments" section.
- The Maintenance Crafts Person then completes the maintenance repairs in accordance with the work request. Some repairs will require an outside contractor to complete.
- The Maintenance Crafts Person completes the service documentation and submits completed Facilities Work Request to the Facilities Supervisor.
- The Facilities Management (Lead Technician Director and Associate Director) reviews the completed Facilities Work Request
- The Facilities Management (Lead Technician Director and Associate Director) files the completed Facilities Work Request in the appropriate equipment file.

### 6.8 Diesel Start Up Procedures

- Steam and Hot Water boilers are started up on diesel every quarter to ensure that during a gas shut down they operate correctly on diesel.
- Ensure diesel tank TF-018 contains enough fuel. Open the corresponding manifold valve.
  - If there is not enough fuel, contact Facilities Instrument and Controls Technician to fill up the tank.
- Turn off boiler.
- Shut down main natural gas valve to boiler.
- Turn on diesel fuel valve.
- Turn on the LP (propane) gas for the igniters. The LP gas tank is located on the west side of 9201G.
  - **For Steam Boilers – BS-005, BS-006, BS-007: Only**
    - Move fuel select switch from natural gas to diesel fuel.
    - Press start switch.
    - Run on diesel fuel for at a minimum of 1 hour.
  - **For Hot water Boilers –BH-003, BH-005, BH-009: Only**
    - Move control panel switch from gas to oil.
    - Turn on supply and return fuel valves. If a boiler has an automated control and needs to be turned on using the FMS system; work with Facilities Instrument and Controls Technician.
    - Press Reset button.
    - Run on diesel fuel for a minimum of 1 hour.

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Title: Facility Steam Boiler/Hot Water Boiler Preventive Maintenance

- After boiler has run on diesel fuel for a minimum of 1 hour, turn off the boiler and perform the above-listed procedures in reverse order.

### 7 References

- LRRRI EHS Manual, Chapter 13, Lockout/Tagout Program
- Facility Steam Boiler/Hot Water Boiler Preventive Maintenance Checklist (on LRRINET)

### 8 Calculations and Formulas

Not Applicable

### 9 Appendices

None

### 10 Version History and Change Summary

Version	Summary
0	New SOP initiated.
1	Changed PM schedule to once per year. There will be quarterly PMs on different boilers to spread out the work. Added Electric Boiler.
2	Added procedures for starting boilers on diesel quarterly.
3	Added clarification for fire tube boilers, clarified some procedures to ensure they are correct. Changed BS and BH to boiler to include both north and south equipment. Updated checklist to reflect all procedures.
4	Removed the readings and documentation of the SOP prior to performing work. Updated from Administrative Coordinator to Facilities Lead Director and Associate Director.
5	Changed ES&H to EHS. Fuel lines have been marked with RED for supply and WHITE for return. Wording has been changed to reflect current management titles and corrections in the SOP.

### 11 Training Requirements for this SOP

**Awareness:** In order to observe or audit against this SOP, entering a Read and Understood in Training Manager is sufficient. Personnel performing this procedure must have entered a Read and Understood in Training Manager before performing this procedure.

**Knowledge:** On-the-job training (OJT) on this SOP in its entirety is not applicable; however, personnel must have current lockout/tagout training before performing this procedure.

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SOP No.: CEM-1668.5	Page 9 of 9
Title: Facility Steam Boiler/Hot Water Boiler Preventive Maintenance	

### 12 Approval

Approved:  LRRRI Management	Effective Date: 15 MAY 2017 Date: 27 APR 2017
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## LOVELACE RESPIRATORY RESEARCH INSTITUTE

SOP No.: CEM-1747.4

Page 1 of 5

Title: **Servicing Standby Generators**

### 1 Purpose

The purpose of this standard operating procedure (SOP) is to describe the procedures for standby generator servicing to ensure all facility standby generators operate reliably when required. Servicing is performed to eliminate potential problems that could cause the standby generators not to run when required. This procedure represents best business practices to ensure that studies run smoothly and that all power functions are maintained. Because this equipment could impact GLP studies, it is required to have an associated SOP per 21 CFR 58, Good Laboratory Practice for Nonclinical Laboratory Studies.

### 2 Responsibilities

- **Facilities Management.(Director, or Lead Technician)**
  - Supervises standby generator servicing.
  - Ensures their servicing is completed annually. Updates this SOP as required.
  - Updates the standby generator equipment list at the completion of servicing, per updates approved by the Facilities Operation Manager.
  - Files the completed contractor servicing report and/or Standby Generator Equipment PM Checklist in the Central Engineering File 2.3.8.23, Standby Generator PM.
  -
- **Maintenance Technician**
  - Reviews this SOP prior to starting standby generator servicing.
  - Contacts a certified diesel generator repair outside contractor to schedule the generator servicing.
  - Reviews the generator (GS-Standby Generator) equipment list for the current operating generators.
  - If provider checklist is not used the technician Obtains a copy of the Standby Generator Equipment PM Checklist (available on LRRINET). The technician will need one copy of the checklist for each generator serviced.
  - Performs the standby generator service work with the outside contractor. Provides the completed contractor servicing report and/or the Standby Generator Equipment PM Checklist to the Facilities Operation Manager.
  - Discuss any SOP discrepancies noted with technicians and Facilities Management.

### 3 Scope

The Central Engineering facility standby generators are essential mechanical equipment used to maintain required environmental conditions for facility personnel, research animals, and

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## LOVELACE RESPIRATORY RESEARCH INSTITUTE

SOP No.: CEM-1747.4

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Title: **Servicing Standby Generators**

experiments performed at the Institute. They therefore require periodic servicing to ensure operational reliability.

#### 4 Precautions

Enter SOP as read and understood in Training Manager.

#### 5 Materials

Not Applicable

#### 6 Procedures

##### 6.1 General

- Each year, Facilities Management initiates a Service Request to perform the annual standby generator servicing. The Service Request is transmitted to the maintenance technician who will contact the outside contractor to perform the standby generator servicing. The maintenance technician works with the outside contractor on the servicing.
- The Maintenance Technician obtains copy of the Standby Generator Equipment PM Checklist from LRRINET.
- The assigned Maintenance technician, in conjunction with a certified diesel generator repair outside contractor, services and repairs the standby generators.
  - The maintenance technician ensures that the outside contractor locks out and tags out the engine start systems.
  - The maintenance technician and outside contractor then perform the basic checks and records the results on the checklist.
  - When the basic checks are complete, the outside contractor will remove the lockout/tagout from the engine start systems.
  - The maintenance technician with the outside contractor will then perform the operational checks.
  - If repairs to the standby generator requires more then 2 hours beyond the normal servicing time, document the problems on a separate Service Request submitted through the Facility Request System and proceed with the standby generator servicing. Record the Service Request number on the outside contractor servicing report and/or the Standby Generator Equipment PM Checklist.
- The outside contractor and Maintenance Technician document the completion of the service by signing their initials and the service date at the end of each Standby Generator servicing report.
- The Maintenance Technician reviews the completed servicing reports then:

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Title: **Servicing Standby Generators**

- Writes a Service Request for standby generators requiring additional repairs. Record the Service Request number on the outside contractor servicing report and/or the Standby Generator Equipment PM Checklist.
- Submits the completed contractor servicing report and/or the Standby Generator Equipment PM Checklist to the Facilities Operations Manager for review.
- Orders necessary parts to perform the next standby generator servicing.

### 7 References

- A. 21 CFR 58, Good Laboratory Practice for Nonclinical Laboratory Studies
- B. Central Engineering Standby Generator (GS) Equipment Files
- C. Central Engineering Standby Generator (GS) Equipment Index
- D. Standby Generator Equipment PM Checklist(available on LRRINET)
- E. EH&S Manual, Chapter 13, Lockout Tagout Program

### 8 Calculations and Formulas

Not Applicable

### 9 Appendices

None

### 10 Version History and Change Summary

Version	Summary
2	Added the in-house checklist form
3	Corrected titles throughout; moved lockout/tagout training requirement to Section 11. Added regulatory driver statement.
4	Removed reference to retired ESS SOP and added reference to EH&S manual. Changed titles of FO&M Manager to Facilities Management. Removed Administrative Coordinator placing tasks under Facilities Management. Removed requirement to have a hard copy of this SOP in technicians' possession.

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### 11 Training Requirements for this SOP

**Awareness:** In order to observe or audit against this SOP, entering a Read and Understood in Training Manager is sufficient. Personnel performing this procedure must have entered a Read and Understood in Training Manager before performing this procedure.

**Knowledge:** On-the-job training (OJT) on this SOP includes the following:

- F. Receive ES&H lock-out/tag-out training (if this training has not been completed or is not current). Refer to EH&S Manual, Chapter 13, Lockout Tagout Program.

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SOP No.: CEM-1747.4	Page 5 of 5
Title: Servicing Standby Generators	

### 12 Approvals

Approved:  LRRRI Management	Effective Date: 17 Jul 2017 Date: 30 Jul 2017
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