# Lea Power Partners, LLC

# Hobbs Generating Station

## Significant Modification to Title V Permit P-244-R1

**July 2020**

*Prepared for:*

Lea Power Partners, LLC
98 N. Twombly Lane
Hobbs, NM 88240

*Prepared by:*

Alliant Environmental, LLC
7804 Pan American Fwy. NE
Albuquerque, NM 87109

| Mail Application To: | | For Department use only: |
|---|---|---|
| New Mexico Environment Department<br>Air Quality Bureau<br>Permits Section<br>525 Camino de los Marquez, Suite 1<br>Santa Fe, New Mexico, 87505<br><br>Phone: (505) 476-4300<br>Fax: (505) 476-4375<br>www.env.nm.gov/aqb | | AIRS No.: |

# Universal Air Quality Permit Application

## Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well. See Section 1-I for submittal instructions for other permits.

**This application is submitted as** (check all that apply): ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☒ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ a NOI 20.2.73 NMAC ☐ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☒ Title V renewal ☐ TV minor mod. ☒ TV significant mod. TV Acid Rain: ☐ New ☐ Renewal PSD Major Source: ☐ PSD major source (new) ☐ minor modification to a PSD source ☐ a PSD major modification

**Acknowledgements:**
☒ I acknowledge that a pre-application meeting is available to me upon request. ☒ Title V Operating, Title IV Acid Rain, and NPR applications have no fees. ***A pre-application meeting was held on April 30, 2018 at 10:00AM at NMED in Santa Fe, NM.***
☐ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).
☐ Check No.: in the amount of
☒ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.
☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance program (SBEAP) and qualifies for 50% of the normal application and permit fees. Enclosed is a check for 50% of the normal application fee which will be verified with the Small Business Certification Form for your company.
☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance Program (SBEAP) but does not qualify for 50% of the normal application and permit fees. To see if you qualify for SBEAP assistance and for the small business certification form go to https://www.env.nm.gov/aqb/sbap/small_business_criteria.html ).

**Citation:** Please provide the **low level citation** under which this application is being submitted: **20.2.72.200.A.(2) and 20.2.70.404.C. NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

# Section 1 – Facility Information

## Section 1-A: Company Information

| | | AI # if known (see 1st 3 to 5 #s of permit IDEA ID No.): **25726** | Updating Permit/NOI #: **P-244-R1** |
|---|---|---|---|
| 1 | Facility Name: **Hobbs Generating Station** | Plant primary SIC Code (4 digits): **4911** | |
| | | Plant NAIC code (6 digits): **221112** | |
| a | Facility Street Address (If no facility street address, provide directions from a prominent landmark): **98 N. Twombly Lane, Hobbs, NM 88240** | | |
| 2 | Plant Operator Company Name: **Lea Power Partners, LLC** | Phone/Fax: **(575) 397-6701 / (575) 993-5301** | |
| a | Plant Operator Address: **98 N. Twombly Lane, Hobbs, NM 88240** | | |

| | | |
|---|---|---|
| b | Plant Operator's New Mexico Corporate ID or Tax ID: **260471741** | |
| 3 | Plant Owner(s) name(s): **Lea Power Partners, LLC, c/o Mr. David Baugh** | Phone/Fax: **(713) 358-9726 / (713) 358-9730** |
| a | Plant Owner(s) Mailing Address(s): **98 N. Twombly Lane, Hobbs, NM 88240** | |
| 4 | Bill To (Company): **Mr. John Schretlen** | Phone/Fax: **(575) 397-6701 / (575) 993-5301** |
| a | Mailing Address: **98 N. Twombly Lane, Hobbs, NM 88240** | E-mail: **John.Schretlen@naes.com** |
| 5 | ☐ Preparer:<br>☒ Consultant: **Alliant Environmental, LLC** | Phone/Fax: **(505) 205-4819** |
| a | Mailing Address: **7804 Pan American Fwy. NE, Ste 5, Albuquerque, NM 87109** | E-mail: **mschluep@alliantenv.com** |
| 6 | Plant Operator Contact: **Mr. John Schretlen** | Phone/Fax: **(575) 397-6701 / (575) 993-5301** |
| a | Address: **98 N. Twombly Lane, Hobbs, NM 88240** | E-mail: **John.Schretlen@naes.com** |
| 7 | Air Permit Contact: **Mr. John Schretlen** | Title: **Plant Manager** |
| a | E-mail: **John.Schretlen@naes.com** | Phone/Fax: **(575) 397-6701 / (575) 993-5301** |
| b | Mailing Address: **98 N. Twombly Lane, Hobbs, NM 88240** | |

## Section 1-B: Current Facility Status

| | | |
|---|---|---|
| 1.a | Has this facility already been constructed? ☒ Yes ☐ No | 1.b If yes to question 1.a, is it currently operating in New Mexico? ☒ Yes ☐ No |
| 2 | If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application?<br>☐ Yes ☒ No | If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application?<br>☒ Yes ☐ No |
| 3 | Is the facility currently shut down? ☐ Yes ☒ No | If yes, give month and year of shut down (MM/YY): |
| 4 | Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☒ No | |
| 5 | If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972?<br>☐Yes ☐No ☐N/A | |
| 6 | Does this facility have a Title V operating permit (20.2.70 NMAC)?<br>☒ Yes ☐ No | If yes, the permit No. is: **P-244-R1** |
| 7 | Has this facility been issued a No Permit Required (NPR)?<br>☐ Yes ☒ No | If yes, the NPR No. is: |
| 8 | Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☒ No | If yes, the NOI No. is: |
| 9 | Does this facility have a construction permit (20.2.72/20.2.74 NMAC)?<br>☒ Yes ☐ No | If yes, the permit No. is: **PSD-3449-M5R2** |
| 10 | Is this facility registered under a General permit (GCP-1, GCP-2, etc.)?<br>☐ Yes ☒ No | If yes, the register No. is: |

## Section 1-C: Facility Input Capacity & Production Rate

| | | | | |
|---|---|---|---|---|
| 1 | What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required) | | | |
| a | Current | Hourly: **4,054 MMBtu/hr (LHV)** | Daily: **97,296 MMBtu/Day (LHV)** | Annually: **29,707,364 MMBtu/yr (LHV)** |
| b | Proposed | Hourly: **4,430.4 MMBtu/hr (LHV)** | Daily: **106,330 MMBtu/Day (LHV)** | Annually: **38,810,450 MMBtu/yr (LHV)** |
| 2 | What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required) | | | |
| a | Current | Hourly: **604 MW nominal** | Daily: **14,496 MW nominal (Hourly * 24)** | Annually: **5,291,040 MW nominal (Daily * 365)** |
| b | Proposed | Hourly: **634 MW nominal** | Daily: **15,216 MW nominal (Hourly * 24)** | Annually: **5,553,840 MW nominal (Daily * 365)** |

## Section 1-D: Facility Location Information

| | | | | | |
|---|---|---|---|---|---|
| 1 | Section: **24** | Range: **36E** | Township: **18S** | County: **Lea** | Elevation (ft): **3,716** |
| 2 | UTM Zone: ☐ 12 or ☒ 13 | | | Datum: ☐ NAD 27 ☐ NAD 83 ☒ WGS 84 | |
| a | UTM E (in meters, to nearest 10 meters): **658,413 mE** | | | UTM N (in meters, to nearest 10 meters): **3,622,425 mE** | |
| b | **AND** Latitude (deg., min., sec.): **32º 43' 47.07" N** | | | Longitude (deg., min., sec.): **103º 18' 34.6" W** | |
| 3 | Name and zip code of nearest New Mexico town: **Hobbs, NM 88240** | | | | |
| 4 | Detailed Driving Instructions from nearest NM town (attach a road map if necessary): **From Hobbs, drive approximately 8 miles west on the Carlsbad Highway, and turn north just before mile marker 95. Drive north for approximately 1.7 miles passing the Maddox Station on the left, and turn west for 0.3 miles. After passing through an access gate, drive north approximately 0.5 miles to the LPP site location.** | | | | |
| 5 | The facility is **8** miles **West** of **Hobbs, NM**. | | | | |
| 6 | Status of land at facility (check one): ☒ Private ☐ Indian/Pueblo ☐ Federal BLM ☐ Federal Forest Service ☐ Other (specify) | | | | |
| 7 | List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: **Hobbs, Lea County, NM and Gaines County, TX** | | | | |
| 8 | **20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/aqb/modeling/class1areas.html)? ☒ Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: **Texas (23 km)** | | | | |
| 9 | Name nearest Class I area: **Carlsbad Caverns National Park** | | | | |
| 10 | Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): **116.2 km** | | | | |
| 11 | Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: **1,680 m from Maddox Station** | | | | |
| 12 | Method(s) used to delineate the Restricted Area: **Continuous Fencing.**<br><br>"**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. | | | | |
| 13 | Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC?<br>☐ Yes ☒ No<br>A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites. | | | | |
| 14 | Will this facility operate in conjunction with other air regulated parties on the same property? ☒ No ☐ Yes<br>If yes, what is the name and permit number (if known) of the other facility? | | | | |

## Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Facility **maximum** operating ($\frac{hours}{day}$): **24** | ($\frac{days}{week}$): **7** | ($\frac{weeks}{year}$): **52** | ($\frac{hours}{year}$): **8,760** | | |
| 2 | Facility's maximum daily operating schedule (if less than 24 $\frac{hours}{day}$)? | Start: **N/A** | ☐AM ☐PM | End: **N/A** | ☐AM ☐PM | |
| 3 | Month and year of anticipated start of construction: **Start of turbine upgrade project: March 15, 2019** | | | | | |
| 4 | Month and year of anticipated construction completion: **July 7, 2019** | | | | | |
| 5 | Month and year of anticipated startup of new or modified facility: **July 7, 2019** | | | | | |
| 6 | Will this facility operate at this site for more than one year? ☒ Yes ☐ No | | | | | |

## Section 1-F: Other Facility Information

| | | | |
|---|---|---|---|
| 1 | Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes ☒ No If yes, specify: | | |
| a | If yes, NOV date or description of issue: | | NOV Tracking No: |
| b | Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☒ No If Yes, provide the 1c & 1d info below: | | |
| c | Document Title: | Date: | Requirement # (or page # and paragraph #): |
| d | Provide the required text to be inserted in this permit: | | |
| 2 | Is air quality dispersion modeling or modeling waiver being submitted with this application? ☐ Yes ☒ No | | |
| 3 | Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes ☒ No | | |
| 4 | Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☒ Yes ☐ No | | |
| a | If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☒ **Minor** (☐ <10 tpy of any single HAP **AND** ☒ <25 tpy of any combination of HAPS) | | |
| 5 | Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☒ No | | |
| a | If yes, include the name of company providing commercial electric power to the facility: ___________________________<br><br>Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user. | | |

## Section 1-G: Streamline Application **(This section applies to 20.2.72.300 NMAC Streamline applications only)**

| | | |
|---|---|---|
| 1 | ☐ I have filled out Section 18, "Addendum for Streamline Applications." | ☒ N/A (This is not a Streamline application.) |

## Section 1-H: Current Title V Information - Required for all applications from TV Sources

**(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))**

| | | |
|---|---|---|
| 1 | Responsible Official (R.O.) (20.2.70.300.D.2 NMAC): **Mr. David Baugh** | Phone: **(713) 358-9726** |
| a | R.O. Title: **Vice President Asset Management** | R.O. e-mail: **dbaugh@camstex.com** |
| b | R. O. Address: **919 Milam St., Suite 2300 Houston, TX 77002** | |
| 2 | Alternate Responsible Official (20.2.70.300.D.2 NMAC): **Mr. Randy York** | Phone: **(919) 747-5030** |
| a | A. R.O. Title: **Senior Vice President Asset Management** | A. R.O. e-mail: **ryork@camstex.com** |
| b | A. R. O. Address: **801 Corporate Center Drive, Suite 116 Raleigh, NC 27607** | |
| 3 | Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship): **N/A** | |
| 4 | Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.): **Lea Power Partners, LLC** | |
| a | Address of Parent Company: **98 N. Twombly Lane, Hobbs, NM 88240** | |
| 5 | Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.): **Not applicable.** | |
| 6 | Telephone numbers & names of the owners' agents and site contacts familiar with plant operations:<br>**Mr. John Schretlen: (575) 397-6701** | |

| | |
|---|---|
| 7 | Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes:<br>Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers:<br>**Texas (23 km)** |

# Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

## Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package** **printed double sided** **'head-to-toe'** **2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Please include a copy of the check on a separate page.

2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy should be printed in book form, 3-hole punched, and **must be double sided**. Note that this is in addition to the head-to-to 2-hole punched copy required in 1) above. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.

3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically. Electronic files for applications for NOIs, any type of General Construction Permit (GCP), or technical revisions to NSRs must be submitted with compact disk (CD) or digital versatile disc (DVD). For these permit application submittals, two CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal. Electronic files for other New Source Review (construction) permits/permit modifications or Title V permits/permit modifications can be submitted on CD/DVD or sent through AQB's secure file transfer service.

## Electronic files sent by (check one):

**X** CD/DVD attached to paper application

☐ secure electronic transfer. Air Permit Contact Name_______________

Email__________________

Phone number ___________

a. If the file transfer service is chosen by the applicant, after receipt of the application, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Submission of the electronic files through the file transfer service needs to be completed within 3 business days after the invitation is received, so the applicant should ensure that the files are ready when sending the hard copy of the application. The applicant will not need a password to complete the transfer. **Do not use the file transfer service for NOIs, any type of GCP, or technical revisions to NSR permits.**

4) Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD) following the instructions above and the instructions in 5 for applications subject to PSD review.

5) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver** and/or electronic air dispersion modeling report, input, and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau.

6) If the applicant submits the electronic files on CD and the application is subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

   If the application is submitted electronically through the secure file transfer service, these extra CDs do not need to be submitted.

## Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted as 2 separate CDs or submitted through the AQB secure file transfer service. Submit a single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 4 electronic files (3 MSWord docs: Universal Application section 1 [UA1], Universal Application section 3-19 [UA3], and Universal Application 4, the modeling report [UA4]) and 1 Excel file of the tables (Universal Application section 2 [UA2]). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision number (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. Do not use special symbols (#, @, etc.) in file names. The footer information should not be modified by the applicant.

## Table of Contents

# Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

| Unit Number[1] | Source Description | Manufacturer | Model # | Serial # | Maximum or Rated Capacity[3] (Specify Units) | Requested Permitted Capacity[3] (Specify Units) | Date of Manufacture or Reconstruction[2]<br>Date of Installation /Construction[2] | Controlled by Unit #<br>Emissions vented to Stack # | Source Classi-fication Code (SCC) | For Each Piece of Equipment, Check One | RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4] | Replacing Unit No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOBB-1 | Combustion Turbine | Mitsubishi Heavy Industries | M501F-F4 | T-488 | 189 MW (1,884 MMBtu/hr LHV nominal) | 189 MW (1,884 MMBtu/hr LHV nominal) | 2001<br>September 2008 | SCR-1 CAT-1<br>1 | 20200201 | ☐ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☒ To Be Modified ☐ To be Replaced | | N/A |
| HOBB-2 | Combustion Turbine | Mitsubishi Heavy Industries | M501F-F4 | T-487 | 189 MW (1,884 MMBtu/hr LHV nominal) | 189 MW (1,884 MMBtu/hr LHV nominal) | 2001<br>September 2008 | SCR-2 CAT-2<br>2 | 20200201 | ☐ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☒ To Be Modified ☐ To be Replaced | | N/A |
| DB-1 | Duct Burner | Forney | Standard | 913864 | 330 MMBtu/hr (LHV nominal) | 330 MMBtu/hr (LHV nominal) | 2007<br>August 2008 | SCR-1 CAT-1<br>1 | 10200601 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| DB-2 | Duct Burner | Forney | Standard | 913865 | 330 MMBtu/hr (LHV nominal) | 330 MMBtu/hr (LHV nominal) | 2007<br>August 2008 | SCR-2 CAT-2<br>2 | 10200601 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| AC-1 | Auxiliary Cooling Tower | Baltimore Air Cooler | FXV3-364-100 | U014653101 | 1,780 gpm | 1,780 gpm | 2002<br>August 2008 | N/A<br>AC-1 | 38500101 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| AC-2 | Auxiliary Cooling Tower | Baltimore Air Cooler | FXV3-364-100 | U014653102 | 1,780 gpm | 1,780 gpm | 2002<br>August 2008 | N/A<br>AC-2 | 38500101 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| AC-3 | Auxiliary Cooling Tower | Baltimore Air Cooler | FXV3-364-100 | U014653103 | 1,780 gpm | 1,780 gpm | 2002<br>August 2008 | N/A<br>AC-3 | 38500101 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| IC-1 | Inlet Chiller | Baltimore Aircoil | 331132A | U014283404 | 15,448 gpm | 15,448 gpm | 2002<br>August 2008 | N/A<br>IC-1 | 38500101 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| IC-2 | Inlet Chiller | Baltimore Aircoil | 331132A | U014283405 | 15,448 gpm | 15,448 gpm | 2002<br>August 2008 | N/A<br>IC-2 | 38500101 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| IC-3 | Inlet Chiller | Baltimore Aircoil | 331132A | U014283406 | 15,448 gpm | 15,448 gpm | 2002<br>August 2008 | N/A<br>IC-3 | 38500101 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| FH-1 | Fuel Gas Heater | Rheos | 2400 | A07193433 | 2.4 MMBtu/hr | 2.4 MMBtu/hr | 2008<br>August 2008 | N/A<br>FH-1 | 39990003 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| FH-2 | Fuel Gas Heater | Rheos | 2400 | A19294264 | 2.4 MMBtu/hr | 2.4 MMBtu/hr | 2019<br>May 2019 | N/A<br>FH-2 | 39990003 | Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☒ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| FH-3 | Fuel Gas Heater | Rheos | 2400 | A20300857 | 2.4 MMBtu/hr | 2.4 MMBtu/hr | 2020<br>2020 | N/A<br>FH-3 | 39990003 | Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☒ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| G-1 | Standby Generator | Volvo Penta | D1641GEP | D16*021102* C3*A | 565 kW (758 hp) | 565 kW (758 hp) | 2008<br>August 2008 | N/A<br>G-1 | 20100102 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |
| FP-1 | Diesel Fire Pump | Detroit Diesel | DDFP06FA-11V | 6VF-300006 | 443 hp | 443 hp | 2001<br>September 2008 | N/A<br>FP-1 | 20100102 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced | | N/A |

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.
[2] Specify dates required to determine regulatory applicability.
[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.
[4] "4SLB" means four stroke lean burn engine, "4SRB" means four stroke rich burn engine, "2SLB" means two stroke lean burn engine, "CI" means compression ignition, and "SI" means spark ignition

# Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html ), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at http://www.env.nm.gov/aqb/forms/InsignificantListTitleV.pdf . TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

| Unit Number | Source Description | Manufacturer | Model No.<br>Serial No. | Max Capacity<br>Capacity Units | List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)<br>Insignificant Activity citation (e.g. IA List Item #1.a) | Date of Manufacture /Reconstruction[2]<br>Date of Installation /Construction[2] | For Each Piece of Equipment, Check Onc |
|---|---|---|---|---|---|---|---|
| T-1 | Diesel Day Tank - Firewater Pump | unknown | unknown<br>unknown | 500 gal<br>500 gal | 20.2.72.202.B(2)<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-2 | Diesel Day Tank - Standby Generator | unknown | unknown<br>unknown | 1,250 gal<br>1,250 gal | 20.2.72.202.B(2)(a)<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-3 | Ammonia Tank | unknown | unknown<br>unknown | 9,000 gal<br>9,000 gal | 20.2.72.402.C.9<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-4 | Caustic Bulk Storage Tank | unknown | unknown<br>unknown | 7,000 gal<br>7,000 gal | 20.2.72.402.C.9<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-5 | Acid Bulk Storage Tank | unknown | unknown<br>unknown | 7,000 gal<br>7,000 gal | 20.2.72.402.C.9<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-6 | Neutralization Tank | unknown | unknown<br>unknown | 50,000 gal<br>50,000 gal | 20.2.72.402.C.9<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| AE-1 | Apex evaporation devices | unknown | unknown<br>unknown | unknown<br>unknown | 20.2.72.402.C.9<br>List Item #1.a. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-7 | Diesel Tank | unknown | unknown<br>unknown | 500 gal<br>500 gal | 20.2.72.202.B(2)<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-8 | Diesel Tank | unknown | unknown<br>unknown | 100 gal<br>100 gal | 20.2.72.202.B(2)<br>List Item #1.b. | unknown<br>unknown | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| T-9 | Gasoline Tank | Patterson Welding Works | unknown<br>1096 | 500 gal<br>500 gal | 20.2.72.202.B(5)<br>List Item #8 | unknown<br>8/29/2016 | ☒ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| | | | | | | | ☐ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |
| | | | | | | | ☐ Existing (unchanged) ☐ To be Removed<br>☐ New/Additional ☐ Replacement Unit<br>☐ To Be Modified ☐ To be Replaced |

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.
[2] Specify date(s) required to determine regulatory applicability.

# Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions.

| Control Equipment Unit No. | Control Equipment Description | Date Installed | Controlled Pollutant(s) | Controlling Emissions for Unit Number(s)[1] | Efficiency (% Control by Weight) | Method used to Estimate Efficiency |
|---|---|---|---|---|---|---|
| SCR-1 | Selective Catalytic Reduction | 2008 | NOx | HOBB-1, DB-1 | Variable, max 91.9% | Manufacturer Data |
| SCR-2 | Selective Catalytic Reduction | 2008 | NOx | HOBB-2, DB-2 | Variable, max 91.9% | Manufacturer Data |
| CAT-1 | Catalytic Oxidation | 2008 | CO, VOC, HAP | HOBB-1, DB-1 | Variable;<br>max CO 85%,<br>max VOC 80%,<br>max HAP 80% | Manufacturer Data |
| CAT-2 | Catalytic Oxidation | 2008 | CO, VOC, HAP | HOBB-2, DB-2 | Variable;<br>max CO 85%,<br>max VOC 80%,<br>max HAP 80% | Manufacturer Data |
| N/A | High Efficiency Drift Eliminator | 2008 | $PM_{10}$ | IC-1 and AC-1 | N/A | N/A |
| N/A | High Efficiency Drift Eliminator | 2008 | $PM_{10}$ | IC-2 and AC-2 | N/A | N/A |
| N/A | High Efficiency Drift Eliminator | 2008 | $PM_{10}$ | IC-3 and AC-3 | N/A | N/A |
| N/A | Dry Low Burner | 2008 | NOx | FH-1 | 0.054 lb/MMbtu | Manufacturer Data |
| N/A | Dry Low Burner | 2008 | NOx | FH-2 | 0.054 lb/MMbtu | Manufacturer Data |
| N/A | Dry Low Burner | 2008 | NOx | FH-3 | 0.054 lb/MMbtu | Manufacturer Data |
| N/A | Dry Low Burner | 2008 | NOx | HOBB-1, DB-1 | BACT | Manufacturer Data |
| N/A | Dry Low Burner | 2008 | NOx | HOBB-2, DB-2 | BACT | Manufacturer Data |
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[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

# Table 2-D: Maximum Emissions (under normal operating conditions)

☐ **This Table was intentionally left blank because it would be identical to Table 2-E.**

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

| Unit No. | NOx | | CO | | VOC | | SOx | | PM[1] | | PM10[1] | | PM2.5[1] | | $H_2S$ | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr |
| HOBB-1 + DB-1 | 178.6 | 782.3 | 66.8 | 292.8 | 5.2 | 22.9 | 10.4 | 45.5 | 17.8 | 77.8 | 17.8 | 77.8 | 17.8 | 77.8 | | | | |
| HOBB-2 + DB-2 | 178.6 | 782.3 | 66.8 | 292.8 | 5.2 | 22.9 | 10.4 | 45.5 | 17.8 | 77.8 | 17.8 | 77.8 | 17.8 | 77.8 | | | | |
| IC-1, IC-2, IC-3 | - | - | - | - | - | - | - | - | 0.70 | 3.0 | 0.35 | 1.5 | 0.001 | 0.01 | | | | |
| FH-1, FH-2, FH-3 | 0.39 | 1.7 | 0.24 | 1.0 | 0.04 | 0.16 | 0.04 | 0.18 | 0.05 | 0.22 | 0.05 | 0.22 | 0.05 | 0.22 | | | | |
| FP-1 | 7.4 | 32.5 | 1.4 | 6.3 | 0.25 | 1.1 | 0.01 | 0.0 | 0.18 | 0.77 | 0.18 | 0.77 | 0.18 | 0.77 | | | | |
| G-1 | 6.5 | 28.3 | 0.86 | 3.8 | 0.20 | 0.87 | 0.01 | 0.0 | 0.12 | 0.52 | 0.12 | 0.52 | 0.12 | 0.52 | | | | |
| AC-1, AC-2, AC-3 | - | - | - | - | - | - | - | - | 0.08 | 0.35 | 0.04 | 0.18 | 0.0002 | 0.001 | | | | |
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| **Totals** | 371.5 | 1,627.1 | 136.2 | 596.6 | 10.9 | 47.9 | 20.8 | 91.2 | 36.6 | 160.5 | 36.3 | 158.8 | 35.9 | 157.1 | | | | |

[1]**Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but PM is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

# Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A “-“ symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or $1.41E^{-4}$).

| Unit No. | NOx | | CO | | VOC | | SOx | | TSP[1] | | PM10[1] | | PM2.5[1] | | $H_2S$ | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr |
| HOBB-1* | 14.5 | 117.8 | 8.8 | 71.7 | 2.5 | 12.3 | 8.7 | 47.9 | 12.0 | 94.8 | 12.0 | 94.8 | 12.0 | 94.8 | | | | |
| HOBB-2* | 14.5 | | 8.8 | | 2.5 | | 8.7 | | 12.0 | | 12.0 | | 12.0 | | | | | |
| HOBB-1* + DB-1 | 18.1 | | 11.0 | | 2.9 | | 10.7 | | 17.8 | | 17.8 | | 17.8 | | | | | |
| HOBB-2* + DB-2 | 18.1 | | 11.0 | | 2.9 | | 10.7 | | 17.8 | | 17.8 | | 17.8 | | | | | |
| IC-1, IC-2, IC-3 | | | | | | | | | 0.70 | 2.1 | 0.35 | 1.1 | 0.001 | 0.004 | | | | |
| FH-1, FH-2, FH-3 | 0.39 | 1.7 | 0.24 | 1.0 | 0.04 | 0.16 | 0.04 | 0.18 | 0.05 | 0.22 | 0.05 | 0.22 | 0.05 | 0.22 | | | | |
| FP-1 | 7.4 | 0.37 | 1.4 | 0.1 | 0.25 | 0.01 | 0.01 | 0.0003 | 0.18 | 0.01 | 0.18 | 0.01 | 0.18 | 0.01 | | | | |
| G-1 | 6.5 | 1.6 | 0.86 | 0.21 | 0.20 | 0.05 | 0.01 | 0.002 | 0.12 | 0.03 | 0.12 | 0.03 | 0.12 | 0.03 | | | | |
| AC-1, AC-2, AC-3 | | | | | | | | | 0.08 | 0.35 | 0.04 | 0.18 | 0.0002 | 0.001 | | | | |
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| | | | | | | | | | | | | | | | | | | |
| **Totals** | 50.5 | 121.5 | 24.5 | 73.1 | 6.3 | 12.6 | 21.5 | 48.1 | 36.6 | 97.5 | 36.3 | 96.2 | 35.9 | 95.0 | | | | |

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

* HOBB-1 and HOBB-2 will either run with the DB or without DB.

# Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

☐ This table is intentionally left blank since all emissions at this facility due to routine or predictable startup, shutdown, or scehduled maintenance are no higher than those listed in Table 2-E and a malfunction emission limit is not already permitted or requested. If you are required to report GHG emissions as described in Section 6a, include any GHG emissions during Startup, Shutdown, and/or Scheduled Maintenance (SSM) in Table 2-P. Provide an explanations of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine our predictable startup, shutdown or scheduled maintenance (SSM)[1], including NOI applications, must include in this table the Maximum Emissions during routine or predictable startup, shutdown and scheduled maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). In Section 6 and 6a, provide emissions calculations for all SSM emissions reported in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (https://www.env.nm.gov/aqb/permit/aqb_pol.html) for more detailed instructions. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

| Unit No. | NOx | | CO | | VOC | | SOx | | TSP[2] | | PM10[2] | | PM2.5[2] | | $H_2S$ | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr |
| HOBB-1 + DB-1 | 193.2 | 35.7 | 2,060.0 | 106.4 | 591.0 | 42.6 | - | 2.51 | - | 4.2 | - | 4.2 | - | 4.2 | | | | |
| HOBB-2 + DB-2 | 193.2 | 35.7 | 2,060.0 | 106.4 | 591.0 | 42.6 | - | 2.51 | - | 4.2 | - | 4.2 | - | 4.2 | | | | |
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| **Totals** | 386.3 | 71 | 4,120.0 | 212.8 | 1,182.0 | 85.2 | - | 5.0 | - | 8.3 | - | 8.3 | - | 8.3 | | | | |

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in this table. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[2] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

# Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

**X** I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

| Stack No. | Serving Unit Number(s) from Table 2-A | NOx | | CO | | VOC | | SOx | | TSP | | PM10 | | PM2.5 | | ☐ $H_2S$ or ☐ Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr |
| See emissions provided in Table 2-E | | | | | | | | | | | | | | | | | |
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| **Totals**: | | | | | | | | | | | | | | | | | |

# Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here:

| Stack Number | Serving Unit Number(s) from Table 2-A | Orientation (H-Horizontal V=Vertical) | Rain Caps (Yes or No) | Height Above Ground (ft) | Temp. (F) | Flow Rate | | Moisture by Volume (%) | Velocity (ft/sec) | Inside Diameter or L x W (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (acfs) | (dscfs) | | | |
| 1 | HOBB-1 | V | No | 165 | 179 | 20,299 | 12,533 | 8.1 | 79.8 | 18 |
| 1 | HOBB-1+DB-1 | V | No | 165 | 179 | 20,446 | 12,435 | 9.5 | 80.3 | 18 |
| 2 | HOBB-2 | V | No | 165 | 179 | 20,299 | 12,533 | 8.1 | 79.8 | 18 |
| 2 | HOBB-2+DB-2 | V | No | 165 | 179 | 20,446 | 12,435 | 9.5 | 80.3 | 18 |
| 3 | G-1 | V | Yes | 10.4 | 893 | 65.0 | - | - | 186.2 | 0.67 |
| 4 | FP-1 | H | No | 11 | 820 | 54.6 | - | - | 123.6 | 0.75 |
| 5-6-7 | FH-1, FH-2, FH-3 | V | No | 15 | 600 | 3,029 | 1,192 | 8.2 | | |
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# Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A “-” symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

| Stack No. | Unit No.(s) | Total HAPs | | Ammonia ☐ HAP or ☒ TAP | | Formaldehyde ☒ HAP or ☐ TAP | | Provide Pollutant Name Here ☐ HAP or ☐ TAP | | Provide Pollutant Name Here ☐ HAP or ☐ TAP | | Provide Pollutant Name Here ☐ HAP or ☐ TAP | | Provide Pollutant Name Here ☐ HAP or ☐ TAP | | Provide Pollutant Name Here ☐ HAP or ☐ TAP | | Provide Pollutant Name Here ☐ HAP or ☐ TAP | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr | lb/hr | ton/yr |
| 1 | HOBB-1 + DB-1 | 0.54 | 3.3 | 32.1 | 281.3 | 0.14 | 1.1 | | | | | | | | | | | | |
| 2 | HOBB-2 + DB-2 | 0.54 | | 32.1 | | 0.14 | | | | | | | | | | | | | |
| 3 | FP-1 | 0.02 | 0.001 | | | 0.004 | 0.0002 | | | | | | | | | | | | |
| 4 | G-1 | 0.02 | 0.006 | | | 0.0004 | 0.0001 | | | | | | | | | | | | |
| 5 | FH-1 + FH-2 + FH-3 | 0.01 | 0.06 | | | 0.001 | 0.002 | | | | | | | | | | | | |
| 6 | T-7 | 0.10 | 0.002 | | | - | - | | | | | | | | | | | | |
| 7 | T-8 | 0.1 | 0.002 | | | | | | | | | | | | | | | | |
| 8 | T-9 | 3.4 | 0.1 | | | | | | | | | | | | | | | | |
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| **Totals:** | | 4.7 | 3.5 | 64.2 | 281.3 | 0.3 | 1.1 | | | | | | | | | | | | |

# Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

| Unit No. | Fuel Type (No. 2 Diesel, Natural Gas, Coal, …) | Specify Units | | | | |
|---|---|---|---|---|---|---|
| | | Lower Heating Value | Hourly Usage | Annual Usage | % Sulfur | % Ash |
| HOBB-1 | Natural Gas | 932 Btu/scf | 1,884 MMBtu/hr (LHV) | 14,290,420 MMBtu/yr (LHV) | 1.7 gr-S/100scf | 0 |
| HOBB-2 | Natural Gas | 932 Btu/scf | 1,884 MMBtu/hr (LHV) | 14,290,420 MMBtu/yr (LHV) | 1.7 gr-S/100scf | 0 |
| DB-1 | Natural Gas | 932 Btu/scf | 330 MMBtu/hr (LHV) | 1,188,096 MMBtu/yr (LHV) | 1.7 gr-S/100scf | 0 |
| DB-2 | Natural Gas | 932 Btu/scf | 330 MMBtu/hr (LHV) | 1,188,096 MMBtu/yr (LHV) | 1.7 gr-S/100scf | 0 |
| FH-1, FH-2, FH-3 | Natural Gas | 932 Btu/scf | 2.4 MMBtu/hr | 21,024 MMBtu/yr | 1.7 gr-S/100scf | 0 |
| FP-1 | Diesel | 19,300 Btu/lb | 24.9 gph | 2,490 gpy | 0.0015% | 0 |
| G-1 | Diesel | 19,300 Btu/lb | 37.2 gph | 18,600 gpy | 0.0015% | 0 |
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# Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

| Tank No. | SCC Code | Material Name | Composition | Liquid Density (lb/gal) | Vapor Molecular Weight (lb/lb*mol) | Average Storage Conditions | | Max Storage Conditions | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Temperature (°F) | True Vapor Pressure (psia) | Temperature (°F) | True Vapor Pressure (psia) |
| All tanks at the facility are exempt from permitting; See Table 2-B. | | | | | | | | | |
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# Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary. See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

| Tank No. | Date Installed | Materials Stored | Seal Type (refer to Table 2-LR below) | Roof Type (refer to Table 2-LR below) | Capacity | | Diameter (M) | Vapor Space (M) | Color (from Table VI-C) | | Paint Condition (from Table VI-C) | Annual Throughput (gal/yr) | Turn-overs (per year) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (bbl) | ($M^3$) | | | Roof | Shell | | | |
| All tanks at the facility are exempt from permitting; See Table 2-B. | | | | | | | | | | | | | |
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## Table 2-L2: Liquid Storage Tank Data Codes Reference Table

| Roof Type | Seal Type, Welded Tank Seal Type | | Seal Type, Riveted Tank Seal Type | | Roof, Shell Color | Paint Condition |
|---|---|---|---|---|---|---|
| **FX**: Fixed Roof | **Mechanical Shoe Seal** | **Liquid-mounted resilient seal** | **Vapor-mounted resilient seal** | **Seal Type** | **WH**: White | Good |
| **IF**: Internal Floating Roof | **A**: Primary only | **A**: Primary only | **A**: Primary only | **A**: Mechanical shoe, primary only | **AS**: Aluminum (specular) | Poor |
| **EF**: External Floating Roof | **B**: Shoe-mounted secondary | **B**: Weather shield | **B**: Weather shield | **B**: Shoe-mounted secondary | **AD**: Aluminum (diffuse) | |
| **P**: Pressure | C: Rim-mounted secondary | C: Rim-mounted secondary | C: Rim-mounted secondary | C: Rim-mounted secondary | **LG**: Light Gray | |
| | | | | | **MG**: Medium Gray | |
| | | | | | **BL**: Black | |
| | | | | | **OT**: Other (specify) | |

Note: 1.00 bbl = 0.159 $M^3$ = 42.0 gal

## Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

| Material Processed | | | | Material Produced | | | |
|---|---|---|---|---|---|---|---|
| **Description** | **Chemical Composition** | **Phase (Gas, Liquid, or Solid)** | **Quantity (specify units)** | **Description** | **Chemical Composition** | **Phase** | **Quantity (specify units)** |
| Natural Gas | Mixed Hydrocarbons | Gas | 106,330 MMBtu/day | Electricity (Power Generation) | Megawatts | N/A | 15,216 MW daily |
| Diesel | Mixed Hydrocarbons | Liquid | 62.1 gph | | | | |
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# Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

| Stack No. | Pollutant(s) | Manufacturer | Model No. | Serial No. | Sample Frequency | Averaging Time | Range | Sensitivity | Accuracy |
|---|---|---|---|---|---|---|---|---|---|
| HOBB-1 and HOBB-1 + DB1 | NOx/$O_2$ | Teledyne Monitor Labs | TML41-O2 | NO169 | 15 min | 1 hour | NOx: min 0 - 10ppm max 0 - 100ppm CO: 0 - 25% | 0 @ < 20ppb < 0.2% @ > 20ppm | 0.5% of reading |
| HOBB-1 and HOBB-1 + DB1 | CO - high | Thermo | 48iQ | 1190581626 | 15 min | 1 hour | 0 - 3,200ppm | 0 @ < 20ppb < 0.5% @ > 20ppm | 0.5% of reading |
| HOBB-1 and HOBB-1 + DB1 | CO - low | | | | | | 0 - 10 ppm | | |
| HOBB-2 and HOBB-2 + DB2 | NOx/O2 | Teledyne Monitor Labs | TML41-O2 | NO268 | 15 min | 1 hour | NOx: min 0 - 10ppm max 0 - 100ppm CO: 0 - 25% | 0 @ < 20ppb < 0.2% @ > 20ppm | 0.5% of reading |
| HOBB-2 and HOBB-2 + DB2 | CO - high | Thermo | 48iQ | 1180930111 | 15 min | 1 hour | 0 - 3,200ppm | 0 @ < 20ppb < 0.5% @ > 20ppm | 0.5% of reading |
| | CO - low | | | | | | 0 - 10ppm | | |
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# Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

| Unit No. | Parameter/Pollutant Measured | Location of Measurement | Unit of Measure | Acceptable Range | Frequency of Maintenance | Nature of Maintenance | Method of Recording | Averaging Time |
|---|---|---|---|---|---|---|---|---|
| HOBB-1 | Fuel Flowrate | Feed to Combustor | Hundred SCF/hr | 0 - 18,000.0 | Annual | Calibration | Plant DCS | 6 sec to record to 1 min avg. |
| HOBB-2 | Fuel Flowrate | Feed to Combustor | Hundred SCF/hr | 0 - 18,000.0 | | | | |
| HOBB-1 +DB-1 | Fuel Flowrate | Feed to Combustor | Hundred SCF/hr | 0 - 4,850.0 | | | | |
| HOBB-2 +DB-2 | Fuel Flowrate | Feed to Combustor | Hundred SCF/hr | 0 - 4,850.0 | | | | |
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# Table 2-P: Green House Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box ☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

| | | $CO_2$ ton/yr | $N_2O$ ton/yr | $CH_4$ ton/yr | $SF_6$ ton/yr | PFC/HFC ton/yr[2] | | | | | | | | | Total GHG Mass Basis ton/yr[4] | Total $CO_2e$ ton/yr[5] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unit No.** | **GWPs [1]** | **1** | **298** | **25** | **23,900** | **footnote 3** | | | | | | | | | | |
| HOBB-1 + DB-1 | **mass GHG** | 984,787 | 1.83 | 18.3 | | | | | | | | | | | 984,807 | |
| | **$CO_2e$** | 984,787 | 544 | 457 | | | | | | | | | | | | 985,788 |
| HOBB-2 + DB-2 | **mass GHG** | 984,787 | 1.83 | 18.3 | | | | | | | | | | | 984,807 | |
| | **$CO_2e$** | 984,787 | 544 | 457 | | | | | | | | | | | | 985,788 |
| FP-1 | **mass GHG** | 25.3 | 2.05E-04 | 0.001 | | | | | | | | | | | 25.3 | |
| | **$CO_2e$** | 25.3 | 0.06 | 0.03 | | | | | | | | | | | | 25.4 |
| G-1 | **mass GHG** | 216.2 | 0.002 | 0.009 | | | | | | | | | | | 216.2 | |
| | **$CO_2e$** | 216.2 | 0.52 | 0.22 | | | | | | | | | | | | 216.9 |
| FH-1, FH-2, FH-3 | **mass GHG** | 3,686 | 0.01 | 0.07 | | | | | | | | | | | 3,686 | |
| | **$CO_2e$** | 3,686 | 2.07 | 1.74 | | | | | | | | | | | | 3,690 |
| | **mass GHG** | | | | | | | | | | | | | | | |
| | **$CO_2e$** | | | | | | | | | | | | | | | |
| | **mass GHG** | | | | | | | | | | | | | | | |
| | **$CO_2e$** | | | | | | | | | | | | | | | |
| | **mass GHG** | | | | | | | | | | | | | | | |
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| | **mass GHG** | | | | | | | | | | | | | | | |
| | **$CO_2e$** | | | | | | | | | | | | | | | |
| | **mass GHG** | | | | | | | | | | | | | | | |
| | **CO2e** | | | | | | | | | | | | | | | |
| | **mass GHG** | | | | | | | | | | | | | | | |
| | **$CO_2e$** | | | | | | | | | | | | | | | |
| **Totals** | **mass GHG** | | | | | | | | | | | | | | 1,973,541 | |
| | **$CO_2e$** | | | | | | | | | | | | | | | 1,975,507 |

[1] **GWP** means Global Warming Potential. Applicant's must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] You must enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis**, is the ton per year green house gas emission before adjustment with its GWP.

[5] **$CO_2e$** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

# Section 3

## Application Summary

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The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

The **Process Summary** shall include a brief description of the facility and its processes.

**Startup, Shutdown, and Maintenance (SSM) routine or predictable emissions:** Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

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**INTRODUCTION**

This application proposes a significant modification to Title V Permit P-244-R1 for Lea Power Partners, LLC (LPP) Hobbs Generating Station (HGS). In addition, this Title V Permit is due for renewal by September 2, 2020. This application shall accommodate both a modification and renewal application of Title V Permit P-244-R1.

HGS is a natural gas fueled, nominal 604 MW net output power plant with two advanced firing temperature, Mitsubishi 501F combustion turbine generators (CTGs), each provided with its own heat recovery steam generator (HRSG) including duct burners, a single condensing, reheat steam turbine generator (STG), and an air cooled condenser serving the STG. The plant generates electricity for sale to Southwestern Public Service Company, its successors or assigns. The facility is located approximately 8 miles West of Hobbs, New Mexico in Lea County.

The site holds both a New Source Review (NSR)/Prevention of Significant Deterioration (PSD) and a Federal Title V Operating permit in the State of New Mexico: PSD-3449-M5 and P-244-R1/P-244-AR2. Emissions for each unit are controlled using carbon monoxide (CO) catalyst and Selective Catalytic Reduction (SCR) with injection of 28% aqueous ammonia.

Mitsubishi Hitachi Power System Americas (MHPSA) proposed to upgrade the two combustion turbines to the F4+ compressor upgrade. The upgrade consists of replacing the Inlet Guide Vanes (IGVs) and first six stages of the compressor, resulting in increased air flow. The expected impact of the upgrade on performance is an increase of 5% in output, no change in heat rate, and a 6.7% increase in turbine exhaust flow.

**BACKGROUND**

The subject units are three-pressure level reheat HRSG's originally designed for NEPCO in 2000 and then moved to the Hobbs site in 2007. The site consists of two triangular pitch, dual train, outdoor HRSGs. Combustion turbines are Mitsubishi 501F machines fueled by natural gas. The HRSG's supply steam to a single steam turbine and operate in floating pressure mode based on steam turbine conditions.

Each HRSG is triple pressure level with reheat, natural circulation, and equipped with auxiliary heat input via a Forney Corporation duct burner. The duct burner system is located between the secondary and primary stages of superheater and reheater heat transfer sections. The HRSG has been designed for duct firing with gas turbine near full load operation. The heat transfer sections are composed of extended surface, triangular pitched, finned tubes.

**PROPOSED PROJECT REVIEW**

A PSD permit revision, permit number PSD-3449-M5, was issued to the Hobbs Generating Station for the following project on December 28, 2018. The approved project at LPP allows for an upgrade to both combustion turbine generators (CTGs), which is expected to increase power output by approximately 5% and increase the turbine flow rate by 6.7%. This change is expected to result in an increase in fuel consumption, exhaust flow rate, and temperature. The F4+ upgrade project is a completely stand-alone project, not tied in any way to previous projects that required a permit modification, including the permit modifications dated 9-23-2011 and 9-5-2014. This compressor upgrade package has only been made available for commercial use by MHPSA since 2017.

Due to the increased exhaust flow rate, short term (lb/hr) and/or long term (tpy) emission rates for oxides of nitrogen ($NO_x$), carbon monoxide (CO), sulfur dioxide ($SO_2$), volatile organic compounds (VOC), particulate matter ($PM_{10}$ and $PM_{2.5}$), sulfuric acid mist ($H_2SO_4$ mist), and carbon dioxide equivalent ($CO_2e$) will increase. However, a review of anticipated emission rate changes shows that the currently permitted short term emission rates for $NO_2$ and CO will not have to be changed or increased. Stack exhaust $NO_x$ emissions will continue to be controlled to 2 parts per million volume dry basis corrected to 15 percent oxygen (ppmvdc) on a 24-hour average basis, using selective catalytic reduction (SCR) with aqueous ammonia ($NH_3$). Stack exhaust CO and VOC emissions will continue to be controlled to 2 ppmvdc on a 1-hour average basis and to 1 ppmvdc on a 24-hour average basis, respectively, by means of oxidation catalyst. A preliminary evaluation of the existing CO catalyst showed that the condition of the existing CO catalyst is meeting the flow cell velocities and available areas for the existing GT performance, but the new performance following the GT compressor upgrades exceeds the CO catalyst capability to reduce CO to 2 ppmvdc. Therefore, the CO oxidation catalyst will be replaced during the compressor upgrade to assure that the 2 ppmvdc on a 1hour average basis and 1 ppmvdc on a 24-hour average basis are met. $SO_2$ emissions will continue to be controlled using pipeline quality natural gas.

In addition to the compressor upgrade, LPP increased the annual operating hours from the previously permitted 8,400 hours per year to 8,760 hours per year. Increasing the operating hours to 8,760 hours per year allows for operational flexibility without having to shut down the plant due to operational time restrictions. LPP will continue to operate under the most stringent Best Available Control Technologies (BACT), as discussed above and as currently authorized. Relaxing the federally enforceable operational limits of 8,400 hrs/yr operation to 8,760 hrs/yr operation triggered a retro-active PSD applicability review back to the year 2014, when the operational limits were imposed. Table 2 below shows which pollutants would have triggered a PSD review if no operational limits were imposed. Therefore, in addition to the pollutants already identified in Table 1 due to this project, $NO_x$ and $SO_2$ are included (retro-actively) in the BACT determination for this permitting action.

**Table 1: PSD Applicability Analysis Both Units Combined**

| Pollutant | Past Actuals (tpy) | Proposed Project Annual (tpy) | Proposed Project Increase (tpy) | PSD SER (tpy) | PSD Review Required? |
|---|---|---|---|---|---|
| $NO_x$ | 89.9 | 123.9 | 34.1 | 40 | No |
| CO | 9.5 | 75.5 | 65.9 | 100 | No |
| VOC | 3.9 | 13.0 | 9.1 | 40 | No |
| $SO_2$ | 17.2 | 50.4 | 33.2 | 40 | No |
| $H_2SO_4$ (mist) | 2.6 | 7.71 | 5.1 | 7 | No |
| TSP/$PM_{10}$ | 48.7 | 90.1 | 46.1 | 15 | Yes |
| $PM_{2.5}$ | 48.7 | 90.1 | 46.1 | 10 | Yes |
| $CO_2e$ | 1,604,421 | 1,971,575 | 367,154 | 75,000 | Yes |

The above PSD applicability does not include Startup, shutdown, and maintenance (SSM) emissions because LPP is not proposing any change (increase or decrease) in permitted $NO_x$, CO, VOC, or $SO_2$ SSM emission rates, or as provided in the last application. These permitted SMM emission rates were estimated in the past including enough buffer for some operational flexibility.

**Table 2: PSD Applicability Analysis Both Units Retro-Active for 2014 Project**

| Pollutant | Past Actuals (tpy) | Proposed Project Annual (tpy) | Proposed Project Increase (tpy) | PSD SER (tpy) | PSD Review Required? |
|---|---|---|---|---|---|
| $NO_x$ | 77.0 | 120.0 | 43.0 | 40 | Yes |
| CO | 10.7 | 73.1 | 62.4 | 100 | No |
| VOC | 8.8 | 12.6 | 3.8 | 40 | No |
| $SO_2$ | 6.7 | 48.3 | 41.6 | 40 | Yes |
| $H_2SO_4$ (mist) | 1.03 | 7.4 | 6.4 | 7 | No |
| TSP/$PM_{10}$ | 72.2 | 85.8 | 13.6 | 15 | No |
| $PM_{2.5}$ | 72.2 | 85.8 | 13.6 | 10 | Yes |
| $CO_2e$ | 1,385,260 | 1,891,328 | 506,068 | 75,000 | Yes |

The workbook tab "Table 106A GT Summary" has a SSM summary table at the end of the tab. This table clearly distinguishes between operating and SSM emissions. This turbine upgrade project does not increase the permitted $NO_x$, CO, VOC, or $SO_2$ SSM limits and LPP wants to keep the SSM emission rates as permitted and previously presented (the SSM emission calculations are also included in the workbook). Since the units can reasonably accommodate all SSM emissions before and after the modification, the past actuals to future actuals for SSM equates to a zero increase. Given this clarification, a PSD applicability analysis was performed without $NO_x$, CO, VOC, or $SO_2$ SSM emissions in the PSD permit modification application submitted to NMED in July, 2018.

Since no emission rate decreases occurred during the contemporaneous period, the net emission rate increases are based on the proposed project emission rate increases. The PSD Significant Emission Rate (SER) was exceeded for TSP/$PM_{10}$/$PM_{2.5}$ and $CO_2e$ and retro-actively for $NO_x$ and $SO_2$. Therefore, this modification constituted a major modification of the existing major source and a PSD review was required for the pollutants with significant emissions per 40 CFR §52.21(b)(23)(i) and New Mexico Administrative Code (NMAC) 20.2.74.302. The main reason why a PSD review for TSP/$PM_{10}$/$PM_{2.5}$ and $CO_2e$ was being triggered, was because the actual emissions from the past five (5) years are much lower than the permitted emission rates, thus the delta between the post-project allowable and the pre-project actual emission rates were greater than the SER.

In addition, the fuel heaters (FH-1 through FH-3) will be replaced with like-kind fuel heaters. FH-2 was replace in May 2019, FH-3 was replaced in 2020 (the new serial numbers have been entered into form UA2), and FH-1 will be replace in 2021. A Technical Permit revision application was prepared and submitted to NMED Air Quality Bureau to authorized these fuel heater replacements. The revised permit was issued by NMED on May 22, 2019.

# Section 4

## Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

A process flow diagram is attached.




RESPONSIBLE ENGINEER

PE#

| NO. | DATE | REVISION | BY | CHK |
|---|---|---|---|---|
| P1 | 09/07/06 | ISSUED FOR PRELIMINARY DESIGN | EFC | BR |
| A | 09/21/06 | ISSUED FOR REVIEW | EFC | BR |

REVISION APPROVAL — REV A — DATE 09/21/06

| DISCIPLINE | REVIEWED | DISCIPLINE | REVIEWED |
|---|---|---|---|
| CIVIL | | ELECTRICAL | |
| STRUCTURAL | | INST & CONTROL | |
| MECHANICAL | | ARCHITECTURAL | |
| PROCESS | | ENVIRONMENTAL | |
| PIPING | | GEN. ARRANG. | |

STATUS

| ISSUED | REV | DATE | DM | SDE | PEM |
|---|---|---|---|---|---|
| PRELIMINARY | P1 | 09/07/06 | RP | BR | AW |
| FOR REVIEW AND APPROVAL | A | | | | |
| APPROVED FOR CONSTRUCTION | | | | | |
| REVISED & APPROVED FOR CONSTRUCTION | | | | | |

SCALE NONE

SPS-EXCEL
Colorado Energy Management
HOBBS POWER STATION
Hobbs, NM

PROJECT NO. 349552

LG Constructors

PROCESS FLOW DIAGRAM

HEAT BALANCE SHEET 1
2 x 1 MHI 501 F

DWG. NO. HB-PR-10-10-01 REV. A

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

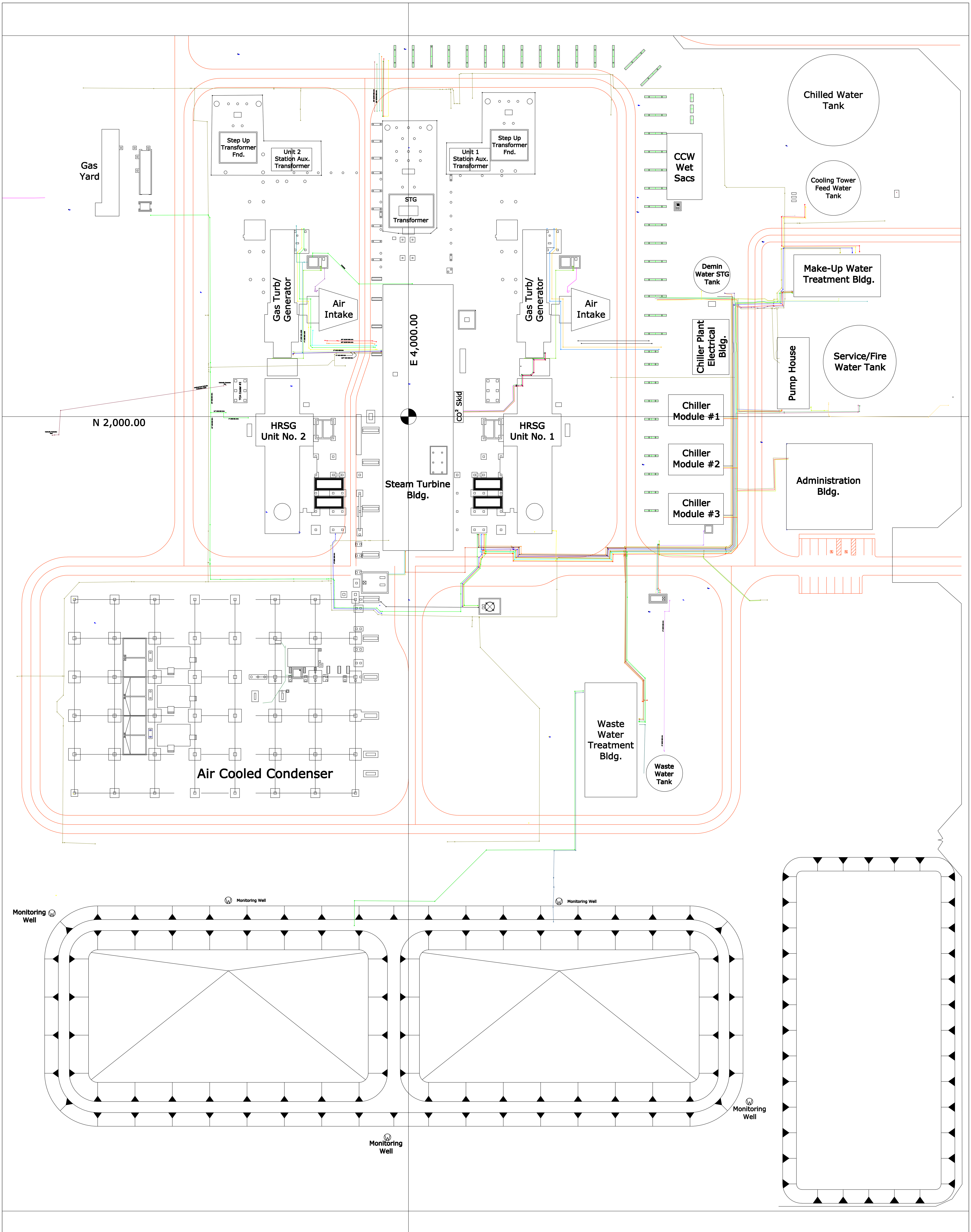
FILENAME: hbpr101001.dlv PLOT DATE: 21-SEP-2006 PLOT TIME:

# Section 5

## Plot Plan Drawn To Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

A Plot Plan drawn to scale is attached.




**Hobbs Generating Station**
Underground Pipe Asbuilt
Field: LPR Survey Group
Drawing: Josh Truxall / Date:6-16-08

# Section 6

## All Calculations

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**Show all calculations** used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

**Tank Flashing Calculations**: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

**SSM Calculations**: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

**Glycol Dehydrator Calculations**: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

**Road Calculations:** Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

**Significant Figures:**
**A.** All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.
**B.** At least 5 significant figures shall be retained in all intermediate calculations.
**C.** In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

- **(1)** If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;
- **(2)** If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**
- **(3)** If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.
- **(4)** The final result of the calculation shall be expressed in the units of the standard.

**Control Devices:** In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

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As required by NMED, emission rate calculations are provided in the UA2 spreadsheet workbook. The only changes proposed relate to the emissions of the combustion turbine generators (CTGs) and duct burners (Unit Nos. HOBB-1, HOBB-2, DB-1 and DB-2). All other permitted emission sources remain unchanged.

Combustion emissions associated with the combustion turbines and duct burners include $NO_x$, CO, VOC, $SO_2$, $PM_{10}$/$PM_{2.5}$, Greenhouse Gas (GHG) emissions, and hazardous air pollutants (HAPs). There may also be ammonia slip from the SCR systems. Emission rate estimates for the CTG/HRSG train stacks are based on vendor estimated data, fuel analysis data, and regulatory requirements.

Detailed emission rate calculations are provided on the following pages. For each pollutant, the total emission rate out of the stack considers the combined flow from the CTG exhaust and the duct burner exhaust, controlled by the SCR and the oxidation catalyst. The proposed hourly emission rate limit for each pollutant is based on the ambient conditions which result in the maximum hourly emission rates.

Annual emission rates are estimated assuming continuous annual operation (8,760 hour per year per unit) as well as cases with maximum annual startups and shutdowns. The UA2 workbook includes all permitted sources and associated emissions.

# Section 6.a

## Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

**Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC)** applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide ($CO_2$), nitrous oxide ($N_2O$), methane ($CH_4$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$).

### Calculating GHG Emissions:

**1.** Calculate the ton per year (tpy) GHG mass emissions and GHG $CO_2$e emissions from your facility.
**2.** GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG $CO_2$e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
**3.** Emissions from routine or predictable start up, shut down, and maintenance must be included.
**4.** Report GHG mass and GHG $CO_2$e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
**5.** All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
**6.** For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following ☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

**Sources for Calculating GHG Emissions:**

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

**Global Warming Potentials (GWP):**
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of $CO_2$ over a specified time period.

**"Greenhouse gas"** for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

**Metric to Short Ton Conversion:**
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.
1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

**All GHG emissions are reported on Table 2-P of the UA2 Form.**

## HOBBS PSD APPLICABILITY ANALYSIS

### PSD Summary Table

| Air Pollutant | Past Actuals Both Units Combined w/o SSM (tpy) | Past Actuals Both Units Combined w/ SSM (tpy) | Proposed Project Annual Both Units Combined w/o SSM (tpy) | Proposed Project Annual Both Units Combined w/SSM (tpy) | PSD Analysis Both Units Combined w/o SSM | | |
|---|---|---|---|---|---|---|---|
| | | | | | Project Increase (tpy) | PSD Significance Level (tpy) | Is PSD Significance Level Exceeded? |
| NOx | 89.9 | 90.8 | 123.9 | 189.3 | 34.1 | 40 | No |
| CO | 9.5 | 11.3 | 75.5 | 284.5 | 65.9 | 100 | No |
| VOC | 3.9 | 5.4 | 13.0 | 97.6 | 9.1 | 40 | No |
| $SO_2$ | 17.2 | 17.3 | 50.4 | 52.9 | 33.2 | 40 | No |
| $H_2SO_4$ (mist)(1) | 2.6 | 2.64 | 7.71 | 8.10 | 5.1 | 7 | No |
| $TSP/PM_{10}$ | 48.6 | 48.7 | 90.1 | 94.8 | 46.1 | 15 | **Yes** |
| $PM_{2.5}$ | 48.6 | 48.7 | 90.1 | 94.8 | 46.1 | 10 | **Yes** |
| $CO_2e$ | 1,604,421 | 1,604,421 | 1,971,575 | 1,909,681 | 367,153.7 | 75,000 | **Yes** |

Notes:

(1) Sulfuric acid mist is calculated assuming a 10% oxidation from $SO_2$ to $SO_3$ and 100% oxidation from $SO_3$ to $H_2SO_4$

$SO_3$ Oxidation = 10%
$SO_2$ MW = 64 lb/lbmole
$SO_3$ MW = 80 lb/lbmole
$SO_3$ to H2SO4 = 100%
$H_2SO_4$ MW = 98 lb/lbmole

### Hobbs Past Actuals both Units Combined w/SSM (tpy)

| Air Pollutant | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | Max. Baseline Actuals | Baseline Year |
|---|---|---|---|---|---|---|
| NOx | 73.6 | 79.6 | 90.8 | 84.1 | 90.8 | 2015-2016 |
| CO | 7.6 | 11.3 | 10.9 | 6.8 | 11.3 | 2014-2015 |
| VOC | 1.9 | 2.1 | 2.4 | 5.4 | 5.4 | 2016-2017 |
| $SO_2$ | 6.6 | 11.5 | 17.3 | 10.4 | 17.3 | 2015-2016 |
| $TSP/PM_{10}$ | 37.7 | 42.0 | 48.7 | 46.3 | 48.7 | 2015-2016 |
| $CO_2e$ | 1,308,640 | 1,445,310 | 1,604,421 | 1,509,882 | 1,604,421 | 2015-2016 |

### Hobbs Past Actuals both Units Combined w/o SSM (tpy)

| Air Pollutant | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | Max. Baseline Actuals | Baseline Year |
|---|---|---|---|---|---|---|
| NOx | 72.4 | 78.3 | 89.9 | 81.4 | 89.9 | 2015-2016 |
| CO | 4.8 | 8.8 | 9.5 | 2.7 | 9.5 | 2015-2016 |
| VOC | 1.8 | 2.0 | 2.4 | 3.9 | 3.9 | 2016-2017 |
| $SO_2$ | 6.5 | 11.3 | 17.2 | 10.2 | 17.2 | 2015-2016 |
| $TSP/PM_{10}$ | 37.7 | 41.9 | 48.6 | 46.3 | 48.6 | 2015-2016 |
| $CO_2e$ | 1,308,640 | 1,445,310 | 1,604,421 | 1,509,882 | 1,604,421 | 2015-2016 |

**Hobbs Past Actuals per Unit**

| Air Pollutant | Both Units Combined w/SSM (tpy) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 |
| NOx | 79.6 | 67.6 | 91.6 | 90.0 | 78.2 | 73.6 | 79.6 | 90.8 | 84.1 |
| CO | 8.8 | 6.4 | 16.1 | 5.7 | 7.9 | 7.6 | 11.3 | 10.9 | 6.8 |
| VOC | 2.1 | 1.7 | 2.5 | 2.3 | 8.5 | 1.9 | 2.1 | 2.4 | 5.4 |
| $SO_2$ | 6.9 | 6.3 | 16.6 | 17.9 | 2.8 | 6.6 | 11.5 | 17.3 | 10.4 |
| $TSP/PM_{10}$ | 39.5 | 35.9 | 48.0 | 49.3 | 43.3 | 37.7 | 42.0 | 48.7 | 46.3 |
| $CO_2e$ | 1,369,681 | 1,247,598 | 1,643,022 | 1,565,821 | 1,453,943 | 1,308,640 | 1,445,310 | 1,604,421 | 1,509,882 |

| Air Pollutant | Both units Combined w/o SSM (tpy) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 |
| NOx | 78.6 | 66.1 | 90.6 | 89.2 | 73.6 | 72.4 | 78.3 | 89.9 | 81.4 |
| CO | 6.1 | 3.5 | 14.0 | 5.0 | 0.3 | 4.8 | 8.8 | 9.5 | 2.7 |
| VOC | 2.1 | 1.5 | 2.5 | 2.3 | 5.4 | 1.8 | 2.0 | 2.4 | 3.9 |
| $SO_2$ | 6.9 | 6.1 | 16.5 | 17.8 | 2.5 | 6.5 | 11.3 | 17.2 | 10.2 |
| $TSP/PM_{10}$ | 39.4 | 35.9 | 48.0 | 49.3 | 43.3 | 37.7 | 41.9 | 48.6 | 46.3 |
| $CO_2e$ | 1,369,681 | 1,247,598 | 1,643,022 | 1,565,821 | 1,453,943 | 1,308,640 | 1,445,310 | 1,604,421 | 1,509,882 |

**Hobbs SSM Emissions per Unit**

| Air Pollutant | HOBB-1 SSM Emissions (tpy) | | | | |
|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 |
| NOx | 1.0 | 1.5 | 1.0 | 0.8 | 4.6 |
| CO | 2.7 | 2.9 | 2.1 | 0.7 | 7.6 |
| VOC | 0.00 | 0.16 | 0.00 | 0.004 | 3.080 |
| $SO_2$ | 0.0 | 0.2 | 0.1 | 0.1 | 0.3 |
| $TSP/PM_{10}$ | 0.06 | 0.03 | 0.02 | 0.03 | 0.02 |

| Air Pollutant | HOBB-2 SSM Emissions (tpy) | | | | |
|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 |
| NOx | 0.9 | 1.8 | 0.9 | 1.1 | 1.8 |
| CO | 3.4 | 2.6 | 3.7 | 1.3 | 3.6 |
| VOC | 0.00 | 0.01 | 0.00 | 0.002 | 2.607 |
| $SO_2$ | 0.0 | 0.1 | 0.1 | 0.1 | 0.16 |
| $TSP/PM_{10}$ | 0.04 | 0.02 | 0.02 | 0.02 | 0.01 |

**HOBBS EMISSION RATE SUMMARY**

**Summary of Emission Rates**

| Air Pollutant | Averaging Period | Table 106.A PSD 3449-M3 (July 11, 2016) | | | Combustion Turbines Emission Rates | | |
|---|---|---|---|---|---|---|---|
| | | CT w/o Duct Burner | CT w/ Duct Burner | CTG Startup & Shutdown | CT w/o Duct Burner | CT w/ Duct Burner | CTG Startup & Shutdown |
| $NO_2$ (lbs/hr), each [(1)] | Hourly rolling 24-hour average based on CEMS data (SSM limits are based on a 1-hour block average) | 14.5 | 18.1 | 193.2 | 14.5 | 18.1 | 193.2 |
| $NO_2$ (ppmv) dry @ 15% $O_2$, each [(2),(3)] | Hourly rolling 24-hour average based on CEMS data | 2.0 BACT | | 96 BACT | 2.0 | | 96 |
| $NO_2$ (lb/MWh), each [(4)] | Daily rolling 30-day average (NSPS KKKK) | 0.43 | | Per NSPS KKKK | 0.43 | | Per NSPS KKKK |
| $NO_2$ (tons/yr), combined | Daily rolling 365-day total (includes SSM emissions) | 181.0 | | | 189.3 | | |
| CO (lbs/hr), each | 1-hour block average (Normal operation and SSM) | 8.8 | 11.0 | 2,060 | 8.8 | 11.0 | 2,060 |
| CO (ppmv) dry @ 15% $O_2$, each [(5),(6)] | 1-hour block average (Normal operation and SSM) | 2.0 BACT | | 3,000 BACT | 2.0 | | 3,000 |
| CO (tons/yr), combined | Daily rolling 365-day total (includes SSM emissions) | 279.5 | | | 284.5 | | |
| VOC (lbs/hr), each | Hourly rolling 24-hour average, calculation based on emission factor determined from compliance test. (compliance with VOC SSM limit will be demonstrated through compliance with CO SSM limits on a 1-hour block average basis). | 2.4 | 2.8 | 591.0 | 2.5 | 2.9 | 591.0 |
| VOC (ppmv) dry @ 15% $O_2$, each [(7),(8)] | Hourly rolling 24-hour average (data (compliance with VOC SSM limit will be demonstrated through compliance with CO SSM limits on a 1-hour block average basis.) | 1.0 BACT | | 900 BACT | 1.0 | | 900 |
| VOC (tons/yr), combined | Daily rolling 365-day total (includes SSM emissions) | 96.4 | | | 97.6 | | |
| $SO_2$ (lbs/hr), each [(9)] | 1-hour block average, calculation based on Sulfur content of fuel | 8.4 | 10.7 | N/A | 8.7 | 10.7 | N/A |
| $SO_2$ (lbs/MMBtu), each [(10)] | Daily rolling 30-day average (NSPS KKKK) | 0.06 | | Per NSPS KKKK | 0.06 | | Per NSPS KKKK |
| $SO_2$ (tons/yr), combined | Daily rolling 365-day total (includes SSM emissions) | 48.2 | | | 52.9 | | |
| TSP/$PM_{10}$/$PM_{2.5}$ (lbs/hr), each | Hourly rolling 24-hour average, calculation based on emission factor determined from compliance test data | 11.3 | 17.1 | N/A | 12.0 | 17.8 | N/A |
| TSP/$PM_{10}$ (lbs/MMBtu), each | Hourly rolling 24-hour average | 0.0071 | 0.0089 | N/A | 0.0071 | 0.0089 | N/A |
| TSP/$PM_{10}$/$PM_{2.5}$ (tons/yr), combined | Daily rolling 365-day total (includes SSM emissions) | 85.8 | | | 94.8 | | |
| $NH_3$ (lbs/hr), each | Calculation based on compliance test data | 32.1 | | N/A | 32.1 | | N/A |
| $NH_3$ (tons/yr), combined | Daily rolling 365-day total | 281.3 | | N/A | 281.3 | | N/A |

Notes:
(1) Nitrogen oxide emissions include all oxides of nitrogen expressed as $NO_2$.
(2) The $NO_2$ limit of 2.0 ppmvd @ 15% $O_2$ is based on the SCR BACT determination.
(3) The $NO_2$ limit of 96 ppmvd @ 15% $O_2$ during Startup & Shutdown is based on CTG performance manufacturer's data plus a 20% safety factor.
(4) $NO_2$ output base limit in accordance with Table 1 to NSPS Subpart KKKK.
(5) The CO limit of 2.0 ppmvd @ 15% $O_2$ is based on the oxidation catalyist BACT determination.
(6) The CO limit of 3,000 ppmvd @ 15% $O_2$ during Startup & Shutdown is based on CTG performance manufacturer's data plus a 20% safety factor.
(7) The VOC limit of 1.0 ppmvd @ 15% $O_2$ is based on the oxidation catalyist BACT determination.
(8) The VOC limit of 900 ppmvd @ 15% O2 during Startup & Shutdown is based on CTG performance manufacturer's data plus a 20% safety factor. Compliance with VOC limits is to be demonstrated through compliance with CO limits.
(9) The proposed post-project $SO_2$ allowable emission rate is based in total sulfur content in the fuel (40 CFR Part 75).
(10) $SO_2$ input base limit in accordance with NSPS Subpart KKKK, §60.4330.
(11) Cold, warm and hot startup hourly mass emission rates (lb/hr) maximum expected emissions during SSM events.

Rollling average period was used to identify worst case scenario and is not intended to be an operational restriction.

**(2) Emission factor (lb/event) represents the total mass emission during the event duration based on vendor performance data. Represented number reflects an average annual value.**

| Air Pollutant | Status | CT w/o Duct Burner ppmvd @ 15% $O_2$ | CT w/ Duct Burner ppmvd @ 15% $O_2$ | CT w/o Duct Burner per Unit | | CT w/Duct Burner per Unit | |
|---|---|---|---|---|---|---|---|
| | | | | Min. Hourly (lb/hr) | Max. Hourly (lb/hr) | Min. Hourly (lb/hr) | Max. Hourly (lb/hr) |
| NOx | pre-control | 24.3 | 21.3 | 141.0 | 172.0 | 147.60 | 178.6 |
| | post-control | 2.0 | 2.0 | 11.8 | 14.2 | 14.4 | 16.8 |
| CO | pre-control | 14.6 | 13.1 | 52.0 | 63.0 | 55.8 | 66.8 |
| | post-control | 2.0 | 2.0 | 7.2 | 8.6 | 8.8 | 10.2 |
| VOC | pre-control | 1.9 | 1.8 | 3.9 | 4.8 | 4.3 | 5.2 |
| | post-control | 1.0 | 1.0 | 2.1 | 2.5 | 2.5 | 2.9 |
| $SO_2$ | - | 0.9 | 0.9 | 7.3 | 8.7 | 9.0 | 10.4 |
| TSP/$PM_{10}$/$PM_{2.5}$ | - | - | - | 10.4 | 12.0 | 16.2 | 17.8 |
| $NH_3$ | - | 10 | 10 | 22 | 26.2 | 26.7 | 31.1 |

Notes:
(1) Estimated post-project hourly mass emission rates. Refer to "100% Load CTG Hourly" for detailed calculations.

## HOBBS EMISSION RATE SUMMARY

### Estimated Post-Project Annual Emission Rates Summary

| Air Pollutant | Status | Annual Emission Rates Per Unit w/o SSM [1] | | | Annual Emission Rates Per Unit w/SSM [2] | | | Annual Both Units Combined w/o SSM (tpy)[3] | Annual Both Units Combined w/SSM (tpy)[4] |
|---|---|---|---|---|---|---|---|---|---|
| | | CT w/o Duct Burner (tpy) | CT w/Duct Burner (tpy) | Annual per Unit (tpy) | CT w/o Duct Burner (tpy) | CT w/Duct Burner (tpy) | Annual per Unit (tpy) | | |
| NOx | pre-control | 392.2 | 310.4 | 702.7 | 355.2 | 310.4 | 665.6 | | |
| | post-control | 32.5 | 29.5 | 62.0 | 29.4 | 29.5 | 58.9 | 123.94 | 189.3 |
| CO | pre-control | 143.7 | 116.3 | 259.9 | 130.1 | 116.3 | 246.3 | | |
| | post-control | 19.8 | 17.9 | 37.7 | 17.9 | 17.9 | 35.9 | 75.5 | 284.5 |
| VOC | pre-control | 10.9 | 9.1 | 20.0 | 9.9 | 9.1 | 18.9 | | |
| | post-control | 3.4 | 3.1 | 6.5 | 3.1 | 3.1 | 6.2 | 13.0 | 97.6 |
| $SO_2$ | | 13.2 | 12.0 | 25.2 | 11.9 | 12.0 | 23.9 | 50.4 | 52.9 |
| $TSP/PM_{10}/PM_{2.5}$ | | 19.7 | 25.4 | 45.1 | 17.8 | 25.4 | 43.2 | 90.1 | 94.8 |
| $NH_3$ | | 60.2 | 54.5 | 114.7 | 54.5 | 54.5 | 109.0 | 229.4 | 218.0 |
| $CO_2$ | | 514,719 | 470,068 | 984,787 | 466,082 | 470,068 | 936,150 | 1,969,573 | 1,907,742 |
| $N_2O$ | | 1.0 | 0.9 | 1.8 | 0.9 | 0.9 | 1.7 | 3.7 | 3.5 |
| $CH_4$ | | 9.5 | 8.7 | 18.3 | 8.6 | 8.7 | 17.4 | 36.5 | 35.4 |
| GHG | | 514,729 | 470,078 | 984,807 | 466,092 | 470,078 | 936,169 | 1,969,613 | 1,907,781 |
| $CO_2e$ | | 515,242 | 470,546 | 985,788 | 466,556 | 470,546 | 937,102 | 1,971,575 | 1,909,681 |

Notes:

(1) Estimated post-project annual mass emission rates without SSM events per unit.

| | | |
|---|---|---|
| CTG w/o DB annual operational hours | 4,974 hr/yr | (outage = 0 hr/yr) |
| CTG w/DB annual operational hours | 3,786 hr/yr | (outage = 0 hr/yr) |
| CTG SSM annual operating hours | 0 hr/yr | |
| CTG Annual Outage days | 15 days/yr | |
| CTG Annual Outage hours | 0 hr/yr | (No outage hours accounted for GHG calculations) |
| Total CTG annual operating hours | 8,760 hr/yr | |

Annual Total (w/o SSM) = CTG w/o DB (tpy) + CTG w/DB (tpy) - $[\text{Hourly (lb/hr)} * \text{Outage Hours (hr/yr)} * 1\text{ ton}/2{,}000\text{lb}]_{w/o\ DB}$ - $[\text{Hourly (lb/hr)} * \text{Outage Hours (hr/yr)} * 1\text{ton}/2{,}000\text{lb}]_{w/DB}$

NOx Post-Control Annual Total (w/o SSM) = 32.5 tpy + 29.5 tpy - [ 11.8 lb/hr * 0 hr/yr * 1 ton/2,000 lb ] - [ 14.4 lb/hr * 0 hr/yr * 1 ton/2,000lb ] = 62.0 tpy per unit

(2) Estimated post-project annual mass emission rates including SSM events per unit.

| | | |
|---|---|---|
| CTG w/o DB annual operational hours | 4,504 hr/yr | (outage = 0 hr/yr) |
| CTG w/DB annual operational hours | 3,786 hr/yr | (outage = 0 hr/yr) |
| CTG SSM annual operating hours | 470 hr/yr | |
| CTG Outage days | 0 days/yr | |
| CTG Outage hours | 0 hr/yr | (No outage hours accounted for GHG calculations) |
| Total CTG annual operating hours | 7,820 hr/yr | |

Annual Total (w/SSM) = CTG w/o DB (tpy) + CTG w/DB (tpy) - $[\text{Hourly (lb/hr)} * \text{Outage Hours (hr/yr)} * 1\text{ ton}/2{,}000\text{lb}]_{w/o\ DB}$ - $[\text{Hourly (lb/hr)} * \text{Outage Hours (hr/yr)} * 1\text{ton}/2{,}000\text{lb}]_{w/DB}$

NOx Post-Control Annual Total (w/SSM) = 29.4 tpy + 29.5 tpy - [ 11.8 lb/hr * 0 hr/yr * 1 ton/2,000 lb ] - [ 14.4 lb/hr * 0 hr/yr * 1 ton/2,000lb ] = 58.9 tpy per unit

(3) Estimated post-project annual mass emission rates without SSM events. Represents an operation at 100% load for 8,760 hr/yr (0 hr of outage per year).
NOx Post-Control Annual Total w/o SSM = 62.0 tpy/unit * 2 units = 123.9 tpy both units combined

(4) Estimated post-project annual mass emission rates with SSM events. Represents an operation at 100% load for 7,820 hr/yr (470 hr/yr SSM and 0 hr of outage per year).
NOx Post-Control Annual Total (w/SSM) = (58.9 tpy/unit + 35.7 tpy/unit SSM) * 2 units = 189.3 tpy both units combined

### Estimated Post-Project SSM Emission Rates Summary [1]

| Air Pollutant | CTG Startup & Shutdown (per unit) | | | Both Units SSM (no change to current permitted values) | | Both Units | | Both Units | |
|---|---|---|---|---|---|---|---|---|---|
| | ppmvd @ 15% $O_2$ | lb/hr | tpy | lb/hr | tpy | tpy (from normal) | tpy TOTAL | tpy "SSM" (Total - normal) | Increase permitted SSM limit? |
| NOx | 96 | 193.2 | 35.7 | 386.3 | 71.5 | 123.9 | 189.3 | 65.3 | No |
| CO | 3,000 | 2,060.0 | 106.4 | 4,120.0 | 212.8 | 75.5 | 284.5 | 209.0 | No |
| VOC | 900 | 591.0 | 42.6 | 1,182.0 | 85.2 | 13.0 | 97.6 | 84.6 | No |
| $SO_2$ | - | 10.7 | 2.5 | 21.4 | 5.0 | 50.4 | 52.9 | 2.5 | No |
| $TSP/PM_{10}/PM_{2.5}$ | - | 17.8 | 4.2 | | | | | | |
| $CO_2$ | - | - | 17,720.8 | | | | | | |
| $N_2O$ | - | - | 0.033 | | | | | | |
| $CH_4$ | - | - | 0.33 | | | | | | |
| GHG | - | - | 17,721.2 | | | | | | |
| $CO_2e$ | - | - | 17,738.8 | | | | | | |

Notes:

(1) Estimated post-project hourly and annual SSM mass emission rates. Refer to "CTG SSM Events" for detailed calculations.

**HOBBS 501F4+ Hourly Emission Rate Calculation (100% Load)**

| | | Case 4 Unfired Winter Chillers Off | Case 4 Fired Winter Chillers Off | Case 5 Unfired Summer Chillers On | Case 5 Fired Summer Chillers On | Case 6 Unfired Summer Chillers Off | Case 6 Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **SITE CONDITIONS** | | | | | | | |
| Ambient Temperature | ºF | 30 | 30 | 95 | 95 | 95 | 95 |
| Ambient Relative Humidity | % | 60 | 60 | 20 | 20 | 20 | 20 |
| Barometric Pressure | psia | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 |
| Compressor Inlet Temperature | ºF | 30 | 30 | 46 | 46 | 95 | 95 |
| **FACILITY CONDITIONS** | | | | | | | |
| GT Power Output | MW | 189.0 | 189.0 | 180.1 | 180.1 | 151.1 | 151.1 |
| GT Model | | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ |
| GT Load | | Base | Base | Base | Base | Base | Base |
| Chillers ON/OFF | | Off | Off | **On** | **On** | Off | Off |
| GT Fuel Flow Rate | lb/hr | 86,940 | 86,940 | 83,592 | 83,592 | 72,720 | 72,720 |
| GT Heat Input (LHV) | MMBtu/hr | 1,765 | 1,765 | 1,697 | 1,697 | 1,477 | 1,477 |
| GT Heat Input (HHV) | MMBtu/hr | 1,884 | 1,884 | 1,812 | 1,812 | 1,576 | 1,576 |
| GT Fuel Flow Rate | MMscf/hr | 1.82 | 1.82 | 1.75 | 1.75 | 1.53 | 1.53 |
| DB Model | | Forney | Forney | Forney | Forney | Forney | Forney |
| DB Status | | Off | On | Off | On | Off | On |
| DB Heat Input (LHV) | MMBtu/hr | - | 330 | - | 330 | - | 330 |
| DB Heat Input (HHV) | MMBtu/hr | - | 366 | - | 366 | - | 366 |
| DB Fuel Flow Rate | MMscf/hr | - | 0.35 | - | 0.35 | - | 0.35 |
| **FUEL ANALYSIS** | | | | | | | |
| Fuel Type | | PNG | PNG | PNG | PNG | PNG | PNG |
| Fuel Molecular Weight | lb/lbmole | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 |
| Sulfur Content | grains/100scf | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| Fuel Heat Content (LHV) | Btu/scf | 932 | 932 | 932 | 932 | 932 | 932 |
| Fuel Heat Content (HHV) | Btu/scf | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| HHV/LHV Ratio | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| **GT EXHAUST GAS ANALYSIS** | | | | | | | |
| Oxygen, O2 | %vol | 12.5 | 12.5 | 12.5 | 12.5 | 12.7 | 12.7 |
| Carbon Dioxide, CO2 | %vol | 3.9 | 3.9 | 3.9 | 3.9 | 3.7 | 3.7 |
| Water, H2O | %vol | 7.7 | 7.7 | 8.4 | 8.4 | 8.3 | 8.3 |
| Nitrogen, N2 | %vol | 74.9 | 74.9 | 74.3 | 74.3 | 74.4 | 74.4 |
| Argon, Ar | %vol | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Total | %vol | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Molecular Weight (GT Exhaust Gases) | lb/lbmole | 28.5 | 28.5 | 28.4 | 28.4 | 28.4 | 28.4 |
| GT Exhaust Temperature | ºF | 1,121 | 1,121 | 1,130 | 1,130 | 1,155 | 1,155 |
| GT Exhaust Flow Rate | lb/hr | 3,834,000 | 3,834,000 | 3,704,400 | 3,704,400 | 3,330,000 | 3,330,000 |
| GT Exhaust Flow Rate | lbmole/hr | 134,651 | 134,651 | 130,437 | 130,437 | 117,304 | 117,304 |
| GT Exhaust Flow Rate | MMscf/hr | 51.9 | 51.9 | 50.3 | 50.3 | 45.2 | 45.2 |
| GT Exhaust Flow Rate | Nm3/hr | 1,469,123 | 1,469,123 | 1,423,144 | 1,423,144 | 1,279,858 | 1,279,858 |
| GT Exhaust Oxygen, O2 | lbmole/hr | 16,895 | 16,895 | 16,247 | 16,247 | 14,902 | 14,902 |
| GT Exhaust Carbon Dioxide, CO2 | lbmole/hr | 5,255 | 5,255 | 5,090 | 5,090 | 4,345 | 4,345 |
| GT Exhaust Water, H2O | lbmole/hr | 10,374 | 10,374 | 10,962 | 10,962 | 9,747 | 9,747 |
| GT Exhaust Nitrogen, N2 | lbmole/hr | 100,914 | 100,914 | 96,963 | 96,963 | 87,253 | 87,253 |
| GT Exhaust Argon, Ar | lbmole/hr | 1,213 | 1,213 | 1,175 | 1,175 | 1,057 | 1,057 |

**HOBBS 501F4+ Hourly Emission Rate Calculation (100% Load)**

| | | Case 4 Unfired Winter Chillers Off | Case 4 Fired Winter Chillers Off | Case 5 Unfired Summer Chillers On | Case 5 Fired Summer Chillers On | Case 6 Unfired Summer Chillers Off | Case 6 Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **GT EMISSION RATES** | | | | | | | |
| NOx | ppmvd @ 15% O2 | 25 | 25 | 25 | 25 | 25 | 25 |
| NOx | ppmvd | 31 | 31 | 31 | 31 | 30 | 30 |
| NOx (as NO2) | lb/hr | 172 | 172 | 165 | 165 | 141 | 141 |
| | | | | | | | |
| CO | ppmvd @ 15% O2 | 15 | 15 | 15 | 15 | 15 | 15 |
| CO | ppmvd | 19 | 19 | 19 | 19 | 18 | 18 |
| CO | lb/hr | 63 | 63 | 60 | 60 | 52 | 52 |
| | | | | | | | |
| VOC | ppmvd @ 15% O2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| VOC | ppmvd | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 |
| VOC (as CH4) | lb/hr | 4.8 | 4.8 | 4.6 | 4.6 | 3.9 | 3.9 |
| | | | | | | | |
| Sulfur Content | grains/100scf | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| SO2 | lb/hr | 8.7 | 8.7 | 8.4 | 8.4 | 7.3 | 7.3 |
| | | | | | | | |
| PM10 | mg/Nm3 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 |
| PM10 | lb/hr | 12.0 | 12.0 | 11.6 | 11.6 | 10.4 | 10.4 |
| | | | | | | | |
| Formaldehyde, HCHO | ppbvd @ 15% O2 | 91 | 91 | 91 | 91 | 91 | 91 |
| Formaldehyde, HCHO | ppmvd | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Formaldehyde, HCHO | lb/hr | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| | | | | | | | |
| **DB EMISSION RATES** | | | | | | | |
| NOx | lb/MMBtu (LHV) | - | 0.02 | - | 0.02 | - | 0.02 |
| NOx | lb/hr | - | 6.6 | - | 6.6 | - | 6.6 |
| | | | | | | | |
| CO | lb/MMBtu (LHV) | - | 0.012 | - | 0.012 | - | 0.012 |
| CO | lb/hr | - | 3.8 | - | 3.8 | - | 3.8 |
| | | | | | | | |
| VOC | lb/MMBtu (LHV) | - | 0.0013 | - | 0.0013 | - | 0.0013 |
| VOC (as CH4) | lb/hr | - | 0.4 | - | 0.4 | - | 0.4 |
| | | | | | | | |
| Sulfur Content | grains/100scf | - | 1.67 | - | 1.67 | - | 1.67 |
| SO2 | lb/hr | - | 1.7 | - | 1.7 | - | 1.7 |
| | | | | | | | |
| PM10 | lb/MMBtu (LHV) | - | 0.0175 | - | 0.0175 | - | 0.0175 |
| PM10 | lb/hr | - | 5.8 | - | 5.8 | - | 5.8 |
| | | | | | | | |
| Formaldehyde, HCHO | lb/MMscf (HHV) | - | 7.50E-02 | - | 7.50E-02 | - | 7.50E-02 |
| Formaldehyde, HCHO | lb/MMBtu (HHV) | - | 7.35E-05 | - | 7.35E-05 | - | 7.35E-05 |
| Formaldehyde, HCHO | lb/hr | - | 0.03 | - | 0.03 | - | 0.03 |
| | | | | | | | |
| **STACK EXHAUST GAS** | | | | | | | |
| Fuel x, in CxHy | | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| Fuel y, in Cx,Hy | | 4.02 | 4.02 | 4.02 | 4.02 | 4.02 | 4.02 |
| | | | | | | | |
| DB Fuel Flow Rate | lbmole/hr | - | 919 | - | 919 | - | 919 |
| Oxygen Consumed at DB, O2 | lbmole/hr | - | 1,875 | - | 1,875 | - | 1,875 |
| Carbon Dioxide Produced at DB, CO2 | lbmole/hr | - | 951 | - | 951 | - | 951 |
| Water Produced at DB, H2O | lbmole/hr | - | 1,847 | - | 1,847 | - | 1,847 |
| | | | | | | | |
| Stack Exhaust Oxygen, O2 | lbmole/hr | 16,895 | 15,021 | 16,247 | 14,373 | 14,902 | 13,027 |
| Stack Exhaust Carbon Dioxide, CO2 | lbmole/hr | 5,255 | 6,206 | 5,090 | 6,041 | 4,345 | 5,296 |
| Stack Exhaust Water, H2O | lbmole/hr | 10,374 | 12,221 | 10,962 | 12,809 | 9,747 | 11,594 |
| Stack Exhaust Nitrogen, N2 | lbmole/hr | 100,914 | 100,914 | 96,963 | 96,963 | 87,253 | 87,253 |
| Stack Exhaust Argon, Ar | lbmole/hr | 1,213 | 1,213 | 1,175 | 1,175 | 1,057 | 1,057 |
| Stack Exhaust Flow Rate | lbmole/hr | 134,651 | 135,574 | 130,437 | 131,360 | 117,304 | 118,227 |
| | | | | | | | |
| Stack Exhaust Oxygen, O2 | %vol | 12.5 | 11.1 | 12.5 | 10.9 | 12.7 | 11.0 |
| Stack Exhaust Carbon Dioxide, CO2 | %vol | 3.9 | 4.6 | 3.9 | 4.6 | 3.7 | 4.5 |
| Stack Exhaust Water, H2O | %vol | 7.7 | 9.0 | 8.4 | 9.8 | 8.3 | 9.8 |
| Stack Exhaust Nitrogen, N2 | %vol | 74.9 | 74.4 | 74.3 | 73.8 | 74.4 | 73.8 |
| Stack Exhaust Argon, Ar | %vol | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Stack Exhaust Flow Rate | %vol | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | | | | | | | |
| Molecular Weight (Stack Exhaust Gases) | lb/lbmole | 28.5 | 28.4 | 28.4 | 28.3 | 28.4 | 28.3 |
| | | | | | | | |
| Stack Exhaust Flow Rate | scfm | 864,693 | 870,623 | 837,631 | 843,560 | 753,296 | 759,226 |
| Stack Exhaust Flow Rate | dscfm | 798,072 | 792,142 | 767,235 | 761,305 | 690,704 | 684,774 |
| Stack Exit Temperature | ºF | 179 | 179 | 179 | 179 | 179 | 179 |
| Stack Exit Pressure | psia | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 |
| Stack Exhaust Flow Rate | acfm | 1,286,582 | 1,295,404 | 1,246,315 | 1,255,138 | 1,120,833 | 1,129,656 |
| Stack Diameter | ft | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Stack Velocity | fps | 84.3 | 84.8 | 81.6 | 82.2 | 73.4 | 74.0 |

**HOBBS 501F4+ Hourly Emission Rate Calculation (100% Load)**

| | | Case 4 Unfired Winter Chillers Off | Case 4 Fired Winter Chillers Off | Case 5 Unfired Summer Chillers On | Case 5 Fired Summer Chillers On | Case 6 Unfired Summer Chillers Off | Case 6 Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **STACK EMISSION RATES** | | | | | | | |
| NOx (pre-SCR) | ppmvd @ 15% O2 | 24.3 | 21.3 | 24.3 | 21.2 | 23.9 | 20.4 |
| NOx (pre-SCR) | ppmvd | 30.1 | 31.5 | 30.0 | 31.5 | 28.5 | 30.1 |
| NOx (pre-SCR as NO2) | lb/hr | 172.0 | 178.6 | 165.0 | 171.6 | 141.0 | 147.6 |
| NOx (post-SCR) | ppmvd @ 15% O2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| NOx (post-SCR) | ppmvd | 2.5 | 3.0 | 2.5 | 3.0 | 2.4 | 2.9 |
| NOx (post-SCR as NO2) | lb/hr | 14.2 | 16.8 | 13.6 | 16.2 | 11.8 | 14.4 |
| CO (pre-Catalytic Oxidation) | ppmvd @ 15% O2 | 14.6 | 13.1 | 14.5 | 12.9 | 14.5 | 12.7 |
| CO (pre-Catalytic Oxidation) | ppmvd | 18.1 | 19.3 | 17.9 | 19.2 | 17.3 | 18.7 |
| CO (pre-Catalytic Oxidation) | lb/hr | 63.0 | 66.8 | 60.0 | 63.8 | 52.0 | 55.8 |
| CO (post-Catalytic Oxidation) | ppmvd @ 15% O2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| CO (post-Catalytic Oxidation) | ppmvd | 2.5 | 3.0 | 2.5 | 3.0 | 2.4 | 2.9 |
| CO (post-Catalytic Oxidation) | lb/hr | 8.6 | 10.2 | 8.3 | 9.9 | 7.2 | 8.8 |
| VOC (pre-Catalytic Oxidation) | ppmvd @ 15% O2 | 1.9 | 1.8 | 1.9 | 1.8 | 1.9 | 1.7 |
| VOC (pre-Catalytic Oxidation) | ppmvd | 2.4 | 2.6 | 2.4 | 2.6 | 2.3 | 2.5 |
| VOC (pre-Catalytic Oxidation as CH4) | lb/hr | 4.8 | 5.2 | 4.6 | 5.0 | 3.9 | 4.3 |
| VOC (post-Catalytic Oxidation) | ppmvd @ 15% O2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| VOC (post-Catalytic Oxidation) | ppmvd | 1.2 | 1.5 | 1.2 | 1.5 | 1.2 | 1.5 |
| VOC (post-Catalytic Oxidation as CH4) | lb/hr | 2.5 | 2.9 | 2.4 | 2.8 | 2.1 | 2.5 |
| SO2 | ppmvd @ 15% O2 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| SO2 | ppmvd | 1.1 | 1.3 | 1.1 | 1.3 | 1.1 | 1.3 |
| SO2 | lb/hr | 8.7 | 10.4 | 8.4 | 10.0 | 7.3 | 9.0 |
| PM10 | lb/hr | 11.98 | 17.76 | 11.61 | 17.38 | 10.44 | 16.21 |
| PM10 | lb/MMBtu (LHV) | 0.0068 | 0.0085 | 0.0068 | 0.0086 | 0.0071 | 0.0090 |
| PM10 | lb/MMBtu (HHV) | 0.0064 | 0.0079 | 0.0064 | 0.0080 | 0.0066 | 0.0084 |
| HCHO | lb/hr | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| NH3 | ppmvd @ 15% O2 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| NH3 | ppmvd | 12.4 | 14.8 | 12.4 | 14.9 | 11.9 | 14.7 |
| NH3 | lb/hr | 26.2 | 31.1 | 25.2 | 30.0 | 21.9 | 26.7 |

Vendor Data

Process Input Data

**HOBBS 501F4 Hourly Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

**FACILITY CONDITIONS**

GT Fuel Flow Rate (MMscf/hr) = GT Heat Input (MMBtu/hr) / Fuel Heat Content (Btu/scf)
GT Fuel Flow Rate = 1,884 MMBtu/hr / 1,033 Btu/scf = 1.82 MMscf/hr

DB Heat Input (HHV) (MMBtu/hr) = DB Heat Input (LHV) (MMBtu/hr) * HHV/LHV Ratio
DB Heat Input (HHV) = 330 MMBtu/hr * 1.1 = 366 MMBtu/hr

DB Fuel Flow Rate (MMscf/hr) = DB Heat Input (MMBtu/hr) / Fuel Heat Content (Btu/scf)
DB Fuel Flow Rate = 366 MMBtu/hr / 1,033 Btu/scf = 0.35 MMscf/hr

**FUEL ANALYSIS**

HHV/LHV Ratio = Fuel Heat Content (HHV) (Btu/scf) / Fuel Heat Content (LHV) (Btu/scf)
HHV/LHV Ratio = 1,033 Btu/scf / 932 Btu/scf = 1.1

**GT EXHAUST GAS ANALYSIS**

Molecular Weight (GT Exhaust Gases) = Sum (%vol * MW)
Molecular Weight (GT Exhaust Gases) = 12.5 %vol * 32.0 lb/lbmole + 3.9 % vol * 44.0 lb/lbmole + 7.7 %vol * 18.0 lb/lbmole + 74.9 %vol * 28.0 lb/lbmole + 0.9 %vol * 39.9 lb/lbmole = 28.5 lb/lbmole

GT Exhaust Flow Rate (lbmole/hr) = GT Exhaust Flow Rate (lb/hr) / MW GT Exhaust Gases (lb/lbmole)
GT Exhaust Flow Rate = 3,834,000 lb/hr / 28.5 lb/lbmole = 134,651 lbmole/hr

GT Exhaust Flow Rate (MMscf/hr) = GT Exhaust Flow Rate (lbmole/hr) * Standard Molar Volume (scf/lbmole) * 1 MMscf/1,000,000 scf
GT Exhaust Flow Rate = 134,651 lbmole/hr * 385.3 scf/lbmole * 1MMscf / 1,000,000scf = 51.9 MMscf/hr

GT Exhaust Flow Rate ($Nm^3$/hr) = GT Exhaust Flow Rate (MMscf/hr) * 1,000,000 scf/MMscf / 35.3 scf/$Nm^3$
GT Exhaust Flow Rate = 51.9 MMscf/hr * 1,000,000 scf/MMscf / 35.3 scf/Nm3 = 1,469,123 Nm3/hr

GT Exhaust $O_2$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $O_2$%
GT Exhaust O2 = 134,651 lbmole/hr * 12.5% = 16,895 lbmole/hr

GT Exhaust $CO_2$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $CO_2$%
GT Exhaust CO2 = 134,651 lbmole/hr * 3.9% = 5,255 lbmole/hr

GT Exhaust $H_2O$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $H_2O$%
GT Exhaust H2O = 134,651 lbmole/hr * 7.7% = 10,374 lbmole/hr

GT Exhaust $N_2$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $N_2$%
GT Exhaust N2 = 134,651 lbmole/hr * 74.9% = 100,914 lbmole/hr

GT Exhaust Ar (lbmole/hr) = GT Exhaust (lbmole/hr) * Ar%
GT Exhaust Ar = 134,651 lbmole/hr * 0.9% = 1,213 lbmole/hr

**HOBBS 501F4 Hourly Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

**GT EMISSION RATES**

NOx (ppmvd) = NOx (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
NOx = 25 ppmvd @ 15% O2 * ( 20.9 - 12.5 / (1 - 7.7/100)) / (20.9-15) = 31 ppmvd

CO (ppmvd) = CO (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
CO = 15 ppmvd @ 15% O2 * ( 20.9 - 12.5 / (1 - 7.7/100)) / (20.9-15) = 19 ppmvd

VOC (ppmvd) = VOC (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
VOC = 2.0 ppmvd @ 15% O2 * ( 20.9 - 12.5 / (1 - 7.7/100)) / (20.9-15) = 2.5 ppmvd

$SO_2$ (lb/hr) = Sulfur Content (grains/Hscf) * 1 Hscf/100scf * 1 $lb_S$/7,000 grains / $MW_S$ ($lb_S$/$lbmole_S$) * 1$lbmole_{SO2}$/$lbmole_S$ * $MW_{SO2}$ ($lb_{SO2}$/$lbmole_{SO2}$) * GT Fuel Flow Rate (MMScf/hr) * 1,000,000 scf/MMscf
SO2 = 1.7 grains/Hscf * 1 Hscf/100scf * 1 lbS/7,000grains / 32.1 lbS/lbmoleS * 1lbmoleSO2/lbmoleS * 64.1 lbSO2/lbmoleSO2 * 1.8 MMscf/hr * 1,000,000 scf/MMscf = 8.7 lb/hr

$PM_{10}$ (lb/hr) = $PM_{10}$ (mg/$Nm^3$) * GT Exhaust Flow Rate ($Nm^3$/hr) * 1g/1,000 mg * 1 lb/453,59g
PM10 = 3.7 mg/Nm3 * 1,469,123 Nm3/hr * 1g/1,000mg * 1lb/453.59g = 12.0 lb/hr

HCHO (ppmvd) = HCHO (ppbvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15) * 1 ppmvd/1,000 ppbvd
HCHO = 91 ppbvd @ 15% O2 * ( 20.9 - 12.5 / (1 - 7.7/100)) / (20.9-15) * 1 ppmvd/1,000 ppbvd = 0.1 ppmvd

HCHO (lb/hr) = GT Exhaust Flow Rate (lbmole/hr) * (1 - $H_2O$ vol%/100) * HCHO (ppmvd) / 1,000,000 * $MW_{HCHO}$ (lb/lbmole)
HCHO = 134,651 lbmole/hr * (1 - 7.7/100) * 0.1 ppmvd/1,000,000 * 30.0 lb/lbmole = 0.4 lb/hr

**DB EMISSION RATES**

NOx (lb/hr) = NOx (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/hr)
NOx = 0.02 lb/MMBtu (LHV) * 330 MMBtu/hr (LHV) = 6.6 lb/hr

CO (lb/hr) = CO (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/hr)
CO= 0.012 lb/MMBtu (LHV) * 330 MMBtu/hr (LHV) = 3.8 lb/hr

VOC (lb/hr) = VOC (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/hr)
VOC= 0.0013 lb/MMBtu (LHV) * 330 MMBtu/hr (LHV) = 0.4 lb/hr

$SO_2$ (lb/hr) = Sulfur Content (grains/Hscf) * 1 Hscf/100scf * 1 $lb_S$/7,000 grains / $MW_S$ ($lb_S$/$lbmole_S$) * 1$lbmole_{SO2}$/$lbmole_S$ * $MW_{SO2}$ ($lb_{SO2}$/$lbmole_{SO2}$) * DB Fuel Flow Rate (MMScf/hr) * 1,000,000 scf/MMscf
SO2 = 1.7 grains/Hscf * 1 Hscf/100scf * 1 lbS/7,000grains / 32.1 lbS/lbmoleS * 1lbmoleSO2/lbmoleS * 64.1 lbSO2/lbmoleSO2 * 0.35 MMscf/hr * 1,000,000 scf/MMscf = 1.7 lb/hr

$PM_{10}$ (lb/hr) = $PM_{10}$ (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/hr)
PM10= 0.0175 lb/MMBtu (LHV) * 330 MMBtu/hr (LHV) = 5.8 lb/hr

HCHO Emission Factor (lb/MMBtu) (HHV) = HCHO Emission Factor (lb/MMscf) (HHV) / 1,020 Btu/scf
HCHO Emission Factor = 7.50 E-02 lb/MMscf (HHV) / 1,020 Btu/scf = 7.35E-05 lb/MMBtu (HHV)

HCHO (lb/hr) = HCHO (lb/MMBtu) (HHV) * DB Heat Input (HHV) (MMBtu/hr)
HCHO= 7.35E-05 lb/MMBtu (HHV) * 366 MMBtu/hr (HHV) = 0.03 lb/hr

**HOBBS 501F4 Hourly Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

**STACK EXHAUST GAS**
Fuel x, in CxHy = stoichiometric lbmoles of carbon in fuel
Fuel y, in Cx,Hy = stoichiometric lbmoles of hydrogen in fuel

DB Fuel Flow Rate (lbmole/hr) =DB Heat Input (HHV) (MMBtu/hr) * 1,000,000 Btu/MMBtu / Fuel Heat Content (HHV) (Btu/scf) / Standard Molar Volume (scf/lbmole)
DB Fuel Flow Rate = 366 MMBtu/hr * 1,000,000 Btu/MMBtu / 1,033 Btu/scf / 385.3 scf/lbmole = 919 lbmole/hr

$O_2$ Consumed at DB (lbmole/hr) = (Fuel x + Fuel y/4) * DB Fuel Flow Rate (lbmole/hr)
O2 Consumed at DB) = (1.04 + 4.02 / 4) * 919 lbmole/hr = 1,875 lbmole/hr

$CO_2$ Produced at DB (lbmole/hr) = Fuel x * DB Fuel Flow Rate (lbmole/hr)
CO2 Produced at DB = 1.04 * 919 lbmole/hr = 951 lbmole/hr

$H_2O$ Produced at DB (lbmole/hr) = Fuel y / 2 * DB Fuel Flow Rate (lbmole/hr)
H2O Produced at DB = 4.02 / 2 * 919 lbmole/hr = 1,847 lbmole/hr

Stack Exhaust $O_2$ (lbmole/hr) = GT Exhaust $O_2$ (lbmole/hr) - DB Consumed $O_2$ (lbmole/hr)
Stack Exahust O2 = 16,895 lbmole/hr - 1,875 lbmole/hr = 15,021 lbmole/hr

Stack Exhaust $CO_2$ (lbmole/hr) = GT Exhaust $CO_2$ (lbmole/hr) + DB Produced $CO_2$ (lbmole/hr)
Stack Exhaust CO2 = 5,255 lbmole/hr + 951 lbmole/hr = 6,206 lbmole/hr

Stack Exhaust $H_2O$ (lbmole/hr) = GT Exhaust $H_2O$ (lbmole/hr) + DB Produced $H_2O$ (lbmole/hr)
Stack Exahust H2O = 10,374 lbmole/hr + 1,847 lbmole/hr = 12,221 lbmole/hr

Stack Exhaust $N_2$ (lbmole/hr) = GT Exhaust $N_2$ (lbmole/hr)
Stack Exhaust N2 = 100,914 lbmole/hr

Stack Exhaust Ar (lbmole/hr) = GT Exhaust Ar (lbmole/hr)
Stack Exhaust Ar = 1,213 lbmole/hr

Stack Exhaust Flow Rate (lbmole/hr) = Sum Stack Exhaust Pollutants Flow Rates (lbmole/hr)
Stack Exhaust Flow Rate = 15,021 lbmole/hr + 6,206 lbmole/hr + 12,221 lbmole/hr + 100,914 lbmole/hr + 1,213 lbmole/hr = 135,574 lbmole/hr

Stack Exhaust i %vol = Stack Exhaust i (lbmole/hr) * 100 / Stack Exhaust Flow Rate (lbmole/hr)
Stack Exhaust O2 = 15,021 lbmole/hr * 100 /135,574 lbmole/hr = 11.1 %vol
Stack Exhaust CO2 = 6,206 lbmole/hr * 100 /135,574 lbmole/hr = 4.6 %vol
Stack Exhaust H2O = 12,221 lbmole/hr * 100 /135,574 lbmole/hr = 9.0 %vol
Stack Exhaust N2 = 100,914 lbmole/hr * 100 /135,574 lbmole/hr = 74.4 %vol
Stack Exhaust Ar = 1,213 lbmole/hr * 100 /135,574 lbmole/hr = 0.9 %vol

Molecular Weight (Stack Exhaust Gases) = Sum (%vol * MW)
Molecular Weight (GT Exhaust Gases) = 11.1 %vol * 32.0 lb/lbmole + 4.6 % vol * 44.0 lb/lbmole + 9.0 %vol * 18.0 lb/lbmole + 74.4 %vol * 28.0 lb/lbmole + 0.9 %vol * 39.9 lb/lbmole = 28.4 lb/lbmole

Stack Exhaust Flow Rate (scfm) = Stack Exhaust Flow Rate (lbmole/hr) * Standard Molar Volume (scf/lbmole) * 1hr/60min
Stack Exhaust Flow Rate = 135,574 lbmole/hr * 385.3 scf/lbmole * 1hr/60min = 870,623 scfm

Stack Exhaust Dry Flow Rate (dscfm) = Stack Exhaust Flow Rate (scfm) * (1 - $H_2O$/100)
Stack Exhaust Dry Flow Rate = 870,623 scfm * (1 - 9.0 %vol / 100) = 792,142 dscfm

Stack Exhaust Flow Rate (acfm) = Stack Exhaust Flow Rate (scfm) *((5/9*(Stack Exit Temp (F)-32)+273.15)/273.15)*(14.696/Stack Exit Pressure (psia))
Stack Exhaust Flow Rate = 870,623 * ((5/9*(179-32)+273.15) K / 273.15 K) *(14.696 psia / 12.83 psia) = 1,295,404 acfm

Stack Exit Velocity (fps) =Stack Exhaust Flow Rate (acfm) / (PI()/4 * Stack Diameter^2) (ft)^2 * 1min/60sec
Stack Exit Velocity = 1,295,404 / (PI()/4 * 18.0^2) ft^2 * 1min/60sec = 84.8 fps

**HOBBS 501F4 Hourly Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

**STACK EMISSION RATES**

NOx (pre-SCR as $NO_2$) (lb/hr) = GT NOx Exhaust (lb/hr) + DB NOx Exhaust (lb/hr)
NOx (pre-SCR as NO2) = 172.0 lb/hr + 6.6 lb/hr = 178.6 lb/hr

NOx (pre-SCR) (ppmvd) = NOx (pre-SCR as $NO_2$) (lb/hr) / (Stack Exhaust Flow Rate (lbmole/hr) * (1 - Stack Exhaust $H_2O$ vol%/100) * 1/1,000,000 * $MW_{NO2}$ (lb/lbmole))
NOx (pre-SCR) = 178.6 lb/hr /( 135,574 lbmole/hr * (1 - 9.0 /100) * 1 / 1,000,000 * 46.0 lb/lbmole) = 31.5 ppmvd

NOx (pre-SCR) (ppmvd @ 15% $O_2$) = NOx (pre-SCR) (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust $O_2$%/(1 - $H_2O$%/100))
NOx (pre-SCR) = 31.5 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 21.3 ppmvd @ 15% O2

NOx (post-SCR) (ppmvd) = NOx (post-SCR) (ppmvd @ 15% $O_2$) * (20.9-$O_2$ vol%/(1-$H_2O$ vol%/100))/(20.9-15)
NOx (post-SCR) = 2.0 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 3.0 ppmvd

NOx (post-SCR as $NO_2$) (lb/hr) = NOx (post-SCR) (ppmvd) * (1 - $H_2O$ %vol/100) * Stack Exhaust Flow Rate (lbmole/hr) /1,000,000 * $MW_{NO2}$ (lb/lbmole)
NOx (post-SCR as NO2) = 3.0 ppmvd * (1 - 9.0/100) * 135,574 lbmole/hr / 1,000,000 * 46.0 lb/lbmole = 16.8 lb/hr

CO (pre-Catalytic Oxidation) (lb/hr) = GT CO Exhaust (lb/hr) + DB CO Exhaust (lb/hr)
CO (pre-Catalytic Oxydation) = 63.0 lb/hr + 3.8 lb/hr = 66.8 lb/hr

CO (pre-Catalytic Oxidation) (ppmvd) = CO (pre-Catalytic Oxidation) (lb/hr) / (Stack Exhaust Flow Rate (lbmole/hr) * (1 - Stack Exhaust $H_2O$ vol%/100) * 1/1,000,000 * $MW_{CO}$ (lb/lbmole))
CO (pre-Catalytic Oxidation) = 66.8 lb/hr /( 135,574 lbmole/hr * (1 - 9.0 /100) * 1 / 1,000,000 * 28.0 lb/lbmole) = 19.3 ppmvd

CO (pre-Catalytic Oxidation) (ppmvd @ 15% $O_2$) = CO (pre-Catalytic Oxidation) (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust $O_2$%/(1 - $H_2O$%/100))
CO (pre-Catalytic Oxidation) = 19.3 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 13.1 ppmvd @ 15% O2

CO (post-Catalytic Oxidation) (ppmvd) = CO (post-Catalytic Oxidation) (ppmvd @ 15% $O_2$) * (20.9-$O_2$ vol%/(1-$H_2O$ vol%/100))/(20.9-15)
CO (post-Catalytic Oxidation) = 2.0 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 3.0 ppmvd

CO (post-Catalytic Oxidation) (lb/hr) = CO (post-Catalytic Oxidation) (ppmvd) * (1 - $H_2O$ %vol/100) * Stack Exhaust Flow Rate (lbmole/hr) /1,000,000 * $MW_{CO}$ (lb/lbmole)
CO (post-Catalytic Oxidation) = 3.0 ppmvd * (1 - 9.0/100) * 135,574 lbmole/hr / 1,000,000 * 28.0 lb/lbmole = 10.2 lb/hr

VOC (pre-Catalytic Oxidation) (lb/hr) = GT VOC Exhaust (lb/hr) + DB VOC Exhaust (lb/hr)
VOC (pre-Catalytic Oxydation) = 4.8 lb/hr + 0.4 lb/hr = 5.2 lb/hr

VOC (pre-Catalytic Oxidation) (ppmvd) = VOC (pre-Catalytic Oxidation) (lb/hr) / (Stack Exhaust Flow Rate (lbmole/hr) * (1 - Stack Exhaust $H_2O$ vol%/100) * 1/1,000,000 * $MW_{VOC}$ (lb/lbmole))
VOC (pre-Catalytic Oxidation) = 5.2 lb/hr /( 135,574 lbmole/hr * (1 - 9.0 /100) * 1 / 1,000,000 * 16.0 lb/lbmole) = 2.6 ppmvd

VOC (pre-Catalytic Oxidation) (ppmvd @ 15% $O_2$) = VOC (pre-Catalytic Oxidation) (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust $O_2$%/(1 - $H_2O$%/100))
VOC (pre-Catalytic Oxidation) = 2.6 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 1.8 ppmvd @ 15% O2

VOC (post-Catalytic Oxidation) (ppmvd) = VOC (post-Catalytic Oxidation) (ppmvd @ 15% $O_2$) * (20.9-$O_2$ vol%/(1-$H_2O$ vol%/100))/(20.9-15)
VOC (post-Catalytic Oxidation) = 1.0 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 1.5 ppmvd

VOC (post-Catalytic Oxidation) (lb/hr) = VOC (post-Catalytic Oxidation (ppmvd) * (1 - $H_2O$ %vol/100) * Stack Exhaust Flow Rate (lbmole/hr) /1,000,000 * $MW_{VOC}$ (lb/lbmole)
VOC (post-Catalytic Oxidation) = 1.5 ppmvd * (1 - 9.0/100) * 135,574 lbmole/hr / 1,000,000 * 16.0 lb/lbmole = 2.9 lb/hr

**HOBBS 501F4 Hourly Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

$SO_2$ (lb/hr) = GT $SO_2$ Exhaust (lb/hr) + DB $SO_2$ Exhaust (lb/hr)
SO2 - 8.7 lb/hr + 1.7 lb/hr = 10.4 lb/hr

$SO_2$(ppmvd) = $SO_2$ (lb/hr) / (Stack Exhaust Flow Rate (lbmole/hr) * (1 - Stack Exhaust $H_2O$ vol%/100) * 1/1,000,000 * $MW_{VOC}$ (lb/lbmole))
SO2 = 10.4 lb/hr /( 135,574 lbmole/hr * (1 - 9.0 /100) * 1 / 1,000,000 * 64.1 lb/lbmole) = 1.3 ppmvd

$SO_2$ (ppmvd @ 15% $O_2$) = $SO_2$ (pre-Catalytic Oxidation) (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust $O_2$%/(1 - $H_2O$%/100))
SO2 = 1.3 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 0.9 ppmvd @ 15% O2

$PM_{10}$ (lb/hr) = GT $PM_{10}$ Exhaust (lb/hr) + DB $PM_{10}$ Exhaust (lb/hr)
PM10 - 12.0 lb/hr + 5.8 lb/hr = 17.8 lb/hr

$PM_{10}$ (lb/MMBtu) = $PM_{10}$ (lb/hr) / (GT Heat Input (MMBtu/hr) + DB Heat Input (MMBtu/hr))
PM10 = 17.8 lb/hr / (1,765 MMBtu/hr (LHV) + 330 MMBtu/hr (LHV)) = 0.0085 lb/MMBtu (LHV)
PM10 = 17.8 lb/hr / (1,884 MMBtu/hr (LHV) + 366 MMBtu/hr (LHV)) = 0.0079 lb/MMBtu (HHV)

HCHO (lb/hr) = GT HCHO Exhaust (lb/hr) + DB HCHO Exhaust (lb/hr)
HCHO = 0.4 lb/hr + 0.03 lb/hr = 0.4 lb/hr

$NH_3$ (ppmvd) = $NH_3$ (ppmvd @ 15% $O_2$) * (20.9-$O_2$ vol%/(1-$H_2O$ vol%/100))/(20.9-15)
NH3 = 10.0 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 14.8 ppmvd

$NH_3$ (lb/hr) = $NH_3$ (ppmvd) * (1 - $H_2O$ %vol/100) * Stack Exhaust Flow Rate (lbmole/hr) /1,000,000 * $MW_{NH3}$ (lb/lbmole)
NH3) = 14.8 ppmvd * (1 - 9.0/100) * 135,574 lbmole/hr / 1,000,000 * 17.0 lb/lbmole = 31.1 lb/hr

**HOBBS 501F4+ Annual Emission Rate Calculation (100% Load) (8,760 hr/yr)**

| | | Case 4 Unfired Winter Chillers Off | Case 4 Fired Winter Chillers Off | Case 5 Unfired Summer Chillers On | Case 5 Fired Summer Chillers On | Case 6 Unfired Summer Chillers Off | Case 6 Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **SITE CONDITIONS** | | | | | | | |
| Ambient Temperature | ºF | 30 | 30 | 95 | 95 | 95 | 95 |
| Ambient Relative Humidity | % | 60 | 60 | 20 | 20 | 20 | 20 |
| Barometric Pressure | psia | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 |
| Compressor Inlet Temperature | ºF | 30 | 30 | 46 | 46 | 95 | 95 |
| **FACILITY CONDITIONS** | | | | | | | |
| Annual Hours of Operation | hr/yr | 1,419 | 1,080 | 1,632 | 1,242 | 1,923 | 1,464 |
| GT Power Output | MW | 189 | 189 | 180 | 180 | 151 | 151 |
| GT Model | | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ |
| GT Load | | Base | Base | Base | Base | Base | Base |
| Chillers | On/Off | Off | Off | **On** | **On** | Off | Off |
| GT Fuel Flow Rate | lb/hr | 86,940 | 86,940 | 83,592 | 83,592 | 72,720 | 72,720 |
| GT Heat Input (LHV) | MMBtu/hr | 1,765 | 1,765 | 1,697 | 1,697 | 1,477 | 1,477 |
| GT Heat Input (HHV) | MMBtu/hr | 1,884 | 1,884 | 1,812 | 1,812 | 1,576 | 1,576 |
| GT Heat Input (LHV) | MMBtu/yr | 2,504,342 | 1,906,200 | 2,769,036 | 2,107,674 | 2,840,840 | 2,162,328 |
| GT Heat Input (HHV) | MMBtu/yr | 2,673,190 | 2,034,720 | 2,956,684 | 2,250,504 | 3,031,255 | 2,307,264 |
| GT Fuel Flow Rate | MMscf/yr | 2,588 | 1,970 | 2,862 | 2,179 | 2,934 | 2,234 |
| DB Model | | Forney | Forney | Forney | Forney | Forney | Forney |
| DB Status | | Off | On | Off | On | Off | On |
| DB Heat Input (LHV) | MMBtu/yr | - | 345,600 | - | 397,440 | - | 445,056 |
| DB Heat Input (HHV) | MMBtu/yr | - | 383,187 | - | 440,665 | - | 493,459 |
| DB Fuel Flow Rate | MMscf/yr | - | 371 | - | 427 | - | 478 |
| GT+DB Heat Input (LHV) | MMBtu/yr | 2,504,342 | 2,251,800 | 2,769,036 | 2,505,114 | 2,840,840 | 2,607,384 |
| GT+DB Heat Input (HHV) | MMBtu/yr | 2,673,190 | 2,417,907 | 2,956,684 | 2,691,169 | 3,031,255 | 2,800,723 |
| **FUEL ANALYSIS** | | | | | | | |
| Fuel Type | | PNG | PNG | PNG | PNG | PNG | PNG |
| Fuel Molecular Weight | lb/lbmole | 17.29 | 17.29 | 17.29 | 17.29 | 17.29 | 17.29 |
| Sulfur Content | grains/100scf | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| Fuel Heat Content (LHV) | Btu/scf | 932 | 932 | 932 | 932 | 932 | 932 |
| Fuel Heat Content (HHV) | Btu/scf | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| HHV/LHV Ratio | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| **GT EXHAUST GAS ANALYSIS** | | | | | | | |
| Oxygen, O2 | %vol | 12.5 | 12.5 | 12.5 | 12.5 | 12.7 | 12.7 |
| Carbon Dioxide, CO2 | %vol | 3.9 | 3.9 | 3.9 | 3.9 | 3.7 | 3.7 |
| Water, H2O | %vol | 7.7 | 7.7 | 8.4 | 8.4 | 8.3 | 8.3 |
| Nitrogen, N2 | %vol | 74.9 | 74.9 | 74.3 | 74.3 | 74.4 | 74.4 |
| Argon, Ar | %vol | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Total | %vol | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Molecular Weight (GT Exhaust Gases) | lb/lbmole | 28.5 | 28.5 | 28.4 | 28.4 | 28.4 | 28.4 |
| GT Exhaust Temperature | ºF | 1,121 | 1,121 | 1,130 | 1,130 | 1,155 | 1,155 |
| GT Exhaust Flow Rate | lb/hr | 3,834,000 | 3,834,000 | 3,704,400 | 3,704,400 | 3,330,000 | 3,330,000 |
| GT Exhaust Flow Rate | lbmole/yr | 191,054,814 | 145,422,904 | 212,836,646 | 162,002,320 | 225,620,739 | 171,733,035 |
| GT Exhaust Flow Rate | MMscf/yr | 73,614 | 56,032 | 82,007 | 62,420 | 86,933 | 66,170 |
| GT Exhaust Flow Rate | Nm3/yr | 2,084,524,985 | 1,586,652,914 | 2,322,178,110 | 1,767,544,496 | 2,461,660,392 | 1,873,712,554 |
| GT Exhaust Oxygen, O2 | lbmole/yr | 23,972,657 | 18,246,980 | 26,511,418 | 20,179,379 | 28,662,801 | 21,816,921 |
| GT Exhaust Carbon Dioxide, CO2 | lbmole/yr | 7,455,611 | 5,674,898 | 8,304,782 | 6,321,251 | 8,357,160 | 6,361,120 |
| GT Exhaust Water, H2O | lbmole/yr | 14,720,053 | 11,204,286 | 17,887,222 | 13,615,002 | 18,747,143 | 14,269,538 |
| GT Exhaust Nitrogen, N2 | lbmole/yr | 143,185,967 | 108,987,147 | 158,216,736 | 120,427,938 | 167,820,812 | 127,738,157 |
| GT Exhaust Argon, Ar | lbmole/yr | 1,720,526 | 1,309,592 | 1,916,488 | 1,458,750 | 2,032,823 | 1,547,299 |

**HOBBS 501F4+ Annual Emission Rate Calculation (100% Load) (8,760 hr/yr)**

| | | **Case 4** Unfired Winter Chillers Off | **Case 4** Fired Winter Chillers Off | **Case 5** Unfired Summer Chillers On | **Case 5** Fired Summer Chillers On | **Case 6** Unfired Summer Chillers Off | **Case 6** Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **GT EMISSION RATES** | | | | | | | |
| NOx | ppmvd @ 15% O2 | 25 | 25 | 25 | 25 | 25 | 25 |
| NOx | ppmvd | 31 | 31 | 31 | 31 | 30 | 30 |
| NOx (as NO2) | lb/hr | 172 | 172 | 165 | 165 | 141 | 141 |
| NOx (as NO2) | lb/yr | 244,049 | 185,760 | 269,235 | 204,930 | 271,197 | 206,424 |
| CO | ppmvd @ 15% O2 | 15 | 15 | 15 | 15 | 15 | 15 |
| CO | ppmvd | 19 | 19 | 19 | 19 | 18 | 18 |
| CO | lb/hr | 63 | 63 | 60 | 60 | 52 | 52 |
| CO | lb/yr | 89,390 | 68,040 | 97,903 | 74,520 | 100,016 | 76,128 |
| VOC | ppmvd @ 15% O2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| VOC | ppmvd | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 |
| VOC (as CH4) | lb/hr | 4.8 | 4.8 | 4.6 | 4.6 | 3.9 | 3.9 |
| VOC (as CH4) | lb/yr | 6,811 | 5,184 | 7,506 | 5,713 | 7,501 | 5,710 |
| Sulfur Content | grains/100scf | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| SO2 | lb/yr | 8,125 | 6,184 | 8,986 | 6,840 | 9,213 | 7,012 |
| PM10 | mg/Nm3 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| PM10 | lb/yr | 11,949 | 9,095 | 13,311 | 10,132 | 14,110 | 10,740 |
| Formaldehyde, HCHO | ppbvd @ 15% O2 | 91 | 91 | 91 | 91 | 91 | 91 |
| Formaldehyde, HCHO | ppmvd | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Formaldehyde, HCHO | lb/yr | 597 | 454 | 659 | 502 | 675 | 514 |
| **DB EMISSION RATES** | | | | | | | |
| NOx | lb/MMBtu (LHV) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| NOx | lb/yr | - | 6,912 | - | 7,949 | - | 8,901 |
| CO | lb/MMBtu (LHV) | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 |
| CO | lb/yr | - | 4,020 | - | 4,624 | - | 5,177 |
| VOC | lb/MMBtu (LHV) | 0.0013 | 0.0013 | 0.0013 | 0.0013 | 0.0013 | 0.0013 |
| VOC (as CH4) | lb/yr | - | 438 | - | 503 | - | 564 |
| Sulfur Content | grains/100scf | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| SO2 | lb/yr | - | 1,165 | - | 1,339 | - | 1,500 |
| PM10 | lb/MMBtu (LHV) | 0.0175 | 0.0175 | 0.0175 | 0.0175 | 0.0175 | 0.0175 |
| PM10 | lb/yr | - | 6,048 | - | 6,955 | - | 7,788 |
| Formaldehyde, HCHO | lb/MMscf (HHV) | 7.50E-02 | 7.50E-02 | 7.50E-02 | 7.50E-02 | 7.50E-02 | 7.50E-02 |
| Formaldehyde, HCHO | lb/MMBtu (HHV) | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.35E-05 |
| Formaldehyde, HCHO | lb/yr | - | 28.2 | - | 32.4 | - | 36.3 |
| **STACK EXHAUST GAS** | | | | | | | |
| Fuel x, in CxHy | | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| Fuel y, in Cx,Hy | | 4.02 | 4.02 | 4.02 | 4.02 | 4.02 | 4.02 |
| DB Fuel Flow Rate | lbmole/yr | - | 962,713 | - | 1,107,120 | - | 1,239,760 |
| Oxygen Consumed at DB, O2 | lbmole/yr | - | 1,963,401 | - | 2,257,911 | - | 2,528,424 |
| Carbon Dioxide Produced at DB, CO2 | lbmole/yr | - | 996,423 | - | 1,145,886 | - | 1,283,171 |
| Water Produced at DB, H2O | lbmole/yr | - | 1,933,956 | - | 2,224,050 | - | 2,490,506 |
| Stack Exhaust Oxygen, O2 | lbmole/yr | 23,972,657 | 16,283,580 | 26,511,418 | 17,921,468 | 28,662,801 | 19,288,497 |
| Stack Exhaust Carbon Dioxide, CO2 | lbmole/yr | 7,455,611 | 6,671,321 | 8,304,782 | 7,467,137 | 8,357,160 | 7,644,290 |
| Stack Exhaust Water, H2O | lbmole/yr | 14,720,053 | 13,138,242 | 17,887,222 | 15,839,052 | 18,747,143 | 16,760,044 |
| Stack Exhaust Nitrogen, N2 | lbmole/yr | 143,185,967 | 108,987,147 | 158,216,736 | 120,427,938 | 167,820,812 | 127,738,157 |
| Stack Exhaust Argon, Ar | lbmole/yr | 1,720,526 | 1,309,592 | 1,916,488 | 1,458,750 | 2,032,823 | 1,547,299 |
| Stack Exhaust Flow Rate | lbmole/yr | 191,054,814 | 146,389,882 | 212,836,646 | 163,114,345 | 225,620,739 | 172,978,288 |
| Stack Exhaust Oxygen, O2 | %vol | 12.5 | 11.1 | 12.5 | 11.0 | 12.7 | 11.2 |
| Stack Exhaust Carbon Dioxide, CO2 | %vol | 3.9 | 4.6 | 3.9 | 4.6 | 3.7 | 4.4 |
| Stack Exhaust Water, H2O | %vol | 7.7 | 9.0 | 8.4 | 9.7 | 8.3 | 9.7 |
| Stack Exhaust Nitrogen, N2 | %vol | 74.9 | 74.4 | 74.3 | 73.8 | 74.4 | 73.8 |
| Stack Exhaust Argon, Ar | %vol | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Stack Exhaust Flow Rate | %vol | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Molecular Weight (Stack Exhaust Gases) | lb/lbmole | 28.5 | 28.4 | 28.4 | 28.3 | 28.4 | 28.3 |

**HOBBS 501F4+ Annual Emission Rate Calculation (100% Load) (8,760 hr/yr)**

| | | Case 4<br>Unfired<br>Winter<br>Chillers Off | Case 4<br>Fired<br>Winter<br>Chillers Off | Case 5<br>Unfired<br>Summer<br>Chillers On | Case 5<br>Fired<br>Summer<br>Chillers On | Case 6<br>Unfired<br>Summer<br>Chillers Off | Case 6<br>Fired<br>Summer<br>Chillers Off |
|---|---|---|---|---|---|---|---|
| **STACK EMISSION RATES** | | | | | | | |
| NOx (pre-SCR) | ppmvd @ 15% O2 | 24.3 | 21.4 | 24.3 | 21.2 | 23.9 | 20.7 |
| NOx (pre-SCR) | ppmvd | 30.1 | 31.4 | 30.0 | 31.4 | 28.5 | 30.0 |
| NOx (pre-SCR as NO2) | lb/yr | 244,049 | 192,672 | 269,235 | 212,879 | 271,197 | 215,325 |
| NOx (pre-SCR as NO2) | tpy | 122.0 | 96.3 | 134.6 | 106.4 | 135.6 | 107.7 |
| NOx (post-SCR) | ppmvd @ 15% O2 | 2 | 2 | 2 | 2 | 2 | 2 |
| NOx (post-SCR) | ppmvd | 2.5 | 2.9 | 2.5 | 3.0 | 2.4 | 2.9 |
| NOx (post-SCR as NO2) | lb/yr | 20,089 | 18,037 | 22,197 | 20,054 | 22,728 | 20,837 |
| NOx (post-SCR as NO2) | tpy | 10.0 | 9.0 | 11.1 | 10.0 | 11.4 | 10.4 |
| CO (pre-Catalytic Oxidation) | ppmvd @ 15% O2 | 14.6 | 13.1 | 14.5 | 13.0 | 14.5 | 12.8 |
| CO (pre-Catalytic Oxidation) | ppmvd | 18.1 | 19.3 | 17.9 | 19.2 | 17.3 | 18.6 |
| CO (pre-Catalytic Oxidation) | lb/yr | 89,390 | 72,060 | 97,903 | 79,144 | 100,016 | 81,305 |
| CO (pre-Catalytic Oxidation) | tpy | 44.7 | 36.0 | 49.0 | 39.6 | 50.0 | 40.7 |
| CO (post-Catalytic Oxidation) | ppmvd @ 15% O2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO (post-Catalytic Oxidation) | ppmvd | 2.5 | 2.9 | 2.5 | 3.0 | 2.4 | 2.9 |
| CO (post-Catalytic Oxidation) | lb/yr | 12,231 | 10,982 | 13,514 | 12,210 | 13,838 | 12,687 |
| CO (post-Catalytic Oxidation) | tpy | 6.1 | 5.5 | 6.8 | 6.1 | 6.9 | 6.3 |
| VOC (pre-Catalytic Oxidation) | ppmvd @ 15% O2 | 1.9 | 1.8 | 1.9 | 1.8 | 1.9 | 1.7 |
| VOC (pre-Catalytic Oxidation) | ppmvd | 2.4 | 2.6 | 2.4 | 2.6 | 2.3 | 2.5 |
| VOC (pre-Catalytic Oxidation as CH4) | lb/yr | 6,811 | 5,622 | 7,506 | 6,217 | 7,501 | 6,273 |
| VOC (pre-Catalytic Oxidation as CH4) | tpy | 3.4 | 2.8 | 3.8 | 3.1 | 3.8 | 3.1 |
| VOC (post-Catalytic Oxidation) | ppmvd @ 15% O2 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| VOC (post-Catalytic Oxidation) | ppmvd | 0.7 | 0.9 | 0.7 | 0.9 | 0.7 | 0.9 |
| VOC (post-Catalytic Oxidation as CH4) | lb/yr | 2,102 | 1,887 | 2,322 | 2,098 | 2,378 | 2,180 |
| VOC (post-Catalytic Oxidation as CH4) | tpy | 1.1 | 0.9 | 1.2 | 1.0 | 1.2 | 1.1 |
| SO2 | ppmvd @ 15% O2 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| SO2 | ppmvd | 0.7 | 0.9 | 0.7 | 0.9 | 0.7 | 0.9 |
| SO2 | lb/yr | 8,125 | 7,349 | 8,986 | 8,179 | 9,213 | 8,512 |
| SO2 | tpy | 4.1 | 3.7 | 4.5 | 4.1 | 4.6 | 4.3 |
| PM10 | lb/yr | 11,949 | 15,143 | 13,311 | 17,087 | 14,110 | 18,529 |
| PM10 | tpy | 6.0 | 7.6 | 6.7 | 8.5 | 7.1 | 9.3 |
| HCHO | lb/yr | 597 | 482 | 659 | 534 | 675 | 550 |
| HCHO | tpy | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 |
| NH3 | ppmvd @ 15% O2 | 10 | 10 | 10 | 10 | 10 | 10 |
| NH3 | ppmvd | 12.4 | 14.7 | 12.4 | 14.8 | 11.9 | 14.5 |
| NH3 | lb/yr | 37,180 | 33,384 | 41,082 | 37,116 | 42,066 | 38,565 |
| NH3 | tpy | 18.6 | 16.7 | 20.5 | 18.6 | 21.0 | 19.3 |
| CO2 | lb/MMBtu (HHV) | 118.9 | 118.9 | 118.9 | 118.9 | 118.9 | 118.9 |
| N2O | lb/MMBtu (HHV) | 2.2E-04 | 2.2E-04 | 2.2E-04 | 2.2E-04 | 2.2E-04 | 2.2E-04 |
| CH4 | lb/MMBtu (HHV) | 2.2E-03 | 2.2E-03 | 2.2E-03 | 2.2E-03 | 2.2E-03 | 2.2E-03 |
| CO2 | tpy | 158,864 | 143,693 | 175,712 | 159,932 | 180,143 | 166,443 |
| N2O | tpy | 0.29 | 0.27 | 0.33 | 0.30 | 0.33 | 0.31 |
| CH4 | tpy | 2.95 | 2.67 | 3.26 | 2.97 | 3.34 | 3.09 |
| CO2 Global Warming Potential | - | 1 | 1 | 1 | 1 | 1 | 1 |
| N2O Global Warming Potential | - | 298 | 298 | 298 | 298 | 298 | 298 |
| CH4 Global Warming Potential | - | 25 | 25 | 25 | 25 | 25 | 25 |
| Total GHG | tpy | 158,867 | 143,696 | 175,715 | 159,936 | 180,147 | 166,446 |
| Total CO2e | tpy | 159,025 | 143,839 | 175,890 | 160,095 | 180,326 | 166,612 |

Vendor Data

Process Input Data

**HOBBS 501F4 Annual Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

**FACILITY CONDITIONS**
Annual Hours of Operation with Duct Firing:
12 hr/day December, January, February, June, July, August and September
9 hr/day March, April, May, November
12 days annual outage (9 hr/day)

Case 4 Fired - Winter - Chillers Off = 12 hr/day * (31 days + 31days + 28 days) = 1,080 hr/yr
Case 4 Unfired - Winter - Chillers Off = 1,080 hr fired/yr * 4,974 total hr unfired/yr / 3,786 total hrfired/yr = 1,419 hr/yr

Case 5 Fired - Summer- Chillers On = 9 hr/day * (31 days + 30 days + 31days + 31 days + 30 days - 12 days) = 1,269 hr/yr
Case 5 Unfired - Summer - Chillers On = 1,242 hr fired/yr * 4,974 total hr unfired/yr / 3,786 total hrfired/yr = 1,632 hr/yr

Case 6 Fired - Summer- Chillers Off = 12 hr/day * (30 days + 31 days + 31 days + 30 days) = 1,464 hr/yr
Case 6 Unfired - Summer - Chillers On = 1,464 hr fired/yr * 4,974 total hr unfired/yr / 3,786 total hrfired/yr = 1,923 hr/yr

GT Heat Input (MMBtu/yr) = GT Heat Input (MMBtu/hr) * Annual Hours of Operation (hr/yr)
GT Heat Input (LHV) = 1,765 MMBtu/hr * 1,080 hr/yr = 1,906,200 MMBtu/yr
GT Heat Input (LHV) = 1,884 MMBtu/hr * 1,080 hr/yr = 2,034,720 MMBtu/yr

GT Fuel Flow Rate (MMscf/yr) = GT Heat Input (MMBtu/yr) (HHV) / Fuel Heat Content (HHV) (Btu/scf)
GT Fuel Flow Rate = 2,034,720 MMBtu/yr / 1,033 Btu/scf = 1,970 MMscf/yr

DB Heat Input (MMBtu/yr) = DB Heat Input (MMBtu/hr) * Annual Hours of Operation (hr/yr)
Case 4 DB Heat Input = 320 MMBtu/hr * 1,080 hr/yr = 345,600 MMBtu/yr
Case 5 DB Heat Input = 320 MMBtu/hr * 1,242 hr/yr = 397,440 MMBtu/yr
Case 6 DB Heat Input = 304 MMBtu/hr * 1,464 hr/yr = 445,056 MMBtu/yr

DB Heat Input (MMBtu/yr) (HHV) = DB Heat Input (MMBtu/yr) (LHV) * HHV/LHV Ratio
DB Heat Input (HHV) = 345,600 MMBtu/yr * 1.1 = 383,187 MMBtu/yr

DB Fuel Flow Rate (MMscf/yr) = DB Heat Input (MMBtu/yr) (HHV) / Fuel Heat Content (HHV) (Btu/scf)
DB Fuel Flow Rate = 383,187 MMBtu/yr / 1,033 Btu/scf = 371 MMscf/yr

GT+DB Heat Input (MMBtu/yr) = GT Heat Input (MMBtu/yr) + DB Heat Input (MMBtu/yr)
GT+DB Heat Input (LHV) = 1,906,200 MMBtu/yr + 345,600 MMBtu/yr = 2,251,800 MMBtu/yr
GT+DB Heat Input (HHV) = 2,034,720 MMBtu/yr + 383,187 MMBtu/yr = 2,417,907 MMBtu/yr

HHV/LHV Ratio = Fuel Heat Content (HHV) (Btu/scf) / Fuel Heat Content (LHV) (Btu/scf)
HHV/LHV Ratio = 1,033 Btu/scf / 932 Btu/scf = 1.1

**GT EXHAUST GAS ANALYSIS**
Molecular Weight (GT Exhaust Gases) = Sum (%vol * MW)
Molecular Weight (GT Exhaust Gases) = 12.5% vol * 32.0 lb/lbmole + 3.9% vol * 44.0 lb/lbmole + 7.7% vol * 18.0 lb/lbmole + 74.9% vol * 28.0 lb/lbmole + 0.9% vol * 39.9 lb/lbmole = 28.5 lb/lbmole

GT Exhaust Flow Rate (lbmole/yr) = GT Exhaust Flow Rate (lb/hr) / MW (GT Exhaust Gases) * Annual Hours of Operation (hr/yr)
GT Exhaust Flow Rate = 3,834,000 lb/hr / 28.5 lb/lbmole * 1,080 hr/yr = 145,422,904 lbmole/yr

GT Exhaust Flow Rate (MMscf/yr) = GT Exhaust Flow Rate (lbmole/yr) * Standard Molar Volume (scf/lbmole) * 1MMscf/1,000,000scf
GT Exhaust Flow Rate = 145,422,904 lbmole/yr * 385.3 scf/lbmole * 1 MMscf/1,000,000 scf = 56,032 MMscf/yr

GT Exhaust Flow Rate ($Nm^3$/yr) = GT Exhaust Flow Rate (MMscf/yr) * 1,000,000 scf/MMscf / 35.3 scf/$Nm^3$
GT Exhaust Flow Rate = 56,032 MMscf/yr * 1,000,000 scf/MMscf / 35.3 scf/Nm3 = 1,586,652,914 Nm3/yr

**HOBBS 501F4 Annual Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

GT Exhaust $O_2$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $O_2$%
GT Exhaust O2 = 145,422,904 lbmole/yr * 12.5% = 18,246,980 lbmole/yr

GT Exhaust $CO_2$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $CO_2$%
GT Exhaust CO2 = 145,422,904 lbmole/yr * 3.9% = 5,674,898 lbmole/yr

GT Exhaust $H_2O$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $H_2O$%
GT Exhaust H2O = 145,422,904 lbmole/yr * 7.7% = 11,204,286 lbmole/yr

GT Exhaust $N_2$ (lbmole/hr) = GT Exhaust (lbmole/hr) * $N_2$%
GT Exhaust N2 = 145,422,904 lbmole/yr * 74.9% = 108,987,147 lbmole/yr

GT Exhaust Ar (lbmole/hr) = GT Exhaust (lbmole/hr) * Ar%
GT Exhaust Ar = 145,422,904 lbmole/yr * 0.9% = 1,309,592 lbmole/yr

**GT EMISSION RATES**
NOx (ppmvd) = NOx (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
NOx = 25 ppmvd @ 15%O2 * (20.9 - 12.5 / (1 - 7.7 / 100)) / (20.9 - 15) = 31 ppmvd

NOx (lb/yr) = NOx (lb/hr) * Annual Hours of Operation (hr/yr)
NOx (lb/yr) = 172 lb/hr * 1,080 hr/yr = 185,760 lb/yr

CO (ppmvd) = CO (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
CO = 15 ppmvd @ 15%O2 * (20.9 - 12.5 / (1 - 7.7 / 100)) / (20.9 - 15) = 19 ppmvd

CO (lb/yr) = CO (lb/hr) * Annual Hours of Operation (hr/yr)
CO (lb/yr) = 63 lb/hr * 1,080 hr/yr = 68,040 lb/yr

VOC (ppmvd) = VOC (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
VOC = 2 ppmvd @ 15%O2 * (20.9 - 12.5 / (1 - 7.7 / 100)) / (20.9 - 15) = 2.5 ppmvd

VOC (lb/yr) = VOC (lb/hr) * Annual Hours of Operation (hr/yr)
VOC (lb/yr) = 5 lb/hr * 1,080 hr/yr = 5,184 lb/yr

$SO_2$ (lb/yr) = Sulfur Content (grains/Hscf) * 1 Hscf/100scf * 1 $lb_S$/7,000 grains / $MW_S$ ($lb_S$/$lbmole_S$) * 1$lbmole_{SO2}$/$lbmole_S$ * $MW_{SO2}$ ($lb_{SO2}$/$lbmole_{SO2}$) * GT Fuel Flow Rate (MMScf/yr) * 1,000,000 scf/MMscf
SO2 = 1.1 grains/Hscf * 1Hscf/100scf * 1lb/7,000grains / 32.1 lb/lbmole * 1lbmoleSO2/lbmoleS * 64.1 lb/lbmole * 1,970 MMscf/yr * 1,000,000 scf/MMscf = 6,184 lb/yr

$PM_{10}$ (lb/yr) = $PM_{10}$ (mg/$Nm^3$) * GT Exhaust Flow Rate ($Nm^3$/yr) * 1g/1,000 mg * 1 lb/453,59g
PM10 = 2.6 mg/Nm3 * 1,586,652,914 Nm3/yr * 1g/1,000mg * 1lb/453.59g = 9,095 lb/yr

HCHO (ppmvd) = HCHO (ppbvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15) * 1 ppmvd/1,000 ppbvd
HCHO = 91 ppbvd @ 15%O2 * (20.9 - 12.5 / (1 - 7.7 / 100)) / (20.9 - 15) * 1 ppmvd/1,000 ppbvd = 0.1 ppmvd

HCHO (lb/yr) = GT Exhaust Flow Rate (lbmole/yr) * (1 - $H_2O$ vol%/100) * HCHO (ppmvd) / 1,000,000 * $MW_{HCHO}$ (lb/lbmole)
HCHO = 145,422,904 lbmole/yr * (1 - 7.7/100) * 0.1 ppmvd/1,000,000 * 30.0 lb/lbmole = 454 lb/yr

**DB EMISSION RATES**
NOx (lb/yr) = NOx (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/yr)
NOx = 0.02 lb/MMBtu (LHV) * 345,600 MMBtu/yr (LHV) = 6,912 lb/yr

CO (lb/yr) = CO (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/yr)
CO = 0.012 lb/MMBtu (LHV) * 345,600 MMBtu/yr (LHV) = 4,020 lb/yr

**HOBBS 501F4 Annual Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

VOC (lb/yr) = VOC (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/yr)
VOC = 0.0013 lb/MMBtu (LHV) * 345,600 MMBtu/yr (LHV) = 438 lb/yr

$SO_2$ (lb/yr) = Sulfur Content (grains/Hscf) * 1 Hscf/100scf * 1 $lb_S$/7,000 grains / $MW_S$ ($lb_S$/$lbmole_S$) * 1$lbmole_{SO2}$/$lbmole_S$ * $MW_{SO2}$ ($lb_{SO2}$/$lbmole_{SO2}$) * GT Fuel Flow Rate (MMScf/yr) * 1,000,000 scf/MMscf
SO2 = 1.1 grains/Hscf * 1Hscf/100scf * 1lb/7,000grains / 32.1 lb/lbmole * 1lbmoleSO2/lbmoleS * 64.1 lb/lbmole * 371 MMscf/yr * 1,000,000 scf/MMscf = 1,165 lb/yr

$PM_{10}$ (lb/yr) = $PM_{10}$ (lb/MMBtu) (LHV) * DB Heat Input (LHV) (MMBtu/yr)
PM10 = 0.0175 lb/MMBtu (LHV) * 345,600 MMBtu/yr (LHV) = 6,048 lb/yr

HCHO Emission Factor (lb/MMBtu) (HHV) = HCHO Emission Factor (lb/MMscf) (HHV) / 1,020 Btu/scf
HCHO Emission Factor = 7.50E-02 lb/MMscf (HHV) / 1,020 Btu/scf = 7.35E-05 lb/MMBtu (HHV)

HCHO (lb/yr) = HCHO (lb/MMBtu) (HHV) * DB Heat Input (HHV) (MMBtu/yr)
HCHO = 7.353E-05 lb/MMBtu (HHV) * 383,187 MMBtu/yr (HHV) = 28.2 lb/yr

**STACK EXHAUST GAS**
Fuel x, in CxHy = stoichiometric lbmoles of carbon in fuel
Fuel y, in Cx,Hy = stoichiometric lbmoles of hydrogen in fuel

DB Fuel Flow Rate (lbmole/yr) =DB Heat Input (HHV) (MMBtu/yr) * 1,000,000 Btu/MMBtu / Fuel Heat Content (HHV) (Btu/scf) / Standard Molar Volume (scf/lbmole)
DB Fuel Flow Rate = 383,187 MMBtu/hr * 1,000,000 Btu/MMBtu / 1,033 Btu/scf / 385.3 scf/lbmole = 962,712.8 lbmole/yr

$O_2$ Consumed at DB (lbmole/yr) = (Fuel x + Fuel y/4) * DB Fuel Flow Rate (lbmole/yr)
O2 Consumed at DB = (1.04 + 4.02 / 4) * 962,713 lbmole/yr = 1,963,401 lbmole/yr

$CO_2$ Produced at DB (lbmole/yr) = Fuel x * DB Fuel Flow Rate (lbmole/yr)
CO2 Produced at DB = 1.04 * 962,713 lbmole/hr = 996,423 lbmole/hr

$H_2O$ Produced at DB (lbmole/yr) = Fuel y / 2 * DB Fuel Flow Rate (lbmole/yr)
H2O Produced at DB = 4.02 / 2 * 962,713 lbmole/hr = 1,933,956 lbmole/hr

Stack Exhaust $O_2$ (lbmole/yr) = GT Exhaust $O_2$ (lbmole/yr) - DB Consumed $O_2$ (lbmole/yr)
Stack Exahust O2 = 18,246,980 lbmole/yr - 1,963,401 lbmole/yr = 16,283,580 lbmole/yr

Stack Exhaust $CO_2$ (lbmole/yr) = GT Exhaust $CO_2$ (lbmole/yr) + DB Produced $CO_2$ (lbmole/yr)
Stack Exhaust CO2 = 5,674,898 lbmole/yr + 996,423 lbmole/yr = 6,671,321 lbmole/yr

Stack Exhaust $H_2O$ (lbmole/yr) = GT Exhaust $H_2O$ (lbmole/yr) + DB Produced $H_2O$ (lbmole/yr)
Stack Exahust H2O = 11,204,286 lbmole/yr + 1,933,956 lbmole/yr = 13,138,242 lbmole/yr

Stack Exhaust $N_2$ (lbmole/yr) = GT Exhaust $N_2$ (lbmole/yr)
Stack Exhaust N2 = 108,987,147 lbmole/yr

Stack Exhaust Ar (lbmole/yr) = GT Exhaust Ar (lbmole/yr)
Stack Exhaust Ar = 1,309,592 lbmole/yr

Stack Exhaust Flow Rate (lbmole/yr) = Sum Stack Exhaust Pollutants Flow Rates (lbmole/yr)
Stack Exhaust Flow Rate = 16,283,580 lbmole/yr + 6,671,321 lbmole/yr + 13,138,242 lbmole/yr + 108,987,147 lbmole/yr + 1,309,592 lbmole/yr = 146,389,882 lbmole/yr

**HOBBS 501F4 Annual Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

Stack Exhaust i %vol = Stack Exhaust i (lbmole/yr) * 100 / Stack Exhaust Flow Rate (lbmole/yr)
Stack Exhaust O2 = 16,283,580 lbmole/yr * 100 /146,389,882 lbmole/yr = 11.1 %vol
Stack Exhaust CO2 = 6,671,321 lbmole/yr * 100 /146,389,882 lbmole/yr = 4.6 %vol
Stack Exhaust H2O = 13,138,242 lbmole/yr * 100 /146,389,882 lbmole/yr = 9.0 %vol
Stack Exhaust N2 = 108,987,147 lbmole/yr * 100 /146,389,882 lbmole/yr = 74.4 %vol
Stack Exhaust Ar = 1,309,592 lbmole/yr * 100 /146,389,882 lbmole/yr = 0.9 %vol

Molecular Weight (Stack Exhaust Gases) = Sum (%vol * MW)
Molecular Weight (GT Exhaust Gases) = 11.1% vol * 32.0 lb/lbmole + 4.6% vol * 44.0 lb/lbmole + 9.0% vol * 18.0 lb/lbmole + 74.4% vol * 28.0 lb/lbmole + 0.9% vol * 39.9 lb/lbmole = 28.4 lb/lbmole

NOx (pre-SCR as $NO_2$) (lb/yr) = GT NOx Exhaust (lb/yr) + DB NOx Exhaust (lb/yr)
NOx (pre-SCR as NO2) = 185,760.0 lb/yr + 6,912.0 lb/yr = 192,672 lb/yr

NOx (pre-SCR) (ppmvd) = NOx (pre-SCR as $NO_2$) (lb/yr) / (Stack Exhaust Flow Rate (lbmole/yr) * (1 - Stack Exhaust $H_2O$ vol%/100) * 1/1,000,000 * $MW_{NO2}$ (lb/lbmole))
NOx (pre-SCR) = 192,672 lb/yr /( 146,389,882 lbmole/yr * (1 - 9.0 /100) * 1 / 1,000,000 * 46.0 lb/lbmole) = 31.4 ppmvd

NOx (pre-SCR) (ppmvd @ 15% $O_2$) = NOx (pre-SCR) (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust $O_2$%/(1 - $H_2O$%/100))
NOx (pre-SCR) = 31.4 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 21.4 ppmvd @ 15% O2

NOx (pre-SCR as $NO_2$) (tpy) = NOx (pre-SCR as $NO_2$) (lb/yr) * 1 ton / 2,000 lb
NOx (pre-SCR as NO2) = 192,672 lb/yr * 1ton / 2,000 lb = 96.3 tpy

NOx (post-SCR) (ppmvd) = NOx (post-SCR) (ppmvd @ 15% $O_2$) * (20.9-$O_2$ vol%/(1-$H_2O$ vol%/100))/(20.9-15)
NOx (post-SCR) = 2.0 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 2.9 ppmvd

NOx (post-SCR as $NO_2$) (lb/yr) = NOx (post-SCR) (ppmvd) * (1 - $H_2O$ %vol/100) * Stack Exhaust Flow Rate (lbmole/yr) /1,000,000 * $MW_{NO2}$ (lb/lbmole)
NOx (post-SCR as NO2) = 2.9 ppmvd * (1 - 9.0/100) * 146,389,882 lbmole/yr / 1,000,000 * 46.0 lb/lbmole = 18,037 lb/yr

NOx (post-SCR as $NO_2$) (tpy) = NOx (post-SCR as $NO_2$) (lb/yr) * 1 ton / 2,000 lb
NOx (post-SCR as NO2) = 18,037 lb/yr * 1ton / 2,000 lb = 9.0 tpy

CO (pre-Catalytic Oxidation) (lb/yr) = GT CO Exhaust (lb/yr) + DB CO Exhaust (lb/yr)
CO (pre-Catalytic Oxidation) = 68,040.0 lb/yr + 4,020.5 lb/yr = 72,060 lb/yr

CO (pre-Catalytic Oxidation) (ppmvd) = CO (pre-Catalytic Oxidation) (lb/yr) / (Stack Exhaust Flow Rate (lbmole/yr) * (1 - Stack Exhaust $H_2O$ vol%/100) * 1/1,000,000 * $MW_{CO}$ (lb/lbmole))
CO (pre-Catalytic Oxidation) = 72,060 lb/yr /( 146,389,882 lbmole/yr * (1 - 9.0 /100) * 1 / 1,000,000 * 28.0 lb/lbmole) = 19.3 ppmvd

CO (pre-Catalytic Oxidation) (ppmvd @ 15% $O_2$) = CO (pre-Catalytic Oxidation) (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust $O_2$%/(1 - $H_2O$%/100))
CO (pre-Catalytic Oxidation) = 19.3 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 13.1 ppmvd @ 15% O2

CO (pre-Catalytic Oxidation) (tpy) = CO (pre-Catalytic Oxidation) (lb/yr) * 1 ton / 2,000 lb
CO (pre-Catalytic Oxidation) = 72,060 lb/yr * 1ton / 2,000 lb = 36.0 tpy

CO (post-Catalytic Oxidation) (ppmvd) = CO (post-Catalytic Oxidation) (ppmvd @ 15% $O_2$) * (20.9-$O_2$ vol%/(1-$H_2O$ vol%/100))/(20.9-15)
CO (post-Catalytic Oxidation) = 2.0 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 2.9 ppmvd

CO (post-Catalytic Oxidation) (lb/yr) = CO (post-Catalytic Oxidation) (ppmvd) * (1 - $H_2O$ %vol/100) * Stack Exhaust Flow Rate (lbmole/yr) /1,000,000 * $MW_{CO}$ (lb/lbmole)
CO (post-Catalytic Oxidation) = 2.9 ppmvd * (1 - 9.0/100) * 146,389,882 lbmole/yr / 1,000,000 * 28.0 lb/lbmole = 10,982 lb/yr

CO (post-Catalytic Oxidation) (tpy) = CO (post-Catalytic Oxidation) * 1 ton / 2,000 lb
CO (post-Catalytic Oxidation)= 10,982 lb/yr * 1ton / 2,000 lb = 5.5 tpy

**HOBBS 501F4 Annual Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

VOC (pre-Catalytic Oxidation) (lb/yr) = GT VOC Exhaust (lb/yr) + DB VOC Exhaust (lb/yr)
VOC (pre-Catalytic Oxidation) = 5,184.0 lb/yr + 437.8 lb/yr = 5,622 lb/yr

VOC (pre-Catalytic Oxidation) (ppmvd) = VOC (pre-Catalytic Oxidation) (lb/yr) / (Stack Exhaust Flow Rate (lbmole/yr) * (1 - Stack Exhaust H2O vol%/100) * 1/1,000,000 * $MW_{VOC}$ (lb/lbmole))
VOC (pre-Catalytic Oxidation) = 5,622 lb/yr /( 146,389,882 lbmole/yr * (1 - 9.0 /100) * 1 / 1,000,000 * 16.0 lb/lbmole) = 2.6 ppmvd

VOC (pre-Catalytic Oxidation) (ppmvd @ 15% O2) = VOC (pre-Catalytic Oxidation) (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust O2%/(1 - H2O%/100))
VOC (pre-Catalytic Oxidation) = 2.6 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 1.8 ppmvd @ 15% O2

VOC (pre-Catalytic Oxidation) (tpy) = VOC (pre-Catalytic Oxidation) (lb/yr) * 1 ton / 2,000 lb
VOC (pre-Catalytic Oxidation) = 5,622 lb/yr * 1ton / 2,000 lb = 2.8 tpy

VOC (post-Catalytic Oxidation) (ppmvd) = VOC (post-Catalytic Oxidation) (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
VOC (post-Catalytic Oxidation) = 0.6 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 0.9 ppmvd

VOC (post-Catalytic Oxidation) (lb/yr) = VOC (post-Catalytic Oxidation) (ppmvd) * (1 - H2O %vol/100) * Stack Exhaust Flow Rate (lbmole/yr) /1,000,000 * MWVOC (lb/lbmole)
VOC (post-Catalytic Oxidation) = 0.9 ppmvd * (1 - 9.0/100) * 146,389,882 lbmole/yr / 1,000,000 * 16.0 lb/lbmole = 1,887 lb/yr

VOC (post-Catalytic Oxidation) (tpy) = VOC (post-Catalytic Oxidation) * 1 ton / 2,000 lb
VOC (post-Catalytic Oxidation)= 1,887 lb/yr * 1ton / 2,000 lb = 0.9 tpy

$SO_2$ (lb/yr) = GT $SO_2$ Exhaust (lb/yr) + DB $SO_2$ Exhaust (lb/yr)
SO2 = 6,184.0 lb/yr + 1,164.6 lb/yr = 7,349 lb/yr

$SO_2$ (ppmvd) = $SO_2$ (lb/yr) / (Stack Exhaust Flow Rate (lbmole/yr) * (1 - Stack Exhaust $H_2O$ vol%/100) * 1/1,000,000 * $MW_{SO2}$ (lb/lbmole))
SO2 = 7,349 lb/yr /( 146,389,882 lbmole/yr * (1 - 9.0 /100) * 1 / 1,000,000 * 64.1 lb/lbmole) = 0.9 ppmvd

$SO_2$ (ppmvd @ 15% $O_2$) = $SO_2$ (ppmvd) * (20.9 - 15) / (20.9 - Stack Exhaust $O_2$%/(1 - $H_2O$%/100))
SO2 = 0.9 ppmvd * (20.9 - 15) / (20.9 - 11.1 / (1 - 9.0/100)) = 0.6 ppmvd @ 15% O2

$SO_2$ (tpy) = $SO_2$ (lb/yr) * 1 ton / 2,000 lb
SO2= 7,349 lb/yr * 1ton / 2,000 lb = 3.7 tpy

$PM_{10}$ (lb/yr) = GT $PM_{10}$ Exhaust (lb/yr) + DB $PM_{10}$ Exhaust (lb/yr)
PM10 = 9,094.7 lb/yr + 6,048.0 lb/yr = 15,143 lb/yr

$PM_{10}$ (tpy) = $PM_{10}$ (lb/yr) * 1 ton / 2,000 lb
PM10 = 15,143 lb/yr * 1ton / 2,000 lb = 7.6 tpy

$NH_3$ (ppmvd) = $NH_3$ (ppmvd @ 15% O2) * (20.9-O2 vol%/(1-H2O vol%/100))/(20.9-15)
NH3 = 10.0 ppmvd @ 15% O2 * (20.9 - 11.1 / (1 - 9.0/100)) / (20.9 - 15) = 14.7 ppmvd

$NH_3$ (lb/yr) = $NH_3$ (ppmvd) * (1 - H2O %vol/100) * Stack Exhaust Flow Rate (lbmole/yr) /1,000,000 * $MW_{NH3}$ (lb/lbmole)
NH3 = 14.7 ppmvd * (1 - 9.0/100) * 146,389,882 lbmole/yr / 1,000,000 * 17.0 lb/lbmole = 33,384 lb/yr

$NH_3$ (tpy) = $NH_3$ (lb/yr) * 1 ton / 2,000 lb
NH3 = 33,384 lb/yr * 1ton / 2,000 lb = 16.7 tpy

**HOBBS 501F4 Annual Emission Rate (100% Load) Example Calculation**
(Example calculations for Case 4 Fired unless otherwise noted)

$CO_2$ (lb/MMBtu) = Fc (scf/MMBtu) * Uf (lbmole/scf) * $MW_{CO2}$ (lb/lbmole)
CO2 Emission Factor = 1,040 scf/MMBtu * 1 lbmole/385 scf * 44 lb/lbmole = 118.9 lb/MMBtu

$N_2O$ (lb/MMBtu) = $N_2O$ (kg/MMBtu) * 1 metric ton / 1,000 kg * 1.1023 short tons / metric ton * 2,000 lb / short ton
N2O Emission Factor = 1.00E-04 kg/MMBtu * 1 metric ton / 1,000 kg * 1.1023 short tons / metric tons * 2,000 lb / short tons = 2.2E-04 lb/MMBtu

$CH_4$ (lb/MMBtu) = $CH_4$ (kg/MMBtu) * 1 metric ton / 1,000 kg * 1.1023 short tons / metric ton * 2,000 lb / short ton
CH4 Emission Factor = 1.00E-04 kg/MMBtu * 1 metric ton / 1,000 kg * 1.1023 short tons / metric tons * 2,000 lb / short tons = 2.2E-03 lb/MMBtu

$CO_2$ (tpy) = $CO_2$ (lb/MMBtu) (HHV) * GT+DB Heat Input (MMBtu/yr) (HHV) * 1 ton / 2,000 lb
CO2 = 118.9 lb/MMBtu (HHV) * 2,417,907 MMBtu/yr (HHV) * 1 ton / 2,000 lb = 143,693 tpy

$N_2O$ (tpy) = $N_2O$ (lb/MMBtu) (HHV) * GT+DB Heat Input (MMBtu/yr) (HHV) * 1 ton / 2,000 lb
N2O = 2.2E-04 lb/MMBtu (HHV) * 2,417,907 MMBtu/yr (HHV) * 1 ton / 2,000 lb = 0.27 tpy

$CH_4$ (tpy) = $CH_4$ (lb/MMBtu) (HHV) * GT+DB Heat Input (MMBtu/yr) (HHV) * 1 ton / 2,000 lb
CH4 = 22.0E-04 lb/MMBtu (HHV) * 2,417,907 MMBtu/yr (HHV) * 1 ton / 2,000 lb = 2.67 tpy

Total GHG (tpy) = $CO_2$ (tpy) + $N_2O$ (tpy) + $CH_4$ (tpy)
Total GHG = 143,693 tpy + 0.27 tpy + 2.67 tpy = 143,696 tpy

Total $CO_2e$ (tpy) = $CO_2$ (tpy) * $GWP_{CO2}$ + $N_2O$ (tpy) * $GWP_{N2O}$ + $CH_4$ (tpy) * $GWP_{CH4}$
Total GHG = 143,693 tpy * 1 + 0.27 tpy * 298 + 2.67 tpy * 25 = 143,839 tpy

**HOBBS 501F4+ Annual Emission Rate Calculation (100% Load) (8,290 hr/yr)**

| | | Case 4 Unfired Winter Chillers Off | Case 4 Fired Winter Chillers Off | Case 5 Unfired Summer Chillers On | Case 5 Fired Summer Chillers On | Case 6 Unfired Summer Chillers Off | Case 6 Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **SITE CONDITIONS** | | | | | | | |
| Ambient Temperature | ºF | 30 | 30 | 95 | 95 | 95 | 95 |
| Ambient Relative Humidity | % | 60 | 60 | 20 | 20 | 20 | 20 |
| Barometric Pressure | psia | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 | 12.83 |
| Compressor Inlet Temperature | ºF | 30 | 30 | 46 | 46 | 95 | 95 |
| **FACILITY CONDITIONS** | | | | | | | |
| Annual Hours of Operation | hr/yr | 1,285 | 1,080 | 1,478 | 1,242 | 1,742 | 1,464 |
| GT Power Output | MW | 189 | 189 | 180 | 180 | 151 | 151 |
| GT Model | | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ | Hobbs 501F4+ |
| GT Load | | Base | Base | Base | Base | Base | Base |
| Chillers | On/Off | Off | Off | **On** | **On** | Off | Off |
| GT Fuel Flow Rate | lb/hr | 86,940 | 86,940 | 83,592 | 83,592 | 72,720 | 72,720 |
| GT Heat Input (LHV) | MMBtu/hr | 1,765 | 1,765 | 1,697 | 1,697 | 1,477 | 1,477 |
| GT Heat Input (HHV) | MMBtu/hr | 1,884 | 1,884 | 1,812 | 1,812 | 1,576 | 1,576 |
| GT Heat Input (LHV) | MMBtu/yr | 2,267,703 | 1,906,200 | 2,507,386 | 2,107,674 | 2,572,405 | 2,162,328 |
| GT Heat Input (HHV) | MMBtu/yr | 2,420,597 | 2,034,720 | 2,677,303 | 2,250,504 | 2,744,828 | 2,307,264 |
| GT Fuel Flow Rate | MMscf/yr | 2,343 | 1,970 | 2,592 | 2,179 | 2,657 | 2,234 |
| DB Model | | Forney | Forney | Forney | Forney | Forney | Forney |
| DB Status | | Off | On | Off | On | Off | On |
| DB Heat Input (LHV) | MMBtu/yr | - | 345,600 | - | 397,440 | - | 445,056 |
| DB Heat Input (HHV) | MMBtu/yr | - | 383,187 | - | 440,665 | - | 493,459 |
| DB Fuel Flow Rate | MMscf/yr | - | 371 | - | 427 | - | 478 |
| GT+DB Heat Input (LHV) | MMBtu/yr | 2,267,703 | 2,251,800 | 2,507,386 | 2,505,114 | 2,572,405 | 2,607,384 |
| GT+DB Heat Input (HHV) | MMBtu/yr | 2,420,597 | 2,417,907 | 2,677,303 | 2,691,169 | 2,744,828 | 2,800,723 |
| **FUEL ANALYSIS** | | | | | | | |
| Fuel Type | | PNG | PNG | PNG | PNG | PNG | PNG |
| Fuel Molecular Weight | lb/lbmole | 17.29 | 17.29 | 17.29 | 17.29 | 17.29 | 17.29 |
| Sulfur Content | grains/100scf | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| Fuel Heat Content (LHV) | Btu/scf | 932 | 932 | 932 | 932 | 932 | 932 |
| Fuel Heat Content (HHV) | Btu/scf | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| HHV/LHV Ratio | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| **GT EXHAUST GAS ANALYSIS** | | | | | | | |
| Oxygen, O2 | %vol | 12.55 | 12.55 | 12.46 | 12.46 | 12.70 | 12.70 |
| Carbon Dioxide, CO2 | %vol | 3.90 | 3.90 | 3.90 | 3.90 | 3.70 | 3.70 |
| Water, H2O | %vol | 7.70 | 7.70 | 8.40 | 8.40 | 8.31 | 8.31 |
| Nitrogen, N2 | %vol | 74.94 | 74.94 | 74.34 | 74.34 | 74.38 | 74.38 |
| Argon, Ar | %vol | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Total | %vol | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Molecular Weight (GT Exhaust Gases) | lb/lbmole | 28.5 | 28.5 | 28.4 | 28.4 | 28.4 | 28.4 |
| GT Exhaust Temperature | ºF | 1,121 | 1,121 | 1,130 | 1,130 | 1,155 | 1,155 |
| GT Exhaust Flow Rate | lb/hr | 3,834,000 | 3,834,000 | 3,704,400 | 3,704,400 | 3,330,000 | 3,330,000 |
| GT Exhaust Flow Rate | lbmole/yr | 173,001,786 | 145,422,904 | 192,725,423 | 162,002,320 | 204,301,530 | 171,733,035 |
| GT Exhaust Flow Rate | MMscf/yr | 66,658 | 56,032 | 74,258 | 62,420 | 78,718 | 66,170 |
| GT Exhaust Flow Rate | Nm3/yr | 1,887,555,395 | 1,586,652,914 | 2,102,752,354 | 1,767,544,496 | 2,229,054,766 | 1,873,712,554 |
| GT Exhaust Oxygen, O2 | lbmole/yr | 21,707,448 | 18,246,980 | 24,006,318 | 20,179,379 | 25,954,414 | 21,816,921 |
| GT Exhaust Carbon Dioxide, CO2 | lbmole/yr | 6,751,120 | 5,674,898 | 7,520,052 | 6,321,251 | 7,567,481 | 6,361,120 |
| GT Exhaust Water, H2O | lbmole/yr | 13,329,135 | 11,204,286 | 16,197,034 | 13,615,002 | 16,975,700 | 14,269,538 |
| GT Exhaust Nitrogen, N2 | lbmole/yr | 129,656,131 | 108,987,147 | 143,266,623 | 120,427,938 | 151,963,196 | 127,738,157 |
| GT Exhaust Argon, Ar | lbmole/yr | 1,557,951 | 1,309,592 | 1,735,397 | 1,458,750 | 1,840,739 | 1,547,299 |

**HOBBS 501F4+ Annual Emission Rate Calculation (100% Load) (8,290 hr/yr)**

| | | Case 4 Unfired Winter Chillers Off | Case 4 Fired Winter Chillers Off | Case 5 Unfired Summer Chillers On | Case 5 Fired Summer Chillers On | Case 6 Unfired Summer Chillers Off | Case 6 Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **GT EMISSION RATES** | | | | | | | |
| NOx | ppmvd @ 15% O2 | 25 | 25 | 25 | 25 | 25 | 25 |
| NOx | ppmvd | 31 | 31 | 31 | 31 | 30 | 30 |
| NOx (as NO2) | lb/hr | 172 | 172 | 165 | 165 | 141 | 141 |
| NOx (as NO2) | lb/yr | 220,989 | 185,760 | 243,794 | 204,930 | 245,571 | 206,424 |
| CO | ppmvd @ 15% O2 | 15 | 15 | 15 | 15 | 15 | 15 |
| CO | ppmvd | 19 | 19 | 19 | 19 | 18 | 18 |
| CO | lb/hr | 63 | 63 | 60 | 60 | 52 | 52 |
| CO | lb/yr | 80,944 | 68,040 | 88,652 | 74,520 | 90,565 | 76,128 |
| VOC | ppmvd @ 15% O2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| VOC | ppmvd | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 |
| VOC (as CH4) | lb/hr | 4.8 | 4.8 | 4.6 | 4.6 | 3.9 | 3.9 |
| VOC (as CH4) | lb/yr | 6,167 | 5,184 | 6,797 | 5,713 | 6,792 | 5,710 |
| Sulfur Content | grains/100scf | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| SO2 | lb/yr | 7,357 | 6,184 | 8,137 | 6,840 | 8,342 | 7,012 |
| PM10 | mg/Nm3 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| PM10 | lb/yr | 10,820 | 9,095 | 12,053 | 10,132 | 12,777 | 10,740 |
| Formaldehyde, HCHO | ppbvd @ 15% O2 | 91 | 91 | 91 | 91 | 91 | 91 |
| Formaldehyde, HCHO | ppmvd | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Formaldehyde, HCHO | lb/yr | 540 | 454 | 597 | 502 | 611 | 514 |
| **DB EMISSION RATES** | | | | | | | |
| NOx | lb/MMBtu (LHV) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| NOx | lb/yr | - | 6,912 | - | 7,949 | - | 8,901 |
| CO | lb/MMBtu (LHV) | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 |
| CO | lb/yr | - | 4,020 | - | 4,624 | - | 5,177 |
| VOC | lb/MMBtu (LHV) | 0.0013 | 0.0013 | 0.0013 | 0.0013 | 0.0013 | 0.0013 |
| VOC (as CH4) | lb/yr | - | 438 | - | 503 | - | 564 |
| Sulfur Content | grains/100scf | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| SO2 | lb/yr | - | 1,165 | - | 1,339 | - | 1,500 |
| PM10 | lb/MMBtu (LHV) | 0.0175 | 0.0175 | 0.0175 | 0.0175 | 0.0175 | 0.0175 |
| PM10 | lb/yr | - | 6,048 | - | 6,955 | - | 7,788 |
| Formaldehyde, HCHO | lb/MMscf (HHV) | 7.50E-02 | 7.50E-02 | 7.50E-02 | 7.50E-02 | 7.50E-02 | 7.50E-02 |
| Formaldehyde, HCHO | lb/MMBtu (HHV) | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.35E-05 | 7.35E-05 |
| Formaldehyde, HCHO | lb/yr | - | 28.18 | - | 32.40 | - | 36.28 |
| **STACK EXHAUST GAS** | | | | | | | |
| Fuel x, in CxHy | | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| Fuel y, in Cx,Hy | | 4.02 | 4.02 | 4.02 | 4.02 | 4.02 | 4.02 |
| DB Fuel Flow Rate | lbmole/yr | - | 962,713 | - | 1,107,120 | - | 1,239,760 |
| Oxygen Consumed at DB, O2 | lbmole/yr | - | 1,963,401 | - | 2,257,911 | - | 2,528,424 |
| Carbon Dioxide Produced at DB, CO2 | lbmole/yr | - | 996,423 | - | 1,145,886 | - | 1,283,171 |
| Water Produced at DB, H2O | lbmole/yr | - | 1,933,956 | - | 2,224,050 | - | 2,490,506 |
| Stack Exhaust Oxygen, O2 | lbmole/yr | 21,707,448 | 16,283,580 | 24,006,318 | 17,921,468 | 25,954,414 | 19,288,497 |
| Stack Exhaust Carbon Dioxide, CO2 | lbmole/yr | 6,751,120 | 6,671,321 | 7,520,052 | 7,467,137 | 7,567,481 | 7,644,290 |
| Stack Exhaust Water, H2O | lbmole/yr | 13,329,135 | 13,138,242 | 16,197,034 | 15,839,052 | 16,975,700 | 16,760,044 |
| Stack Exhaust Nitrogen, N2 | lbmole/yr | 129,656,131 | 108,987,147 | 143,266,623 | 120,427,938 | 151,963,196 | 127,738,157 |
| Stack Exhaust Argon, Ar | lbmole/yr | 1,557,951 | 1,309,592 | 1,735,397 | 1,458,750 | 1,840,739 | 1,547,299 |
| Stack Exhaust Flow Rate | lbmole/yr | 173,001,786 | 146,389,882 | 192,725,423 | 163,114,345 | 204,301,530 | 172,978,288 |
| Stack Exhaust Oxygen, O2 | %vol | 12.5 | 11.1 | 12.5 | 11.0 | 12.7 | 11.2 |
| Stack Exhaust Carbon Dioxide, CO2 | %vol | 3.9 | 4.6 | 3.9 | 4.6 | 3.7 | 4.4 |
| Stack Exhaust Water, H2O | %vol | 7.7 | 9.0 | 8.4 | 9.7 | 8.3 | 9.7 |
| Stack Exhaust Nitrogen, N2 | %vol | 74.9 | 74.4 | 74.3 | 73.8 | 74.4 | 73.8 |
| Stack Exhaust Argon, Ar | %vol | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Stack Exhaust Flow Rate | %vol | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Molecular Weight (Stack Exhaust Gases) | lb/lbmole | 28.5 | 28.4 | 28.4 | 28.3 | 28.4 | 28.3 |

**HOBBS 501F4+ Annual Emission Rate Calculation (100% Load) (8,290 hr/yr)**

| | | Case 4 Unfired Winter Chillers Off | Case 4 Fired Winter Chillers Off | Case 5 Unfired Summer Chillers On | Case 5 Fired Summer Chillers On | Case 6 Unfired Summer Chillers Off | Case 6 Fired Summer Chillers Off |
|---|---|---|---|---|---|---|---|
| **STACK EMISSION RATES** | | | | | | | |
| NOx (pre-SCR) | ppmvd @ 15% O2 | 24.3 | 21.4 | 24.3 | 21.2 | 23.9 | 20.7 |
| NOx (pre-SCR) | ppmvd | 30.1 | 31.4 | 30.0 | 31.4 | 28.5 | 30.0 |
| NOx (pre-SCR as NO2) | lb/yr | 220,989 | 192,672 | 243,794 | 212,879 | 245,571 | 215,325 |
| NOx (pre-SCR as NO2) | tpy | 110.5 | 96.3 | 121.9 | 106.4 | 122.8 | 107.7 |
| NOx (post-SCR) | ppmvd @ 15% O2 | 2 | 2 | 2 | 2 | 2 | 2 |
| NOx (post-SCR) | ppmvd | 2.5 | 2.9 | 2.5 | 3.0 | 2.4 | 2.9 |
| NOx (post-SCR as NO2) | lb/yr | 18,190 | 18,037 | 20,099 | 20,054 | 20,580 | 20,837 |
| NOx (post-SCR as NO2) | tpy | 9.1 | 9.0 | 10.0 | 10.0 | 10.3 | 10.4 |
| CO (pre-Catalytic Oxidation) | ppmvd @ 15% O2 | 14.6 | 13.1 | 14.5 | 13.0 | 14.5 | 12.8 |
| CO (pre-Catalytic Oxidation) | ppmvd | 18.1 | 19.3 | 17.9 | 19.2 | 17.3 | 18.6 |
| CO (pre-Catalytic Oxidation) | lb/yr | 80,944 | 72,060 | 88,652 | 79,144 | 90,565 | 81,305 |
| CO (pre-Catalytic Oxidation) | tpy | 40.5 | 36.0 | 44.3 | 39.6 | 45.3 | 40.7 |
| CO (post-Catalytic Oxidation) | ppmvd @ 15% O2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO (post-Catalytic Oxidation) | ppmvd | 2.5 | 2.9 | 2.5 | 3.0 | 2.4 | 2.9 |
| CO (post-Catalytic Oxidation) | lb/yr | 11,075 | 10,982 | 12,237 | 12,210 | 12,530 | 12,687 |
| CO (post-Catalytic Oxidation) | tpy | 5.5 | 5.5 | 6.1 | 6.1 | 6.3 | 6.3 |
| VOC (pre-Catalytic Oxidation) | ppmvd @ 15% O2 | 1.9 | 1.8 | 1.9 | 1.8 | 1.9 | 1.7 |
| VOC (pre-Catalytic Oxidation) | ppmvd | 2.41 | 2.63 | 2.4 | 2.6 | 2.3 | 2.5 |
| VOC (pre-Catalytic Oxidation as CH4) | lb/yr | 6,167 | 5,622 | 6,797 | 6,217 | 6,792 | 6,273 |
| VOC (pre-Catalytic Oxidation as CH4) | tpy | 3.1 | 2.8 | 3.4 | 3.1 | 3.4 | 3.1 |
| VOC (post-Catalytic Oxidation) | ppmvd @ 15% O2 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| VOC (post-Catalytic Oxidation) | ppmvd | 0.7 | 0.9 | 0.7 | 0.9 | 0.7 | 0.9 |
| VOC (post-Catalytic Oxidation as CH4) | lb/yr | 1,903 | 1,887 | 2,103 | 2,098 | 2,153 | 2,180 |
| VOC (post-Catalytic Oxidation as CH4) | tpy | 1.0 | 0.9 | 1.1 | 1.0 | 1.1 | 1.1 |
| SO2 | ppmvd @ 15% O2 | 0.58 | 0.59 | 0.58 | 0.59 | 0.58 | 0.59 |
| SO2 | ppmvd | 0.72 | 0.86 | 0.72 | 0.87 | 0.70 | 0.85 |
| SO2 | lb/yr | 7,357 | 7,349 | 8,137 | 8,179 | 8,342 | 8,512 |
| SO2 | tpy | 3.7 | 3.7 | 4.1 | 4.1 | 4.2 | 4.3 |
| PM10 | lb/yr | 10,820 | 15,143 | 12,053 | 17,087 | 12,777 | 18,529 |
| PM10 | tpy | 5.4 | 7.6 | 6.0 | 8.5 | 6.4 | 9.3 |
| HCHO | lb/yr | 540 | 482 | 597 | 534 | 611 | 550 |
| HCHO | tpy | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 |
| NH3 | ppmvd @ 15% O2 | 10 | 10 | 10 | 10 | 10 | 10 |
| NH3 | ppmvd | 12.38 | 14.71 | 12.37 | 14.80 | 11.94 | 14.50 |
| NH3 | lb/yr | 33,667 | 33,384 | 37,200 | 37,116 | 38,091 | 38,565 |
| NH3 | tpy | 16.8 | 16.7 | 18.6 | 18.6 | 19.0 | 19.3 |
| CO2 | lb/MMBtu (HHV) | 118.9 | 118.9 | 118.9 | 118.9 | 118.9 | 118.9 |
| N2O | lb/MMBtu (HHV) | 2.2E-04 | 2.2E-04 | 2.2E-04 | 2.2E-04 | 2.2E-04 | 2.2E-04 |
| CH4 | lb/MMBtu (HHV) | 2.2E-03 | 2.2E-03 | 2.2E-03 | 2.2E-03 | 2.2E-03 | 2.2E-03 |
| CO2 | tpy | 143,853 | 143,693 | 159,108 | 159,932 | 163,121 | 166,443 |
| N2O | tpy | 0.27 | 0.27 | 0.30 | 0.30 | 0.30 | 0.31 |
| CH4 | tpy | 2.67 | 2.67 | 2.95 | 2.97 | 3.03 | 3.09 |
| CO2 Global Warming Potential | - | 1 | 1 | 1 | 1 | 1 | 1 |
| N2O Global Warming Potential | - | 298 | 298 | 298 | 298 | 298 | 298 |
| CH4 Global Warming Potential | - | 25 | 25 | 25 | 25 | 25 | 25 |
| Total GHG | tpy | 143,856 | 143,696 | 159,112 | 159,936 | 163,125 | 166,446 |
| Total CO2e | tpy | 143,999 | 143,839 | 159,270 | 160,095 | 163,287 | 166,612 |

Vendor Data

Process Input Data

### HOBBS 501F4+ Hazardous Air Pollutants

#### HAPs Emission Rates Summary Table per Unit

| Hazardous Air Pollutants (HAPs) | Max. Hourly Emission Rate (lb/hr)[(1)] | Annual Emission Rate (tpy)[(2)] |
|---|---|---|
| Formaldehyde | 0.14 | 0.56 |
| Hexane | 0.21 | 0.36 |
| Total HAPs | 0.54 | 1.67 |

Notes:
(1) Max. Hourly Emission Rate (lb/hr) = CTG + HRSG DB Max. Hourly Emisison Rate (lb/hr) * (1 - Control Efficiency)

Oxidation Catalyst Reduction Control = 68% Sims Roy, Emission Standards Division (Docket A-95-51, December 30, 1990)

Formaldehyde Max. Hourly Emission Rate= 0.45 lb/hr * (1 - 0.68) = 0.14 lb/hr

(2) Annual Emission Rate (tpy) = CTG + HRSG DB Annual Emission Rate (tpy) * (1 - Control Efficiency)

Formaldehyde Annual Emission Rate = 1.75 tpy * (1 - 0.68) = 0.56 tpy

#### CTG + HRSG DB Speciated HAP Emission Rates per Unit

| Hazardous Air Pollutants (HAPs) | Max. Hourly Emission Rate (lb/hr)[(1)] | Annual Emission Rate (tpy)[(2)] |
|---|---|---|
| 1,3-Butadiene | < 8.20E-04 | < 0.003 |
| Acetaldehyde | 0.08 | 0.30 |
| Acrolein | 0.01 | 0.05 |
| Benzene | 0.02 | 0.09 |
| Dichlorobenzene | 4.30E-04 | 7.43E-04 |
| Ethylbenzene | 0.06 | 0.24 |
| **Formaldehyde** | **0.45** | **1.75** |
| **Hexane** | **0.65** | **1.11** |
| Naphthalene | 0.003 | 0.01 |
| PAHs | 4.23E-03 | 0.02 |
| Propylene Oxide | < 0.06 | < 0.21 |
| Toluene | 0.25 | 0.96 |
| Xylenes | 0.12 | 0.47 |
| Arsenic | 7.17E-05 | 1.24E-04 |
| Beryllium | < 4.30E-06 | < 7.43E-06 |
| Cadmium | 3.95E-04 | 6.81E-04 |
| Chromium | 5.02E-04 | 8.67E-04 |
| Cobalt | 3.01E-05 | 5.20E-05 |
| Manganese | 1.36E-04 | 2.35E-04 |
| Nickel | 7.53E-04 | 0.001 |
| Selenium | < 8.61E-06 | < 1.49E-05 |

Notes:
(1) Max. Hourly Emssion Rate (lb/hr) = CTG Hourly Emission Rate (lb/hr) + DB Hourly Emission Rate (lb/hr)

Benzene Max. Hourly Emission Rate = 0.02 lb/hr + 7.53E-04 lb/hr = 0.02 lb/hr

(2) Annual Emission Rate (tpy) = CTG Annual Emission Rate (tpy) + DB Annual Emission Rate (tpy)

Benzene Annual Emission Rate = 0.09 tpy + 1.30E-03 tpy = 0.09 tpy

#### CTG HAPs Emission Rates per Unit

| Hazardous Air Pollutants (HAPs) | Emission Factor (lb/MMBtu) [(2)] | Emission Factor (lb/MMBtu) [(3)] | Max. Hourly Emission Rate (lb/hr) [(4)] | Annual Emission Rate (tpy) [(5)] |
|---|---|---|---|---|
| 1,3-Butadiene | < 4.30E-07 | < 4.35E-07 | < 0.001 | < 0.003 |
| Acetaldehyde | 4.00E-05 | 4.05E-05 | 0.08 | 0.30 |
| Acrolein | 6.40E-06 | 6.48E-06 | 0.01 | 0.05 |
| Benzene | 1.20E-05 | 1.22E-05 | 0.02 | 0.09 |
| Ethylbenzene | 3.20E-05 | 3.24E-05 | 0.06 | 0.24 |
| Formaldehyde[(1)] | - | - | - | - |
| Naphthalene | 1.30E-06 | 1.32E-06 | 0.002 | 0.01 |
| PAHs | 2.20E-06 | 2.23E-06 | 0.00 | 0.02 |
| Propylene Oxide | < 2.90E-05 | < 2.94E-05 | < 0.06 | < 0.21 |
| Toluene | 1.30E-04 | 1.32E-04 | 0.25 | 0.96 |
| Xylenes | 6.40E-05 | 6.48E-05 | 0.12 | 0.47 |

#### CTG Characteristics

| | | Mitsubishi 501F4+ |
|---|---|---|
| Fuel Heating Content (HHV) | Btu/scf | 1,033 |
| Max. CTG Heat Rate (HHV) [(6)] | MMBtu/hr | 1,884 |
| Annual CTG Heat Rate (HHV) [(7)] | MMBtu/yr | 14,626,756 |

Notes:
(1) Formaldehyde: refer to combined cycle hourly and annual calculations.
(2) Emission factors as published by US EPA AP42, Chapter 3.1, Table 3.1-3 (April, 2000)
(3) Per AP 42 Chapter 3.1, Table 3.1-3 note c. Emission factors can be converted to actual natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to 1,020 Btu/scf.
(4) Max. Hourly Emission Rate (lb/hr) = Emission Factor (lb/MMBtu) * Max. GT Heat Rate (MMBtu/hr)

Max. Benzene Emission Rate = 1.22E-05 lb/MMBtu * 1,884 MMBtu/hr = 0.02 lb/hr

(5) Annual Emission Rate (tpy) = Emission Factor (lb/MMBtu) * Annual GT Heat Rate (MMBtu/hr) * GT Annual Hours of Operation (hr/yr) * 1ton/2,000lb

Annual. Benzene Emission Rate = 1.22E-05 lb/MMBtu * 14,626,756 MMBtu/yr * 1ton/2,000lb = 0.09 tpy

(6) Maximum Heat Rate for evaluated scenarios.
(7) Annual Heat Rate for evaluated scenarios.

**HOBBS 501F4+ Hazardous Air Pollutants**

**DB HAPs Emission Rates per Unit**

| Hazardous Air Pollutants (HAPs) | Emission Factor (lb/MMscf) (3) | Emission Factor (lb/MMscf) (4) | Max. Hourly Emission Rate (lb/hr) (5) | Annual Emission Rate (tpy) (6) |
|---|---|---|---|---|
| 2-Methylnaphthalene (1) | 2.40E-05 | 2.43E-05 | 8.61E-06 | 1.49E-05 |
| 3-Methylchloranthrene (1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| 7,12-Dimethylbenz(a)anthracene (1) | 1.60E-05 | 1.62E-05 | 5.74E-06 | 9.91E-06 |
| Acenaphthene (1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| Acenaphthylene(1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| Anthracene (1) | < 2.40E-06 | < 2.43E-06 | < 8.61E-07 | 1.49E-06 |
| Benz(a)anthracene (1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| Benzene | 2.10E-03 | 2.13E-03 | 7.53E-04 | 1.30E-03 |
| Benzo(a)pyrene (1) | < 1.20E-06 | < 1.22E-06 | < 4.30E-07 | 7.43E-07 |
| Benzo(b)fluoranthene (1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| Benzo(g,h,i)perylene (1) | < 1.20E-06 | < 1.22E-06 | < 4.30E-07 | 7.43E-07 |
| Benzo(k)fluoranthene (1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| Chrysene (1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| Dibenzo(a,h)anthracene (1) | < 1.20E-06 | < 1.22E-06 | < 4.30E-07 | 7.43E-07 |
| Dichlorobenzene | 1.20E-03 | 1.22E-03 | 4.30E-04 | 7.43E-04 |
| Fluoranthene (1) | 3.00E-06 | 3.04E-06 | 1.08E-06 | 1.86E-06 |
| Fluorene (1) | 2.80E-06 | 2.84E-06 | 1.00E-06 | 1.73E-06 |
| Formaldehyde (2) | - | - | - | - |
| Hexane | 1.80 | 1.82 | 0.65 | 1.11 |
| Indeno(1,2,3-cd)pyrene (1) | < 1.80E-06 | < 1.82E-06 | < 6.46E-07 | 1.11E-06 |
| Naphthalene | 6.10E-04 | 6.18E-04 | 2.19E-04 | 3.78E-04 |
| Phenanathrene (1) | 1.70E-05 | 1.72E-05 | 6.10E-06 | 1.05E-05 |
| Pyrene (1) | 5.00E-06 | 5.06E-06 | 1.79E-06 | 3.10E-06 |
| Toluene | 3.40E-03 | 3.44E-03 | 1.22E-03 | 2.11E-03 |
| Arsenic | 2.00E-04 | 2.03E-04 | 7.17E-05 | 1.24E-04 |
| Beryllium | < 1.20E-05 | < 1.22E-05 | < 4.30E-06 | 7.43E-06 |
| Cadmium | 1.10E-03 | 1.11E-03 | 3.95E-04 | 6.81E-04 |
| Chromium | 1.40E-03 | 1.42E-03 | 5.02E-04 | 8.67E-04 |
| Cobalt | 8.40E-05 | 8.51E-05 | 3.01E-05 | 5.20E-05 |
| Manganese | 3.80E-04 | 3.85E-04 | 1.36E-04 | 2.35E-04 |
| Nickel | 2.10E-03 | 2.13E-03 | 7.53E-04 | 1.30E-03 |
| Selenium | < 2.40E-05 | < 2.43E-05 | < 8.61E-06 | 1.49E-05 |

**DB Characteristics**

| | | Forney |
|---|---|---|
| Fuel Heating Content (HHV) | Btu/scf | 1,033 |
| Max. DB Heat Rate (HHV) (7) | MMBtu/hr | 366 |
| Annual DB Heat Rate (HHV) (8) | MMBtu/yr | 1,263,174 |

Notes:

(1) HAP because it is Polycyclic Aromatic Hydrocarbon (PAH).
(2) Formaldehyde: refer to combined cycle hourly and annual calculations.
(3) Emission factors as published by US EPA AP42, Chapter 1.4, Tables 1.4-3 and 1.4-4 (July 1998)
(4) Per AP 42 Chapter 1.4 Tables 1.4-3 and 1.4-4 emission factors are based on 1,020 Btu/scf heating value. Emissions factor have been adjusted to actual heat content by multiplying the given emission factor by the ratio of the specified heating value to 1,020 Btu/scf.
(5) Max. Hourly Emission Rate (lb/hr) = Emission Factor (lb/MMscf) * Max. DB Heat Rate (MMBtu/hr) / Fuel Heating Content (Btu/scf)
Max. DB Benzene Emission Rate = 2.13E-03 lb/MMscf * 366 MMBtu/hr / 1,033 Btu/scf = 7.53E-04 lb/hr
(6) Annual Em. Rate (tpy) = Em. Factor (lb/MMscf) * Annual DB Heat Rate (MMBtu/yr) / Fuel Heating Cont. (Btu/scf) * 1ton/2,000lb
Annual DB Benzene Emission Rate = 2.13E-03 lb/MMscf * 1,263,174 MMBtu/yr / 1,033 Btu/scf * 1ton/2,000lb = 1.30E-03 tpy
(7) Maximum Heat Rate for evaluated scenarios.
(8) Annual Heat Rate for evaluated scenarios.

# Section 7

## Information Used To Determine Emissions

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**<u>Information Used to Determine Emissions</u> shall include the following**:

☒ If manufacturer data are used, include specifications for emissions units <u>and</u> control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
☐ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
☒ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
☐ If an older version of AP-42 is used, include a complete copy of the section.
☒ If an EPA document or other material is referenced, include a complete copy.
☐ Fuel specifications sheet.
☒ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

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The following information was used to determine the CTG/HRSG emission rates post-upgrade. All relevant documentation is included. The detailed emission rate calculations are provided in Section 6 and the UA2 Form. The information is as follows:

- Mitsubishi Hitachi Power System Americas (MHPSA) CTG performance data, Effective date 10/11/2017.
- Formaldehyde emission factor as published by 40 CFR 63, Subpart YYYY Table 1 (§63.6100).
- HAPs turbine emission factors as published by U.S. EPA AP-42 Chapter 3.1, Table 3.1-3 (April, 2000).
- HAPs emission control percentage as published in the December 30, 1990 Memorandum "Hazardous Air Pollutant (HAP) Emission Control Technology for New Stationary Combustion Turbines", Sims Roy, Emission Standards Division, Combustion Group (Docket A-95-51).
- HAPs duct burner emission factors as published by U.S. EPA AP-42 Chapter 1.4, Tables 1.4-3 and 1.4-4 (July 1998).
- 40 CFR Part 75, Appendix G, Equation G-4 (§98.43(a)), CO2 emission factor. 40 CFR 98, Subpart C, Table C-2, CH4 and N2O emission factors.
- 40 CFR 98, Subpart A, Table A-1, Global Warming Potential.

# Section 8

## Map(s)

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**A map** such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

| | |
|---|---|
| The UTM or Longitudinal coordinate system on both axes | An indicator showing which direction is north |
| A minimum radius around the plant of 0.8km (0.5 miles) | Access and haul roads |
| Topographic features of the area | Facility property boundaries |
| The name of the map | The area which will be restricted to public access |
| A graphical scale | |

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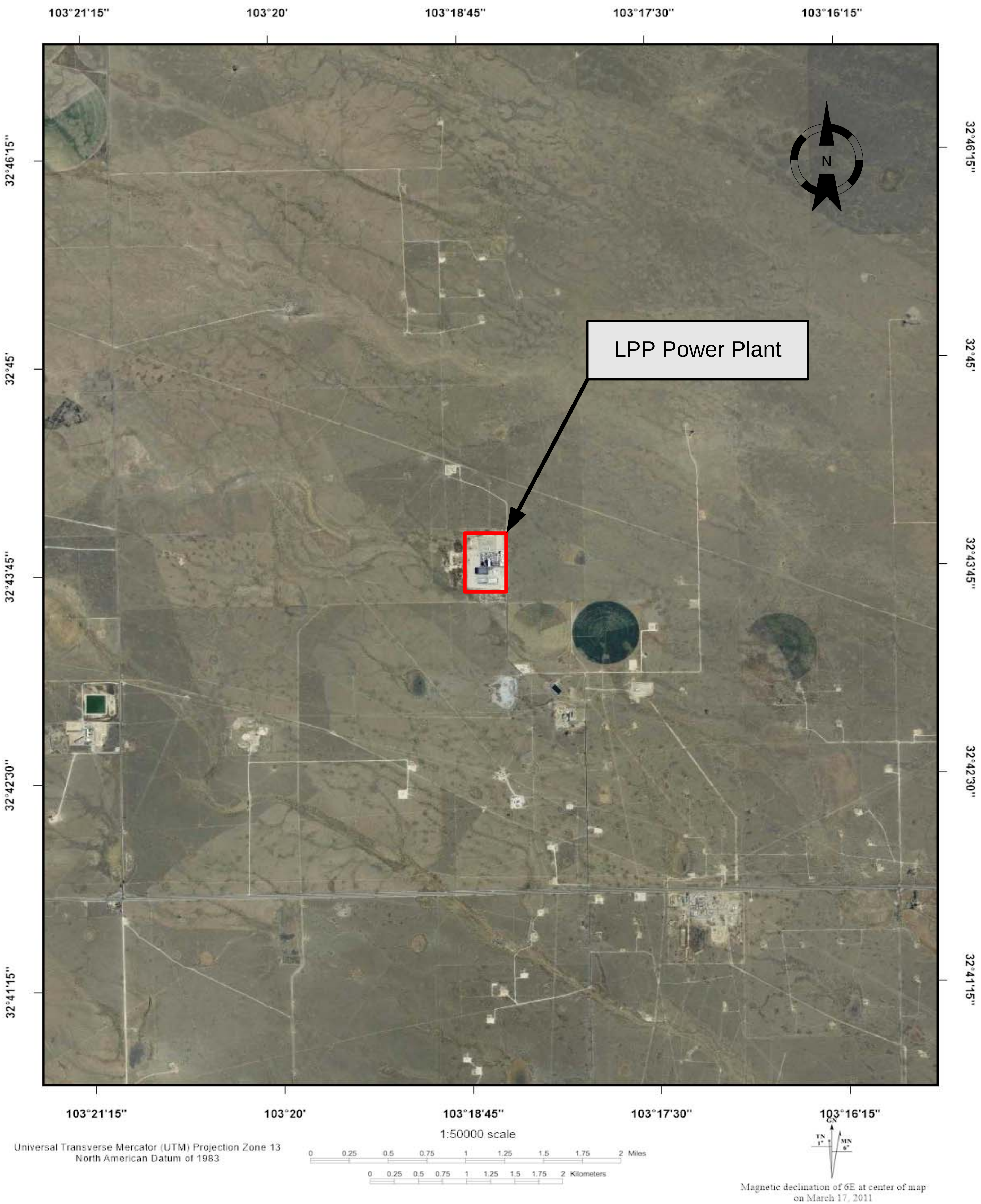
An area map of the facility is attached.




ALLIANT ENVIRONMENTAL, LLC

## Area Map

## Lea Power Partners, LLC

| Scale: | Drawn by: | Date: | | Project No.: | File Name: | Figure: |
|---|---|---|---|---|---|---|
| **1:50,000** | MRS | 4/14/2020 | **LPP Power Plant**<br>N 32° 43' 47.1" Latitude<br>W -103° 18' 34.6" Longitude | 085-002 | **LPP Power Plant Area Map** | 2-1 |
| | Chk'd by: | Date: | | | | |

# Section 9

## Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)
(This proof is required by: 20.2.72.203.A.14 NMAC “Documentary Proof of applicant’s public notice”)

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☒ **I have read the AQB “Guidelines for Public Notification for Air Quality Permit Applications”**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

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As this is a Title V permit application, public notice is not required. Public notice was completed for this project with the revision to PSD permit number PSD-3449-M5, issued December 28, 2018.

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# Section 10

## Written Description of the Routine Operations of the Facility

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**A written description of the routine operations of the facility**. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

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HGS is a natural gas fueled, nominal 604 MW net output power plant with two advanced firing temperature, Mitsubishi 501F CTGs, each provided with its own HRSG including duct burners, a single condensing, reheat STG, and an air cooled condenser serving the STG. The plant generates electricity for sale to Southwestern Public Service Company, its successors or assigns. The facility is located approximately 9 miles West of Hobbs, New Mexico in Lea County.

The exhaust from each CTG is delivered to a HRSG that produces the steam to drive the STG. Supplemental firing, using duct burners, is employed during periods of peak demand to increase HRSG steam production.

A surface condenser (heat exchanger) is used to condense the steam exhaust from the STG. Condensing the steam produces a slight vacuum, thus increasing the pressure differential that drives the steam turbine and increasing the overall efficiency of the power plant. Dry cooling is utilized to condense the steam exhaust from the steam turbine.

Several small emission sources are used at HGS, including 3 inlet chillers, 3 auxiliary cooling towers, 3 natural gas fuel heaters, a firewater pump, a standby generator and a number of storage tanks. The inlet air chilling system consists of three crossflow cooling towers that serve to enhance the overall output of the plant by lowering the temperature of the air entering the CTGs during periods of high ambient temperature (November through May). The auxiliary cooling towers consist of three crossflow closed-circuit wet cooling towers. The natural gas fuel heaters are used to pretreat the natural gas before it is fed to the CTGs. The firewater pump diesel engine is used to provide fire protection water for the plant and operates under 100 hours per year. The standby diesel generator operates under 500 hours per year and is used to provide the plant electrical requirements during complete black-out situations. Both engines fire low sulfur diesel fuel only.

Storage tanks at the site include two diesel tanks for the firewater pump diesel engine and the standby generator diesel engine, two additional diesel storage tanks, one gasoline storage tank, an aqueous ammonia storage tank for the SCR $NO_x$ emissions control unit, a caustic storage tank and an aqueous sulfuric acid storage tank for the cooling towers pH control, a neutralization tank that serves the wastewater facility, and several water storage tanks.

# Section 11

## Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

**A. Identify the emission sources evaluated in this section** (list and describe)**:**

**B. Apply the 3 criteria for determining a single source:**

**SIC Code:** Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☒ **Yes** ☐ **No**

**Common Ownership or Control:** Surrounding or associated sources are under common ownership or control as this source.

☒ **Yes** ☐ **No**

**Contiguous or Adjacent:** Surrounding or associated sources are contiguous or adjacent with this source.

☒ **Yes** ☐ **No**

**C. Make a determination:**

☒ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

# Section 12

## Section 12.A

## PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

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As this is a Title V permit application, a PSD applicability analysis is not required. A PSD applicability analysis was completed for this project with the revision to PSD permit number PSD-3449-M5, issued December 28, 2018.

# Section 13

## Determination of State & Federal Air Quality Regulations

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**This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.**

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

**Required Information for Specific Equipment:**
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

**Required Information for Regulations that Apply to the Entire Facility:**
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

**Regulatory Citations for Regulations That Do Not, but Could Apply:**
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

**Regulatory Citations for Emission Standards:**
**For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard.** Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

**Federally Enforceable Conditions:**
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

**EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc**: http://cfpub.epa.gov/adi/

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There are no changes to prior representations.

| STATE REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.) |
|---|---|---|---|---|
| 20.2.1 NMAC | General Provisions | Yes | Facility | General Provisions apply to Notice of Intent, Construction, and Title V permit applications. |
| 20.2.3 NMAC | Ambient Air Quality Standards NMAAQS | Yes | Facility | If subject, this would normally apply to the entire facility.<br>20.2.3 NMAC is a State Implementation Plan (SIP) approved regulation that limits the maximum allowable concentration of, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide.<br>Title V applications, see exemption at 20.2.3.9 NMAC<br>The TSP NM ambient air quality standard was repealed by the EIB effective November 30, 2018. |
| 20.2.7 NMAC | Excess Emissions | Yes | Facility | All Title V major sources are subject to Air Quality Control Regulations, as defined in 20.2.7 NMAC, and are thus subject to the requirements of this regulation. Also listed as applicable in NSR Permit PSD-3449-M5R2. |
| 20.2.23 NMAC | Fugitive Dust Control | Yes | Facility | This regulation may apply if,<br>this is an application for a notice of intent (NOI) per 20.2.73 NMAC,<br>if the activity or facility is a fugitive dust source listed at 20.2.23.108.A NMAC, **and** if the activity or facility is located in an area subject to a mitigation plan pursuant to 40 CFR 51.930.<br>http://164.64.110.134/parts/title20/20.002.0023.html<br><br>As of January 2019, the only areas of the State subject to a mitigation plan per 40 CFR 51.930 are in Doña Ana and Luna Counties.<br>Sources exempt from 20.2.23 NMAC are activities and facilities subject to a permit issued pursuant to the NM Air Quality Control Act, the Mining Act, or the Surface Mining Act (20.2.23.108.B NMAC.<br><br>**20.2.23.108 APPLICABILITY:**<br>**A.** This part shall apply to persons owning or operating the following fugitive dust sources in areas requiring a mitigation plan in accordance with 40 CFR Part 51.930:<br>**(1)** disturbed surface areas or inactive disturbed surface areas, or a combination thereof, encompassing an area equal to or greater than one acre;<br>**(2)** any commercial or industrial bulk material processing, handling, transport or storage operations.<br>**B.** The following fugitive dust sources are exempt from this part:<br>**(1)** agricultural facilities, as defined in this part;<br>**(2)** roadways, as defined in this part;<br>**(3)** operations issued permits pursuant to the state of New Mexico Air Quality Control Act, Mining Act or Surface Mining Act; and<br>**(4)** lands used for state or federal military activities.<br>[20.2.23.108 NMAC - N, 01/01/2019] |
| 20.2.33 NMAC | Gas Burning Equipment - Nitrogen Dioxide | Yes | DB-1, DB-2 | Hobbs duct burners are new gas burning equipment with a heat input greater than 1,000,000 MMBtu/yr per unit. Hobbs fuel gas heaters are new gas burning equipment with a heat input less than 1,000,000 MMBtu/yr, therefore this part does not apply to these equipment.<br>Note: "New gas burning equipment" means gas burning equipment, the construction or modification of which is commenced after February 17, 1972. |
| 20.2.34 NMAC | Oil Burning Equipment: $NO_2$ | No | N/A | Not applicable. This facility has no oil burning equipment having a heat input of greater than 1,000,000 MMBtu/yr per unit. |
| 20.2.35 NMAC | Natural Gas Processing Plant – Sulfur | No | N/A | Not applicable. Hobbs is not a Natural Gas Processing Plant; therefore, it is not subject to the requirements of 20.2.35 NMAC. |
| 20.2.37 and 20.2.36 NMAC | Petroleum Processing Facilities and Petroleum | No | N/A | Not applicable. Hobbs is not a Petroleum Processing Facility; therefore, it is not subject to the requirements of 20.2.37 NMAC. |

| STATE REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.) |
|---|---|---|---|---|
| | Refineries | | | |
| 20.2.38 NMAC | Hydrocarbon Storage Facility | N/A | N/A | Not applicable. Hobbs does not have hydrocarbon storage tanks with a capacity of 20,000 gallons or greater, nor does it contain a "tank battery" or "Storage facility". |
| 20.2.39 NMAC | Sulfur Recovery Plant - Sulfur | N/A | N/A | Not applicable. Hobbs is not a Sulfur Recovery Plant. |
| 20.2.61.109 NMAC | Smoke & Visible Emissions | Yes | HOBB-1, HOBB-2, DB-1, DB-2, FH-1, FH-2, FH-3, G-1 and FP-1 | Hobbs CTGs, HRSG duct burners, fuel gas heaters, standby generator and diesel fire pump will not cause visible emissions to equal or exceed an opacity of 20%. |
| 20.2.70 NMAC | Operating Permits | Yes | Facility | Hobbs operates under Operating Permit No. P244-R1. The facility is a major source for NOx, CO, $PM_{10}$/$PM_{2.5}$ and $CO_2$e. |
| 20.2.71 NMAC | Operating Permit Fees | Yes | Facility | Hobbs is subject to 20.2.70 NMAC and is therefore subject to 20.2.71 NMAC. |
| 20.2.72 NMAC | Construction Permits | Yes | Facility | Hobbs is subject to 20.2.72 NMAC and NSR Permit number: PSD-3449-M5. |
| 20.2.73 NMAC | NOI & Emissions Inventory Requirements | Yes | Facility | **Emissions Inventory Reporting:** 20.2.73.300 NMAC applies. All Title V major sources meet the applicability requirements of 20.2.73.300 NMAC. |
| 20.2.74 NMAC | Permits – Prevention of Significant Deterioration (PSD) | Yes | Facility | Hobbs is a PSD major source as defined by:<br>(1) Any stationary source listed in 20.2.74.501 NMAC Table 1 (i.e., fossil fuel-fired steam electric facilities greater than 250 MMBtu) which emits, or has the potential to emit, emissions equal to or greater than 100 tons per year of any regulated pollutant. |
| 20.2.75 NMAC | Construction Permit Fees | Yes | Facility | This facility is subject to 20.2.72 NMAC and is in turn subject to 20.2.75 NMAC. N/A if subject to 20.2.71 NMAC. |
| 20.2.77 NMAC | New Source Performance | Yes | HOBB-1, HOBB-2, G-1 | Hobbs is a stationary source subject to the requirements of 40 CFR Part 60, as amended through September 23, 2013. |
| 20.2.78 NMAC | Emission Standards for HAPS | N/A | Units Subject to 40 CFR 61 | Under normal operating conditions the site is not subject to 40 CFR Part 61. Refer to Table 13-2 40 CFR Part 61 Subpart M for further discussion. |

| STATE REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.) |
|---|---|---|---|---|
| 20.2.79 NMAC | Permits – Nonattainment Areas | No | Facility | Not applicable. Hobbs is located in Lea County, an attainment area for all regulated pollutants. |
| 20.2.80 NMAC | Stack Heights | No | | Not cited as applicable in NSR Permit PSD-3449-M5R2. |
| 20.2.82 NMAC | MACT Standards for source categories of HAPS | Yes | G-1, FP-1 | Hobbs is a minor source of hazardous air pollutants. The standby generator and fire water pump are subject to 40 CFR 63 Subpart ZZZZ. |

## Example of a Table for Applicable FEDERAL REGULATIONS (Note: This is not an exhaustive list):

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 50 | NAAQS | Yes | Facility | Defined as applicable at 20.2.70.7.E.11. Any national ambient air quality standard. Not directly applicable to individual emission sources. |
| NSPS 40 CFR 60, Subpart A | General Provisions | Yes | HOBB-1, HOBB-2, DB-1, DB-2, G-1 | Hobbs CTGs and HRSG duct burners are subject to 40 CFR 60 Subpart KKKK. Hobbs standby generator is subject to 40 CFR 60 Subpart IIII; therefore, these units are also subject to 40 CFR 60 Subpart A - General Provisions. |
| NSPS 40 CFR60.40a, Subpart Da | Subpart Da, Performance Standards for **Electric Utility Steam Generating Units** | No | N/A | Not applicable. Emissions from the HRSG duct burners are subject to 40 CFR 60 Subpart KKKK and therefore are exempt from the requirements of Subpart Da. |
| NSPS 40 CFR60.40b Subpart Db | **Electric Utility Steam Generating Units** | | | Not applicable. Emissions from the HRSG duct burners are subject to 40 CFR 60 Subpart KKKK and therefore are exempt from the requirements of Subpart Db. |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 60.40c, Subpart Dc | Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units | No | N/A | Not applicable. Hobbs has no petroleum liquid storage vessels subject to this regulation. |
| NSPS 40 CFR 60, Subpart Ka | Standards of Performance for **Storage Vessels for Petroleum Liquids** for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and **Prior** to July 23, 1984 | No | N/A | Not applicable. Hobbs does not have storage vessels with a capacity greater than or equal to 75 cubic meters that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. |
| NSPS 40 CFR 60, Subpart Kb | Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** July 23, 1984 | No | N/A | Not applicable. Emissions from the HRSG duct burners are subject to 40 CFR 60 Subpart KKKK and therefore are exempt from the requirements of Subpart Db. |
| NSPS 40 CFR 60.330 Subpart GG | **Stationary Gas Turbines** | No | N/A | Units HOBB-1 and HOBB-2 have a heat input equal to 1,697 MMBtu/hour (nominal), which is greater than the 10 MMBtu/hour threshold. These units were manufactured on 2007 which is after the October 3, 1977 applicability date. |
| NSPS 40 CFR 60, Subpart KKK | Leaks of VOC from **Onshore Gas Plants** | No | N/A | Not applicable. Hobbs is not an Onshore Gas Plant. |
| NSPS 40 CFR Part 60 Subpart LLL | Standards of Performance for **Onshore Natural Gas Processing**: $SO_2$ Emissions | No | N/A | Not applicable. Hobbs is not an Onshore Natural Gas Processing plant. |
| NSPS 40 CFR Part 60 Subpart OOOO | Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction | No | N/A | Not applicable. Hobbs is not an Oil and Gas facility. |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| | commenced after August 23, 2011 and before September 18, 2015 | | | |
| NSPS 40 CFR Part 60 Subpart OOOOa | Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015 | No | N/A | Not applicable. Hobbs is not an Oil and Gas facility. |
| NSPS 40 CFR 60 Subpart IIII | Standards of performance for Stationary Compression Ignition Internal Combustion Engines | Yes | G-1 | **Hobbs Diesel Standby Generator was manufactured after July 1, 2006 and is not a fire pump engine. Therefore, this unit is subject to the provisions of NSPS IIII, (§60.4200(a)(2)(i)). Hobbs Diesel Fire Water Pump, was manufactured and constructed in 2011, before all applicable trigger dates in the rule; therefore, it is not subject to NSPS IIII.** |
| NSPS 40 CFR Part 60 Subpart JJJJ | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines | No | N/A | Not applicable. Hobbs is not equipped with any stationary spark ignition internal combustion engine. |
| NSPS 40 CFR 60 Subpart TTTT | Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units | No | N/A | Not applicable. Modification date predates NSPS applicability date. |
| NSPS 40 CFR 60 Subpart UUUU | Emissions Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units | No | N/A | Not applicable. Hobbs is not an Electric Utility Generating Unit. |
| NSPS 40 CFR 60, Subparts WWW, XXX, Cc, and Cf | Standards of performance for Municipal Solid Waste (MSW) Landfills | No | N/A | Not applicable. Hobbs is not a Municipal Solid Waste (MSW) Landfill. |
| NESHAP 40 CFR 61 Subpart A | General Provisions | Yes (Potentially) | Facility | Potentially Hobbs could be subject to 40 CFR 61 Subpart M. Refer to discussion below. |
| NESHAP 40 CFR 61 Subpart E | National Emission Standards for **Mercury** | No | N/A | Not applicable. This facility does not process mercury. |
| NESHAP 40 CFR 61 Subpart V | National Emission Standards for **Equipment Leaks** (Fugitive Sources) | No | N/A | Not applicable. Hobbs does not operate any sources in volatile hazardous air pollutant (VHAP) service. |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| MACT<br>40 CFR 63, Subpart A | General Provisions | Yes | G-1<br>FP-1<br>T-9 | The Hobbs Diesel Standby Generator and Diesel Fire Water Pump are subject to MACT Subpart ZZZZ, and the gasoline storage tank is subject to MACT Subpart CCCCCC, therefore these sources must comply with the requirements of MACT Subpart A. |
| MACT<br>40 CFR 63.760 Subpart HH | **Oil and Natural Gas Production Facilities** | No | N/A | Not applicable. Hobbs is not an Oil and Natural Gas Production facility. |
| MACT<br>40 CFR 63 Subpart HHH | | No | N/A | Not applicable. Hobbs is not a natural gas transmission and storage facility. |
| MACT 40 CFR 63 Subpart DDDDD | National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters | No | N/A | Not applicable. No major boilers and/or process heaters are located at Hobbs. |
| MACT 40 CFR 63 Subpart UUUUU | National Emission Standards for Hazardous Air Pollutants Coal & Oil Fire Electric Utility Steam Generating Unit | No | N/A | Not applicable. Hobbs is not a coal and oil fire electric utility steam generating unit. |
| MACT<br>40 CFR 63 Subpart ZZZZ | National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**) | Yes | G-1<br>FP-1 | Hobbs Diesel Standby Generator (G-1) is a new (emergency) stationary RICE at an area source of HAPs. Per §63.6590(c)(1), G-1 meets the requirements of MACT ZZZZ by meeting the requirements of NSPS IIII.<br>Hobbs Diesel Fire Water Pump (FP-1) is an existing emergency RICE at an area source of HAPs and must comply with the requirements of MACT ZZZZ as of May 3, 2013. |
| MACT<br>40 CFR 63 Subpart CCCCCC | Gasoline Dispensing Facilities | Yes | T-9 | The affected source is located at an area source of HAPs. The proposed gasoline storage tank (T-9) will have a monthly throughput of less than 10,000 gallons of gasoline, and therefore, T-9 must comply with the requirements in §63.11116, which include: (1) minimize gasoline spills; (2) clean up spills as expeditiously as practicable; (3) cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use; and (4) minimize gasoline sent to open waste collection systems. |
| 40 CFR 64 | **Compliance Assurance Monitoring** | Yes | Facility | Hobbs CTGs/HRSG exhaust stacks are equipped with a CEMS that satisfy the CAM exemption requirements (§64.2(b)(1)(vi)). |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 68 | **Chemical Accident Prevention** | No | N/A | Not applicable. Hobbs does not manufacture, process, use, store, or otherwise handle regulated substances in excess of the quantities specified in 10 CFR 68. |
| Title IV – Acid Rain 40 CFR 72 | **Acid Rain** | Yes | HOBB-1, HOBB-2 | Hobbs CTGs are subject to the requirements of the Acid Rain Program. |
| Title IV – Acid Rain 40 CFR 73 | **Sulfur Dioxide** Allowance Emissions | Yes | HOBB-1, HOBB-2 | Hobbs must obtain $SO_2$ calendar year allowances. |
| Title IV-Acid Rain 40 CFR 75 | **Continuous Emissions Monitoring** | Yes | HOBB-1, HOBB-2 | Hobbs CTG/HRSG exhaust stack is equipped with a CEMS for NOx, CO and $O_2$. |
| Title IV – Acid Rain 40 CFR 76 | **Acid Rain** Nitrogen Oxides **Emission Reduction Program** | No | N/A | Hobbs is not subject to the acid rain nitrogen oxides emission reduction program. |
| Title VI – 40 CFR 82 | Protection of **Stratospheric Ozone** | Yes | Facility | Hobbs equipment includes appliances containing CFCs and is therefore subject to the requirements of 40 CFR 82. Hobbs uses only certified technicians for the maintenance, service, repair and disposal of these appliances and maintains the appropriate records. |

# Section 14

## Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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☒ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **<u>Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies</u>** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☐ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **<u>Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown</u>** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☐ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

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Startup and shutdown procedures are either based on manufacturer's recommendations and/or based on HGS' operating experience. These procedures are designed to proactively address the potential for malfunction to the greatest extent possible. These procedures dictate a sequence of operations that are designed to minimize emissions from the facility during events that result in shutdown and subsequent startup.

HGS equipment incorporates various safety devices and features that aid in the prevention of excess emissions in the event of an operational emergency. If an operational emergency does occur and excess emissions occur, Hobbs will submit the required Excess Emissions Report as per 20.2.7 NMAC. Corrective action to eliminate the excess emissions and prevent recurrence in the future will be undertaken as quickly as safety allows.

# Section 15

## Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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**Alternative Operating Scenarios:** Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

**Construction Scenarios**: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: https://www.env.nm.gov/aqb/permit/aqb_pol.html. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title "Construction Scenarios", specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

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Not applicable, HGS does not have an alternative operating scenario.

# Section 16

## Air Dispersion Modeling

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1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

| **What is the purpose of this application?** | Enter an X for each purpose that applies |
|---|---|
| New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above. | |
| New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions. | |
| Reporting existing pollutants that were not previously reported. | |
| Reporting existing pollutants where the ambient impact is being addressed for the first time. | |
| Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above. | **X** |
| Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC) | |
| Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements. | |
| Other: i.e. SSM modeling. See #2 above. | |
| This application does not require modeling since this is a No Permit Required (NPR) application. | |
| This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC). | |
| This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines. | |

**Check each box that applies:**

☐ See attached, approved modeling **waiver for all** pollutants from the facility.
☐ See attached, approved modeling **waiver for some** pollutants from the facility.
☐ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.
☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.
☒ No modeling is required.

# Section 17

## Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

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**Table 17–1 Compliance Test History Table**

| Unit No. | Permit No. | Permit Cond. | Test Description | Test Date |
|---|---|---|---|---|
| HOBB-1/DB-1 | PSD 3449 | A401A | Initial Compliance for PM/PM10/PM2.5 | 3/5/2015 - 3/6/2015 |
| | | A401C | RATA testing in accordance with EPA test methods for NOx and CO. | 6/4/2020<br>7/30/2019<br>6/6/2018<br>9/21/2017<br>923/2016<br>9/23/2015<br>9/17/2014 |
| | | A401E | Annual ammonia compliance testing. | 9/23/2015-<br>9/24/2015<br>9/17/2014 |
| | PSD 3449 | A401C | RATA testing in accordance with EPA test methods for NOx and CO. | 6/4/2020<br>7/30/2019<br>6/6/2018<br>9/21/2017<br>923/2016<br>11/13/2013<br>11/7/2012<br>11/30/2011 |
| | | A401A | Annual stack testing for NOx and CO. | 11/13/2013<br>11/7/2012<br>11/30/2011 |
| | | A401E | Annual ammonia compliance testing. | 11/13/2013<br>11/7/2012<br>11/30/2011 |
| HOBB-2/DB-2 | PSD 3449 | A401A | Initial Compliance for PM/PM10/PM2.5 | 3/11/2015 - 3/12/2015 |
| | | A401C | RATA testing in accordance with EPA test methods for NOx and CO. | 6/3/2020<br>7/26/2019<br>6/6/2018<br>9/21/2017<br>923/2016<br>9/23/2015-<br>9/24/2015<br>9/16/2014 |

| | | | | |
|---|---|---|---|---|
| | | A401E | Annual ammonia compliance testing. | 9/25/2015-<br>9/27/2015<br>9/16/2014 |
| | PSD 3449 | A401C | RATA testing in accordance with EPA test methods for NOx and CO. | 6/3/2020<br>7/26/2019<br>6/6/2018<br>9/21/2017<br>9/23/2016<br>11/14/2013<br>11/8/2012<br>12/1/2011 |
| | | A401A | Annual stack testing for NOx and CO. | 11/14/2013<br>11/8/2012<br>12/1/2011 |
| | | A401E | Annual ammonia compliance testing. | 11/14/2013<br>11/8/2012<br>12/1/2011 |
| HOBB1 | PSD 3449 | A401A | Initial Compliance for PM/PM10/PM2.5 | 9/29/2015-<br>10/1/2015 |
| HOBB2 | PSD 3449 | A401A | Initial Compliance for PM/PM10/PM2.5 | 9/29/2015-<br>10/1/2015 |
| G-1 | PSD 3449 | A111 B | Opacity test. | 6/4/2020<br>7/26/2019<br>6/6/2018<br>9/24/2015<br>9/17/2014 |
| | PSD 3449 | A111 B | Opacity test. | 11/12/2013<br>11/6/2012<br>11/29/2011 |
| FP-1 | PSD 3449 | A111 B | Opacity test. | 6/4/2020<br>7/30/2019<br>6/6/2018<br>9/24/2015<br>9/17/2014 |
| | PSD 3449 | A111 B | Opacity test. | 11/12/2013<br>11/6/2012<br>11/29/2011 |

# Section 18

## Addendum for Streamline Applications

Do not print this section unless this is a streamline application.

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**Not Applicable**

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# Section 19

## Requirements for Title V Program

Do not print this section unless this is a Title V application.

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**Who Must Use this Attachment:**

* Any major source as defined in 20.2.70 NMAC.
* Any source, including an area source, subject to a standard or other requirement promulgated under Section 111 - Standards of Performance for New Stationary Sources, or Section 112 Hazardous Air Pollutants, of the 1990 federal Clean Air Act ("federal Act"). Non-major sources subject to Sections 111 or 112 of the federal Act are exempt from the obligation to obtain an 20.2.70 NMAC operating permit until such time that the EPA Administrator completes rulemakings that require such sources to obtain operating permits. In addition, sources that would be required to obtain an operating permit solely because they are subject to regulations or requirements under Section 112(r) of the federal Act are exempt from the requirement to obtain an Operating Permit.
* Any Acid Rain source as defined under title IV of the federal Act. The Acid Rain program has additional forms. See http://www.env.nm.gov/aqb/index.html. Sources that are subject to both the Title V and Acid Rain regulations are encouraged to submit both applications simultaneously.
* Any source in a source category designated by the EPA Administrator ("Administrator"), in whole or in part, by regulation, after notice and comment.

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To save paper and to standardize the application format, delete this sentence, and begin your submittal for this item here.

---

### 19.1 - 40 CFR 64, Compliance Assurance Monitoring (CAM) (20.2.70.300.D.10.e NMAC)

Any source subject to 40CFR, Part 64 (Compliance Assurance Monitoring) must submit all the information required by section 64.7 with the operating permit application. The applicant must prepare a separate section of the application package for this purpose; if the information is already listed elsewhere in the application package, make reference to that location. Facilities not subject to Part 64 are invited to submit periodic monitoring protocols with the application to help the AQB to comply with 20.2.70 NMAC. Sources subject to 40 CFR Part 64, must submit a statement indicating your source's compliance status with any enhanced monitoring and compliance certification requirements of the federal Act.

---

**Hobbs CTGs/HRSG exhaust stacks are equipped with a CEMS that satisfy the CAM exemption requirements (§64.2(b)(1)(vi)); therefore, Part 64 is not applicable.**

---

### 19.2 - Compliance Status (20.2.70.300.D.10.a & 10.b NMAC)

Describe the facility's compliance status with each applicable requirement at the time this permit application is submitted. This statement should include descriptions of or references to all methods used for determining compliance. This statement should include descriptions of monitoring, recordkeeping and reporting requirements and test methods used to determine compliance with all applicable requirements. Refer to Section 2, Tables 2-N and 2-O of the Application Form as necessary. (20.2.70.300.D.11 NMAC) For facilities with existing Title V permits, refer to most recent Compliance Certification for existing requirements. Address new requirements such as CAM, here, including steps being taken to achieve compliance.

---

**Methods for determining compliance, and requirements for monitoring, recordkeeping, reporting, and testing included in the Title V permit will continue to be met by LPP.**

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### 19.3 - Continued Compliance (20.2.70.300.D.10.c NMAC)

Provide a statement that your facility will continue to be in compliance with requirements for which it is in compliance at the time of permit application. This statement must also include a commitment to comply with other applicable requirements as they come into effect during the permit term. This compliance must occur in a timely manner or be consistent with such schedule expressly required by the applicable requirement.

---

**LPP is in compliance and will continue to be in compliance with the requirements of the Title V permit. Furthermore, LPP has made a commitment to comply with other applicable requirements as they come into effect during the permit term. This compliance will occur in a timely manner and/or be consistent with such schedule expressly required by the applicable requirement.**

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## 19.4 - Schedule for Submission of Compliance (20.2.70.300.D.10.d NMAC)

You must provide a proposed schedule for submission to the department of compliance certifications during the permit term. This certification must be submitted annually unless the applicable requirement or the department specifies a more frequent period. A sample form for these certifications will be attached to the permit.

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**Compliance certifications for the HGS will be submitted annually, as required by the Tile V permit and 20.2.70.300.D.10.**

---

## 19.5 - Stratospheric Ozone and Climate Protection

In addition to completing the four (4) questions below, you must submit a statement indicating your source's compliance status with requirements of Title VI, Section 608 (National Recycling and Emissions Reduction Program) and Section 609 (Servicing of Motor Vehicle Air Conditioners).

---

1. Does your facility have any air conditioners or refrigeration equipment that uses CFCs, HCFCs or other ozone-depleting substances? ☒ **Yes** ☐ **No**

2. Does any air conditioner(s) or any piece(s) of refrigeration equipment contain a refrigeration charge greater than 50 lbs? ☐ **Yes** ☒ **No**
(If the answer is yes, describe the type of equipment and how many units are at the facility.)

3. Do your facility personnel maintain, service, repair, or dispose of any motor vehicle air conditioners (MVACs) or appliances ("appliance" and "MVAC" as defined at 82. 152)? ☐ **Yes** ☒ **No**

4. Cite and describe which Title VI requirements are applicable to your facility (i.e. 40 CFR Part 82, Subpart A through G.)

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**LPP does not produce, manufacture, transform, destroy, import, or export any stratospheric ozone-depleting substances (CFCs, HCFCs); does not maintain or service motor vehicle air conditioning units or refrigeration equipment; and does not sell, distribute, or offer for sale any product that may contain stratospheric ozone-depleting substances. LPP shall continue to comply with the conditions stipulated in 40 CFR 82, Subparts A-G of the Stratospheric Ozone Protection Program (Title VI of the Clean Air Act Amendments), as applicable.**

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## 19.6 - Compliance Plan and Schedule

Applications for sources, which are not in compliance with all applicable requirements at the time the permit application is submitted to the department, must include a proposed compliance plan as part of the permit application package. This plan shall include the information requested below:

**A. Description of Compliance Status:** (20.2.70.300.D.11.a NMAC)
A narrative description of your facility's compliance status with respect to all applicable requirements (as defined in 20.2.70 NMAC) at the time this permit application is submitted to the department.

**B. Compliance plan:** (20.2.70.300.D.11.B NMAC)
A narrative description of the means by which your facility will achieve compliance with applicable requirements with which it is not in compliance at the time you submit your permit application package.

**C. Compliance schedule:** (20.2.70.300D.11.c NMAC)
A schedule of remedial measures that you plan to take, including an enforceable sequence of actions with milestones, which will lead to compliance with all applicable requirements for your source. This schedule of compliance must be at least as stringent as that contained in any consent decree or administrative order to which your source is subject. The obligations of any consent decree or administrative order are not in any way diminished by the schedule of compliance.

**D. Schedule of Certified Progress Reports:** (20.2.70.300.D.11.d NMAC)
A proposed schedule for submission to the department of certified progress reports must also be included in the compliance schedule. The proposed schedule must call for these reports to be submitted at least every six (6) months.

**E. Acid Rain Sources:** (20.2.70.300.D.11.e NMAC)
If your source is an acid rain source as defined by EPA, the following applies to you. For the portion of your acid rain source subject to the acid rain provisions of title IV of the federal Act, the compliance plan must also include any additional requirements under the acid rain provisions of title IV of the federal Act. Some requirements of title IV regarding the schedule and methods the source will use to achieve compliance with the acid rain emissions limitations may supersede the requirements of title V and 20.2.70 NMAC. You will need to consult with the Air Quality Bureau permitting staff concerning how to properly meet this requirement.

**NOTE**: The Acid Rain program has additional forms. See http://www.env.nm.gov/aqb/index.html. Sources that are subject to both the Title V and Acid Rain regulations are **encouraged** to submit both applications **simultaneously**.

---

**LPP is in compliance with all applicable requirements at the time this application is submitted; therefore, a new compliance plan is not being proposed.**

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## 19.7 - 112(r) Risk Management Plan (RMP)

Any major sources subject to section 112(r) of the Clean Air Act must list all substances that cause the source to be subject to section 112(r) in the application. The permittee must state when the RMP was submitted to and approved by EPA.

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**Not applicable, as the HGS does not manufacture, process, use, store, or otherwise handle regulated substances in excess of the quantities specified in 40 CFR 68.**

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## 19.8 - Distance to Other States, Bernalillo, Indian Tribes and Pueblos

Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B NMAC)?

(If the answer is yes, state which apply and provide the distances.)

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**Texas (23 km).**

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## 19.9 - Responsible Official

**Mr. David Baugh, Vice President Asset Management**
**Phone: (713) 358-9726**
**Email: dbaugh@camstex.com**

# Section 20

## Other Relevant Information

**<u>Other relevant information</u>**. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

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All relevant information has been incorporated in the appropriate application pages.

# Section 21

## Addendum for Landfill Applications

Do not print this section unless this is a landfill application.

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**Not Applicable**

# Section 22: Certification

Company Name: **Consolidated Asset Management Services (New Mexico), LLC**

I, **David Baugh**, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 1st day of July, 2020, upon my oath or affirmation, before a notary of the State of

Texas.

*Signature

7/1/2020
Date

DAVID BAUGH
Printed Name

VP-Asset Management
Title

Scribed and sworn before me on this 1 day of July, 2020.

My authorization as a notary of the State of Texas expires on the

22 day of August, 2021.

Notary's Signature

07/01/2020
Date

estephany villarreal
Notary's Printed Name

ESTEPHANY VILLARREAL
My Notary ID # 131256200
Expires August 22, 2021

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.