

# *Cirrus Consulting, LLC*

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August 26, 2019

Ted Schooley  
Permit Programs Manager  
New Mexico Environment Department  
Air Quality Bureau  
525 Camino de los Marquez, Suite 1  
Santa Fe, New Mexico, 87505-1816

Re:       **Application to Renew Title V Operating Permit P018-R3**  
          **Harvest Four Corners LLC – Thompson Compressor Station,**  
          Agency Interest No. 1191

Dear Mr. Schooley,

On behalf of Harvest Four Corners LLC (Williams), Cirrus Consulting, LLC is pleased to submit this application for to renew Title V Operating Permit P018-R3 for the Thompson Compressor Station.

In accordance with the instructions in the NMAQB Universal Air Quality Permit Application, one hard copy original and one hard copy review copy application is included. A CD containing the application electronic files is included in each hard copy.

If any additional information is needed with regard to this application, please contact Ms. Monica Smith of Harvest at (505) 632-4625.

Sincerely,

*Lisa Killion*

Lisa Killion  
Sr. Environmental Scientist

Enclosures –   One application original hard copy, with electronic files on CD  
                  One application review hard copy, with electronic files on CD

cc:       Monica Smith, Williams (electronic copy)  
          Bobby Myers, Cirrus (electronic copy)



**NEW MEXICO 20.2.70.300.B(2) NMAC APPLICATION  
TO RENEW TITLE V OPERATING PERMIT P018-R3**

**THOMPSON COMPRESSOR STATION**

**Submitted By:**



***Harvest Four Corners, LLC***

**1755 Arroyo Drive  
Bloomfield, New Mexico 87413**

**Prepared By:**

***Cirrus Consulting, LLC***

**951 Diestel Road  
Salt Lake City, Utah 84105  
(801) 484-4412**

**August 2019**

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

**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.

\$500 NSR application Filing Fee enclosed **OR**  The full permit fee associated with 10 fee points (required w/ streamline applications).

Check No.: [redacted] in the amount of [redacted]

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](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: **20.2.70.300.B(2) 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 1 <sup>st</sup> 3 to 5 #s of permit IDEA ID No.): <b>1191</b>	Updating Permit/NOI #: <b>P018-R3</b>
1	Facility Name: Thompson Compressor Station	Plant primary SIC Code (4 digits): 1389	
		Plant NAIC code (6 digits): 213112	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): From the intersection of NM 516 and County Road 3535 in Flora Vista near the Farmer’s Market, turn northwest on County Road 3535 and drive northwest 1.6 miles to where the pavement ends. Turn left on County Road 3536 and drive 0.6 miles to the station.		
2	Plant Operator Company Name: Harvest Four Corners, LLC	Phone/Fax: 505-632-4600 / 505-632-4782	
a	Plant Operator Address: 1755 Arroyo Drive, Bloomfield, NM 87413		

b	Plant Operator's New Mexico Corporate ID or Tax ID: 20-4283559	
3	Plant Owner(s) name(s): Harvest Four Corners, LLC	Phone/Fax: 505-632-4600 / 505-632-4782
a	Plant Owner(s) Mailing Address(s): 1755 Arroyo Drive, Bloomfield NM 87413	
4	Bill To (Company): Harvest Four Corners, LLC	Phone/Fax: 505-632-4600 / 505-632-4782
a	Mailing Address: 1755 Arroyo Drive, Bloomfield NM 87413	E-mail: N/A
5	<input type="checkbox"/> Preparer: <input checked="" type="checkbox"/> Consultant: Bobby Myers, Cirrus Consulting, LLC	Phone/Fax: 801-484-4412 / 801-484-4192
a	Mailing Address: 951 S. Diestel Road, Salt Lake City, UT 84105	E-mail: <a href="mailto:bmyers@cirrusllc.com">bmyers@cirrusllc.com</a>
6	Plant Operator Contact: Monica Smith	Phone/Fax: 505-632-4625 / 505-632-4782
a	Address: 1755 Arroyo Drive, Bloomfield NM 87413	E-mail: msmith@harvestmidstream.com
7	Air Permit Contact: Monica Smith	Title: Environmental Specialist
a	E-mail: msmith@harvestmidstream.com	Phone/Fax: 505-632-4625 / 505-632-4782
b	Mailing Address: 1755 Arroyo Drive, Bloomfield NM 87413	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

**Section 1-B: Current Facility Status**

1.a	Has this facility already been constructed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.b If yes to question 1.a, is it currently operating in New Mexico? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Is the facility currently shut down? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, the permit No. is: P-018-R3-M1
7	Has this facility been issued a No Permit Required (NPR)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, the permit No. is: 0761-M10-R1
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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: 8.4 mmcf <sup>(a)</sup>	Daily: 202.5 mmcf <sup>(a)</sup>	Annually: 73,918 mmcf <sup>(a)</sup>
b	Proposed	Hourly: 8.4 mmcf <sup>(a)</sup>	Daily: 202.5 mmcf <sup>(a)</sup>	Annually: 73,918 mmcf <sup>(a)</sup>
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: 8.4 mmcf <sup>(a)</sup>	Daily: 202.5 mmcf <sup>(a)</sup>	Annually: 73,918 mmcf <sup>(a)</sup>

b	Proposed	Hourly: 8.4 mmcf <sup>(a)</sup>	Daily: 202.5 mmcf <sup>(a)</sup>	Annually: 73,918 mmcf <sup>(a)</sup>
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<sup>(a)</sup> Station capacity is a direct function of available horsepower. The throughput is therefore dependent on atmospheric temperature, gas temperature, atmospheric pressure, gas pressure, relative humidity and gas quality, as well as other factors. The "capacity" expressed in the application is a nominal quantity, neither an absolute maximum nor an average. The actual throughput will vary from the nominal amount.

### Section 1-D: Facility Location Information

1	Section: 04 & 09	Range: 12W	Township: 30N	County: San Juan	Elevation (ft): 5,815
2	UTM Zone: <input checked="" type="checkbox"/> 12 or <input type="checkbox"/> 13			Datum: <input type="checkbox"/> NAD 27 <input checked="" type="checkbox"/> NAD 83 <input type="checkbox"/> WGS 84	
a	UTM E (in meters, to nearest 10 meters): 758,787 m			UTM N (in meters, to nearest 10 meters): 4,080,438 m	
b	AND Latitude (deg., min., sec.): 36° 50' 4.0"			Longitude (deg., min., sec.): -108° 05' 53.3"	
3	Name and zip code of nearest New Mexico town: Flora Vista, NM 87415				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): See Section 1-A.1.a.				
5	The facility is ~0.5 (distance) mile north-northwest (direction) of Flora Vista, NM (nearest town).				
6	Status of land at facility (check one): <input checked="" type="checkbox"/> Private <input type="checkbox"/> Indian/Pueblo <input type="checkbox"/> Federal BLM <input type="checkbox"/> Federal Forest Service <input type="checkbox"/> 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: Farmington, Aztec, Bloomfield; Ute Mountain Ute, Navajo Nation; San Juan Co.				
8	20.2.72 NMAC applications <b>only</b> : 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 <a href="http://www.env.nm.gov/aqb/modeling/classIareas.html">www.env.nm.gov/aqb/modeling/classIareas.html</a> )? <input type="checkbox"/> Yes <input type="checkbox"/> No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: N/A				
9	Name nearest Class I area: Mesa Verde National Park				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 48.09 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: ~20 meters (north)				
12	Method(s) used to delineate the Restricted Area: Fenceline  "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? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 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? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes 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 <b>maximum</b> operating ( $\frac{\text{hours}}{\text{day}}$ ): 24	( $\frac{\text{days}}{\text{week}}$ ): 7	( $\frac{\text{weeks}}{\text{year}}$ ): 52	( $\frac{\text{hours}}{\text{year}}$ ): 8,760	
2	Facility's maximum daily operating schedule (if less than 24 $\frac{\text{hours}}{\text{day}}$ )? Start: N/A		AM PM	End: N/A	AM PM
3	Month and year of anticipated start of construction: N/A				
4	Month and year of anticipated construction completion: N/A				
5	Month and year of anticipated startup of new or modified facility: N/A				
6	Will this facility operate at this site for more than one year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, specify:		
a	If yes, NOV date or description of issue: N/A	NOV Tracking No: N/A	
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, provide the 1c & 1d info below:		
c	Document Title: N/A	Date: N/A	Requirement # (or page # and paragraph #): N/A
d	Provide the required text to be inserted in this permit: N/A		
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
a	If Yes, what type of source? <input type="checkbox"/> Major ( <input type="checkbox"/> ≥10 tpy of any single HAP <b>OR</b> <input type="checkbox"/> ≥25 tpy of any combination of HAPS) <b>OR</b> <input checked="" type="checkbox"/> Minor ( <input checked="" type="checkbox"/> <10 tpy of any single HAP <b>AND</b> <input checked="" type="checkbox"/> <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
a	If yes, include the name of company providing commercial electric power to the facility: _____ 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	<input type="checkbox"/> I have filled out Section 18, "Addendum for Streamline Applications." <input checked="" type="checkbox"/> N/A (This is not a Streamline application.)
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**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): Travis Jones	Phone: 713-289-2630
a	R.O. Title: EH&S Manager	R.O. e-mail: trjones@harvestmidstream.com
b	R. O. Address: 1111 Travis Street, Houston, TX 77002	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC): TBD	Phone: TBD
a	A. R.O. Title: TBD	A. R.O. e-mail: TBD
b	A. R. O. Address: TBD	
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.): Hilcorp Energy Company	
a	Address of Parent Company: 1111 Travis Street, Houston, TX 77002	
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.): N/A	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations: N/A	



7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: 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: Yes. Colorado (18 km); Southern Ute Tribe (18 km), Jicarilla Apache Tribe (80 km), Navajo Nation Tribal lands (18 km / 16 km checkerboard), Ute Mountain Ute Tribe (14 km).
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## 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-toe 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. Upon receipt of the application fee, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD).
- 4) 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.
- 5) 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. 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, Universal Application section 3-19, and Universal Application 4, the modeling report) and **1 Excel file** of the tables (Universal Application section 2). 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 # (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. The footer information should not be modified by the applicant.

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**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 <sup>1</sup>	Source Description	Make	Model #	Serial #	Manufacturer's Rated Capacity <sup>3</sup> (Specify Units)	Requested Permitted Capacity <sup>3</sup> (Specify Units)	Date of Manufacture <sup>2</sup>	Controlled by Unit #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB) <sup>4</sup>	Replacing Unit No.	
							Date of Construction/ Reconstruction <sup>2</sup>	Emissions vented to Stack #					
1	Turbine (Compressor)	Solar Saturn	T-1300	OHG10-S6147 (Pkg # S428435)	1,300 hp	1,125 hp	6/1/1996	N/A	20200201	X Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							6/1/1996	1					
9	Turbine (Compressor)	Solar Saturn	10-T1200	OHC16-S6132 (Pkg # S401519)	1,200 hp	997 hp	10/1/1969	N/A	20200201	X Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							3/21/2006	9					
14	Turbine (Compressor)	Solar Centaur	40-4700S	OHA15-C8819 (Pkg # CC80016)	4,700 hp	3,834 hp	12/23/2010	N/A	20200201	X Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							12/23/2010	14					
SSM <sup>5</sup>	Startup, Shutdown & Maintenance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20200201	X Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							N/A	N/A					
P1	Pigging	N/A	N/A	N/A	N/A	N/A	N/A	N/A	31000211	Existing (unchanged) X New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							N/A	N/A					
F1	Equipment Leaks	N/A	N/A	N/A	N/A	N/A	N/A	N/A	31088811	X Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							N/A	N/A					
SEP-1	Inlet Separator (heated)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	Existing (unchanged) X New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							N/A	N/A					
T-3	Condensate Storage Tank	N/A	N/A	919	500 bbl	500 bbl	9/1/1985	N/A	40400311-12	Existing (unchanged) New/Additional X To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							9/1/1985	N/A					
T-12	Condensate Storage Tank	N/A	N/A	389	400 bbl	400 bbl	12/29/2003	N/A	40400311-12	Existing (unchanged) New/Additional X To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							12/29/2003	N/A					
T-4, T-16, T-20 (in aggregate)	Produced Water Storage Tanks	N/A	N/A	N/A	N/A	120,000 bbl/yr	N/A	N/A	40400315	Existing (unchanged) X New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							N/A	N/A					
F2	Truck Loading (Condensate)	N/A	N/A	N/A	N/A	27,010 bbl/yr	N/A	N/A	40400311-12	Existing (unchanged) New/Additional X To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							N/A	N/A					
M1	Malfunctions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	31000299	X Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced	N/A	N/A
							NA	N/A					
										Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced		
										Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced		
										Existing (unchanged) New/Additional To Be Modified	To be Removed Replacement Unit To be Replaced		

<sup>1</sup> 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.

<sup>2</sup> Specify dates required to determine regulatory applicability

<sup>3</sup> 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

<sup>4</sup> "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 ignitic

<sup>5</sup> "SSM" is currently identified as "SSM from 1a, 2a, 9a & 14a" in the permit.

Unit 2 (and 2a) were removed from the permit in December 2018.

The emission source is being re-named and shortened to "SSM" for simplicity.

**Table 2-B: Insignificant Activities<sup>1</sup> (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 20.2.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](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.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction <sup>2</sup>	For Each Piece of Equipment, Check One	
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction <sup>2</sup>		
15	ESD Heater (Catalytic)			5	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				Mbtu/hr	Insignificant Activity Item # 1.a/1.b			
16	Orifice Heater (Catalytic)			5	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				Mbtu/hr	Insignificant Activity Item # 1.a/1.b			
17	Catalytic Heater			18	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				Mbtu/hr	Insignificant Activity Item # 1.a/1.b			
18	Separator Heater			15	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				Mbtu/hr	Insignificant Activity Item # 1.a/1.b			
19	Separator Heater			17.5	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				Mbtu/hr	Insignificant Activity Item # 1.a/1.b			
20	Low Side Slug Catcher Heater			15	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				Mbtu/hr	Insignificant Activity Item # 1.a/1.b			
21	High Side Slug Catcher Heater			15	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				Mbtu/hr	Insignificant Activity Item # 1.a/1.b			
T2	Methanol Storage Tank			8,820	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Insignificant Activity Item # 1.a/1.b			
T5	Ambitrol Storage Tank			900	20.2.72.202.B(2) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Insignificant Activity Item # 5			
T7	Lubrication Oil Storage Tank			250	20.2.72.202.B(2) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Insignificant Activity Item # 5			
T8a	Lubrication Oil Storage Tank			450	20.2.72.202.B(2) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Insignificant Activity Item # 5			
T8b	Lubrication Oil Storage Tank			550	20.2.72.202.B(2) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Insignificant Activity Item # 5			
T17	Non-Potable Water Storage Tank			4000	20.2.72.202.B(2) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Trivial Activities List Item # 1			
T18	Soap Storage Tank			300	20.2.72.202.B(2) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Trivial Activities List Item # 1			
T21	Industrial Bactericide Storage Tank			170	20.2.72.202.B(2) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				gal	Trivial Activities List Item # 1			
F3	Truck Loading (Produced Water)			N/A	20.2.72.202.B(5) NMAC		X Existing (unchanged)	To be Removed Replacement Unit
				N/A	Insignificant Activity Item # 1.a/1.b			

<sup>1</sup> 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.

<sup>2</sup> 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.

<b>Control Equipment Unit No.</b>	<b>Control Equipment Description</b>	<b>Date Installed</b>	<b>Controlled Pollutant(s)</b>	<b>Controlling Emissions for Unit Number(s)<sup>1</sup></b>	<b>Efficiency (% Control by Weight)</b>	<b>Method used to Estimate Efficiency</b>
N/A						

<sup>1</sup> 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)

**X 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 <sup>1</sup>		PM10 <sup>1</sup>		PM2.5 <sup>1</sup>		H <sub>2</sub> S		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
<b>Totals</b>																		

<sup>1</sup>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<sup>-4</sup>).

Unit No.	NOx		CO		VOC		SOx		PM <sup>1</sup>		PM10 <sup>1</sup>		PM2.5 <sup>1</sup>		H <sub>2</sub> S		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
1	4.59	20.09	7.67	33.60	0.18	0.77	4.27E-02	0.19	8.30E-02	0.36	8.30E-02	0.36	8.30E-02	0.36	-	-	-	-
9	6.76	29.61	10.98	48.09	0.31	1.38	3.83E-02	0.17	7.44E-02	0.33	7.44E-02	0.33	7.44E-02	0.33	-	-	-	-
14	5.59	24.50	4.48	19.62	0.26	1.12	0.12	0.55	0.24	1.06	0.24	1.06	0.24	1.06	-	-	-	-
SSM <sup>2</sup>	-	-	-	-	unspecified	12.40	-	-	-	-	-	-	-	-	-	-	-	-
P1	-	-	-	-	unspecified	1.83	-	-	-	-	-	-	-	-	-	-	-	-
F1	-	-	-	-	0.908370326	3.41	-	-	-	-	-	-	-	-	-	-	-	-
SEP-1 <sup>3</sup>	-	-	-	-	with T3	with T3	-	-	-	-	-	-	-	-	-	-	-	-
T-3 <sup>2,3,4</sup>	-	-	-	-	unspecified	130.70	-	-	-	-	-	-	-	-	-	-	-	-
T-12 <sup>3</sup>	-	-	-	-	with T3	with T3	-	-	-	-	-	-	-	-	-	-	-	-
T-4, T-16, T-20 (in aggregate)	-	-	-	-	unspecified	15.72	-	-	-	-	-	-	-	-	-	-	-	-
F2	-	-	-	-	33.61	2.27	-	-	-	-	-	-	-	-	-	-	-	-
M1	-	-	-	-	unspecified	10.00	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>	16.94	74.20	23.13	101.31	35.26	179.60	0.21	0.90	0.40	1.75	0.40	1.75	0.40	1.75	-	-	-	-

<sup>1</sup> **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).

<sup>2</sup> The SSM emissions and condensate tank emissions are each brought forward from the current permit.

<sup>3</sup> Facility-wide flash emissions emissions of VOC are accounted for under the tank T-3 (flash) emissions for condensate tank T-3.

<sup>4</sup> Condensate tank unit T-3 emissions include facility-wide flash emissions emissions of VOC + storage tank working and breathing losses.

**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 scheduled 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 explanation of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine or predictable startup, shutdown or scheduled maintenance (SSM)<sup>1</sup>, 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](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		PM <sup>2</sup>		PM10 <sup>2</sup>		PM2.5 <sup>2</sup>		H <sub>2</sub> S		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
SSM <sup>3</sup>	-	-	-	-	not specified	12.40	-	-	-	-	-	-	-	-	-	-	-	-
M-1 <sup>3</sup>	-	-	-	-	not specified	10.00	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>	-	-	-	-	not specified	22.40	-	-	-	-	-	-	-	-	-	-	-	-

<sup>1</sup> 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.

<sup>2</sup> **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).

<sup>3</sup> The VOC emissions for SSM and malfunctions (M1) are carried forward from the previous permit.



### 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

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		PM		PM10		PM2.5		H <sub>2</sub> S 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
<b>Totals:</b>																	

### 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 (ft)
						(acfs)	(dscfs)			
1	1	V	No	45	852	514			235	1.67
9	9	V	No	28	766	472			216	1.67
14	14	V	No	30	755	1433			203	3.00

**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		Acetaldehyde X HAP or TAP		Benzene X HAP or TAP		Formaldehyde X HAP or TAP		n-Hexane X HAP or TAP		Toluene X HAP or TAP		Xylene X 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	1	0.1	0.5	-	0.2	-	-	-	0.2	-	-	-	-	-	-	-				
9	9	0.1	0.4	-	0.2	-	-	-	0.2	-	-	-	-	-	-	-				
14	14	0.4	1.5	0.1	0.6	-	-	0.1	0.6	-	0.1	-	-	-	-	-				
SSM	SSM	-	0.4	-	-	-	0.1	-	-	-	0.3	-	0.1	-	-	-				
P1	P1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
F1	F1	-	0.1	-	-	-	-	-	-	-	0.1	-	-	-	-	-				
SEP-1 <sup>1</sup>	SEP-1 <sup>1</sup>	with T-3	with T-3	-	-	with T-3	with T-3	-	-	with T-3	with T-3	with T-3	with T-3	with T-3	with T-3					
T-3 <sup>2</sup>	T-3 <sup>2</sup>	2.6	11.3	-	-	0.1	0.6	-	-	2.0	8.7	0.4	1.9	-	-					
T-12 <sup>1</sup>	T-12 <sup>1</sup>	with T-3	with T-3	-	-	with T-3	with T-3	-	-	with T-3	with T-3	with T-3	with T-3	with T-3	with T-3					
T4, T16, T20 (aggregate)	T4, T16, T20 (aggregate)	-	2.7	-	-	-	0.4	-	-	-	1.3	-	0.5	-	0.4					
F2	F2	8.0	0.5	-	-	0.3	-	-	-	4.4	0.3	1.7	0.1	1.4	0.1					
M1	M1	-	0.3	-	-	-	-	-	-	-	0.3	-	0.1	-	-					
<b>Totals</b>		11.2	17.8	0.2	1.0	0.4	1.2	0.2	1.0	6.5	11.0	2.2	2.7	1.4	0.6					

<sup>1</sup> Facility-wide flash emissions are accounted for under the tank T-3 (flash) emissions for condensate tank T-3.

<sup>2</sup> Condensate tank unit T-3 emissions = [facility-wide] flash emissions emissions + storage tank working and breathing losses.

### Table 2-J: Fuel

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

Unit No.	Fuel Type (low sulfur Diesel, ultra low sulfur diesel, Natural Gas, Coal, ...)	Fuel Source: purchased commercial, pipeline quality natural gas, residue gas, raw/field natural gas, process gas (e.g. SRU tail gas) or other	Specify Units				
			Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
1	Natural Gas	Raw/Field Natural Gas	900 Btu/scf	14.0 Mscf	122.4 MMscf	--	--
9	Natural Gas	Raw/Field Natural Gas	900 Btu/scf	12.5 Mscf	109.7 MMscf	--	--
14	Natural Gas	Raw/Field Natural Gas	900 Btu/scf	40.8 Mscf	357.1 MMscf	--	--

**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)		
T2	40700816	Methanol	Methanol	6.6	32.04	67.36	1.8115	80.79	2.6951		
T3	40400311-12	Condensate	Mixed hydrocarbon liquids	6.1	67.6185	64.94	3.3546	76.64	4.2445		
T4	40400315	Produced Water	Produced water w/trace of hydrocarbons	8.3	N/A*	N/A*	N/A*	N/A*	N/A*		
T5	40400314	Ambitol	Glycol	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)							
T7	40400313	Lubrication Oil	Lubrication oil	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)							
T8a	40400313	Lubrication Oil	Lubrication oil	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)							
T8b	40400313	Lubrication Oil	Lubrication oil	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)							
T12	40400311-12	Condensate	Mixed hydrocarbon liquids	6.1	67.6185	64.94	3.3546	76.64	4.2445		
T16	40400313	Blowdown	Produced water w/trace of hydrocarbons	8.3	N/A*	N/A*	N/A*	N/A*	N/A*		
T20	40400315	Produced Water	Produced water w/trace of hydrocarbons	8.3	N/A*	N/A*	N/A*	N/A*	N/A*		
				* N/A: The emission calculations do not yield this data.							

**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 <sup>3</sup> )			Roof	Shell			
T2		Methanol	N/A	FX	210	33.4	3.20	0.11	MG	MG	Good	42,100	4.8
T3		Condensate	N/A	FX	500	79.5	4.57	1.03	LG	LG	Good	1,134,420	54.0
T4		Produced Water	N/A	FX	70	11.1	N/A*	N/A*	N/A*	N/A*	N/A*	5,040,000	--
T5		Ambitrol	N/A	FX	21	3.3	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)						
T7		Lubrication Oil	N/A	FX	6	1.0	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)						
T8a		Lubrication Oil	N/A	FX	11	1.7	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)						
T8b		Lubrication Oil	N/A	FX	13	2.1	Insignificant source under Insignificant Activites List, Item No. 5 (Vapor pressure < 10 mm Hg)						
T12		Condensate	N/A	FX	400	63.6	4.57	1.03	LG	LG	Good	with T-3	with T-3
T16		Blowdown (produced water)	N/A	FX	45	7.2	N/A*	N/A*	N/A*	N/A*	N/A*	with T-4	--
T20		Produced Water	N/A	FX	210		N/A*	N/A*	N/A*	N/A*	N/A*	with T-4	--
							* N/A: The emission calculations do not yield this data.						

**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
	Mechanical Shoe Seal	Liquid-mounted resilient seal	Vapor-mounted resilient seal	Seal Type		
FX: Fixed Roof					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<sup>3</sup> = 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)
Low pressure natural gas	C1 - C6+	Gas	73,918 mmscfy <sup>1</sup>	High pressure natural gas	C1 - C6+	Gas	73,918 mmscfy <sup>1</sup>
Condensate	Hydrocarbon (HC)	Liquid	1,134,420 gal/yr	Condensate	Hydrocarbon (HC)	Liquid	1,134,420 gal/yr
Produced water	H <sub>2</sub> O + trace of HC	Liquid	5,040,000 gal/yr	Produced water	H <sub>2</sub> O + trace of HC	Liquid	5,040,000 gal/yr

<sup>1</sup> The station capacity is a direct function of available horsepower. The throughput is therefore dependent on atmospheric temperature and pressure, gas temperature and pressure, relative humidity and gas quality, as well as other factors. The “throughput” expressed above is a nominal quantity (with a 15 percent safety factor), neither an absolute maximum, nor an average. Actual throughput will vary from the nominal amount.

### 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
N/A									



**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
N/A								

**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 CO<sub>2</sub>e emissions are less than 75,000 tons per year.

Unit No.		CO <sub>2</sub> ton/yr	N <sub>2</sub> O ton/yr	CH <sub>4</sub> ton/yr	SF <sub>6</sub> ton/yr	PFC/HFC ton/yr <sup>2</sup>									Total GHG Mass Basis ton/yr <sup>4</sup>	Total CO <sub>2</sub> e ton/yr <sup>5</sup>
Unit No.	GWPs <sup>1</sup>	1	298	25	22,800	footnote 3										
	mass GHG															
	CO <sub>2</sub> e															
	mass GHG															
	CO <sub>2</sub> e															
	mass GHG															
	CO <sub>2</sub> e															
	mass GHG															
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	mass GHG															
	CO <sub>2</sub> e															
	mass GHG															
	CO <sub>2</sub> e															
<b>Total</b>	mass GHG															
	CO <sub>2</sub> e															

<sup>1</sup> GWP (Global Warming Potential): Applicants 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.

<sup>2</sup> For HFCs or PFCs describe the specific HFC or PFC compound and use a separate column for each individual compound.

<sup>3</sup> For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

<sup>4</sup> Green house gas emissions on a mass basis is the ton per year green house gas emission before adjustment with its GWP.

<sup>5</sup> CO<sub>2</sub>e 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](http://www.env.nm.gov/aqb/permit/app_form.html)) for more detailed instructions on SSM emissions.

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The Harvest Four Corners, LLC (Harvest) – Thompson Compressor Station (Thompson CS) is submitting this air quality permit application to the New Mexico Air Quality Bureau (NMAQB) for a renewal to Title V Operating Permit P018-R3 (issued August 27, 2015), as revised (December 2018, P018-R3-M1). The facility is a production gathering field compressor station that pressurizes natural gas for transport through natural gas pipelines. The facility also operates under the authority of Construction Permit 0761-M10, (issued September 20, 2018) as revised through an Administrative revision (December 2018). This permit renewal application is submitted under section 20.2.70.300.B(2) of the New Mexico Administrative Code (NMAC).

The facility includes the following equipment and emission sources:

- One natural gas fired, 1,125 site rated-horsepower (hp) Solar Saturn 10-T1300 compressor turbine engine, unit 1;
- One natural gas fired, 997-site-rated hp Solar Saturn 10-T1200 compressor turbine engine, unit 9;
- One natural gas fired, 3,834-site-rated hp Solar Centaur 40-4700S compressor turbine engine, unit 14;
- Two condensate liquid storage tanks, including one 21,000 gallon (500-barrel) and one 16,800 gallon (400-barrel) tank, units T-3 and T-12, respectively;
- Associated condensate truck loading activities, unit F-2;

- Emissions of volatile organic compounds (VOC) associated with startup, shutdown and routine maintenance activities (SSM); and
- Up to 10 tons per year (tpy) of facility-wide malfunction emissions of VOC, designated as unit M.

Other unregulated emission sources include the inlet separator, various small heaters throughout the facility, pigging/slug catching activities, miscellaneous/unregulated liquid storage tanks and their associated truck loading activities, and fugitive emissions of VOC.

A previously-permitted unit 2 reciprocating internal combustion engine was retired from both the Title V Operating Permit and the Construction permit in December 2018.

In addition, Harvest identifies the following changes to the Thompson Compressor Station's Title V Operating Permit that have already been incorporated into the facility's NSR (Construction) Permit:

- **Add** the following existing equipment to the regulated emission sources list (as allowed by NSR permit 0761-M10):
  - Facility inlet separator (heated), unit SEP-1. The current permit provides a single emission limit that encompasses the VOC emissions from the facility's inlet separator/slug receiver with condensate tanks T-3 and T-12 under a single aggregated emission limit of 130.7 tpy (Table 104.A, Regulated Sources List). With this application, Harvest requests that the existing heated inlet separator before the condensate storage tanks, unit SEP-1, be added to the regulated equipment list (Table 104.A Regulated Sources List) as a permitted emission unit. Although the separator has not previously been identified as an individual emissions source in previous applications, its maximum operating pressure and associated VOC emissions had been included in the condensate tank flash and working and breathing losses.  
  
(Note that the Potential To Emit (PTE) for facility-wide flash emissions of VOC continues to aggregate flash emissions associated with the inlet separator and the condensate tanks.)
  - Facility pigging/slug catching, unit P1. The existing source is being added as a permitted emission unit;
  - The produced water storage tanks (units T-4, T-16 and T-20). A change of emission calculation methodology results in a calculated increase in PTE with VOC emissions no longer below the exempt source emission threshold.

- **Increase** the condition A203.A allowable total annual condensate liquid throughput, from 13,770 barrels per year (bpy) (equals 578,340 gallons/yr [gpy]) to 27,010 bpy/1,134,420 gpy. The maximum inlet separator inlet pressure associated with the PTE calculation is 272 psia; and
- **Increase** the allowable VOC emissions from truck loading of condensate liquids to 2.3 tpy.
- With this application, the VOC emissions associated with startup, shutdown and routine maintenance activities, currently “1a, 2a, 9a & 14a”, are simplified and re-named to “SSM”.

As shown in section 6 (All Calculations), the above requested increase in condensate throughput for condensate storage tanks T-3 and T-12 is associated with slightly *lower* predicted (aggregated) VOC emissions overall, including the tank working/breathing losses and facility-wide flash emissions of VOC. **Note that Harvest does not seek any change to the currently permitted emission rate of 130.7 tpy VOC.** Therefore, the aggregated emission rate of 130.7 tpy VOC for condensate storage tanks T-3 and T-12 is brought forward from the current permits (NSR and Title V).

The changes identified above do not result in any “de-bottlenecking” or other associated emissions, nor do they affect the status of the facility under Title V or PSD.

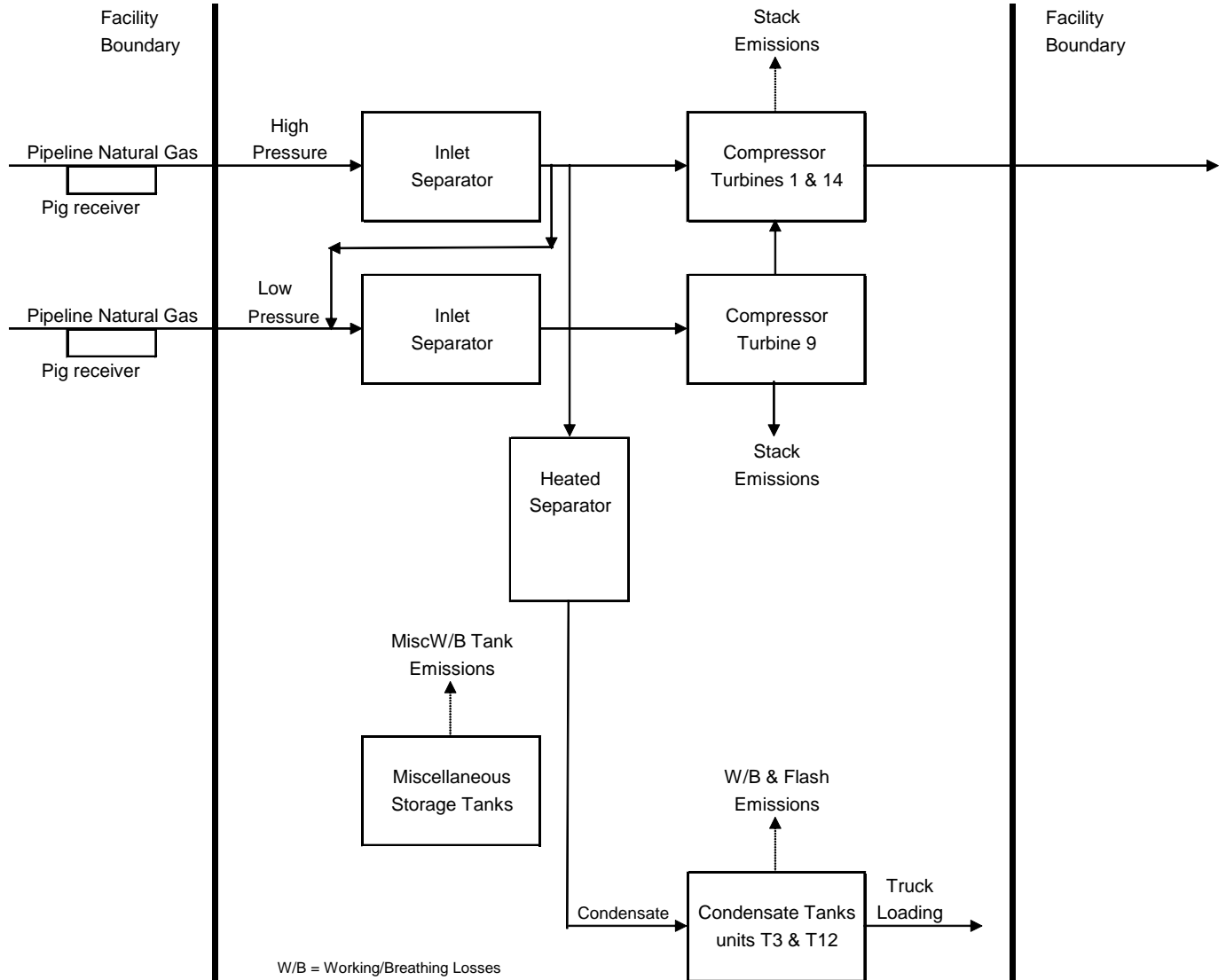
The facility is a true minor source under the 20.2.74 NMAC Prevention of Significant Deterioration (PSD) program.

As explained in section 13 of this application, the Thompson CS is a major source of HAP under 40 CFR 63, subpart HH (*NESHAP for Oil and Natural Gas Production Facilities*), although with no affected units. The facility is an area source of HAP under 40 CFR 63, subparts YYYY (*NESHAP for Stationary Combustion Turbines*) and DDDDD (*NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*).

# 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.



# Section 5

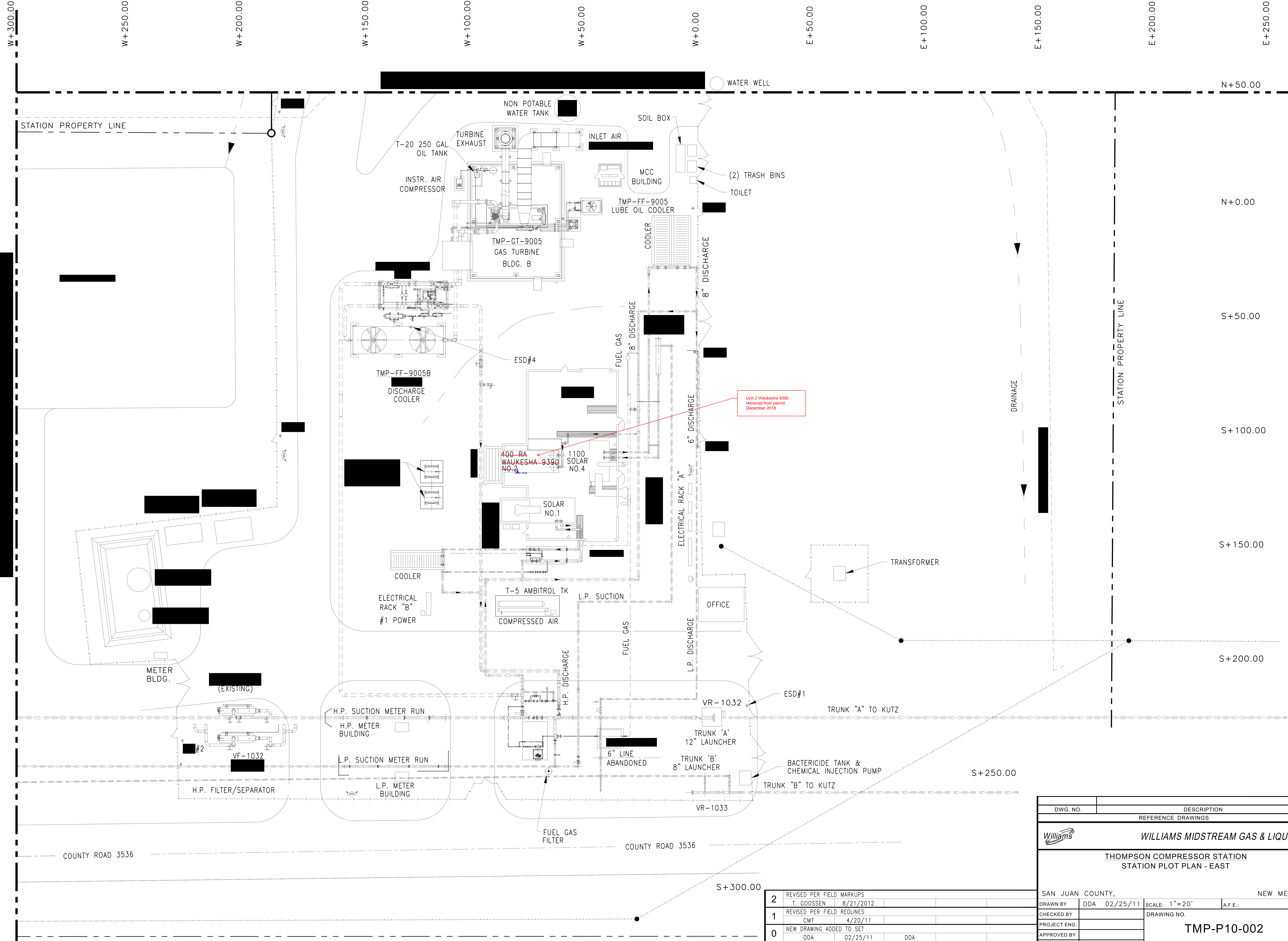
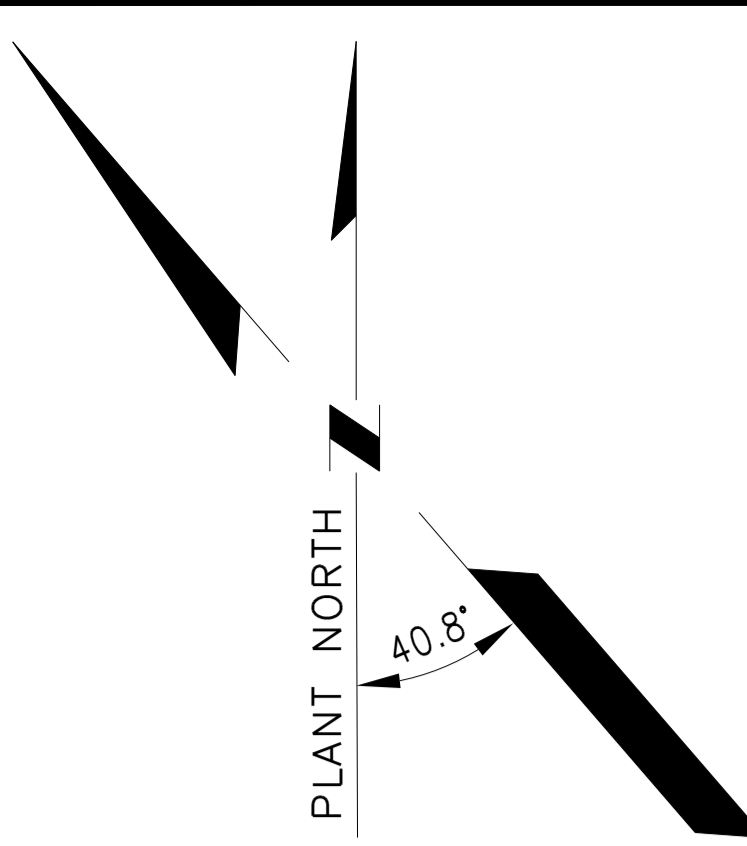
## Plot Plan Drawn To Scale

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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.

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Please see the following page(s).



Unit 2 Walkesha 9390 removed from permit December 2018

400 RA WALKESHA 9390 NO.2

1100 SOLAR NO.4

SOLAR NO.1

TRANSFORMER

METER BLDG. (EXISTING)

#2 VF-1032

H.P. FILTER/SEPARATOR

H.P. SUCTION METER RUN

H.P. METER BUILDING

L.P. SUCTION METER RUN

L.P. METER BUILDING

T-5 AMBITROL TK COMPRESSED AIR

FUEL GAS FILTER

COUNTY ROAD 3536

VR-1032

TRUNK 'A' 12\"/>

TRUNK 'B' 8\"/>

VR-1033

ESD#1

TRUNK 'A' TO KUTZ

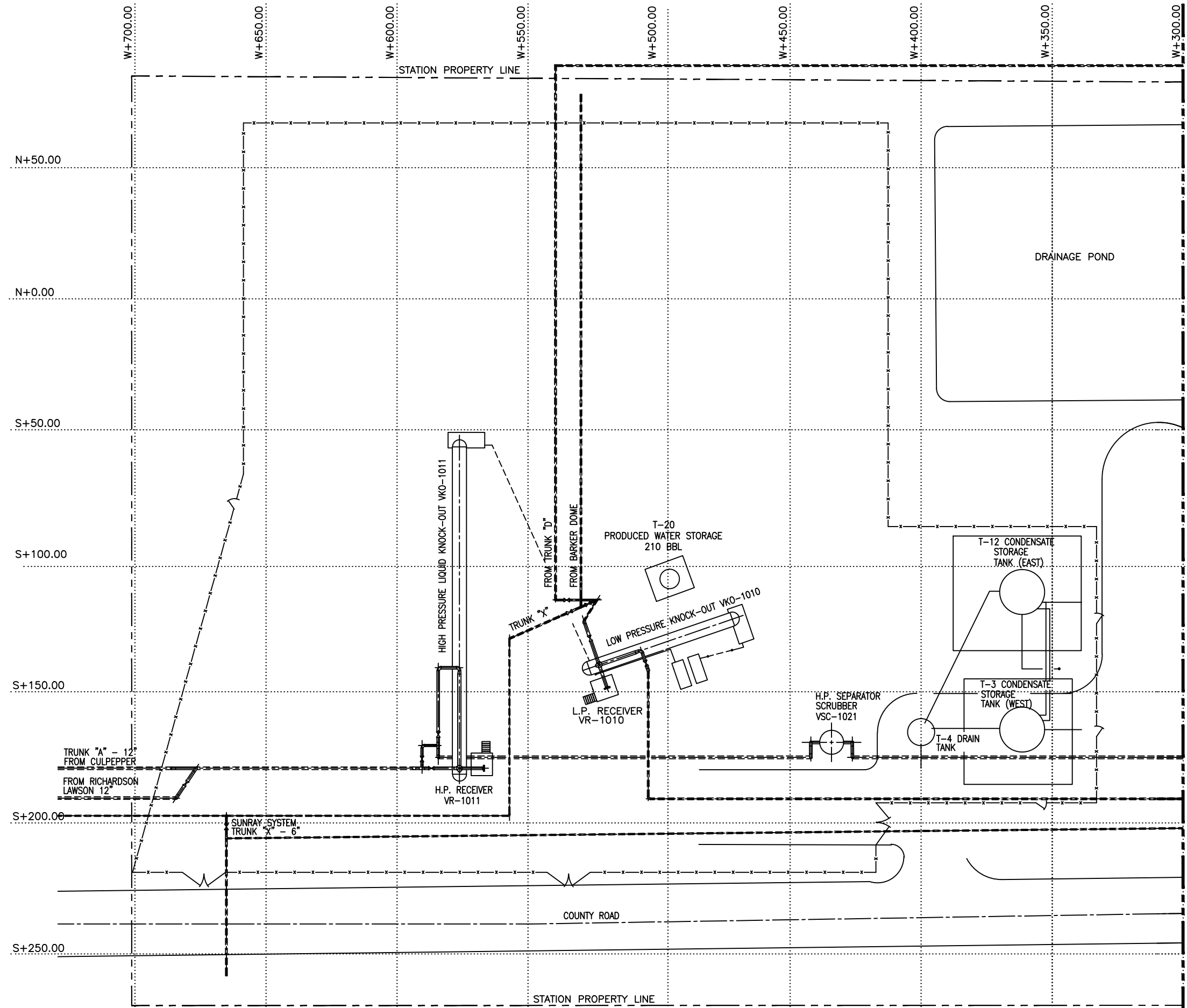
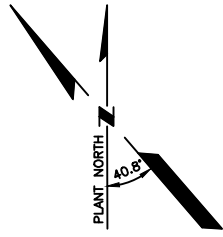
BACTERICIDE TANK & CHEMICAL INJECTION PUMP

TRUNK 'B' TO KUTZ

2	REVISED PER FIELD MARKUPS	T. GOOSSEN	8/21/2012				
1	REVISED PER FIELD REDLINES	CMT	4/20/11				
0	NEW DRAWING ADDED TO SET	DDA	02/25/11	DDA			
REV	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENG.	APPROVED BY	DATE ISSUED	

DWG. NO.	DESCRIPTION		
	REFERENCE DRAWINGS		
WILLIAMS MIDSTREAM GAS & LIQUIDS			
<b>THOMPSON COMPRESSOR STATION</b> <b>STATION PLOT PLAN - EAST</b>			
SAN JUAN COUNTY,		NEW MEXICO	
DRAWN BY	DDA	02/25/11	SCALE: 1"=20'
CHECKED BY			A.F.E.:
PROJECT ENG.			DRAWING NO.
APPROVED BY			TMP-P10-002
DATE ISSUED			





MATCHLINE SEE TMP-P10-002 FOR CONTINUATION

**REVISED**  
 2/12/2014  
**DESTROY ALL PREVIOUS REV'S.**

DWG. NO.	DESCRIPTION
	REFERENCE DRAWINGS
<b>WILLIAMS MIDSTREAM GAS &amp; LIQUIDS</b>	
<b>THOMPSON COMPRESSOR STATION</b> STATION PLOT PLAN - WEST	
SAN JUAN COUNTY, NEW MEXICO	
DRAWN BY	DDA 2/25/11
CHECKED BY	
PROJECT ENG.	
APPROVED BY	
DATE ISSUED	
SCALE: 1"=20' A.F.E.	
DRAWING NO. <b>TMP-P10-003</b>	

3	REVISED PER FIELD REDLINES FROM J.E.	T. GOOSSEN	2/12/2014		
1	REVISED PER FIELD REDLINES	CMT	4/20/11		
0	NEW DRAWING ADDED TO STATION SET	DDA	02/25/11	DDA	
REV	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENG.	APPROVED BY

# 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 rationale 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](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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### *Turbines*

The nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO) and volatile organic compound (VOC) emissions from combustion turbine units 1, 9 and 14 are brought forward from the current construction permit (NSR 0761-M10). The sulfur dioxide (SO<sub>2</sub>) and particulate emissions are calculated using AP-42 emission factors from Table 3.1-2a. Hazardous air pollutant (HAP) emissions are calculated using GRI-HAPCalc 3.01 emissions estimation software. All emission calculations assume operation at full site capacity for 8,760 hours per year.

The turbines start up with no load and a rich fuel mixture. As a result, the emissions during startups are minimized. Because the turbines take only minutes to reach operating temperature, emissions during startup are not expected to exceed the steady-state allowable limits. Similarly, emissions during shutdown do not exceed the steady-state allowable limits, because fuel and air flow cease within seconds of shutdown. Emissions due to scheduled maintenance are negligible as the turbines are not in operation during maintenance.

### *Heaters (Insignificant)*

NO<sub>x</sub>, CO, VOC, SO<sub>2</sub> and particulate emissions from the exempt inlet separator heaters (units 18 & 19) and the slug catcher heaters (units 20 & 21) are calculated using AP-42 emission factors and the maximum fuel use of all three heaters, combined. The emissions from the catalytic heater units 15, 16 and 17 do not have manufacturer or other emission factors available. (Catalytic heater technology is regarded as having little, if any emissions. Therefore these heaters are also considered insignificant. However, for the sake of conservatism in the emission calculations, their combined heat inputs are added to the aggregated heat rates of the conventional small heaters in the emission calculations. Hazardous air pollutant (HAP) emissions are calculated using GRI-HAPCalc 3.01 emissions estimation software and the sum of the individual maximum heat rates of the heaters. All emission calculations assume operation at full site capacity for 8,760 hours per year. Based on an aggregated PTE of less than 1 tpy for any regulated air pollutant, the heaters are an insignificant emission source under the NMAQB Operating Permit Program List of Insignificant Activities (Insignificant Activities List), Item No. 1.

### *Compressor SSM and Venting*

Emissions associated with compressor and associated piping blowdowns during routine and predictable startup, shutdown and/or maintenance activities (SSM) from the turbines, compressors and piping

associated with the station are vented to the atmosphere. SSM emissions from the turbines result from the blowdown of motive gas used to drive turbine components during startups and shutdowns. SSM emissions from the compressors occur when high pressure gas is used to purge air from the compressors and associated piping prior to startups. Also, after shutdowns, high pressure gas in the compressors and associated piping is released to atmosphere as a safety precaution.

One common reason for compressor startups and shutdowns is a change in the amount of compression required from the station due to fluctuations in the pipeline. To prolong the life of equipment and reduce engine emissions, the compressors are shutdown when not needed. It is “routine or predictable” that the compressors at the station will come on-line and drop off-line many times during the course of operation. It is also standard industry practice.

A compressor is also shut down for maintenance of the turbine engine, the compressor, or other equipment at the station. The maintenance is scheduled based the unit time in service and/or monitoring of equipment (visual and automated), in accordance with company and standard industry practice. This maintenance is also “routine or predictable”.

SSM emissions of VOC and HAP from blowdown of the turbines, compressors and piping associated with the facility are calculated from the composition of the natural gas, the quantity of gas vented during each event, and the estimated number of annual events. The composition of the natural gas is based on an extended gas analysis of the facility inlet gas line sampled on December 10, 2018. The quantity of gas vented during each event is determined by Harvest engineering. The annual number of blowdown events for the compressors are estimated based on historical data. A safety factor is incorporated because VOC and HAP emissions from each blowdown event are dependent on the composition of the gas in the pipeline, and because the annual number of blowdowns may vary. Experience indicates the composition of the gas varies over time. Use of a safety factor is designed to ensure an adequate emissions limit, which includes emissions from other miscellaneous SSM activities.

The SSM emissions identified in this application are routine or predictable startup, shutdown and/or scheduled maintenance, and do not include malfunctions or upsets.

### *Condensate Storage Tanks*

VMGSim emissions modeling software is used to calculate the facility-wide emissions of flashed VOC and HAP associated with the facility inlet separator (SEP-1), the 500-barrel condensate tank (unit T-3) and the 400-barrel condensate liquid storage tank (unit T-12). The flashed gas VOC (tpy) emission calculations are taken directly from the VMGSim analysis output "2018 Thompson Compressor Station Emissions Model ". The emission model input includes a representative Thompson Compressor Station SPL liquid (‘Hide Side Slug Receiver’, ‘Liquid Spot Sample’) analysis sampled on February 16, 2018, a facility-wide maximum condensate throughput of 74 barrels per day (27,010 barrels per year (bpy)), and

temperature and pressure conditions representative of the Thompson CS facility. HAP emissions from the facility inlet separator and condensate storage tank flashed gases are calculated from the speciated mole fraction streams of the software output.

The speciated HAP in the flashed gas are derived from the 'Emissions\_to\_ATM', 'M2 Out' MoleFlow/Composition Fraction stream. The HAP weight fraction of the VOC is calculated from the molar fractions of the gas.

Working and breathing losses of VOC and HAP from the condensate tanks are calculated using TANKS 4.0.9d emission estimation software and an assumed annual facility throughput of 27,010 bpy (1,134,420 gallons per year (gpy)) of condensate. The condensate liquid composition, including HAP constituents, is estimated from the extended liquid analysis input to the VMGSim emissions model discussed above. The liquid was sampled prior to VOC flashing; therefore, the extended liquid analysis is "normalized" to balance the liquid composition of the light molecular weight volatile gases flashed during depressurization upon entry of the liquid to the storage tank. Normalizing removes the weight percentages of the flashed gases and reassigns them to the weight percentage of the lightest hydrocarbon that exists at in a liquid state at atmospheric pressure (i.e., the butanes), resulting in a more conservative estimate of storage tank working and breathing losses.

Note that the increase in condensate throughput for condensate storage tanks T-3 and T-12 is associated with slightly lower predicted VOC emissions overall, in aggregate (including tank working/breathing losses and facility-wide flash emissions of VOC), **Harvest does not seek any change to the currently permitted emission rate of 130.7 tpy VOC.**

### *Condensate Truck Loading Emissions*

VOC and HAP emissions from condensate truck loading activities (unit F-2) are estimated using emission factors from AP-42 Section 5.2, *Truck Loading*, and the estimated maximum throughput of condensate and produced water loaded annually. The emission calculations assume submerged loading during transfer operations. The HAP emissions are based on the HAP vapor mass fractions of VOC in the TANKS 4.09d output.

### *Produced Water Storage Tanks*

The aggregated VOC and HAP emissions from the unit T-4 and T-20 produced water storage tanks (2,940-gallon/70-barrels (bbl) and 8,820-gallon/210 bbl, respectively) and the 1,890-gallon/45 bbl blowdown [produced water] storage tank (unit T-16) are calculated by selecting the most conservative emission factors from the Colorado Department of Public Health and Environment (CDPHE) February 8, 2010 PS Memo 09-02 "Oil and Gas Produced Water Tank Batteries Regulatory Definitions and Guidance" and the Texas Commission on Environmental Quality (TCEQ) August 2010 project "Emission

Factor Determination for Produced Water Storage Tanks”, and the maximum annual facility-wide produced water throughput. The aggregated emissions of VOC exceed 1 tpy; therefore, the aggregated emissions from produced water tank units T-4, T-20 and T-16 are no longer an insignificant source. The aggregated storage tanks are added to the application Table 2-A, Regulated Emission Sources.

### *Produced Water Truck Loading Emissions (Insignificant)*

Emissions of VOC and HAP from produced water truck loading activities (unit L-2) are estimated using emission factors from AP-42 Section 5.2, *Truck Loading* and the estimated maximum annual facility throughput of produced water. The emission calculations assume submerged loading during transfer operations. The HAPs are calculated from the weight ratios of the CDPHE/TCEQ produced water emission factors of HAP to VOC (lb/bbl HAP / lb/bbl VOC), and applied to the truck loading pph and tpy VOC emission rates. Based on a calculated PTE of less than 1 tpy for any regulated air pollutant, the produced water truck loading emissions are an insignificant emission source under the Insignificant Activities List, Item No. 1.

### *Storage Tanks (Insignificant)*

The storage tank working and breathing losses from the 8,820-gallon (210-barrel) methanol storage tank (unit T-2) are calculated using the TANKS 4.0.9d. Based on a calculated PTE of less than 1 tpy for any regulated air pollutant, the methanol storage tank is an insignificant source under the Insignificant Activities List, Item No. 1.

Residual Oil #6 is used to approximate the stored contents of the 250-, 450- and 550-gallon lube oil storage tanks (units T-7, T-8a and T-8b, respectively) and the 275-, 375- and 1890-gallon used oil tanks (units T-3, T-4 and T-5, respectively). The residual oil liquid has a vapor pressure of less than 10 millimeters of mercury (mm Hg); therefore, the lube oil storage tanks are insignificant under the Insignificant Activities List, Item No. 5.

The 900-gallon unit T-5 storage tank contains Ambitol, a mixture ethylene or propylene glycol, water and less than 5% dipotassium hydrogen phosphate. As the vapor pressure of ethylene and propylene glycol is less than 10 mm Hg, the Ambitol storage tank is insignificant under the Insignificant Activities List, Item No. 5.

### *Storage Tanks (Trivial)*

There are no criteria or hazardous air pollutant emissions from the 4,000-gallon non-potable water storage tank (unit T-17), the 300-gallon water-based degreaser soap storage tank (unit T-18), and/or the 170 gallon Industrial Bactericide storage tank (unit T-21). Therefore, they are considered trivial sources under the NMAQB Operating Permit Program List of Trivial Activities, Item No. 1.

There are no flash emissions associated with any of the insignificant storage tanks.

Due to the nature of the operations, startup and shutdown emissions from the storage tanks are assumed to be accounted for in the storage tank emission estimates. Emissions due to maintenance will be negligible as the units will not be in operation.

### *Fugitive Emissions*

Fugitive emissions of VOC and HAP from equipment leaks (unit F-1) are calculated using emission factors from Table 2.4 of the *1995 Protocol for Equipment Leak Emission Estimates* published by the Environmental Protection Agency (EPA); equipment counts from Harvest; and the natural gas stream composition obtained from the inlet extended gas analysis identified above. The HAP components of the natural gas are derived from the species molar percentages in the natural gas.

Due to the nature of the source, it is estimated that SSM emissions from valves, connectors, seals, etc. are accounted for in the calculations.

### *Malfunctions*

Malfunction (unit M1) emissions are set at 10 tons of VOC per year to account for emissions that may occur during upsets and malfunctions (including, but not limited to, unscheduled blowdowns and relief valve release). The speciated HAP emissions are calculated as weight percentages of the set VOC emission rate from the inlet extended gas analysis identified above.

Note that the malfunction emissions include the venting of gas only, and not combustion emissions.

### *Pig Receiver (Slug Catcher)*

The facility includes two pig receivers (aggregated under unit P-1) which are used to remove water from the natural gas pipeline during pigging operations. A “pig” is a device that is periodically inserted and propelled through a pipeline for the purpose of cleaning and/or internal inspection. The pig is inserted into the line at an upstream location, and through the pressure of the natural gas behind it, is propelled downstream, pushing along with it residual material through the pipeline. The pig is then “caught” into a receptacle (pig receiver) at the compressor station facility downstream. Pressurized water “slugs” and gas is pushed into the catcher or inlet scrubber. The gas is separated and routed into the gathering line, and the depressurized slug of water is drained and diverted to a produced water storage tank. A small amount of natural gas is released when the pig receiver is opened to retrieve the pig, including VOC and HAP constituents in the natural gas. The pig receiver /slug catcher VOC emissions are fugitive emissions that result from opening valves at the pig receiving compartment along the line.

Emissions of VOC and HAP are calculated from the composition of the natural gas, and the sum aggregated volume of gas released per year during pigging operations. The composition of the natural gas is based on the inlet extended gas analysis identified above. The annual quantity of gas released is determined by Harvest engineering based on historical data with safety factor is incorporated.



## Turbine Exhaust Emissions Data and Calculations

Unit Number: **1**  
 Description: Solar Saturn 10-T1300

Note: The data on this worksheet applies to each individual emissions unit identified above.

### Horsepower Calculations

<b>5,800</b> ft above MSL	Elevation	
<b>1,300</b> hp	Nameplate hp	Mfg. data
1,048 hp	Site-rated hp	NMAQB Procedure # 02.002-00
<b>1,125</b> hp	Site-rated hp	Mfg. data

### Fuel Consumption

<b>11,175</b> Btu/hp-hr	Brake specific fuel consumption	Mfg. data
12.57 MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x Mfg. site-rated hp / 1,000,000
<b>900</b> Btu/scf	Field gas heating value	Laboratory analysis
13,969 scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
<b>8,760</b> hr/yr	Annual operating time	Harvest
110,130 MMBtu/yr	Annual fuel consumption	MMBtu/hr x 8,760 hr/yr
122.37 MMscf/yr	Annual fuel consumption	scf/hr x 8,760 hr/yr / 1,000,000

### Steady-State Emission Rates

Pollutant	Uncontrolled,	
	pph	tpy
NOX	<b>4.59</b>	<b>20.09</b>
CO	<b>7.67</b>	<b>33.60</b>
VOC	<b>1.76E-01</b>	<b>7.70E-01</b>

Emission rates taken from the Solar Data Sheet

VOC is estimated to be 20% of UHC

Uncontrolled Emission Rate (pph) = tons/yr (tpy) x 2000 lb/ton / hr/yr

Uncontrolled Emission Rate (tpy) = Mfg-provided emission rate

Pollutant	Uncontrolled,		
	lb/MMBtu	pph	tpy
SO2	<b>3.40E-03</b>	4.27E-02	1.87E-01
TSP	<b>6.60E-03</b>	8.30E-02	3.63E-01
PM10	<b>6.60E-03</b>	8.30E-02	3.63E-01
PM2.5	<b>6.60E-03</b>	8.30E-02	3.63E-01

Emission factors taken from AP-42, Table 3.1-2a

Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr

Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

### Exhaust Parameters

<b>852</b> °F	Exhaust temperature	Mfg. data
<b>30,822</b> cfm	Stack flowrate	Calculated from mfg. data
<b>1.67</b> ft	Stack diameter	Harvest
234.52 fps	Stack velocity	Stack flowrate / stack area / 60
<b>45.00</b> ft	Stack height	Harvest

## Turbine Exhaust Emissions Data and Calculations

Unit Number: **9**  
 Description: Solar Saturn 10-T1200

Note: Where more than one emissions unit is identified above, this worksheet provides

### Horsepower Calculations

<b>5,800</b> ft above MSL	Elevation	
<b>1,200</b> hp	Nameplate hp	Mfg. data
967 hp	Site-rated hp	NMAQB Procedure # 02.002-00
<b>997</b> hp	Site-rated hp	Mfg. data

### Fuel Consumption

<b>11,305</b> Btu/hp-hr	Brake specific fuel consumption	Mfg. data
11.27 MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x Mfg. site-rated hp / 1,000,000
<b>900</b> Btu/scf	Field gas heating value	Laboratory analysis
12,523 scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
<b>8,760</b> hr/yr	Annual operating time	Harvest
98,735 MMBtu/yr	Annual fuel consumption	MMBtu/hr x 8,760 hr/yr
109.71 MMscf/yr	Annual fuel consumption	scf/hr x 8,760 hr/yr / 1,000,000

### Steady-State Emission Rates

Pollutant	Uncontrolled,	
	pph	tpy
NOX	<b>6.76</b>	<b>29.61</b>
CO	<b>10.98</b>	<b>48.09</b>
VOC	<b>3.14E-01</b>	<b>1.38</b>

Emission rates taken from the Solar Data Sheet

VOC is estimated to be 20% of UHC

Uncontrolled Emission Rates (pph) = Mfg-provided emission rate

Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Pollutant	Uncontrolled,		
	lb/MMBtu	pph	tpy
SO2	<b>3.40E-03</b>	3.83E-02	1.68E-01
TSP	<b>6.60E-03</b>	7.44E-02	3.26E-01
PM10	<b>6.60E-03</b>	7.44E-02	3.26E-01
PM2.5	<b>6.60E-03</b>	7.44E-02	3.26E-01

Emission factors taken from AP-42, Table 3.1-2a

Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr

Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

### Exhaust Parameters

<b>766</b> °F	Exhaust temperature	Mfg. data
<b>28,331</b> cfm	Stack flowrate	Calculated from mfg. data
<b>1.67</b> ft	Stack diameter	Harvest
215.57 fps	Stack velocity	Stack flowrate / stack area / 60
<b>28.00</b> ft	Stack height	Harvest

## Turbine Exhaust Emissions Data and Calculations

Unit Number: **14**

Description: Solar Centaur 40-4700S

Note: The data on this worksheet applies to each individual emissions unit identified above.

### Horsepower Calculations

<b>5,800</b> ft above MSL	Elevation	
<b>4,700</b> hp	Nameplate hp	Mfg. data
3,788 hp	Site-rated hp	NMAQB Procedure # 02.002-00
<b>3,834</b> hp	Site-rated hp	Mfg. data

### Fuel Consumption

<b>9,568</b> Btu/hp-hr	Brake specific fuel consumption	Mfg. data
36.68 MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x Mfg. site-rated hp / 1,000,000
<b>900</b> Btu/scf	Field gas heating value	Laboratory analysis
40,760 scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
<b>8,760</b> hr/yr	Annual operating time	Harvest
321,349 MMBtu/yr	Annual fuel consumption	MMBtu/hr x 8,760 hr/yr
357.05 MMscf/yr	Annual fuel consumption	scf/hr x 8,760 hr/yr / 1,000,000

### Steady-State Emission Rates

Pollutant	Uncontrolled,	
	pph	tpy
NOX	<b>5.59</b>	<b>24.50</b>
CO	<b>4.48</b>	<b>19.62</b>
VOC	<b>2.57E-01</b>	<b>1.12</b>

Emission rates taken from the Solar Data Sheet

VOC is estimated to be 20% of UHC

Uncontrolled Emission Rate (pph) = tons/yr (tpy) x 2000 lb/ton / hr/yr

Uncontrolled Emission Rate (tpy) = Mfg-provided emission rate

Pollutant	Uncontrolled,		
	lb/MMBtu	pph	tpy
SO2	<b>3.40E-03</b>	1.25E-01	5.46E-01
TSP	<b>6.60E-03</b>	2.42E-01	1.06
PM10	<b>6.60E-03</b>	2.42E-01	1.06
PM2.5	<b>6.60E-03</b>	2.42E-01	1.06

Emission factors taken from AP-42, Table 3.1-2a

Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr

Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

### Exhaust Parameters

<b>755</b> °F	Exhaust temperature	Mfg. data
<b>85,969</b> cfm	Stack flowrate	Mfg. data
<b>3.00</b> ft	Stack diameter	Mfg. data
202.70 fps	Stack velocity	Stack flowrate / stack area / 60
<b>30.00</b> ft	Stack height	Mfg. data

**GRI-HAPCalc® 3.01**  
**Turbine Report**

<b>Facility ID:</b>	<b>THOMPSON</b>	<b>Notes:</b>	<b>Combustion Turbine</b>
<b>Operation Type:</b>	<b>COMPRESSOR STATION</b>		
<b>Facility Name:</b>	<b>THOMPSON COMPRESSOR STATION</b>		
<b>User Name:</b>	<b>Cirrus</b>		
<b>Units of Measure:</b>	<b>U.S. STANDARD</b>		

*Note: Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".*

**Turbine Unit**

Unit Name: 10-T1200

Hours of Operation: 8,760 Yearly  
Rate Power: 997 hp  
Fuel Type: NATURAL GAS  
Emission Factor Set: FIELD > EPA > LITERATURE  
Additional EF Set: -NONE-

**Calculated Emissions (ton/yr)**

<u>Chemical Name</u>	<u>Emissions</u>	<u>Emission Factor</u>	<u>Emission Factor Set</u>
<b>HAPs</b>			
PAHs	0.0001	0.00000970 g/bhp-hr	EPA
Formaldehyde	0.1629	0.01693680 g/bhp-hr	GRI Field
Acetaldehyde	0.1667	0.01733570 g/bhp-hr	GRI Field
1,3-Butadiene	0.0006	0.00006160 g/bhp-hr	GRI Field
Acrolein	0.0025	0.00026000 g/bhp-hr	GRI Field
Propional	0.0083	0.00086500 g/bhp-hr	GRI Field
Propylene Oxide	0.0012	0.00012730 g/bhp-hr	EPA
Benzene	0.0052	0.00053840 g/bhp-hr	GRI Field
Toluene	0.0040	0.00041100 g/bhp-hr	GRI Field
Ethylbenzene	0.0014	0.00014050 g/bhp-hr	EPA
Xylenes(m,p,o)	0.0120	0.00124410 g/bhp-hr	GRI Field
2,2,4-Trimethylpentane	0.0154	0.00160530 g/bhp-hr	GRI Field
n-Hexane	0.0145	0.00150580 g/bhp-hr	GRI Field
Phenol	0.0011	0.00011010 g/bhp-hr	GRI Field
Naphthalene	0.0001	0.00000760 g/bhp-hr	GRI Field
2-Methylnaphthalene	0.0000	0.00000130 g/bhp-hr	GRI Field
Biphenyl	0.0032	0.00033050 g/bhp-hr	GRI Field
Phenanthrene	0.0000	0.00000050 g/bhp-hr	GRI Field
Chrysene	0.0000	0.00000100 g/bhp-hr	GRI Field
Beryllium	0.0000	0.00000010 g/bhp-hr	GRI Field
Phosphorus	0.0006	0.00006520 g/bhp-hr	GRI Field
Chromium	0.0001	0.00000820 g/bhp-hr	GRI Field
Manganese	0.0002	0.00001750 g/bhp-hr	GRI Field
Nickel	0.0001	0.00000610 g/bhp-hr	GRI Field
Cobalt	0.0000	0.00000160 g/bhp-hr	GRI Field
Arsenic	0.0000	0.00000060 g/bhp-hr	GRI Field
Selenium	0.0000	0.00000030 g/bhp-hr	GRI Field

Cadmium	0.0000	0.00000020 g/bhp-hr	GRI Field
Mercury	0.0000	0.00000270 g/bhp-hr	GRI Field
Lead	0.0000	0.00000340 g/bhp-hr	GRI Field

**Total** 0.4002

**Criteria Pollutants**

PM	0.2787	0.02897200 g/bhp-hr	EPA
CO	20.2788	2.10828420 g/bhp-hr	GRI Field
NMHC	1.8648	0.19387800 g/bhp-hr	GRI Field
NMEHC	0.0887	0.00921840 g/bhp-hr	EPA
NOx	12.0441	1.25216290 g/bhp-hr	GRI Field
SO2	0.0099	0.00102720 g/bhp-hr	GRI Field

**Other Pollutants**

Methane	9.4954	0.98719230 g/bhp-hr	GRI Field
Acetylene	0.0689	0.00716540 g/bhp-hr	GRI Field
Ethylene	0.1342	0.01395450 g/bhp-hr	GRI Field
Ethane	1.4436	0.15008370 g/bhp-hr	GRI Field
Propane	0.1539	0.01600000 g/bhp-hr	GRI Field
Isobutane	0.0462	0.00480000 g/bhp-hr	GRI Field
Butane	0.0500	0.00520000 g/bhp-hr	GRI Field
Cyclopentane	0.0159	0.00165110 g/bhp-hr	GRI Field
Butyrald/Isobutyraldehyde	0.0129	0.00134000 g/bhp-hr	GRI Field
n-Pentane	0.7806	0.08115000 g/bhp-hr	GRI Field
Cyclohexane	0.0589	0.00612400 g/bhp-hr	GRI Field
Methylcyclohexane	0.0849	0.00883120 g/bhp-hr	GRI Field
n-Octane	0.0307	0.00318890 g/bhp-hr	GRI Field
1,3,5-Trimethylbenzene	0.0289	0.00300000 g/bhp-hr	GRI Field
n-Nonane	0.0051	0.00053260 g/bhp-hr	GRI Field
CO2	4,644.5122	482.86607780 g/bhp-hr	EPA
Vanadium	0.0000	0.00000070 g/bhp-hr	GRI Field
Copper	0.0002	0.00002050 g/bhp-hr	GRI Field
Molybdenum	0.0002	0.00002030 g/bhp-hr	GRI Field
Barium	0.0002	0.00002290 g/bhp-hr	GRI Field

Unit Name: 10-T1300

Hours of Operation: 8,760 Yearly  
 Rate Power: 1125 hp  
 Fuel Type: NATURAL GAS  
 Emission Factor Set: FIELD > EPA > LITERATURE  
 Additional EF Set: -NONE-

**Calculated Emissions (ton/yr)**

<u>Chemical Name</u>	<u>Emissions</u>	<u>Emission Factor</u>	<u>Emission Factor Set</u>
<b><u>HAPs</u></b>			
PAHs	0.0001	0.00000970 g/bhp-hr	EPA
Formaldehyde	0.1838	0.01693680 g/bhp-hr	GRI Field
Acetaldehyde	0.1882	0.01733570 g/bhp-hr	GRI Field
1,3-Butadiene	0.0007	0.00006160 g/bhp-hr	GRI Field
Acrolein	0.0028	0.00026000 g/bhp-hr	GRI Field
Propional	0.0094	0.00086500 g/bhp-hr	GRI Field
Propylene Oxide	0.0014	0.00012730 g/bhp-hr	EPA
Benzene	0.0058	0.00053840 g/bhp-hr	GRI Field

Toluene	0.0045	0.00041100 g/bhp-hr	GRI Field
Ethylbenzene	0.0015	0.00014050 g/bhp-hr	EPA
Xylenes(m,p,o)	0.0135	0.00124410 g/bhp-hr	GRI Field
2,2,4-Trimethylpentane	0.0174	0.00160530 g/bhp-hr	GRI Field
n-Hexane	0.0163	0.00150580 g/bhp-hr	GRI Field
Phenol	0.0012	0.00011010 g/bhp-hr	GRI Field
Naphthalene	0.0001	0.00000760 g/bhp-hr	GRI Field
2-Methylnaphthalene	0.0000	0.00000130 g/bhp-hr	GRI Field
Biphenyl	0.0036	0.00033050 g/bhp-hr	GRI Field
Phenanthrene	0.0000	0.00000050 g/bhp-hr	GRI Field
Chrysene	0.0000	0.00000100 g/bhp-hr	GRI Field
Beryllium	0.0000	0.00000010 g/bhp-hr	GRI Field
Phosphorus	0.0007	0.00006520 g/bhp-hr	GRI Field
Chromium	0.0001	0.00000820 g/bhp-hr	GRI Field
Manganese	0.0002	0.00001750 g/bhp-hr	GRI Field
Nickel	0.0001	0.00000610 g/bhp-hr	GRI Field
Cobalt	0.0000	0.00000160 g/bhp-hr	GRI Field
Arsenic	0.0000	0.00000060 g/bhp-hr	GRI Field
Selenium	0.0000	0.00000030 g/bhp-hr	GRI Field
Cadmium	0.0000	0.00000020 g/bhp-hr	GRI Field
Mercury	0.0000	0.00000270 g/bhp-hr	GRI Field
Lead	0.0000	0.00000340 g/bhp-hr	GRI Field

**Total** 0.4514

**Criteria Pollutants**

PM	0.3144	0.02897200 g/bhp-hr	EPA
CO	22.8823	2.10828420 g/bhp-hr	GRI Field
NMHC	2.1043	0.19387800 g/bhp-hr	GRI Field
NMEHC	0.1001	0.00921840 g/bhp-hr	EPA
NOx	13.5904	1.25216290 g/bhp-hr	GRI Field
SO2	0.0111	0.00102720 g/bhp-hr	GRI Field

**Other Pollutants**

Methane	10.7145	0.98719230 g/bhp-hr	GRI Field
Acetylene	0.0778	0.00716540 g/bhp-hr	GRI Field
Ethylene	0.1515	0.01395450 g/bhp-hr	GRI Field
Ethane	1.6289	0.15008370 g/bhp-hr	GRI Field
Propane	0.1737	0.01600000 g/bhp-hr	GRI Field
Isobutane	0.0521	0.00480000 g/bhp-hr	GRI Field
Butane	0.0564	0.00520000 g/bhp-hr	GRI Field
Cyclopentane	0.0179	0.00165110 g/bhp-hr	GRI Field
Butyrald/Isobutyraldehyde	0.0145	0.00134000 g/bhp-hr	GRI Field
n-Pentane	0.8808	0.08115000 g/bhp-hr	GRI Field
Cyclohexane	0.0665	0.00612400 g/bhp-hr	GRI Field
Methylcyclohexane	0.0958	0.00883120 g/bhp-hr	GRI Field
n-Octane	0.0346	0.00318890 g/bhp-hr	GRI Field
1,3,5-Trimethylbenzene	0.0326	0.00300000 g/bhp-hr	GRI Field
n-Nonane	0.0058	0.00053260 g/bhp-hr	GRI Field
CO2	5,240.7987	482.86607780 g/bhp-hr	EPA
Vanadium	0.0000	0.00000070 g/bhp-hr	GRI Field
Copper	0.0002	0.00002050 g/bhp-hr	GRI Field
Molybdenum	0.0002	0.00002030 g/bhp-hr	GRI Field
Barium	0.0002	0.00002290 g/bhp-hr	GRI Field

Unit Name: 40-4700S

Hours of Operation: 8,760 Yearly  
 Rate Power: 3834 hp  
 Fuel Type: NATURAL GAS  
 Emission Factor Set: FIELD > EPA > LITERATURE  
 Additional EF Set: -NONE-

**Calculated Emissions** (ton/yr)

<u>Chemical Name</u>	<u>Emissions</u>	<u>Emission Factor</u>	<u>Emission Factor Set</u>
<b><u>HAPs</u></b>			
PAHs	0.0004	0.00000970 g/bhp-hr	EPA
Formaldehyde	0.6265	0.01693680 g/bhp-hr	GRI Field
Acetaldehyde	0.6412	0.01733570 g/bhp-hr	GRI Field
1,3-Butadiene	0.0023	0.00006160 g/bhp-hr	GRI Field
Acrolein	0.0096	0.00026000 g/bhp-hr	GRI Field
Propional	0.0320	0.00086500 g/bhp-hr	GRI Field
Propylene Oxide	0.0047	0.00012730 g/bhp-hr	EPA
Benzene	0.0199	0.00053840 g/bhp-hr	GRI Field
Toluene	0.0152	0.00041100 g/bhp-hr	GRI Field
Ethylbenzene	0.0052	0.00014050 g/bhp-hr	EPA
Xylenes(m,p,o)	0.0460	0.00124410 g/bhp-hr	GRI Field
2,2,4-Trimethylpentane	0.0594	0.00160530 g/bhp-hr	GRI Field
n-Hexane	0.0557	0.00150580 g/bhp-hr	GRI Field
Phenol	0.0041	0.00011010 g/bhp-hr	GRI Field
Naphthalene	0.0003	0.00000760 g/bhp-hr	GRI Field
2-Methylnaphthalene	0.0000	0.00000130 g/bhp-hr	GRI Field
Biphenyl	0.0122	0.00033050 g/bhp-hr	GRI Field
Phenanthrene	0.0000	0.00000050 g/bhp-hr	GRI Field
Chrysene	0.0000	0.00000100 g/bhp-hr	GRI Field
Beryllium	0.0000	0.00000010 g/bhp-hr	GRI Field
Phosphorus	0.0024	0.00006520 g/bhp-hr	GRI Field
Chromium	0.0003	0.00000820 g/bhp-hr	GRI Field
Manganese	0.0006	0.00001750 g/bhp-hr	GRI Field
Nickel	0.0002	0.00000610 g/bhp-hr	GRI Field
Cobalt	0.0001	0.00000160 g/bhp-hr	GRI Field
Arsenic	0.0000	0.00000060 g/bhp-hr	GRI Field
Selenium	0.0000	0.00000030 g/bhp-hr	GRI Field
Cadmium	0.0000	0.00000020 g/bhp-hr	GRI Field
Mercury	0.0001	0.00000270 g/bhp-hr	GRI Field
Lead	0.0001	0.00000340 g/bhp-hr	GRI Field
<b>Total</b>	<b>1.5385</b>		
<b><u>Criteria Pollutants</u></b>			
PM	1.0716	0.02897200 g/bhp-hr	EPA
CO	77.9829	2.10828420 g/bhp-hr	GRI Field
NMHC	7.1713	0.19387800 g/bhp-hr	GRI Field
NMEHC	0.3410	0.00921840 g/bhp-hr	EPA
NOx	46.3160	1.25216290 g/bhp-hr	GRI Field
SO2	0.0380	0.00102720 g/bhp-hr	GRI Field

## Other Pollutants

Methane	36.5151	0.98719230 g/bhp-hr	GRI Field
Acetylene	0.2650	0.00716540 g/bhp-hr	GRI Field
Ethylene	0.5162	0.01395450 g/bhp-hr	GRI Field
Ethane	5.5514	0.15008370 g/bhp-hr	GRI Field
Propane	0.5918	0.01600000 g/bhp-hr	GRI Field
Isobutane	0.1775	0.00480000 g/bhp-hr	GRI Field
Butane	0.1923	0.00520000 g/bhp-hr	GRI Field
Cyclopentane	0.0611	0.00165110 g/bhp-hr	GRI Field
Butyrald/Isobutyraldehyde	0.0496	0.00134000 g/bhp-hr	GRI Field
n-Pentane	3.0016	0.08115000 g/bhp-hr	GRI Field
Cyclohexane	0.2265	0.00612400 g/bhp-hr	GRI Field
Methylcyclohexane	0.3267	0.00883120 g/bhp-hr	GRI Field
n-Octane	0.1180	0.00318890 g/bhp-hr	GRI Field
1,3,5-Trimethylbenzene	0.1110	0.00300000 g/bhp-hr	GRI Field
n-Nonane	0.0197	0.00053260 g/bhp-hr	GRI Field
CO2	17,860.6419	482.86607780 g/bhp-hr	EPA
Vanadium	0.0000	0.00000070 g/bhp-hr	GRI Field
Copper	0.0008	0.00002050 g/bhp-hr	GRI Field
Molybdenum	0.0008	0.00002030 g/bhp-hr	GRI Field
Barium	0.0008	0.00002290 g/bhp-hr	GRI Field



## Heater Exhaust Emissions Calculations

Unit Number: 15, 16, 17, 18, 19, 20 & 21 (in aggregate) - Insignificant source demonstration  
 Description: Heater

Note: The data on this worksheet applies to each individual emissions unit identified above.

### Fuel Consumption

0.0905	MMBtu/hr	Capacity	Mfg. data
900	Btu/scf	Field gas heating value	Nominal heat content
101	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest
793	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
0.88	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000

### Steady-State Emission Rates

Pollutants	Emission Factors, lb/MMscf	Uncontrolled Emission Rates,	
		pph	tpy
NOX	100	0.01	0.04
CO	84	0.01	0.04
VOC	5.5	5.53E-04	2.42E-03
SO2	0.6	6.03E-05	2.64E-04
TSP	7.60	7.64E-04	3.35E-03
PM10	7.60	7.64E-04	3.35E-03
PM2.5	7.60	7.64E-04	3.35E-03
Lead	5.00E-04	5.03E-08	2.20E-07

Emission factors taken from AP-42, Tables 1.4-1 & 1.4-2

Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr

Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

### Exhaust Parameters

N/A °F	Exhaust temperature	Mfg. data
N/A acfm	Stack flowrate	Mfg. data
N/A ft	Stack exit diameter	Harvest
N/A ft^2	Stack exit area	3.1416 x ((ft / 2) ^2)
N/A fps	Stack exit velocity	acfm / ft^2 / 60 sec/min
N/A ft	Stack height	Harvest

**GRI-HAPCalc® 3.01**  
**External Combustion Devices Report**

Facility ID:	THOMPSON	Notes: Combustion Turbine
Operation Type:	COMPRESSOR STATION	
Facility Name:	THOMPSON COMPRESSOR STATION	
User Name:	Cirrus	
Units of Measure:	U.S. STANDARD	

*Note: Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".*

**External Combustion Devices**

Unit Name: HEATERS

Hours of Operation: 8,760 Yearly  
Heat Input: \*\*\*\*\* MMBtu/hr  
Fuel Type: NATURAL GAS  
Device Type: HEATER  
Emission Factor Set: FIELD > EPA > LITERATURE  
Additional EF Set: -NONE-

**Calculated Emissions (ton/yr)**

<u>Chemical Name</u>	<u>Emissions</u>	<u>Emission Factor</u>	<u>Emission Factor Set</u>
<b>HAPs</b>			
7,12-Dimethylbenz(a)anthracene	0.0000	0.0000000157 lb/MMBtu	EPA
Formaldehyde	0.0003	0.0008440090 lb/MMBtu	GRI Field
Methanol	0.0004	0.0009636360 lb/MMBtu	GRI Field
Acetaldehyde	0.0003	0.0007375920 lb/MMBtu	GRI Field
1,3-Butadiene	0.0001	0.0003423350 lb/MMBtu	GRI Field
Benzene	0.0003	0.0007480470 lb/MMBtu	GRI Field
Toluene	0.0004	0.0010163310 lb/MMBtu	GRI Field
Ethylbenzene	0.0008	0.0021128220 lb/MMBtu	GRI Field
Xylenes(m,p,o)	0.0005	0.0013205140 lb/MMBtu	GRI Field
2,2,4-Trimethylpentane	0.0011	0.0028417580 lb/MMBtu	GRI Field
n-Hexane	0.0006	0.0014070660 lb/MMBtu	GRI Field
Phenol	0.0000	0.0000001070 lb/MMBtu	GRI Field
Styrene	0.0008	0.0020788960 lb/MMBtu	GRI Field
Naphthalene	0.0000	0.0000005100 lb/MMBtu	GRI Field
2-Methylnaphthalene	0.0000	0.0000001470 lb/MMBtu	GRI Field
Acenaphthylene	0.0000	0.0000000670 lb/MMBtu	GRI Field
Biphenyl	0.0000	0.0000004730 lb/MMBtu	GRI Field
Acenaphthene	0.0000	0.0000000900 lb/MMBtu	GRI Field
Fluorene	0.0000	0.0000000800 lb/MMBtu	GRI Field
Anthracene	0.0000	0.0000000870 lb/MMBtu	GRI Field
Phenanthrene	0.0000	0.0000000600 lb/MMBtu	GRI Field
Fluoranthene	0.0000	0.0000000900 lb/MMBtu	GRI Field
Pyrene	0.0000	0.0000000830 lb/MMBtu	GRI Field
Benz(a)anthracene	0.0000	0.0000000870 lb/MMBtu	GRI Field
Chrysene	0.0000	0.0000001170 lb/MMBtu	GRI Field

Benzo(a)pyrene	0.0000	0.0000000700	lb/MMBtu	GRI Field
Benzo(b)fluoranthene	0.0000	0.0000001500	lb/MMBtu	GRI Field
Benzo(k)fluoranthene	0.0000	0.0000007600	lb/MMBtu	GRI Field
Benzo(g,h,i)perylene	0.0000	0.0000002600	lb/MMBtu	GRI Field
Indeno(1,2,3-c,d)pyrene	0.0000	0.0000001200	lb/MMBtu	GRI Field
Dibenz(a,h)anthracene	0.0000	0.0000001030	lb/MMBtu	GRI Field
Lead	0.0000	0.0000004902	lb/MMBtu	EPA

<b>Total</b>	<hr/>	0.0056		
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### Criteria Pollutants

VOC	0.0021	0.0053921569	lb/MMBtu	EPA
PM	0.0029	0.0074509804	lb/MMBtu	EPA
PM, Condensable	0.0022	0.0055882353	lb/MMBtu	EPA
PM, Filterable	0.0007	0.0018627451	lb/MMBtu	EPA
CO	0.0128	0.0323636360	lb/MMBtu	GRI Field
NMHC	0.0034	0.0085294118	lb/MMBtu	EPA
NOx	0.0382	0.0970167730	lb/MMBtu	GRI Field
SO2	0.0002	0.0005880000	lb/MMBtu	EPA

### Other Pollutants

Dichlorobenzene	0.0000	0.0000011765	lb/MMBtu	EPA
Methane	0.0041	0.0105212610	lb/MMBtu	GRI Field
Acetylene	0.0055	0.0140000000	lb/MMBtu	GRI Field
Ethylene	0.0004	0.0009476310	lb/MMBtu	GRI Field
Ethane	0.0010	0.0026312210	lb/MMBtu	GRI Field
Propylene	0.0009	0.0023454550	lb/MMBtu	GRI Field
Propane	0.0004	0.0010686280	lb/MMBtu	GRI Field
Isobutane	0.0006	0.0014640770	lb/MMBtu	GRI Field
Butane	0.0005	0.0013766990	lb/MMBtu	GRI Field
Cyclopentane	0.0004	0.0011304940	lb/MMBtu	GRI Field
Pentane	0.0014	0.0034671850	lb/MMBtu	GRI Field
n-Pentane	0.0006	0.0014221310	lb/MMBtu	GRI Field
Cyclohexane	0.0004	0.0009183830	lb/MMBtu	GRI Field
Methylcyclohexane	0.0009	0.0022011420	lb/MMBtu	GRI Field
n-Octane	0.0011	0.0028538830	lb/MMBtu	GRI Field
1,2,3-Trimethylbenzene	0.0013	0.0034224540	lb/MMBtu	GRI Field
1,2,4-Trimethylbenzene	0.0013	0.0034224540	lb/MMBtu	GRI Field
1,3,5-Trimethylbenzene	0.0013	0.0034224540	lb/MMBtu	GRI Field
n-Nonane	0.0014	0.0036604170	lb/MMBtu	GRI Field
CO2	46.3765	117.6470588235	lb/MMBtu	EPA

## Turbine & Compressor Blowdown Emissions Calculations

Unit Number: **SSM (previously 1a, 9a & 14a)**  
 Description: SSM from Turbine, Compressor & Piping Associated With Station

**Throughput**

<p><b>3</b> # of units  <b>108</b> events/yr/unit  <b>4,215</b> scf/event  <b>7,000</b> scf/event                  3,633,660 scf/yr</p>	<p>Number of units                  Blowdowns per year per unit                  Gas loss per blowdown (compressor)                  Gas loss per blowdown (turbine)                  Annual gas loss</p>	<p>Harvest                  Harvest                  Harvest                  Harvest                  # of units x events/yr/unit                  x [scf/event (compressor)                  + scf/event (turbine)]</p>
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**Emission Rates**

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	6.817E-03	12.39
2,2,4-Trimethylpentane	6.339E-06	1.15E-02
Benzene	2.059E-05	3.74E-02
Ethylbenzene	1.119E-06	2.03E-03
n-Hexane	1.454E-04	2.64E-01
Toluene	3.279E-05	5.96E-02
Xylene	9.794E-06	1.78E-02

Emission factors calculated from gas composition (see table below)  
 Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

**Gas Composition**

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	1.8655	44.01	2.164E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4417	28.01	3.261E-04
Methane	86.5100	16.04	3.657E-02
Ethane	6.3818	30.07	5.058E-03
Propane	2.7506	44.09	3.196E-03
Isobutane	0.4939	58.12	7.566E-04
n-Butane	0.7432	58.12	1.139E-03
Isopentane	0.2542	72.15	4.834E-04
n-Pentane	0.1836	72.15	3.491E-04
Cyclopentane	0.0084	70.14	1.553E-05
n-Hexane	0.0640	86.17	1.454E-04
Cyclohexane	0.0713	84.16	1.582E-04
Other hexanes	0.0950	86.18	2.158E-04
Heptanes	0.0435	100.20	1.149E-04
Methylcyclohexane	0.0395	98.19	1.022E-04
2,2,4-Trimethylpentane	0.0024	100.21	6.339E-06
Benzene	0.0100	78.11	2.059E-05
Toluene	0.0135	92.14	3.279E-05
Ethylbenzene	0.0004	106.17	1.119E-06
Xylenes	0.0035	106.17	9.794E-06
C8+ Heavies	0.0243	110.00	7.045E-05
Total	100.0003		
Total VOC			6.817E-03

Gas stream composition obtained from Thompson Inlet LP extended gas analysis dated December 10, 2018.  
 Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.4 scf/lb-mole

## Condensate Storage Tank Emissions Summary

Unit Number: **T-3 & T-12**

Description: Condensate Storage Tanks

**Emission Rates**

Source/Pollutants	Working/Breathing Losses,		Flash Losses,	Uncontrolled Emission Rates,
	ppy	tpy	tpy	tpy
<b>T-3 Condensate Tank</b>				
VOC *	7,847.73	3.92	125.65	129.57
2,2,4-Trimethylpentane	2.14	1.07E-03	3.01E-02	3.11E-02
Benzene	34.45	1.72E-02	0.604	0.622
Ethylbenzene	1.64	8.20E-04	3.91E-02	3.99E-02
n-Hexane	891.63	4.46E-01	7.830	8.28
Toluene	61.80	3.09E-02	1.805	1.84
Xylene	13.62	6.81E-03	9.32E-03	1.61E-02
<b>T-12 Condensate Tank</b>				
VOC *	with T-3	with T-3	with T-3	with T-3
2,2,4-Trimethylpentane	with T-3	with T-3	with T-3	with T-3
Benzene	with T-3	with T-3	with T-3	with T-3
Ethylbenzene	with T-3	with T-3	with T-3	with T-3
n-Hexane	with T-3	with T-3	with T-3	with T-3
Toluene	with T-3	with T-3	with T-3	with T-3
Xylene	with T-3	with T-3	with T-3	with T-3
<b>Combined Total</b>				
VOC	7,847.73	3.92	125.65	129.57
2,2,4-Trimethylpentane	2.14	1.07E-03	3.01E-02	3.11E-02
Benzene	34.45	1.72E-02	0.60	0.62
Ethylbenzene	1.64	8.20E-04	3.91E-02	3.99E-02
n-Hexane	891.63	0.45	7.83	8.28
Toluene	61.80	3.09E-02	1.80	1.84
Xylene	13.62	6.81E-03	9.32E-03	1.61E-02
<b>Total HAP</b>	<b>1,005.28</b>	<b>0.50</b>	<b>10.32</b>	<b>10.82</b>

Working/breathing losses taken from TANKS 4.0 results

Working/Breathing **tpy** emissions calculated from TANKS 4.09d results with safety factor applied.

Flash emissions (**tpy**) calculated from VMGSim flash emissions model.

Safety factor: **1** (i.e., no safety factor applied)

# VOC Flash Emissions Calculations

## Facility-wide Flash Gas Emissions (T-3, T-12 Flash)

### Stream Flash Gas Emissions

Pollutant	Emission Rate, tpy
<b>VOC</b>	<b>125.646</b>
2,2,4-Trimethylpentane	3.01E-02
Benzene	0.604
Ethylbenzene	3.91E-02
n-Hexane	7.830
Toluene	1.805
Xylenes	9.32E-03

VOC (tpy) is from VMGSim analysis "2018 Thompson Compressor Station Emissions Model", LP Separator included between LP Slug Receiver and ATM Tank: 'Emissions\_to\_ATM EmissionsDetail.VOCs 125.646 [ton(short)/y]'

HAP emissions = VOC tpy x individual HAP component weight fraction from the VMGSim output stream, 'Emissions\_to\_ATM : M2.Out' stream individual HAP component weight fractions

### Stream Flash Gas Composition

Component	Speciated Mole Fraction, Flashed Gas	Molecular Weight, lb/lb-mole	VOC Mole Fraction*MW	Weight Fraction of Flashed VOC	Emission Rate, tpy
Carbon dioxide	2.754E-02	44.01	1.2122	0.0542	6.81
Nitrogen	2.081E-04	28.01	0.0058	0.0003	0.03
Methane	0.3789	16.04	6.0776	0.2716	34.12
Ethane	0.2027	30.07	6.0946	0.2724	34.22
Propane	0.1809	44.09	7.9774	0.3565	44.79
Isobutane	4.339E-02	58.12	2.5217	0.1127	14.16
n-Butane	6.919E-02	58.12	4.0213	0.1797	22.58
Isopentane	2.979E-02	72.15	2.1491	0.0960	12.07
n-Pentane	2.352E-02	72.15	1.6972	0.0758	9.53
Isohexane	3.729E-03	86.17	0.3214	0.0144	1.80
n-Hexane	1.618E-02	86.17	1.3945	0.0623	7.83
Cyclohexane	9.605E-04	84.16	0.0808	0.0036	0.45
Isoheptane	2.045E-03	100.20	0.2049	0.0092	1.15
n-Heptane	1.064E-02	100.20	1.0665	0.0477	5.99
Methylcyclohexane	0.0000	98.19	0.0000	0.0000	0.00
2,2,4-Trimethylpentane	5.343E-05	100.21	0.0054	0.0002	0.03
Benzene	1.378E-03	78.11	0.1076	0.0048	0.60
Toluene	3.489E-03	92.14	0.3214	0.0144	1.80
Ethylbenzene	6.556E-05	106.17	0.0070	0.0003	0.04
Xylenes	1.564E-05	106.17	0.0017	0.0001	0.01
C8+ Heavies	4.544E-03	110.00	0.4998	0.0223	2.81
Total VOC	0.3899		22.3777	1.0000	125.646

Flashed gas emission rates based on VMGSim "2018 Thompson Compressor Station Emissions Model" using SPL liquid analysis sampled 02/16/2018 (Hide Side Slug Receiver -Liquid Spot) as input.

VOC (tpy) is from VMGSim analysis "2018 Thompson Compressor Station Emissions Model", LP Separator included between LP Slug Receiver and ATM Tank: 'Emissions\_to\_ATM EmissionsDetail.VOCs 125.646 [ton(short)/y]'  
 VOC includes C3 - C8+. The CO2, N2, C1 & C2 compounds are not VOC.)

Speciated Mole Fraction, Flashed Gas' is based on VMGSim stream 'Emissions\_to\_ATM : M2.Out', 'Mole Flow/Composition, Fraction'.

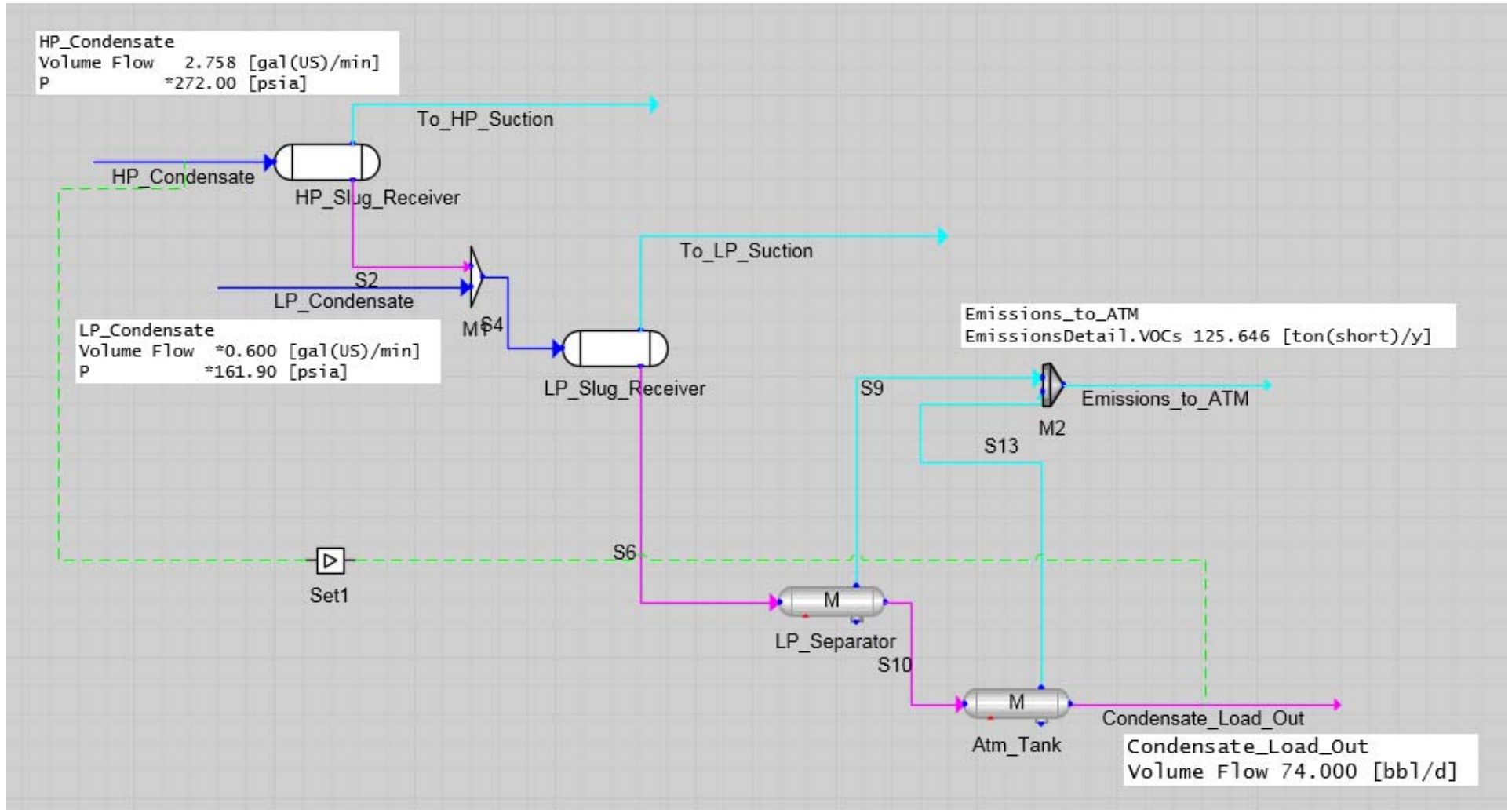
Synonyms: "Isohexane" = 2-methylpentane; "Isoheptane" = 2-methylhexane

Xylenes Mole Fraction = o-Xylene

C8+ Heavies = n-Octane + n-Nonane + n-Decane + 2-methylheptane

Weight Fraction of Flashed VOC = (Mole Fraction, Flashed Gas x Molecular Wt, lb/lb-mole) / Total VOC mol% MW

# 2018 Thompson Compressor Station Emissions Model



LP Separator included between LP Slug Receiver and ATM Tank



Name	Condensate_Load_Out		Emissions_to_ATM		HP_Condensate		LP_Condensate		S2	
Description										
Upstream Op	Atm_Tank.Liq0		M2.Out		HP_Slug_Receiver.In		M1.In0		HP_Slug_Receiver.Liq0	
Downstream Op									M1.In1	
VapFrac	0.00		1.00		0.0198		0.02996		0.00	
T [F]	62.5		91.5		60.0		60.0		60.0	
P [psia]	11.90		11.90		272.00		161.90		272.00	
MoleFlow/Composition	Fraction	lbmol/h	Fraction	lbmol/h	Fraction	lbmol/h	Fraction	lbmol/h	Fraction	lbmol/h
NITROGEN	0.00	0.00	0.00021	0.00	0.00018	0.00	0.00	0.00	0.00011	0.00
CARBON DIOXIDE	0.00033	0.00	0.02754	0.04	0.00495	0.05	0.00328	0.01	0.00471	0.04
METHANE	0.0008	0.01	0.37891	0.48	0.09907	0.91	0.07038	0.12	0.08321	0.75
ETHANE	0.00724	0.06	0.20268	0.26	0.03347	0.31	0.03852	0.06	0.033	0.30
PROPANE	0.02673	0.21	0.18093	0.23	0.0424	0.39	0.06061	0.10	0.0428	0.38
ISOBUTANE	0.01662	0.13	0.04339	0.06	0.01718	0.16	0.02981	0.05	0.01745	0.16
n-BUTANE	0.04041	0.31	0.06919	0.09	0.03749	0.34	0.06616	0.11	0.03814	0.34
ISOPENTANE	0.04327	0.33	0.02979	0.04	0.0344	0.32	0.06639	0.11	0.03505	0.31
n-PENTANE	0.04517	0.35	0.02352	0.03	0.03512	0.32	0.06757	0.11	0.0358	0.32
n-HEXANE	0.10682	0.83	0.01618	0.02	0.09307	0.85	0.07318	0.12	0.09493	0.85
n-HEPTANE	0.21371	1.65	0.01064	0.01	0.19904	1.82	0.05867	0.10	0.20304	1.82
WATER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIETHANOLAMINE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,2,4-TRIMETHYLPENTANE	0.001	0.01	0.00005	0.00	0.00098	0.01	0.00	0.00	0.001	0.01
BENZENE	0.01057	0.08	0.00138	0.00	0.0101	0.09	0.00218	0.00	0.0103	0.09
TOLUENE	0.05593	0.43	0.00349	0.00	0.04758	0.44	0.04065	0.07	0.04854	0.44
n-OCTANE	0.22155	1.72	0.0038	0.00	0.21633	1.98	0.00024	0.00	0.22069	1.98
ETHYLBENZENE	0.00385	0.03	0.00007	0.00	0.00373	0.03	0.00016	0.00	0.00381	0.03
m-XYLENE	0.0373	0.29	0.00073	0.00	0.03545	0.32	0.00543	0.01	0.03616	0.32
n-NONANE	0.06635	0.51	0.00039	0.00	0.05631	0.52	0.04601	0.08	0.05745	0.52
n-DECANE	0.03625	0.28	0.00007	0.00	0.03315	0.30	0.01194	0.02	0.03382	0.30
2-METHYLPENTANE	0.01708	0.13	0.00373	0.00	0.00	0.00	0.09425	0.16	0.00	0.00
CYCLOHEXANE	0.00981	0.08	0.00096	0.00	0.00	0.00	0.0532	0.09	0.00	0.00
2-METHYLHEPTANE	0.01076	0.08	0.00028	0.00	0.00	0.00	0.05773	0.10	0.00	0.00
o-XYLENE	0.00103	0.01	0.00002	0.00	0.00	0.00	0.00553	0.01	0.00	0.00
2-METHYLHEXANE	0.02741	0.21	0.00205	0.00	0.00	0.00	0.14813	0.25	0.00	0.00
<b>Total</b>	<b>1.00</b>	<b>7.74</b>	<b>1.00</b>	<b>1.28</b>	<b>1.00</b>	<b>9.17</b>	<b>1.00</b>	<b>1.67</b>	<b>1.00</b>	<b>8.99</b>
Mass Flow [lb/h]	755.25		45.77		797.03		132.47		793.62	
Volume Flow [ft3/s]	0.005		0.175		0.006		0.001		0.005	
Std Liq Volume Flow [ft3/s]	0.005		0.000		0.005		0.001		0.005	
Std Gas Volume Flow [MMSCFD]	7.0507E-2		1.162E-2		8.3495E-2		1.5216E-2		8.1842E-2	
Energy [Btu/h]	-3.347E+4		7.537E+3		-3.144E+4		-5.878E+3		-3.219E+4	
H [Btu/lbmol]	-4323.4		5907.8		-3430.0		-3518.2		-3582.2	
S [Btu/lbmol-F]	41.493		49.467		42.067		28.638		42.111	
MW	97.56		35.88		86.94		79.29		88.32	
Mass Density [lb/ft3]	43.6265		0.0728		36.0253		27.5259		42.6133	
Cp [Btu/lbmol-F]	50.124		15.511		45.234		41.422		45.945	
Thermal Conductivity [Btu/h-ft-F]	0.0760		0.0149		0.0776		0.0486		0.0779	
Viscosity [cP]	4.6770E-1		9.2388E-3		3.6065E-1		2.8375E-1		3.7801E-1	
Molar Volume [ft3/lbmol]	2.236		493.097		2.413		2.881		2.073	
Z Factor	0.0048		0.9921		0.1192		0.0831		0.1027	
Surface Tension [dyne/cm]	20.4885		0.0000		18.1625		17.1048		18.1625	
Speed of Sound										





Name	S4		S6		S9		S10		S13	
Description										
Upstream Op	M1.Out		LP_Slug_Receiver.Liq0		LP_Separator.Vap		LP_Separator.Liq0		Atm_Tank.Vap	
Downstream Op	LP_Slug_Receiver.In		LP_Separator.In0		M2.In1		Atm_Tank.In0		M2.In0	
VapFrac	0.04225		0.00		1.00		0.00		1.00	
T [F]	58.5		58.5		100.0		100.0		62.5	
P [psia]	161.90		161.90		35.00		35.00		11.90	
MoleFlow/Composition	Fraction	lbmol/h	Fraction	lbmol/h	Fraction	lbmol/h	Fraction	lbmol/h	Fraction	lbmol/h
NITROGEN	0.00009	0.00	0.00003	0.00	0.00024	0.00	0.00	0.00	0.00004	0.00
CARBON DIOXIDE	0.00448	0.05	0.00373	0.04	0.02798	0.03	0.00083	0.01	0.02494	0.00
METHANE	0.0812	0.87	0.04807	0.49	0.41113	0.45	0.00462	0.04	0.18878	0.03
ETHANE	0.03387	0.36	0.03167	0.32	0.19525	0.21	0.0121	0.11	0.24649	0.05
PROPANE	0.04559	0.49	0.04601	0.47	0.16729	0.18	0.03149	0.29	0.26144	0.05
ISOBUTANE	0.01939	0.21	0.01997	0.20	0.04007	0.04	0.01756	0.16	0.06298	0.01
n-BUTANE	0.04253	0.45	0.04401	0.45	0.06426	0.07	0.04159	0.38	0.09828	0.02
ISOPENTANE	0.03997	0.43	0.04158	0.42	0.02809	0.03	0.0432	0.39	0.03977	0.01
n-PENTANE	0.04078	0.43	0.04247	0.43	0.02236	0.02	0.04487	0.41	0.03037	0.01
n-HEXANE	0.09152	0.98	0.09549	0.97	0.01582	0.02	0.10502	0.96	0.01834	0.00
n-HEPTANE	0.18041	1.92	0.18833	1.92	0.01063	0.01	0.2096	1.91	0.01072	0.00
WATER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIETHANOLAMINE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,2,4-TRIMETHYLPENTANE	0.00084	0.01	0.00088	0.01	0.00005	0.00	0.00098	0.01	0.00006	0.00
BENZENE	0.00903	0.10	0.00942	0.10	0.00135	0.00	0.01039	0.09	0.00157	0.00
TOLUENE	0.0473	0.50	0.04937	0.50	0.00345	0.00	0.05487	0.50	0.00369	0.00
n-OCTANE	0.18613	1.98	0.19433	1.98	0.00386	0.00	0.21713	1.98	0.00347	0.00
ETHYLBENZENE	0.00323	0.03	0.00338	0.03	0.00007	0.00	0.00377	0.03	0.00006	0.00
m-XYLENE	0.03135	0.33	0.03273	0.33	0.00074	0.00	0.03655	0.33	0.00069	0.00
n-NONANE	0.05565	0.59	0.05811	0.59	0.00041	0.00	0.06501	0.59	0.00032	0.00
n-DECANE	0.03039	0.32	0.03173	0.32	0.00008	0.00	0.03552	0.32	0.00005	0.00
2-METHYLPENTANE	0.01478	0.16	0.01541	0.16	0.00362	0.00	0.01682	0.15	0.00439	0.00
CYCLOHEXANE	0.00834	0.09	0.0087	0.09	0.00094	0.00	0.00963	0.09	0.00108	0.00
2-METHYLHEPTANE	0.00905	0.10	0.00945	0.10	0.00028	0.00	0.01055	0.10	0.00026	0.00
o-XYLENE	0.00087	0.01	0.00091	0.01	0.00002	0.00	0.00101	0.01	0.00001	0.00
2-METHYLHEXANE	0.02322	0.25	0.02424	0.25	0.00202	0.00	0.0269	0.25	0.00218	0.00
Total	1.00	10.66	1.00	10.21	1.0000	1.09	1.00	9.12	1.00	0.18
Mass Flow [lb/h]	926.09		917.03		38.03		879.00		7.74	
Volume Flow [ft3/s]	0.010		0.006		0.051		0.006		0.024	
Std Liq Volume Flow [ft3/s]	0.006		0.006		0.000		0.006		0.000	
Std Gas Volume Flow [MMSCFD]	9.7057E-2		9.2957E-2		9.9357E-3		8.3021E-2		1.684E-3	
Energy [Btu/h]	-3.807E+4		-3.997E+4		6.452E+3		-2.134E+4		1.085E+3	
H [Btu/lbmol]	-3572.1		-3916.2		5914.3		-2341.0		5869.7	
S [Btu/lbmol-F]	40.397		40.360		47.440		44.883		48.712	
MW	86.90		89.85		34.86		96.43		41.87	
Mass Density [lb/ft3]	25.5521		42.8219		0.2075		42.5922		0.0900	
Cp [Btu/lbmol-F]	44.948		46.483		15.417		51.747		17.019	
Thermal Conductivity [Btu/h-ft-F]	0.0730		0.0736		0.0157		0.0709		0.0118	
Viscosity [cP]	3.6281E-1		4.0195E-1		9.4753E-3		3.5858E-1		8.3304E-3	
Molar Volume [ft3/lbmol]	3.401		2.098		167.972		2.264		464.975	
Z Factor	0.0998		0.0619		0.9790		0.0134		0.9875	
Surface Tension [dyne/cm]	18.7582		18.7582		0.0000		18.0610		0.0000	
Speed of Sound										



Customer:  
Project:

Sheet1  
Job No: ---  
Prepared by: ---

Name	To_HP_Suction		To_LP_Suction	
Description				
Upstream Op	HP_Slug_Receiver.Vap		LP_Slug_Receiver.Vap	
Downstream Op				
VapFrac	1.00		1.00	
T [F]	60.0		58.5	
P [psia]	272.00		161.90	
MoleFlow/Composition	Fraction	lbmol/h	Fraction	lbmol/h
NITROGEN	0.00379	0.00	0.00155	0.00
CARBON DIOXIDE	0.01708	0.00	0.02155	0.01
METHANE	0.88442	0.16	0.83222	0.37
ETHANE	0.05651	0.01	0.08366	0.04
PROPANE	0.0227	0.00	0.03615	0.02
ISOBUTANE	0.00382	0.00	0.00626	0.00
n-BUTANE	0.00549	0.00	0.00897	0.00
ISOPENTANE	0.00205	0.00	0.00331	0.00
n-PENTANE	0.00155	0.00	0.0025	0.00
n-HEXANE	0.00113	0.00	0.00148	0.00
n-HEPTANE	0.00077	0.00	0.00089	0.00
WATER	0.00	0.00	0.00	0.00
DIETHANOLAMINE	0.00	0.00	0.00	0.00
2,2,4-TRIMETHYLPENTANE	0.00	0.00	0.00	0.00
BENZENE	0.0001	0.00	0.00013	0.00
TOLUENE	0.00022	0.00	0.0003	0.00
n-OCTANE	0.00028	0.00	0.0003	0.00
ETHYLBENZENE	0.00	0.00	0.00001	0.00
m-XYLENE	0.00005	0.00	0.00006	0.00
n-NONANE	0.00002	0.00	0.00003	0.00
n-DECANE	0.00	0.00	0.00	0.00
2-METHYLPENTANE	0.00	0.00	0.00036	0.00
CYCLOHEXANE	0.00	0.00	0.00009	0.00
2-METHYLHEPTANE	0.00	0.00	0.00002	0.00
o-XYLENE	0.00	0.00	0.00	0.00
2-METHYLHEXANE	0.00	0.00	0.00018	0.00
Total	1.00	0.18	1.00	0.45
Mass Flow [lb/h]	3.41		9.06	
Volume Flow [ft3/s]	0.001		0.004	
Std Liq Volume Flow [ft3/s]	0.000		0.000	
Std Gas Volume Flow [MMSCFD]	1.653E-3		4.1005E-3	
Energy [Btu/h]	7.445E+2		1.904E+3	
H [Btu/lbmol]	4102.1		4228.6	
S [Btu/lbmol-F]	39.921		41.236	
MW	18.79		20.12	
Mass Density [lb/ft3]	0.9744		0.6108	
Cp [Btu/lbmol-F]	9.989		10.139	
Thermal Conductivity [Btu/h-ft-F]	0.0200		0.0188	
Viscosity [cP]	1.0669E-2		1.0435E-2	
Molar Volume [ft3/lbmol]	19.286		32.935	
Z Factor	0.9402		0.9586	
Surface Tension [dyne/cm]	0.0000		0.0000	
Speed of Sound				

## TANKS 4.09d Condensate Liquid Input

## NORMALIZED THOMPSON COMPRESSOR STATION CONDENSATE LIQUID SPECIATION PROFILE

Component	Mole Fraction	Component MW	Component Weight, lb/lb-mole (Mol fraction x MW)	Weight (Wt.) Fraction (lb/lb-mol / Total Liquid lb/lb-mol)	NORMALIZED TANKS 4.0.9d SPECIATION INPUT		TANKS Input
					Wt%	Normalization method	Wt. %
CO2	3.26E-04	44.01	0.0143	1.43E-04	-		-
N2	4.86E-08	28.01	1.36E-06	1.36E-08	-		-
C1	8.05E-04	16.04	0.0129	0.0001	-		-
C2	7.24E-03	30.07	0.2178	0.0022	-		-
C3	2.67E-02	44.09	1.1786	0.0118	-		-
IC4	1.66E-02	58.12	0.9660	0.0097	1.6775	$= ((i\text{-Butane (IC4) Wt. fraction)} + (\text{Sum of CO}_2, \text{N}_2, \text{C}_1, \text{C}_2, \text{C}_3 \text{ Wt. fractions}) / 2)) \times 100$	4.7375
NC4	4.04E-02	58.12	2.3488	0.0235	3.0600	$= ((n\text{-Butane (NC4) Wt. fraction)} + (\text{Sum of CO}_2, \text{N}_2, \text{C}_1, \text{C}_2, \text{C}_3 \text{ Wt. fractions}) / 2)) \times 100$	-
IC5	4.33E-02	72.15	3.1217	0.0312	3.1211		3.1211
NC5	4.52E-02	72.15	3.2593	0.0326	3.2587		3.2587
Hexanes		86.17	0.0000	0.0000	-		-
Heptanes	2.41E-01	100.21	24.1629	0.2416	24.1583		24.1583
Octanes	2.32E-01	114.23	26.5365	0.2653	26.5315		26.5315
Nonanes	6.64E-02	128.20	8.5064	0.0850	8.5048		8.5048
Benzene	1.06E-02	78.11	0.8257	0.0083	0.8255		0.8255
Toluene	5.59E-02	92.14	5.1532	0.0515	5.1522		5.1522
E-Benzene	3.85E-03	106.17	0.4086	0.0041	0.4085		0.4085
Xylenes	3.83E-02	106.16	4.0691	0.0407	4.0683		4.0683
n-C6	1.24E-01	106.16	13.1532	0.1315	13.1507		13.1507
2,2,4-Trimethylpentane	9.98E-04	100.21	0.1000	0.0010	0.1000		0.1000
C10 Plus	3.63E-02	142.29	5.1583	0.0516	5.1573		5.1573
Cyclohexane	9.81E-03	84.16	0.8256	8.25E-03	0.8254		0.8254
Methylcyclohexane	0.00E+00	98.19	0.0000	0.0000	0.0000		0.0000
Total	1.0000		100.0	1.00	100.0		100.0000
Notes:							
Hydrocarbon (HC) liquid stream composition for TANKS 4.09d input is based on the VMGSim Thompson Compressor Station Emissions Model output including low pressure separator (LP Sep), process stream "Condensate_Load_Out" 'Atm_Tank.Liq0'.							
The VMGSim program included the Thompson Compressor Station liquid stream sampled 02/16/2018 as input.							
TANKS 4.09d speciation for							
Butane = IC4 + NC4;							
Heptanes = n-heptane + 2-methylhexane (isoheptane);							
Octanes = n-octane + 2-methylheptane;							
n-C6 = Hexanes + n-hexane + 2-methylpentane (isohexane)							

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Tank Identification and Physical Characteristics**

**Identification**

User Identification:	Thompson Condensate (500 bbl)
City:	San Juan Co., NM T30N, R09W, Sec. 32
State:	New Mexico
Company:	Williams Four Corners
Type of Tank:	Vertical Fixed Roof Tank
Description:	Condensate storage tank, 500 bbl capacity 27,010 bpy throughput (1,134,420 gpy)

**Tank Dimensions**

Shell Height (ft):	16.00
Diameter (ft):	15.00
Liquid Height (ft) :	16.00
Avg. Liquid Height (ft):	4.00
Volume (gallons):	21,000.00
Turnovers:	54.02
Net Throughput(gal/yr):	1,134,420.00
Is Tank Heated (y/n):	N

**Paint Characteristics**

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

**Roof Characteristics**

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	15.00

**Breather Vent Settings**

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meteorological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Liquid Contents of Storage Tank**

**Thompson Condensate (500 bbl) - Vertical Fixed Roof Tank**  
**San Juan Co., NM T30N, R09W, Sec. 32, New Mexico**

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Condensate	All	64.94	53.24	76.64	58.39	3.7032	2.8988	4.6733	66.7204			98.25	
2,2,4-Trimethylpentane (isooctane)						0.6857	0.4887	0.9450	114.2300	0.0010	0.0003	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3372	0.9653	1.8208	78.1100	0.0083	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Butane						28.6704	23.0459	35.2667	58.1300	0.0474	0.5401	58.13	Option 1: VP60 = 26.098 VP70 = 31.306
Cyclohexane						1.3827	1.0058	1.8695	84.1600	0.0083	0.0045	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Decane (-n)						0.0374	0.0286	0.0489	142.2900	0.0516	0.0008	142.29	Option 1: VP60 = .033211 VP70 = .041762
Ethylbenzene						0.1286	0.0854	0.1894	106.1700	0.0041	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Heptane (-n)						0.7080	0.4981	0.9910	100.2000	0.2416	0.0680	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						2.1727	1.6003	2.9030	86.1700	0.1315	0.1136	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopentane						11.2522	8.5746	14.3915	72.1500	0.0312	0.1397	72.15	Option 1: VP60 = 10.005 VP70 = 12.53
Nonane (-n)						0.0741	0.0558	0.0981	128.2600	0.0850	0.0025	128.26	Option 1: VP60 = .065278 VP70 = .08309
Octane (-n)						0.1666	0.1231	0.2250	114.2300	0.2653	0.0176	114.23	Option 1: VP60 = .145444 VP70 = .188224
Pentane (-n)						7.6199	5.8716	9.7769	72.1500	0.0326	0.0987	72.15	Option 3: A=27691, B=7.558
Toluene						0.3844	0.2666	0.5435	92.1300	0.0515	0.0079	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Xylene (-m)						0.1073	0.0710	0.1586	106.1700	0.0407	0.0017	106.17	Option 2: A=7.009, B=1462.266, C=215.11

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Detail Calculations (AP-42)**

**Thompson Condensate (500 bbl) - Vertical Fixed Roof Tank**  
**San Juan Co., NM T30N, R09W, Sec. 32, New Mexico**

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Annual Emission Calculations

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Standing Losses (lb):	3,029.2301
Vapor Space Volume (cu ft):	2,302.3890
Vapor Density (lb/cu ft):	0.0439
Vapor Space Expansion Factor:	0.2921
Vented Vapor Saturation Factor:	0.2811
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,302.3890
Tank Diameter (ft):	15.0000
Vapor Space Outage (ft):	13.0289
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	4.0000
Roof Outage (ft):	1.0289
Roof Outage (Dome Roof)	
Roof Outage (ft):	1.0289
Dome Radius (ft):	15.0000
Shell Radius (ft):	7.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0439
Vapor Molecular Weight (lb/lb-mole):	66.7204
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.7032
Daily Avg. Liquid Surface Temp. (deg. R):	524.6094
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.0642
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2921
Daily Vapor Temperature Range (deg. R):	46.7976
Daily Vapor Pressure Range (psia):	1.7744
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.7032
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	2.8988
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	4.6733
Daily Avg. Liquid Surface Temp. (deg R):	524.6094
Daily Min. Liquid Surface Temp. (deg R):	512.9100
Daily Max. Liquid Surface Temp. (deg R):	536.3088
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2811
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.7032
Vapor Space Outage (ft):	13.0289
Working Losses (lb):	4,818.5028
Vapor Molecular Weight (lb/lb-mole):	66.7204
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.7032

Annual Net Throughput (gal/yr.):	1,134,420.0000
Annual Turnovers:	54.0200
Turnover Factor:	0.7220
Maximum Liquid Volume (gal):	21,000.0000
Maximum Liquid Height (ft):	16.0000
Tank Diameter (ft):	15.0000
Working Loss Product Factor:	1.0000

Total Losses (lb):	7,847.7330
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**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Individual Tank Emission Totals**

**Emissions Report for: Annual**

**Thompson Condensate (500 bbl) - Vertical Fixed Roof Tank**  
**San Juan Co., NM T30N, R09W, Sec. 32, New Mexico**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Condensate	4,818.50	3,029.23	7,847.73
Butane	2,602.52	1,636.12	4,238.64
Isopentane	672.91	423.04	1,095.94
Pentane (-n)	475.78	299.10	774.88
Heptane (-n)	327.74	206.04	533.77
Octane (-n)	84.68	53.24	137.92
Nonane (-n)	12.07	7.59	19.66
Benzene	21.15	13.30	34.45
Toluene	37.94	23.85	61.80
Ethylbenzene	1.01	0.63	1.64
Xylene (-m)	8.36	5.26	13.62
Hexane (-n)	547.46	344.17	891.63
2,2,4-Trimethylpentane (isooctane)	1.31	0.83	2.14
Decane (-n)	3.70	2.33	6.02
Cyclohexane	21.87	13.75	35.62





## Truck Loading Emissions Data and Calculations

Unit Number **F2**  
 Description: Truck Loading - **Condensate**

**Emission Factor**

<p><b>0.6</b></p> <p><b>4.2445</b> psia</p> <p><b>67.6185</b> lb/lb-mole</p> <p><b>76.64</b> °F</p> <p>536.31 °R</p> <p>4.00 lb/10<sup>3</sup> gal</p>	<p>Saturation factor, S</p> <p>True vapor pressure of liquid, P</p> <p>Molecular weight of vapors, M</p> <p>Temperature of liquid</p> <p>Temperature of liquid, T</p> <p>Emission factor, L</p>	<p>AP-42, Table 5.2-1 (submerged loading &amp; dedicated service)</p> <p>TANKS 4.0 output file</p> <p>TANKS 4.0 output file</p> <p>TANKS 4.0 output file</p> <p>°F + 459.67</p> <p>AP-42, Section 5.2, Equation 1</p> $L = 12.46 \frac{SPM}{T}$
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Note: The total control efficiency is equal to the collection efficiency of the system (90 percent for trucks subjected to annual leak checks) times the control efficiency of the control device

**Production Rate**

<p><b>8.40</b> 10<sup>3</sup> gal/hr</p> <p><b>1,134.420</b> 10<sup>3</sup> gal/yr</p>	<p>Maximum hourly production rate</p> <p>Maximum annual production rate</p>	<p>Harvest</p> <p>Harvest</p> <p>(74 bbl/day x 42 gal/bbl x 365 days/yr) / (1,000 gal/yr)</p>
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**Steady-State Emission Rates**

Pollutant	Emission Rates	
	pph	tpy
VOC	33.61	2.27

Uncontrolled Emission Rate (pph) = lb/10<sup>3</sup> gal x 10<sup>3</sup> gal/hr

Uncontrolled Emission Rate (tpy) = lb/10<sup>3</sup> gal x 10<sup>3</sup> gal/yr / 2,000 lb/ton

Controlled Emission Rate (pph) = Uncontrolled Emission Rate (pph) x (1 - (% / 100))

Controlled Emission Rate (tpy) = Uncontrolled Emission Rate (tpy) x (1 - (% / 100))

Pollutants	Wt. Fraction of VOC	Emission Rates	
		pph	tpy
2,2,3-Trimeth	<b>0.0010</b>	3.36E-02	2.27E-03
Benzene	<b>0.0083</b>	2.79E-01	1.88E-02
Ethylbenzen	<b>0.0041</b>	1.38E-01	9.30E-03
n-Hexane	<b>0.1315</b>	4.42	2.98E-01
Toluene	<b>0.0515</b>	1.73E+00	1.17E-01
Xylene	<b>0.0407</b>	1.37E+00	9.24E-02

Wt. Fraction of VOC is from the TANKS 4.0 Liquid Mass Fraction results

Emission rate, pph = Wt. Fraction of VOC x VOC Emission rate (pph)

Emission rate, tpy = Wt. Fraction of VOC x VOC Emission rate (tpy)

### Storage Tank Emissions Calculations

Unit Number: T-4, T-16 & T-20

Description: Produced Water Storage Tanks (in aggregate)

Note: The data on this worksheet applies to each individual emissions unit identified above.

**Throughput**

5,040,000	gallons per year (gpy)	Annual liquid throughput	Harvest
120,000	barrels (bbl) per year	Annual liquid throughput	gpy / 42 bbl/gal

**Emission Rates**

Pollutant	Emission Factor, lb/bbl	Uncontrolled Emission Rate, tpy
VOC	0.262	15.72
Benzene	0.007	4.20E-01
Ethylbenzene	0.0007	4.20E-02
n-Hexane	0.022	1.32E+00
Toluene	0.009	5.40E-01
Xylene	0.006	3.60E-01

VOC, Benzene, and n-Hexane emission factors are from the CDPHE PS Memo 09-02 (Oil & Gas Produced Water Tank Batteries - Regulatory Definitions & Permitting Guidance)  
 Ethylbenzene, toluene, and xylene emissions factors (Non-Texas) are from the TCEQ Project 2010-29 (Emission Factor Determination for Produced Water Storage Tanks) report  
 Emission Rate (tpy) = lb/bbl x bbl/yr / 2,000 lb/ton

## Truck Loading Emissions Calculations

Unit Number: **F3 (Insignificant source demonstration)**

Description: **Truck Loading - Produced Water**

### Emission Factor

<p><b>0.6</b></p> <p><b>0.5425</b> psia</p> <p><b>20.7704</b> lb/lb-mole</p> <p><b>67.36</b> °F</p> <p>527.03 °R</p> <p>0.16 lb/10<sup>3</sup> gal</p>	<p>Saturation factor, S</p> <p>True vapor pressure of liquid, P</p> <p>Molecular weight of vapors, M</p> <p>Temperature of liquid</p> <p>Temperature of liquid, T</p> <p>Emission factor, L</p>	<p>AP-42, Table 5.2-1 (submerged loading &amp; dedicated service)</p> <p>TANKS 4.0 output file for similar fixed roof tank</p> <p>TANKS 4.0 output file for similar fixed roof tank</p> <p>TANKS 4.0 output file for similar fixed roof tank</p> <p>°F + 459.67</p> <p>AP-42, Section 5.2, Equation 1</p> $L = 12.46 \frac{SPM}{T}$
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### Production Rate

<p><b>8.40</b> 10<sup>3</sup> gal/hr</p> <p><b>5,040</b> 10<sup>3</sup> gal/yr</p>	<p>Maximum hourly production rate</p> <p>Maximum annual production rate</p>	<p>Harvest</p> <p>Harvest</p>
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### Steady-State Emission Rates

Pollutant	Uncontrolled Emission Rates,	
	pph	tpy
VOC	1.34	0.403

Uncontrolled Emission Rate (pph) = lb/10<sup>3</sup> gal x 10<sup>3</sup> gal/hr

Uncontrolled Emission Rate (tpy) = lb/10<sup>3</sup> gal x 10<sup>3</sup> gal/yr / 2,000 lb/ton

Pollutants	Wt Fraction of HAP	Emission Rates,	
		pph	tpy
Benzene	0.0267	3.59E-02	1.08E-02
Ethylbenzene	0.0027	3.59E-03	1.08E-03
n-Hexane	0.0840	1.13E-01	3.38E-02
Toluene	0.0344	4.61E-02	1.38E-02
m-Xylene	0.0229	3.07E-02	9.22E-03

Wt. Fraction of HAP = CDPHE/TCEQ Produced Water HAP emission factor (lb/bbl) / VOC emission factor (lb/bbl).

Emission rate, pph = Wt. Fraction of HAP x VOC Emission rate (pph)

Emission rate, tpy = Wt. Fraction of VOC x VOC Emission rate (tpy)

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Tank Identification and Physical Characteristics**

**Identification**

User Identification:	Thompson Tank T2 (Methanol)
City:	Aztec
State:	New Mexico
Company:	Williams Four Corners LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	8,820 Gallon Methanol Tank

**Tank Dimensions**

Shell Height (ft):	14.00
Diameter (ft):	10.50
Liquid Height (ft) :	13.00
Avg. Liquid Height (ft):	6.50
Volume (gallons):	8,420.00
Turnovers:	5.00
Net Throughput(gal/yr):	42,100.00
Is Tank Heated (y/n):	N

**Paint Characteristics**

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

**Roof Characteristics**

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.06

**Breather Vent Settings**

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meteorological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Liquid Contents of Storage Tank**

**Thompson Tank T2 (Methanol) - Vertical Fixed Roof Tank**  
**Aztec, New Mexico**

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Methyl alcohol	All	67.36	53.93	80.79	59.23	1.8115	1.1881	2.6951	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Detail Calculations (AP-42)**

**Thompson Tank T2 (Methanol) - Vertical Fixed Roof Tank**  
**Aztec, New Mexico**

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Annual Emission Calculations

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Standing Losses (lb):	344.9598
Vapor Space Volume (cu ft):	658.8969
Vapor Density (lb/cu ft):	0.0103
Vapor Space Expansion Factor:	0.2419
Vented Vapor Saturation Factor:	0.5778
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	658.8969
Tank Diameter (ft):	10.5000
Vapor Space Outage (ft):	7.6094
Tank Shell Height (ft):	14.0000
Average Liquid Height (ft):	6.5000
Roof Outage (ft):	0.1094
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1094
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	5.2500
Vapor Density	
Vapor Density (lb/cu ft):	0.0103
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2419
Daily Vapor Temperature Range (deg. R):	53.7176
Daily Vapor Pressure Range (psia):	1.5070
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.1881
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	2.6951
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.5778
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115

Vapor Space Outage (ft):	7.6094
Working Losses (lb):	58.1799
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.8115
Annual Net Throughput (gal/yr.):	42,100.0000
Annual Turnovers:	5.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	8,420.0000
Maximum Liquid Height (ft):	13.0000
Tank Diameter (ft):	10.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	403.1397



**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Individual Tank Emission Totals**

**Emissions Report for: Annual**

**Thompson Tank T2 (Methanol) - Vertical Fixed Roof Tank**  
**Aztec, New Mexico**

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	58.18	344.96	403.14

## Equipment Leaks Emissions Calculations

Unit Number: **F1**

Description: Valves, Connectors, Seals &amp; Open-Ended Lines

### Steady-State Emission Rates

Equipment	Number of Components, # of sources	Emission Factors, kg/hr/source	Emission Factors, lb/hr/source	Uncontrolled TOC Emission Rates,	
				pph	tpy
Valves	378	0.0045	0.0099	3.74	16.39
Connectors	339	0.0002	0.0004	0.15	0.65
Pump Seals	0	0.0024	0.0053	0.00	0.00
Compressor Seals	36	0.0088	0.0194	0.70	3.05
Pressure Relief Valves	25	0.0088	0.0194	0.48	2.12
Open-Ended Lines	103	0.0020	0.0044	0.45	1.99
Total				<b>5.53</b>	<b>24.20</b>

Number of components based on the numbers of compressors and dehydrators at the station (see next page)

Emission factors taken from the EPA "1995 Protocol for Equipment Leak Emission Estimates"

Emission factors (lb/hr/source) = Emission factors (kg/hr/source) x 2.2 lb/kg

Uncontrolled TOC Emission Rates (pph) = lb/hr/source x # of sources

Uncontrolled TOC Emission Rates (tpy) = Uncontrolled TOC Emission Rates (pph) x 8,760 hr/yr / 2,000 lb/ton

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent of TOC, %	Uncontrolled Emission Rates,	
					pph	tpy
Carbon dioxide	1.8655	44.010				
Hydrogen sulfide	0.0000	34.070				
Nitrogen	0.4417	28.013				
Methane	86.5100	16.043	1387.880	75.486		
Ethane	6.3818	30.070	191.901	10.437		
Propane	2.7506	44.097	121.293	6.597	3.65E-01	1.60E+00
Isobutane	0.4939	58.123	28.707	1.561	8.63E-02	3.78E-01
n-Butane	0.7432	58.123	43.197	2.349	1.30E-01	5.69E-01
Isopentane	0.2542	72.150	18.341	0.998	5.51E-02	2.41E-01
n-Pentane	0.1836	72.150	13.247	0.720	3.98E-02	1.74E-01
Cyclopentane	0.0084	70.134	0.589	0.032	1.77E-03	7.75E-03
n-Hexane	0.0640	86.177	5.515	0.300	1.66E-02	7.26E-02
Cyclohexane	0.0713	84.161	6.001	0.326	1.80E-02	7.90E-02
Other hexanes	0.0950	86.177	8.187	0.445	2.46E-02	1.08E-01
Heptanes	0.0435	100.204	4.359	0.237	1.31E-02	5.74E-02
Methylcyclohexane	0.0395	98.188	3.878	0.211	1.17E-02	5.11E-02
2,2,4-Trimethylpentane	0.0024	114.231	0.274	0.015	8.24E-04	3.61E-03
Benzene	0.0100	78.114	0.781	0.042	2.35E-03	1.03E-02
Toluene	0.0135	92.141	1.244	0.068	3.74E-03	1.64E-02
Ethylbenzene	0.0004	106.167	0.042	0.002	1.28E-04	5.59E-04
Xylenes	0.0035	106.167	0.372	0.020	1.12E-03	4.89E-03
C8+ Heavies	0.0243	114.231	2.776	0.151	8.34E-03	3.65E-02
Total	100.0003		1838.583			
Total VOC				14.076	0.778	3.407

Gas stream composition obtained from Thompson Inlet LP extended gas analysis dated December 10, 2018.

Component Weights (lb/lb-mole) = (% / 100) \* Molecular Weights (lb/lb-mole)

Weight Percent of TOC (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)

Uncontrolled Emission Rates (pph) = Total Uncontrolled TOC Emission Rate (pph) x (% / 100)

Uncontrolled Emission Rates (tpy) = Total Uncontrolled TOC Emission Rate (tpy) x (% / 100)

## Equipment Leaks Emissions Calculations

Unit Number: **F1**

Description: Valves, Connectors, Seals &amp; Lines

Number of Compression Units at the Facility: **3**Number of Dehydrators at the Facility: **0**

Process Equipment Description	Equipment Count						Instrument Count		
	Valves	Connectors	Pump Seals	Compressor Seals	Pressure Relief Valves	Open-end	Flow	Level	Pressure
Station inlet, meter run to pulsation dampener	17	14	0	0	1	13	3	0	3
Pulsation dampener	12	8	0	0	0	2	0	4	1
Compressor suction header	7	4	0	0	0	3	0	0	1
Suction header feed to instrument gas header	3	1	0	0	0	1	0	0	0
Compressor discharge header and bypass to station discharge	6	5	0	0	0	3	0	1	1
Compressor discharge header and suction header bypass lines	4	2	0	0	0	2	0	0	1
Fuel gas header	2	2	0	0	1	2	0	0	1
Instrument gas header	2	2	0	0	1	2	0	0	0
Station discharge header	9	5	0	0	1	6	0	0	2
Fuel gas recovery header	2	2	0	0	1	2	0	0	0
Fuel gas feed and filter loop	15	9	0	0	0	1	0	4	1
Instrument gas feed and filter loop	9	11	0	0	0	3	0	0	0
Produced water storage tank	1	0	0	0	0	1	0	1	0
ESD panel	12	0	0	0	0	0	0	0	0
Starting gas header	6	2	0	0	1	3	0	0	0
Hot gas header	2	2	0	0	0	2	0	0	0
Volume bottle lop	12	4	0	24	1	2	0	0	1
Components from Compressors	132	177	0	12	18	33	0	12	27
Components from dehydrators	0	0	0	0	0	0	0	0	0
Total	253	250	0	36	25	81	3	22	39
Adjusted Total	378	339	0	36	25	103			

The following additions are included in the Adjusted Total:

- 1 valve is added for each open end line
- 2 connectors are added for each flow meter
- 2 valves, 2 connectors and 1 open end line are added for each level gauge
- 1 connector is added for each pressure gauge

The component count is based on an evaluation of the Sim Mesa Compressor Station (two stage compression)

## Malfunction Emissions Data and Calculations

Unit Number: **M1**  
 Description: **Malfunctions**

Note: Where more than one emissions unit is identified above, this worksheet provides the emission rates and operating parameters for each individual emissions unit.

### Emission Rates

Pollutant	Emission Rate, tpy
VOC	10.00
2,2,4-Trimethylpentane	9.30E-03
Benzene	3.02E-02
Ethylbenzene	1.64E-03
n-Hexane	2.13E-01
Toluene	4.81E-02
Xylene	1.44E-02

$$\text{HAP Emission Rate (tpy)} = \text{VOC Emission Rate (tpy)} * [\text{HAP Weight Percent of VOC (\%)} / 100]$$

Component	Mole Percent, %	Molecular Weight, lb/lb-mole	Component Weight, lb/lb-mole	Weight Percent of VOC, %
Carbon dioxide	1.8655	44.01	--	--
Hydrogen sulfide	0.0000	34.07	--	--
Nitrogen	0.4417	28.01	--	--
Methane	86.5100	16.04	--	--
Ethane	6.3818	30.07	--	--
Propane	2.7506	44.09	1.21E+00	4.69E+01
Isobutane	0.4939	58.12	2.87E-01	1.11E+01
n-Butane	0.7432	58.12	4.32E-01	1.67E+01
Isopentane	0.2542	72.15	1.83E-01	7.09E+00
n-Pentane	0.1836	72.15	1.32E-01	5.12E+00
Cyclopentane	0.0084	70.14	5.89E-03	2.28E-01
n-Hexane	0.0640	86.17	5.51E-02	2.13E+00
Cyclohexane	0.0713	84.16	6.00E-02	2.32E+00
Other hexanes	0.0950	86.18	8.19E-02	3.17E+00
Heptanes	0.0435	100.20	4.36E-02	1.69E+00
Methylcyclohexane	0.0395	98.19	3.88E-02	1.50E+00
2,2,4-Trimethylpentane	0.0024	100.21	2.41E-03	9.30E-02
Benzene	0.0100	78.11	7.81E-03	3.02E-01
Toluene	0.0135	92.14	1.24E-02	4.81E-01
Ethylbenzene	0.0004	106.17	4.25E-04	1.64E-02
Xylenes	0.0035	106.17	3.72E-03	1.44E-01
C8+ Heavies	0.0243	110.00	2.67E-02	1.03E+00
Total VOC			2.59	100.00

Gas stream composition obtained from Thompson Inlet LP extended gas analysis dated December 10, 2018.  
 Component Weight (lb/lb-mole) = [Mole Percent (scf/scf) / 100] \* Molecular Weight (lb/lb-mole)  
 Weight Percent of VOC (%) = 100 \* Component Weight (lb/lb-mole) / Total VOC (lb/lb-mole)

## Pig Receiver Emissions Calculations

Unit Number: **P-1**

Description: Pig Receiver

**Throughput**

533,904 scf/yr

Annual gas loss

# of units x total # of events/yr x scf/event

**Emission Rates**

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	6.817E-03	1.82
2,2,4-Trimethylpentane	6.339E-06	1.69E-03
Benzene	2.059E-05	5.50E-03
Ethylbenzene	1.119E-06	2.99E-04
n-Hexane	1.454E-04	3.88E-02
Toluene	3.279E-05	8.75E-03
Xylene	9.794E-06	2.61E-03

Emission factors calculated from gas composition (see table below)

Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

**Gas Composition**

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	1.8655	44.01	2.164E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4417	28.01	3.261E-04
Methane	86.5100	16.04	3.657E-02
Ethane	6.3818	30.07	5.058E-03
Propane	2.7506	44.09	3.196E-03
Isobutane	0.4939	58.12	7.566E-04
n-Butane	0.7432	58.12	1.139E-03
Isopentane	0.2542	72.15	4.834E-04
n-Pentane	0.1836	72.15	3.491E-04
Cyclopentane	0.0084	70.14	1.553E-05
n-Hexane	0.0640	86.17	1.454E-04
Cyclohexane	0.0713	84.16	1.582E-04
Other hexanes	0.0950	86.18	2.158E-04
Heptanes	0.0435	100.20	1.149E-04
Methylcyclohexane	0.0395	98.19	1.022E-04
2,2,4-Trimethylpentane	0.0024	100.21	6.339E-06
Benzene	0.0100	78.11	2.059E-05
Toluene	0.0135	92.14	3.279E-05
Ethylbenzene	0.0004	106.17	1.119E-06
Xylenes	0.0035	106.17	9.794E-06
C8+ Heavies	0.0243	110.00	7.045E-05
Total	100.0003		
Total VOC			6.817E-03

Gas stream composition obtained from Thompson Inlet LP extended gas analysis dated December 10, 2018.

Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.4 scf/lb-mole

## Extended Gas Analysis

### Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	1.8655	44.01	2.164E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4417	28.01	3.261E-04
Methane	86.5100	16.04	3.657E-02
Ethane	6.3818	30.07	5.058E-03
Propane	2.7506	44.09	3.196E-03
Isobutane	0.4939	58.12	7.566E-04
n-Butane	0.7432	58.12	1.139E-03
Isopentane	0.2542	72.15	4.834E-04
n-Pentane	0.1836	72.15	3.491E-04
Cyclopentane	0.0084	70.14	1.553E-05
n-Hexane	0.0640	86.17	1.454E-04
Cyclohexane	0.0713	84.16	1.582E-04
Other hexanes	0.0950	86.18	2.158E-04
Heptanes	0.0435	100.20	1.149E-04
Methylcyclohexane	0.0395	98.19	1.022E-04
2,2,4-Trimethylpentane	0.0024	114.23	7.226E-06
Benzene	0.0100	78.11	2.059E-05
Toluene	0.0135	92.14	3.279E-05
Ethylbenzene	0.0004	106.17	1.119E-06
Xylenes	0.0035	106.17	9.794E-06
C8+ Heavies	0.0243	110.00	7.045E-05
Total	100.0003		
Total VOC			6.818E-03

Gas stream composition obtained from Thompson Inlet LP extended gas analysis dated December 10, 2018.  
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.4 scf/lb-mole

Hydrocarbon compound Non-Detect (ND) responses in the analytical lab report are less than 1 ppm, and are reported as zero mole percent in the gas analysis used in the emission calculations.

# Section 6.a

## Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

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**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<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

### Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO<sub>2</sub>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<sub>2</sub>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<sub>2</sub>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 CO<sub>2</sub>e 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 CO<sub>2</sub>e 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<sub>2</sub> 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)

## *Greenhouse Gas (GHG) Emissions*

Greenhouse gas (GHG) emission calculations are provided. Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) emissions, nitrous oxide (N<sub>2</sub>O) (combustion sources only), and total GHG are reported in tons per year (tpy). Carbon dioxide equivalent (CO<sub>2</sub>e) emissions (including CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub>) are reported in metric tonnes per year. The CO<sub>2</sub>e is calculated by summing the estimated CO<sub>2</sub> emissions with the CH<sub>4</sub> emissions (adjusted for the Global Warming Potential (GWP) of the CH<sub>4</sub>) and the N<sub>2</sub>O emissions (adjusted for the GWP of the N<sub>2</sub>O). The GWPs are from Title 40, Part 98 (40 CFR 98), *Mandatory Greenhouse Gas Reporting*, Table A-1.

The portion of 40 CFR 98, Table A-1 that includes the GWPs for CH<sub>4</sub> and N<sub>2</sub>O is included in Section 7. 40 CFR 98, Subpart A (including Table A-1) is available for download in its entirety through the U.S. Government Publications Office (GPO) website at <http://ecfr.gpoaccess.gov/> under the “Code of Federal Regulations” link.

**Combustion Equipment GHG.** GHG emissions, including CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O exhaust emissions from the combustion equipment (i.e., the turbines and aggregated heaters) are calculated from emission factors from 40 CFR 98, Part C, Tables C-1 & C-2, and the engine higher heating value (HHV) design heat rate.

Emission factors and methodologies from 40 CFR 98, Table C-1 and C-2 are included in Section 7. 40 CFR 98, Subpart C (including Tables C-1 and C-2) is available for download in its entirety through the U.S. Government Publications Office (GPO) website at <http://ecfr.gpoaccess.gov/> under the “Code of Federal Regulations” link.

**Non-Combustion Equipment GHG (General).** The non-combustion GHG emissions from the facility are based on 40 CFR 98, Subpart W, *Petroleum and Natural Gas Systems*, or an appropriate method published in the American Petroleum Institute’s 2009 *Compendium of Greenhouse Gas Emission Estimates Methodologies for the Oil and Gas Industry* (API Compendium). The emission calculation methods used are noted in the GHG calculations spreadsheets.

40 CFR 98, Subpart W is published and available for download in its entirety through the U.S. Government Publications Office (GPO) website at <http://ecfr.gpoaccess.gov/> under the “Code of Federal Regulations” link. The API Compendium in its entirety is available at <http://www.api.org/environment-health-and-safety/climate-change/whats-new/compendium-ghg-methodologies-oil-and-gas-industry>

Excerpts of the cited 40 CFR 98 and API Compendium materials are provided in Section 7.

**SSM Compressor Blowdown GHG.** Compressor blowdown emissions, including emissions from SSM turbine motive gas, compressor venting and associated piping, are calculated from the estimated



total annual gas losses (scf/yr) and the molar fraction of CO<sub>2</sub> and CH<sub>4</sub> in the natural gas extended analysis.

**Malfunction Emissions GHG.** GHG emissions from malfunctions are calculated based on the estimated total volume of annual gas (scf/yr) associated with the specified type of VOC emissions and the molar fractions of CO<sub>2</sub> and CH<sub>4</sub> in the natural gas extended analysis.

**Centrifugal Compressor Venting Emissions.** Annual GHG emissions from centrifugal compressor vented emissions, including compressor blowdown leakage, oil degassing vents and isolation valve leakage, are estimated from the number of compressors; the estimated compressor operating times; the CO<sub>2</sub> and CH<sub>4</sub> molar composition of the gas stream; and the density of the GHG gases according to appropriate equations from 40 CFR 98, Subpart W, equations W-22 and W-36, and paragraph 98.233(v).

Isolation valve leakage occurs when the compressors are not in operation, i.e., when the compressors operate zero hours. The GHG emissions from isolation valve leakage are less than the combined blowdown valve leakage and oil degassing vent emissions that occur when compressor(s) are in operation. Therefore, the PTE is calculated assuming 8760 hours per year of compressor operation (corresponding with zero hours of isolation valve leakage per year).

**Equipment Leaks Emissions.** GHG emissions from facility-wide equipment leaks are based on the estimated total annual gas losses (scf/yr) associated with the estimated number of components, the corresponding emission factors from the EPA's 1995 *Protocol for Equipment Leak Emission Estimates*, and the molar fraction of CO<sub>2</sub> and CH<sub>4</sub> contained in the natural gas extended analysis.

**Natural Gas Driven Pneumatic Device Venting Emissions and Natural Gas Driven Pneumatic Pump Venting Emissions.** Gas-driven pneumatic device and pneumatic pump emissions are calculated from the facility gas stream composition for CO<sub>2</sub> and CH<sub>4</sub>, the estimated number of devices, and the appropriate emission factors from 40 CFR 98, Subpart W, Table W-1A (Western U.S. - Gas Service).

**Storage Tank and Truck Loading GHG.** CO<sub>2</sub> and CH<sub>4</sub> emissions associated with the facility-wide flashed gases are calculated from the speciated mole fractions of flashed gas in the VMGSim emission calculation program output stream for the inlet separator and condensate storage tanks. The post-flashed condensate liquid that is transferred during truck loading does not contain appreciable amounts of any gases, including GHG.

GHG emissions from the working and breathing losses from the produced water tanks and exempt storage tanks are considered zero, based on the stored contents are either non-flashing liquids or post-flashed liquid. The methanol tank does not contain appreciable amounts of GHG. Similarly, any transferred liquid (truck loading) does not contain appreciable amounts of any gases, including GHG.

**Pigging Receiving/Slug Catching Emissions GHG.** GHG emissions from the slug receiver are calculated based on the total annual volume of gas (scf/yr) associated with the tpy of VOC emissions and the molar fractions of CO<sub>2</sub> and CH<sub>4</sub> in the natural gas extended analysis.

**Malfunction Emissions GHG.** GHG emissions from malfunctions are calculated based on the estimated total volume of annual gas (scf/yr) associated with the specified tpy of VOC emissions and the molar fractions of CO<sub>2</sub> and CH<sub>4</sub> in the a recent natural gas extended analysis.

The sum total CO<sub>2</sub>e from the GHG from the current permitted facility and the proposed malfunction PTE is below 75,000 tpy of CO<sub>2</sub>e.

### Green House Gas Emissions Data and Calculations

Sources	Facility Total Emissions				
	CO2, tpy	CH4, tpy	N2O, tpy	GHG, tpy	CO2e, tpy
Engine & Turbine Exhaust Emissions	34,381.15	6.48E-01	6.48E-02	34,381.87	34416.66
SSM Emissions	3.93	66.45	--	70.38	1665.15
Centrifugal Compressor Venting Emissions	25.97	439.59	--	465.56	11015.74
Heater & Boiler Exhaust Emissions	51.41	9.69E-04	9.69E-05	51.41	51.47
Equipment Leak Emissions	0.56	9.55	--	10.11	239.22
Natural Gas Pneumatic Device Venting Emissions	2.19	36.95	--	39.14	926.06
Natural Gas Driven Pneumatic Pump Venting Emissions	0.13	2.13	--	2.25	53.34
Malfunction Emissions	3.17	53.65	--	56.82	1344.42
Storage Tank Emissions	6.81	34.12	--	40.93	859.92
Pigging Emissions	0.58	9.76	--	10.34	244.67
Total	34,475.90	652.86	6.49E-02	35,128.83	50,816.66

### Engine & Turbine Exhaust Emissions

Unit Numbers	Description	Emission Factors			Emission Rates		
		CO2, kg/MMBtu	CH4, kg/MMBtu	N2O, kg/MMBtu	CO2, tpy	CH4, tpy	N2O, tpy
1	Solar Saturn 10-T1300	53.06	1.00E-03	1.00E-04	7,140.96	1.35E-01	1.35E-02
14	Solar Centaur 40-T4700S	53.06	1.00E-03	1.00E-04	6,402.44	1.21E-01	1.21E-02
9	Solar Saturn 10-T1200	53.06	1.00E-03	1.00E-04	20,837.75	3.93E-01	3.93E-02
Total					34,381.15	0.65	6.48E-02

The emissions factors are taken from 40 CFR 98, Subpart C, Tables C-1 & C-2  
 Emission Rates (tpy) = kg/MMBtu x 2.2 lb/kg x MMBtu/yr / 2,000 lb/ton

Unit Numbers	Description	Fuel Types	Operating Times, hr/yr	LHV Design Heat Rates, MMBtu/hr	HHV	
					Design Heat Rates, MMBtu/hr	Fuel Usages, MMBtu/yr
1	Solar Saturn 10-T1300	Nat. Gas	8,760	12.57	13.97	122,348
14	Solar Centaur 40-T4700S	Nat. Gas	8,760	11.27	12.52	109,695
9	Solar Saturn 10-T1200	Nat. Gas	8,760	36.68	40.76	357,019

The fuel types and operating times are provided by Harvest.  
 The LHV design heat rates are taken from manufacturers data  
 HHV Design Heat Rates (MMBtu/hr) = LHV Design Heat Rates (MMBtu/hr) / 0.9 LHV/HHV  
 HHV Fuel Usages (MMBtu/yr) = HHV Design Heat Rates (MMBtu/hr) x hr/yr

### SSM Emissions

Unit Numbers	Description	Total Gas Losses, scf/yr	CO2 Emission Factors, lb/scf	CH4 Emission Factors, lb/scf	Emission Rates	
					CO2, tpy	CH4, tpy
SSM	SSM	3,633,660	0.0022	0.0366	3.93	66.45

The annual blowdown volumes are calculated from data provided by Harvest.  
 The CO2 and CH4 emission factors are calculated from the facility extended gas analysis  
 Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

## Green House Gas Emissions Data and Calculations

### Centrifugal Compressor Venting Emissions

Unit Numbers	Description	Emission Rates	
		CO <sub>2</sub> , tpy	CH <sub>4</sub> , tpy
NA	Blowdown Valve Leakage	4.76	80.55
NA	Oil Degassing Vents	21.21	359.04
NA	Isolation Valve Leakage	0.00	0.00
	Total	25.97	439.59

Operating mode - includes blowdown valve leakage (wet and dry seal) and the oil degassing vents (wet seal)

Non-operating depressurized mode - includes isolation valve leakage (wet & dry seal) through open blowdown vents (without blind flanges)

A combination of equations W-22 & W-36 (Subpart W) is used to calculate centrifugal compressor emissions

As the NMED requires CO<sub>2</sub> & CH<sub>4</sub> emissions rather than CO<sub>2e</sub> emissions, it is not necessary to include the global warming potential from equation W-36

CO<sub>2</sub> Emission Rates (tpy) = # x scf/hr x hr/yr x (CO<sub>2</sub> Mole Percent (%) / 100) x CO<sub>2</sub> Density (kg/scf)  
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

CH<sub>4</sub> Emission Rates (tpy) = # x scf/hr x hr/yr x (CH<sub>4</sub> Mole Percent (%) / 100) x CH<sub>4</sub> Density (kg/scf)  
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

Unit Numbers	Description	Number of Compressors #	Gas Emissions, scf/hr	Operating Times, hr/yr	CO <sub>2</sub> Mole Percents, %	CH <sub>4</sub> Mole Percents, %	CO <sub>2</sub> Density, kg/scf	CH <sub>4</sub> Density, kg/scf
NA	Blowdown Valve Leakage	3	167.4	8,760	1.87	86.51	0.0526	0.0192
NA	Oil Degassing Vents	3	746.2	8,760	1.87	86.51	0.0526	0.0192
NA	Isolation Valve Leakage	3	10.8	0	1.87	86.51	0.0526	0.0192

The number of compressors are provided by Harvest.

Emission factors are the three year rolling average (2012-2014) of all measurements from the [former] Williams Field Services, LLC compressor fleet located at natural gas processing plants

The operating times (the average operating times for all station compressors combined) is provided by Harvest.

The facility CO<sub>2</sub> and CH<sub>4</sub> contents are taken from the facility extended gas analysis

The CO<sub>2</sub> & CH<sub>4</sub> densities (kg/scf) are taken from Subpart W, Paragraph 98.233(v)

## Green House Gas Emissions Data and Calculations

### Heater & Boiler Exhaust Emissions

Unit Numbers	Description	Emission Factors			Emission Rates		
		CO2, kg/MMBtu	CH4, kg/MMBtu	N2O, kg/MMBtu	CO2, tpy	CH4, tpy	N2O, tpy
Heaters	(15 - 21, in aggregate)	53.06	1.00E-03	1.00E-04	51.41	9.69E-04	9.69E-05
	Total				51.41	9.69E-04	9.69E-05

The emissions factors are taken from 40 CFR 98, Subpart C, Tables C-1 & C-2

Emission Rates (tpy) = kg/MMBtu x 2.2 lb/kg x MMBtu/yr / 2,000 lb/ton

Unit Numbers	Description	Fuel Types	Operating Times, hr/yr	LHV Design Heat Rates, MMBtu/hr	HHV	
					Design Heat Rates, MMBtu/hr	Fuel Usages, MMBtu/yr
Heaters	(18, 19, 20 & 21 aggregated)	Nat. Gas	8,760	0.0905	0.101	881

HHV Fuel Usages (MMBtu/yr) = HHV Design Heat Rate (MMBtu/hr) x hr/yr

### Equipment Leaks Emissions

Unit Numbers	Description	Emission Rates	
		CO2, tpy	CH4, tpy
NA	Valves	0.43	7.3
NA	Connectors	0.05	0.9
NA	Open-Ended Lines	0.03	0.5
NA	Pressure Relief Valves	0.05	0.8
	Total	0.56	9.5

A combination of equations W-31 & W-36 (Subpart W) is used to calculate uncombusted CO2 & CH4 emissions

As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36

CO2 Emission Rate (tpy) = # x scf/hr/component x (CO2 Content (mole %) / 100) x hr/yr x CO2 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

CH4 Emission Rate (tpy) = # x scf/hr/component x (CH4 Content (mole %) / 100) x hr/yr x CH4 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

Unit Numbers	Description	Number of Components, #	Emission Factors, scf/hr /component	CO2 Contents, mole %	CH4 Contents, mole %	Operating Times, hr/yr	CO2 Density, kg/scf	CH4 Density, kg/scf
NA	Valves	378	0.121	1.87	86.51	8,760	0.0526	0.0192
NA	Connectors	339	0.017	1.87	86.51	8,760	0.0526	0.0192
NA	Open-Ended Lines	103	0.031	1.87	86.51	8,760	0.0526	0.0192
NA	Pressure Relief Valves	25	0.193	1.87	86.51	8,760	0.0526	0.0192

The number of sources are calculated based on the number of compressors and dehydrators at the station (see criteria pollutant and HAP equipment leaks calculations)

The emission factors are taken from Subpart W, Table W-1A (Western U.S. - Gas Service)

The facility CO2 and CH4 contents are taken from the facility extended gas analysis

The operating times are provided by Harvest (default is the entire year)

The CO2 & CH4 densities are taken from Subpart W, Paragraph 98.233(v)

## Green House Gas Emissions Data and Calculations

### Natural Gas Pneumatic Device Venting Emissions

Unit Numbers	Description	Number of Devices, #	Emission Factors, scf/hr/device	Operating Times, hr/yr	Emission Rates	
					CO2, tpy	CH4, tpy
NA	Continuous High Bleed Pneumatic Devices	0	37.3	8,760	0.00	0.00
NA	Intermittent Bleed Pneumatic Devices	17	13.5	8,760	2.18	36.73
NA	Continuous Low Bleed Pneumatic Devices	1	1.39	8,760	0.01	0.22
	Total				2.19	36.95

The number of devices are estimated

The emission factors are taken from Subpart W, Table W-1A (Western U.S. - Gas Service)

The operating times are provided by Harvest

Equation W-1 (Subpart W) is used to calculate CO2 & CH4 emissions

As the NMED requires CO2 & CH4 emissions in addition to CO2e emissions, it is necessary to divide by the global warming potentials

CO2 Emission Rates (tpy) = # x scf/hr/device x (CO2 Content (mole %) / 100) x CO2 Conversion Factors (tonne CO2e/scf) x hr/yr  
x (2,204.6 lb/tonne / 2,000 lb/ton) / CO2 Global Warming Potentials (tonne CO2e/tonne CO2)

CH4 Emission Rates (tpy) = # x scf/hr/device x (CH4 Contents (mole %) / 100) x CH4 Conversion Factors (tonne CO2e/scf) x hr/yr  
x (2,204.6 lb/tonne / 2,000 lb/ton) / CH4 Global Warming Potentials (tonne CO2e/tonne CH4)

Unit Numbers	Description	CO2 Contents, mole %	CH4 Contents, mole %	CO2 Conversion Factors, tonne CO2e /scf	CH4 Conversion Factors, tonne CO2e /scf	CO2 Global Warming Potentials, tonne CO2e /tonne CO2	CH4 Global Warming Potentials, tonne CO2e /tonne CH4
NA	Continuous High Bleed Pneumatic Devices	1.87	86.51	5.262E-05	4.790E-04	1	25
NA	Continuous Low Bleed Pneumatic Devices	1.87	86.51	5.262E-05	4.790E-04	1	25
NA	Intermittent Bleed Pneumatic Devices	1.87	86.51	5.262E-05	4.790E-04	1	25

The facility CO2 and CH4 contents are taken from the facility extended gas analysis

The conversion factors are taken from Subpart W, Paragraph 98.233(a)

The global warming potentials are taken from 40 CFR Part 98, Table A-1

### Natural Gas Driven Pneumatic Pump Venting Emissions

#### Emission Rates

Unit Number	Description	Number of Pumps, #	Emission Factor, scf/hr/pump	Operating Time, hr/yr	Emission Rates	
					CO2, tpy	CH4, tpy
NA	Pneumatic Pump Venting	1	13.3	8,760	0.13	2.13

The number of pumps are estimated

The emission factor is taken from Subpart W, Table W-1A (Western U.S. - Gas Service)

The operating time is provided by Harvest (default is the entire year)

Equation W-2 (Subpart W) is used to calculate CO2 & CH4 emissions

As the NMED requires CO2 & CH4 emissions in addition to CO2e emissions, it is necessary to divide by the global warming potentials

CO2 Emission Rate (tpy) = # x scf/hr/pump x (CO2 Content (mole %) / 100) x CO2 Conversion Factor (tonne CO2e/scf) x hr/yr  
x (2,204.6 lb/tonne / 2,000 lb/ton) / CO2 Global Warming Potentials (tonne CO2e/tonne CO2)

CH4 Emission Rate (tpy) = # x scf/hr/pump x (CH4 Content (mole %) / 100) x CH4 Conversion Factor (tonne CO2e/scf) x hr/yr  
x (2,204.6 lb/tonne / 2,000 lb/ton) / CH4 Global Warming Potentials (tonne CO2e/tonne CH4)

Unit Number	Description	CO2 Content, mole %	CH4 Content, mole %	CO2 Conversion Factor, tonne CO2e /scf	CH4 Conversion Factor, tonne CO2e /scf	CO2 Global Warming Potential, tonne CO2e /tonne CO2	CH4 Global Warming Potential, tonne CO2e /tonne CH4
NA	Pneumatic Pump Venting	1.87	86.51	5.262E-05	4.790E-04	1	25

The facility CO2 and CH4 contents are taken from the facility extended gas analysis

The conversion factors are taken from Subpart W, Paragraph 98.233(a)

The operating time is provided by Harvest (the default is the entire year)

The global warming potentials are taken from 40 CFR Part 98, Table A-1

## Green House Gas Emissions Data and Calculations

### Malfunction Emissions

Unit Number	Description	Emission Rates		
		VOC, tpy	CO2, tpy	CH4, tpy
M1	Malfunctions	10.00	3.17	53.65

The VOC emission rate is estimated (see calculations workbook)

CO2 Emission Rate (tpy) = VOC Emission Rate (tpy) x (Total Component Weight (lb/lb-mole) / VOC Component Weight (lb-lb-mole)) x (CO2 Weight % of Total (%) / 100)

CH4 Emission Rate (tpy) = VOC Emission Rate (tpy) x (Total Component Weight (lb/lb-mole) / VOC Component Weight (lb-lb-mole)) x (CH4 Weight % of Total (%) / 100)

Unit Number	Description	Total Component Weight, lb/lb-mole	VOC Component Weight, lb/lb-mole	CO2 Weight % of Total, %	CH4 Weight % of Total, %
M1	Malfunctions	19.33	2.59	4.25	71.80

The total & VOC component weights and CO2 & CH4 weight % of totals are calculated from the facility extended gas analysis

### Storage Tank Emissions

Unit Number	Description	Emission Rates	
		CO2, tpy	CH4, tpy
T3 (flash)	Facility-wide flash emissions	6.81	34.12
--	Non- & post- flashing tanks	0.00	0.00
	Total	6.81	34.12

The emission rates are taken from HYSYS output files, as applicable

### Pigging Emissions

Unit Number	Description	Emission Rates		
		VOC, tpy	CO2, tpy	CH4, tpy
P1	Pigging	1.82	0.58	9.76

The VOC emission rate is estimated (see calculations workbook)

CO2 Emission Rate (tpy) = VOC Emission Rate (tpy) x (Total Component Weight (lb/lb-mole) / VOC Component Weight (lb-lb-mole)) x (CO2 Weight % of Total (%) / 100)

CH4 Emission Rate (tpy) = VOC Emission Rate (tpy) x (Total Component Weight (lb/lb-mole) / VOC Component Weight (lb-lb-mole)) x (CH4 Weight % of Total (%) / 100)

Unit Number	Description	Total Component Weight, lb/lb-mole	VOC Component Weight, lb/lb-mole	CO2 Weight % of Total, %	CH4 Weight % of Total, %
P1	Pigging	19.33	2.59	4.25	71.80

The total & VOC component weights and CO2 & CH4 weight % of totals are calculated from the facility extended gas analysis

## Green House Gas Emissions Data and Calculations

### Gas Stream Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent of Total, %	Emission Factors, lb/scf
Carbon Dioxide	1.8655	44.01	0.82	4.2481	0.0022
Hydrogen Sulfide	0.0000	34.07	0.00	0.0000	0.0000
Nitrogen	0.4417	28.01	0.12	0.6402	0.0003
Methane	86.5100	16.04	13.88	71.7993	0.0366
Ethane	6.3818	30.07	1.92	9.9295	0.0051
Propane	2.7506	44.09	1.21	6.2751	0.0032
IsoButane	0.4939	58.12	0.29	1.4853	0.0008
Normal Butane	0.7432	58.12	0.43	2.2350	0.0011
IsoPentane	0.2542	72.15	0.18	0.9490	0.0005
Normal Pentane	0.1836	72.15	0.13	0.6854	0.0003
Cyclopentane	0.0084	70.14	0.01	0.0305	0.0000
n-Hexane	0.0640	86.17	0.06	0.2854	0.0001
Cyclohexane	0.0713	84.16	0.06	0.3105	0.0002
Other Hexanes	0.0950	86.18	0.08	0.4236	0.0002
Heptanes	0.0435	100.20	0.04	0.2255	0.0001
Methylcyclohexane	0.0395	98.19	0.04	0.2007	0.0001
2,2,4-Trimethylpentane	0.0024	100.21	0.00	0.0124	0.0000
Benzene	0.0100	78.11	0.01	0.0404	0.0000
Toluene	0.0135	92.14	0.01	0.0644	0.0000
Ethylbenzene	0.0004	106.17	0.00	0.0022	0.0000
Xylenes	0.0035	106.17	0.00	0.0192	0.0000
C8+ heavies	0.0243	110.00	0.03	0.1383	0.0001
Total	100.0003		19.33	100.0000	0.0509
VOC			2.59	--	0.0068

Gas stream composition obtained from Thompson Inlet LP extended gas analysis dated December 10, 2018.

Note: The GHG calculations utilize the raw sampled gas analysis (i.e., not normalized to remove N<sub>2</sub>, CO<sub>2</sub>, C<sub>1</sub> & C<sub>2</sub>) because it results in a more conservative estimate of GHG emissions.

Component Weights (lb/lb-mole) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole)

Weight Percent of Total (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)

Emission Factors (lb/scf) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole) / 379.4 scf/lb-mole



## Green House Gas Emissions Data and Calculations

### Flash Gas Stream Composition (VOC & non-VOC)

Component	Speciated Mole Fraction, Flashed Gas	Molecular Weight, lb/lb-mole	Mole Fraction x MW	Component Weight (Wt.) Fraction of Total (VOC+Non-VOC)	Emission Rate, tpy
Carbon dioxide	2.754E-02	44.01	1.2122	3.39E-02	6.81
Nitrogen	2.081E-04	28.01	0.0058	1.63E-04	0.03
Methane	0.3789	16.04	6.0776	0.1699	34.12
Ethane	0.2027	30.07	6.0946	0.1704	34.22
Propane	0.1809	44.09	7.9774	0.2230	44.79
Isobutane	4.339E-02	58.12	2.5217	0.0705	14.16
n-Butane	6.919E-02	58.12	4.0213	0.1124	22.58
Isopentane	2.979E-02	72.15	2.1491	0.0601	12.07
n-Pentane	2.352E-02	72.15	1.6972	0.0475	9.53
Isohexane	3.729E-03	86.17	0.3214	0.0090	1.80
n-Hexane	1.618E-02	86.17	1.3945	0.0390	7.83
Cyclohexane	9.605E-04	84.16	0.0808	2.26E-03	0.45
Isoheptane	2.045E-03	100.20	0.2049	0.0057	1.15
n-Heptane	1.064E-02	100.20	1.0665	0.0298	5.99
Methylcyclohexane	0.0000	98.19	0.0000	0.00E+00	0.00
2,2,4-Trimethylpentane	5.343E-05	100.21	0.0054	1.50E-04	0.03
Benzene	1.378E-03	78.11	0.1076	3.01E-03	0.60
Toluene	3.489E-03	92.14	0.3214	8.99E-03	1.80
Ethylbenzene	6.556E-05	106.17	0.0070	1.95E-04	0.04
Xylenes	1.564E-05	106.17	0.0017	4.64E-05	0.01
C8+ Heavies	4.544E-03	110.00	0.4998	1.40E-02	2.81
Total (All gas)	0.9993		35.7679	1.0000	200.83
Total VOC:	0.3899		22.3777	0.6256	125.65
Total Non-VOC:	0.6093		13.3902	0.3744	75.18

Flashed gas emission rates based on VMGSim "2018 Thompson Compressor Station Emissions Model" using SPL liquid analysis sampled 02/16/2018 (Hide Side Slug Receiver -Liquid Spot) as input.

Speciated Mole Fraction, Flashed Gas' is based on VMGSim stream 'ATM\_Emissions', 'Atm\_Tank.Vap', 'Mole Flow/Composition, Fraction'.

Xylenes Mole Fraction = o-Xylene

C8+ Heavies = n-Octane + n-Nonane + n-Decane + 2-methylheptane

Total VOC Flash Emissions, tpy 125.65 tpy VOC

= VMGSim analysis "2018 Thomposon Compressor Station Emissions Model: LP Separator Impact on Emissions", Figure 2. LP Separator not modeled. LP Slug Reciver Dumping Straight to ATM Tank, 'ATM\_Emissions', 'EmissionsDetail.VOCs' 169.327 [ton(short)/y]

Total VOC Component Wt. Fraction of Total

= Sum of individual Component Wt. Fraction of Total (C3 to C8+)

Total Flash Gas Emissions (VOC + Non-VOC), tpy 200.83 tpy Total Gas (VOC + Non-VOC),

Individual Component Emission Rate, tpy

= (Total Flash Gas Emissions (VOC + Non-VOC), tpy) x (Component Wt. Fraction of Total)

# Section 7

## Information Used To Determine Emissions

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**Information Used to Determine Emissions shall include the following:**

- If manufacturer data are used, include specifications for emissions units and 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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Please see the following pages.

SOLAR TURBINES INCORPORATED  
 ENGINE PERFORMANCE CODE REV. 2.71  
 CUSTOMER: WILLIAMS FIELD SERVICES  
 JOB ID: OD6-054

DATE RUN: 12-AUG-96  
 RUN BY: BYRD, DE

NEW EQUIPMENT PREDICTED EMISSION PERFORMANCE  
 DATA FOR POINT NUMBER 1

Fuel: SD NATURAL GAS Customer: WILLIAMS FIELD SERVICES  
 Water Injection: NO Inquiry Number: OD6-054  
 Number of Engines Tested: 13  
 Model: SATURN 10-T1300 CS/ED STANDARD GAS  
 Emissions Data: REV. 0.0

CRITICAL WARNINGS IN USE OF DATA FOR PERMITTING

1. Short term permitting values such as PPMV or lbs/hr should be based on worst case actual operating conditions specific to the application and the site. Worst case for one pollutant is not necessarily the same for another. The values on this form are only predicted emissions at one specific operating condition; not necessarily the worst case.
2. Long term reference emission units (e.g. tons/yr) should reference the average conditions at the site (e.g. ISO). That number should not be derived from the worst case value referenced above, or conversely this average must not be used to calculate worst case.
3. Nominal values are based on actual test results, or predicted in the case of no actual engine tests. Expected maximum values should be referenced for permitting.
4. If a Solonox model is planned to be installed in the future, use no less than 50 PPMV CO.

The following predicted emissions performance is based on the following specific single point: (see attached)

Hp= 1125, %Pull Load= 100.0, Elev= 5500 ft, IRH= 20.0, Temperature= 20.0 F

NOX		CO		UHC - includes methane + ethane.	
NOM	MAX	NOM	MAX	NOM	MAX
55.15	91.00	97.05	250.00	5.982	50.000
12.17	28.03	13.04	33.60	0.460	3.849
0.221	0.365	0.237	0.610	0.0084	0.0659

Assume VOC's are 60% of UHC  
 PPMVd at 15% O2 3.85 ± 0.6  
 ton/yr  
 lbs/MBTU (Fuel LEV)

2.34 ton VOCs

OTHER IMPORTANT NOTES

1. Solar does not provide maximum values for water-to-fuel ratio, SOX, particulates, or conditions outside those above without separate written approval.
2. Solar can optionally provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
3. Fuel must meet solar standard fuel specification KS 9-98. Predicted emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If the above information is being used regarding existing equipment, it should be verified by actual site testing.

# Solar Turbines

A Caterpillar Company

## PREDICTED EMISSION PERFORMANCE

Customer <b>Williams ES</b>		Engine Model <b>SATURN 10-1200</b>	
Job ID <b>Kutz</b>		<b>CS/MD STANDARD</b>	
Inquiry Number <b>Kutz</b>		Fuel Type <b>SD NATURAL GAS</b>	Water Injection <b>NO</b>
Run By <b>Michael E Clay</b>	Date Run <b>26-Aug-05</b>	Engine Emissions Data <b>REV. 0.0</b>	Engines Tested <b>5</b>

	NO <sub>x</sub> EMISSIONS			CO EMISSIONS		UHC EMISSIONS	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
1	997 Hp	100.0% Load	Elev. 5600 ft	Rel. Humidity 60.0%	Temperature 0 Deg. F		
	lbm/hr	2.32	6.76	5.53	10.98	0.46	1.57
2	979 Hp	100.0% Load	Elev. 5600 ft	Rel. Humidity 60.0%	Temperature 20.0 Deg. F		
	lbm/hr	2.40	6.63	4.10	10.77	0.44	1.54
3	949 Hp	100.0% Load	Elev. 5600 ft	Rel. Humidity 60.0%	Temperature 40.0 Deg. F		
	lbm/hr	2.39	6.45	2.79	10.47	0.43	1.50
4	915 Hp	100.0% Load	Elev. 5600 ft	Rel. Humidity 60.0%	Temperature 60.0 Deg. F		
	lbm/hr	2.28	6.24	1.61	10.13	0.42	1.45
5	871 Hp	100.0% Load	Elev. 5600 ft	Rel. Humidity 60.0%	Temperature 80.0 Deg. F		
	lbm/hr	2.01	5.99	1.54	9.73	0.40	1.39
6	802 Hp	100.0% Load	Elev. 5600 ft	Rel. Humidity 60.0%	Temperature 100.0 Deg. F		
	lbm/hr	1.53	5.62	1.44	9.13	0.37	1.31

x.60 = 0.977

- Important Notes
1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another. The emission values on this form are only predicted emissions at the specific operating conditions listed.
  2. Solar's typical SoLoNO<sub>x</sub> warranty is for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 80% and 100% load for liquid fuel. An emission warranty for non-SoLoNO<sub>x</sub> equipment is for greater than 0 deg F and between 80% and 100% load.
  3. Fuel must meet Solar standard fuel specification ES 9-98. Predicted emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
  4. If needed, Solar can provide generic documents to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO<sub>2</sub>, PM<sub>10/2.5</sub>, VOC, and formaldehyde.
  5. Solar can optionally provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.

VOCs  
 $1.57 \times 0.6 = 0.942 \text{ lb/hr}$   
 $\frac{0.942 \text{ lb/hr}}{2000 \text{ lb}} = 4.71 \times 10^{-4}$

# Solar Turbines

A Caterpillar Company

## PREDICTED ENGINE PERFORMANCE

Customer <b>Williams ES</b>	
Job ID <b>Kutz</b>	
Run By <b>Michael E Clay</b>	Date Run <b>26-Aug-05</b>
Engine Performance Code <b>REV. 3.27</b>	Engine Performance Data <b>REV. 0.0</b>

Model <b>SATURN 10-1200</b>
Package Type <b>CS/MD</b>
Match <b>STANDARD</b>
Fuel System <b>GAS</b>
Fuel Type <b>SD NATURAL GAS</b>

### DATA FOR MINIMUM PERFORMANCE

Elevation	feet	<b>5600</b>					
Inlet Loss	in H2O	<b>3.0</b>					
Exhaust Loss	in H2O	<b>3.0</b>					
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Engine Inlet Temperature	deg F	<b>0</b>	<b>20.0</b>	<b>40.0</b>	<b>60.0</b>	<b>80.0</b>	<b>100.0</b>
Relative Humidity	%	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>
Driven Equipment Speed	RPM	<b>22300</b>	<b>22300</b>	<b>22278</b>	<b>22213</b>	<b>22043</b>	<b>21619</b>
Specified Load	HP	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>
Net Output Power	HP	<b>997</b>	<b>979</b>	<b>949</b>	<b>915</b>	<b>871</b>	<b>802</b>
Fuel Flow	mmBtu/hr	<b>11.27</b>	<b>11.07</b>	<b>10.79</b>	<b>10.48</b>	<b>10.15</b>	<b>9.66</b>
Heat Rate	Btu/HP-hr	<b>11305</b>	<b>11306</b>	<b>11362</b>	<b>11447</b>	<b>11653</b>	<b>12038</b>
Therm Eff	%	<b>22.507</b>	<b>22.504</b>	<b>22.395</b>	<b>22.227</b>	<b>21.836</b>	<b>21.136</b>
Engine Exhaust Flow	lbm/hr	<b>43929</b>	<b>42699</b>	<b>41474</b>	<b>40202</b>	<b>38651</b>	<b>36532</b>
Exhaust Temperature	deg F	<b>766</b>	<b>794</b>	<b>818</b>	<b>842</b>	<b>864</b>	<b>887</b>

Fuel Gas Composition (Volume Percent)	CH4	92.79	C2H6	4.16	C3H8	0.84	C4	0.18	C5	0.04	C6	0.04
	CO2	0.44	H2S	0.0001	N2	1.51						

Fuel Gas Properties	LHV (Btu/Scf)	939.2	Specific Gravity	0.5970	Wobbe Index at 60F	1215.6
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Notes	<b>Kutz T-1000</b>
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# Solar Turbines

A Caterpillar Company

## PREDICTED EMISSION PERFORMANCE

Customer <b>Williams Midstream</b>	
Job ID <b>Thompson Plant</b>	
Inquiry Number <b>OD09-423</b>	
Run By <b>Michael E Clay</b>	Date Run <b>30-Mar-09</b>

Engine Model <b>CENTAUR 40-4700S CS/MD 80F MATCH</b>	
Fuel Type <b>CHOICE GAS</b>	Water Injection <b>NO</b>
Engine Emissions Data <b>REV. 0.1</b>	

### NOx EMISSIONS

### CO EMISSIONS

### UHC EMISSIONS

<b>1</b>	<b>3834 Hp</b>	<b>100.0% Load</b>	<b>Elev. 5600 ft</b>	<b>Rel. Humidity 60.0%</b>	<b>Temperature 0 Deg. F</b>
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PPMvd at 15% O2	<b>38.00</b>	<b>50.00</b>	<b>25.00</b>
ton/yr	<b>24.50</b>	<b>19.62</b>	<b>5.62</b>
lbm/MMBtu (Fuel LHV)	<b>0.152</b>	<b>0.122</b>	<b>0.035</b>
lbm/(MW-hr)	<b>1.96</b>	<b>1.57</b>	<b>0.45</b>
(gas turbine shaft pwr) lbm/hr	<b>5.59</b>	<b>4.48</b>	<b>1.28</b>

<b>2</b>	<b>3728 Hp</b>	<b>100.0% Load</b>	<b>Elev. 5600 ft</b>	<b>Rel. Humidity 60.0%</b>	<b>Temperature 20.0 Deg. F</b>
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PPMvd at 15% O2	<b>38.00</b>	<b>50.00</b>	<b>25.00</b>
ton/yr	<b>23.65</b>	<b>18.94</b>	<b>5.43</b>
lbm/MMBtu (Fuel LHV)	<b>0.152</b>	<b>0.122</b>	<b>0.035</b>
lbm/(MW-hr)	<b>1.94</b>	<b>1.56</b>	<b>0.45</b>
(gas turbine shaft pwr) lbm/hr	<b>5.40</b>	<b>4.32</b>	<b>1.24</b>

<b>3</b>	<b>3592 Hp</b>	<b>100.0% Load</b>	<b>Elev. 5600 ft</b>	<b>Rel. Humidity 60.0%</b>	<b>Temperature 40.0 Deg. F</b>
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PPMvd at 15% O2	<b>38.00</b>	<b>50.00</b>	<b>25.00</b>
ton/yr	<b>22.96</b>	<b>18.39</b>	<b>5.27</b>
lbm/MMBtu (Fuel LHV)	<b>0.152</b>	<b>0.122</b>	<b>0.035</b>
lbm/(MW-hr)	<b>1.96</b>	<b>1.57</b>	<b>0.45</b>
(gas turbine shaft pwr) lbm/hr	<b>5.24</b>	<b>4.20</b>	<b>1.20</b>

#### Notes

- For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
- Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
- Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
- If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
- Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
- Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

# Solar Turbines

A Caterpillar Company

## PREDICTED EMISSION PERFORMANCE

Customer <b>Williams Midstream</b>	
Job ID <b>Thompson Plant</b>	
Inquiry Number <b>OD09-423</b>	
Run By <b>Michael E Clay</b>	Date Run <b>30-Mar-09</b>

Engine Model <b>CENTAUR 40-4700S CS/MD 80F MATCH</b>	
Fuel Type <b>CHOICE GAS</b>	Water Injection <b>NO</b>
Engine Emissions Data <b>REV. 0.1</b>	

### NOx EMISSIONS

### CO EMISSIONS

### UHC EMISSIONS

<b>4</b>	<b>3447 Hp</b>	<b>100.0% Load</b>	<b>Elev. 5600 ft</b>	<b>Rel. Humidity 60.0%</b>	<b>Temperature 60.0 Deg. F</b>
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PPMvd at 15% O2	<b>38.00</b>	<b>50.00</b>	<b>25.00</b>
ton/yr	<b>22.19</b>	<b>17.77</b>	<b>5.09</b>
lbm/MMBtu (Fuel LHV)	<b>0.151</b>	<b>0.121</b>	<b>0.035</b>
lbm/(MW-hr)	<b>1.97</b>	<b>1.58</b>	<b>0.45</b>
(gas turbine shaft pwr) lbm/hr	<b>5.07</b>	<b>4.06</b>	<b>1.16</b>

<b>5</b>	<b>3242 Hp</b>	<b>100.0% Load</b>	<b>Elev. 5600 ft</b>	<b>Rel. Humidity 60.0%</b>	<b>Temperature 80.0 Deg. F</b>
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PPMvd at 15% O2	<b>38.00</b>	<b>50.00</b>	<b>25.00</b>
ton/yr	<b>21.05</b>	<b>16.86</b>	<b>4.83</b>
lbm/MMBtu (Fuel LHV)	<b>0.150</b>	<b>0.120</b>	<b>0.034</b>
lbm/(MW-hr)	<b>1.99</b>	<b>1.59</b>	<b>0.46</b>
(gas turbine shaft pwr) lbm/hr	<b>4.81</b>	<b>3.85</b>	<b>1.10</b>

<b>6</b>	<b>2877 Hp</b>	<b>100.0% Load</b>	<b>Elev. 5600 ft</b>	<b>Rel. Humidity 60.0%</b>	<b>Temperature 100.0 Deg. F</b>
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PPMvd at 15% O2	<b>38.00</b>	<b>50.00</b>	<b>25.00</b>
ton/yr	<b>19.18</b>	<b>15.37</b>	<b>4.40</b>
lbm/MMBtu (Fuel LHV)	<b>0.148</b>	<b>0.119</b>	<b>0.034</b>
lbm/(MW-hr)	<b>2.04</b>	<b>1.64</b>	<b>0.47</b>
(gas turbine shaft pwr) lbm/hr	<b>4.38</b>	<b>3.51</b>	<b>1.00</b>

#### Notes

1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
2. Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 65% and 100% load for liquid fuel (except for the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F and between 80% and 100% load.
3. Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
5. Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
6. Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

# Solar Turbines

A Caterpillar Company

## PREDICTED ENGINE PERFORMANCE

Customer <b>Williams Midstream</b>	
Job ID <b>Thompson Plant</b>	
Run By <b>Michael E Clay</b>	Date Run <b>30-Mar-09</b>
Engine Performance Code <b>REV. 3.41</b>	Engine Performance Data <b>REV. 2.2</b>

Model <b>CENTAUR 40-4700S</b>
Package Type <b>CS/MD</b>
Match <b>80F MATCH</b>
Fuel System <b>GAS</b>
Fuel Type <b>CHOICE GAS</b>

### DATA FOR MINIMUM PERFORMANCE

Elevation	feet	<b>5600</b>
Inlet Loss	in H2O	<b>3.0</b>
Exhaust Loss	in H2O	<b>4.0</b>
Accessory on GP Shaft	HP	<b>14.0</b>

		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Engine Inlet Temperature	deg F	<b>0</b>	<b>20.0</b>	<b>40.0</b>	<b>60.0</b>	<b>80.0</b>	<b>100.0</b>
Relative Humidity	%	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>
Driven Equipment Speed	RPM	<b>15500</b>	<b>15500</b>	<b>15500</b>	<b>15500</b>	<b>15500</b>	<b>15217</b>
Specified Load	HP	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>	<b>FULL</b>
Net Output Power	HP	<b>3834</b>	<b>3728</b>	<b>3592</b>	<b>3447</b>	<b>3242</b>	<b>2877</b>
Fuel Flow	mmBtu/hr	<b>36.69</b>	<b>35.46</b>	<b>34.50</b>	<b>33.47</b>	<b>32.00</b>	<b>29.60</b>
Heat Rate	Btu/HP-hr	<b>9568</b>	<b>9510</b>	<b>9605</b>	<b>9711</b>	<b>9872</b>	<b>10289</b>
Therm Eff	%	<b>26.593</b>	<b>26.755</b>	<b>26.492</b>	<b>26.201</b>	<b>25.773</b>	<b>24.730</b>
Engine Exhaust Flow	lbm/hr	<b>134505</b>	<b>130414</b>	<b>125872</b>	<b>121221</b>	<b>115259</b>	<b>107268</b>
Exhaust Temperature	deg F	<b>755</b>	<b>773</b>	<b>800</b>	<b>827</b>	<b>852</b>	<b>871</b>

Fuel Gas Composition (Volume Percent)	Methane (CH4)	<b>88.92</b>
	Ethane (C2H6)	<b>4.89</b>
	Propane (C3H8)	<b>2.03</b>
	I-Butane (C4H10)	<b>0.37</b>
	N-Butane (C4H10)	<b>0.56</b>
	I-Pentane (C5H12)	<b>0.21</b>
	N-Pentane (C5H12)	<b>0.16</b>
	Hexane (C6H14)	<b>0.41</b>
	Carbon Dioxide (CO2)	<b>1.95</b>
	Nitrogen (N2)	<b>0.51</b>
Sulfur Dioxide (SO2)	<b>0.0001</b>	

Fuel Gas Properties	LHV (Btu/Scf)	<b>993.9</b>	Specific Gravity	<b>0.6485</b>	Wobbe Index at 60F	<b>1234.2</b>
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This performance was calculated with a basic inlet and exhaust system. Special equipment such as low noise silencers, special filters, heat recovery systems or cooling devices will affect engine performance. Performance shown is "Expected" performance at the pressure drops stated, not guaranteed.

Notes	<b>38 ppm runs</b>
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Table 3.1-2a. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM STATIONARY GAS TURBINES

Emission Factors <sup>a</sup> - Uncontrolled				
Pollutant	Natural Gas-Fired Turbines <sup>b</sup>		Distillate Oil-Fired Turbines <sup>d</sup>	
	(lb/MMBtu) <sup>c</sup> (Fuel Input)	Emission Factor Rating	(lb/MMBtu) <sup>c</sup> (Fuel Input)	Emission Factor Rating
CO <sub>2</sub> <sup>f</sup>	110	A	157	A
N <sub>2</sub> O	0.003 <sup>g</sup>	E	ND	NA
Lead	ND	NA	1.4 E-05	C
SO <sub>2</sub>	0.94S <sup>h</sup>	B	1.01S <sup>h</sup>	B
Methane	8.6 E-03	C	ND	NA
VOC	2.1 E-03	D	4.1 E-04 <sup>j</sup>	E
TOC <sup>k</sup>	1.1 E-02	B	4.0 E-03 <sup>l</sup>	C
PM (condensable)	4.7 E-03 <sup>l</sup>	C	7.2 E-03 <sup>l</sup>	C
PM (filterable)	1.9 E-03 <sup>l</sup>	C	4.3 E-03 <sup>l</sup>	C
PM (total)	6.6 E-03 <sup>l</sup>	C	1.2 E-02 <sup>l</sup>	C

<sup>a</sup> Factors are derived from units operating at high loads ( $\geq 80$  percent load) only. For information on units operating at other loads, consult the background report for this chapter (Reference 16), available at “www.epa.gov/ttn/chief”. ND = No Data, NA = Not Applicable.

<sup>b</sup> SCCs for natural gas-fired turbines include 2-01-002-01, 2-02-002-01 & 03, and 2-03-002-02 & 03.

<sup>c</sup> Emission factors based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60°F. To convert from (lb/MMBtu) to (lb/10<sup>6</sup> scf), multiply by 1020. Similarly, these emission factors can be converted to other natural gas heating values.

<sup>d</sup> SCCs for distillate oil-fired turbines are 2-01-001-01, 2-02-001-01, 2-02-001-03, and 2-03-001-02.

<sup>e</sup> Emission factors based on an average distillate oil heating value of 139 MMBtu/10<sup>3</sup> gallons. To convert from (lb/MMBtu) to (lb/10<sup>3</sup> gallons), multiply by 139.

<sup>f</sup> Based on 99.5% conversion of fuel carbon to CO<sub>2</sub> for natural gas and 99% conversion of fuel carbon to CO<sub>2</sub> for distillate oil. CO<sub>2</sub> (Natural Gas) [lb/MMBtu] = (0.0036 scf/Btu)(%CON)(C)(D), where %CON = weight percent conversion of fuel carbon to CO<sub>2</sub>, C = carbon content of fuel by weight, and D = density of fuel. For natural gas, C is assumed at 75%, and D is assumed at 4.1 E+04 lb/10<sup>6</sup>scf. For distillate oil, CO<sub>2</sub> (Distillate Oil) [lb/MMBtu] = (26.4 gal/MMBtu) (%CON)(C)(D), where C is assumed at 87%, and the D is assumed at 6.9 lb/gallon.

<sup>g</sup> Emission factor is carried over from the previous revision to AP-42 (Supplement B, October 1996) and is based on limited source tests on a single turbine with water-steam injection (Reference 5).

<sup>h</sup> All sulfur in the fuel is assumed to be converted to SO<sub>2</sub>. S = percent sulfur in fuel. Example, if sulfur content in the fuel is 3.4 percent, then S = 3.4. If S is not available, use 3.4 E-03 lb/MMBtu for natural gas turbines, and 3.3 E-02 lb/MMBtu for distillate oil turbines (the equations are more accurate).

<sup>j</sup> VOC emissions are assumed equal to the sum of organic emissions.

<sup>k</sup> Pollutant referenced as THC in the gathered emission tests. It is assumed as TOC, because it is based on EPA Test Method 25A.

<sup>l</sup> Emission factors are based on combustion turbines using water-steam injection.

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

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

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

<sup>b</sup> Expressed as NO<sub>2</sub>. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO<sub>x</sub> emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO<sub>x</sub> emission factor.

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

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

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

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

VOC = Volatile Organic Compounds.

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

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

<sup>d</sup> Based on 100% conversion of fuel sulfur to SO<sub>2</sub>. Assumes sulfur content is natural gas of 2,000 grains/10<sup>6</sup> scf. The SO<sub>2</sub> emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO<sub>2</sub> emission factor by the ratio of the site-specific sulfur content (grains/10<sup>6</sup> scf) to 2,000 grains/10<sup>6</sup> scf.

## TANKS 4.09d Condensate Liquid Input

## NORMALIZED THOMPSON COMPRESSOR STATION CONDENSATE LIQUID SPECIATION PROFILE

Component	Mole Fraction	Component MW	Component Weight, lb/lb-mole (Mol fraction x MW)	Weight (Wt.) Fraction (lb/lb-mol / Total Liquid lb/lb-mol)	NORMALIZED TANKS 4.0.9d SPECIATION INPUT		TANKS Input
					Wt%	Normalization method	Wt. %
CO2	3.26E-04	44.01	0.0143	1.43E-04	-		-
N2	4.86E-08	28.01	1.36E-06	1.36E-08	-		-
C1	8.05E-04	16.04	0.0129	0.0001	-		-
C2	7.24E-03	30.07	0.2178	0.0022	-		-
C3	2.67E-02	44.09	1.1786	0.0118	-		-
IC4	1.66E-02	58.12	0.9660	0.0097	1.6775	$= ((i\text{-Butane (IC4) Wt. fraction}) + (\text{Sum of CO}_2, \text{N}_2, \text{C}_1, \text{C}_2, \text{C}_3 \text{ Wt. fractions}) / 2)) \times 100$	4.7375
NC4	4.04E-02	58.12	2.3488	0.0235	3.0600	$= ((n\text{-Butane (NC4) Wt. fraction}) + (\text{Sum of CO}_2, \text{N}_2, \text{C}_1, \text{C}_2, \text{C}_3 \text{ Wt. fractions}) / 2)) \times 100$	-
IC5	4.33E-02	72.15	3.1217	0.0312	3.1211		3.1211
NC5	4.52E-02	72.15	3.2593	0.0326	3.2587		3.2587
Hexanes		86.17	0.0000	0.0000	-		-
Heptanes	2.41E-01	100.21	24.1629	0.2416	24.1583		24.1583
Octanes	2.32E-01	114.23	26.5365	0.2653	26.5315		26.5315
Nonanes	6.64E-02	128.20	8.5064	0.0850	8.5048		8.5048
Benzene	1.06E-02	78.11	0.8257	0.0083	0.8255		0.8255
Toluene	5.59E-02	92.14	5.1532	0.0515	5.1522		5.1522
E-Benzene	3.85E-03	106.17	0.4086	0.0041	0.4085		0.4085
Xylenes	3.83E-02	106.16	4.0691	0.0407	4.0683		4.0683
n-C6	1.24E-01	106.16	13.1532	0.1315	13.1507		13.1507
2,2,4-Trimethylpentane	9.98E-04	100.21	0.1000	0.0010	0.1000		0.1000
C10 Plus	3.63E-02	142.29	5.1583	0.0516	5.1573		5.1573
Cyclohexane	9.81E-03	84.16	0.8256	8.25E-03	0.8254		0.8254
Methylcyclohexane	0.00E+00	98.19	0.0000	0.0000	0.0000		0.0000
Total	1.0000		100.0	1.00	100.0		100.0000
Notes:							
Hydrocarbon (HC) liquid stream composition for TANKS 4.09d input is based on the VMGSim Thompson Compressor Station Emissions Model output including low pressure separator (LP Sep), process stream "Condensate_Load_Out" 'Atm_Tank.Liq0'.							
The VMGSim program included the Thompson Compressor Station liquid stream sampled 02/16/2018 as input.							
TANKS 4.09d speciation for							
Butane = IC4 + NC4;							
Heptanes = n-heptane + 2-methylhexane (isoheptane);							
Octanes = n-octane + 2-methylheptane;							
n-C6 = Hexanes + n-hexane + 2-methylpentane (isohexane)							



Certificate of Analysis  
 Number: 1030-18020878-001A

Houston Laboratories  
 8820 Interchange Drive  
 Houston, TX 77054  
 Phone 713-660-0901

Environmental Department  
 Williams  
 1755 Arroyo Drive  
 Bloomfield, NM 87402

Feb. 23, 2018

Station Name: Thompson Compressor Station  
 Station Location: Hide Side Slug Receiver  
 Method: GPA 2103M  
 Cylinder No: CP 565  
 Analyzed: 02/22/2018 15:22:04 by RR

Sampled By:  
 Sample Of: Liquid Spot  
 Sample Date: 02/16/2018 12:20  
 Sample Conditions: 200 psig  
 PO/Ref. No: 651377

**Analytical Data**

Components	Mol. %	MW	Wt. %	Sp. Gravity	L.V. %
Nitrogen	0.018	28.013	0.006	0.8069	0.005
Methane	9.907	16.043	1.866	0.3000	4.315
Carbon Dioxide	0.495	44.010	0.256	0.8172	0.217
Ethane	3.347	30.069	1.182	0.3563	2.302
Propane	4.240	44.096	2.196	0.5072	3.004
Iso-Butane	1.718	58.122	1.173	0.5628	1.446
n-Butane	3.749	58.122	2.559	0.5842	3.039
Iso-Pentane	3.440	72.149	2.915	0.6251	3.236
n-Pentane	3.512	72.149	2.976	0.6307	3.274
i-Hexanes	5.027	84.877	5.010	0.6676	5.208
n-Hexane	4.280	86.175	4.332	0.6641	4.527
2,2,4-Trimethylpentane	0.098	114.229	0.132	0.6964	0.132
Benzene	1.010	78.112	0.927	0.8844	0.727
Heptanes	19.904	94.810	22.164	0.7187	21.401
Toluene	4.758	92.138	5.149	0.8719	4.098
Octanes	21.633	107.270	27.256	0.7405	25.544
Ethylbenzene	0.373	106.165	0.465	0.8716	0.370
Xylenes	3.545	106.165	4.421	0.8699	3.526
Nonanes	5.631	123.140	8.144	0.7522	7.511
Decanes Plus	3.315	176.492	6.871	0.7795	6.118
	<u>100.000</u>		<u>100.000</u>		<u>100.000</u>

Calculated Physical Properties	Total	C10+
Specific Gravity at 60°F	0.6939	0.7795
API Gravity at 60°F	72.418	50.027
Molecular Weight	85.145	176.492
Pounds per Gallon (in Vacuum)	5.785	6.499
Pounds per Gallon (in Air)	5.779	6.492
Cu. Ft. Vapor per Gallon @ 14.696 psia	25.784	13.973

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.



Certificate of Analysis  
Number: 1030-18020878-001A

Houston Laboratories  
8820 Interchange Drive  
Houston, TX 77054  
Phone 713-660-0901

Environmental Department  
Williams  
1755 Arroyo Drive  
Bloomfield, NM 87402

Feb. 23, 2018

Station Name: Thompson Compressor Station  
Station Location: Hide Side Slug Reciever  
PO/Ref. No: 651377  
Cylinder No: CP 565

Sampled By:  
Sample Of: Liquid Spot  
Sample Date: 02/16/2018 12:20  
Sample Conditions: 200 psig

**Analytical Data**

Test	Method	Result	Units	Detection Limit	Lab Tech.	Analysis Date
Shrinkage Factor	Proprietary	0.9223			MR	02/22/2018
Flash Factor	Proprietary	142.2882	Cu.Ft./STBbl.		MR	02/22/2018
Color Visual	Proprietary	Light Straw			MR	02/22/2018
API Gravity @ 60° F	ASTM D-4052	61.88	°		EV	02/22/2018

Hydrocarbon Laboratory Manager

Quality Assurance:

The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

loading operation, resulting in high levels of vapor generation and loss. If the turbulence is great enough, liquid droplets will be entrained in the vented vapors.

A second method of loading is submerged loading. Two types are the submerged fill pipe method and the bottom loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the cargo tank. In the bottom loading method, a permanent fill pipe is attached to the cargo tank bottom. During most of submerged loading by both methods, the fill pipe opening is below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

The recent loading history of a cargo carrier is just as important a factor in loading losses as the method of loading. If the carrier has carried a nonvolatile liquid such as fuel oil, or has just been cleaned, it will contain vapor-free air. If it has just carried gasoline and has not been vented, the air in the carrier tank will contain volatile organic vapors, which will be expelled during the loading operation along with newly generated vapors.

Cargo carriers are sometimes designated to transport only one product, and in such cases are practicing "dedicated service". Dedicated gasoline cargo tanks return to a loading terminal containing air fully or partially saturated with vapor from the previous load. Cargo tanks may also be "switch loaded" with various products, so that a nonvolatile product being loaded may expel the vapors remaining from a previous load of a volatile product such as gasoline. These circumstances vary with the type of cargo tank and with the ownership of the carrier, the petroleum liquids being transported, geographic location, and season of the year.

One control measure for vapors displaced during liquid loading is called "vapor balance service", in which the cargo tank retrieves the vapors displaced during product unloading at bulk plants or service stations and transports the vapors back to the loading terminal. Figure 5.2-5 shows a tank truck in vapor balance service filling a service station underground tank and taking on displaced gasoline vapors for return to the terminal. A cargo tank returning to a bulk terminal in vapor balance service normally is saturated with organic vapors, and the presence of these vapors at the start of submerged loading of the tanker truck results in greater loading losses than encountered during nonvapor balance, or "normal", service. Vapor balance service is usually not practiced with marine vessels, although some vessels practice emission control by means of vapor transfer within their own cargo tanks during ballasting operations, discussed below.

Emissions from loading petroleum liquid can be estimated (with a probable error of  $\pm 30$  percent)<sup>4</sup> using the following expression:

$$L_L = 12.46 \frac{SPM}{T} \quad (1)$$

where:

$L_L$  = loading loss, pounds per 1000 gallons ( $\text{lb}/10^3 \text{ gal}$ ) of liquid loaded

$S$  = a saturation factor (see Table 5.2-1)

$P$  = true vapor pressure of liquid loaded, pounds per square inch absolute (psia)  
(see Figure 7.1-5, Figure 7.1-6, and Table 7.1-2)

$M$  = molecular weight of vapors, pounds per pound-mole ( $\text{lb}/\text{lb-mole}$ ) (see Table 7.1-2)

$T$  = temperature of bulk liquid loaded,  $^{\circ}\text{R}$  ( $^{\circ}\text{F} + 460$ )

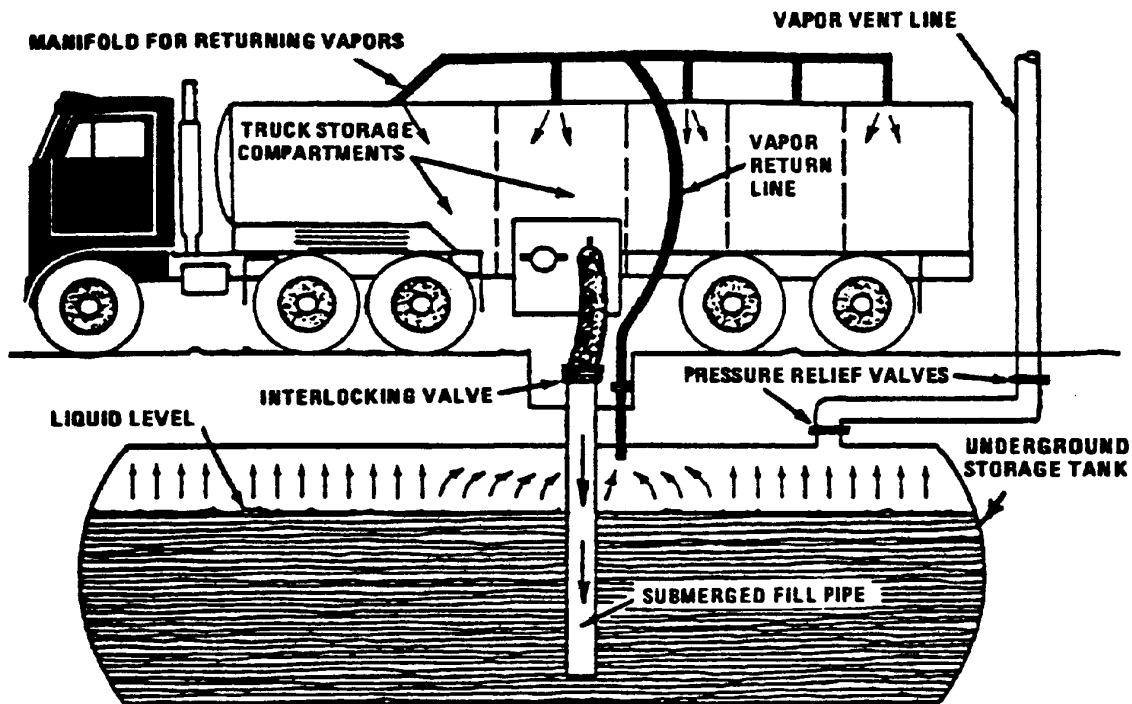


Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels <sup>a</sup>	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

<sup>a</sup> For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.



## PS Memo 09-02

**To:** Stationary Sources Program, Local Agencies, and Regulated Community  
**From:** Chris Laplante and Roland C. Hea, Colorado Air Pollution Control Division  
**Date:** February 8, 2010  
**Subject:** Oil & Gas Produced Water Tank Batteries  
Regulatory Definitions and Permitting Guidance

---

This guidance document is intended to answer frequently asked questions concerning oil and gas industry produced water tank batteries. This document does not address any other equipment types that may be part of a common facility with a tank battery. Nothing in this guidance should be construed regarding Air Pollution Control Division (Division) permitting of evaporation ponds or water treatment facilities. Please consult with the Division for information regarding the permitting of evaporation ponds or water treatment facilities.

### Revision History

October 1, 2009	Initial issuance.
February 8, 2010	First revision. This guidance document replaces the October 1, 2009 version. Revised language to clarify APEN fee structure, definition of modification, APEN submittals, and produced water exemption.

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Document source:

[https://www.colorado.gov/pacific/sites/default/files/AP\\_Memo-09-02-Oil-\\_-Gas-Produced-Water-Tank-Batteries-Regulatory-Definitions-and-Permitting-Guidance.pdf](https://www.colorado.gov/pacific/sites/default/files/AP_Memo-09-02-Oil-_-Gas-Produced-Water-Tank-Batteries-Regulatory-Definitions-and-Permitting-Guidance.pdf)

### 3. EMISSION FACTORS AND SITE SPECIFIC SAMPLING Q&A

#### 3.1. *What are the State approved default emission factors for produced water tanks?*

County	Produced Water Tank Default Emission Factors <sup>1</sup> (lb/bbl) <sup>2</sup>		
	VOC	Benzene	n-Hexane
Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, & Weld	0.262	0.007	0.022
Garfield, Mesa, Rio Blanco, & Moffat	0.178	0.004	0.010
Remainder of Colorado <sup>3</sup>	0.262	0.007	0.022

<sup>1</sup> Testing may be performed at any site to determine site-specific emissions factors. These default emission factors may be revised by the Division in the future, pending approved data and testing results.

<sup>2</sup> Units of lb/bbl means pounds of emissions per barrel of produced water throughput

<sup>3</sup> For counties not listed in this table, use the emissions factors listed as a conservative measure or perform testing to determine a site-specific emission factor

#### 3.2. *What type of emissions are included in the produced water tank state default emission factors?*

State default emission factors for produced water tanks include flash, working, and breathing losses.

#### 3.3. *Are there limits as to when produced water tank state default emission factors may be used?*

State default emission factors may be used at all oil and gas industry tank batteries. The Division intends to work with industry to refine emission factors and may develop separate emission factors for E&P and non-E&P sites.

#### 3.4. *When are site-specific emission factors required for tank batteries?*

Site-specific emission factors may be developed and used on a voluntary basis for any tank battery. The Division reserves the authority to require site-specific emission factors at any time. Site-specific emission factors may only be applied at the tank battery for which they were developed, unless otherwise approved by the Division.

#### 3.5. *How is a site-specific emission factor developed?*

A site-specific emission factor for tank batteries is developed by performing a Division approved stack test. A test protocol must be submitted and approved by the Division prior to performing the test. Once a test protocol has been approved by the Division, subsequent testing may be performed following the approved protocol without submittal to the Division.

The Division must be notified of the site specific testing at least 30-days prior to the actual test date.



Emission Factor  
Determination for Produced  
Water Storage Tanks

TCEQ Project 2010-29

Prepared for:  
**Texas Commission on Environmental Quality**  
**Austin, Texas**

Prepared by:  
**ENVIRON International Corporation**  
**Novato, California**

Date:  
**August 2010**

ENVIRON Project Number:  
**06-17477T**

Document source:

<https://www.tceq.texas.gov/assets/public/implementation/air/am/contracts/reports/ei/5820784005FY1024-20100830-environ-%20EmissionFactorDeterminationForProducedWaterStorageTanks.pdf>

## Executive Summary

The overall purpose of this Study is to evaluate volatile organic compounds (VOC), speciated VOC and hazardous air pollutant (HAP) emissions from produced water and/or saltwater storage tanks servicing oil and gas wells and to develop appropriate VOC and HAP emission factors. The emission factors are to be used for emission inventory development purposes.

The primary source of information for this study was testing conducted by the Texas Commission on Environmental Quality (TCEQ) under Work Order 522-7-84005-FY10-25, *Upstream Oil & Gas Tank Measurements*, TCEQ Project 2010-39. As part of this referenced testing project, pressurized produced water samples were taken at seven different tank batteries located in Johnson, Wise and Tarrant Counties, Texas (all part of the Eastern Barnett Shale region) and analyzed for flash gas volume and composition. The sample collection and analysis conducted as part of TCEQ Project 2010-39 was done according to strict sampling and quality assurance procedures. In addition to TCEQ Project 2010-39 data, a thorough review of publically-available information sources identified a limited amount of data on produced water emissions. This was supplemented by data provided by two natural gas producers and one petroleum engineering services company. Other than TCEQ Project 2010-39 data, however, it could not be confirmed that any of the data had undergone a rigorous quality assurance process and therefore is considered secondary data, used to support conclusions drawn using the primary data but not used directly in deriving the produced water emission factors.

Emissions from produced water storage tanks consist of flash emissions, working losses and breathing losses. Flash emissions are determined using flash gas analysis. Working and breathing losses are estimated using EPA TANKS 4.09d software. Using this approach and the assumptions detailed within this report, it is determined that working and breathing losses associated with primary data source sites are very small compared to flash emissions and can be ignored without affecting the overall emission factor determination.

Table ES-1 presents the recommended emission factors for VOC and four HAPs – benzene, toluene, ethylbenzene and xylenes – derived from the primary data source sites. For comparative purposes, average emissions from Texas and non-Texas secondary sites are also presented in Table ES-1.

**Table ES-1. Recommended Emission Factors and Comparative Data**

Pollutant	Average Produced Water Emission Factor by Data Set (lb/bbl)		
	Recommended Emission Factor	Secondary Data – Texas	Secondary Data – Non-Texas
VOC	0.01	0.012	0.18
Benzene	0.0001	0.0012	0.004
Toluene	0.0003	0.0012	0.009
Ethylbenzene	0.000006	0.0001	0.0007
Xylenes	0.00006	0.0003	0.006

### Extended Gas Analysis

**Gas Composition : Thompson Inlet LP (12/10/2018)**

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	1.8655	44.01	2.164E-03
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	0.4417	28.01	3.261E-04
Methane	86.5100	16.04	3.657E-02
Ethane	6.3818	30.07	5.058E-03
Propane	2.7506	44.09	3.196E-03
Isobutane	0.4939	58.12	7.566E-04
n-Butane	0.7432	58.12	1.139E-03
Isopentane	0.2542	72.15	4.834E-04
n-Pentane	0.1836	72.15	3.491E-04
Cyclopentane	0.0084	70.14	1.553E-05
n-Hexane	0.0640	86.17	1.454E-04
Cyclohexane	0.0713	84.16	1.582E-04
Other hexanes	0.0950	86.18	2.158E-04
Heptanes	0.0435	100.20	1.149E-04
Methylcyclohexane	0.0395	98.19	1.022E-04
2,2,4-Trimethylpentane	0.0024	114.23	7.226E-06
Benzene	0.0100	78.11	2.059E-05
Toluene	0.0135	92.14	3.279E-05
Ethylbenzene	0.0004	106.17	1.119E-06
Xylenes	0.0035	106.17	9.794E-06
C8+ Heavies	0.0243	110.00	7.045E-05
Total	100.0003		
Total VOC			6.818E-03

Gas stream composition obtained from Thompson Inlet LP extended gas analysis dated December 10, 2018.  
 Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.4 scf/lb-mole

Hydrocarbon compound Non-Detect (ND) responses in the analytical lab report are less than 1 ppm, and are reported as zero mole percent in the gas analysis used in the emission calculations.

Gas constituent pentane isomer neopentane (MW 72.151) is added to the isopentane isomer (MW 72.151).

Gas constituent methylcyclopentane (MW 84.162) is added to the cyclohexane (MW 84.162).

'Heptanes' includes gas constituents 2-Methylhexane (Isoheptane), 3-Methylhexane, i-Heptanes, and Heptane.

'C8+ Heavies' includes gas constituents 2-Methylheptane, 4-Methylheptane, i-octanes, octane, i-Heptanes, and Heptane.

**Raw GAS Analysis : Thompson Inlet LP (12/10/2018)**

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Nitrogen	0.4417	28.01	3.261E-04
CO2	1.8655	44.01	2.16E-03
Methane	86.5100	16.04	3.66E-02
Ethane	6.3818	30.07	5.06E-03
Propane	2.7506	44.09	3.20E-03
Iso-Butane	0.4939	58.12	7.57E-04
N-Butane	0.7432	58.12	1.14E-03
Neopentane (2,2,-Dimethylpropane)	0.0056	72.15	1.06E-05
i-Pentane	0.2486	72.15	4.73E-04
N-Pentane	0.1836	72.15	3.49E-04
Neohexane (2,2,4-Dimethylbutane)	0.0087	86.17	1.98E-05
2,3-Dimethylbutane	0.0081	86.18	1.84E-05
Cyclopentane	0.0084	70.14	1.55E-05
2-Methylpentane (Isohexane)	0.0544	86.18	1.24E-04
3-Methylpentane	0.0238	86.18	5.41E-05
C6 (n-Hexane)	0.0640	86.17	1.45E-04
Methylcyclopentane	0.0472	84.16	1.05E-04
Benzene	0.0100	78.11	2.06E-05
Cyclohexane	0.0241	84.16	5.35E-05
2-Methylhexane (Isoheptane)	0.0076	100.21	2.01E-05
3-Methylhexane	0.0091	100.21	2.40E-05
2,2,4-Trimethylpentane (Isooctane)	0.0024	114.23	7.23E-06
i-Heptanes	0.0049	100.20	1.29E-05
Heptane	0.0219	100.20	5.78E-05
Methylcyclohexane	0.0395	98.19	1.02E-04
Toluene	0.0135	92.14	3.28E-05
2-Methylheptane	0.0066	114.23	1.99E-05
4-Methylheptane	0.0034	114.23	1.02E-05
i-Octanes	0.0037	114.23	1.11E-05
Octane	0.0073	114.23	2.20E-05
Ethylbenzene	0.0004	106.17	1.12E-06
m-, p- Xylene	0.0032	106.17	8.95E-06
o-Xylene	0.0003	106.17	8.40E-07
i-C9	0.0010	128.2	3.38E-06
C9	0.0010	128.2	3.38E-06
i-C10	0.0006	142.29	2.25E-06
C10	0.0007	142.29	2.63E-06
i-C11	0.0000	156.31	0.00E+00
C11	0.0000	156.31	0.00E+00
C12P	0.0000	170.33	0.00E+00
Sum Total	100.0003		0.0509
Total VOC			2.17E-04



2030 Afton Place  
 Farmington, NM 87401  
 (505) 325-6622

Analysis No: HM180009  
 Cust No: 33700-10040

### Well/Lease Information

Customer Name: HARVEST MIDSTREAM  
 Well Name: THOMPSON INLET LP  
 County/State:  
 Location:  
 Field:  
 Formation:  
 Cust. Stn. No.: 0121630

Source:  
 Well Flowing:  
 Pressure: 57 PSIG  
 Flow Temp: 45 DEG. F  
 Ambient Temp: DEG. F  
 Flow Rate: MCF/D  
 Sample Method:  
 Sample Date: 12/10/2018  
 Sample Time: 10.07 AM  
 Sampled By: DENNIS FERRARI  
 Sampled by (CO): HARVEST

Heat Trace:  
 Remarks: CALCULATED MOLECULAR WEIGHT = 19.3533

### Analysis

Component:	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.4417	0.4341	0.0490	0.00	0.0043
CO2	1.8655	1.8335	0.3190	0.00	0.0283
Methane	86.5100	85.0248	14.7050	873.75	0.4792
Ethane	6.3818	6.2722	1.7110	112.94	0.0663
Propane	2.7506	2.7034	0.7600	69.21	0.0419
Iso-Butane	0.4939	0.4854	0.1620	16.06	0.0099
N-Butane	0.7432	0.7304	0.2350	24.24	0.0149
Neopentane 2,2 dmc3	0.0056	0.0055	0.0020	0.22	0.0001
I-Pentane	0.2486	0.2443	0.0910	9.94	0.0062
N-Pentane	0.1836	0.1804	0.0670	7.36	0.0046
Neohexane	0.0087	N/R	0.0040	0.41	0.0003
2-3-Dimethylbutane	0.0081	N/R	0.0030	0.38	0.0002
Cyclopentane	0.0084	N/R	0.0020	0.32	0.0002
2-Methylpentane	0.0544	N/R	0.0230	2.58	0.0016
3-Methylpentane	0.0238	N/R	0.0100	1.13	0.0007
C6	0.0640	0.3692	0.0260	3.04	0.0019
Methylcyclopentane	0.0472	N/R	0.0170	2.12	0.0014
Benzene	0.0100	N/R	0.0030	0.37	0.0003
Cyclohexane	0.0241	N/R	0.0080	1.08	0.0007
2-Methylhexane	0.0076	N/R	0.0040	0.41	0.0003
3-Methylhexane	0.0091	N/R	0.0040	0.50	0.0003
2-2-4-Trimethylpentane	0.0024	N/R	0.0010	0.15	0.0001
i-heptanes	0.0049	N/R	0.0020	0.26	0.0002
Heptane	0.0219	N/R	0.0100	1.21	0.0008

Methylcyclohexane	0.0395	N/R	0.0160	2.06	0.0013
Toluene	0.0135	N/R	0.0050	0.60	0.0004
2-Methylheptane	0.0066	N/R	0.0030	0.41	0.0003
4-Methylheptane	0.0034	N/R	0.0020	0.21	0.0001
i-Octanes	0.0037	N/R	0.0020	0.22	0.0001
Octane	0.0073	N/R	0.0040	0.46	0.0003
Ethylbenzene	0.0004	N/R	0.0000	0.02	0.0000
m, p Xylene	0.0032	N/R	0.0010	0.17	0.0001
o Xylene (& 2,2,4 tmc7)	0.0003	N/R	0.0000	0.02	0.0000
i-C9	0.0010	N/R	0.0010	0.07	0.0000
C9	0.0010	N/R	0.0010	0.07	0.0000
i-C10	0.0006	N/R	0.0000	0.04	0.0000
C10	0.0007	N/R	0.0000	0.05	0.0000
i-C11	0.0000	N/R	0.0000	0.00	0.0000
C11	0.0000	N/R	0.0000	0.00	0.0000
C12P	0.0000	N/R	0.0000	0.00	0.0000
<b>Total</b>	<b>100.00</b>	<b>98.283</b>	<b>18.253</b>	<b>1132.10</b>	<b>0.6674</b>

\* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

\*\*@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z):	1.0029	CYLINDER #:	201
BTU/CU.FT IDEAL:	1134.7	CYLINDER PRESSURE:	61 PSIG
BTU/CU.FT (DRY) CORRECTED FOR (1/Z):	1138.0	ANALYSIS DATE:	12/11/2018
BTU/CU.FT (WET) CORRECTED FOR (1/Z):	1118.2	ANALYSIS TIME:	11:12:55 AM
DRY BTU @ 15.025:	1160.8	ANALYSIS RUN BY:	PATRICIA KING
REAL SPECIFIC GRAVITY:	0.6691		

**GPM, BTU, and SPG calculations as shown above are based on current GPA constants.**

**GPA Standard: GPA 2286-14**

**GC: SRI Instruments 8610 Last Cal/Verify: 12/11/2018**

**GC Method: C12+BTEX Gas**



HARVEST MIDSTREAM  
WELL ANALYSIS COMPARISON

**Lease:** THOMPSON INLET LP  
**Stn. No.:** 0121630  
**Mtr. No.:**

12/11/2018  
33700-10040

---

Smpl Date:	12/10/2018
Test Date:	12/11/2018
Run No:	HM180009
Nitrogen:	0.4417
CO2:	1.8655
Methane:	86.5100
Ethane:	6.3818
Propane:	2.7506
I-Butane:	0.4939
N-Butane:	0.7432
2,2 dmc3:	0.0056
I-Pentane:	0.2486
N-Pentane:	0.1836
Neohexane:	0.0087
2-3-	0.0081
Cyclopentane:	0.0084
2-Methylpentane:	0.0544
3-Methylpentane:	0.0238
C6:	0.0640
Methylcyclopentane:	0.0472
Benzene:	0.0100
Cyclohexane:	0.0241
2-Methylhexane:	0.0076
3-Methylhexane:	0.0000
2-2-4-	0.0024
i-heptanes:	0.0049
Heptane:	0.0219
Methylcyclohexane:	0.0395
Toluene:	0.0135
2-Methylheptane:	0.0066
4-Methylheptane:	0.0034
i-Octanes:	0.0037
Octane:	0.0073
Ethylbenzene:	0.0004
m, p Xylene:	0.0032
o Xylene (& 2,2,4	0.0003
i-C9:	0.0010
C9:	0.0010
i-C10:	0.0006
C10:	0.0007
i-C11:	0.0000
C11:	0.0000
C12P:	0.0000
BTU:	1138.0
GPM:	18.2670
SPG:	0.6691



# 1995 Protocol for Equipment Leak Emission Estimates

Emission Standards Division

U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Air and Radiation  
Office of Air Quality Planning and Standards  
Research Triangle Park, North Carolina 27711

November 1995

TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

Equipment Type	Service <sup>a</sup>	Emission Factor (kg/hr/source) <sup>b</sup>
Valves	Gas	4.5E-03
	Heavy Oil	8.4E-06
	Light Oil	2.5E-03
	Water/Oil	9.8E-05
Pump seals	Gas	2.4E-03
	Heavy Oil	NA
	Light Oil	1.3E-02
	Water/Oil	2.4E-05
Others <sup>c</sup>	Gas	8.8E-03
	Heavy Oil	3.2E-05
	Light Oil	7.5E-03
	Water/Oil	1.4E-02
Connectors	Gas	2.0E-04
	Heavy Oil	7.5E-06
	Light Oil	2.1E-04
	Water/Oil	1.1E-04
Flanges	Gas	3.9E-04
	Heavy Oil	3.9E-07
	Light Oil	1.1E-04
	Water/Oil	2.9E-06
Open-ended lines	Gas	2.0E-03
	Heavy Oil	1.4E-04
	Light Oil	1.4E-03
	Water/Oil	2.5E-04

<sup>a</sup>Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

<sup>b</sup>These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

<sup>c</sup>The "other" equipment type was derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

Table A-1 to Subpart A of Part 98—Global Warming Potentials

GLOBAL WARMING POTENTIALS

[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Carbon dioxide	124-38-9	CO <sub>2</sub>	1
Methane	74-82-8	CH <sub>4</sub>	<sup>a</sup> 25
Nitrous oxide	10024-97-2	N <sub>2</sub> O	<sup>a</sup> 298
HFC-23	75-46-7	CHF <sub>3</sub>	<sup>a</sup> 14,800
HFC-32	75-10-5	CH <sub>2</sub> F <sub>2</sub>	<sup>a</sup> 675
HFC-41	593-53-3	CH <sub>3</sub> F	<sup>a</sup> 92
HFC-125	354-33-6	C <sub>2</sub> HF <sub>5</sub>	<sup>a</sup> 3,500
HFC-134	359-35-3	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub>	<sup>a</sup> 1,100
HFC-134a	811-97-2	CH <sub>2</sub> FCF <sub>3</sub>	<sup>a</sup> 1,430
HFC-143	430-66-0	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	<sup>a</sup> 353
HFC-143a	420-46-2	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	<sup>a</sup> 4,470
HFC-152	624-72-6	CH <sub>2</sub> FCH <sub>2</sub> F	53
HFC-152a	75-37-6	CH <sub>3</sub> CHF <sub>2</sub>	<sup>a</sup> 124
HFC-161	353-36-6	CH <sub>3</sub> CH <sub>2</sub> F	12
HFC-227ea	431-89-0	C <sub>3</sub> HF <sub>7</sub>	<sup>a</sup> 3,220
HFC-236cb	677-56-5	CH <sub>2</sub> FCF <sub>2</sub> CF <sub>3</sub>	1,340
HFC-236ea	431-63-0	CHF <sub>2</sub> CHFCF <sub>3</sub>	1,370
HFC-236fa	690-39-1	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>	<sup>a</sup> 9,810
HFC-245ca	679-86-7	C <sub>3</sub> H <sub>3</sub> F <sub>5</sub>	<sup>a</sup> 693
HFC-245fa	460-73-1	CHF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	1,030
HFC-365mfc	406-58-6	CH <sub>3</sub> CF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	794
HFC-43-10mee	138495-42-8	CF <sub>3</sub> CFHCFHCF <sub>2</sub> CF <sub>3</sub>	<sup>a</sup> 1,640
Sulfur hexafluoride	2551-62-4	SF <sub>6</sub>	<sup>a</sup> 22,800
Trifluoromethyl sulphur pentafluoride	373-80-8	SF <sub>5</sub> CF <sub>3</sub>	17,700
Nitrogen trifluoride	7783-54-2	NF <sub>3</sub>	17,200
PFC-14 (Perfluoromethane)	75-73-0	CF <sub>4</sub>	<sup>a</sup> 7,390
PFC-116 (Perfluoroethane)	76-16-4	C <sub>2</sub> F <sub>6</sub>	<sup>a</sup> 12,200
PFC-218 (Perfluoropropane)	76-19-7	C <sub>3</sub> F <sub>8</sub>	<sup>a</sup> 8,830
Perfluorocyclopropane	931-91-9	C-C <sub>3</sub> F <sub>6</sub>	17,340
PFC-3-1-10 (Perfluorobutane)	355-25-9	C <sub>4</sub> F <sub>10</sub>	<sup>a</sup> 8,860
PFC-318 (Perfluorocyclobutane)	115-25-3	C-C <sub>4</sub> F <sub>8</sub>	<sup>a</sup> 10,300
PFC-4-1-12 (Perfluoropentane)	678-26-2	C <sub>5</sub> F <sub>12</sub>	<sup>a</sup> 9,160
PFC-5-1-14 (Perfluorohexane, FC-72)	355-42-0	C <sub>6</sub> F <sub>14</sub>	<sup>a</sup> 9,300
PFC-9-1-18	306-94-5	C <sub>10</sub> F <sub>18</sub>	7,500
HCFE-235da2 (Isoflurane)	26675-46-7	CHF <sub>2</sub> OCHClCF <sub>3</sub>	350
HFE-43-10pccc (H-Galden 1040x, HG-11)	E1730133	CHF <sub>2</sub> OCF <sub>2</sub> OC <sub>2</sub> F <sub>4</sub> OCHF <sub>2</sub>	1,870

HFE-125	3822-68-2	CHF <sub>2</sub> OCF <sub>3</sub>	14,900
HFE-134 (HG-00)	1691-17-4	CHF <sub>2</sub> OCHF <sub>2</sub>	6,320
HFE-143a	421-14-7	CH <sub>3</sub> OCF <sub>3</sub>	756
HFE-227ea	2356-62-9	CF <sub>3</sub> CHFOCF <sub>3</sub>	1,540
HFE-236ca12 (HG-10)	78522-47-1	CHF <sub>2</sub> OCF <sub>2</sub> OCHF <sub>2</sub>	2,800
HFE-236ea2 (Desflurane)	57041-67-5	CHF <sub>2</sub> OCHF <sub>2</sub> CF <sub>3</sub>	989
HFE-236fa	20193-67-3	CF <sub>3</sub> CH <sub>2</sub> OCF <sub>3</sub>	487
HFE-245cb2	22410-44-2	CH <sub>3</sub> OCF <sub>2</sub> CF <sub>3</sub>	708
HFE-245fa1	84011-15-4	CHF <sub>2</sub> CH <sub>2</sub> OCF <sub>3</sub>	286
HFE-245fa2	1885-48-9	CHF <sub>2</sub> OCH <sub>2</sub> CF <sub>3</sub>	659
HFE-254cb2	425-88-7	CH <sub>3</sub> OCF <sub>2</sub> CHF <sub>2</sub>	359
HFE-263fb2	460-43-5	CF <sub>3</sub> CH <sub>2</sub> OCH <sub>3</sub>	11
HFE-329mcc2	134769-21-4	CF <sub>3</sub> CF <sub>2</sub> OCF <sub>2</sub> CHF <sub>2</sub>	919
HFE-338mcf2	156053-88-2	CF <sub>3</sub> CF <sub>2</sub> OCH <sub>2</sub> CF <sub>3</sub>	552
HFE-338pcc13 (HG-01)	188690-78-0	CHF <sub>2</sub> OCF <sub>2</sub> CF <sub>2</sub> OCHF <sub>2</sub>	1,500
HFE-347mcc3 (HFE-7000)	375-03-1	CH <sub>3</sub> OCF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>	575
HFE-347mcf2	171182-95-9	CF <sub>3</sub> CF <sub>2</sub> OCH <sub>2</sub> CHF <sub>2</sub>	374
HFE-347pcf2	406-78-0	CHF <sub>2</sub> CF <sub>2</sub> OCH <sub>2</sub> CF <sub>3</sub>	580
HFE-356mec3	382-34-3	CH <sub>3</sub> OCF <sub>2</sub> CHF <sub>2</sub> CF <sub>3</sub>	101
HFE-356pcc3	160620-20-2	CH <sub>3</sub> OCF <sub>2</sub> CF <sub>2</sub> CHF <sub>2</sub>	110
HFE-356pcf2	50807-77-7	CHF <sub>2</sub> CH <sub>2</sub> OCF <sub>2</sub> CHF <sub>2</sub>	265
HFE-356pcf3	35042-99-0	CHF <sub>2</sub> OCH <sub>2</sub> CF <sub>2</sub> CHF <sub>2</sub>	502
HFE-365mcf3	378-16-5	CF <sub>3</sub> CF <sub>2</sub> CH <sub>2</sub> OCH <sub>3</sub>	11
HFE-374pc2	512-51-6	CH <sub>3</sub> CH <sub>2</sub> OCF <sub>2</sub> CHF <sub>2</sub>	557
HFE-449s1 (HFE-7100)	163702-07-6	C <sub>4</sub> F <sub>9</sub> OCH <sub>3</sub>	297
Chemical blend	163702-08-7	(CF <sub>3</sub> ) <sub>2</sub> CF <sub>2</sub> OCF <sub>2</sub> CH <sub>3</sub>	
HFE-569sf2 (HFE-7200)	163702-05-4	C <sub>4</sub> F <sub>9</sub> OC <sub>2</sub> H <sub>5</sub>	59
Chemical blend	163702-06-5	(CF <sub>3</sub> ) <sub>2</sub> CF <sub>2</sub> OCF <sub>2</sub> OC <sub>2</sub> H <sub>5</sub>	
Sevoflurane (HFE-347mmz1)	28523-86-6	CH <sub>2</sub> FOCH(CF <sub>3</sub> ) <sub>2</sub>	345
HFE-356mm1	13171-18-1	(CF <sub>3</sub> ) <sub>2</sub> CHOCH <sub>3</sub>	27
HFE-338mmz1	26103-08-2	CHF <sub>2</sub> OCH(CF <sub>3</sub> ) <sub>2</sub>	380
(Octafluorotetramethy-lene) hydroxymethyl group	NA	X-(CF <sub>2</sub> ) <sub>4</sub> CH(OH)-X	73
HFE-347mmy1	22052-84-2	CH <sub>3</sub> OCF(CF <sub>3</sub> ) <sub>2</sub>	343
Bis(trifluoromethyl)-methanol	920-66-1	(CF <sub>3</sub> ) <sub>2</sub> CHOH	195
2,2,3,3,3-pentafluoropropanol	422-05-9	CF <sub>3</sub> CF <sub>2</sub> CH <sub>2</sub> OH	42
PFPME (HT-70)	NA	CF <sub>3</sub> OCF(CF <sub>3</sub> )CF <sub>2</sub> OCF <sub>2</sub> OCF <sub>3</sub>	10,300

\*The GWP for this compound is different than the GWP in the version of Table A-1 to subpart A of part 98 published on October 30, 2009.

**Table C-1 to Subpart C of Part 98—Default CO<sub>2</sub> Emission Factors and High Heat Values for Various Types of Fuel**

**DEFAULT CO<sub>2</sub> EMISSION FACTORS AND HIGH HEAT VALUES FOR VARIOUS TYPES OF FUEL**

<b>Fuel type</b>	<b>Default high heat value</b>	<b>Default CO<sub>2</sub> emission factor</b>
Coal and coke	mmBtu/short ton	kg CO <sub>2</sub> /mmBtu
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	mmBtu/scf	kg CO <sub>2</sub> /mmBtu
(Weighted U.S. Average)	$1.026 \times 10^{-3}$	53.06
Petroleum products	mmBtu/gallon	kg CO <sub>2</sub> /mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG) <sup>1</sup>	0.092	61.71
Propane <sup>1</sup>	0.091	62.87
Propylene <sup>2</sup>	0.091	67.77
Ethane <sup>1</sup>	0.068	59.60
Ethanol	0.084	68.44
Ethylene <sup>2</sup>	0.058	65.96
Isobutane <sup>1</sup>	0.099	64.94
Isobutylene <sup>1</sup>	0.103	68.86
Butane <sup>1</sup>	0.103	64.77
Butylene <sup>1</sup>	0.105	68.72
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.88
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02

Petrochemical Feedstocks	0.125	71.02
Petroleum Coke	0.143	102.41
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.54
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.54
Other fuels—solid	mmBtu/short ton	kg CO <sub>2</sub> /mmBtu
Municipal Solid Waste	9.95 <sup>3</sup>	90.7
Tires	28.00	85.97
Plastics	38.00	75.00
Petroleum Coke	30.00	102.41
Other fuels—gaseous	mmBtu/scf	kg CO <sub>2</sub> /mmBtu
Blast Furnace Gas	0.092 × 10 <sup>-3</sup>	274.32
Coke Oven Gas	0.599 × 10 <sup>-3</sup>	46.85
Propane Gas	2.516 × 10 <sup>-3</sup>	61.46
Fuel Gas <sup>4</sup>	1.388 × 10 <sup>-3</sup>	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO <sub>2</sub> /mmBtu
Wood and Wood Residuals (dry basis) <sup>5</sup>	17.48	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	10.39	105.51
Biomass fuels—gaseous	mmBtu/scf	kg CO <sub>2</sub> /mmBtu
Landfill Gas	0.485 × 10 <sup>-3</sup>	52.07
Other Biomass Gases	0.655 × 10 <sup>-3</sup>	52.07
Biomass Fuels—Liquid	mmBtu/gallon	kg CO <sub>2</sub> /mmBtu
Ethanol	0.084	68.44
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

<sup>1</sup>The HHV for components of LPG determined at 60 °F and saturation pressure with the exception of ethylene.

<sup>2</sup>Ethylene HHV determined at 41 °F (5 °C) and saturation pressure.

<sup>3</sup>Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

<sup>4</sup>Reporters subject to subpart X of this part that are complying with §98.243(d) or subpart Y of this part may only use the default HHV and the default CO<sub>2</sub> emission factor for fuel gas combustion under the conditions prescribed in §98.243(d)(2)(i) and (d)(2)(ii) and §98.252(a)(1) and (a)(2), respectively. Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C-5) or Tier 4.

<sup>5</sup>Use the following formula to calculate a wet basis HHV for use in Equation C-1:  $HHV_w = ((100 - M)/100) * HHV_d$ , where  $HHV_w$  = wet basis HHV, M = moisture content (percent) and  $HHV_d$  = dry basis HHV from Table C-1.

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**Table C-2 to Subpart C of Part 98—Default CH<sub>4</sub> and N<sub>2</sub>O Emission Factors for Various Types of Fuel**

Fuel type	Default CH <sub>4</sub> emission factor (kg CH <sub>4</sub> /mmBtu)	Default N <sub>2</sub> O emission factor (kg N <sub>2</sub> O/mmBtu)
Coal and Coke (All fuel types in Table C-1)	$1.1 \times 10^{-02}$	$1.6 \times 10^{-03}$
Natural Gas	$1.0 \times 10^{-03}$	$1.0 \times 10^{-04}$
Petroleum (All fuel types in Table C-1)	$3.0 \times 10^{-03}$	$6.0 \times 10^{-04}$
Fuel Gas	$3.0 \times 10^{-03}$	$6.0 \times 10^{-04}$
Municipal Solid Waste	$3.2 \times 10^{-02}$	$4.2 \times 10^{-03}$
Tires	$3.2 \times 10^{-02}$	$4.2 \times 10^{-03}$
Blast Furnace Gas	$2.2 \times 10^{-05}$	$1.0 \times 10^{-04}$
Coke Oven Gas	$4.8 \times 10^{-04}$	$1.0 \times 10^{-04}$
Biomass Fuels—Solid (All fuel types in Table C-1, except wood and wood residuals)	$3.2 \times 10^{-02}$	$4.2 \times 10^{-03}$
Wood and wood residuals	$7.2 \times 10^{-03}$	$3.6 \times 10^{-03}$
Biomass Fuels—Gaseous (All fuel types in Table C-1)	$3.2 \times 10^{-03}$	$6.3 \times 10^{-04}$
Biomass Fuels—Liquid (All fuel types in Table C-1)	$1.1 \times 10^{-03}$	$1.1 \times 10^{-04}$

Note: Those employing this table are assumed to fall under the IPCC definitions of the “Energy Industry” or “Manufacturing Industries and Construction”. In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC “Energy Industry” category may employ a value of 1g of CH<sub>4</sub>/mmBtu.

**Table W-1A of Subpart W of Part 98—Default Whole Gas Emission Factors for Onshore Petroleum and Natural Gas Production**

Onshore petroleum and natural gas production	Emission factor (scf/hour/component)
<b>Eastern U.S.</b>	
<b>Population Emission Factors—All Components, Gas Service<sup>1</sup></b>	
Valve	0.027
Connector	0.003
Open-ended Line	0.061
Pressure Relief Valve	0.040
Low Continuous Bleed Pneumatic Device Vents <sup>2</sup>	1.39
High Continuous Bleed Pneumatic Device Vents <sup>2</sup>	37.3
Intermittent Bleed Pneumatic Device Vents <sup>2</sup>	13.5
Pneumatic Pumps <sup>3</sup>	13.3
<b>Population Emission Factors—All Components, Light Crude Service<sup>4</sup></b>	
Valve	0.05
Flange	0.003
Connector	0.007
Open-ended Line	0.05
Pump	0.01
Other <sup>5</sup>	0.30
<b>Population Emission Factors—All Components, Heavy Crude Service<sup>6</sup></b>	
Valve	0.0005
Flange	0.0009
Connector (other)	0.0003
Open-ended Line	0.006
Other <sup>5</sup>	0.003
<b>Western U.S.</b>	
<b>Population Emission Factors—All Components, Gas Service<sup>1</sup></b>	
Valve	0.121
Connector	0.017
Open-ended Line	0.031
Pressure Relief Valve	0.193
Low Continuous Bleed Pneumatic Device Vents <sup>2</sup>	1.39
High Continuous Bleed Pneumatic Device Vents <sup>2</sup>	37.3
Intermittent Bleed Pneumatic Device Vents <sup>2</sup>	13.5
Pneumatic Pumps <sup>3</sup>	13.3
<b>Population Emission Factors—All Components, Light Crude Service<sup>4</sup></b>	
Valve	0.05
Flange	0.003



Connector (other)	0.007
Open-ended Line	0.05
Pump	0.01
Other <sup>5</sup>	0.30
<b>Population Emission Factors—All Components, Heavy Crude Service<sup>6</sup></b>	
Valve	0.0005
Flange	0.0009
Connector (other)	0.0003
Open-ended Line	0.006
Other <sup>5</sup>	0.003

<sup>1</sup>For multi-phase flow that includes gas, use the gas service emissions factors.

<sup>2</sup>Emission Factor is in units of “scf/hour/device.”

<sup>3</sup>Emission Factor is in units of “scf/hour/pump.”

<sup>4</sup>Hydrocarbon liquids greater than or equal to 20°API are considered “light crude.”

<sup>5</sup>“Others” category includes instruments, loading arms, pressure relief valves, stuffing boxes, compressor seals, dump lever arms, and vents.

<sup>6</sup>Hydrocarbon liquids less than 20°API are considered “heavy crude.”

factors. The emission factors can be adjusted based on the CH<sub>4</sub> content of the site-specific gas used to drive the devices if the natural gas is significantly different from the default basis. Also, if the pneumatic devices are driven with gas that contains significant quantities of CO<sub>2</sub>, the CH<sub>4</sub> emission factors can be adjusted based on the relative concentrations of CH<sub>4</sub> and CO<sub>2</sub> in the gas to estimate the CO<sub>2</sub> emissions.

In production, the continuous bleed, intermittent bleed, and average pneumatic device emission factors shown in Table 5-15 are taken from the 1996 GRI/EPA report (Volumes 2 and 12) (Harrison, 1996; Shires, 1996). The pneumatic device emission factors from the GRI/EPA reports were derived using vendor and/or measured data for both intermittent and continuous bleed devices. The instrument controller emission factor (pressure unspecified) is taken from a 2002 CAPP document and is based on data collected in Alberta, Canada (CAPP, 2002). Other pneumatic device emission factors such as transmitters and controllers are taken from a 2003 CAPP report (CAPP, 2003). The emission factors from the 2003 CAPP document are most appropriate for standard (high-bleed) components that were common prior to 1985 and are a function of the device operating pressure (factors are given at 140 kPa or 240 kPa, both gauge pressure).

**Table 5-15. Gas-Driven Pneumatic Device CH<sub>4</sub> Emission Factors**

Device Type	Emission Factor <sup>a</sup> , Original Units	Uncertainty <sup>b</sup> (±%)	Emission Factor <sup>c</sup> , Converted to Tonnes Basis
<b>Production Segment</b>			
Based on 78.8 mole% CH <sub>4</sub> <sup>a</sup>			
Continuous bleed <sup>a</sup>	654 scfd gas/device	40.3	3.608 tonnes/device-yr
Continuous bleed, low/no-bleed <sup>d</sup>	33.4 scfd gas/device	107	0.184 tonnes/device-yr
Continuous bleed, high-bleed <sup>d</sup>	896 scfd gas/device	33.1	4.941 tonnes/device-yr
Intermittent bleed <sup>a</sup>	323 scfd gas/device	41.2	1.782 tonnes/device-yr
<i>Production average<sup>a</sup> (if device type is unknown)</i>	<i>345 scfd CH<sub>4</sub>/device</i>	<i>49.5</i>	<i>2.415 tonnes/device-yr</i>
Transmitter (140 kPag) <sup>e</sup>	0.12 m <sup>3</sup> gas/hr/device	Uncertainty not specified	0.56 tonnes/device-yr
Transmitter (240 kPag) <sup>e</sup>	0.2 m <sup>3</sup> gas/hr/device		0.94 tonnes/device-yr
Controller (140 kPag) <sup>e</sup>	0.6 m <sup>3</sup> gas/hr/device		2.8 tonnes/device-yr
Controller (240 kPag) <sup>e</sup>	0.8 m <sup>3</sup> gas/hr/device		3.7 tonnes/device-yr
Controller (pressure not specified) <sup>f</sup>	0.1996 m <sup>3</sup> gas/hr/device		0.9333 tonnes/device-yr
I/P Transducer (140 kPag) <sup>e</sup>	0.6 m <sup>3</sup> gas/hr/device		2.8 tonnes/device-yr
I/P Transducer (240 kPag) <sup>e</sup>	0.8 m <sup>3</sup> gas/hr/device		3.7 tonnes/device-yr
P/P Positioner (140 kPag) <sup>e</sup>	0.32 m <sup>3</sup> gas/hr/device		1.5 tonnes/device-yr

**Table 5-15. Gas-Driven Pneumatic Device CH<sub>4</sub> Emission Factors, continued**

Device Type	Emission Factor <sup>a</sup> , Original Units	Uncertainty <sup>b</sup> (±%)	CH <sub>4</sub> Emission Factor <sup>c</sup> , Converted to Tonnes Basis
<b>Production Segment, continued</b>			Based on 78.8 mole% CH <sub>4</sub> <sup>a</sup>
P/P Positioner (240 kPag) <sup>e</sup>	0.5 m <sup>3</sup> gas/hr/device		2.3 tonnes/device-yr
I/P Positioner (140 kPag) <sup>e</sup>	0.4 m <sup>3</sup> gas/hr/device		1.9 tonnes/device-yr
I/P Positioner (240 kPag) <sup>e</sup>	0.6 m <sup>3</sup> gas/hr/device		2.8 tonnes/device-yr
<b>Processing</b>			Based on 86.8 mole% CH <sub>4</sub> <sup>a</sup>
Continuous bleed	497,584 scf gas/device-yr	35.5	8.304 tonnes/device-yr
Piston valve operator	48 scf gas/device-yr	60.9	8.010E-04 tonnes/device-yr
Pneumatic/hydraulic valve operator	5,627 scf gas/device-yr	134	0.0939 tonnes/device-yr
Turbine valve operator	67,599 scf gas/device-yr	407	1.128 tonnes/device-yr
<i>Processing average (if device type is unknown)</i>	<i>164,949 scf CH<sub>4</sub>/plant-yr</i>	<i>170</i>	<i>3.164 tonnes/plant-yr</i>
	<i>7.431<sup>g</sup> scf CH<sub>4</sub>/MMscf processed</i>		<i>1.425E-04 tonnes/10<sup>6</sup> scf processed 5.034E-03 tonnes/10<sup>6</sup> m<sup>3</sup> processed</i>
<b>Transmission and Storage</b>			Based on 93.4 mole% CH <sub>4</sub> <sup>a</sup>
Continuous bleed	497,584 scf gas/device-yr	35.5	8.915 tonnes/device-yr
Pneumatic/hydraulic valve operator	5,627 scf gas/device-yr	134	0.1008 tonnes/device-yr
Turbine valve operator	67,599 scf gas/device-yr	407	1.211 tonnes/device-yr
<i>Transmission or Storage average (if device type is unknown)</i>	<i>162,197 scf CH<sub>4</sub>/device-yr</i>	<i>96.3</i>	<i>3.111 tonnes/device-yr</i>
<b>Distribution</b>			
Pneumatic isolation valves <sup>h</sup> based on 93.4 mole% CH <sub>4</sub>	0.366 tonnes CH <sub>4</sub> /device-yr	Uncertainty not specified	0.366 tonnes/device-yr
Pneumatic control loops <sup>h</sup> based on 94.4 mole% CH <sub>4</sub>	3.465 tonnes CH <sub>4</sub> /device-yr		3.465 tonnes/device-yr
<i>Distribution average (if device type is unknown) based on 94.9 mole% CH<sub>4</sub> weighted avg.</i>	<i>2.941 tonnes CH<sub>4</sub>/device-yr</i>		<i>2.941 tonnes/device-yr</i>

Footnotes and Sources:

<sup>a</sup> Shires, T.M. and M.R. Harrison. *Methane Emissions from the Natural Gas Industry, Volume 12: Pneumatic Devices, Final Report*, GRI-94/0257.29 and EPA-600/R-96-080I, Gas Research Institute and U.S. Environmental Protection Agency, June 1996; and Harrison, M.R., L.M. Campbell, T.M. Shires, and R.M. Cowgill. *Methane Emissions from the Natural Gas Industry, Volume 2: Technical Report, Final Report*, GRI-94/0257.1 and EPA-600/R-96-080b, Gas Research Institute and U.S. Environmental Protection Agency, June 1996. The average CH<sub>4</sub> concentration associated with these emission factors is provided in Table E-4.

<sup>b</sup> Uncertainty based on 95% confidence interval converted from the 90% confidence intervals for the data used to develop the original emission factor.

<sup>c</sup> CH<sub>4</sub> emission factors converted from scf or m<sup>3</sup> are based on 60°F and 14.7 psia.

<sup>d</sup> High-bleed devices refer to devices with leak rates greater than 6 scf/hr while low-bleed devices are 6 scf/hr or lower. Developed from data used for Volume 12 of the GRI/EPA natural gas industry CH<sub>4</sub> emissions study (Shires, 1996). Refer to Appendix B for the development of these emission factors.

<sup>e</sup> Canadian Association of Petroleum Producers (CAPP), *Calculating Greenhouse Gas Emissions*, Table 1-12, Canadian Association of Petroleum Producers, Publication Number 2003-03, April 2003. Note that the emission factors provided by this source are for the total gas emitted and were converted to a CH<sub>4</sub> basis using the CH<sub>4</sub> content shown in the table. I/P refers to a device that converts electric current to pneumatic pressure. P/P refers to a device that converts pneumatic pressure to pneumatic pressure.

<sup>f</sup> Canadian Association of Petroleum Producers (CAPP), *Estimation of Flaring and Venting Volumes from Upstream Oil and Gas Facilities*, Table 3-4, Canadian Association of Petroleum Producers, Publication Number 2002-0009, May 2002. Factor shown is based on data collected in Alberta, and was converted from a total gas basis to a CH<sub>4</sub> basis using the CH<sub>4</sub> content shown in the table.

<sup>g</sup> Shires, T.M. and C.J. Loughran. *Updated Canadian National Greenhouse Gas Inventory for 1995, Emission Factor Documentation, Technical Memorandum*, August 23, 2001.

<sup>h</sup> Derived from estimated processing pneumatic devices vented CH<sub>4</sub> emissions (0.1196 ± 133% Bscf/YR) (Harrison, et al., Vol 2, 1996), and estimated annual gas processed (16,450.855 Bscf/YR (DOE, 1993)).

significantly different CH<sub>4</sub> content from the default basis. Also, if the facility gas contains significant quantities of CO<sub>2</sub>, the CH<sub>4</sub> emission factor can be adjusted based on the relative concentrations of CH<sub>4</sub> and CO<sub>2</sub> in the gas to estimate the CO<sub>2</sub> emissions.

**Table 5-25. Gas Processing Segment CH<sub>4</sub> Emission Factor for Non-Routine Activities**

Source	CH <sub>4</sub> Emission Factor <sup>a</sup> , Original Units	CH <sub>4</sub> Emission Factor <sup>b</sup> , Converted to Tonnes Basis	CH <sub>4</sub> Content Basis of Factor	Uncertainty <sup>c</sup> (±%)
Gas processing non-routine emissions	184 scf/10 <sup>6</sup> scf processed	3.524E-03 tonne/10 <sup>6</sup> scf processed	86.8 mole %	Not available
		0.1244 tonnes/10 <sup>6</sup> m <sup>3</sup> processed		

Footnotes and Sources:

<sup>a</sup> Derived from estimated processing blowdown vented methane emissions (2.9475 Bscf/yr, [Harrison et al., Vol. 2, 1996]) and estimated annual gas processed (16,045.855 Bscf/yr [DOE, 1993]).

<sup>b</sup> CH<sub>4</sub> emission factors converted from scf or m<sup>3</sup> are based on 60°F and 14.7 psia. The average CH<sub>4</sub> concentration associated with these emission factors is provided in Table E-4. The CH<sub>4</sub> emission factors can be adjusted based on the relative concentrations of CH<sub>4</sub> and CO<sub>2</sub> to estimate CO<sub>2</sub> emissions.

<sup>c</sup> Uncertainty based on 95% confidence interval converted from the 90% confidence intervals for the data used to develop the original emission factor.

Due to the hazards associated with H<sub>2</sub>S, venting of sour gas is generally avoided/prohibited.

Where the sour gas stream is routed to a combustion control device, the methodologies provided in Section 4.7 should be applied.

An example is provided in Exhibit 5.33.

**EXHIBIT 5.33: Sample Calculation for Processing Non-Routine Related Emissions**

**INPUT DATA:**

A natural gas processing facility treats 20×10<sup>6</sup> m<sup>3</sup> of gas per day. The facility gas has a typical CH<sub>4</sub> content and no CO<sub>2</sub>. Estimate the blowdown emissions for this facility.

**CALCULATION METHODOLOGY:**

The processing plant throughput is multiplied by the emission factor presented in Table 5-25. The CH<sub>4</sub> emission factor is not corrected by the site CH<sub>4</sub> content because the composition is assumed to be consistent with the default emission factor CH<sub>4</sub> content.

Gas processing plant blowdowns:

$$CH_4 : \frac{20 \times 10^6 \text{ m}^3}{\text{day}} \times \frac{365 \text{ days}}{\text{yr}} \times \frac{0.1244 \text{ tonnes } CH_4}{10^6 \text{ m}^3} = \underline{908 \text{ tonnes } CH_4/\text{yr}}$$

# Section 8

## Map(s)

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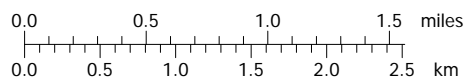
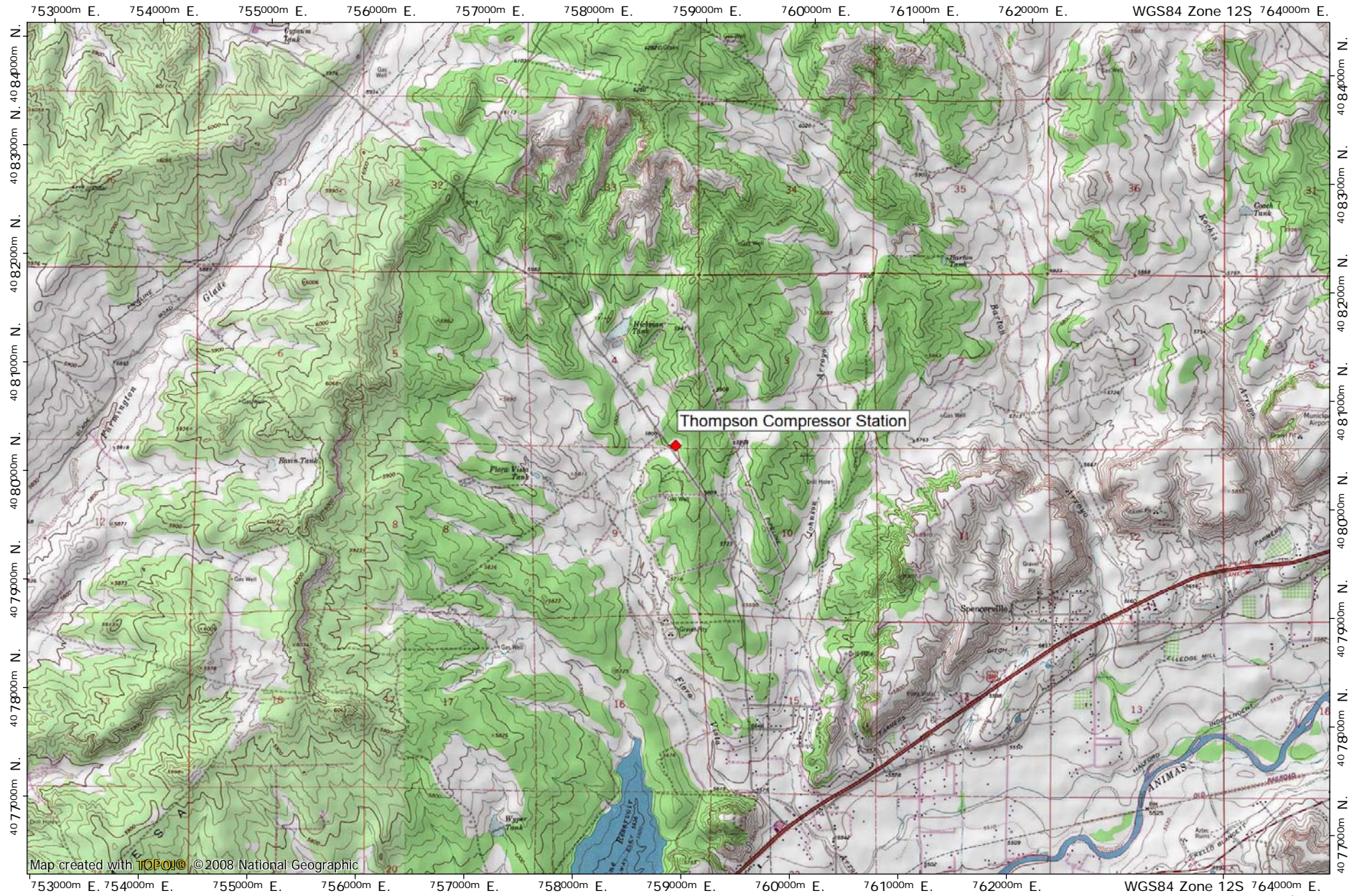
A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

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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Please see the following page(s).

WILLIAMS FOUR CORNERS LLC - THOMPSON COMPRESSOR STATION - San Juan County., NM T 30 N, R 12 W, Sections 04 & 09



TN  $\uparrow$  MN  
9 1/2°  
01/03/18

# 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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Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant’s Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

**New Permit** and **Significant Permit Revision** public notices must include all items in this list.

**Technical Revision** public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1.  A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
  2.  A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
  3.  A copy of the property tax record (20.2.72.203.B NMAC).
  4.  A sample of the letters sent to the owners of record.
  5.  A sample of the letters sent to counties, municipalities, and Indian tribes.
  6.  A sample of the public notice posted and a verification of the local postings.
  7.  A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
  8.  A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
  9.  A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
  10.  A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
  11.  A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.
- 

Not applicable for this Title V Operating Permit renewal application submitted under 20.2.70 NMAC.

# 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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The Thompson Compressor Station compresses natural gas for pipeline transmission. Natural gas is received from independent producers via gathering pipelines. The natural gas stream typically contains condensate liquid and produced water, which are separated from the gas stream via an inlet separator. The resulting condensate and produced water are stored in fixed-roof storage tanks until offsite transport via tank trucks. Other storage tanks at the facility store methanol, lube oil, Ambitrol, soap, and industrial bactericide.

The natural gas is compressed for pipeline transmission using centrifugal compressors driven by the natural gas-fired turbine combustion engines. The compressed natural gas exits the facility and is routed downstream.

The slug receiver “catches” a pipeline “pig” to remove s water from the pipeline. The “pig” is a device that is inserted into the pipeline at an upstream point, is pushed through the pipeline along with the pressurized natural gas, and pushes a “slug” of water through the pipeline until the slug is separated and diverted off into a receptacle (receiver). The separated natural gas then continues downstream, and the depressurized water is diverted to a produced water tank.

There are no process bottlenecks that limit production.

Other emission sources include: startups, shutdowns and routine maintenance (SSM) from the compressors and piping, and fugitive emissions from process piping (valves, flanges, seals, etc.).

The facility is authorized to operate continuously.



# 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):

#### Thompson Compressor Station

### 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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**A PSD applicability determination for all sources.** For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

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Not applicable for applications submitted under 20.2.70 NMAC.

# 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 RELEVANT 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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## Federal Regulations

Federal standards and requirements are embodied in Title 40 (Protection of the Environment), Subchapter C (Air Programs) of the CFR, Parts 50 through 99. The applicability of those parts of the CFR that are consistent with the limited list of standards and requirements defined as applicable requirements are identified in the following pages.

### FEDERAL REGULATIONS APPLICABILITY CHECKLIST

FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	<b>National Ambient Air Quality Standards (NAAQS)</b>	Yes	Facility	The requirement to comply with the National Ambient Air Quality Standards applies to all sources operating within the State of New Mexico, including the station.
40 CFR 51	<b>Requirements for Preparation, Adoption, and Submittal of Implementation Plans</b>	No		The responsibility to prepare, adopt and submit for EPA approval Implementation Plans applies to local and state/tribal governmental agencies.  The facility is not a local, state or tribal governmental agency and therefore, the regulation does not apply.
40 CFR 52	<b>Approval and Promulgation of Implementation Plans</b>	No		40 CFR 52.21, <i>Prevention of Significant Deterioration of Air Quality</i> is not applicable to the facility, as it is a Prevention of Significant Deterioration (PSD) minor source.  The remainder of the subpart is also not applicable as it addresses approval of local, state and/or tribal agency Implementation Plans for administering the Prevention of Deterioration (PSD) program.
NSPS 40 CFR 60, Subpart A	<b>General Provisions</b>	Yes	Units 1, 9 & 14	Applies if any other NSPS subpart applies. NSPS subparts GG and KKKK are applicable; therefore, subpart A is also applicable.
NSPS 40 CFR60, Subpart Da	Performance Standards for <b>Electric Utility Steam Generating Units</b>	No		The subpart applies to each electric utility steam generating unit that is capable of combusting more than 73 megawatts (MW) (250 million British thermal units per hour (MMBtu/hr)) heat input of fossil fuel (either alone or in combination with any other fuel); and that commences construction, modification, or reconstruction after September 18, 1978.  The compressor station is not an affected facility as defined under the regulation; therefore, the subpart does not apply.
NSPS 40 CFR 60, Subpart Db	Standards of Performance for <b>Industrial-Commercial-Institutional Steam Generating Units</b>	No		The subpart applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 MW (100 million Btu/hour).  The compressor station is not an affected facility as defined in the regulation; therefore, the subpart does not apply.

FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
NSPS 40 CFR 60, Subpart Dc	Standards of Performance for <b>Small Industrial-Commercial-Institutional Steam Generating Units</b>	No		<p>The subpart applies to each steam generating unit that commences construction, modification, or reconstruction after June 9, 1989, and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr).</p> <p>The facility does not have any affected sources under the regulation; therefore, the subpart does not apply.</p>
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for <b>Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984</b>	No		<p>The affected facility to which this subpart applies are storage tanks with capacity greater than 151,416 liters (40,000 gallons) that are used to store petroleum liquids for which construction is commenced after May 18, 1978.</p> <p>The facility does not have equipment defined as an affected facility as defined in the regulation; therefore, the subpart does not apply.</p>
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for <b>Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984</b>	No		<p>The affected facility to which this subpart applies is any storage vessels with a capacity greater than or equal to 75 cubic meters (m<sup>3</sup>) used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.</p> <p>Except for the unit T-3 condensate storage tank, all of the storage tanks at the facility are below 75 m<sup>3</sup> capacity. Therefore, the regulation does not apply to these tanks.</p> <p>Although the unit T-3 condensate liquid storage tank is a 21,000 gallon (79.5 m<sup>3</sup>) tank constructed in 1985, the tank is used for condensate stored, processed or treated prior to custody transfer. Under the provisions of § 60.110b(b)(4), the subpart does not apply to the tank, and the regulation is not applicable.</p>
NSPS 40 CFR 60 Subpart GG	Standards of Performance for <b>Stationary Gas Turbines</b>	Yes	Unit 1	<p>Affected facilities under the subpart are stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour and for which construction commenced after October 3, 1977</p> <p>Combustion turbine units 1, 9 and 14 were constructed in 1996, 2006 and 2010, respectively. The unit 1 turbine has a heat input of 12.57 MMBtu/hr, the unit 9 turbine has a heat input of 11.27 MMBtu/hr, and the unit 14 turbine heat input is 36.68 MMBtu/hr. Based on its construction date, subpart GG is applicable to combustion turbine unit 1.</p> <p>Combustion turbine units 9 and 14 are subject to NSPS subpart KKKK based on their construction dates. Under §60.4305(b), stationary combustion turbines regulated under subpart KKKK are exempt from the requirements of subpart GG; therefore, units 9 and 14 are not subject to NSPS subpart GG.</p>

FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
NSPS 40 CFR 60, Subpart KKK	Standards of Performance for <b>Leaks of VOC from Onshore Gas Plants</b>	No		<p>An affected facility under the subpart is an onshore gas plant that commences construction, reconstruction, or modification after January 20, 1984, and includes the group of all equipment (each pump, pressure relief device, open-ended valve or line, valve, compressor, and flange or other connector that is in VOC service or in wet gas service, and any device or system required by this subpart) except compressors (defined in § 60.631) within a process unit. A compressor station, dehydration unit, sweetening unit, underground storage tank, field gas gathering system, or liquefied natural gas unit is covered by this subpart if it is located at an onshore natural gas processing plant. If the unit is not located at the plant site, then it is exempt from the provisions of this subpart.</p> <p>The facility is not an onshore gas plant and the subpart does not apply.</p>
NSPS 40 CFR 60, Subpart LLL	Standards of Performance for <b>Onshore Natural Gas Processing: SO<sub>2</sub> Emissions</b>	No		<p>An affected facility is each sweetening unit, and each sweetening unit followed by a sulfur recovery unit, for which construction or modification commenced after January 20, 1984 at a natural gas processing plant.</p> <p>The facility is not a natural gas processing plant and does not include any affected units as defined by the subpart; therefore the subpart does not apply.</p>
NSPS 40 CFR 60, Subpart JJJ	Standards of Performance for <b>Stationary Spark Ignition Internal Combustion Engines</b>	No		<p>Under § 60.4230, the requirements of the subpart apply to spark-ignition (SI), reciprocating internal combustion engines (RICE) constructed, modified or reconstructed after June 12, 2006.</p> <p>There are no RICE at the facility, and the regulation is not applicable.</p>
NSPS 40 CFR 60, Subpart KKKK	Standards of Performance for <b>Stationary Combustion Turbines</b>	Yes	Units 9 & 14	<p>This subpart establishes emission standards and compliance schedules for the control of emissions from stationary combustion turbines that commenced construction, modification or reconstruction after February 18, 2005.</p> <p>Construction of the unit 1 combustion turbine was in 1996, prior to the applicability date of the regulation. Therefore, the subpart does not apply to unit 1 turbine.</p> <p>Combustion turbines 9 and 14 are each a stationary combustion turbine with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour, and were constructed in 2006 and 2010, respectively. Therefore, the subpart is applicable to the units 9 and 14 combustion turbines.</p>
NSPS 40 CFR 60, Subpart OOOO	Standards of Performance for <b>Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced After August 23, 2011, and on or before September 18, 2015</b>	No		<p>Subpart OOOO establishes natural gas production, processing, transmission and distribution emission and equipment standards, including well completions; single continuous bleed, natural gas driven pneumatic controllers operating at bleed rates greater than 6 scfh and located between a wellhead and point of custody transfer; equipment leaks and sweetening units at natural gas processing plants; reciprocating compressors; centrifugal compressors; and storage vessels at well sites. The regulation includes provisions for initial and continuous compliance demonstrations, and recordkeeping and reporting requirements.</p> <p>As it applies to the natural gas production segment, "affected sources" include the following sources constructed, modified or reconstructed after August 23, 2011:</p> <ul style="list-style-type: none"> <li>- Each affected single natural gas well, as described in the regulation;</li> <li>- Each reciprocating compressor, unless it is located at a well site or adjacent well site;</li> <li>- Each single continuous bleed, natural gas driven pneumatic controller operating at a bleed rate of greater than 6 scfh and located between a wellhead and point of custody transfer;</li> <li>- Each single storage vessel affected facility with VOC emissions of six (6)</li> </ul>

FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
				<p>tpy or greater.</p> <p>The equipment at the facility were constructed prior to the applicability date, and there are no reciprocating compressors at the facility; therefore, the regulation is not applicable. Should a new affected source under the regulation be installed at the facility at a future time, the applicability of the subpart to that source shall be re-evaluated. As applicable, Harvest will comply with the requirements of the regulation.</p>
NSPS 40 CFR 60, Subpart OOOOa	<b>Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015</b>	No		<p>Subpart OOOOa establishes emission standards and compliance schedules for the control of GHG methane emission limits as well as emission standards and compliance schedules for the control of VOC and SO<sub>2</sub> emissions for crude oil and natural gas facilities that commence construction, modification, or reconstruction after September 18, 2015.</p> <p>As it applies to equipment at a compressor station in the natural gas production segment, "affected sources" include the following emission sources constructed, modified or reconstructed after September 18, 2015 (§60.5365a):</p> <ul style="list-style-type: none"> <li>- Each single reciprocating compressor (§60.5365a(c));</li> <li>- Each pneumatic controller that is a single continuous bleed natural gas-driven pneumatic controller operating at a natural gas bleed rate greater than 6 scfh (§60.5365a(d)(1));</li> <li>- Each single storage vessel with the potential for VOC emissions equal to or greater than 6 tpy (§60.5365a(e)); and</li> <li>- The collection of fugitive emissions components at a compressor station, as defined in §60.5430a (§60.5365a(j)).</li> </ul> <p>The equipment at the facility were constructed prior to the applicability date or do not otherwise trigger the applicability of the regulation.</p> <p>Should a new affected source be installed at the facility, the applicability of the subpart to that source shall be evaluated upon installation. As applicable, Harvest will comply with the applicable requirements in the subpart for any future devices installed.</p>
NESHAP 40 CFR 61, Subpart A	<b>General Provisions</b>	No		<p>40 CFR 61 National Emission Standards for Hazardous Air Pollutants (NESHAP) provides standards for equipment that emits hazardous air pollutants by specific source types.</p> <p>Subpart A, General Provisions, applies if any other 40 CFR 61 NESHAP subpart applies. Subpart A is not applicable because there are no stationary sources at this facility for which a standard is prescribed under this part.</p>
NESHAP 40 CFR 61, Subpart V	<b>National Emission Standard for Equipment Leaks (Fugitive Emission Sources)</b>	No		<p>40 CFR 61, subpart V provides equipment standards, and monitoring, recordkeeping and reporting standards for specified equipment in VHAP service, including fugitive emissions from pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and required control devices or systems.</p> <p>Subpart V is not applicable because none of the potentially affected sources are in VHAP service.</p>
MACT 40 CFR 63, Subpart A	<b>General Provisions</b>	No		<p>Applies if any other 40 CFR 63 (NESHAP/MACT) subpart applies. There are no MACT standards applicable to the facility equipment. Therefore, the regulation does not apply.</p>
MACT 40 CFR 63, Subpart M	<b>National Emission Standard for Asbestos</b>	No		<p>The subpart includes standards for minimizing asbestos emissions from several operations, including demolition and renovation activities.</p> <p>No existing or planned operation or activity at this facility triggers the applicability of this requirement. Therefore, the regulation does not apply.</p>

FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
<p>MACT 40 CFR 63, Subpart HH</p>	<p>National Emission Standards for Hazardous Air Pollutants From <b>Oil and Natural Gas Production Facilities</b></p>	<p>No</p>		<p>Under § 63.760, the subpart applies to owners and operators of affected sources located at oil and natural gas production facilities, including facilities that are major and area sources of hazardous air pollutants (HAP).</p> <p>Under the definitions provided in §63.761, the facility is a natural gas production field facility. As such, the definition of “major source” in §63.762 provides that only HAP emissions from glycol dehydration units and storage vessels are aggregated for a major source determination. The aggregated HAP emissions from the storage vessels are above the major HAP source threshold for a single HAP; therefore, the facility is a <b>major</b> source of HAP under subpart HH.</p> <p>Under §63.761(b)(1) for major HAP production field facility source, the affected sources include (i) each glycol dehydration unit, and (ii) “each storage vessel with the potential for flash emissions”. (There are no glycol dehydration units at the facility.) Under the definitions provided in §63.761, “<i>Storage vessel with the potential for flash emissions</i> means any storage vessel that contains a hydrocarbon liquid with a stock tank GOR equal to or greater than 0.31 cubic meters per liter and an API gravity equal to or greater than 40 degrees <u>and an actual annual average hydrocarbon liquid throughput equal to or greater than 79,500 liters per day.</u> . . . “. [Note 79,500 liters per day = 500 barrels per day (bpd).]</p> <p>The facility maximum condensate throughput is 74 bpd, well below the regulatory threshold contained in the definition. Therefore, for the purpose of the subpart, the condensate storage tanks at the facility are not considered “storage vessels with the potential for flash emissions” under the regulatory definition, and thus are not affected sources under the subpart. Therefore, there are no affected sources at the facility and the regulation is not applicable.</p>
<p>MACT 40 CFR 63 Subpart HHH</p>	<p>National Emission Standards for Hazardous Air Pollutants From <b>Natural Gas Transmission and Storage Facilities</b></p>	<p>No</p>		<p>Under §63.1270, applies to owners and operators of natural gas transmission and storage facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company), and that are major sources of hazardous air pollutants (HAP) emissions as defined in §63.1271.</p> <p>A production segment natural gas compressor station is not in the natural gas transmission and storage source category covered by the subpart. Therefore, the regulation does not apply.</p>
<p>MACT 40 CFR 63 Subpart YYYY</p>	<p>National Emission Standards for Hazardous Air Pollutants From <b>Stationary Combustion Turbines</b></p>	<p>No</p>		<p>Under § 63.6080, subpart YYYY establishes emission and operating limitations for stationary combustion turbines located at a major source of HAP emissions. Under § 63.6175, “<i>Major source</i>, as used in this subpart, has the same meaning as in §63.2, except that . . . (3) For production field facilities, only HAP emissions from glycol dehydration units, storage vessel with the potential for flash emissions, combustion turbines and reciprocating internal combustion engines shall be aggregated for a major source determination . . . “</p> <p>The facility’s condensate tanks (units T-3 and T-12) store condensate liquids with associated flash emissions. However, the regulatory definition at §63.6175 provides that “<i>Storage vessel with the potential for flash emissions</i> means any storage vessel that contains a hydrocarbon liquid with a stock tank gas-to-oil ratio equal to or greater than 0.31 cubic meters per liter and an American Petroleum Institute gravity equal to or greater than 40 degrees <u>and an actual annual average hydrocarbon liquid throughput equal to or greater than 79,500 liters per day.</u> . . . “. [Note 79,500 liters per day = 500 barrels per day (bpd).]</p> <p>The facility maximum condensate throughput is 74 bpd, well below the regulatory threshold contained in the definition. Therefore, for the purpose of the subpart, the condensate storage tanks are not considered “storage vessels with the potential for flash emissions” within the regulatory meaning, and their HAP emissions are not considered in making a determination of major HAP source status. Accordingly, for the purposes of the applicability of the subpart,</p>



FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
				the facility is an <b>area</b> source of HAP under subpart HH, and the subpart does not apply.
MACT 40 CFR 63, Subpart ZZZZ	National Emission Standards for Hazardous Air Pollutants for <b>Stationary Reciprocating Internal Combustion Engines</b>	No		40 CFR 63, Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from existing, new, modified and reconstructed stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP. The regulation contains provisions for initial and continuous compliance demonstration.  There are no RICE at the facility. Therefore, the regulation does not apply.
MACT 40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for <b>Industrial, Commercial, and Institutional Boilers and Process Heaters</b>	No		40 CFR 63, Subpart DDDDD establishes emission limits and work practice standards for industrial, commercial, or institutional boiler or process heaters, as defined in § 63.7575, that are located at or are part of a major source of HAP, as defined under § 63.2 except as specified under § 63.7491.  Under §63.7485, for purposes of the subpart a major source of HAP is as defined in §63.2, except that for oil and natural gas production facilities, a major source of HAP is as defined in §63.7575. The Thompson CS is a natural gas production facility. Under the definitions in §63.7575, “ <i>Major source for oil and natural gas production facilities</i> , as used in this subpart, shall have the same meaning as in §63.2, except that . . . (3) For facilities that are production field facilities, only HAP emissions from glycol dehydration units and <u>storage vessels with the potential for flash emissions</u> shall be aggregated for a major source determination . . .”  There are no glycol dehydration units at the Thompson C.S.  Subpart DDDDD does not provide a definition for ‘storage vessel with the potential for flash emissions’, but has historically cross-referenced the definitions in subpart HH for production field facilities. The regulatory definition at §63.761 provides that “ <i>Storage vessel with the potential for flash emissions</i> means any storage vessel that contains a hydrocarbon liquid with a stock tank GOR equal to or greater than 0.31 cubic meters per liter and an API gravity equal to or greater than 40 degrees <u>and an actual annual average hydrocarbon liquid throughput equal to or greater than 79,500 liters per day</u> . . . “. [Note 79,500 liters per day = 500 barrels per day (bpd).]  The facility maximum condensate throughput is 74 bpd, well below the regulatory threshold contained in the definition. Therefore, for the purpose of the subpart, the condensate storage tanks are not considered “storage vessels with the potential for flash emissions” within the regulatory meaning, and their HAP emissions are not considered in making a determination of major HAP source status. Accordingly, the facility is an <b>area</b> source of HAP under the subpart; and the subpart is therefore not applicable.
MACT 40 CFR 63 Subpart JJJJJ	National Emission Standards for Hazardous Air Pollutants for <b>Industrial, Commercial, and Institutional Boilers Area Sources</b>	No		40 CFR 63, Subpart JJJJJ establishes emission limits, work practice standards, emission reduction measures, and management practices for new, reconstructed, or existing affected sources that are industrial, commercial, or institutional boilers within a subcategory listed in §63.11200 and defined in §63.11237, and that are located at an area source of HAP.  The facility does not have industrial, commercial or institutional boilers of one of the listed subcategories in §63.11200. Also, under § 63.11195(e), the regulation does not apply to gas-fired units. Therefore, the regulation does not apply.
40 CFR 64	<b>Compliance Assurance Monitoring</b>	No		40 CFR 64, <i>Compliance Assurance Monitoring</i> (CAM) monitoring requirements are applicable to sources that are located at a major source, that are required to obtain a part 70 or 71 permit, and with uncontrolled criteria pollutant emission rates equal to or exceeding the major source threshold (100

FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
				<p>tons per year), that use a control device to achieve compliance with an emission limit or standard, and which the resulting controlled emissions are less than the major source threshold. Passive control devices such as lean-burn technology are not considered a control device as defined in 40 CFR 64 definitions and as clarified in discussions with EPA.</p> <p>There are no emission units at the facility with uncontrolled emissions that are a major source. Therefore, the regulation is not applicable under §64.2(a).</p>
40 CFR 68	<b>Chemical Accident Prevention Provisions</b>	No		40 CFR 68, <i>Chemical Accident Prevention Provisions</i> , is not applicable because the facility does not store any of the identified toxic and flammable substances in quantities exceeding the applicability thresholds.
40 CFR 70	<b>State Operating Permit Programs</b>	No		<p>40 CFR 70, <i>State Operating Permit Programs</i>, is not applicable: The regulation provides for the establishment of comprehensive State air quality permitting programs consistent with the requirements of title V of the Clean Air Act (Act). New Mexico Environment Department (NMED) was delegated authority by the EPA to administer the State operating permit program through regulations adopted into the State Implementation Plan (SIP) and 20.2.70 NMAC.</p> <p>Although Harvest is subject to the Operating Permit Program for facilities within NMED jurisdiction as implemented by the State, there are no specific requirements of the regulation that are applicable directly to applicants. Therefore, the regulation does not apply.</p>
40 CFR 71	<b>Federal Operating Permit Programs</b>	No		<p>40 CFR 71, <i>Federal Operating Permit Programs</i> sets forth requirements and the corresponding standards and procedures by which the EPA Administrator issues operating permits in the absence of an approved State operating permit program.</p> <p>The New Mexico Environment Department (NMED) has received delegated authority to administer Title V permits under the State operating permit program approved under 40 CFR Part 70. There are no specific requirements applicable directly to applicants with facilities in NMED jurisdiction. Therefore, 40 CFR 71 does not apply.</p>
40 CFR 72	<b>Permits Regulation</b>	No		40 CFR 72, <i>Permits Regulation</i> , is not applicable because the facility does not operate a source subject to Title IV of the Clean Air Act (CAA).
40 CFR 73	<b>Sulfur Dioxide Allowance System</b>	No		40 CFR 73, <i>Sulfur Dioxide Allowance System</i> , is not applicable to the facility because it does not operate a source subject to Title IV of the Clean Air Act (CAA).
40 CFR 75	<b>Continuous Emission Monitoring</b>	No		40 CFR 75, <i>Continuous Emission Monitoring</i> , is not applicable to the facility because it does not operate a source subject to Title IV of the Clean Air Act (CAA) and does not measure emissions with Continuous Emission Monitoring Systems (CEMS).
40 CFR 76	<b>Acid Rain Nitrogen Dioxide Emission Reduction Program</b>	No		40 CFR 76, <i>Acid Rain Nitrogen Dioxide Emission Reduction Program</i> , is not applicable to the facility because it does not operate a source subject to Title IV of the Clean Air Act (CAA).
40 CFR 77	<b>Excess Emissions</b>	No		40 CFR 77, <i>Excess Emissions</i> , is not applicable to the facility because it does not operate a source subject to Title IV of the Clean Air Act (CAA).
40 CFR 78	<b>Appeal Procedures for Acid Rain Program</b>	No		40 CFR 78, <i>Appeal Procedures for Acid Rain Program</i> , is not applicable to the facility because it does not operate a source subject to Title IV of the Clean Air Act (CAA).

FEDERAL REGULATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 82	<b>Protection of Stratospheric Ozone</b>	No		<p>The purpose of 40 CFR 82, <i>Protection of Stratospheric Ozone</i> is to implement the <i>Montreal Protocol on Substances that Deplete the Ozone Layer</i>. Under §82.1(b), the subpart applies to anyone that produces, transforms, destroys, imports or exports a controlled substance or imports or exports a controlled product.</p> <p>The facility does not carry out any of the listed activities, nor does it maintain or service motor vehicle air conditioning units or refrigeration equipment. The facility does not sell, distribute, or offer for sale or distribution any product that contains ozone-depleting substances. Therefore, the subpart does not have direct applicability to the facility.</p>
40 CFR 98	<b>Mandatory Greenhouse Gas Reporting</b>	Yes		<p>40 CFR 98, <i>Mandatory Greenhouse Gas Reporting</i>, is a federal requirement that is applicable to facilities that include source categories listed in Subpart A, Table A-3, or to facilities with annual emissions of 25,000 metric tons of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) or more in combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all applicable source categories listed in Table A-3 and Table A-4 of Subpart A.</p> <p>The regulation applies to the facility as its actual annual CO<sub>2</sub>e emissions have previously exceeded the reporting threshold as defined in Subpart A, <i>General Provision</i>, Subpart C, <i>General Stationary Fuel Combustion Sources</i>, and, as applicable, Subpart W, <i>Petroleum Oil and Natural Gas Systems</i>. The GHG emissions inventory is reported annually.</p>
CAA Section 112(r)	<b>Chemical Accident Prevention Provisions</b>	No		CAA Section 112(r), <i>Chemical Accident Prevention Provisions</i> . The station does not store designated toxic and flammable chemicals in quantities exceeding the applicable thresholds.

### State Regulations

Applicable state requirements are embodied in the New Mexico SIP, the New Mexico Administrative Code (NMAC), and the terms and conditions of any preconstruction permits issued pursuant to regulations promulgated through rulemaking under Title I of the CAA. A summary of the applicability of the NMACs is presented on the following pages.

### STATE REGULATIONS APPLICABILITY CHECKLIST

<u>STATE REGULATIONS</u> CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
20.2.1 NMAC	<b>General Provisions</b> *	Yes	Facility	<p>20.2.1 NMAC, <i>General Provisions</i>, establishes procedures for protecting confidential information, procedures for seeking a variance, NMAQB's authority to require sampling equipment, severability, the effective date for conformance with the NMACs, and prohibits the violation of other requirements in attempting to comply with NMACs.</p> <p>Although this regulation may apply to the facility, it does not impose any specific requirements.</p>
20.2.2 NMAC	<b>Definitions</b> *	No		<p>20.2.2 NMAC, <i>Definitions</i>, establishes definitions used throughout the remaining regulations.</p> <p>Although this regulation may apply to the facility, it does not impose any specific requirements on the operation of the facility as</p>

<b>STATE REGU- LATIONS CITATION</b>	<b>Title</b>	<b>Applies? Enter Yes or No</b>	<b>Unit(s) or Facility</b>	<b>JUSTIFICATION:</b>
				described in the permit. Therefore, the regulation is considered not applicable.
20.2.3 NMAC	<b>Ambient Air Quality Standards</b>	Yes	Facility	20.2.3 NMAC, <i>Ambient Air Quality Standards</i> , is a SIP approved regulation that limits the maximum allowable concentration of total suspended particulates (TSP), sulfur compounds, carbon monoxide (CO) and nitrogen dioxide (NO <sub>2</sub> ) in the areas of New Mexico under the jurisdiction of the Environmental Improvement Board. Under subsection 20.2.3.9, the requirements of the part are not considered applicable requirements under 20.2.70 NMAC (i.e., federally enforceable requirements), as defined by that part. However, the regulation applies to sources required to obtain a permit under 20.2.72 NMAC, and it does not limit which terms and conditions of permits issued pursuant to 20.2.72 NMAC are applicable requirements for permits issued pursuant to 20.2.70 NMAC.
20.2.5 NMAC	<b>Source Surveillance</b>	No		20.2.5 NMAC, <i>Source Surveillance</i> , establishes the NMAQB's authority to require recordkeeping/ surveillance upon request.  Although this regulation may apply to the facility, it does not impose any specific requirements on the operation of the facility as described in the permit. Therefore, the regulation is considered not applicable.
20.2.7 NMAC	<b>Excess Emissions</b>	Yes	Facility	20.2.7 NMAC, <i>Excess Emissions</i> , is applicable because it prohibits excess emissions and proscribes notification procedures in the event of excess emissions.
20.2.8 NMAC	<b>Emissions Leaving New Mexico *</b>	No		20.2.8 NMAC, <i>Emissions Leaving New Mexico</i> , establishes prohibitions on the release of pollutants that cross New Mexico State boundaries.  Although this regulation may apply to the facility, it does not impose any specific requirements on the operation of the facility as described in the permit. Therefore, the regulation is considered not applicable.
20.2.33 NMAC	<b>Gas Burning Equipment - Nitrogen Dioxide</b>	No		20.2.33 NMAC, <i>Gas Burning Equipment - Nitrogen Dioxide</i> , does not apply to the station because the compressor station does not include new or existing gas burning equipment (external combustion emission sources, such as gas fired boilers and heaters) having a heat input of greater than 1,000,000 million British Thermal Units per year per unit.
20.2.34 NMAC	<b>Oil Burning Equipment: NO<sub>2</sub></b>	No		20.2.34 NMAC, <i>Oil Burning Equipment: NO<sub>2</sub></i> , does not apply to the station because the compressor station does not have oil burning equipment.
20.2.35 NMAC	<b>Natural Gas Processing Plant – Sulfur</b>	No		20.2.35 NMAC, <i>Natural Gas Processing Plant – Sulfur</i> , applies to new natural gas processing plants for which a modification commenced on or after July 1, 1974. The regulation is not applicable to the station because the facility is not a natural gas processing plant.
20.2.38 NMAC	<b>Hydrocarbon Storage</b>	No		20.2.38 NMAC, <i>Hydrocarbon Storage Facilities</i> , is not applicable because the facility does not store hydrocarbons containing hydrogen sulfide; does not have a hydrocarbon liquid throughput of 50,000 barrels or greater located within a municipality or within five miles of a municipality with population of 20,000 or more; nor is there a new hydrocarbon tank battery with storage capacity of 65,000 gallons or greater.

<b>STATE REGU- LATIONS CITATION</b>	<b>Title</b>	<b>Applies? Enter Yes or No</b>	<b>Unit(s) or Facility</b>	<b>JUSTIFICATION:</b>
20.2.61.109 NMAC	<b>Smoke &amp; Visible Emissions</b>	Yes	Combustion turbines 1, 9 & 14; Heater units 18 - 21	20.2.61 NMAC, <i>Smoke and Visible Emissions</i> , limits visible emissions from stationary combustion equipment to less than 20 percent opacity.  The station combustion turbines and heaters are subject to the regulation as they are each stationary combustion sources.
20.2.70 NMAC	<b>Operating Permits</b>	Yes		20.2.70 NMAC, <i>Operating Permits</i> , contains permitting requirements for major sources of criteria and hazardous air pollutants subject to Part 70 (Title V) permitting requirements.  The facility Potential To Emit for criteria pollutants is above the major source Title V permitting thresholds. Therefore, the regulation is applicable and the facility must apply for and obtain a Title V Operating Permit. In addition to its construction permit, the current facility Title V Operating Permit No. is <b>P018-R3</b> .
20.2.71 NMAC	<b>Operating Permit Fees</b>	Yes		20.2.71 NMAC, <i>Operating Permit Emission Fees</i> , specifies fees for emissions from facilities subject to Part 70 (Title V) permitting requirements under 20.2.70 NMAC.  The regulation is applicable as the facility is subject to permitting requirements under 20.2.70 NMAC.
20.2.72 NMAC	<b>Construction Permits</b>	Yes		20.2.72 NMAC, <i>Construction Permits</i> , requires a construction [NSR] permit for stationary source with emissions greater than 10 pounds per hour or 25 tons per year of criteria pollutants.  The station emissions exceed the permit requirement thresholds; therefore, the station is required to apply for and obtain an NSR permit. The construction (NSR) permit issued under 20.2.72 for this facility is permit No. <b>0761-M10</b> .
20.2.73 NMAC	<b>NOI &amp; Emissions Inventory Requirements</b>	Yes		20.2.73 NMAC requires that owners/operators intending to construct a new stationary source that has a potential emission rate (uncontrolled emissions) greater than 10 tons per year of any regulated air contaminant, or 1 ton per year of lead, must file a notice of intent (NOI) with the department.  The station emits regulated air pollutants in amounts greater than 10 tons per year. Therefore, the facility is subject to the regulation. The requirement to file an NOI with the Department is fulfilled with the application for a construction permit under 20.2.72 NMAC.
20.2.74 NMAC	<b>Permits – PSD</b>	No		20.2.74 NMAC, <i>Permits, Prevention of Significant Deterioration (PSD)</i> , provides requirements for sources subject to permit requirements for PSD facilities.  The facility emissions do not exceed the PSD permit threshold levels. Therefore, the regulation does not apply.
20.2.75 NMAC	<b>Construction Permit Fees</b>	Yes		20.2.75 NMAC, <i>Construction Permit Fees</i> , establishes the fee schedule associated with the filing of permits and permit revisions.  The regulation is applicable to the facility for its construction permit submitted under 20.2.72 NMAC.
20.2.77 NMAC	<b>New Source Performance Standards</b>	Yes	Combustion turbines 1, 9 & 14	20.2.77 NMAC, <i>New Source Performance Standards</i> , incorporates by reference specific Standards of Performance for New Stationary Sources (NSPS) codified under 40 CFR 60, as amended through January 15, 2017.  The facility includes equipment that are subject to NSPS subparts A, GG and KKKK to as they were promulgated through January 15, 2017. Therefore, the regulation is applicable.

<b>STATE REGU- LATIONS CITATION</b>	<b>Title</b>	<b>Applies? Enter Yes or No</b>	<b>Unit(s) or Facility</b>	<b>JUSTIFICATION:</b>
20.2.78 NMAC	<b>Emission Standards for HAPS</b>	No		20.2.78 NMAC, <i>Emission Standards for Hazardous Air Pollutants</i> , incorporates by reference specific National Emission Standards for Hazardous Air Pollutants (NESHAPs) codified under 40 CFR 61, as amended through January 15, 2017.  The regulation is not applicable as none of the emission units at the facility are subject to any NESHAP under 40 CFR 61.
20.2.79 NMAC	<b>Permits – Nonattainment Areas</b>	No		20.2.79 NMAC, <i>Permits - Nonattainment Areas</i> , is not applicable to the station because the compressor station is not located within a non-attainment area.
20.2.80 NMAC	<b>Stack Heights</b>	No		20.2.80 NMAC, <i>Stack Heights</i> , establishes guidelines for the selection of an appropriate stack height for the purposes of atmospheric dispersion modeling.  Atmospheric dispersion modeling was previously provided in support of the facility's construction permit. Based on the NMAQB dispersion modeling guidance document, air quality dispersion modeling is not required for this Title V Operating Permit renewal application.
20.2.82 NMAC	<b>MACT Standards for source categories of HAPS</b>	No		20.2.82 NMAC, <i>Maximum Achievable Control Technology Standards for Source Categories of Hazardous Air Pollutants</i> , incorporates by reference specified federal Maximum Available Control Technology (MACT) Standards codified in 40 CFR 63, as amended through January 15, 2017.  The facility does not have equipment subject to a MACT standard. Therefore, the regulation does not apply.
20.2.84 NMAC	<b>Acid Rain Permits</b>	No		20.2.84 NMAC, <i>Acid Rain Permits</i> , is not applicable to the station because the compressor station does not operate an affected unit under the regulation.

\* = These NMACs are administrative in nature and do not establish prohibitions, standards, or requirements.

# 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 **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** 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 **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** 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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# 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](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).

---

Not applicable.



# Section 16

## Air Dispersion Modeling

- 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](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. <b>Note:</b> 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.	X

**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.

An ambient air quality impact analysis including dispersion modeling was provided in support of construction permit 0761-M8. The dispersion modeling demonstrated that the facility will comply with the National Ambient Air Quality Standards and applicable PSD increments.

# Section 17

## Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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

### Compliance Test History Table

Unit No.	Test Description	Test Date
1	Tested in accordance with EPA test methods for NO <sub>x</sub> and CO as required by Construction Permit 0761-M8, Condition A205.A & .C.	3/08/2011 <sup>1</sup>
9	Tested in accordance with EPA test methods for NO <sub>x</sub> and CO as required by Construction Permit 0761-M8, Condition A205.A & .C.	6/26/2018 (NSPS subpart KKKK requirement)
14	Tested in accordance with EPA test methods for NO <sub>x</sub> and CO as required by Construction Permit 0761-M8, Condition A205.A & .C.	6/26/2018 (NSPS subpart KKKK requirement)

<sup>1</sup>Unit 1 has operated less than 10% of any given monitoring period since the last compliance test.

# Section 18

## Addendum for Streamline Applications

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

---

**Streamline Applications do not require a complete application. Submit Sections 1-A, 1-B, 1-D, 1-F, 1-G, 2-A, 2-C thru L, Sections 3 thru 8, Section 13, Section 18, Section 22, and Section 23 (Certification). Other sections may be required at the discretion of the Department. 20.2.72.202 NMAC Exemptions do not apply to Streamline sources. 20.2.72.219 NMAC revisions and modifications do not apply to Streamline sources, thus 20.2.72.219 type actions require a complete new application submittal. Please do not print sections of a streamline application that are not required.**

---

Not applicable.

# Section 19

## Requirements for Title V Program

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

---

### 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.
- 

### **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.

---

The Thompson CS is not subject to 40 CFR, Part 64, Compliance Assurance Monitoring (CAM); consequently, a monitoring protocol is not required with this application.

---

### **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.

---

The Thompson CS is in compliance with all applicable requirements affecting the facility. A copy of Part 1 (Permit Requirements Certification Table) of the 2018 Annual Compliance Certification (ACC) is provided in Section 20, Other Relevant Information. It identifies the requirements of the current Title V operating permit and the methods and data used to determine compliance with that permit. It is assumed that compliance with the Title V operating permit ensures compliance with the construction permit and New Mexico regulations.

**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.

The Thompson CS will continue to be in compliance with applicable requirements for which it is in compliance at the time of this permit application. In addition, the station will, in a timely manner or consistent with such schedule expressly required by the applicable requirement, comply with other applicable requirements as they come into effect during the permit term.

**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.

The submittal of compliance certifications during the five-year term of the operating permit will occur annually.

**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.)

The station 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.

Harvest shall continue to maintain compliance 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).

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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**.

---

The Thompson CS is in compliance with all applicable requirements; consequently, a compliance plan, a compliance schedule, and a schedule of certified progress reports is not required.

The Thompson CS is not equipped with any acid rain sources; consequently, compliance with the acid rain provisions is not required as a part of this permit application.

---

## 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.

The Thompson CS is not subject to 40 CFR 68, Chemical Accident Prevention Provisions; consequently, a Risk Management Plan is not required.

### 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.)

Yes, the property on which the station is constructed and operated on is closer than 80 km (50 miles) from other states, local pollution control programs and Indian tribes and pueblos as described below:

#### Neighboring States, Class I Areas, and Indian Lands

	Approximate Distance to Facility (kilometers)
<b>Neighboring States</b>	
Colorado	18
<b>Indian Lands</b>	
Jicarilla Apache Tribe	80
Ute Mountain Ute Tribe	14
Southern Ute Tribe	18
Navajo Nation	18

### 19.9 - Responsible Official

The responsible official for the Thompson CS is Travis Jones, EH&S Manager.

# Section 20

## Other Relevant Information

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**Other relevant information.** 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.

---

As discussed in Section 19.2, this section contains the Part 1 (Permit Requirements Certification Table) of the 2018 Annual Compliance Certification (ACC).



## Part 1 - Permit Requirements Certification Table

Annual Compliance Certification Data for Title V Permit No. P018-R3				
1. Permit Condition # and Permit Condition:	2. Method(s) or other information or other facts used to determine the compliance status:	3. What is the frequency of data collection used to determine compliance?	4. Was this facility in compliance with this requirement during the reporting period?	5. Were there any deviations associated with this requirement during the reporting period?
<b>FACILITY SPECIFIC REQUIREMENTS</b>				
<b>A101 Permit Duration (expiration)</b>  <b>A.</b> The term of this permit is five (5) years. It will expire five years from the date of issuance. Application for renewal of this permit is due twelve (12) months prior to the date of expiration. (20.2.70.300.B.2 and 302.B NMAC)	Submittal of a renewal application by August 27, 2019 (12 months prior to expiration of this permit) will demonstrate compliance with this condition.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>A101 Permit Duration (expiration)</b>  <b>B.</b> If a timely and complete application for a permit renewal is submitted, consistent with 20.2.70.300 NMAC, but the Department has failed to issue or disapprove the renewal permit before the end of the term of the previous permit, then the permit shall not expire and all the terms and conditions of the permit shall remain in effect until the renewal permit has been issued or disapproved. (20.2.70.400.D NMAC)	Submittal of a renewal application by August 27, 2019 (12 months prior to expiration of this permit) will demonstrate compliance with this condition.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>A102 Facility: Description</b>  <b>B.</b> This facility is located approximately 4.8 miles west of Aztec, New Mexico in San Juan County. (20.2.70.302.A(7) NMAC)	Semi-annual reports and this ACC are used to determine that the source continues to comply with this condition.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

<b>A103 Facility: : Regulated Sources</b>  <b>A.</b> The permittee shall comply with all applicable sections of the requirements listed in <a href="#">Table 103.A</a> .	Semi-annual reports and the annual emissions inventory are used to demonstrate compliance with the identified applicable requirements of Table 103-A.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																																			
<b>Table 103.A: Applicable Requirements</b>																																																							
<table border="1"> <thead> <tr> <th data-bbox="132 402 1209 475">Applicable Requirements</th> <th data-bbox="1220 402 1539 475">Federally Enforceable</th> <th data-bbox="1539 402 1965 475">Unit No.</th> </tr> </thead> <tbody> <tr> <td data-bbox="132 475 1209 553">NSR Permit No.: 0761M8R1, 0761M9, 0761M9R1, 0761M9R2, &amp; 0761M9R3 (Per 20.2.72 NMAC)</td> <td data-bbox="1220 475 1539 553" style="text-align: center;">X</td> <td data-bbox="1539 475 1965 553">Entire Facility</td> </tr> <tr> <td data-bbox="132 553 1209 589">20.2.1 NMAC General Provisions</td> <td data-bbox="1220 553 1539 589" style="text-align: center;">X</td> <td data-bbox="1539 553 1965 589">Entire Facility</td> </tr> <tr> <td data-bbox="132 589 1209 625">20.2.7 NMAC Excess Emissions</td> <td data-bbox="1220 589 1539 625" style="text-align: center;">X</td> <td data-bbox="1539 589 1965 625">Entire Facility</td> </tr> <tr> <td data-bbox="132 625 1209 660">20.2.61 NMAC Smoke and Visible Emissions</td> <td data-bbox="1220 625 1539 660" style="text-align: center;">X</td> <td data-bbox="1539 625 1965 660">1, 2, 9, and 14</td> </tr> <tr> <td data-bbox="132 660 1209 696">20.2.70 NMAC Operating Permits</td> <td data-bbox="1220 660 1539 696" style="text-align: center;">X</td> <td data-bbox="1539 660 1965 696">Entire Facility</td> </tr> <tr> <td data-bbox="132 696 1209 732">20.2.71 NMAC Operating Permit Emission Fees</td> <td data-bbox="1220 696 1539 732" style="text-align: center;">X</td> <td data-bbox="1539 696 1965 732">Entire Facility</td> </tr> <tr> <td data-bbox="132 732 1209 768">20.2.72 NMAC Construction Permit</td> <td data-bbox="1220 732 1539 768" style="text-align: center;">X</td> <td data-bbox="1539 732 1965 768">Entire Facility</td> </tr> <tr> <td data-bbox="132 768 1209 803">20.2.73 NMAC Notice of Intent and Emissions Inventory Requirements</td> <td data-bbox="1220 768 1539 803" style="text-align: center;">X</td> <td data-bbox="1539 768 1965 803">Entire Facility</td> </tr> <tr> <td data-bbox="132 803 1209 839">20.2.77 NMAC New Source Performance</td> <td data-bbox="1220 803 1539 839" style="text-align: center;">X</td> <td data-bbox="1539 803 1965 839">1, 9, 14</td> </tr> <tr> <td data-bbox="132 839 1209 875">20.2.82 NMAC MACT Standards for Source Categories of HAPS</td> <td data-bbox="1220 839 1539 875" style="text-align: center;">X</td> <td data-bbox="1539 839 1965 875">2</td> </tr> <tr> <td data-bbox="132 875 1209 911">40 CFR 50 National Ambient Air Quality Standards</td> <td data-bbox="1220 875 1539 911" style="text-align: center;">X</td> <td data-bbox="1539 875 1965 911">Entire Facility</td> </tr> <tr> <td data-bbox="132 911 1209 946">40 CFR 60, Subpart A, General Provisions</td> <td data-bbox="1220 911 1539 946" style="text-align: center;">X</td> <td data-bbox="1539 911 1965 946">1, 9, 14</td> </tr> <tr> <td data-bbox="132 946 1209 982">40 CFR 60, Subpart GG, Stationary Gas Turbines</td> <td data-bbox="1220 946 1539 982" style="text-align: center;">X</td> <td data-bbox="1539 946 1965 982">1</td> </tr> <tr> <td data-bbox="132 982 1209 1018">40 CFR 60, Subpart KKKK, Stationary Gas Turbines</td> <td data-bbox="1220 982 1539 1018" style="text-align: center;">X</td> <td data-bbox="1539 982 1965 1018">9, 14</td> </tr> <tr> <td data-bbox="132 1018 1209 1053">40 CFR 63, Subpart A, General Provisions</td> <td data-bbox="1220 1018 1539 1053" style="text-align: center;">X</td> <td data-bbox="1539 1018 1965 1053">2</td> </tr> <tr> <td data-bbox="132 1053 1209 1089">40 CFR 63, Subpart ZZZZ</td> <td data-bbox="1220 1053 1539 1089" style="text-align: center;">X</td> <td data-bbox="1539 1053 1965 1089">2</td> </tr> </tbody> </table>	Applicable Requirements	Federally Enforceable	Unit No.	NSR Permit No.: 0761M8R1, 0761M9, 0761M9R1, 0761M9R2, & 0761M9R3 (Per 20.2.72 NMAC)	X	Entire Facility	20.2.1 NMAC General Provisions	X	Entire Facility	20.2.7 NMAC Excess Emissions	X	Entire Facility	20.2.61 NMAC Smoke and Visible Emissions	X	1, 2, 9, and 14	20.2.70 NMAC Operating Permits	X	Entire Facility	20.2.71 NMAC Operating Permit Emission Fees	X	Entire Facility	20.2.72 NMAC Construction Permit	X	Entire Facility	20.2.73 NMAC Notice of Intent and Emissions Inventory Requirements	X	Entire Facility	20.2.77 NMAC New Source Performance	X	1, 9, 14	20.2.82 NMAC MACT Standards for Source Categories of HAPS	X	2	40 CFR 50 National Ambient Air Quality Standards	X	Entire Facility	40 CFR 60, Subpart A, General Provisions	X	1, 9, 14	40 CFR 60, Subpart GG, Stationary Gas Turbines	X	1	40 CFR 60, Subpart KKKK, Stationary Gas Turbines	X	9, 14	40 CFR 63, Subpart A, General Provisions	X	2	40 CFR 63, Subpart ZZZZ	X	2				
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40 CFR 63, Subpart A, General Provisions	X	2																																																					
40 CFR 63, Subpart ZZZZ	X	2																																																					
<b>A103 Facility: Applicable Regulations</b>  <b>C.</b> Compliance with the terms and conditions of this permit regarding source emissions and operation demonstrate compliance with national ambient air quality standards specified at 40 CFR 50, which were applicable at the time air dispersion modeling was performed for the facility's NSR Permit 0761-	Semi-annual reports and the annual emissions inventory are used to demonstrate compliance with the terms and condition of this permit.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																																			

M8.				
<b>A104 Facility: Regulated Sources</b>				
A. Table 104.A lists the emission units authorized for this facility. Emission units identified as insignificant or trivial activities (as defined in 20.2.70.7 NMAC) and/or equipment not regulated pursuant to the Act are not included.	Semi-annual reports and the annual emissions inventory, along with the Management of Change Request (MOCR) procedures, are used to determine that no unauthorized equipment has been added or operated during the applicable period.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**Table 104.A: Regulated Sources List**

Unit No.	Source Description	Make Model	Skid Package Serial No.	Engine / Combustor Serial No.	Site-rated Capacity	Manufacture Date
1	Turbine	Solar Saturn 10-T1300	S428435	OHG10-S6147	1125 hp	6/1/1996
2	RICE, 4SLB	Waukesha 9390GL	76240	365526	1864 hp	12/31/1981
9	Turbine	Solar Saturn 10-T1200	S401519	OHK10-S7194	997 hp	10/1/1969 (3/21/2006 <sup>1</sup> )
14	Turbine	Solar Centaur 40-4700S	CC80016	OHA15-C8819	3,834 hp	12/23/2010
T-3	Condensate tank	NA	919	NA	500 bbl	9/1985
T-12	Condensate tank	NA	389	NA	400 bbl	12/29/2003
F-2	Truck Loading	NA	NA	NA	NA	NA

<sup>1</sup> Reconstruction date used to determine NSPS KKKK applicability.

Note: All TBD (to be determined) units and like-kind engine replacements must be evaluated for applicability to NSPS and NESHAP requirements.

<b>A106 Facility: Allowable Emissions</b>				
A. The following Section lists the emission units, and their allowable emission limits. (40 CFR 50; 40 CFR 60, Subparts A, GG, and KKKK; 40 CFR 63, Subparts A and ZZZZ: Paragraphs 1, 7, and 8 of 20.2.70.302.A NMAC; and NSR Permits 0761M8, 0761-M9, & 0761-M9R1).	Semi-annual reports and this ACC are used to determine that the source continues to comply with applicable requirements.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**Table 106.A: Allowable Emissions**

Unit No.	<sup>1</sup> NO <sub>x</sub> pph	NO <sub>x</sub> tpy	CO pph	CO tpy	VOC pph	VOC tpy
1	4.6	20.1	7.7	33.6	<	<
2	6.2	27.0	10.9	47.7	4.1	18.0
9	6.8	29.6	11.0	48.1	<	1.4
14	5.6	24.5	4.5	19.6	<	1.1
T-3 and T-12	-	-	-	-	*	130.7
F-2	-	-	-	-	*	1.8

1 Nitrogen dioxide emissions include all oxides of nitrogen expressed as NO<sub>2</sub>.

2 Title V annual fee assessments are based on the sum of allowable tons per year emission limits in Sections A106 and A107.

“-” indicates the application represented emissions as not expected for this pollutant.

“<” indicates the application represented uncontrolled emissions less than 1.0 pph or 1.0 tpy for this pollutant. Allowable limits are not imposed on this level of emissions, except for flares and pollutants with controls.

“\*” indicates hourly emission limits are not appropriate for this operating situation.

<p><b>A106 Facility: Allowable Emissions</b></p> <p><b>B.</b> NO<sub>x</sub> emissions from Solar Saturn Turbine Unit 1 shall not exceed 150 ppmv at 15 percent oxygen on a dry basis. (40 CFR 60.332)</p>	<p>NSPS GG initial testing of unit 1 occurred in a previous monitoring period.</p>	<p><input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b>A106 Facility: Allowable Emissions</b></p> <p><b>C.</b> SO<sub>2</sub> emissions from Solar Saturn Turbine Unit 1, shall not exceed 0.015 percent by volume at 15 percent oxygen on a dry basis, or shall not burn fuel which contains sulfur in excess of 0.8 percent by weight (8000 ppmw). (40 CFR 60.333)</p>	<p>Fuel sulfur monitoring records demonstrate compliance with monitoring requirements.</p>	<p><input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>

<p><b>A106 Facility: Allowable Emissions</b></p> <p><b>D.</b> NO<sub>x</sub> emissions from Solar Saturn Unit 9 and Solar Centaur Unit 14 shall not exceed 100 ppm at 15 percent O<sub>2</sub>, dry basis or shall not exceed 690 ng/J of useful output (5.5 lb/MWh). (40 CFR 60.4320)</p>	<p>Periodic tests are used to determine that the sources continue to comply with this requirement.</p>	<p><input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b>A106 Facility: Allowable Emissions</b></p> <p><b>E.</b> SO<sub>2</sub> emissions from Solar Saturn Unit 9 and Solar Centaur Unit 14, shall not exceed 110 nanograms per Joule (ng/J) (0.90 pounds per megawatt-hour (lb/MWh)) gross output or the facility shall demonstrate compliance by burning only natural gas that contains total potential sulfur emissions less than 26 ng SO<sub>2</sub>/J (0.060 lb SO<sub>2</sub>/MMBtu) heat input. (40 CFR 60.4330(a))</p>	<p>Fuel sulfur monitoring records demonstrate compliance with monitoring requirements.</p>	<p><input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b>A107 Facility: Allowable Startup, Shutdown, &amp; Maintenance (SSM) and Malfunction Emissions</b></p> <p><b>A.</b> The maximum allowable SSM and Malfunction emissions limits for this facility are listed in Table 107.A and were relied upon by the Department to determine compliance with applicable regulations.</p>	<p>SSM monitoring records are used to determine that the source continues to comply with this requirement.</p>	<p><input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>

<b>A107 Facility: Allowable SSM and Malfunction Units, Activities, and Emission Limits<sup>1</sup></b>				
<b>Unit No.</b>	<b>Description</b>	<b>VOC (tpy)</b>	<b>H<sub>2</sub>S (pph)</b>	<b>H<sub>2</sub>S (tpy)</b>
SSM from 1a, 2a, 9a, 14a	<sup>1</sup> Compressor & Associated Piping Blowdowns during Routine and Predictable Startup, Shutdown, and/or Maintenance (SSM)	12.4	<	<
M	<sup>1</sup> Venting of Gas Due to Malfunction	10.0	<	<
<p>1. This authorization does not include VOC combustion emissions.                      “&lt;” indicates the application represented that uncontrolled venting, blowdown, or pigging emissions of H<sub>2</sub>S are less than 0.1 pph or 0.44 tpy. Allowable limits, monitoring, and recordkeeping are not required on this level of H<sub>2</sub>S venting, blowdown, or pigging emissions.</p>				
<p><b>A107 Facility: Allowable Startup, Shutdown, &amp; Maintenance (SSM) and Malfunction Emissions</b></p> <p><b>B.</b> The authorization of emission limits for startup, shutdown, maintenance, and malfunction does not supersede the requirements to minimize emissions according to Conditions B101.C and B107.A.</p>		<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p><b>A107 Facility: Allowable Startup, Shutdown, &amp; Maintenance (SSM) and Malfunction Emissions</b></p> <p><b>C.</b> SSM Emissions</p> <p><b>Requirement:</b> The permittee shall perform a facility inlet gas analysis once every calendar year and complete the following recordkeeping to demonstrate compliance with routine and predictable startup, shutdown, and maintenance (SSM) emission limits in Table 107.A.</p>		<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

<p><b>Monitoring:</b> The permittee shall monitor the permitted routine and predictable startups and shutdowns and scheduled maintenance events.</p>	<p>SSM monitoring records are used to determine that the source continues to comply with this requirement.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Recordkeeping:</b> To demonstrate compliance, each month records shall be kept of the cumulative total of VOC emissions during the first 12 months due to SSM events and, thereafter of the monthly rolling 12 month total of VOC emissions due to SSM events.</p> <p>Records shall also be kept of the inlet gas analysis, the percent VOC of the gas based on the most recent gas analysis, and of the volume of total gas vented in MMscf used to calculate the VOC emissions.</p> <p>The permittee shall record the calculated emissions and all parameters used in calculations in accordance with Condition B109, except the requirement in B109.E to record the start and end times of SSM events shall not apply to the venting of known quantities of VOC.</p>	<p>SSM monitoring records are used to determine that the source continues to comply with this requirement.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Reporting:</b> The permittee shall report in accordance with Section B110.</p>	<p>SSM monitoring records are included in the applicable semi-annual reports.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>A107 Facility: Allowable Startup, Shutdown, &amp; Maintenance (SSM) and Malfunction Emissions</b></p> <p><b>D. Malfunction Emissions</b></p> <p><b>Requirement:</b> The permittee shall perform a facility inlet gas analysis once every calendar year and complete the following recordkeeping to demonstrate compliance with malfunction (M) emission limits in Table</p>	<p>The applicable semi-annual reports contain record of the annual gas analysis and records of any malfunctions occurring during the monitoring period that are attributed to M1 emission limits.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>

107.A.				
<p><b>Monitoring:</b> The permittee shall monitor all malfunction events that result in VOC emissions including identification of the equipment or activity that is the source of emissions.</p>	<p>Records of any malfunctions occurring during the monitoring period that are attributed to M1 emission limits are included in the applicable semi-annual reports.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Recordkeeping:</b> To demonstrate compliance, each month records shall be kept of the cumulative total of VOC emissions due to malfunction events during the first 12 months and, thereafter of the monthly rolling 12 month total of VOC emissions due to malfunction events.</p> <p>Records shall also be kept of the inlet gas analysis, the percent VOC of the gas based on the most recent gas analysis, of the volume of total gas vented in MMscf used to calculate the VOC emissions, a description of the event, and whether the emissions resulting from the event will be used toward the permitted malfunction emission limit or whether the event is reported under 20.2.7 NMAC.</p> <p>The permittee shall record the calculated emissions and all parameters used in calculations in accordance with Condition B109, except the requirement in B109.E to record the start and end times of malfunction events shall not apply to the venting of known quantities of VOC.</p>	<p>Records of any malfunctions occurring during the monitoring period that are attributed to M1 emission limits are used to determine that the source continues to comply with this requirement.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Reporting:</b> The permittee shall report in accordance with Section B110.</p>	<p>Malfunction monitoring records are included in the applicable semi-annual reports.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>A108 Facility: Facility Hours of Operation</b></p> <p>A. This facility is authorized for continuous operation. Monitoring, recordkeeping, and</p>		<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>



reporting are not required to demonstrate compliance with continuous hours of operation.				
<b>A109 Facility: Reporting Schedules</b>  <b>A.</b> A Semi-Annual Report of monitoring activities is due within 45 days following the end of every 6-month reporting period. The six month reporting periods start on <b>October 1<sup>st</sup></b> and <b>April 1<sup>st</sup></b> of each year.	The first semi-annual report for this compliance period was submitted April 30, within 45 days of the end of the monitoring period. Submittal of the semi-annual report associated with this ACC by November 14 will demonstrate compliance with this requirement.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>A109 Facility: Reporting Schedules</b>  <b>B.</b> The Annual Compliance Certification Report is due within 30 days of the end of every 12-month reporting period. The 12-month reporting period starts on <b>October 1<sup>st</sup> of each year.</b>	Submittal of the ACC by Oct. 30 will demonstrate compliance with the ACC reporting requirement.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>A110 Facility: Fuel and Fuel Sulfur Requirements</b>  <b>A.</b> Fuel and Fuel Sulfur Requirements  <b>Requirement:</b> All combustion emission units shall combust only natural gas containing no more than <b>0.2</b> grains of total sulfur per 100 dry standard cubic feet. (NSR 0761M8R1, Condition A110.A, revised)	Natural gas is used for fuel.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Monitoring:</b> For Units 1, 9, and 14 the permittee shall monitor the total sulfur content of the fuel being fired or maintain the specified records below.	Fuel sulfur test results are included with the applicable semi-annual report.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Recordkeeping:</b> The permittee shall demonstrate compliance with the natural gas limit on total sulfur content by maintaining records of a current, valid purchase contract, tariff sheet or transportation contract for the gaseous fuel, or fuel gas analysis, specifying the allowable limit or less. If fuel gas analysis	Fuel sulfur test results are maintained as required and included with the applicable semi-annual report.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

is used, the analysis shall not be older than <b>one year</b> .				
<b>Reporting:</b> The permittee shall report in accordance with Section B110.	Fuel sulfur test results are included with the applicable semi-annual report.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>A111 Facility: 20.2.61 NMAC Opacity</b>  <b>A.</b> 20.2.61 NMAC Opacity Limit (Unit 1, 2, 9, 14)  <b>Requirement:</b> Visible emissions from all stationary combustion emission stacks shall not equal or exceed an opacity of 20 percent in accordance with the requirements at 20.2.61.109 NMAC. (NSR 0761M8R1, Condition A111.A)	Natural gas is used for fuel.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Monitoring:</b> Use of natural gas fuel constitutes compliance with 20.2.61 NMAC unless opacity equals or exceeds 20% averaged over a 10-minute period. When any visible emissions are observed during operation other than during startup mode, opacity shall be measured over a 10-minute period, in accordance with the procedures at 40 CFR 60, Appendix A, Reference Method 9 (EPA Method 9) as required by 20.2.61.114 NMAC, or the operator will be allowed to shut down the equipment to perform maintenance/repair to eliminate the visible emissions. Following completion of equipment maintenance/repair, the operator shall conduct visible emission observations following startup in accordance with the following procedures: <ul style="list-style-type: none"> <li>• Visible emissions observations shall be conducted over a 10-minute period during operation after completion of startup mode in accordance with the procedures at 40 CFR 60, Appendix</li> </ul>	Natural gas is used for fuel. No visible emissions were observed during the applicable monitoring period.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

<p>A, Reference Method 22 (EPA Method 22). If no visible emissions are observed, no further action is required.</p> <ul style="list-style-type: none"> <li>If any visible emissions are observed during completion of the EPA Method 22 observation, subsequent opacity observations shall be conducted over a 10-minute period, in accordance with the procedures at EPA Method 9 as required by 20.2.61.114 NMAC.</li> </ul> <p>For the purposes of this condition, <i>Startup mode</i> is defined as the startup period that is described in the facility's startup plan.</p>				
<p><b>Recordkeeping:</b> If no visible emissions were observed, none.</p> <p>If any visible emissions observations were conducted, the permittee shall keep records in accordance with the requirements of Section B109 and as follows:</p> <ul style="list-style-type: none"> <li>For any visible emissions observations conducted in accordance with EPA Method 22, record the information on the form referenced in EPA Method 22, Section 11.2.</li> </ul> <p>For any opacity observations conducted in accordance with the requirements of EPA Method 9, record the information on the form referenced in EPA Method 9, Sections 2.2 and 2.4.</p>	<p>Reports of observed opacity, had they occurred, would be made in accordance with section B110.</p>	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p><b>Reporting:</b> The permittee shall report in accordance with Section B110.</p>	<p>Reports of observed opacity, had they occurred, would be made in accordance with section B110.</p>	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

<p><b>A201 Engines</b></p> <p><b>A. Maintenance and Repair Monitoring (Unit 2)</b></p> <p><b>Requirement:</b> Compliance with the allowable emission limits in Table 106.A shall be demonstrated by properly maintaining and repairing the units.</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore maintenance as described in the requirement was not undertaken.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Monitoring:</b> Maintenance and repair shall meet the minimum manufacturer's or permittee's recommended maintenance schedule. Activities that involve maintenance, adjustment, replacement, or repair of functional components with the potential to affect the operation of an emission unit shall be documented as they occur for the following events:</p> <p>(1) Routine maintenance that takes a unit out of service for more than two hours during any twenty-four hour period.</p> <p>(2) Unscheduled repairs that require a unit to be taken out of service for more than two hours in any twenty-four hour period.</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore maintenance as described in the requirement was not undertaken.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Recordkeeping:</b> The permittee shall maintain records in accordance with Section B109, including records of maintenance and repairs activities and a copy of the manufacturer's or permittee's recommended maintenance schedule.</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore maintenance as described in the requirement was not undertaken.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Reporting:</b> The permittee shall report in accordance with Section B110.</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore maintenance as described in the requirement was not undertaken.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>

<p><b>A201 Engines</b></p> <p><b>B. Periodic Emissions Test (Unit 2)</b></p> <p><b>Requirement:</b> Compliance with the allowable emission limits in Table 106.A shall be demonstrated by annual emission tests. (NSR 0761M8R1, Condition A110.A and revised)</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore was not tested.</p>	<p><input type="checkbox"/> Continuous</p> <p><input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes</p> <p><input checked="" type="checkbox"/> No</p>
<p><b>Monitoring:</b> The permittee shall test using a portable analyzer or EPA Reference Methods subject to the requirements and limitations of Section B108, General Monitoring Requirements. For periodic testing of NOx and CO, emissions tests shall be carried out as described below. Test results that demonstrate compliance with the CO emission limits shall also be considered to demonstrate compliance with the VOC emission limits.</p> <p>(1) The monitoring period shall be annual, based on a calendar year.</p> <p>(2) The tests shall continue based on the existing testing schedule.</p> <p>(3) All subsequent monitoring shall occur in each succeeding monitoring period. No two monitoring events shall occur closer together in time than 25% of a monitoring period.</p> <p>(4) The permittee shall follow the General Testing Procedures of Section B111.</p> <p>(5) Performance testing required by 40 CFR 60, Subpart JJJJ or IIII or 40 CFR 63, Subpart ZZZZ may be used to satisfy these periodic testing requirements if they meet the requirements of this condition and are completed during the specified monitoring period.</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore was not tested.</p>	<p><input type="checkbox"/> Continuous</p> <p><input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes</p> <p><input checked="" type="checkbox"/> No</p>

<p><b>Recordkeeping:</b> The permittee shall maintain records in accordance with Section B109, B110, and B111.</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore was not tested.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Reporting:</b> The permittee shall report in accordance with Section B109, B110, and B111.</p>	<p>Unit 2 did not operate during the applicable monitoring period and therefore was not tested.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>A201 Engines</b></p> <p>C. 40 CFR 63, Subpart ZZZZ (Unit 2)</p> <p><b>Requirement:</b> The unit is subject to 40 CFR 63, Subpart ZZZZ and the permittee shall comply with all applicable requirements of Subpart A and Subpart ZZZZ.</p>	<p>Unit 2 did not operate during the applicable monitoring period. Records of ZZZZ applicability are maintained as required.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Monitoring:</b> The permittee shall comply with all applicable monitoring requirements of 40 CFR 63, Subpart A and Subpart ZZZZ.</p>	<p>Unit 2 did not operate during the applicable monitoring period. Records of ZZZZ applicability are maintained as required.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Recordkeeping:</b> The permittee shall comply with all applicable recordkeeping requirements of 40 CFR 63, Subpart A and Subpart ZZZZ, including but not limited to 63.6655 and 63.10.</p>	<p>Unit 2 did not operate during the applicable monitoring period. Records of ZZZZ applicability are maintained as required.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>Reporting:</b> The permittee shall comply with all applicable reporting requirements of 40 CFR 63, Subpart A and ZZZZ, including but not limited to 63.6645, 63.6650, 63.9, and 63.10.</p>	<p>Unit 2 did not operate during the applicable monitoring period. Records of ZZZZ applicability are maintained as required.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<p><b>A203 Tanks</b></p> <p>A. Tank Throughput and Separator Pressure (Units T3, T12 and F-2)</p> <p><b>Requirement:</b> Compliance with the allowable emission limits in Table 106.A shall be demonstrated by not exceeding the monthly rolling 12-month total condensate throughput/truck loading to/from the units of 578,340 gallons per year (13,770 barrels/year)</p>	<p>Condensate throughput / truck loadout records and separator pressure records are used to demonstrate that the source continues to comply with this requirement.</p>	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>

<p>and the monthly rolling 12-month average separator pressure of 272 psia. The annual truck loadout volume shall not exceed allowable tank throughput. (NSR Permit 0761M8R1, Condition A203.A, revised)</p>				
<p><b>Monitoring:</b> The permittee shall monitor the monthly total throughput/truck loading and the upstream separator pressure once per month.</p>	<p>Condensate throughput / truck loadout records and separator pressure records are used to demonstrate that the source continues to comply with this requirement.</p>	<p><input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><b>Recordkeeping:</b> The permittee shall record: 1) the monthly total throughput/truck loading of liquids and, 2) the monthly separator pressure.</p> <p>Each month the permittee shall use these values to calculate and record:</p> <p>3) during the first 12 months of monitoring, the cumulative total liquid throughput/truck loading and after the first 12 months of monitoring, the monthly rolling 12-month total liquid throughput/truck loading and, 4) during the first 12 months of monitoring, the cumulative average separator pressure, and after the first 12 months of monitoring, the monthly rolling 12-month average separator pressure.</p> <p>Tank breathing and working emissions were calculated using the USEPA Tanks program Version 4.0.9.d and tank flashing emissions using <b>HYSYS® 2.4</b>. Emission rates computed using the same parameters, but with a different Department approved algorithm that exceed these values will not be deemed non-compliance with this permit.</p>	<p>Condensate throughput / truck loadout records and separator pressure records are used to demonstrate that the source continues to comply with this requirement.</p>	<p><input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>

Records shall be maintained in accordance with Section B109.				
<b>Reporting:</b> The permittee shall report in accordance with Section B110.	Condensate throughput / truck loadout records and separator pressure records are used to demonstrate that the source continues to comply with this requirement.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>A205 Turbines</b>  A. Periodic Emissions Tests (Units 1, 9, and 14)  <b>Requirement:</b> Compliance with the allowable emission limits in Table 106.A shall be demonstrated by periodic emission tests.	Periodic portable analyzer test and/or EPA method test results demonstrate compliance with allowable emissions limits.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Monitoring:</b> The permittee shall test using a portable analyzer or EPA Reference Methods subject to the requirements and limitations of Section B108, General Monitoring Requirements. For periodic testing of NOx and CO, emissions tests shall be carried out as described below. Test results that demonstrate compliance with the CO emission limits shall also be considered to demonstrate compliance with the VOC emission limits.  (1) The test period shall be annual, based on a calendar year.  (2) The tests shall continue based on the existing testing schedule.  (3) All subsequent monitoring shall occur in each succeeding monitoring period. No two monitoring events shall occur closer together in time than 25% of a monitoring period.  (4) The permittee shall follow the General Testing Procedures of Section B111.  (5) Performance testing required by 40 CFR 60, Subpart GG or 40 CFR 60, Subpart KKKK	Periodic test reports included in the applicable semi-annual reports demonstrate compliance with emissions limits.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No



may be used to satisfy these periodic testing requirements if they meet the requirements of this condition and are completed during the specified monitoring period.				
<p><b>Recordkeeping:</b> The permittee shall maintain records in accordance with Section B109. The permittee shall also record the results of the periodic emissions tests, including the turbine's fuel flow rate and horsepower at the time of the test, and the type of fuel fired (natural gas, field gas, etc.).</p> <p>If a combustion analyzer is used to measure excess air in the exhaust gas, records shall be kept of the make and model of the instrument and instrument calibration data. If an ORSAT apparatus or other gas absorption analyzer is used, the permittee shall record all calibration results.</p> <p>The permittee shall also keep records of all raw data used to determine exhaust gas flow and of all calculations used to determine flow rates and mass emissions rates.</p>	Records of these tests are maintained as required, and are available on request.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Reporting:</b> The permittee shall report in accordance with Section B109, B110, and B111.	Periodic test reports included in the applicable semi-annual reports demonstrate compliance with emissions limits.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<p><b>A205 Turbines</b></p> <p><b>B.</b> 40 CFR 60, Subpart GG (Unit 1)</p> <p><b>Requirement:</b> The unit is subject to 40 CFR 60, Subpart GG and the permittee shall comply with the applicable requirements of 40 CFR 60, Subpart A and Subpart GG.</p>	See below for the methods used to determine compliance with the applicable requirements of subparts A and GG.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Monitoring:</b> The permittee shall comply with the monitoring and testing requirements of 40 CFR 60.334 and 60.335.	Fuel sulfur monitoring records demonstrate compliance with monitoring requirements. Testing requirements were completed in a previous monitoring period.	<input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Recordkeeping:</b> The permittee shall comply	Fuel sulfur monitoring records demonstrate	<input type="checkbox"/> Continuous	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> Yes

with the recordkeeping requirements of 40 CFR 60.334 and 40 CFR 60.7.	compliance with monitoring requirements. Testing requirements were completed in a previous monitoring period; records are maintained as required.	<input checked="" type="checkbox"/> <b>Intermittent</b>	<input type="checkbox"/> <b>No</b>	<input checked="" type="checkbox"/> <b>No</b>
<b>Reporting:</b> The permittee shall comply with the reporting requirements of 40 CFR 60.7.	Fuel sulfur monitoring records are included with the applicable semi-annual reports.	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<b>A205 Turbines</b>  C. 40 CFR 60, Subpart KKKK (Units 9 and 14)  <b>Requirement</b> The units are is subject to 40 CFR 60, Subpart KKKK and the permittee shall comply with the applicable requirements of 40 CFR 60, Subpart A and Subpart KKKK.	See below for the methods used to determine compliance with the applicable requirements of subparts A and KKKK.	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<b>Monitoring:</b> The permittee shall comply with all applicable monitoring and testing requirements, including but not limited to 40 CFR 60.4333.	Monitoring and test results are maintained and included in the applicable semi-annual reports.	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<b>Recordkeeping:</b> The permittee shall comply with all applicable recordkeeping requirements, including but not limited to 40 CFR 60.7.	Records of monitoring and test results are maintained as required.	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
<b>Reporting:</b> The permittee shall comply with all applicable reporting requirements, including but not limited to 40 CFR 60.4375, 60.4395, and 60.7.	Monitoring and test results are maintained and included in the applicable semi-annual reports.	<input type="checkbox"/> <b>Continuous</b> <input checked="" type="checkbox"/> <b>Intermittent</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>

## PART 1 B General Conditions

<b>1. Have these General Conditions been met during this reporting period?</b>  <i>If the section Heading is marked as N/A no remarks are required.</i> <i>Check only one box per subject heading.</i> <i>Explain answers in remarks row under subject heading.</i>	2. Was this facility in compliance with this requirement during the reporting period?	3. Does not apply	
<b>B100 <u>Introduction</u></b> A. N/A	<input type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
<b>REMARKS:</b>			
<b>B101 <u>Legal</u></b>  A. Permit Terms and Conditions (20.2.70 sections 7, 201.B, 300, 301.B, 302, 405 NMAC) <ul style="list-style-type: none"> <li>(1) The permittee shall abide by all terms and conditions of this permit, except as allowed under Section 502(b)(10) of the Federal Act, and 20.2.70.302.H.1 NMAC. Any permit noncompliance is grounds for enforcement action, and significant or repetitious noncompliance may result in termination of this permit. Additionally, noncompliance with federally enforceable conditions of this permit constitutes a violation of the Federal Act. (20.2.70.302.A.2.a NMAC)</li> <li>(2) Emissions trading within a facility (20.2.70.302.H.2 NMAC)                         <ul style="list-style-type: none"> <li>(a) The Department shall, if an applicant requests it, issue permits that contain terms and conditions allowing for the trading of emissions increases and decreases in the permitted facility solely for the purpose of complying with a federally enforceable emissions cap that is established in the permit in addition to any applicable requirements. Such terms and conditions shall include all terms and conditions required under 20.2.70.302 NMAC to determine compliance. If applicable requirements apply to the requested emissions trading, permit conditions shall be issued only to the extent that the applicable requirements provide for trading such increases and decreases without a case-by-case approval.</li> <li>(b) The applicant shall include in the application proposed replicable procedures and permit terms that ensure the emissions trades are quantifiable and enforceable. The Department shall not include in the emissions trading provisions any emissions units for which emissions are not quantifiable or for which there are no replicable procedures to enforce the emissions trades. The permit shall require compliance with all applicable requirements.</li> </ul> </li> <li>(3) It shall not be a defense for the permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (20.2.70.302.A.2.b NMAC)</li> <li>(4) If the Department determines that cause exists to modify, reopen and revise, revoke and reissue, or terminate</li> </ul>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below

## **PART 1 B General Conditions**

<p>this permit, this shall be done in accordance with 20.2.70.405 NMAC. (20.2.70.302.A.2.c NMAC)</p> <p>(5) The permittee shall furnish any information the Department requests in writing to determine if cause exists for reopening and revising, revoking and reissuing, or terminating the permit, or to determine compliance with the permit. This information shall be furnished within the time period specified by the Department. Additionally, the permittee shall furnish, upon request by the Department, copies of records required by the permit to be maintained by the permittee. (20.2.70.302.A.2.f NMAC)</p> <p>(6) A request by the permittee that this permit be modified, revoked and reissued, or terminated, or a notification by the permittee of planned changes or anticipated noncompliance, shall not stay any conditions of this permit. (20.2.70.302.A.2.d NMAC)</p> <p>(7) This permit does not convey property rights of any sort, or any exclusive privilege. (20.2.70.302.A.2.e NMAC)</p> <p>(8) In the case where an applicant or permittee has submitted information to the Department under a claim of confidentiality, the Department may also require the applicant or permittee to submit a copy of such information directly to the Administrator of the EPA. (20.2.70.301.B NMAC)</p> <p>(9) The issuance of this permit, or the filing or approval of a compliance plan, does not relieve the permittee from civil or criminal liability for failure to comply with the state or Federal Acts, or any applicable state or federal regulation or law. (20.2.70.302.A.6 NMAC and the New Mexico Air Quality Control Act NMSA 1978, Chapter 74, Article 2)</p> <p>(10) If any part of this permit is challenged or held invalid, the remainder of the permit terms and conditions are not affected and the permittee shall continue to abide by them. (20.2.70.302.A.1.d NMAC)</p> <p>(11) A responsible official (as defined in 20.2.70.7.AE NMAC) shall certify the accuracy, truth and completeness of every report and compliance certification submitted to the Department as required by this permit. These certifications shall be part of each document. (20.2.70.300.E NMAC)</p> <p>(12) Revocation or termination of this permit by the Department terminates the permittee's right to operate this facility. (20.2.70.201.B NMAC)</p> <p>(13) The permittee shall continue to comply with all applicable requirements. For applicable requirements that will become effective during the term of the permit, the permittee shall meet such requirements on a timely basis. (Sections 300.D.10.c and 302.G.3 of 20.2.70 NMAC)</p> <p><b>B. Permit Shield (20.2.70.302.J NMAC)</b></p> <p>(1) Compliance with the conditions of this permit shall be deemed to be compliance with any applicable requirements existing as of the date of permit issuance and identified in Table 103.A. The requirements in Table 103.A are applicable to this facility with specific requirements identified for individual emission units.</p> <p>(2) The Department has determined that the requirements in Table 103.B as identified in the permit application are</p>			
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## PART 1 B General Conditions

<p>not applicable to this source, or they do not impose any conditions in this permit.</p> <p>(3) This permit shield does not extend to administrative amendments (Subsection A of 20.2.70.404 NMAC), to minor permit modifications (Subsection B of 20.2.70.404 NMAC), to changes made under Section 502(b)(10), changes under Paragraph 1 of subsection H of 20.2.70.302 of the Federal Act, or to permit terms for which notice has been given to reopen or revoke all or part under 20.2.70.405 and 20.2.70.302J(6).</p> <p>(4) This permit shall, for purposes of the permit shield, identify any requirement specifically identified in the permit application or significant permit modification that the department has determined is not applicable to the source, and state the basis for any such determination. (20.2.70.302.A.1.f NMAC)</p> <p>C. The owner or operator of a source having an excess emission shall, to the extent practicable, operate the source, including associated air pollution control equipment, in a manner consistent with good air pollutant control practices for minimizing emissions. (20.2.7.109 NMAC). The establishment of allowable malfunction emission limits does not supersede this requirement.</p>			
<p><b>REMARKS:</b> Facility was in compliance with applicable requirements during the applicable period.</p>			
<p><b>B102 Authority</b></p> <p>A. This permit is issued pursuant to the federal Clean Air Act ("Federal Act"), the New Mexico Air Quality Control Act ("State Act") and regulations adopted pursuant to the State and Federal Acts, including Title 20, New Mexico Administrative Code, Chapter 2, Part 70 (20.2.70 NMAC) - Operating Permits.</p> <p>B. This permit authorizes the operation of this facility. This permit is valid only for the named permittee, owner, and operator. A permit modification is required to change any of those entities.</p> <p>C. The Department specifies with this permit, terms and conditions upon the operation of this facility to assure compliance with all applicable requirements, as defined in 20.2.70 NMAC at the time this permit is issued. (20.2.70.302.A.1 NMAC)</p> <p>D. Pursuant to the New Mexico Air Quality Control Act NMSA 1978, Chapter 74, Article 2, all terms and conditions in this permit, including any provisions designed to limit this facility's potential to emit, are enforceable by the Department. All terms and conditions are enforceable by the Administrator of the United States Environmental Protection Agency ("EPA") and citizens under the Federal Act, unless the term or condition is specifically</p>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below

## PART 1 B General Conditions

designated in this permit as not being enforceable under the Federal Act. (20.2.70.302.A.5 NMAC)			
E. The Department is the Administrator for 40 CFR Parts 60, 61, and 63 pursuant to the Modification and Exceptions of Section 10 of 20.2.77 NMAC (NSPS), 20.2.78 NMAC (NESHAP), and 20.2.82 NMAC (MACT).			

**REMARKS:**

Only the permitted owner operated the facility during the applicable period.

**B103 Annual Fee**

The permittee shall pay Title V fees to the Department consistent with the fee schedule in 20.2.71 NMAC - Operating Permit Emission Fees. The fees will be assessed and invoiced separately from this permit. (20.2.70.302.A.1.e NMAC)

<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
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**REMARKS:**

2017 operating permit emission fees were paid on May 7, 2018.

**B104 Appeal Procedures**

(20.2.70.403.A NMAC)

A. Any person who participated in a permitting action before the Department and who is adversely affected by such permitting action, may file a petition for a hearing before the Environmental Improvement Board ("board"). The petition shall be made in writing to the board within thirty (30) days from the date notice is given of the Department's action and shall specify the portions of the permitting action to which the petitioner objects, certify that a copy of the petition has been mailed or hand-delivered, and attach a copy of the permitting action for which review is sought. Unless a timely request for a hearing is made, the decision of the Department shall be final. The petition shall be copied simultaneously to the Department upon receipt of the appeal notice. If the petitioner is not the applicant or permittee, the petitioner shall mail or hand-deliver a copy of the petition to the applicant or permittee. The Department shall certify the administrative record to the board. Petitions for a hearing shall be sent to:

Secretary, New Mexico Environmental Improvement Board  
1190 St. Francis Drive, Runnels Bldg. Rm N2153  
Santa Fe, New Mexico 87502

<input type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input checked="" type="checkbox"/> <b>N/A</b> Explain Below
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**REMARKS:**

Department action.

## PART 1 B General Conditions

	<input checked="" type="checkbox"/> Yes Explain Below	<input type="checkbox"/> No Explain Below	<input type="checkbox"/> N/A Explain Below
<p><b>B105 <u>Submittal of Reports and Certifications</u></b></p> <p>A. Stack Test Protocols and Stack Test Reports shall be submitted electronically to <a href="mailto:Stacktest.AQB@state.nm.us">Stacktest.AQB@state.nm.us</a> or as directed by the Department.</p> <p>B. Excess Emission Reports shall be submitted as directed by the Department. (20.2.7.110 NMAC)</p> <p>C. Compliance Certification Reports, Semi-Annual monitoring reports, compliance schedule progress reports, and any other compliance status information required by this permit shall be certified by the responsible official and submitted to the mailing address below, or as directed by the Department:</p> <p style="margin-left: 40px;">Manager, Compliance and Enforcement Section New Mexico Environment Department Air Quality Bureau 525 Camino de los Marquez, Suite 1 Santa Fe, NM 87505-1816</p> <p>D. Compliance Certification Reports shall also be submitted to the Administrator at the address below (20.2.70.302.E.3 NMAC):</p> <p style="margin-left: 40px;">Chief, Air Enforcement Section US EPA Region-6, 6EN-AA 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733</p>			
<p><b>REMARKS:</b> Stack test reports, semi-annual reports and ACCs are submitted to the appropriate regulatory personnel.</p>			

## PART 1 B General Conditions

<p><b>B106 <u>NSPS and/or MACT Startup, Shutdown, and Malfunction Operations</u></b></p> <p>A. If a facility is subject to a NSPS standard in 40 CFR 60, each owner or operator that installs and operates a continuous monitoring device required by a NSPS regulation shall comply with the excess emissions reporting requirements in accordance with 40 CFR 60.7(c).</p> <p>B. If a facility is subject to a NSPS standard in 40 CFR 60, then in accordance with 40 CFR 60.8(c), operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard.</p> <p>C. If a facility is subject to a MACT standard in 40 CFR 63, then the facility is subject to the requirement for a Startup, Shutdown and Malfunction Plan (SSM) under 40 CFR 63.6(e)(3), unless specifically exempted in the applicable subpart. (20.2.70.302.A.1 and A.4 NMAC)</p>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
<p><b>REMARKS:</b> There are no NSPS requirements to install a CMS device for the units operating at this facility.</p> <p>No emissions in excess of applicable standards occurred during the applicable period.</p> <p>Although NESHAP standards apply to this facility, no requirements are currently applicable to units currently operating.</p>			
<p><b>B107 <u>Startup, Shutdown, and Maintenance Operations</u></b></p> <p>A. The establishment of permitted startup, shutdown, and maintenance (SSM) emission limits does not supersede the requirements of 20.2.7.14.A NMAC. Except for operations or equipment subject to Condition B106, the permittee shall establish and implement a plan to minimize emissions during routine or predictable start up, shut down, and scheduled maintenance (SSM work practice plan) and shall operate in accordance with the procedures set forth in the plan. (20.2.7.14.A NMAC)</p>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
<p><b>REMARKS:</b> Williams has prepared and implemented an SSM Plan for compliance with 20.2.7 NMAC.</p>			



# **PART 1 B General Conditions**

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## PART 1 B General Conditions

<b>B108 <u>General Monitoring Requirements</u></b> (20.2.70. 302.A and C NMAC)	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
<p>A. These requirements do not supersede or relax requirements of federal regulations.</p> <p>B. The following monitoring and/or testing requirements shall be used to determine compliance with applicable requirements and emission limits. Any sampling, whether by portable analyzer or EPA reference method, that measures an emission rate over the applicable averaging period greater than an emission limit in this permit constitutes noncompliance with this permit. The Department may require, at its discretion, additional tests pursuant to EPA Reference Methods at any time, including when sampling by portable analyzer measures an emission rate greater than an emission limit in this permit; but such requirement shall not be construed as a determination that the sampling by portable analyzer does not establish noncompliance with this permit and shall not stay enforcement of such noncompliance based on the sampling by portable analyzer.</p> <p>C. If the emission unit is shutdown at the time when periodic monitoring is due to be accomplished, the permittee is not required to restart the unit for the sole purpose of performing the monitoring. Using electronic or written mail, the permittee shall notify the Department's Enforcement Section of a delay in emission tests prior to the deadline for accomplishing the tests. Upon recommencing operation, the permittee shall submit any pertinent pre-test notification requirements set forth in the current version of the Department's Standard Operating Procedures For Use Of Portable Analyzers in Performance Test, and shall accomplish the monitoring.</p> <p>D. The requirement for monitoring during any monitoring period is based on the percentage of time that the unit has operated. However, to invoke monitoring period exemptions at B108.D(2), hours of operation shall be monitored and recorded.</p> <p>(1) If the emission unit has operated for more than 25% of a monitoring period, then the permittee shall conduct monitoring during that period.</p> <p>(2) If the emission unit has operated for 25% or less of a monitoring period then the monitoring is not required. After two successive periods without monitoring, the permittee shall conduct monitoring during the next period regardless of the time operated during that period, except that for any monitoring period in which a unit has operated for less than 10% of the monitoring period, the period will not be considered as one of the two successive periods.</p> <p>(3) If invoking the monitoring period exemption in B108.D(2), the actual operating time of a unit shall not exceed the monitoring period required by this permit before the required monitoring is performed. For example, if the monitoring period is annual, the operating hours of the unit shall not exceed 8760 hours before monitoring is</p>			

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<p>conducted. Regardless of the time that a unit actually operates, a minimum of one of each type of monitoring activity shall be conducted during the five year term of this permit.</p> <p>E. The permittee is not required to report a deviation for any monitoring or testing in a Specific Condition if the deviation was authorized in this General Condition <b>B108</b>.</p> <p>F. For all periodic monitoring events, except when a federal or state regulation is more stringent, three test runs shall be conducted at 90% or greater of the unit's capacity as stated in this permit, or in the permit application if not in the permit, and at additional loads when requested by the Department. If the 90% capacity cannot be achieved, the monitoring will be conducted at the maximum achievable load under prevailing operating conditions except when a federal or state regulation requires more restrictive test conditions. The load and the parameters used to calculate it shall be recorded to document operating conditions and shall be included with the monitoring report.</p> <p>G. When requested by the Department, the permittee shall provide schedules of testing and monitoring activities. Compliance tests from previous NSR and Title V permits may be re-imposed if it is deemed necessary by the Department to determine whether the source is in compliance with applicable regulations or permit conditions.</p> <p>H. If monitoring is new or is in addition to monitoring imposed by an existing applicable requirement, it shall become effective 120 days after the date of permit issuance. For emission units that have not commenced operation, the associated new or additional monitoring shall not apply until 120 days after the units commence operation. All pre-existing monitoring requirements incorporated in this permit shall continue to apply from the date of permit issuance. All monitoring periods, unless stated otherwise in the specific permit condition or federal requirement, shall commence at the beginning of the 12 month reporting period as defined at condition A109.B.</p>				
<p><b>REMARKS:</b>          Periodic test reports that are completed during the applicable period are included in the applicable semi-annual reports.</p>				

## PART 1 B General Conditions

<b>B109 General Recordkeeping Requirements</b> (20.2.70.302.D.1 NMAC)	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
<p>A. The permittee shall maintain records to assure and verify compliance with the terms and conditions of this permit and any applicable requirements that become effective during the term of this permit. The minimum information to be included in these records is (20.2.70.302.D.1 NMAC):</p> <p>(1) Records required for testing and sampling:</p> <ul style="list-style-type: none"> <li>(a) equipment identification (include make, model and serial number for all tested equipment and emission controls);</li> <li>(b) date(s) and time(s) of sampling or measurements;</li> <li>(c) date(s) analyses were performed;</li> <li>(d) the company or entity that performed the analyses;</li> <li>(e) analytical or test methods used;</li> <li>(f) results of analyses or tests; and</li> <li>(g) operating conditions existing at the time of sampling or measurement.</li> </ul> <p>(2) Records required for equipment inspections and/or maintenance required by this permit:</p> <ul style="list-style-type: none"> <li>(a) equipment identification number (including make, model and serial number)</li> <li>(b) date(s) and time(s) of inspection, maintenance, and/or repair</li> <li>(c) date(s) any subsequent analyses were performed (if applicable)</li> <li>(d) name of the person or qualified entity conducting the inspection, maintenance, and/or repair</li> <li>(e) copy of the equipment manufacturer's or the owner or operator's maintenance or repair recommendations (if required to demonstrate compliance with a permit condition)</li> <li>(f) description of maintenance or repair activities conducted</li> <li>(g) all results of any required parameter readings</li> <li>(h) a description of the physical condition of the equipment as found during any required inspection</li> <li>(i) results of required equipment inspections including a description of any condition which required adjustment to bring the equipment back into compliance and a description of the required adjustments</li> </ul>			

## PART 1 B General Conditions

<p>B. The permittee shall keep records of all monitoring data, equipment calibration, maintenance, and inspections, Data Acquisition and Handling System (DAHS) if used, reports, and other supporting information required by this permit for at least five (5) years from the time the data was gathered or the reports written. Each record shall clearly identify the emissions unit and/or monitoring equipment, and the date the data was gathered. (20.2.70.302.D.2 NMAC)</p> <p>C. If the permittee has applied and received approval for an alternative operating scenario, then the permittee shall maintain a log at the facility, which documents, contemporaneously with any change from one operating scenario to another, the scenario under which the facility is operating. (20.2.70.302.A.3 NMAC)</p> <p>D. The permittee shall keep a record describing off permit changes made at this source that result in emissions of a regulated air pollutant subject to an applicable requirement, but not otherwise regulated under this permit, and the emissions resulting from those changes. (20.2.70.302.I.2 NMAC)</p> <p>E. Unless otherwise indicated by Specific Conditions, the permittee shall keep the following records for malfunction emissions and routine and predictable emissions during startup, shutdown, and scheduled maintenance (SSM):</p> <p>(1) The owner or operator of a source subject to a permit, shall establish and implement a plan to minimize emissions during routine or predictable startup, shutdown, and scheduled maintenance through work practice standards and good air pollution control practices. This requirement shall not apply to any affected facility defined in and subject to an emissions standard and an equivalent plan under 40 CFR Part 60 (NSPS), 40 CFR Part 63 (MACT), or an equivalent plan under 20.2.72 NMAC - Construction Permits, 20.2.70 NMAC - Operating Permits, 20.2.74 NMAC - Permits - Prevention of Significant Deterioration (PSD), or 20.2.79 NMAC - Permits - Nonattainment Areas. (20.2.7.14.A NMAC) The permittee shall keep records of all sources subject to the plan to minimize emissions during routine or predictable SSM and shall record if the source is subject to an alternative plan and therefore, not subject to the plan requirements under 20.2.7.14.A NMAC.</p> <p>(2) If the facility has allowable SSM emission limits in this permit, the permittee shall record all SSM events, including the date, the start time, the end time, a description of the event, and a description of the cause of the event. This record also shall include a copy of the manufacturer's, or equivalent, documentation showing that any maintenance qualified as scheduled. Scheduled maintenance is an activity that occurs at an established frequency pursuant to a written protocol published by the manufacturer or other reliable source. The authorization of allowable SSM emissions does not supersede any applicable federal or state standard. The most stringent requirement applies.</p> <p>(3) If the facility has allowable malfunction emission limits in this permit, the permittee shall record all malfunction</p>			
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## PART 1 B General Conditions

<p>events to be applied against these limits. The permittee shall also include the date, the start time, the end time, and a description of the event. <b>Malfunction means</b> any sudden and unavoidable failure of air pollution control equipment or process equipment beyond the control of the owner or operator, including malfunction during startup or shutdown. A failure that is caused entirely or in part by poor maintenance, careless operation, or any other preventable equipment breakdown shall not be considered a malfunction. (20.2.7.7.E NMAC) The authorization of allowable malfunction emissions does not supersede any applicable federal or state standard. The most stringent requirement applies. This authorization only allows the permittee to avoid submitting reports under 20.2.7 NMAC for total annual emissions that are below the authorized malfunction emission limit.</p> <p>(4) The owner or operator of a source shall meet the operational plan defining the measures to be taken to mitigate source emissions during malfunction, startup or shutdown. (20.2.72.203.A(5) NMAC)</p>			
<p><b>REMARKS:</b> Records are maintained in accordance with recordkeeping requirements.</p>			
<p><b>B110 <u>General Reporting Requirements</u></b> (20.2.70.302.E NMAC)</p> <p>A. Reports of required monitoring activities for this facility shall be submitted to the Department on the schedule in section A109. Monitoring and recordkeeping requirements that are not required by a NSPS or MACT shall be maintained on-site or (for unmanned sites) at the nearest company office, and summarized in the semi-annual reports, unless alternative reporting requirements are specified in the equipment specific requirements section of this permit.</p> <p>B. Reports shall clearly identify the subject equipment showing the emission unit ID number according to this operating permit. In addition, all instances of deviations from permit requirements, including those that occur during emergencies, shall be clearly identified in the reports required by section A109. (20.2.70.302.E.1 NMAC)</p> <p>C. The permittee shall submit reports of all deviations from permit requirements, including those attributable to upset conditions as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. These reports shall be submitted as follows:</p> <p>(1) Deviations resulting in excess emissions as defined in 20.2.7.7 NMAC (including those classified as emergencies as defined in section B114.A) shall be reported in accordance with the timelines specified by 20.2.7.110 NMAC and in the semi-annual reports required in section A109. (20.2.70.302.E.2 NMAC)</p> <p>(2) All other deviations shall be reported in the semi-annual reports required in section A109. (20.2.70.302.E.2 NMAC).</p>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below

## PART 1 B General Conditions

<p>D. The permittee shall submit reports of excess emissions in accordance with 20.2.7.110.A NMAC.</p> <p>E. Results of emission tests and monitoring for each pollutant (except opacity) shall be reported in pounds per hour (unless otherwise specified) and tons per year. Opacity shall be reported in percent. The number of significant figures corresponding to the full accuracy inherent in the testing instrument or Method test used to obtain the data shall be used to calculate and report test results in accordance with 20.2.1.116.B and C NMAC. Upon request by the Department, CEMS and other tabular data shall be submitted in editable, MS Excel format.</p> <p>F. At such time as new units are installed as authorized by the applicable NSR Permit, the permittee shall fulfill the notification requirements in the NSR permit.</p> <p>G. Periodic Emissions Test Reporting: The permittee shall report semi-annually a summary of the test results.</p> <p>H. The permittee shall submit an emissions inventory for this facility annually. The emissions inventory shall be submitted by the later of April 1 or within 90 days after the Department makes such request. (20.2.73 NMAC and 20.2.70.302.A.1 NMAC)</p> <ol style="list-style-type: none"><li>(1) The facility emits, or has the potential to emit, 5 tons per year or more of lead or lead compounds, or 100 tons per year or more of PM10, PM2.5, sulfur oxides, nitrogen oxides, carbon monoxide, or volatile organic compounds.</li><li>(2) The facility is defined as a major source of hazardous air pollutants under 20.2.70 NMAC (Operating Permits).</li><li>(3) The facility is located in an ozone nonattainment area and which emits, or has the potential to emit, 25 tons per year or more of nitrogen oxides or volatile organic compounds.</li><li>(4) Upon request by the department.</li><li>(5) The permittee shall submit the emissions inventory report by April 1 of each year, unless a different deadline is specified by the current operating permit.</li></ol> <p>I. Emissions trading within a facility (20.2.70.302.H.2 NMAC)</p> <ol style="list-style-type: none"><li>(1) For each such change, the permittee shall provide written notification to the department and the administrator at least seven (7) days in advance of the proposed changes. Such notification shall state when the change will occur and shall describe the changes in emissions that will result and how these increases and decreases in emissions will comply with the terms and conditions of the permit.</li><li>(2) The permittee and department shall attach each such notice to their copy of the relevant permit.</li></ol>			
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## PART 1 B General Conditions

**REMARKS:**

Reports are submitted in accordance with reporting requirements.

**B111 General Testing Requirements**

A. Compliance Tests

- (1) Compliance test requirements from previous permits (if any) are still in effect, unless the tests have been satisfactorily completed. Compliance tests may be re-imposed if it is deemed necessary by the Department to determine whether the source is in compliance with applicable regulations or permit conditions. (20.2.72 NMAC Sections 210.C and 213)
- (2) Compliance tests shall be conducted within sixty (60) days after the unit(s) achieve the maximum normal production rate. If the maximum normal production rate does not occur within one hundred twenty (120) days of source startup, then the tests must be conducted no later than one hundred eighty (180) days after initial startup of the source.
- (3) Unless otherwise indicated by Specific Conditions or regulatory requirements, the default time period for each test run shall be **at least** 60 minutes and each performance test shall consist of three separate runs using the applicable test method. For the purpose of determining compliance with an applicable emission limit, the arithmetic mean of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances, beyond the owner or operator's control, compliance may, upon the Department approval, be determined using the arithmetic mean of the results of the two other runs.
- (4) Testing of emissions shall be conducted with the emissions unit operating at 90 to 100 percent of the maximum operating rate allowed by the permit. If it is not possible to test at that rate, the source may test at a lower operating rate, subject to the approval of the Department.
- (5) Testing performed at less than 90 percent of permitted capacity will limit emission unit operation to 110 percent of the tested capacity until a new test is conducted.
- (6) If conditions change such that unit operation above 110 percent of tested capacity is possible, the source must submit a protocol to the Department within 30 days of such change to conduct a new emissions test.

B. EPA Reference Method Tests

	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below



## PART 1 B General Conditions

- |  |  |  |  |
|--|--|--|--|
| <p>(1) All compliance tests required by this permit, unless otherwise specified by Specific Conditions of this permit, shall be conducted in accordance with the requirements of 40 CFR 60, Subpart A, General Provisions, and the following EPA Reference Methods as specified by 40 CFR 60, Appendix A:</p> <ul style="list-style-type: none"><li>(a) Methods 1 through 4 for stack gas flowrate</li><li>(b) Method 5 for TSP</li><li>(c) Method 6C and 19 for SO<sub>2</sub></li><li>(d) Method 7E for NO<sub>x</sub> (test results shall be expressed as nitrogen dioxide (NO<sub>2</sub>) using a molecular weight of 46 lb/lb-mol in all calculations (each ppm of NO/NO<sub>2</sub> is equivalent to 1.194 x 10<sup>-7</sup> lb/SCF)</li><li>(e) Method 9 for opacity</li><li>(f) Method 10 for CO</li><li>(g) Method 19 may be used in lieu of Methods 1-4 for stack gas flowrate upon approval of the Department. A justification for this proposal must be provided along with a contemporaneous fuel gas analysis (preferably on the day of the test) and a recent fuel flow meter calibration certificate (within the most recent quarter).</li><li>(h) Method 7E or 20 for Turbines per 60.335 or 60.4400</li><li>(i) Method 29 for Metals</li><li>(j) Method 201A for filterable PM<sub>10</sub> and PM<sub>2.5</sub></li><li>(k) Method 202 for condensable PM</li><li>(l) Method 320 for organic Hazardous Air Pollutants (HAPs)</li><li>(m) Method 25A for VOC reduction efficiency</li><li>(n) Method 30B for Mercury</li></ul> <p>(2) Alternative test method(s) may be used if the Department approves the change.</p> |  |  |  |
|--|--|--|--|

### C. Periodic Monitoring and Portable Analyzer Requirements

- (1) Periodic emissions tests (periodic monitoring) may be conducted in accordance with EPA Reference Methods or by utilizing a portable analyzer. Periodic monitoring utilizing a portable analyzer shall be conducted in accordance with the requirements of ASTM D 6522-00. However, if a facility has met a previously approved Department criterion for portable analyzers, the analyzer may be operated in accordance with that criterion until it is replaced.

## PART 1 B General Conditions

<p>(2) Unless otherwise indicated by Specific Conditions or regulatory requirements, the default time period for each test run shall be <b>at least</b> 20 minutes.</p> <p>Each performance test shall consist of three separate runs. The arithmetic mean of results of the three runs shall be used to determine compliance with the applicable emission limit.</p> <p>(3) Testing of emissions shall be conducted in accordance with the requirements at Section B108.F.</p> <p>(4) During emissions tests, pollutant, O<sub>2</sub> concentration and fuel flow rate shall be monitored and recorded. This information shall be included with the test report furnished to the Department.</p> <p>(5) Stack gas flow rate shall be calculated in accordance with 40 CFR 60, Appendix A, Method 19 utilizing fuel flow rate (scf) determined by a dedicated fuel flow meter and fuel heating value (Btu/scf) determined from a fuel sample obtained preferably during the day of the test, but no earlier than three months prior to the test date. Alternatively, stack gas flow rate may be determined by using EPA Methods 1-4.</p> <p>D. Test Procedures:</p> <p>(1) The permittee shall notify the Department's Program Manager, Compliance and Enforcement Section at least thirty (30) days before the test to afford a representative of the Department an opportunity to be present at the test. (40CFR 60.8(d))</p> <p>(2) Equipment shall be tested in the "as found" condition. Equipment may not be adjusted or tuned prior to any test for the purpose of lowering emissions, and then returned to previous settings or operating conditions after the test is complete.</p> <p>(3) Contents of test notifications, protocols and test reports shall conform to the format specified by the Department's Universal Test Notification, Protocol and Report Form and Instructions. Current forms and instructions are posted to NMED's Air Quality web site under Compliance and Enforcement Testing.</p> <p>(4) The permittee shall provide (a) sampling ports adequate for the test methods applicable to the facility, (b) safe sampling platforms, (c) safe access to sampling platforms and (d) utilities for sampling and testing equipment.</p> <p>(5) The stack shall be of sufficient height and diameter and the sample ports shall be located so that a representative test of the emissions can be performed in accordance with the requirements of EPA Method 1 or ASTM D 6522-00 as applicable.</p> <p>(6) Where necessary to prevent cyclonic flow in the stack, flow straighteners shall be installed</p> <p>(7) Unless otherwise indicated by Specific Conditions or regulatory requirements, test reports shall be submitted to the Department no later than 30 days after completion of the test.</p>				
<p><b>REMARKS:</b> Testing that occurred during the applicable period was completed in accordance with the appropriate procedures.</p>				

## PART 1 B General Conditions

<b>B112 Compliance</b>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
<p>A. The Department shall be given the right to enter the facility at all reasonable times to verify the terms and conditions of this permit. Required records shall be organized by date and subject matter and shall at all times be readily available for inspection. The permittee, upon verbal or written request from an authorized representative of the Department who appears at the facility, shall immediately produce for inspection or copying any records required to be maintained at the facility. Upon written request at other times, the permittee shall deliver to the Department paper or electronic copies of any and all required records maintained on site or at an off-site location. Requested records shall be copied and delivered at the permittee's expense within three business days from receipt of request unless the Department allows additional time. Required records may include records required by permit and other information necessary to demonstrate compliance with terms and conditions of this permit. (NMSA 1978, Section 74-2-13)</p> <p>B. A copy of the most recent permit(s) issued by the Department shall be kept at the permitted facility or (for unmanned sites) at the nearest company office and shall be made available to Department personnel for inspection upon request. (20.2.70.302.G.3 NMAC)</p> <p>C. Emissions limits associated with the energy input of a Unit, i.e. lb/MMBtu, shall apply at all times unless stated otherwise in a Specific Condition of this permit. The averaging time for each emissions limit, including those based on energy input of a Unit (i.e. lb/MMBtu) is one (1) hour unless stated otherwise in a Specific Condition of this permit or in the applicable requirement that establishes the limit. (20.2.70.302.A.1 and G.3 NMAC)</p> <p>D. The permittee shall submit compliance certification reports certifying the compliance status of this facility with respect to all permit terms and conditions, including applicable requirements. These reports shall be made on the pre-populated Compliance Certification Report Form that is provided to the permittee by the Department, and shall be submitted to the Department and to EPA at least every 12 months. For the most current form, please contact the Compliance Reports Group at email:reportsgroup.aqb@state.nm.us. For additional reporting guidance see <a href="http://www.nmenv.state.nm.us/aqb/enforce_compliance/TitleVReporting.htm">http://www.nmenv.state.nm.us/aqb/enforce_compliance/TitleVReporting.htm</a>. (20.2.70.302.E.3 NMAC)</p> <p>E. The permittee shall allow representatives of the Department, upon presentation of credentials and other documents as may be required by law, to do the following (20.2.70.302.G.1 NMAC):</p> <p>(1) enter the permittee's premises where a source or emission unit is located, or where records that are required by</p>			

## PART 1 B General Conditions

<p>this permit to be maintained are kept;</p> <p>(2) have access to and copy, at reasonable times, any records that are required by this permit to be maintained;</p> <p>(3) inspect any facilities, equipment (including monitoring and air pollution control equipment), work practices or operations regulated or required under this permit; and</p> <p>(4) sample or monitor any substances or parameters for the purpose of assuring compliance with this permit or applicable requirements or as otherwise authorized by the Federal Act.</p>			
<p><b>REMARKS:</b> Records and permits are maintained as required. Representatives have not been denied access to the facility and applicable files during the applicable period.</p>			
<p><b>B113 <u>Permit Reopening and Revocation</u></b></p> <p>A. This permit will be reopened and revised when any one of the following conditions occurs, and may be revoked and reissued when A(3) or A(4) occurs. (20.2.70.405.A.1 NMAC)</p> <p>(1) Additional applicable requirements under the Federal Act become applicable to a major source three (3) or more years before the expiration date of this permit. If the effective date of the requirement is later than the expiration date of this permit, then the permit is not required to be reopened unless the original permit or any of its terms and conditions has been extended due to the Department's failure to take timely action on a request by the permittee to renew this permit.</p> <p>(2) Additional requirements, including excess emissions requirements, become applicable to this source under Title IV of the Federal Act (the acid rain program). Upon approval by the Administrator, excess emissions offset plans will be incorporated into this permit.</p> <p>(3) The Department or the Administrator determines that the permit contains a material mistake or that inaccurate statements were made in establishing the terms and conditions of the permit.</p> <p>(4) The Department or the Administrator determines that the permit must be revised or revoked and reissued to assure compliance with an applicable requirement.</p> <p>B. Proceedings to reopen or revoke this permit shall affect only those parts of this permit for which cause to reopen or revoke exists. Emissions units for which permit conditions have been revoked shall not be operated until new permit conditions have been issued for them. (20.2.70.405.A.2 NMAC)</p>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below

## PART 1 B General Conditions

<b>REMARKS:</b> No communication has been received from the regulating agency to indicate that the permit has been reopened, revoked or revised.			
<p><b>B114 Emergencies</b> (20.2.70.304 NMAC)</p> <p>A. An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the permittee, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, or careless or improper operation.</p> <p>B. An emergency constitutes an affirmative defense to an action brought for noncompliance with technology-based emission limitations contained in this permit if the permittee has demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:</p> <ol style="list-style-type: none"> <li>(1) An emergency occurred and that the permittee can identify the cause(s) of the emergency;</li> <li>(2) This facility was at the time being properly operated;</li> <li>(3) During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit; and</li> <li>(4) The permittee submitted notice of the emergency to the Department within 2 working days of the time when emission limitations were exceeded due to the emergency. This notice fulfills the requirement of 20.2.70.302.E.2 NMAC. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.</li> </ol> <p>C. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.</p> <p>D. This provision is in addition to any emergency or upset provision contained in any applicable requirement.</p>	<input checked="" type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input type="checkbox"/> <b>N/A</b> Explain Below
<b>REMARKS:</b>			

## PART 1 B General Conditions

No emergencies occurred during this period.			
<b>B115 <u>Stratospheric Ozone</u></b> (20.2.70.302.A.1 NMAC)	<input type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input checked="" type="checkbox"/> <b>N/A</b> Explain Below
A. If this facility is subject to 40 CFR 82, Subpart F, the permittee shall comply with the following standards for recycling and emissions reductions:			
(1) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices, except for motor vehicle air conditioners (MVAC) and MVAC-like appliances. (40 CFR 82.156)			
(2) Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment. (40 CFR 82.158)			
(3) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program. (40 CFR 82.161)			
<b>REMARKS:</b> The facility is not subject to 40CFR 82 subpart F.			
<b>B116 <u>Acid Rain Sources</u></b> (20.2.70.302.A.9 NMAC)	<input type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input checked="" type="checkbox"/> <b>N/A</b> Explain Below
A. If this facility is subject to the federal acid rain program under 40 CFR 72, this section applies.			
B. Where an applicable requirement of the Federal Act is more stringent than an applicable requirement of regulations promulgated under Title IV of the Federal Act, both provisions are incorporated into this permit and are federally enforceable.			
C. Emissions exceeding any allowances held by the permittee under Title IV of the Federal Act or the regulations promulgated thereunder are prohibited.			
D. No modification of this permit is required for increases in emissions that are authorized by allowances acquired pursuant to the acid rain program, provided that such increases do not require a permit modification under any other applicable requirement.			

## PART 1 B General Conditions

<p>E. The permittee may not use allowances as a defense to noncompliance with any other applicable requirement.</p> <p>F. No limit is placed on the number of allowances held by the acid rain source. Any such allowance shall be accounted for according to the procedures established in regulations promulgated under Title IV of the Federal Act.</p> <p>G. The acid rain permit is an enclosure of this operating permit.</p>			
<p><b>REMARKS:</b> The facility is not subject to 40CFR 72 acid rain program</p>			
<p><b>B117 <u>Risk Management Plan</u></b> (20.2.70.302.A.1 NMAC)</p> <p>A. If this facility is subject to the federal risk management program under 40 CFR 68, this section applies.</p> <p>B. The owner or operator shall certify annually that they have developed and implemented a RMP and are in compliance with 40 CFR 68.</p> <p>C. If the owner or operator of the facility has not developed and submitted a risk management plan according to 40 CFR 68.150, the owner or operator shall provide a compliance schedule for the development and implementation of the plan. The plan shall describe, in detail, procedures for assessing the accidental release hazard, preventing accidental releases, and developing an emergency response plan to an accidental release. The plan shall be submitted in a method and format to a central point as specified by EPA prior to the date specified in 40 CFR 68.150.b.</p>	<input type="checkbox"/> <b>Yes</b> Explain Below	<input type="checkbox"/> <b>No</b> Explain Below	<input checked="" type="checkbox"/> <b>N/A</b> Explain Below
<p><b>REMARKS:</b> The facility is not subject to the federal RMP under 40CFR68</p>			

**Part 2**

## ACC Deviation Summary Report for Permit P018-R3

1. Are there any deviations identified in Part 1, Column 5. If NO, no further information is required on Part 2 of this form. If YES, answer question 2 below.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Have all deviations identified in Part 1, Column 5 been reported to the NMED as required by 20.2.7 NMAC or in a Semi-Annual Monitoring Report (20.2.70.302.E.1 NMAC)? If Yes, no further information is required on Part 2 of this form. If No, answer question 3 below and enter the required information in the Deviation Summary Table for each deviation not yet reported to the NMED.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Did any of the deviations result in excess emissions? For excess emissions deviations that have not previously been reported per requirements of 20.2.7 NMAC, a completed Excess Emission Form for each deviation must be attached to this report.	<input type="checkbox"/> Yes <input type="checkbox"/> No

**Deviation Summary Table for deviations not yet reported.**

No.	Applicable Requirement (Include Rule Citation)	Emission Unit ID(s)	Cause of Deviation	Corrective Action Taken
1				
2				
3				
4				
5				



### Deviation Summary Table (cont.)

Deviation Started		Deviation Ended		Pollutant	Monitoring Method	Amount of Emissions	Did you attach an excess emission form?
No.	Date	Time	Date				
1							<input type="checkbox"/> Yes <input type="checkbox"/> No
2							<input type="checkbox"/> Yes <input type="checkbox"/> No
3							<input type="checkbox"/> Yes <input type="checkbox"/> No
4							<input type="checkbox"/> Yes <input type="checkbox"/> No
5							<input type="checkbox"/> Yes <input type="checkbox"/> No

# Section 21

## Addendum for Landfill Applications

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

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**Landfill Applications are not required to complete Sections 1-C Input Capacity and Production Rate, 1-E Operating Schedule, 17 Compliance Test History, and 18 Streamline Applications. Section 12 – PSD Applicability is required only for Landfills with Gas Collection and Control Systems and/or landfills with other non-fugitive stationary sources of air emissions such as engines, turbines, boilers, heaters. All other Sections of the Universal Application Form are required.**

**EPA Background Information for MSW Landfill Air Quality Regulations:**

**<https://www3.epa.gov/airtoxics/landfill/landflpg.html>**

**NM Solid Waste Bureau Website: <https://www.env.nm.gov/swb/>**

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Not applicable.

# Section 22: Certification

Company Name: HARVEST MIDSTREAM

I, TRAVIS JONES, 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 21 day of AUGUST, 2019, upon my oath or affirmation, before a notary of the State of

NEW MEXICO

Travis Jones  
\*Signature

8/21/2019  
Date

TRAVIS JONES  
Printed Name

EHS MANAGER  
Title

Scribed and sworn before me on this 21 day of August, 2019.

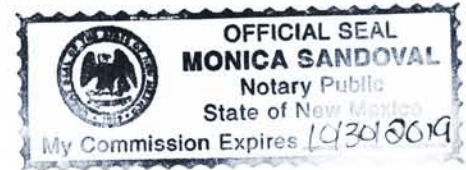
My authorization as a notary of the State of New Mexico expires on the

30 day of October, 2019.

Monica Sandoval  
Notary's Signature

8/21/2019  
Date

Monica Sandoval  
Notary's Printed Name



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

