TITLE V RENEWAL
DCP OPERATING COMPANY, LP
ARTESIA GAS PLANT

Prepared By:

Samuel Keen – Environmental Manager

DCP Operating Company, LP
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June 2021

Project 213201.0087

Trinity Consultants
9400 Holly Ave NE, Bldg 3, Ste 300, Albuquerque, NM 87122 / P 505.266.6611 / **trinityconsultants.com**

June 23, 2021

Permit Programs Manager
NMED Air Quality Bureau
525 Camino de los Marquez Suite 1
Santa Fe, NM 87505-1816

RE: Application for Title V Renewal of Title V Permit P095-R3
DCP Operating Company, LP – Artesia Gas Plant

Permit Programs Manager:

DCP Operating Company, LP is submitting this application for a Title V renewal for its Artesia Gas Plant facility. This submittal is pursuant to 20.2.70.300.B.2 NMAC, which requires a Title V application to be submitted at least twelve months prior to the expiration of the current permit. Title V Permit P095-R3 expires on June 27, 2022.

The format and content of this application are consistent with the Bureau's current policy regarding Title V applications. Enclosed are two hard copies of the application, including an original certification and two discs containing the electronic files. Please feel free to contact either myself at (505) 266-6611 or Samuel Keen, Environmental Manager for DCP Operating Company, LP, at (713) 735-3978 if you have any questions regarding this application.

Sincerely,

Adam Erenstein
Manager of Consulting Services

Cc: Samuel Keen, P.E (DCP Operating Company, LP)
Trinity Project File 213201.0087

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

Universal Air Quality Permit Application

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

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

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

Acknowledgements:
☑ I acknowledge that a pre-application meeting is available to me upon request. ☑ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.
☐ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).
☐ Check No.: ______ in the amount of ______
☑ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.
☐ I acknowledge there is an annual fee for permits in addition to the permit review fee: www.env.nm.gov/air-quality/permit-fees-2/.
☐ This facility qualifies for the small business fee reduction per 20.2.75.11.C. NMAC. The full $500.00 filing fee is included with this application and I understand the fee reduction will be calculated in the balance due invoice. The Small Business Certification Form has been previously submitted or is included with this application. (Small Business Environmental Assistance Program Information: www.env.nm.gov/air-quality/small-biz-eap-2/.)

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 1st 3 to 5 #s of permit IDEA ID No.):199	Updating Permit/NOI #:P095-R3
1	Facility Name: Artesia Gas Plant	Plant primary SIC Code (4 digits): 1321	
		Plant NAIC code (6 digits):48621	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): County Road 206, 3 miles South of the junction of County Road 206 and US Highway 82.		
2	Plant Operator Company Name: DCP Operating Company, LP	Phone/Fax: 713-735-3978	
a	Plant Operator Address: 2107 CityWest Blvd., #600, Houston, TX 77042		

b	Plant Operator's New Mexico Corporate ID or Tax ID: 036785	
3	Plant Owner(s) name(s): DCP Operating Company, LP	Phone/Fax: 713-735-3978
a	Plant Owner(s) Mailing Address(s): 2107 CityWest Blvd., #600, Houston, TX 77042	
4	Bill To (Company): DCP Operating Company, LP	Phone/Fax: 713-735-3978
a	Mailing Address: 2107 CityWest Blvd., #600, Houston, TX 77042	E-mail: SEKeen@dcpmidstream.com
5	☐ Preparer: ☑ Consultant: Adam Erenstein	Phone/Fax: 505-266-6611
a	Mailing Address: 9400 Holly Ave., Bldg. 3 Ste. 300, Albuquerque, NM 87122	E-mail: aerenstein@trinityconsultants.com
6	Plant Operator Contact: Samuel Keen	Phone/Fax: 713-735-3978
a	Mailing Address: 2107 CityWest Blvd., #600, Houston, TX 77042	E-mail: SEKeen@dcpmidstream.com
7	Air Permit Contact: Samuel Keen	Title: Environmental Engineer
a	E-mail: SEKeen@dcpmidstream.com	Phone/Fax: 713-735-3978
b	Mailing Address: 2107 CityWest Blvd., #600, Houston, TX 77042	
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? ☑ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☑ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☑ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☑Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ☑ No	If yes, give month and year of shut down (MM/YY): N/A
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☑ Yes ☐ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐Yes ☐No ☑N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☑ Yes ☐ No	If yes, the permit No. is: P-095-R3
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☑ No	If yes, the NPR No. is: N/A
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☑ No	If yes, the NOI No. is: N/A
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☑ Yes ☐ No	If yes, the permit No. is: 0434-M10-R2
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ☑ No	If yes, the register No. is: N/A

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: 3.75 MMscf	Daily: 90 MMscf	Annually: 32,850 MMscf
b	Proposed	Hourly: 3.75 MMscf	Daily: 90 MMscf	Annually: 32,850 MMscf
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: 3.75 MMscf	Daily: 90 MMscf	Annually: 32,850 MMscf

b	Proposed	Hourly: 3.75 MMscf	Daily: 90 MMscf	Annually: 32,850 MMscf

Section 1-D: Facility Location Information

1	Section: 7	Range: 28E	Township: 18S	County: Eddy	Elevation (ft): 3,600
2	UTM Zone: ☐ 12 or ☑ 13			Datum: ☐ NAD 27 ☑ NAD 83 ☐ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 574,000 m E			UTM N (in meters, to nearest 10 meters): 3,624,400 m N	
b	**AND** Latitude (deg., min., sec.): 32° 45' 17.9"			Longitude (deg., min., sec.): -104° 12' 36.10"	
3	Name and zip code of nearest New Mexico town: Artesia, NM 88211				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): Drive 12.7 miles east of Artesia on US HWY 82. Then 3 miles south on County Road 206, Illinois Camp Road.				
5	The facility is 13 miles east-southeast of Artesia.				
6	Status of land at facility (check one): ☑ Private ☐ Indian/Pueblo ☐ Federal BLM ☐ Federal Forest Service ☐ Other (specify)				
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: **Municipalities:** None. **Tribes:** None. **Counties:** Eddy				
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/aqb/modeling/class1areas.html)? ☐ Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: N/A				
9	Name nearest Class I area: Carlsbad Caverns National Park				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): ~64 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: ~5,000 m				
12	Method(s) used to delineate the Restricted Area: Continuous fencing "**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? ☐ Yes ☑ 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? ☑ No ☐ Yes If yes, what is the name and permit number (if known) of the other facility? **N/A**				

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

1	Facility **maximum** operating ($\frac{\text{hours}}{\text{day}}$): 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 – No construction is proposed.					
4	Month and year of anticipated construction completion: N/A – No construction is proposed.					
5	Month and year of anticipated startup of new or modified facility: N/A – No construction is proposed.					
6	Will this facility operate at this site for more than one year? ☑ Yes ☐ No					

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes ☑ No If yes, specify: N/A		
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? ☐ Yes ☑ 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? ☐ Yes ☑ No		
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes ☑No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☐ Yes ☐ No		
a	If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☑ **Minor** (☑ <10 tpy of any single HAP **AND** ☑ <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☑ No		
a	If yes, include the name of company providing commercial electric power to the facility: ___N/A______________ Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

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

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

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

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

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC): Randy Deluane	Phone: (713) 268-7488
a	R.O. Title: Vice President-Permian	R.O. e-mail: RCDeLaune@dcpmidstream.com
b	R. O. Address: 5718 Westheimer Road, Suite 1900, Houston, TX 77057	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC): Scot Millican	Phone: (575) 234-6441
a	A. R.O. Title: Asset Director-Permian	A. R.O. e-mail: SAMillican@dcpmidstream.com
b	A. R. O. Address:1925 Illinois Camp Rd, Artesia, NM 88210	
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):	
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.): N/A	
a	Address of Parent Company: N/A	
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: No

Section 1-I – Submittal Requirements

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

Hard Copy Submittal Requirements:

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

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

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

Electronic files sent by (check one):

☑ CD/DVD attached to paper application

☐ secure electronic transfer. Air Permit Contact Name_______________________

Email_______________________

Phone number _______________________

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

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

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

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

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

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

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

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible

format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

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

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

Table of Contents

Table 2-A: Regulated Emission Sources

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

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] Date of Construction/ Reconstruction[2]	Controlled by Unit # Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
10	Natural Gas Fueled Compressor Engine	White Superior	8G825	20297	800 hp	800 hp	1965 > 12/9/10	N/A 10	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
11	Natural Gas Fueled Compressor Engine	White Superior	8G825	20221	800 hp	800 hp	1976 1976	N/A 11	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
12	Natural Gas Fueled Compressor Engine	White Superior	8G825	264699	800 hp	800 hp	1976 1976	N/A 12	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
13	Natural Gas Fueled Compressor Engine	White Superior	8G825	269359	800 hp	800 hp	1976 1976	N/A 13	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
14	Natural Gas Fueled Compressor Engine	White Superior	8G825	269339	800 hp	800 hp	1976 1976	N/A 14	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
15	Natural Gas Fueled Compressor Engine	White Superior	8G825	269349	800 hp	800 hp	1976 1976	N/A 15	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
16	Natural Gas Fueled Compressor Engine	White Superior	8G825	269369	800 hp	800 hp	1976 1976	N/A 16	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
17	Natural Gas Fueled Compressor Engine	White Superior	8G825	19097	800 hp	800 hp	3/29/1967 6/23/2017	N/A 17	20200253	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
19	Gas Furnace	Regen	Optimized	J761577	3 MMBtu/hr	3 MMBtu/hr	Unknown Unknown	N/A 19	30600102	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
20	Boiler #2	Wickes	N/A	61870-3	36 MMBtu/hr	36 MMBtu/hr	Unknown Unknown	N/A 20	30600102	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
22 (pilot & purge & blanket gas only)	Emergency Wet Gas Flare	NA	N/A	NA	1.64 MMBtu/hr	1.64 MMBtu/hr	Unknown Unknown	N/A 22	30600903	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
23 (pilot & purge gas only)	Emergency Acid Gas Flare	NA	N/A	NA	1.64 MMBtu/hr	1.64 MMBtu/hr	Unknown Unknown	N/A 23	30600903	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
25	Natural Gas Fueled Compressor Engine	White Superior	8G825	301999	800 hp	800 hp	1984 1984	N/A 25	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
26	Natural Gas Fueled Compressor Engine	White Superior	8G825	285599	800 hp	800 hp	2005 2005	N/A 26	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
27	Natural Gas Fueled Compressor Engine	White Superior	8G825	279289	800 hp	800 hp	1991 1991	N/A 27	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
28	Boiler #1	Wickes	N/A	61787-1	36 MMBtu/hr	36 MMBtu/hr	Unknown Unknown	N/A 28	30600102	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] Date of Construction/ Reconstruction[2]	Controlled by Unit # Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
30	Natural Gas Fueled Compressor Engine	Caterpillar	G3516LE	4EK03683	1340 hp	1340 hp	2001 2001	N/A 30	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
31	Natural Gas Fueled Compressor Engine	Caterpillar	G3516LE	WPW02174	1340 hp	1340 hp	2011 >2/27/12	N/A 31	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
32	Natural Gas Fueled Compressor Engine	Caterpillar	G3516LE	WPW02129	1340 hp	1340 hp	04/2008 2008	N/A 32	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
33	Natural Gas Fueled Compressor Engine	Caterpillar	G3516LE	4EK03489	1340 hp	1340 hp	2001 2001	N/A 33	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
34	Natural Gas Fueled Compressor Engine	Caterpillar	G3516LE	4EK03692	1340 hp	1340 hp	2001 2001	N/A 34	20200254	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
38 (FUG-1)	Facility-Wide Fugitives	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
39	Natural Gas Fueled Compressor Engine	Waukesha	7042GSI	318846	1,200 hp	1,200 hp	Unknown 2009	N/A 39	20200253	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
40	Reboiler	TBD	TBD	TBD	0.5 MMBtu/hr	0.5 MMBtu/hr	TBD TBD	N/A 40	30600102	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
Dehy	TEG Dehydrator	Sivalis	ABFO	5303	7.5 gal/min	7.5 gal/min	Unknown Unknown	N/A N/A	31000301	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
Dehy-2	TEG Dehydrator	TBD	TBD	TBD	5 MMSCFD	5 MMSCFD	TBD TBD	N/A N/A	31000301	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
GT-1	Gunbarrel Separator	N/A	N/A	N/A	400 bbl	400 bbl	2008 2008	VRU VRU	40301105	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-C	Condensate Tank with Blanket Gas	Permian	N/A	28579	300 bbl	300 bbl	1998 1998	N/A 22	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-48	Feed Tank	N/A	N/A	N/A	500 bbl	500 bbl	2005 2005	VRU VRU	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-49	Feed Tank	N/A	N/A	N/A	500 bbl	500 bbl	2005 2005	VRU VRU	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-50	Oil Tank	N/A	N/A	N/A	500 bbl	500 bbl	2005 2005	VRU VRU	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
Load-1[4]	Load 1	N/A	N/A	N/A	225,000 bbl/yr	225,000 bbl/yr	N/A N/A	N/A N/A	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2]	Controlled by Unit #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One		RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
							Date of Construction/ Reconstruction[2]	Emissions vented to Stack #					
Haul-1	Haul 1	N/A	N/A	N/A	4 trucks/day	4 trucks/day	N/A	N/A	31088811	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified	☐ To be Removed ☐ Replacement Unit ☐ To be Replaced	N/A	N/A
							N/A	N/A					
Haul-2	Haul 2	N/A	N/A	N/A	2 trucks/day	2 trucks/day	N/A	N/A	31088811	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified	☐ To be Removed ☐ Replacement Unit ☐ To be Replaced	N/A	N/A
							N/A	N/A					
CT-N	Cooling Tower	Unknown	Unknown	Unknown	3470 gpm	3470 gpm	2001	N/A	30600701	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified	☐ To be Removed ☐ Replacement Unit ☐ To be Replaced	N/A	N/A
							2001	N/A					
CT-S	Cooling Tower	Unknown	Unknown	Unknown	3470 gpm	3470 gpm	2001	N/A	30600701	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified	☐ To be Removed ☐ Replacement Unit ☐ To be Replaced	N/A	N/A
							2001	N/A					

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

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

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at https://www.env.nm.gov/wp-content/uploads/sites/2/2017/10/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[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
T-04	Overflow Tank	N/A	N/A	90	Not source of pollutants	2008	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Trivial	2008	
36	Heater Treater	Natco	N/A	0.75	2.72.202.B.5	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	MMBtu/hr	Insignificant Activity Item #1.a.	Unknown	
TK-1	Gasoline Tank	Unknown	N/A	500	2.72.202.B.5	1994	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	
TK-2	Diesel Fuel Tank	Unknown	N/A	500	2.72.202.B.5	1994	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	
TK-5	Methanol tank	Unknown	N/A	16,300	2.72.202.B.5.	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	
TK-6	Antifreeze tank	Unknown	N/A	16,300	2.72.202.B.2	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-9	Lube Oil tank	Unknown	N/A	500	2.72.202.B.2	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-10	100% Triethylene Glycol	Unknown	N/A	500	2.72.202.B.2	1988	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-11	100% Triethylene Glycol	Unknown	N/A	500	2.72.202.B.2	1988	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-12	Amine tank	Unknown	N/A	100	2.72.202.B.2	1956	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #5	Unknown	
TK-13	Slimicide tank	Unknown	N/A	400	2.72.202.B.2	1993	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-13A	BD 1501 Soap tank	Unknown	N/A	420	2.72.202.B.2	2001	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-14	Corrosion Inhibitor tank	Unknown	N/A	560	2.72.202.B.2	1993	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-15	Lube Oil Tank	Unknown	Permian Tk	210	2.72.202.B.2	1993	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			35315	bbl	Insignificant Activity Item #5	Unknown	

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
TK-16	Slop Oil (50% water/ 50% oil)	Unknown	Unknown	300	2.72.202.B.2	Aug-94	☑ Existing (unchanged) ☐ To be Removed
			27021	bbl	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-18	Methanol tank	Unknown	N/A	470	2.72.202.B.2.	1991	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-19	Boiler Treatment	Unknown	N/A	2,000	2.72.202.B.2	1991	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-20	Boiler Treatment	Unknown	N/A	400	2.72.202.B.2	1993	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-21	Solvent tank	Unknown	N/A	500	2.72.202.B.2	1985	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-22	Used Oil Tank	Unknown	N/A	8,800	2.72.202.B.2	1985	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-23	Lube Oil tank	Unknown	N/A	500	2.72.202.B.2	1960	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-24	30% ethylene glycol; 70% water	Unknown	N/A	10,000	2.72.202.B.2	1960	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-25	Methanol tank	Unknown	N/A	500	2.72.202.B.5	1991	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-26	Slimicide tank	Unknown	Betz	500	2.72.202.B.5	1993	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-26A	Sulfuric Acid	Unknown	N/A	500	2.72.202.B.5	2001	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-28	Detergent/soap	Unknown	N/A	220	2.72.202.B.2	1991	☑ Existing (unchanged) ☐ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-29	Water/oil from drain syst	Unknown	N/A	210,000	2.72.202.B.2	1959	☐ Existing (unchanged) ☑ To be Removed
			N/A	gal	Insignificant Activity Item #5	Unknown	☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

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[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
SV 18.42	Water/oil from drain syst	Unknown	N/A	8400	2.72.202.B.2	1991	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
SV 18.43	Water/oil from drain syst	Unknown	N/A	8400	2.72.202.B.2	1991	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
SV 18.44	Water/oil from drain syst	Unknown	N/A	8400	2.72.202.B.2	1991	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-30	Treated Water tank	Unknown	N/A	500	2.72.202.B.2	1985	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-31	Product (cold NGL)	Unknown	N/A	773	2.72.202.B.5	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #5	Unknown	
TK-32	Product (cold NGL)	Unknown	N/A	773	2.72.202.B.5	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #5	Unknown	
TK-33	Product (cold NGL)	Unknown	N/A	773	2.72.202.B.5	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #5	Unknown	
TK-34	Product (cold NGL)	Unknown	N/A	773	2.72.202.B.5	1976	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #1.a.	Unknown	
TK-35	Propane tank	Unknown	N/A	3,888	2.72.202.B.5	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	
TK-36	Propane tank	Unknown	N/A	8,943	2.72.202.B.5	1976	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	
TK-37	Treated Water tank	Unknown	N/A	1000	2.72.202.B.2	1982	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #5	Unknown	
TK-38	Treated Water tank	Unknown	N/A	1,000	2.72.202.B.2	1982	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #5	Unknown	
TK-39	Brine tank	Unknown	N/A	210	2.72.202.B.2	1960	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #5	Unknown	
TK-41	Sulfuric Acid	Unknown	N/A	500	2.72.202.B.2	2001	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-42	Lube Oil tank	Unknown	N/A	500	2.72.202.B.2	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-43	Lube Oil tank	Unknown	N/A	500	2.72.202.B.2	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #5	Unknown	
TK-44	Slimicide tank	Unknown	N/A	400	2.72.202.B.5	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
TK-45	Amine Surge Tank	Unknown	N/A	2,100	2.72.202.B.5	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	
TK-46	Treated Water for water injection	Scaletrol	N/A	400	2.72.202.B.5	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gal	Insignificant Activity Item #1.a.	Unknown	
TK-47	Treated Water Overflow tank	Unknown	N/A	500	2.72.202.B.5	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			AT-2569	bbl	Insignificant Activity Item #1.a.	Unknown	
TK-48	Treated Water Overflow tank	Unknown	N/A	500	2.72.202.B.5	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	Insignificant Activity Item #1.a.	Unknown	
comfort heater	comfort heater	Unknown	Unknown	< 5	2.72.202.B.1	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			Unknown	MMbtu/hr	Insignificant Activity Item #3	Unknown	
AC-1	Air Compressor	Ingersol Rand	Unknown	48	2.72.202.A.2	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			Unknown	hp	Insignificant Activity Item #6	Unknown	
Pump1	Waer Utility Pump	Chevrolet	Unknown	35	2.72.202.A.2	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			Unknown	hp	Insignificant Activity Item #6	Unknown	
Pump2	Waer Utility Pump	Unknown	Unknown	35	2.72.202.A.2	Unknown	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			Unknown	hp	Insignificant Activity Item #6	Unknown	

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

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

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

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
VRU	Vapor Recovery Unit	2008	VOCs	GT-1, TK-48, TK-49, TK-50	95% annual; 100% short-term	Engineering Estimate
10	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	10	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
11	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	11	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
12	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	12	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
13	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	13	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
14	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	14	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
15	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	15	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
16	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	16	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
17	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	17	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
25	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	25	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
26	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	26	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
27	AFR & NSCR Catalytic Converter	Unknown	NO_x, CO, VOC, HAPs	27	~80% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst
30	Oxidation catalyst	Unknown	NO_x, CO, VOC, HAPs	30	~80% NO_x and CO; 64% VOC & HAPs	Nominal for Catalyst
31	Oxidation catalyst	Unknown	NO_x, CO, VOC, HAPs	31	~80% NO_x and CO; 64% VOC & HAPs	Nominal for Catalyst
32	Oxidation catalyst	Unknown	NO_x, CO, VOC, HAPs	32	~80% NO_x and CO; 64% VOC & HAPs	Nominal for Catalyst
33	Oxidation catalyst	Unknown	NO_x, CO, VOC, HAPs	33	~80% NO_x and CO; 64% VOC & HAPs	Nominal for Catalyst
34	Oxidation catalyst	Unknown	NO_x, CO, VOC, HAPs	34	~80% NO_x and CO; 64% VOC & HAPs	Nominal for Catalyst
39	AFR & NSCR Catalytic Converter	2009	NO_x, CO, VOC, HAPs	39	~85% NO_x & CO; 75% VOC & HAPs	Nominal for Catalyst

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

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

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

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

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
10	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
11	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
12	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
13	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
14	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
15	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
16	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
17	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
19	0.30	1.3	0.25	1.1	0.016	0.072	0.0018	0.0078	0.023	0.10	0.023	0.10	0.023	0.10	-	-	-	-
20	3.5	15.5	3.0	13.0	0.19	0.85	0.021	0.093	0.27	1.2	0.27	1.2	0.27	1.2	-	-	-	-
22 (pilot & purge & blanket gas)	0.22	0.98	1.2	5.3	-	-	0.023	0.10	-	-	-	-	-	-	2.3E-05	1.0E-04	-	-
23 (pilot & purge gas)	0.086	0.38	0.47	2.1	-	-	0.0090	0.040	-	-	-	-	-	-	9.0E-06	3.9E-05	-	-
25	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
26	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
27	26.5	115.9	26.5	115.9	3.5	15.4	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	-	-
28	3.5	15.5	3.0	13.0	0.2	0.9	0.0212	0.093	0.27	1.17	0.27	1.17	0.268	1.17	-	-	-	-
30	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.101	0.44	-	-	-	-
31	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.101	0.44	-	-	-	-
32	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.101	0.44	-	-	-	-
33	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.101	0.44	-	-	-	-
34	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.101	0.44	-	-	-	-
38 (FUG-1)	-	-	-	-	9.0	39.6	-	-	-	-	-	-	-	-	0.14	0.60	-	-
39	58.2	254.9	84.7	370.8	2.6	11.6	0.12	0.53	0.17	0.73	0.17	0.73	0.17	0.73	-	-	-	-
40	0.049	0.21	0.041	0.18	0.0027	0.012	0.0071	0.031	0.0037	0.016	0.0037	0.016	0.0037	0.016	-	-	-	-
Dehy[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GT-1[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-C[5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-48[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-49[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-50[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Load-1	-	-	-	-	6.5	28.3	-	-	-	-	-	-	-	-	-	-	-	-
Haul-1	-	-	-	-	-	-	-	-	5.5	2.9	1.4	0.73	0.14	0.073	-	-	-	-
Haul-2	-	-	-	-	-	-	-	-	5.5	0.90	1.4	0.23	0.14	0.023	-	-	-	-
CT-N	-	-	-	-	-	-	-	-	0.31	1.4	0.20	0.86	0.00068	0.0030	-	-	-	-
CT-S	-	-	-	-	-	-	-	-	0.28	1.2	0.18	0.78	0.00062	0.0027	-	-	-	-
Totals	504.8	2211.2	531.5	2327.9	77.9	341.1	0.28	1.2	13.5	14.9	5.1	11.1	2.2	8.6	0.14	0.60	-	-

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

Table 2-E: Requested Allowable Emissions

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

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
10	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
11	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
12	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
13	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
14	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
15	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
16	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
17	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
19	0.30	1.30	0.25	1.10	0.02	0.07	0.0018	0.0078	0.023	0.10	0.023	0.10	0.023	0.10	-	-		
20	3.53	15.46	2.96	12.99	0.19	0.85	0.021	0.09	0.27	1.17	0.27	1.17	0.27	1.17	-	-		
22 (pilot & purge & blanket gas)	0.22	0.98	1.21	5.32	-	-	0.023	0.10	-	-	-	-	-	-	2.3E-05	0.0001		
23 (pilot & purge gas)	0.086	0.38	0.47	2.06	-	-	0.01	0.04	-	-	-	-	-	-	9E-06	3.9E-05		
25	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
26	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
27	5.29	23.19	5.29	23.19	0.88	3.84	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-		
28	3.57	15.64	3.00	13.14	0.20	0.86	0.021	0.09	0.27	1.19	0.27	1.19	0.27	1.19	-	-		
30	5.91	25.88	5.91	25.88	1.48	6.47	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-		
31	5.91	25.88	5.91	25.88	1.48	6.47	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-		
32	5.91	25.88	5.91	25.88	1.48	6.47	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-		
33	5.91	25.88	5.91	25.88	1.48	6.47	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-		
34	5.91	25.88	5.91	25.88	1.48	6.47	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-		
38 (FUG-1)	-	-	-	-	9.05	39.62	-	-	-	-	-	-	-	-	-	-		
39	8.60	37.66	11.90	52.14	0.40	1.74	0.12	0.53	0.17	0.73	0.17	0.73	0.17	0.73	-	-		
40	0.049	0.215	0.041	0.180	0.003	0.012	0.007	0.031	0.004	0.016	0.004	0.016	0.004	0.016	-	-		
Dehy[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
DEHY-2[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GT-1[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
TK-C[5]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
TK-48[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
TK-49[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
TK-50[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Load-1	-	-	-	-	6.46	28.29	-	-	-	-	-	-	-	-	-	-		
Haul-1	-	-	-	-	-	-	-	-	1.23	0.20	0.31	0.051	0.031	0.0051	-	-		
Haul-2	-	-	-	-	-	-	-	-	1.23	0.64	0.31	0.16	0.03145	0.0164	-	-		
CT-N	-	-	-	-	-	-	-	-	0.31	1.36	0.20	0.86	0.00068	0.0030	-	-		
CT-S	-	-	-	-	-	-	-	-	0.28	1.24	0.18	0.78	0.00062	0.0027	-	-		
Totals	104.13	456.09	107.62	471.38	33.35	146.06	0.28	1.21	5.00	11.94	2.95	10.36	2.00	8.53	3.2E-05	0.00014		

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

[3] Units Dehy and Dehy-2 are completely closed systems with any flash and recirculation gas routed to the VRU and reinjected into inlet gas for recycling. There are no emissions from these

[4] Units GT-1, TK-48, TK-49, and TK-50 are controlled by a VRU with 100% control efficiency. To allow for downtime for maintenance and repair, the effective control efficiency for the VRU

[5] Unit TK-C always has blanket gas which prevents working and breathing emissions. There are no flashing emissions as the liquids being handled are at atmospheric pressure. Emissions from blanket gas are routed to flare Unit 22.

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

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

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

Unit No.	NOx		CO		VOC		SOx		PM[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
22[3]	642.9	7.5	3,498.3	40.7	2,685.1	27.2	4,918.4	49.9	-	-	-	-	-	-	52.3	0.53	-	-
23[3]	10.4	2.4	56.6	13.2	0.0050	0.00082	2,001.0	328.2	-	-	-	-	-	-	21.3	3.5	-	-
SSM[3]	-	-	-	-	2959.6	23.2	-	-	-	-	-	-	-	-	93.3	0.70	-	-
Malfunction[4]	642.9	10.0	3,498.3	10.0	2,685.1	10.0	4,918.4	10.0	-	-	-	-	-	-	52.3	9.0	-	-
Totals	653.35	19.91	3554.97	63.90	5644.76	60.35	11837.74	388.09	-	-	-	-	-	-	166.85	13.72	-	-

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

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

[3] Units 22 and 23 are considered part of SSM however they have been given their own individual line on this table for clarity.

[4] lb/hr emission rates are equal to the maximum lb/hr of SSM emissions

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

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

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

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		PM		PM10		PM2.5		☐ H_2S or ☐ Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																	

Table 2-H: Stack Exit Conditions

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

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
10	10	V	No	46	1340	70.0	N/A	N/A	89.2	1.0
11	11	V	No	46	1340	70.0	N/A	N/A	89.2	1.0
12	12	V	No	46	1340	70.0	N/A	N/A	89.2	1.0
13	13	V	No	46	1340	70.0	N/A	N/A	89.2	1.0
14	14	V	No	46	1340	70.0	N/A	N/A	89.2	1.0
15	15	V	No	46	1340	70.0	N/A	N/A	89.2	1.0
16	16	V	No	46.3	1340	70.0	N/A	N/A	89.2	1.0
17	17	V	No	46.3	1340	70.0	N/A	N/A	89.2	1.0
19	19	V	No	33.1	630	211.7	N/A	N/A	20.8	3.6
20	20	V	No	42.3	750	281.7	N/A	N/A	57.4	2.5
22	22	V	No	70.6	1832	131.9	N/A	N/A	65.6	1.6
23	23	V	No	70.6	1832	131.9	N/A	N/A	65.6	1.6
24	24	V	No	98	1000	274.8	N/A	N/A	27	3.6
25	25	V	No	40.3	1340	70.0	N/A	N/A	89.2	1.0
26	26	V	No	40.3	1340	70.0	N/A	N/A	89.2	1.0
27	27	V	No	40.3	1340	70.0	N/A	N/A	89.2	1.0
28	28	V	No	44.7	750	281.7	N/A	N/A	57.4	2.5
30	30	V	No	42.0	855	128.1	N/A	N/A	163	1.0
31	31	V	No	42	855	128.1	N/A	N/A	163	1.0
32	32	V	No	42	855	128.1	N/A	N/A	163	1.0
33	33	V	No	42	855	128.1	N/A	N/A	163	1.0
34	34	V	No	42	855	128.1	N/A	N/A	163	1.0
39	39	V	No	46	1125	116.1	N/A	N/A	147.9	1.0
40	40	V	No	15	600	3.43	N/A	N/A	9.8	0.70

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		Formaldehyde ☑ HAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		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
10	10	0.065	0.29	0.044	0.19														
11	11	0.065	0.29	0.044	0.19														
12	12	0.065	0.29	0.044	0.19														
13	13	0.065	0.29	0.044	0.19														
14	14	0.065	0.29	0.044	0.19														
15	15	0.065	0.29	0.044	0.19														
16	16	0.065	0.29	0.044	0.19														
17	17	0.065	0.29	0.044	0.19														
19	19	0.043	0.19	0.0025	0.011														
20	20	0.094	0.41	0.0026	0.012														
22 (pilot & purge & blanket gas)	22 (pilot & purge & blanket gas)	-	-	-	-														
23 (pilot & purge gas)	23 (pilot & purge gas)	-	-	-	-														
25	25	0.065	0.29	0.044	0.19														
26	26	0.065	0.29	0.044	0.19														
27	27	0.065	0.29	0.044	0.19														
28	28	0.094	0.41	0.0026	0.012														
30	30	0.25	1.1	0.19	0.81														
31	31	0.25	1.1	0.19	0.81														
32	32	0.25	1.1	0.19	0.81														
33	33	0.25	1.1	0.19	0.81														
34	34	0.25	1.1	0.19	0.81														
N/A	38 (FUG-1)	0.23	1.0	-	-														
39	39	0.098	0.43	0.066	0.29														
40	40	0.0013	0.0057	4.6E-05	0.00020														

Stack No.	Unit No.(s)	Total HAPs		Formaldehyde ☑ HAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		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
N/A	Dehy[1]	-	-	-	-														
N/A	DEHY-2[1]	-	-	-	-														
N/A	GT-1[2]	-	-	-	-														
N/A	TK-C[3]	-	-	-	-														
N/A	TK-48[2]	-	-	-	-														
N/A	TK-49[2]	-	-	-	-														
N/A	TK-50[2]	-	-	-	-														
N/A	Load-1	0.14	0.61	-	-														
N/A	Haul-1	-	-	-	-														
N/A	Haul-2	-	-	-	-														
N/A	CT-N	-	-	-	-														
N/A	CT-S	-	-	-	-														
	Totals:	2.68	11.75	1.48	6.49														

[1] Units Dehy and Dehy-2 are completely closed systems with any flash and recirculation gas routed to the VRU and reinjected into inlet gas for recycling. There are no emissions from these units.

[2] Units GT-1, TK-48, TK-49, and TK-50 are controlled by a VRU with 100% control efficiency. To allow for downtime for maintenance and repair, the effective control efficiency for the VRU is 95%. The

[3] Unit TK-C always has blanket gas which prevents working and breathing emissions. There are no flashing emissions as the liquids being handled are at atmospheric pressure. Emissions from blanket gas are

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
10	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
11	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
12	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
13	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
14	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
15	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
16	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
17	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
19	Sweet Natural Gas	Pipeline quality natural gas	1,008	3.0 Mscf	26.1 MMscf	5 gr S/ 100 scf	Negligible
20	Sweet Natural Gas	Pipeline quality natural gas	1,008	30.0 Mscf	260.7 MMscf	5 gr S/ 100 scf	Negligible
22 (pilot)	Sweet Natural Gas	Pipeline quality natural gas	1,008	1.6 Mscf	14.3 MMscf	5 gr S/ 100 scf	Negligible
23 (pilot)	Sweet Natural Gas	Pipeline quality natural gas	1,008	1.6 Mscf	14.3 MMscf	5 gr S/ 100 scf	Negligible
25	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
26	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
27	Sweet Natural Gas	Pipeline quality natural gas	1,008	6.3 Mscf	55.6 MMscf	5 gr S/ 100 scf	Negligible
28	Sweet Natural Gas	Pipeline quality natural gas	1,008	30.0 Mscf	260.7 MMscf	5 gr S/ 100 scf	Negligible
30	Sweet Natural Gas	Pipeline quality natural gas	1,008	10.0 Mscf	87.9 MMscf	5 gr S/ 100 scf	Negligible
31	Sweet Natural Gas	Pipeline quality natural gas	1,008	10.0 Mscf	87.9 MMscf	5 gr S/ 100 scf	Negligible

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
32	Sweet Natural Gas	Pipeline quality natural gas	1,008	10.0 Mscf	87.9 MMscf	5 gr S/ 100 scf	Negligible
33	Sweet Natural Gas	Pipeline quality natural gas	1,008	10.0 Mscf	87.9 MMscf	5 gr S/ 100 scf	Negligible
34	Sweet Natural Gas	Pipeline quality natural gas	1,008	10.0 Mscf	87.9 MMscf	5 gr S/ 100 scf	Negligible
39	Sweet Natural Gas	Pipeline quality natural gas	1,008	8.5 Mscf	74.6 MMscf	5 gr S/ 100 scf	Negligible
40	Sweet Natural Gas	Pipeline quality natural gas	1,008	0.50 Mscf	4.3 MMscf	5 gr S/ 100 scf	Negligible

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)
TK-48	40400311	Oil Water Mix	~50% oil; 50% water	7.36	18	61.55	0.25	75.43	0.40
TK-49	40400311	Oil Water Mix	~50% oil; 50% water	7.36	18	61.55	0.25	75.43	0.40
TK-50	40400311	Crude Oil	Crude Oil (RVP 5)	7.1	50	61.55	3.90	75.43	5.25
TK-C	40400311	Condensate with blanket gas	Condensate (RVP 10)	5.6	66	69.79	6.24	82.00	7.81

Table 2-L: Tank Data

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

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			
TK-48	2005	Oil Water Mix	FX	NA	500	80	4.88	6	OT (Red)	OT (Red)	Good	3,860,010	182.50
TK-49	2005	Oil Water Mix	FX	NA	500	80	4.88	6	OT (Red)	OT (Red)	Good	3,860,010	182.50
TK-50	2005	Crude Oil	FX	NA	500	80	4.88	6	OT (Red)	OT (Red)	Good	3,860,010	182.50
TK-C	1998	Condensate with blanket gas	FX	NA	714	80	3.96	Horizonal	LG	LG	Good	4,368,000	145.60

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

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

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

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

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Field Natural Gas	Methane; low concentration VOCs	Gas	~90 MMscfd	Dry gas	Methane; low concentration VOCs	Gas	~90 MMscfd
				Natural gas liquids	Mixed hydrocarbons	Liquid	285 bbl/day

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 - There is no CEM equipment used at this facility.									

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 - There is no PEM equipment used at this facility.								

Table 2-P: Greenhouse Gas Emissions

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

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]									Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	GWPs [1]	1	298	25	22,800	footnote 3										
10	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
11	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
12	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
13	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
14	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
15	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
16	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
17	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
19	mass GHG	1568.1	2.96E-03	0.030											1568.1	
	CO_2e	1568.1	0.9	0.7												1569.7
20	mass GHG	18799.3	3.5E-02	0.35											18799.7	
	CO_2e	18799.3	10.6	8.9												18818.8
25	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
26	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
27	mass GHG	3340.5	6.3E-03	0.063											3340.6	
	CO_2e	3340.5	1.9	1.6												3344.0
28	mass GHG	18799.3	3.5E-02	0.35											18799.7	
	CO_2e	18799.3	10.6	8.9												18818.8
30	mass GHG	5281.1	9.96E-03	0.10											5281.2	
	CO2e	5281.1	3.0	2.5												5286.6
31	mass GHG	5281.1	9.96E-03	0.10											5281.2	
	CO_2e	5281.1	3.0	2.5												5286.6
32	mass GHG	5281.1	9.96E-03	0.10											5281.2	
	CO2e	5281.1	3.0	2.5												5286.6
33	mass GHG	5281.1	9.96E-03	0.10											5281.2	
	CO_2e	5281.1	3.0	2.5												5286.6
34	mass GHG	5281.1	9.96E-03	0.10											5281.2	
	CO2e	5281.1	3.0	2.5												5286.6

39	**mass GHG**	4482.0	8.45E-03	0.085											4482.1	
	CO_2e	4482.0	2.5	2.1												4486.7
40	**mass GHG**	256.0	4.83E-04	0.0048											256.0	
	CO2e	256.0	0.1	0.1												256.3
Total	**mass GHG**	107055.9	0.2	2.0											107,058.2	
	CO_2e	107055.9	60.2	50.5												107,166.6

[1] **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.

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

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

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

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

Section 3

Application Summary

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

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

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

DCP Operating Company, LP (DCP) is submitting this application and the accompanying material to apply for a Title V Renewal (pursuant to 20.2.70.300.B(2) NMAC) to its current Title V Operating permit P095-R3 for the Artesia Gas Plant (Artesia).

The Artesia Gas Plant is a natural gas plant, SIC code 1321, located in Eddy County, New Mexico, approximately 13 miles southeast of Artesia. The plant is currently operating under NSR Permit 0434-M10-R2 and Title V Operating permit P095-R3. Under these permits, the Artesia plant is permitted to process and treat 90 MMscfd of natural gas per day with an acid gas injection well (AGI).

This application seeks to incorporate the following changes:

Summary of Permitting Actions to be Incorporated

Permit	Date Issued	Application Type	Changes
NSR # 0434-M10R2	6/23/2017	NSR Administrative Revision and TV Administrative Amendment	• Like-kind replacement for Unit No. 17 a White Superior 8G825 to new SN 19097 and new Manufacture date 3/29/1967.
NSR No. 0434M10R1	4/30/2015	NSR Administrative Revision and TV Administrative Amendment	• This revision consists of replacing insignificant source TK 29 with three 200 barrel tanks (SV 18.42, SV-18.43 and SV-18.44) which are also insignificant sources.

The Artesia Gas Plant is a major source under the Prevention of Significant Deterioration (PSD) rules as currently permitted, and will remain a major source after the modifications proposed. Artesia is an existing PSD major source that has never had a major modification. This facility will also remain a major source for operating permit purposes under Title V (20.2.70 NMAC).

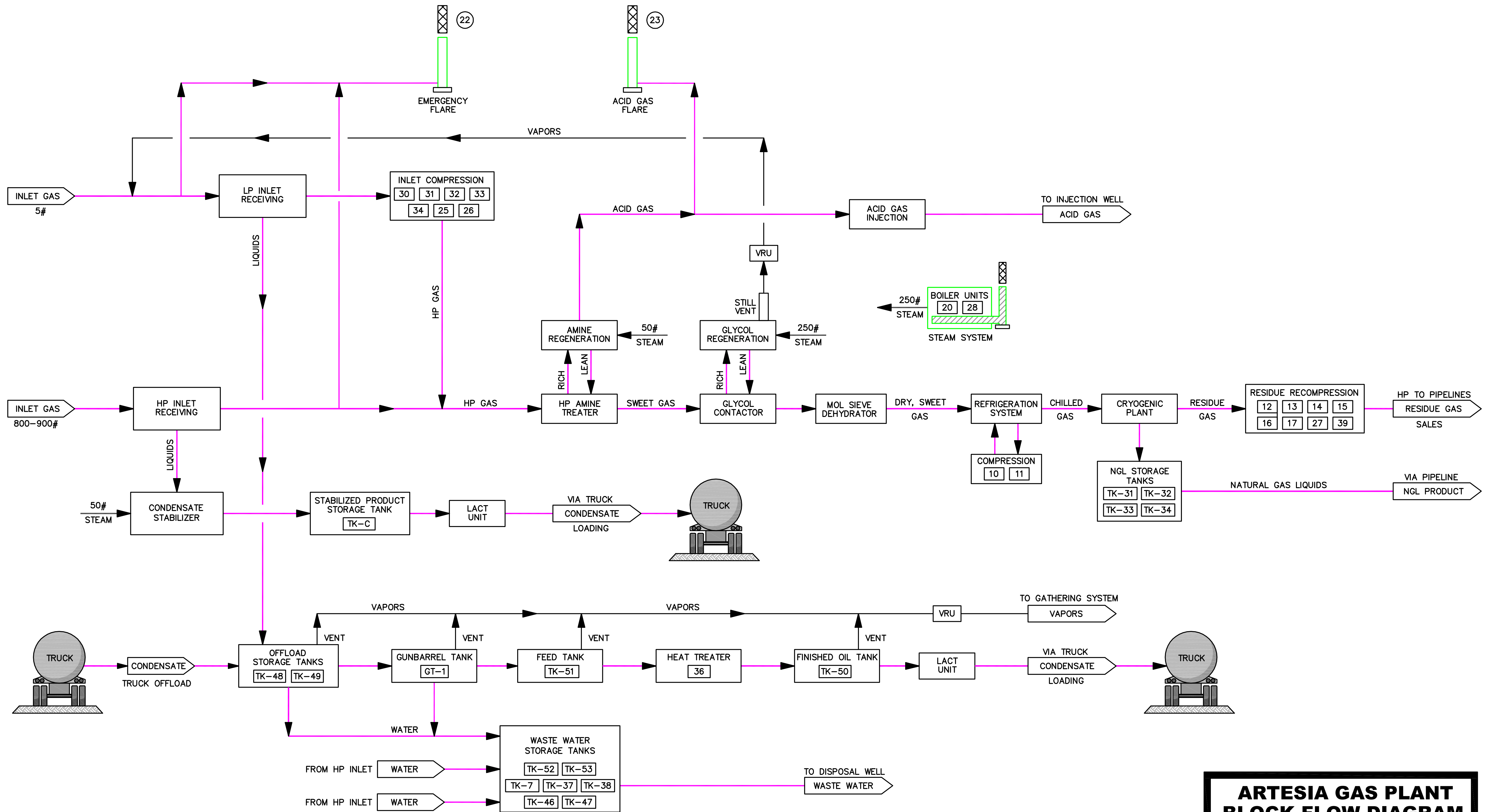
Section 4

Process Flow Sheet

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

A process flow diagram is attached.

ARTESIA GAS PLANT BLOCK FLOW DIAGRAM



SIMPLIFIED PROCESS FLOW DIAGRAM

REV	DATE	REVISION	BY	CHK'D	ENGR.	ENGR. MGR.
0	1–19–05	DRAWN FROM DEFS PLANT SKETCH (NO DATE)	J.R.E.	L.K.M.		
1	5–1–07	REVISIONS PER: J.R. FIELD SKETCH	J.R.E.	J.R.		
2	4–17–09	REVISIONS PER: J.D.B. FIELD SKETCH	J.R.E.	J.D.B.		
3	1–26–11	REVISIONS PER: J.D.B. FIELD SKETCH	J.R.E.	J.D.B.		
4	5–2–14	CHANGED OFFLOAD CONDESATE FROM PIPELINE TO TRUCK	J.R.E.	J.C.		

REV	DATE	REVISION	BY	CHK'D	ENGR.	ENGR. MGR.

dcp Midstream

ARTESIA GAS PLANT
ARTESIA GATHERING SYSTEM

Eddy County
NEW MEXICO

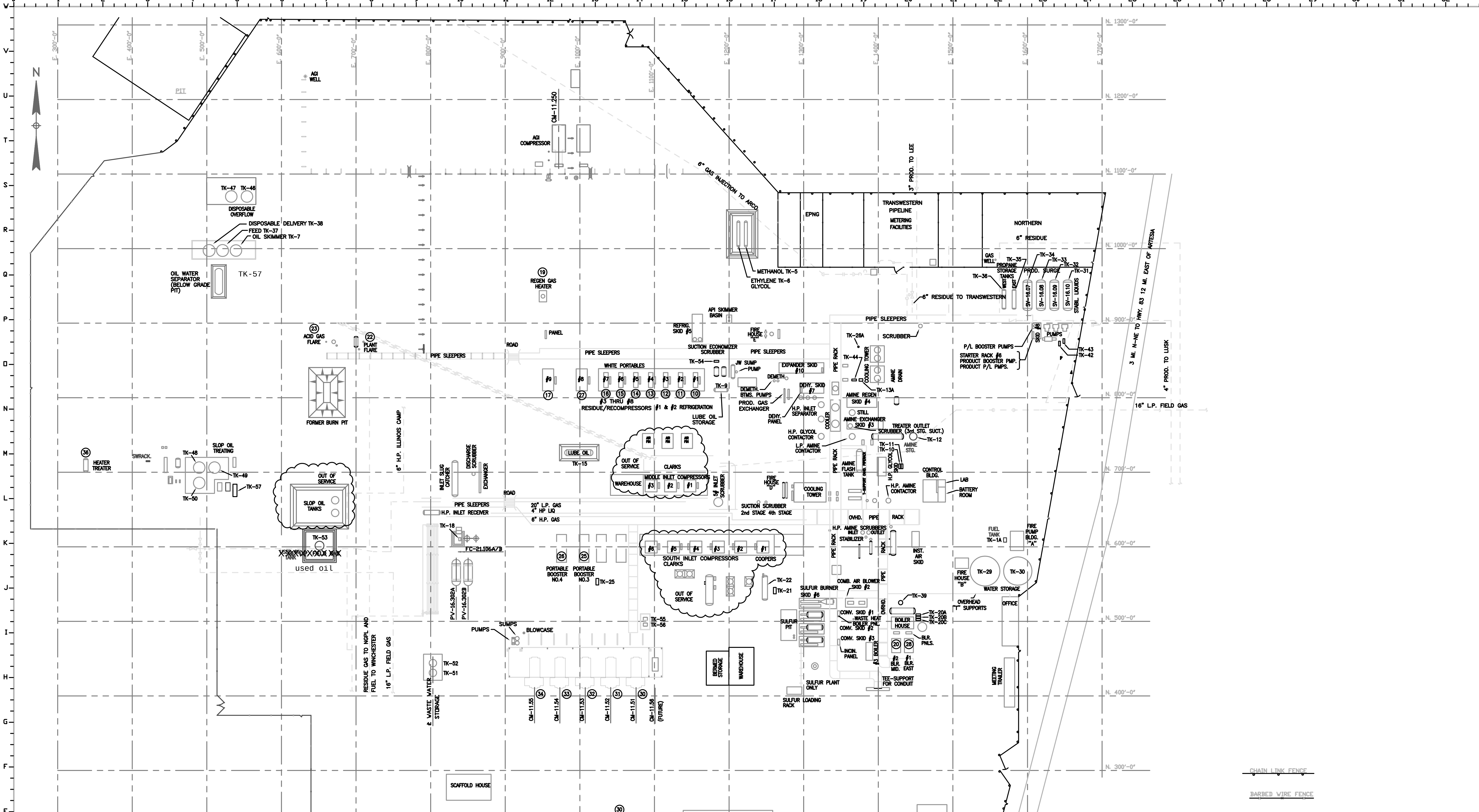
DWG. NO. \data\EhsDrawings\Mapping\NewMexico\Artesia\Artesia_Flow

Section 5

Plot Plan Drawn To Scale

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

A plot plan is attached.



NOTE: INITIAL WALKDOWN - MANAGEMENT OF CHANGE -

NO.	DATE	BY	DESCRIPTION	APP'D
14	11/5/03	DSS	AS BUILT	
13	8/22/03	DSS	REDRAWN (ZAP ECS)	
12	9/30/02	JXT	ADDED 4" TO EXIST. SEPTIC SYS.	
11	12/19/01	PASH	REV. FOR 70MMSCFD EXP. PROJ.	
10	5/26/98	JC	REV. TO SHOW NEW COOLING TWR.	
9	8/2/94	RRK	REV. FENCE LINE & MISC. EQIP.	
8	6/23/94	JAM	MOVE S. FENCE TO N.0+0'	
7	1/17/94	JC	GENERAL REVISIONS	
6	11/17/93	JWE	REVISED EQUIPMENT	
5	9/17/93	JWE	REV. AREA CLASS. ADD NOTE 6	
15	2/20/06	wrt	UPDATED PLOT PLAN	

ISSUE

dcp Midstream.

ARTESIA GAS PLANT
EDDY COUNTY
ARTESIA, NEW MEXICO
SITE PLAN

DRAFTED BY: DSS — CHECKED BY:
DATE: 8/22/03 — SCALE: 1"=60'
APPROVAL BY: — DATE:

DWG NO. GWD-764 MP-7 — ISSUE 15

PLOT: FEB 20, 2006 TIME: 3:21 PM

Section 6

All Calculations

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

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

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

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

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

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

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

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

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

STEADY-STATE EMISSIONS – UNCHANGED

The following units are not affected by the proposed changes in this application.

White Superior 8G825 Engines - Units 10-17, 25-27

Emission factors for NO_x, CO, and VOC are as permitted in Permit 0434-M10-R2. Controlled emission rates are based on 80% reduction of NO_x and CO and 75% reduction of VOC and HAPs as permitted in Permit 0434-M10-R2. Emissions of SO_2 and particulates are calculated based on AP-42 emission factors from Table 3.2-3. Hazardous air pollutant emissions were calculated using GRI-HAPCalc 3.01. As a conservative measure, it was assumed that TSP = PM_{10} = $PM_{2.5}$. Greenhouse gas emissions were estimated using methodology from 40 CFR Part 98 and emission factors from Tables C-1 and C-2 of Part 98.

3 MMBtu/hr Heater – Unit 19

Emissions of NO_x, CO, VOC, SO_2, and particulates from Unit 19 were calculated using emission factors from Tables 1.4-1 and 1.4-2 of AP-42. As a conservative measure, it was assumed that TSP = PM_{10} = $PM_{2.5}$. Hazardous air pollutant emissions were calculated using GRI-HAPCalc 3.01. Greenhouse gas emissions were estimated using methodology from 40 CFR Part 98 and emission factors from Tables C-1 and C-2 of Part 98.

Wickes Boilers – Units 20 and 28

NO_x, CO, VOC, PM, and SO_2 emissions were calculated using AP-42 factors for external natural gas combustion sources in Tables 1.4-1 and 1.4-2. As a conservative measure, it was assumed that TSP = PM_{10} = $PM_{2.5}$. Hazardous air pollutant emissions were calculated using GRI-HAPCalc 3.01. Greenhouse gas emissions were estimated using methodology from 40 CFR Part 98 and emission factors from Tables C-1 and C-2 of Part 98.

Acid Gas Flare (Unit 23) Steady-State Emissions

Emission rates for NO_x and CO are based on emission factors from AP-42 Table 13.5-1 (9/91) (Reformatted 1/95). It is assumed that there is no VOC content in the pilot and purge gas as the purchased fuel is methane. Emissions of H_2S and SO_2 from the pilot and purge gas are based respectively on the specification of sweet natural gas fuel, 0.25 gr H_2S/100scf and 5 gr S/100scf.

Caterpillar G3516LE Engines – Units 30-34

Uncontrolled emissions of NO_x, CO, and VOC are as permitted in Permit 0434-M10-R2. Controlled emissions of NO_x, CO, and VOC were calculated using manufacturer's data. Emissions of SO_2 and particulates were calculated using emission factors from AP-42 Table 3.2-2. As a conservative measure, it was assumed that TSP = PM_{10} = $PM_{2.5}$. Hazardous air pollutant emissions were calculated using GRI-HAPCalc 3.01. A 64% control was applied to HAP emissions due to catalyst reduction. Greenhouse gas emissions were estimated using methodology from 40 CFR Part 98 and emission factors from Tables C-1 and C-2 of Part 98.

Waukesha L7042GSI – Unit 39

Uncontrolled emissions of NO_x, CO, and VOC were estimated using manufacturer's data. Controlled emission rates are based on 85% reduction of NO_x and CO and 75% reduction of VOC and HAPs as permitted in Permit 0434-M10-R2. Emissions of SO2 were estimated based on a pipeline fuel sulfur content of 50 grains of total sulfur per Mscf. Particulate emissions were calculated using AP-42 emission factors from Table 3.2-3. As a conservative measure, it was assumed that TSP = PM_{10} = $PM_{2.5}$. Hazardous air pollutant emissions were calculated using GRI-HAPCalc 3.01. Greenhouse gas emissions were estimated using methodology from 40 CFR Part 98 and emission factors from Tables C-1 and C-2 of Part 98.

5 MMscf/day Glycol Dehydrator with 0.5 MMBtu/hr Reboiler – Units Dehy-2 and 40

The glycol dehydrator is a closed system and will have a reboiler and condenser associated with the unit. Since the dehydrator is a closed system, there are no emissions associated with this unit. The only emission will be from the reboiler.

The reboiler emission rates for NO_x, CO, VOC, and PM were calculated using AP-42 factors for external natural gas combustion sources, Table 1.4-1 and 1.4-2. PM_{10} and $PM_{2.5}$ emissions are set equal to PM emissions as a conservative measure. SO_2 emissions were calculated based on the units' fuel consumption and a maximum sulfur content of five grains of total sulfur per 100 standard cubic feet (5 gr/100 scf). GHG emissions were calculated using 40 CFR 98 Subpart C Tier 1.

Glycol Dehydrator – Unit Dehy

The glycol dehydrator is a closed system and will have a reboiler and condenser associated with the unit. Since the dehydrator is a closed system, there are no emissions associated with this unit.

Cooling Towers - Units CT-N and CT-S

The particulate emissions were calculated using the procedure described in AP-42 Section 13.4 – Wet Cooling Towers. A Frisbee table was created to determine the particle distribution and subsequently PM_{10}, $PM_{2.5}$, and TSP emissions.

The following emission sources are existing.

Emergency Wet Gas Flare (Unit 22) Steady-State Emissions

Emission rates for NO_x and CO are based on emission factors from AP-42 Table 13.5-1 (9/91) (Reformatted 1/95). It is assumed that there is no VOC content in the pilot and purge gas as the purchased fuel is methane. Emissions of H_2S and SO_2 from the pilot and purge gas are based respectively on the specification of sweet natural gas fuel, 0.25 gr H_2S/100scf and 5 gr S/100scf.

Facility-Wide Fugitive Emissions – Unit 38 (FUG)

Fugitive emissions were estimated using emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, November 1995, EPA-453/R-95-017. Component counts were estimated as previously permitted. The percent VOC and HAPs are from the inlet gas analysis dated 8/22/2012.

Fugitive VOC emissions from fittings from gunbarrel tank GT-1 (represented in past applications under Unit F-1) were calculated using the same methodology as described above. These emissions were added to the facility-wide emissions to obtain an overall facility fugitive emission rate.

Condensate Loadout – Unit Load-1

Emissions from loading of condensate out of the facility by truck were calculated using Equation 1 in AP-42 Section 5.2-4. The loading of condensate out of the facility is 9,450,000 gallons per year. This includes 2,520,000 gallons per year of condensate from TK-50 and 6,930,000 gallons per year from TK-C.

Hauling of Condensate out of Facility – Unit Haul-1

Emissions from truck hauling of condensate out of the facility on unpaved roads were calculated with methodology in AP-42 Section 5.2. Controlled emissions are based on a combination of base course treatment (gravel) and a speed limit of 25 mph. Control efficiencies for these are from NMED guidance and the WRAP Fugitive Dust Handbook, September 7, 2006 (Page 8).

Hauling of Condensate into Facility – Unit Haul-2

Emissions from truck hauling of condensate into the facility on unpaved roads were calculated with methodology in AP-42 Section 5.2. Controlled emissions are based on a combination of base course treatment (gravel) and a speed limit of 25 mph. Control efficiencies for these are from NMED guidance and the WRAP Fugitive Dust Handbook, September 7, 2006 (Page 8).

SSM EMISSIONS - UNCHANGED

Facility SSM emissions include plant turnaround, plant startup (post turnaround), condensate tank degassing during VRU downtime, gas piping degassing, pig launcher degassing, vacuum trucks, engine startup, compressor blowdown, emergency wet gas flare and acid gas flare SSM emissions. The following activities are not affected by the proposed changes in this application.

Plant Turnaround

Multiple steps comprise a plant turnaround. Step 1 - For the natural gas system, emissions to the atmosphere after opening pipelines are calculated using the Ideal Gas Law and are based on the entire pipe volume venting to the atmosphere at pipeline pressure. Step 2 - For systems in liquid service clingage emissions degassing emissions occur after the system is de-inventoried. Degassing emissions are calculated using the Ideal Gas Law. Step 3 - After systems are degassed and opened, residual materials (clingage) may be emitted to the atmosphere. Clingage emissions are estimated using system volumes and an assumed clingage amount.

Total lb/hr emissions from each liquid system turnaround step (degassing, clingage) assume that any liquid system may undergo turnaround at any time. Maximum lb/hr emissions from all turnaround steps are calculated as the maximum lb/hr emission rate from any step.

Plant Startup (Post-Turnaround)

For the natural gas system, emissions to the atmosphere occur from a three step pressure test and purge prior to plant startup. These emissions are calculated using the Ideal Gas Law and are based on the entire pipe volume venting to the atmosphere at each purge step pressure.

Gas Piping Degassing & Pig Launcher Degassing

Emissions to the atmosphere after opening pipelines are calculated using the Ideal Gas Law and are based on the entire pipe volume venting to the atmosphere at pipeline pressure.

Vacuum Trucks

Emissions from vacuum trucks are estimated using the loading loss method of AP-42, Chapter 5.2: Transportation and Marketing of Petroleum Liquids, 1995. Calculations are performed based on the concentrations of the individual organic species since the wastes contain significant non-volatile content (i.e. solids). A truck can be loaded in one hour; therefore, the emissions per loading activity reflect the lb/hr emission rate.

Engine Startup & Compressor Blowdown

Emissions are calculated based on an estimated volume of gas released from each unit for engine startup and compressor blowdown multiplied by the number of activities throughout the year. This volume is then multiplied by the gas analysis mol% divided by 379 scf/mol then multiplied by Molecular Weight to arrive at a lb/event.

Emergency Wet Gas Flare (Unit 22) and Acid Gas Flare (Unit 23) SSM Emissions

Emission rates for NO_x and CO are based on emission factors from AP-42 Table 13.5-1 (9/91) (Reformatted 1/95). Emissions of VOC from SSM flaring are calculated using the gas analysis found in Section 7 and the assumption of 98% destruction of VOCs. Emissions of H_2S and SO_2 from SSM flaring are calculated using the gas analysis found in Section 7 and an assumed 98% combustion of H_2S. Conversion of H_2S to SO_2 was assumed as 100%. Greenhouse gas emissions were estimated using methodology from the Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry (August 2009).

Upset/Malfunction

DCP's limit of 10 tons per year per pollutant for upset/malfunction emissions of NO_x, CO, VOC, and SO_2 and a total limit of 9 tons per year for upset/malfunction emissions of H_2S are as permitted in Permit 0434-M10-R2.

Condensate Tank Degassing During VRU Downtime

Tank working and breathing losses for tanks TK-48, TK-49, TK-50, and GT-1 were calculated using Tanks 4.0.9d. Tank working and breathing losses for tanks TK-48, TK-49, TK-50, and GT-1 are as permitted in Permit 0434-M10-R2.

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

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

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e 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_2e 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_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following ☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

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

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

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

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

Facility Steady State Emissions Summary

Uncontrolled Emissions

Unit No.	NOx		CO		VOC		SOx		TSP		PM10		PM2.5		H_2S		Total HAPs		Formaldehyde		CO_2e
	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	lb/hr	ton/yr	ton/yr
10	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
11	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
12	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
13	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
14	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
15	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
16	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
17	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
19	0.30	1.3	0.25	1.1	0.016	0.072	0.0018	0.0078	0.023	0.10	0.023	0.10	0.023	0.10	-	-	0.043	0.19	0.0025	0.011	1569.7
20	3.5	15.5	3.0	13.0	0.19	0.85	0.021	0.093	0.27	1.2	0.27	1.2	0.27	1.2	-	-	0.094	0.41	0.0026	0.012	18818.8
22 (pilot & purge & TK-C blanket gas)	0.22	0.98	1.2	5.3	-	-	0.023	0.10	-	-	-	-	-	-	2.3E-05	1.0E-04	-	-	-	-	-
23 (pilot & purge gas)	0.086	0.38	0.47	2.1	-		0.0090	0.040	-	-	-	-	-	-	9.0E-06	3.9E-05	-	-	-	-	-
25	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
26	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
27	26.5	115.9	26.5	115.9	3.5	15.4	0.004	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.26	1.1	0.18	0.77	3344.0
28	3.5	15.5	3.0	13.0	0.19	0.85	0.021	0.093	0.27	1.2	0.27	1.2	0.27	1.2	-	-	0.094	0.41	0.0026	0.012	18818.8
30	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.70	3.1	0.51	2.3	5286.6
31	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.70	3.1	0.51	2.3	5286.6
32	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.70	3.1	0.51	2.3	5286.6
33	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.70	3.1	0.51	2.3	5286.6
34	29.6	129.4	29.6	129.4	4.1	18.1	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.70	3.1	0.51	2.3	5286.6
38 (FUG-1)	-	-	-	-	9.0	39.6	-	-	-	-	-	-	-	-	0.14	0.60	0.23	1.0	-	-	-
39	58.2	254.9	84.7	370.8	2.6	11.6	0.12	0.53	0.17	0.73	0.17	0.73	0.17	0.73	-	-	0.39	1.7	0.26	1.2	4486.7
40	0.049	0.21	0.041	0.18	0.0027	0.012	0.0071	0.031	0.0037	0.016	0.0037	0.016	0.0037	0.016	-	-	0.0013	0.0057	4.6E-05	0.00020	256.3
Dehy[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GT-1[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-C[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-48[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-49[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-50[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Load-1	-	-	-	-	6.5	28.3	-	-	-	-	-	-	-	-	-	-	0.14	0.61	-	-	-
Haul-1	-	-	-	-	-	-	-	-	5.5	2.9	1.4	0.73	0.14	0.073	-	-	-	-	-	-	-
Haul-2	-	-	-	-	-	-	-	-	5.5	0.90	1.4	0.23	0.14	0.023	-	-	-	-	-	-	-
CT-N	-	-	-	-	-	-	-	-	0.31	1.4	0.20	0.86	0.00068	0.0030	-	-	-	-	-	-	-
CT-S	-	-	-	-	-	-	-	-	0.28	1.2	0.18	0.78	0.00062	0.0027	-	-	-	-	-	-	-
Totals	**504.8**	**2211.2**	**531.5**	**2327.9**	**77.9**	**341.1**	**0.28**	**1.2**	**13.5**	**14.9**	**5.1**	**11.1**	**2.2**	**8.6**	**1.4E-01**	**6.0E-01**	**7.4**	**32.3**	**4.8**	**20.9**	**107166.6**

[1] Units Dehy and Dehy-2 are completely closed systems with any flash and recirculation gas routed to the VRU and reinjected into inlet gas for recycling. There are no emissions from these units.

[2] Units GT-1, TK-48, TK-49, and TK-50 are controlled by a VRU with 100% control efficiency. To allow for downtime for maintenance and repair, the effective control efficiency for the VRU is 95%. The emissions associated with VRU downtime are accounted for under Startup, Shutdown, and Maintenance emissions.

[3] Unit TK-C always has blanket gas which prevents working and breathing emissions. There are no flashing emissions as the liquids being handled are at atmospheric pressure. Emissions from blanket gas are routed to flare Unit 22.

Facility Steady State Emissions Summary

Controlled Emissions

Unit No.	NOx		CO		VOC		SOx		TSP		PM10		PM2.5		H_2S		Total HAPs		Formaldehyde		CO_2e
	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	lb/hr	ton/yr	ton/yr
10	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.02	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
11	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
12	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
13	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
14	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
15	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
16	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
17	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
19	0.30	1.3	0.25	1.1	0.016	0.072	0.0018	0.0078	0.023	0.10	0.023	0.10	0.023	0.10	-	-	0.043	0.19	0.0025	0.011	1,569.7
20	3.5	15.5	3.0	13.0	0.19	0.85	0.021	0.093	0.27	1.2	0.27	1.2	0.27	1.2	-	-	0.094	0.41	0.0026	0.012	18,818.8
22 (pilot & purge & blanket gas)	0.22	0.98	1.2	5.3	-	-	0.023	0.10	-	-	-	-	-	-	2.3E-05	1.0E-04	-	-	-	-	-
23 (pilot & purge gas)	0.086	0.38	0.47	2.1	-	-	0.0090	0.040	-	-	-	-	-	-	9.0E-06	3.9E-05	-	-	-	-	-
25	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
26	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
27	5.3	23.2	5.3	23.2	0.88	3.8	0.0038	0.016	0.064	0.28	0.064	0.28	0.064	0.28	-	-	0.065	0.29	0.044	0.19	3,344.0
28	3.6	15.6	3.0	13.1	0.20	0.86	0.021	0.094	0.27	1.2	0.27	1.2	0.27	1.2	-	-	0.094	0.41	0.0026	0.012	18,818.8
30	5.9	25.9	5.9	25.9	1.5	6.5	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.25	1.1	0.19	0.81	5,286.6
31	5.9	25.9	5.9	25.9	1.5	6.5	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.25	1.1	0.19	0.81	5,286.6
32	5.9	25.9	5.9	25.9	1.5	6.5	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.25	1.1	0.19	0.81	5,286.6
33	5.9	25.9	5.9	25.9	1.5	6.5	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.25	1.1	0.19	0.81	5,286.6
34	5.9	25.9	5.9	25.9	1.5	6.5	0.0059	0.026	0.10	0.44	0.10	0.44	0.10	0.44	-	-	0.25	1.1	0.19	0.81	5,286.6
38 (FUG-1)	-	-	-	-	9.0	39.6	-	-	-	-	-	-	-	-	-	-	0.23	1.0	-	-	-
39	8.6	37.7	11.9	52.1	0.40	1.7	0.12	0.53	0.17	0.73	0.17	0.73	0.17	0.73	-	-	0.098	0.43	0.066	0.29	4,486.7
40	0.049	0.21	0.041	0.18	0.0027	0.012	0.0071	0.031	0.0037	0.016	0.0037	0.016	0.0037	0.016	-	-	0.0013	0.0057	4.6E-05	0.00020	256.3
Dehy[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GT-1[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-C[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-48[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-49[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-50[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Load-1	-	-	-	-	6.5	28.3	-	-	-	-	-	-	-	-	-	-	0.14	0.61	-	-	-
Haul-1	-	-	-	-	-	-	-	-	1.2	0.64	0.31	0.16	0.031	0.016	-	-	-	-	-	-	-
Haul-2	-	-	-	-	-	-	-	-	1.2	0.20	0.31	0.051	0.031	0.0051	-	-	-	-	-	-	-
CT-N	-	-	-	-	-	-	-	-	0.31	1.4	0.20	0.86	0.00068	0.0030	-	-	-	-	-	-	-
CT-S	-	-	-	-	-	-	-	-	0.28	1.2	0.18	0.78	0.00062	0.0027	-	-	-	-	-	-	-
Totals	**104.1**	**456.1**	**107.6**	**471.4**	**33.3**	**146.1**	**0.28**	**1.2**	**5.0**	**11.9**	**2.9**	**10.4**	**2.0**	**8.5**	**3.2E-05**	**1.4E-04**	**2.7**	**11.7**	**1.5**	**6.5**	**107,166.6**

[1] Units Dehy and Dehy-2 are completely closed systems with any flash and recirculation gas routed to the VRU and reinjected into inlet gas for recycling. There are no emissions from these units.

[2] Units GT-1, TK-48, TK-49, and TK-50 are controlled by a VRU with 100% control efficiency. To allow for downtime for maintenance and repair, the effective control efficiency for the VRU is 95%. The emissions associated with VRU downtime are accounted for under Startup, Shutdown, and Maintenance emissions.

[3] Unit TK-C always has blanket gas which prevents working and breathing emissions. There are no flashing emissions as the liquids being handled are at atmospheric pressure. Emissions from blanket gas are routed to flare Unit 22.

DCP Midstream, LP - Artesia Gas Plant

White Superior 8G825 Compressor Engines

Emission unit number(s):	10-17, 25-27
Source description:	4-stroke rich burn natural gas engines
Manufacturer:	White Superior
Model:	8G825

Fuel Consumption

Heat rate:	7546	Btu/hp-hr	Manufacturer's data
Horsepower:	800	hp	Manufacturer's data
Fuel heat value:	1008	BTU/scf	Site LHV
Total input heat rate:	6.4	MMBtu/hr	Permit 0434-M7-R2
Fuel consumption:	6.3	Mscf/hr	Input heat rate / fuel heat value
Annual fuel usage:	55.6	MMscf/yr	8760 hrs/yr operation

Exhaust Parameters

Exhaust temp:	1340	°F	Eng. estimate
Stack height:	46.0	ft	Eng. estimate
Stack diameter:	1.0	ft	Eng. estimate
Exhaust flow:	4200	acfm	Eng. estimate
Exhaust velocity:	89.1	ft/sec	Exhaust flow / stack area

Emission Rates

Uncontrolled Emissions

NOx	CO	VOC	SO_2[1]	PM[2]		
26.47	26.47	3.51			lb/hr	Carried forward from Permit 0434-M7-R2
			5.88E-04	0.010	lb/MMBtu	AP-42 Table 3.2-3
26.5	**26.5**	**3.5**	**0.0038**	**0.064**	lb/hr	Hourly emission rate
115.9	**115.9**	**15.4**	**0.016**	**0.28**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
0.26	**0.18**	**0.016**	**0.015**	lb/hr	Hourly emission rate
1.1	**0.77**	**0.071**	**0.067**	tpy	GRI-HAPCalc 3.01 Annual emission rate (8760 hrs/yr)

Controlled Emissions

NOx	CO	VOC	SO_2[1]	PM[2]		
80%	80%	75%			%	Percent reduction from NSCR (Permit 0434-M7-R2)
			5.88E-04	0.010	lb/MMBtu	AP-42 Table 3.2-3
5.3	**5.3**	**0.88**	**0.0038**	**0.064**	lb/hr	Hourly emission rate
23.2	**23.2**	**3.8**	**0.016**	**0.28**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
75%	75%	75%	75%	%	Percent reduction from NSCR
0.065	**0.044**	**0.0041**	**0.0038**	lb/hr	Hourly emission rate
0.29	**0.19**	**0.018**	**0.017**	tpy	GRI-HAPCalc 3.01 Annual emission rate (8760 hrs/yr)

Notes 1. SO_2 calculation assumes 100% conversion of fuel elemental sulfur to SO_2.
2. TSP = PM-10 = PM-25=AP-42 PM Filterable + PM Condensable
3. HAPs estimated using GRI-HAPCalc 3.01

DCP Midstream, LP - Artesia Gas Plant

Gas Furnace

Emission unit number(s):	19
Source description:	Natural gas furnace
Manufacturer:	Regen
Model:	Optimized

Fuel Consumption

Total input heat rate:	3.00	MMBtu/hr	
Fuel heat value:	1008	BTU/scf	Site LHV
Fuel rate:	3.0	Mscf/hr	Input heat rate / fuel heat value
Annual fuel usage:	26.1	MMscf/yr	8760 hrs/yr operation

Exhaust Parameters

Exhaust temp:	630	°F	Eng. estimate
Stack height:	33.1	ft	Eng. estimate
Stack diameter:	3.6	ft	Eng. estimate
Exhaust flow:	4200.0	acfm	Va = Vs*(Ps/Pa)*(Ta/Ts)
Exhaust velocity:	89.2	ft/sec	Exhaust flow / stack area

Emission Rates

Uncontrolled Emissions

NOx	CO	VOC	SO_2[1]		
100	84	5.5	0.6	lb/MMscf	AP-42 Table 1.4-1 & 2 (7/98)
0.30	**0.25**	**0.02**	**0.0018**	lb/hr	Hourly emission rate
1.3	**1.1**	**0.07**	**0.0078**	tpy	Annual emission rate (8760 hrs/yr)

TSP[2]	PM-10[2]	PM-2.5[2]		
7.6	7.6	7.6	lb/MMscf	AP-42 Table 1.4-2 (7/98)
0.02	**0.02**	**0.02**	lb/hr	Hourly emission rate
0.10	**0.10**	**0.10**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
0.04	**0.0025**	**0.0022**	**-**	lb/hr	Hourly emission rate
0.2	**0.011**	**0.010**	**-**	tpy	Annual emission rate (8760 hrs/yr)

Notes 1. SO_2 calculation assumes 100% conversion of fuel elemental sulfur to SO_2.

2. TSP = PM-10 = PM-25=AP-42 PM Filterable + PM Condensable

3. HAPs estimated using GRI-HAPCalc 3.01

DCP Midstream, LP - Artesia Gas Plant

Natural Gas Boilers

Emission unit number(s):	20, 28
Source description:	Natural gas boilers
Manufacturer:	Wickes
Model:	N/A

Fuel Consumption

Total input heat rate:	36.0	MMBtu/hr	
Fuel heat value:	1008	BTU/scf	Site LHV
Fuel rate:	35.7	Mscf/hr	Input heat rate / fuel heat value
Annual fuel usage:	312.9	MMscf/yr	8760 hrs/yr operation

Exhaust Parameters

Exhaust temp (Tstk):	750	°F	Eng. estimate
Site Elevation:	3600	ft MSL	
Ambient pressure (Pstk):	26.2	in. Hg	Calculated based on elevation
F factor:	10610	wscf/MMBtu	40 CFR 60 Appx A Method 19
Exhaust flow	6366	scfm	Calculated from F factor and heat rate
Exhaust flow:	16915	acfm	scfm * (Pstd/Pstk)*(Tstk/Tstd), Pstd = 29.92 "Hg, Tstd = 520 °R
Stack diameter:	2.5	ft	measured
Stack height:	42.3	ft	measured
Exhaust velocity:	57.4	ft/sec	Exhaust flow ÷ stack area

Emission Rates

Uncontrolled Emissions

NOx	CO	VOC	SO_2[1]		
100	84	5.5	0.6	lb/MMscf	AP-42 Table 1.4-1 & 2 (7/98)
98.8	83.0	5.4	0.59	lb/MMscf	EF Conversion, per AP-42 = Fuel Heat Value / EF Heat Value * EF
3.53	**2.96**	**0.19**	**0.02**	lb/hr	Hourly emission rate
15.5	**13.0**	**0.85**	**0.0928**	tpy	Annual emission rate (8760 hrs/yr)

TSP[2]	PM-10[2]	PM-2.5[2]		
7.6	7.6	7.6	lb/MMscf	AP-42 Table 1.4-2 (7/98)
7.5	7.5	7.5	lb/MMscf	EF Conversion, per AP-42 = Fuel Heat Value / EF Heat Value * EF
0.27	**0.27**	**0.27**	lb/hr	Hourly emission rate
1.17	**1.17**	**1.17**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
0.094	**0.0026**	**0.010**	-	lb/hr	Hourly emission rate
0.41	**0.012**	**0.046**	-	tpy	GRI-HAPCalc 3.01 Annual emission rate (8760 hrs/yr)

Notes 1. SO_2 calculation assumes 100% conversion of fuel elemental sulfur to SO_2.
2. TSP = PM-10 = PM-25=AP-42 PM Filterable + PM Condensable
3. HAPs were estimated using GRI HAPCalc 3.01

DCP Midstream, LP - Artesia Gas Plant

Caterpillar G3516TALE

Emission unit number(s):	30, 31, 32, 33, 34
Source description:	4-stroke lean burn natural gas engine
Manufacturer:	Caterpillar
Model:	G3516TALE

Fuel Consumption

Engine speed:	1400	rpm	Manufacturer's data
Horsepower:	1340	hp	Manufacturer's data
Heat rate:	7546	Btu/hp-hr	Manufacturer's data
Fuel heat value:	1008	BTU/scf	Site LHV
Total input heat rate:	10.11	MMBtu/hr	Heat rate (Btu/hp-hr) * Horsepower (hp) * (1 MMBtu/10^6 Btu)
Fuel consumption:	10.0	Mscf/hr	Input heat rate / fuel heat value
Annual fuel usage:	87.9	MMscf/yr	8760 hrs/yr operation

Exhaust Parameters

Exhaust temp:	855	°F	Eng. estimate
Stack height:	42.0	ft	Eng. estimate
Stack diameter:	1.0	ft	Eng. estimate
Exhaust flow:	7685.0	acfm	Eng. estimate
Exhaust velocity:	163.1	ft/sec	Exhaust flow / stack area

Emission Rates

Uncontrolled Emissions

NOx	CO	VOC	SO_2[1]	PM[2]		
29.55	29.55	4.14			lb/hr	Carried forward from Permit 0434-M7-R2
			0.00059	0.010	lb/MMBtu	AP-42 Table 3.2-2
29.6	**29.6**	**4.1**	**0.0059**	**0.10**	lb/hr	Hourly emission rate
129.4	**129.4**	**18.1**	**0.026**	**0.44**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
0.70	**0.51**	**0.081**	**0.050**	lb/hr	Hourly emission rate
3.1	**2.25**	**0.36**	**0.22**	tpy	GRI-HAPCalc 3.01 Annual emission rate (8760 hrs/yr)

Controlled Emissions

NOx	CO	VOC	SO_2[1]	PM[2]		
2	2	0.5			g/hp-hr	Manufacturer's data
			0.00059	0.010	lb/MMBtu	AP-42 Table 3.2-2
5.9	**5.9**	**1.5**	**0.0059**	**0.10**	lb/hr	Hourly emission rate
25.9	**25.9**	**6.5**	**0.026**	**0.44**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
64%	64%	64%	64%	%	Percent catalyst reduction
0.25	**0.19**	**0.029**	**0.018**	lb/hr	Hourly emission rate
1.1	**0.81**	**0.13**	**0.079**	tpy	GRI-HAPCalc 3.01 Annual emission rate (8760 hrs/yr)

Notes 1. SO_2 calculation assumes 100% conversion of fuel elemental sulfur to SO_2.
2. TSP = PM-10 = PM-25=AP-42 PM Filterable + PM Condensable
3. HAPs estimated using GRI-HAPCalc 3.01

DCP Midstream, LP - Artesia Gas Plant

Facility-Wide Fugitive Emissions

Emission unit number(s): 38 (FUG)

Source description: Facility-Wide Fugitive Emissions

Fugitive Emissions from Fittings from Gunbarrel Tank GT-1

Facility-Wide Fugitive Emissions

Equipment Type	Emission Factor (kg/hr/source)[1]	Emission Factor (lb/hr/source)	Source Count[2]	% VOC[3]	% HAP[3]	% H_2S[3]	Emission Rate (lb/hr) VOC	Emission Rate (lb/hr) H_2S	Emission Rate (lb/hr) Total HAP	Emission Rate (tpy) VOC	Emission Rate (tpy) H_2S	Emission Rate (tpy) Total HAP
Valves - Inlet Gas	0.0045	0.00992	1020	18.7%	0.62%	0.75%	1.9	0.076	0.062	8.3	0.33	0.27
Valves - Liquid	0.0025	0.0055	650	100%	2.10%	0%	3.6	0.0	0.075	15.7	0.0	0.33
Relief Valves	0.0088	0.0194	250	18.7%	0.62%	0.75%	0.91	0.036	0.030	4.0	0.16	0.13
Pump Seals - Liquid	0.013	0.029	15	100%	2.10%	0%	0.43	0.0	0.0090	1.9	0.0	0.040
Flanges/Connectors - Inlet Gas[4]	0.00039	0.00086	3000	18.7%	0.62%	0.75%	0.48	0.019	0.016	2.1	0.08	0.070
Flanges/Connectors - Liquid[4]	0.00021	0.00046	3400	100%	2.10%	0%	1.6	0.0	0.033	6.9	0.0	0.15
Compressor Seals	0.0088	0.0194	30	18.7%	0.62%	0.75%	0.11	0.004	0.0036	0.48	0.019	0.016
							9.0	**0.14**	**0.23**	**39.3**	**0.60**	**1.0**

Notes:

1. Emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, November 1995, EPA-453/R-95-017
2. Source counts based on estimates as previously permitted.
3. Percent VOC, HAP, and H2S for gas based on inlet gas analysis from 8/22/2012. Percent VOC in liquids conservatively assumed to be 100%. Percent H2S in liquids is zero.
Percent HAP in liquids estimated based on the ratio of VOC and HAP in the previous gas analysis.
Total HAPs is the sum of n-Hexane, Benzene, Toluene, Ethylbenzene, and Xylene.
4. The higher of the emission factors for flanges and connectors was used here since the source count is for flanges and connectors combined.

Fugitive Emissions from Fittings from Gunbarrel Tank GT-1

Equipment Type	Emission Factor (kg/hr/source)[1]	Emission Factor (lb/hr/source)	Source Count[2]	% VOC[3]	VOC Emission Rate (lb/hr)	VOC Emission Rate (tpy)
Valves - Liquid	0.0025	0.0055	5	100%	0.028	0.12
Pump Seals - Liquid	0.013	0.0287	1	100%	0.029	0.13
Connectors - Liquid	0.00021	0.00046	7	100%	0.0032	0.014
Flanges - Liquid	0.00011	0.00024	10	100%	0.0024	0.011
					0.062	0.27

Notes:

1. Emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, November 1995, EPA-453/R-95-017
2. Source counts based on estimates as previously permitted.
3. Percent VOC in liquids conservatively assumed to be 100%.

Overall Facility Fugitive Emissions

Emission Rate (lb/hr) VOC	Emission Rate (lb/hr) H_2S	Emission Rate (lb/hr) Total HAP	Emission Rate (tpy) VOC	Emission Rate (tpy) H_2S	Emission Rate (tpy) Total HAP
9.0	0.14	0.23	39.6	0.60	1.0

DCP Midstream, LP - Artesia Gas Plant

Waukesha L7042GSI

Emission unit number(s):	39
Source description:	Natural gas engine
Manufacturer:	Waukesha
Model:	L7042GSI
Aspiration:	TA

Engine Horsepower and RPM

Engine speed:	1200	rpm	Mfg data
Sea level hp:	1478	hp	Mfg data
Actual engine speed	1000	rpm	Mechanically limited by compressor
Actual Site hp:	1200	hp	Mechanically limited by compressor

Fuel Consumption

BSFC:	7155	Btu/hp-hr	Mfg data
Fuel heat value:	1008	Btu/scf	Pipeline specification
Heat input:	8.6	MMBtu/hr	BSFC * actual site hp
Fuel consumption:	8.5	Mscf/hr	Heat input / fuel heat value
Annual fuel usage:	74.6	MMscf/yr	8760 hrs/yr operation

Exhaust Parameters

Exhaust temp (Tstk):	1125	°F	Mfg data
Stack height:	46	ft	Engineering estimate
Stack diameter:	1	ft	Engineering estimate
Exhaust flow:	6969	acfm	Mfg data
Exhaust velocity:	147.9	ft/sec	Exhaust flow ÷ stack area

Emission Calculations

Uncontrolled Emissions

NOx	CO	NMHC	SO_2[1]		
22.0	32.0	0.35		g/hp-hr	Mfg data
		1.86		Safety factor	
		1.00		g/hp-hr	
			50	gr Total Sulfur/Mscf	Pipeline specification
58.2	**84.7**	**2.6**	**0.12**	lb/hr	Hourly emission rate
254.9	**370.8**	**11.6**	**0.53**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
0.39	**0.26**	**0.024**	**0.023**	lb/hr	Hourly emission rate
1.7	**1.2**	**0.11**	**0.10**	tpy	Annual emission rate (8760 hrs/yr)

Controlled Emissions

NOx	CO	NMHC	SO_2[1]		
85%	85%	75%		Control Efficiency	AFR/Catalytic Convertor
3.25	4.5	0.15		g/hp-hr	
			50	gr Total Sulfur/Mscf	Pipeline specification
8.6	**11.9**	**0.40**	**0.12**	lb/hr	Hourly emission rate
37.7	**52.1**	**1.7**	**0.53**	tpy	Annual emission rate (8760 hrs/yr)

TSP[2]	PM-10[2]	PM-2.5[3]		
1.94E-02	1.94E-02	1.94E-02	lb/MMBtu	AP-42 Table 3.2-3 (7/00)
0.17	**0.17**	**0.17**	lb/hr	Hourly emission rate
0.73	**0.73**	**0.73**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
75%	75%	75%	75%		
0.10	**0.066**	**0.0061**	**0.0057**	lb/hr	Hourly emission rate
0.43	**0.29**	**0.027**	**0.025**	tpy	Annual emission rate (8760 hrs/yr)

1. SO_2 calculation assumes 100% converstion of fuel elemental sulfur to SO_2.
2. TSP = PM-10 = AP-42 PM10(filterable) + PM Condensable
3. PM-2.5 = AP-42 PM2.5(filterable) + PM Condensable
4. HAPs estimated using GRI-HAPCalc 3.01

DCP Midstream, LP - Artesia Gas Plant

0.5 MMBtu/hr Glycol Dehydrator Reboiler

Emission unit number(s):	Unit 40
Source description:	TEG Dehydrator Reboiler
Manufacturer:	Unknown

Fuel Consumption

Input heat rate:	0.50	MMBtu/hr	
Fuel heat value:	1008	Btu/scf	
Fuel rate:	496	scf/hr	Input heat rate / fuel heat value
Annual fuel usage:	4.3	MMscf/yr	8760 hrs/yr operation

Exhaust Parameters

Heat Rate:	500	MBtu/hr	Design Specification
Exhaust temp (Tstk):	600	°F	Design Specification
Site Elevation:	3556	ft MSL	
Ambient pressure (Pstk):	26.25	in. Hg	Calculated based on elevation
F factor:	10610	wscf/MMBtu	40 CFR 60 Appx A Method 19
Exhaust flow	88.4	scfm	Calculated from F factor and heat rate
Exhaust flow:	205.5	acfm	scfm * (Pstd/Pstk)*(Tstk/Tstd), Pstd = 29.92 "Hg, Tstd = 520 °R
Stack diameter:	0.7	ft	Design Specification
Stack height:	15	ft	Design Specification
Exhaust velocity:	9.8	ft/sec	Exhaust flow ÷ stack area

Emission Rates

Uncontrolled Reboiler Emissions

NOx	CO	VOC	SO_2[1]	PM [2]		
100	84	5.5		7.6	lb/MMscf	AP-42 Table 1.4-1 & 2
98.8	83.0	5.4		7.5	lb/MMscf	EF Conversion, per AP-42 = Fuel Heat Value / EF Heat Value * EF
			5		gr Total Sulf	Pipeline specification
0.049	**0.041**	**0.0027**	**0.0071**	**0.0037**	lb/hr	Hourly emission rate
0.21	**0.18**	**0.012**	**0.031**	**0.016**	tpy	Annual emission rate (8760 hrs/yr)

Total HAP[3]	HCOH[3]	Acetaldehyde[3]	Acrolein[3]		
0.0013	**0.000046**	**0.00014**	**-**	lb/hr	Hourly emission rate
0.0057	**0.00020**	**0.00060**	**-**	tpy	GRI-HAPCalc 3.01 Annual emission rate (8760 hrs/yr)

	CO_2	CH_4	N_2O	CO_2e [4]		
GHG Emissions	53.02	0.001	0.0001		kg/MMbtu	40 CFR 98 Subpart C TIER 1
	232.2	**4.4E-03**	**4.4E-04**	**232.5**	tonnes/yr	(1*10^-3)*EF*Fuel Heat Value*Annual Fuel Usage
	256.0	**4.8E-03**	**4.8E-04**	**256.3**	tons/yr	

Notes:

[1] SO_2 emissions calculated using a fuel sulfur content of 5 gr S/100scf. SO_2 calculation assumes 100% conversion of fuel elemental sulfur to SO_2.

[2] Assumes PM (Total) = TSP = PM-10 = PM-2.5

[3] GRI HAPCalc 3.01

[4] Warming potential of CH4 is 25 times greater than CO2; warming potential of N2O is 298 times greater than CO2

[5] The glycol dehydrator is a closed system and will have a reboiler and condenser associated with the unit. There are no emissions vented to the atmosphere.

[6] The only emission associated with the dehydrator are emission from the reboiler.

DCP Midstream, LP - Artesia Gas Plant

Condensate Loading Out of the Facility

Emission unit number(s): Load-1
Source description: Condensate loading out of the facility by truck

LL = 12.46 (SPM) / T   AP-42 5.2-4, Eq. 1 (6/08)

Tank TK-50

	TK-50	
S =	0.6	Saturation factor, Submerged loading, normal dedicated service. AP-42, Table 5.2-1. (6/08)
T =	76	Temperature of bulk liquids loaded, F
P =	7.00	True vapor pressure of liquids loaded, psia
M =	66	Vapor MW for RVP 10, lb/lbmole
LL =	6.4	lb VOC/1000 gallons loaded
Loadout From TK-50	2,520,000.0	gallons/year
	60,000.0	bbl/year
Loading Losses from TK-50	**8.1**	tpy

Tank TK-C

	TK-C	
S =	0.6	Saturation factor, Submerged loading, normal dedicated service. AP-42, Table 5.2-1. (6/08)
T =	70	Temperature of bulk liquids loaded, F
P =	6.25	True vapor pressure of liquids loaded, psia
M =	66	Vapor MW for RVP 10, lb/lbmole
LL =	5.8	lb VOC/1000 gallons loaded
Loadout from TK-C	6,930,000.0	gallons/year
	165,000.0	bbl/year
Loading Losses from TK-C	**20.2**	tpy
Requested Loadout Out of Facility =	9,450,000.0	gallons/year
	225,000.0	bbl/year

Total Loading Out VOC Emissions

	6.46	lb/hr	
	28.29	tpy	8760 hours per year
HAP Emissions	28.80	tpy	Uncontrolled TK-50 and TK-C working and breathing VOC losses
	0.62	tpy	Uncontrolled TK-50 and TK-C working and breathing HAP losses
	0.61	tpy	Loadout HAPs = (Working and breathing HAPs/Working and breathing VOC) * Loadout VOC
	0.14	lb/hr	Loadout HAPs

DCP Midstream, LP - Artesia Gas Plant

Haul Road Emissions from Condensate Loading Out of Facility

Emission unit number(s):	Haul-1
Source description:	Hauling emissions from condensate loading out of facility

Input Data

Empty vehicle weight[1]	16	tons	
Load weight[2]	21.2	tons	
Loaded vehicle[3]	37.2	tons	
Mean vehicle weight[4]	26.6	tons	
Requested Loadout Quantity	9,450,000.0	gallons/year	
Vehicle frequency	1250.0	Trucks/yr	Total TK-50 and TK-C loadout (gal/yr) / (7,560 gal/truck)
Vehicle frequency	3.4	vehicles/day	(Trucks/year) / (365 days/year)
Vehicle frequency	1	trips/hour	
Round-trip distance	0.80	mile/trip	
Operating hours	8760	hours/yr	
Surface silt content[5]	4.8	%	
Annual wet days[6]	60	days/yr	
Vehicle miles traveled[7]	0.80	mile/hr	
Emission Control Factor	77.6%	Combination of base course treatment (gravel) and speed limit of 25 mph	

Control for base course treatment and watering = 60% Based on NMED Guidance (Email form Mary Gerhart, January 17, 2014)

Control for speed limit of 25 mph = 44% Based on WRAP Fugitive Handbook, September 7, 2006 (Page 8)

Emission Factors and Constants

Parameter	PM_{30}	PM_{10}	$PM_{2.5}$
k, lb/VMT[8]	4.9	1.5	0.15
a, lb/VMT[8]	0.70	0.90	0.90
b, lb/VMT[8]	0.45	0.45	0.45
Hourly EF, lb/VMT[9]	6.89	1.76	0.18
Annual EF, lb/VMT[10]	5.75	1.47	0.15

Uncontrolled Emissions

PM_{30}	PM_{10}	$PM_{2.5}$	
5.5	1.4	0.14	lb/hr[11]
2.9	0.73	0.073	ton/yr[12]

Controlled Emissions

PM_{30}	PM_{10}	$PM_{2.5}$	
1.2	0.31	0.031	lb/hr[11]
0.64	0.16	0.016	ton/yr[12]

Notes

[1] Empty vehicle weight includes driver and occupants and full fuel load.

[2] Cargo, transported materials, etc. (5.6 lb/gal RVP 10 *7560 gal truck/ 2000lb/ton)

[3] Loaded vehicle weight = Empty + Load Size

[4] Mean Vehicle weight = (Loaded Weight + Empty Weight) / 2

[5] AP-42 Table 13.2.2-1, Taconite mining and processing mean silt content

[6] AP-42 Figure 13.2.2-1

[7] VMT/hr = Vehicle Miles Traveled per hour = Trips per hour * Segment Length

[8] Table 13.2.2-2, Industrial Roads

[9] AP-42 13.2.2, Equation 1a

[10] AP-42 13.2.2, Equation 2

[11] lb/hr = Hourly EF (lb/VMT) * VMT (mile/hr)

[12] ton/yr = Annual EF (lb/VMT) * Truck/day * Mile/truck * 365day/yr * 1ton/2000lb

DCP Midstream, LP - Artesia Gas Plant

Haul Road Emissions from Condensate Loadout Into Facility

Emission unit number(s):	Haul-2		
Source description:	Hauling emissions from condensate loadout into facility		

Input Data

Empty vehicle weight[1]	16	tons	
Load weight[2]	21.2	tons	
Loaded vehicle[3]	37.2	tons	
Mean vehicle weight[4]	26.6	tons	
Requested Loadout Into Facility	2,940,000.0	gallons/year	
Vehicle frequency	388.9	Trucks/yr	Total loadout (gal/yr) / (7,560 gal/truck)
Vehicle frequency	1.1	vehicles/day	(Trucks/year) / (365 days/year)
Vehicle frequency	1	trips/hour	
Round-trip distance	0.80	mile/trip	
Operating hours	8760	hours/yr	
Surface silt content[5]	4.8	%	
Annual wet days[6]	60	days/yr	
Vehicle miles traveled[7]	0.80	mile/hr	
Emission Control Factor	77.6%	Combination of base course treatment (gravel) and speed limit of 25 mph	

Control for base course treatment and watering = 60% Based on NMED guidance (email from Mary Gerhart, January 17, 2014)

Control for speed limit of 25 mph = 44% Based on WRAP Fugitive Dust Handbook, September 7, 2006 (Page 8)

Emission Factors and Constants

Parameter	PM_{30}	PM_{10}	$PM_{2.5}$
k, lb/VMT[8]	4.9	1.5	0.15
a, lb/VMT[8]	0.70	0.90	0.90
b, lb/VMT[8]	0.45	0.45	0.45
Hourly EF, lb/VMT[9]	6.89	1.76	0.18
Annual EF, lb/VMT[10]	5.75	1.47	0.15

Uncontrolled Emissions

PM_{30}	PM_{10}	$PM_{2.5}$	
5.5	1.4	0.14	lb/hr[11]
0.90	0.23	0.023	ton/yr[12]

Controlled Emissions

PM_{30}	PM_{10}	$PM_{2.5}$	
1.2	0.3	0.03	lb/hr[11]
0.20	0.051	0.0051	ton/yr[12]

Notes

1 Empty vehicle weight includes driver and occupants and full fuel load.
2 Cargo, transported materials, etc. (5.6 lb/gal RVP 10 *7560 gal truck/ 2000lb/ton)
3 Loaded vehicle weight = Empty + Load Size
4 Mean Vehicle weight = (Loaded Weight + Empty Weight) / 2
5 AP-42 Table 13.2.2-1, Taconite mining and processing mean silt content
6 AP-42 Figure 13.2.2-1
7 VMT/hr = Vehicle Miles Traveled per hour = Trips per hour * Segment Length
8 Table 13.2.2-2, Industrial Roads
9 AP-42 13.2.2, Equation 1a
10 AP-42 13.2.2, Equation 2
11 lb/hr = Hourly EF (lb/VMT) * VMT (mile/hr)
12 ton/yr = Annual EF (lb/VMT) * Truck/day * Mile/truck * 365day/yr * 1ton/2000lb

DCP Midstream, LP - Artesia Gas Plant

Cooling Tower Emissions

Units: CT-N & CT-S

	Cooling Water Recirculation Rate (gpm)	Drift Rate fraction of Circulating Flow %	Total Drift Mass lb/min	Drift Mass Escape from Facility Boundary %	Drift Mass Leaving Site lb/min	Circulating Water Total Dissolved Solids (ppm_w)
Notes	1	2	3	4	5	6
CT-N	3,470	0.02%	6	43.30%	2.5	2,147
CT-S	3,470	0.02%	6	39.30%	2.3	2,147

	Hourly Uncontrolled Particulate Emissions (lb/hr)	Annual Uncontrolled Particulate Emissions (tpy)	Hourly Uncontrolled TSP Emissions (lb/hr)	Annual Uncontrolled TSP Emissions (tpy)	Hourly Uncontrolled PM_{10} Emissions (lb/hr)	Annual Uncontrolled PM_{10} Emissions (tpy)	Hourly Uncontrolled $PM_{2.5}$ Emissions (lb/hr)	Annual Uncontrolled $PM_{2.5}$ Emissions (tpy)
Notes	7	7	8	8	8	8	8	8
CT-N	0.32	1.41	0.31	1.36	0.20	0.86	0.00068	0.0030
CT-S	0.29	1.28	0.28	1.24	0.18	0.78	0.00062	0.0027

Notes

1 Cooling Tower Water Recirculation rate based on maximum pump capacity.

2 Drift Rate from AP-42 13.4-1, induced draft cooling towers.

3 Total Drift Mass = Recirculation rate * Drift Rate Fraction * Drift Density (8.34 lb/gal)

4 Facility boundary located 200 ft from the North Cooling Tower and 230 ft from the South Cooling Tower ; 56.7% of drift mass retained on site for CT-N and 60.7%of drift mass retained on site for CT-S (Figure 8, "Effects of Pathogenic and Toxic Materials Transported Via Cooling Device Drift, Volume 1. Technical Report," EPA)

5 Drift mass leaving site = Total Drift Mass * % Drift Mass escape from facility boundary

6 TDS is assumed to be 1,431 $ppm_{w;}$ A 50% safety factor was applied as a conservative measure.

7 Total particulate emission calculated using procedure described in Section 13.4 of AP-42 (01/95), Wet Cooling Towers.
PM = Water Circulation Rate (see Note 1) * Drift Rate (see Note 2) * Percent drift mass escape (see Note 4) * TDS (see Note 6)
Particulate Hourly Emissions:

$$\frac{3{,}470\text{ gal}}{\text{min}} \left| \frac{60\text{ min}}{\text{hr}} \right| \frac{0.0002\text{ gal drift}}{\text{gal recirculation}} \left| 43.30\% \right| \frac{8.34\text{ lb drift}}{\text{gal drift}} \left| \frac{000\text{ lb PM}}{10^6\text{ lb drift}} \right. = \frac{0.29\text{ lb}}{\text{hr}}$$

Particulate annual emissions = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

8 Particle size distribution based on the following distribution (from Frisbee Table)

Particle Distribution	
Particle	**Mass Fraction of Total Particulates**
TSP (PM 30)	0.96
PM10	0.61
PM2.5	0.002

DCP Midstream, LP - Artesia Gas Plant

Cooling Tower Emissions - Frisbee Table

Facility TDS	1431.00	ppmw
Safety Factor	50%	
Facility TDS	2146.50	ppmw

EPRI Droplet Diameter (μm)	Solid Particle Diameter (μm)	EPRI % Mass Smaller	Interpolated Percentage Particulate Fractions	
10	0.992	0		
20	1.984	0.196		
30	2.975	0.226	0.002	PM2.5
40	3.967	0.514		
50	4.959	1.816		
60	5.951	5.702		
70	6.943	21.348		
90	8.926	49.812		
110	10.910	70.509	0.610	PM10
130	12.894	82.023		
150	14.877	88.012		
180	17.853	91.032		
210	20.828	92.468		
240	23.804	94.091		
270	26.779	94.689		
300	29.755	96.288		
350	34.714	97.011	0.963	TSP
400	39.673	98.34		
450	44.632	99.071		
500	49.591	99.071		
600	59.510	100		

Air Compressor

Generator Set	AC-1		
Description	Air Compressor		
Manufacturer	Ingersol Rand		
Model	unknnown		
Operating Hours	30	days	
	720	hours	5 days x 24 hr/day
Engine			
Sea level horsepower	48	hp	Manufacturer's data

Emission Calculations

Uncontrolled Emissions

CO	NOx	VOC[2]	SO_2	PM[1]			
6.68E-03	0.031	2.51E-03	2.05E-03	2.20E-03	lb/hp-hr	AP-42 Table 3.3-1	Emission Factors for uncontrolled diesel engines
0.32	**1.49**	**0.12**	**0.10**	**0.11**	lb/hr	lb/hp-hr*hp	
0.12	**0.54**	**0.043**	**0.035**	**0.038**	tpy	Annual emission rate (8760 hrs/yr)	

Notes:

[1] As a conservative measure, PM-2.5 and PM-10 are assumed equal to total particulate matter (PM).

[2] VOC AP-42 emission factor = exhaust (0.00247 lb/hp-hr) + crankcase emission (0.0000441 lb/hp-hr) factors.

DCP MIDSTREAM
Artesia Gas Plant
SSM & M ACTIVITY EMISSIONS SUMMARY

Unit	NOx		CO		VOCs		SOx		TSP		PM10		PM2.5		H_2S		CO2e	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Plant turnaround	-	-	-	-	1,769.2	12.7	-	-	-	-	-	-	-	-	14.6	0.0073	-	9.2
Plant Startup (post turnaround)	-	-	-	-	684.3	2.40	-	-	-	-	-	-	-	-	45.3	0.16	-	198.3
Condensate Tank Degassing (VRU Downtime)	-	-	-	-	0.44	1.9	-	-	-	-	-	-	-	-	0.029	0.13	-	-
Gas Piping Degassing (meter proving and line isolation)	-	-	-	-	6.1	0.11	-	-	-	-	-	-	-	-	0.40	7.3E-03	-	9.1
PIG Launcher Degassing	-	-	-	-	3.6	0.094	-	-	-	-	-	-	-	-	0.24	6.2E-03	-	7.8
Vacuum Trucks (Condensate Tank Cleanout)	-	-	-	-	6.3	0.010	-	-	-	-	-	-	-	-	0.42	6.3E-04	-	0.79
Engine Startup	-	-	-	-	56.2	1.7	-	-	-	-	-	-	-	-	3.7	0.11	-	139.5
Compressor Engine Blowdown	-	-	-	-	433.4	4.3	-	-	-	-	-	-	-	-	28.7	0.29	-	46.5
Emergency Wet Gas Flare	642.9	7.5	3,498.3	40.7	2,685.1	27.2	4,918.4	49.9	-	-	-	-	-	-	52.3	0.53	-	11804.4
Acid Gas Flare	10.4	2.43	56.6	13.2	0.01	0.001	2,001.0	328.2	-	-	-	-	-	-	21.3	3.48	-	381.9
SSM Emission Total	**653.3**	**9.9**	**3,555.0**	**53.9**	**5,644.8**	**50.3**	**6,919.4**	**378.1**	**-**	**-**	**-**	**-**	**-**	**-**	**166.8**	**4.7**	**-**	**12,597.4**
Non-Flaring SSM Total	-	-	-	-	2,959.61	23.2	-	-	-	-	-	-	-	-	93.3	0.70	-	411.1

Unit	NOx		CO		VOCs		SOx		TSP		PM10		PM2.5		H_2S	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Malfunction	642.9	10.0	3,498.3	10.0	2,685.1	10.0	4,918.4	10.0	-	-	-	-	-	-	52.3	9.0
Malfunction Total	642.9	10.0	3,498.3	10.0	2,685.1	10.0	4,918.4	10.0	-	-	-	-	-	-	52.3	9.0

Unit	NOx		CO		VOCs		SOx		TSP		PM10		PM2.5		H_2S	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
SSM & Malfunction Emisson Totals	**653.3**	**19.9**	**3,555.0**	**63.9**	**5,644.8**	**60.3**	**6,919.4**	**388.1**	**-**	**-**	**-**	**-**	**-**	**-**	**166.8**	**13.7**

DCP MIDSTREAM
Artesia Gas Plant
SAMPLE EMISSIONS CALCULATIONS -TURNAROUND EMISSIONS

Calculation Basis:

Multiple steps comprise a plant turnaround. Step 1 - For the natural gas system, emissions to the atmosphere after opening pipelines are calculated using the Ideal Gas Law and are based on the entire pipe volume venting to the atmosphere at pipeline pressure. Step 2 - For systems in liquid service clingage emissions degassing emissions occur after the system is de-inventoried. Degassing emissions are calculated using the Ideal Gas Law. Step 3 - After systems are degassed and opened, residual materials (clingage) may be emitted to the atmosphere. Clingage emissions are estimated using system volumes and an assumed clingage amount.

Total lb/hr emissions from each liquid system turnaround step (degassing, clingage) assume that any liquid system may undergo turnaround at any time. Maximum lb/hr emissions from all turnaround steps is calculated as the maximum lb/hr emission rate from any step.

Constants and Variables:

	System/Service Name									
	N.G. (gas)	**Glycol**	**Lube oil**	**Amine**	**NGL Product**	**Propane (liq)**	**Methanol**	**Condensate**		
fluid type (@ atm):	**Gas**	**Liquid**	**Liquid**	**Liquid**	**Gas**	**Gas**	**Liquid**	**Liquid**		
Volume:	1,388,000	1,563	86,400	5,534	42,001	2,456	1,880	2,203	scf (for N.G.), gal (for liquids)	
Process Temperature :	95.00								° F	
Ideal Gas Constant :	10.73								$(ft^3)(psi)/(lbmol)(°R)$	
Density:	0.0544	9.28	7.50	8.66	0.23	0.20	6.66	6.00	lb/scf (for gas), lb/gal (for liquid) - from DCP turnaround quantity calculations	
Vapor Pressure:	N/A	0.001	0.010	0.002	24.7	24.7	3.868	-9.44	psig	
Molecular Weight:	20.63	62.07	170	119.16	51	44	32	50	lb/lbmol	from Gas Composition Sheet
VOC Content :	18.73	100	100	100	100	100	100	0.19	Wt. %	from Gas Composition Sheet
Benzene Content:	0.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Wt. %	from Gas Composition Sheet
H2S Content:	1.2389	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Wt. %	from Gas Composition Sheet
CO2 Content:	1.7417	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Wt. %	from Gas Composition Sheet
CH4 Content:	61.9703	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Wt. %	from Gas Composition Sheet

VOC Emissions, N.G. System Blowdown

Volume of system = 1,388,000 ft^3

Amount HC vented to atmosphere (lb) = (Volume x density)

$$= \frac{1{,}388{,}000\ ft^3}{} \;\Big|\; \frac{0.054\ lb}{ft^3}$$

=	9,444	lbs N.G. (lb/hr)	8 hours for plant blowdown
=	1,769	lbs VOC (lb/hr)	
Maximum number of turnarounds =	1.00	activity/yr	from site data sheet
=	7.08	tpy VOC	
=	1.09	lb/hr Benzene	
=	5.45E-04	tpy Benzene	
=	14.62	lb/hr H2S	
=	7.31E-03	tpy H2S	
=	20.6	lb/hr CO2	
=	1.03E-02	tpy CO2	
=	731.5	lb/hr CH4	
=	3.66E-01	tpy CH4	
=	9.2	tpy CO2e	

DCP MIDSTREAM
Artesia Gas Plant
SAMPLE EMISSIONS CALCULATIONS -TURNAROUND EMISSIONS

<u>Liquid system opening loss (vapor space, atm liquid systems only)</u>

Amount emitted (lbs) = P*V*MW / (R * T)

<u>Glycol system:</u>

Amount VOC vented to atmosphere (lb) = (Volume x molecular weight x vapor pressure) / (Gas Constant x Temperature [°R]) * MW

=	1,563 gal	1	0.13368 ft3	62.07 lb	0.001 psig	100 % VOC
	10.73 ft^3 * psi / °R * lb-mol	555 ° R	gal	lb-mol		

= 2.87E-03 lbs VOC/hr assume degassing occurs in one hour
= 1.43E-06 tpy VOC

<u>Lube Oil system:</u>

Amount VOC vented to atmosphere (lb) = (Volume x molecular weight x vapor pressure) / (Gas Constant x Temperature [°R]) * MW

=	86,400 gal	1	0.13368 ft3	170.00 lb	0.010 psig	100 % VOC
	10.73 ft^3 * psi / °R * lb-mol	555 ° R	gal	lb-mol		

= 3.30 lbs VOC/hr assume degassing occurs in one hour
= 1.65E-03 tpy VOC

<u>Amine system:</u>

Amount VOC vented to atmosphere (lb) = (Volume x molecular weight x vapor pressure) / (Gas Constant x Temperature [°R]) * MW

=	5,534 gal	1	0.13368 ft3	119.16 lb	0.0025 psig	100 % VOC
	10.73 ft^3 * psi / °R * lb-mol	555 ° R	gal	lb-mol		

= 0.037 lbs VOC/hr assume degassing occurs in one hour
= 1.83E-05 tpy VOC

<u>Methanol system:</u>

Amount VOC vented to atmosphere (lb) = (Volume x molecular weight x vapor pressure) / (Gas Constant x Temperature [°R]) * MW

=	1,880 gal	1	0.13368 ft3	32.00 lb	3.87 psig	100 % VOC
	10.73 ft^3 * psi / °R * lb-mol	555 ° R	gal	lb-mol		

= 5.22 lbs VOC/hr assume degassing occurs in one hour
= 2.61E-03 tpy VOC

<u>Condensate system:</u>

Amount VOC vented to atmosphere (lb) = (Volume x molecular weight x vapor pressure) / (Gas Constant x Temperature [°R]) * MW

=	2,203 gal	1	0.13368 ft3	50.00 lb	-9.44 psig	0.2 % VOC
	10.73 ft^3 * psi / °R * lb-mol	555 ° R	gal	lb-mol		

= -0.04 lbs VOC/hr assume degassing occurs in one hour
= -2.19E-05 tpy VOC

<u>NGL Product system:</u>

Amount VOC vented to atmosphere (lb) = (Volume x molecular weight x vapor pressure) / (Gas Constant x Temperature [°R]) * MW

=	42,001 scf	1	51.00 lb	24.70 psig	100.0 % VOC
	10.73 ft^3 * psi / °R * lb-mol	555 ° R	lb-mol		

= 1110.41 lbs VOC/hr assume degassing occurs in 8 hours
= 4.44 tpy VOC

<u>Propane (liq) system:</u>

Amount VOC vented to atmosphere (lb) = (Volume x molecular weight x vapor pressure) / (Gas Constant x Temperature [°R]) * MW

=	2,456 scf	1	44.00 lb	24.70 psig	100.0 % VOC
	10.73 ft^3 * psi / °R * lb-mol	555 ° R	lb-mol		

= 56.02 lbs VOC/hr assume degassing occurs in 8 hours
= 0.22 tpy VOC

DCP MIDSTREAM
Artesia Gas Plant
SAMPLE EMISSIONS CALCULATIONS -TURNAROUND EMISSIONS

Total degassing (all systems):	1174.9	lbs VOC/hr
	4.67	tpy VOC

System clingage loss (vapor space)

Assume:	0.25	% of liquid volume remains as clingage and is emitted to atm.
Assume:	0.05	% of NGL and Propane liquid system volume remains as clingage and is emitted to atm.
Duration of clingage losses:	24	hrs

System:	Glycol	Lube oil	Amine	Methanol	Condensate		
fluid type (@ atm):	Liquid	Liquid	Liquid	Liquid	Liquid		
Clingage volume:	3.91	216	13.84	4.70	5.51	gal	
Density:	9.28	7.50	8.66	6.66	6.00	lb/gal - from DCP turnaround quantity calculations	
% VOC:	100	100	100	100	0.19	wt %	
	36.24	1,619.35	119.86	31.3	0.06	lb/activity	
VOC Emissions:	2	67	5	1.31	0.0026	lb/hr	assumed that clingage losses occur over a 24 hour period
	0.02	0.81	0.06	0.02	3.1E-05	tpy	

Total clingage (all systems):	75.3	lbs VOC/hr
	0.90	tpy VOC

Example calculation: Glycol system

Amount VOC vented to atmosphere (lb) = (System volume x % clingage x density x % VOC)

$$= \frac{1{,}563\ \text{gal}}{} \times \frac{0.25\ \%\ \text{clingage}}{} \times \frac{9.28\ \text{lb}}{\text{gal}} \times \frac{100\ \%\ \text{VOC}}{}$$

55

Total Turnaround Activity Emissions:

lb/hr VOC:	1,769	Maximum hourly emissions from blowdown, liquid system venting or clingage steps.
tpy VOC:	12.65	Sum of emissions from all turnaround steps.
lb/hr H2S:	14.62	
tpy H2S:	7.31E-03	
lb/hr benzene:	1.09	
tpy benzene:	5.45E-04	
tpy CO2e	9.2	

DCP MIDSTREAM
Artesia Gas Plant
SAMPLE EMISSIONS CALCULATIONS -STARTUP EMISSIONS, POST TURNAROUND

Calculation Basis:

For the natural gas system, emissions to the atmosphere occur from a three step pressure test and purge prior to plant startup. These emissions are calculated using the Ideal Gas Law and are based on the entire pipe volume venting to the atmosphere at each purge step pressure.

Constants and Variables:

	N.G. (gas) System		
Plant startup duration:	7	hrs	From site data sheet
Annual startup frequency:	1	activity/yr (equivalent to turnaround frequency)	From site data sheet
Gas System Equipment Volume:	35,900	cu. Ft., from DCP turnaround quantity calculations	From site data sheet
Process Temperature :	80.00	° F	
Density:	0.0455	lb/scf (for gas)- from DCP turnaround quantity calculations	
VOC Content :	18.73	Wt. %	From Gas Composition Sheet
Benzene Content:	0.09	Wt. %	From Gas Composition Sheet
H2S Content:	1.2389	Wt. %	From Gas Composition Sheet
CO2 Content:	1.7417	Wt. %	
CH4 Content:	61.9703	Wt. %	

VOC Emissions, N.G. System Blowdown:

Amount of gas vented to atmosphere (scf) = [Equipment volume x (system purge step pressure (psi) + 14.7)] / [540 deg R* 14.7 psi] * 520 deg R

System Purge Step #:	1	2	3	
System pressure prior to Purge:	30	50	100	psi
Amount of gas vented to atm:	112,203	162,406	287,913	cf @ 95 deg F [1]
	112.20	162.41	287.91	mcf @ 95 deg F [1]
Total gas vented to atm (all steps):	562.52			mcf
	25.57			klbs
Hourly gas emission rate:	3652.74			lb/hr
Hourly VOC emission rate:	684.33			lb/hr
Hourly benzene emission rate:	3.37			lb/hr
Hourly H2S emission rate:	45.25			lb/hr
Annual VOC Emission rate:	2.40			tpy
Annual benzene emission rate:	1.18E-02			tpy
Annual H2S emission rate:	1.58E-01			tpy

Note: [1] TCEQ guidance of final temperature for depressurizing to atmosphere, from chemical sector MSS permitting.

GHG Emissions	lb/hr	tpy
CO2	63.6	0.22
CH4	2263.6	7.9
Total CO2e		198.3

DCP Midstream, LP - Artesia Gas Plant

SSM Condensate Storage Tanks

Emission units:	TK-48, TK-49
Number of Tanks:	2
Source Description:	500 bbl Condensate Tanks

General Tank Information

Volume	500	bbl		
Height (shell)	16	ft		
Diameter	15	ft		
Tank Throughput	70,000	bbl/yr	Conservative estimate for total condensate into both tanks TK-48 and TK-49	
Tank Throughput	2,940,000	gal/yr		bbl/yr *42 gal/bbl
Turnovers	183	turnovers/yr for each tank		Tank throughput / Tank Volume

VOC Emissions For Each Tank During VRU Downtime

Uncontrolled Emissions					
	VOC				
	20,754	lb/yr	TANKS 4.09 d	Working and Breathing	
	10.38	**tpy**	tpy = lb/hr x [(8760hr/yr) / (2000lb/ton)])		
Controlled Emissions	100%		VRU Control Efficiency		
	5%		VRU Downtime per year		
Requested SSM Emissions	**0.52**	**tpy**	TANKS 4.09 d	Working and Breathing	Uncontrolled working & breathing x 5%
Total VOC for TK-48 & TK-49	**1.04**	**tpy**	**Working and Breathing**		

HAP Emissions For Each Tank During VRU Downtime

Uncontrolled Emissions

HAP	lb/yr	Uncontrolled tpy	Controlled[2] tpy
Benzene	133.1	0.067	0.0033
Toluene	154.2	0.077	0.0039
Ethylbenzene	10.7	0.0054	0.00027
Xylene (-m)	44.9	0.022	0.0011
n-Hexane	118.0	0.059	0.0030
TOTAL HAPs	460.84	**0.23**	**0.012**

Total HAPs for TK-48 & TK-49	0.46	tpy	
Controlled Emissions	100%		VRU Control Efficiency
	5%		VRU Downtime per year
	0.012	**tpy**	Total HAPs
Total HAPs for TK-48 & TK-49	**0.023**	**tpy**	**Working and Breathing**

H2S Emissions During VRU Downtime

Uncontrolled Emissions				
	1.24	% H2S	Inlet Gas	Based on Analysis 08/22/2012
	18.73	% VOC	Inlet Gas	Based on Analysis 08/22/2012
	0.069	tpy H2S	Working and breathing H2S = [Working and breathing VOC]*[(% H2S in inlet) / (% VOC in inlet)]	

Note:
1 HAP Emissions calculated using TANKS 4.09 d with a gas analysis dated 08/22/2012.
2 VRU has a 100% efficiency with 5% downtime per year
3 There are no flashing emissions as the liquids being handled are at atmospheric pressure.

DCP Midstream, LP - Artesia Gas Plant

SSM Condensate Storage Tanks

Emission units:	TK-50
Number of Tanks:	1
Source Description:	500 bbl Condensate Tank

General Tank Information

Volume	500	bbl	
Height (shell)	16	ft	
Diameter	15	ft	
Tank Throughput	60,000	bbl/yr	Conservative estimate for total condensate into TK-50
Tank Throughput	2,520,000	gal/yr	bbl/yr *42 gal/bbl
Turnovers	183	turnovers/yr for each tank	Tank throughput / Tank Volume

VOC Emissions During VRU Downtime

Uncontrolled Emissions

	VOC				
	19,986	lb/yr	TANKS 4.09 d	Working and Breathing	
	9.99	**tpy**	tpy = lb/hr x [(8760hr/yr) / (2000lb/ton)]		
Controlled Emissions	100%		VRU Control Efficiency		
	5%		VRU Downtime per year		
Requested SSM Emissions	**0.50**	**tpy**	**TANKS 4.09 d**	**Working and Breathing**	uncontrolled working & breathing x 5%

HAP Emissions During VRU Downtime

Uncontrolled Emissions

HAP	lb/yr	Uncontrolled tpy	Controlled[2] tpy
Benzene	128.2	0.064	0.0032
Toluene	148.5	0.074	0.0037
Ethylbenzene	10.3	0.0052	0.00026
Xylene (-m)	43.2	0.022	0.0011
n-Hexane	113.6	0.057	0.0028
TOTAL HAPs	443.78	**0.22**	**0.011**

Controlled Emissions	100%		VRU Control Efficiency	
	5%		VRU Downtime per year	
Requested SSM Emissions	**0.011**	**tpy**	**TANKS 4.09 d**	**Working and Breathing**

H2S Emissions During VRU Downtime

Uncontrolled Emissions

1.24	% H2S	Inlet Gas	Based on Analysis 08/22/2012
18.73	% VOC	Inlet Gas	Based on Analysis 08/22/2012
0.033	tpy H2S	Working and breathing H2S = [Working and breathing VOC]*[(% H2S in inlet) / (% VOC in inlet)]	

Note:

1 HAP Emissions calculated using TANKS 4.09 d with a gas analysis dated 08/22/2012.
2 VRU has a 100% efficiency with 5% downtime per year
3 There are no flashing emissions as the liquids being handled are at atmospheric pressure.

DCP Midstream, LP - Artesia Gas Plant

SSM Gunbarrel Separator

Emission units:	GT-1
Number of Tanks:	1
Source Description:	400 bbl Gunbarrel condensate/water separator tank

General Tank Information

Volume	400	bbl	
Height (shell)	20	ft	
Diameter	12	ft	
Tank Throughput	192	maximum bbl/day	Engineering estimate
Tank Throughput	70,000	bbl/yr	Maximum daily throughput*365 days/yr
Tank Throughput	2,940,000	gal/yr	bbl/yr *42 gal/bbl
Turnovers	183	turnovers/yr	Tank throughput / Tank Volume

VOC Emissions During VRU Downtime

Uncontrolled Emissions

	VOC			
	14,762	lb/yr	TANKS 4.09 d	Working and Breathing
	7.38	**tpy**	tpy = lb/hr x [(8760hr/yr) / (2000lb/ton)])	
Controlled Emissions	100%		VRU Control Efficiency	
	5%		VRU Downtime per year	
Requested SSM Emissions	**0.37**	**tpy**	**TANKS 4.09 d**	**Working and Breathing**

uncontrolled working & breathing x 5%

HAP Emissions During VRU Downtime

Uncontrolled Emissions

HAP	lb/yr	Uncontrolled tpy	Controlled[2] tpy
Benzene	92.0	0.046	0.0023
Toluene	105.4	0.053	0.0026
Ethylbenzene	7.2	0.0036	0.0002
Xylene (-m)	30.3	0.015	0.0008
n-Hexane	82.1	0.041	0.0021
TOTAL HAPs	316.93	**0.16**	**0.0079**

Controlled Emissions	100%		VRU Control Efficiency	
	5%		VRU Downtime per year	
Requested SSM Emissions	**0.0079**	**tpy**	**TANKS 4.09 d**	**Working and Breathing**

H2S Emissions During VRU Downtime

Uncontrolled Emissions

1.24	% H2S	Inlet Gas	Based on Analysis 08/22/2012
18.73	% VOC	Inlet Gas	Based on Analysis 08/22/2012
0.024	tpy H2S	Working and breathing H2S = [Working and breathing VOC]*[(% H2S in inlet) / (% VC	

Note:

1 HAP Emissions calculated using TANKS 4.09 d with a gas analysis dated 08/22/2012.

2 VRU has a 100% efficiency with 5% downtime per year

3 There are no flashing emissions associated with the gunbarrel separator as the liquids being handled are at atmospheric pressure.

DCP MIDSTREAM
Artesia Gas Plant
SAMPLE EMISSIONS CALCULATIONS - PIPING OPENED TO ATMOSPHERE

Calculation Basis:

Emissions to the atmosphere after opening pipelines are calculated using the Ideal Gas Law and are based on the entire pipe volume venting to the atmosphere at pipeline pressure.

Constants and Variables:

Venting Pressure :	1200	psia	Default
Piping Volume :	7.85	ft^3	Represents a 10ft. length of 12 in. diameter line
Process Temperature :	95.00	° F	
Ideal Gas Constant :	10.73	(ft^3)(psi)/(lbmol)(°R)	
Molecular Weight:	20.63	lb/lb mol	From Gas Composition Sheet
Activities per year :	36	count/year	Monthly meter proving and twice monthly line repair
VOC Content :	18.73	Wt. %	From Gas Composition Sheet
Benzene Content:	0.09	Wt. %	
H2S Content:	0.75	mol %	
CO_2 Concentration:	0.82	mol %	
CH_4 Concentration:	79.90	mol %	

Example Calculation - VOC Emissions

Volume of system = 7.85 ft^3

Amount HC vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{1200.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \left| \frac{8 \text{ ft}^3}{555 \text{ ° R}} \right| \frac{20.63 \text{ lb}}{\text{lb-mol}}$$

= 32.63 lbs HC/activity (lb/hr)
= 6.11 lbs VOC/activity (lb/hr)
= 0.11 tpy VOC
= 0.03 lbs Benzene
= 5.43E-04 tpy Benzene

Example Calculation - H2S Emissions

Volume of system = 7.85 ft^3

Amount vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{1200.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \left| \frac{8 \text{ ft}^3}{555 \text{ ° R}} \right| \frac{0.75 \text{ lb-mol H2S}}{100 \text{ lb-mol Gas}} \left| \frac{34.08 \text{ lb H2S}}{1 \text{ lb-mol H2S}} \right.$$

= 4.04E-01 lbs H2S/activity (lb/hr)
= 7.28E-03 tpy H2S

Example Calculation - CO2 Emissions

Volume of system = 7.85 ft^3

Amount vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{1200.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \left| \frac{8 \text{ ft}^3}{555 \text{ ° R}} \right| \frac{0.82 \text{ lb-mol CO2}}{100 \text{ lb-mol Gas}} \left| \frac{44.01 \text{ lb CO2}}{1 \text{ lb-mol CO2}} \right.$$

= 5.68E-01 lbs CO2/activity (lb/hr)
= 1.02E-02 tpy CO2

Example Calculation - CH4 Emissions

Volume of system = 7.85 ft^3

Amount vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{1200.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \left| \frac{8 \text{ ft}^3}{555 \text{ ° R}} \right| \frac{79.90 \text{ lb-mol CH4}}{100 \text{ lb-mol Gas}} \left| \frac{16.04 \text{ lb CH4}}{1 \text{ lb-mol CH4}} \right.$$

= 2.03E+01 lbs CH4/activity (lb/hr)
= 0.4 tpy CH4

Total CO_2e 9.1 tpy CO_2e

DCP MIDSTREAM
Artesia Gas Plant
SAMPLE EMISSIONS CALCULATIONS - PIGGING

Calculation Basis:

Emissions to the atmosphere after opening pipelines are calculated using the Ideal Gas Law and are based on the entire pipe volume venting to the atmosphere at pipeline pressure.

Constants and Variables:

Venting Pressure :	400	psia	Default discharge pressure
Piping Volume :	13.9	ft^3	
Process Temperature :	95	° F	
Ideal Gas Constant :	10.73	(ft^3)(psi)/(lbmol)(°R)	
Molecular Weight:	20.63	lb/lb mol	From Gas Composition Sheet
Activities per year :	52	count/year	From MSS Activity Summary Sheet
VOC Content :	18.73	Wt. %	From Gas Composition Sheet
Benzene Content:	0.09	Wt. %	
H2S Content:	0.75	mol %	
CO_2 Concentration:	0.82	mol %	
CH_4 Concentration:	79.90	mol %	

Example Calculation - VOC Emissions

Amount HC vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{400.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \cdot \frac{14 \text{ ft}^3}{555 \text{ °R}} \cdot \frac{20.63 \text{ lb}}{\text{lb-mol}}$$

= 19.22 lbs HC/activity (lb/hr)
= 3.60 lbs VOC/activity (lb/hr)
= 0.09 tpy VOC
= 1.78E-02 lbs Benzene/activity (lb/hr)
= 4.62E-04 tpy Benzene

Example Calculation - H2S Emissions

Amount vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{400.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \cdot \frac{14 \text{ ft}^3}{555 \text{ °R}} \cdot \frac{0.750 \text{ lb-mol H2S}}{100 \text{ lb-mol Gas}} \cdot \frac{34.08 \text{ lb H2S}}{1 \text{ lb-mol H2S}}$$

= 2.38E-01 lbs H2S
= 6.19E-03 tpy H2S

Example Calculation - CO2 Emissions

Amount vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{400.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \cdot \frac{14 \text{ ft}^3}{555 \text{ °R}} \cdot \frac{0.817 \text{ lb-mol CO2}}{100 \text{ lb-mol Gas}} \cdot \frac{44.01 \text{ lb CO2}}{1 \text{ lb-mol CO2}}$$

= 0.33 lbs CO_2
= 8.70E-03 tpy CO_2

Example Calculation - CH4 Emissions

Amount vented to atmosphere (lb) = (Pressure x Volume) / (Gas Constant x Temperature [°R]) * MW

$$= \frac{400.00 \text{ psia}}{10.73 \text{ ft}^3 \text{ * psi / °R * lb-mol}} \cdot \frac{14 \text{ ft}^3}{555 \text{ °R}} \cdot \frac{79.900 \text{ lb-mol CH4}}{100 \text{ lb-mol Gas}} \cdot \frac{16.04 \text{ lb CH4}}{1 \text{ lb-mol CH4}}$$

= 11.9 lbs CH_4
= 0.31 tpy CH_4

Total CO_2e 7.8 tpy CO_2e

DCP MIDSTREAM
Artesia Gas Plant
EMISSION CALCULATIONS - VACUUM TRUCKS (TANK CLEANING)

Calculation Basis:

Emissions from vacuum trucks are estimated using the loading loss method of AP-42, Chapter 5.2: Transportation and Marketing of Petroleum Liquids, 1995. Calculations are performed based on the concentrations of the individual organic species since the wastes contain significant non-volatile content (i.e. solids). A truck can be loaded in one hour, therefore the emissions per loading activity reflect the lb/hr emission rate.

L_L = 12.46 SPM/T *(SF)

where:

L_L = loading loss, pounds VOC per 1000 gallons (lb/10^3 gal) of liquid loaded
S = a saturation factor
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia)
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole)
T = temperature of bulk liquid loaded, ºR (ºF+460)
SF = safety factor due to vacuum loading

Material Collected by Vacuum Truck	Organic Constituent	Tank Volume (gal)	Constituent Concentration (% volume)	Liquid Heel (% volume of tank)	Amount Loaded (gal)	S, Saturation Loss Factor	P, Vapor Pressure (psi)	M, Molecular Weight (lb/lb-mole)	T, Bulk Loading Temp (ºF)	VOC Wt. Fraction	SF, Safety Factor	L_L (lb/1000 gal)	Loss (lbs/activity) (lb/hr)
Condensate	Condensate	21000	100	20	4200	0.60	5.69	50.00	68	0.19	2	8.05	6.34

Number of Vacuum Trucks per year:	1	March 5 email from S. Harris
Number of Condensate Tanks:	3	From Site Data Sheet
H2S Concentration (wt frac):	0.0124	From Inlet Gas Analysis Dated 8/22/2012
Benzene Concentration (wt frac):	0.0009	From Inlet Gas Analysis Dated 8/22/2012
CO2 Concentration (wt frac):	0.0174	From Inlet Gas Analysis Dated 8/22/2012
CH4 Concentration (wt frac):	0.6197	From Inlet Gas Analysis Dated 8/22/2012

Example Calculation :

Volume of Constituent Loaded (gal) = 4200 gal

Loading Loss (lb/1000 gal) = L_L = 12.46 SPM/T * (SF) = (12.46) * (0.6) * (5.688) * (50) / (68 + 460) * 2 = 8.0537 lb/1000 gal

VOC Emissions per Condensate Cleanout (lb/hr) = (4200 gal) / (1000) * (8.054 lb/1000 gal) * (0.19 VOC wt. Fracti 6.34 lb/hr

H2S Emissions per Condensate Cleanout (lb/hr) =	0.419
Benzene Emissions per Condensate Cleanout (lb/hr) =	0.031
CO_2 Emissions per Condensate Cleanout (lb/hr) =	0.59
CH_4 Emissions per Condensate Cleanout (lb/hr) =	21.0

Activities per year per tank=	1
Number of Condensate Tanks:	3

Condensate Cleanout VOC Annual Emissions (tpy) =	9.51E-03
Condensate Cleanout H2S Annual Emissions (tpy) =	6.29E-04
Condensate Cleanout Benzene Annual Emissions (tpy) =	4.69E-05
Condensate Cleanout CO_2 Annual Emissions (tpy) =	8.8E-04
Condensate Cleanout CH_4 Annual Emissions (tpy) =	0.031
Condensate Cleanout CO_2eAnnual Emissions (tpy) =	0.79

DCP Midstream
Artesia Gas Plant
Engine Startup/Warmup Calculations

Example Calculations:

Per Activity Propane Emissions Calculation:

ER (lb propane/startup) = Gas released (scf/release) x mol % / 379 scf/mol * MW

$$= \frac{324 \text{ scf}}{\text{release}} \left| \quad \right| \frac{4.38 \text{ mol \%}}{100} \left| \frac{44.096 \text{ lb}}{\text{lb mol}} \right| \frac{\text{lb-mol}}{379 \text{ scf}} = 12.75 \text{ lb propane/startup}$$

Annual VOC Emissions Calculation:

Annual ER (tpy) = Gas Released per activity (lb/startup) x No. of activities per year / 2000 lb

$$= \frac{\text{lb}}{\text{activity}} \left| \quad \right| \frac{\text{\# of startups}}{\text{yr}} \left| \frac{\text{ton}}{2000 \text{ lb}} \right.$$

Startup Emissions Calculations:

Calculation of gas released for each unit:

Activity	Gas Released (scf/release)	Gas Released in lb mol/hr
Compressor Blowdown	2500	6.60
Engine Startup	324	0.85

Note: Gas Release based on input from Site Data sheet.

DCP Midstream
Artesia Gas Plant
Engine Startup/Warmup Calculations

Calculation of gas emissions from compressor blowdown and engine startup events:

Gas Analysis Component	Molecular Weight	Mole %	Gas Weight per compressor blowdown (lb/hr)	Gas Weight per compressor startup (lb/hr)
Carbon Dioxide	44	0.817	2.3701	0.3072
Hydrogen Sulfide	34	0.750	1.6858	0.2185
Nitrogen	28	1.373	2.5364	0.3287
methane	16	79.900	84.3269	10.9288
ethane	30	9.909	19.6554	2.5473
propane	44	4.384	12.7509	1.6525
i-butane	58	0.564	2.1607	0.2800
N-butane	58	1.207	4.6258	0.5995
i-pentane	72	0.305	1.4497	0.1879
n-pentane	72	0.293	1.3930	0.1805
cyclopentane	70	0.026	0.1221	0.0158
n-hexane	114	0.076	0.5745	0.0745
cyclohexane	84	0.044	0.2437	0.0316
other hexanes	86	0.142	0.8038	0.1042
heptanes	100	0.076	0.5030	0.0652
Methylcyclohexane	98	0.038	0.2461	0.0319
2,2,4-trimethylpentane	114	0.000	0.0000	0.0000
benzene	78	0.024	0.1257	0.0163
toluene	92	0.016	0.0960	0.0124
ethylbenzene	106	0.001	0.0070	0.0009
xylenes	106	0.005	0.0371	0.0048
octanes	114	0.031	0.2351	0.0305
nonanes	128	0.011	0.0948	0.0123
decanes	142	0.001	0.0047	0.0006
C11	156	0.002	0.0196	0.0025
C12+	170	0.000	0.0000	0.0000
Total Gas Released		99.994	136.07	0.0000
Total VOC Released		7.25	**25.49**	**3.30**

Compressor blowdown summary of non-methane, non-ethane VOC, benzene, H2S and combustion byproduct emissions:

DRE (%): 0

Pollutant	Emission Factor (lb/MMBTU)	Convert Factor (lb SO2/lb H2S)	Number of Annual Activities	Emission Rate (lb/activity)	Emission Rate (tpy)
VOC			340	433.39	4.33
Benzene				2.14	0.02
Hydrogen Sulfide				28.66	0.29
Carbon Monoxide	0.550			0.00	0.00
Nitrogen Oxides	0.138			0.00	0.00
Sulfur Dioxide		1.9		0.00	0.00

GHG Pollutant	Hourly ER (lb/activity)	Number of Annual Activities	Annual ER (tpy)
CO_2	0.3072	340.0	0.052
CH_4	10.9288		1.86
CO_2e			46.5

Engine startup summary of non-methane, non-ethane VOC and benzene emissions:

Pollutant	Hourly ER (lb/activity)	Number of Annual Activities	ER (lb/hr)	Annual ER (tpy)
VOC	3.30	1,020	56.17	1.69
Benzene	0.016		2.77E-01	0.0083
Hydrogen Sulfide	0.2185		3.71E+00	0.11142

GHG Pollutant	Hourly ER (lb/activity)	Number of Annual Activities	Annual ER (tpy)
CO_2	0.31	1,020	0.16
CH_4	10.9		5.6
CO_2e			139.5

DCP Midstream, LP - Artesia Gas Plant

Emergency Wet Gas Flare

Emission Unit: 22

Estimated Flared Gas Composition Used for Calculations

Component	MW	Flared Gas[1] Mol%	MW * wet vol %	HHV Btu/scf[2]	Btu/scf * wet vol %	Mass Fraction (wet)	Spec. Volume[2] ft^3/lb	Spec. Volume VOC ft^3/lb
Water	18.02	0.0000%	0.00	0.0	0.0	0.00	21.06	
Hydrogen Sulfide	34.08	0.4144%	0.14	637.02	2.6	0.01	11.136	
Carbon Dioxide	44.01	1.0534%	0.46	0.0	0.0	0.02	8.623	
Nitrogen	28.01	1.7683%	0.50	0.0	0.0	0.02	13.547	
Oxygen	32.00	0.0000%	0.00	0.0	0.0	0.00	13.5	
Methane	16.04	71.6031%	11.49	1009.7	723.0	0.49	23.65	
Ethane	30.07	12.2486%	3.68	1768.7	216.6	0.16	12.62	
Propane	44.10	6.6464%	2.93	2517.2	167.3	0.12	8.606	3.514
i-Butane	58.12	0.9775%	0.57	3252.6	31.8	0.02	6.529	0.517
n-Butane	58.12	2.4062%	1.40	3262	78.5	0.06	6.529	1.272
i-Pentane	72.15	0.7272%	0.52	4007.7	29.1	0.02	4.26	0.311
Pentanes	72.15	0.7169%	0.52	4008.7	28.7	0.02	5.26	0.379
Hexanes+	86.18	1.4380%	1.24	4756.1	68.4	0.05	4.404	0.760
		100%	23.45		1346.1	1.00		6.753
NMNEHC (VOC)		12.9%				30.6%		

[1] *Based on Analysis 07/1/2012, ARTESIA PLT 5# FLARE, unit 22.*
to provide conservative estimates for sulfur dioxide and heat release estimate.
[2] *Component HHVs and specific volumes obtained from Physical Properties of Hydrocarbons, API Research Project 44, Fig. 16-1, Rev. 1981.*

Fuel Data

Flare Pilot	500	scf/hr	Design
	0.0005	MMscf/hr	
	1008.00	Btu/scf	Pipeline Gas, HHV
	0.50	MMBtu/hr	MMscf/hr * Btu/scf
Purge Gas	25.80	Mscf/day	Design
	1.075	Mscf/hr	Mscf/d / 24 hr/day
	0.001075	MMscf/hr	Mscf/hr / 1000
	1000.00	Btu/scf	Pipeline Gas, HHV
	1.08	MMBtu/hr	MMscf/hr * Btu/scf
TK-C Blanket Gas	1.50	Mscf/day	Design
	0.0625	Mscf/hr	Mscf/d / 24 hr/day
	0.0000625	MMscf/hr	Mscf/hr / 1000
	1000.00	Btu/scf	Pipeline Gas, HHV
	0.06	MMBtu/hr	MMscf/hr * Btu/scf
Flared Gas - Short Term	7.0	MMscf/hr	Effective hourly flowrate
	1,346	Btu/scf	Heating value calculated from gas compostion above.
	9,452	MMBtu/hr	Hourly heat rate = Heating value * Effective hourly flow rate.
Flared Gas - Annual	142.1	MMscf/yr	Estimated Maximum annual SSM flow rate. Not a requested limit; for calculation only.
Total	9453.3	MMBtu/hr	**Pilot + Purge gas + TK-C Blanket Gas + Flared gas**

Stack Parameters

	1000	˚C	Exhaust temperature	Per NMAQB guidelines
	20	m/sec	Exhaust velocity	Per NMAQB guidelines
	70.6	ft	Flare height	
Pilot + Purge Gas + TK-C Blanket Gas				
	16.04	g/mol	Pilot & Purge gas molecular weight	Mol. wt. of methane, the dominant species
	114,905	cal/sec	Heat release (q)	MMBtu/hr * 10^6 * 252 cal/Btu ÷ 3600 sec/hr
	92,816		q_n	$q_n = q(1-0.048(MW)^{1/2})$
	0.3047	m	Effective stack diameter (D)	$D = (10^{-6}q_n)^{1/2}$
Pilot + Purge Gas + TK-C Blanket Gas				
	23.45	g/mol	Flared gas molecular weight	Volume weighted mol. wt. of all components
	6.62E+08	cal/sec	Heat release (q)	MMBtu/hr * 10^6 * 252 cal/Btu ÷ 3600 sec/hr
	5.08E+08		q_n	$q_n = q(1-0.048(MW)^{1/2})$
	22.5373	m	Effective stack diameter (D)	$D = (10^{-6}q_n)^{1/2}$

DCP Midstream, LP - Artesia Gas Plant

Emergency Wet Gas Flare

Emission Unit: 22

Emission Rates

Pilot + Purge Gas + TK-C Blanket Gas

NOx	CO	VOC	H_2S	SO_2	Units	
0.0680	0.3700				lb/MMBtu	AP-42 Table 13.5-1 (9/91) (Reformatted 1/95)
			4E-04		lb H_2S/Mscf	Purchased sweet natural gas fuel, 0.25 gr H_2S/100scf
			5.85E-04		lb H_2S/hr	H_2S rate * fuel usage
				7E-03	lb S/Mscf	Purchased sweet natural gas fuel, 5 gr S/100scf
				1E-02	lb SO_2/hr*	SO_2 rate * fuel usage
		0.00%			mol%	Assume no VOC content in purchased fuel (methane)
		23.7			ft^3/lb	Specific volume (methane)
		0.00			lb/hr	vol. Gas * mole fraction / specific volume
100%	100%	100%	100%	100%	%	Safety Factor
0.1360	0.7400				lb/MMBtu	Unit emission rate with Safety Factor
0.223	**1.215**				lb/hr	lb/MMBtu * MMBtu/hr
		0.00	**2.3E-05**	**0.023**	lb/hr	98% combustion H_2S; 100% conversion to SO_2
0.98	**5.32**	**0.00**	**1.0E-04**	**0.10**	tpy	8760 hrs/yr

Flared Gas

NOx	CO	VOC	H_2S	SO_2	Units	
0.0680	0.3700				lb/MMBtu	AP-42 Table 13.5-1 (9/91) (Reformatted 1/95)
		12.91%	0.41%		mol%	Flare Gas
		6.753	11.136		ft^3/lb	Specific volume
		134,257.2	2,612.9		lb/hr	vol. Gas * mole fraction / specific volume
642.72	3497.13				lb/hr	lb/MMBtu * MMBtu/hr
642.72	3497.13	134,257.2	2,612.9	4918.3	lb/hr	Uncontrolled emissions
6.50	35.38	1,358.2	26.4	49.8	tpy	at maximum rate

Unit 22 - Emergency Wet Gas Flare	NOx	CO	VOC	H_2S	SO_2	HAPs	Units
Pilot + Purge + TK-C Blanket Gas	**642.9**	**3498.3**	**2685.1**	**52.3**	**4918.4**	**38.6**	lb/hr
+ Flared Gas	**7.5**	**40.7**	**27.2**	**0.53**	**49.9**	**0.39**	tpy

GHG Emissions

	CO_2e Short Tons/yr		
CO_2	11,536.2	Eq 4-15	API Compendium
CH_4	10.7	Eq 4-16	API Compendium
N_2O	0.00023	Eq 4-17	API Compendium
Total CO2e	**11,804**		

DCP Midstream, LP - Artesia Gas Plant

Emergency Acid Gas Flare

Emission Unit: 23

Estimated Flared Gas Composition Used for Calculations

Component	MW	Flared Gas[1] Mol%	MW * wet vol %	HHV Btu/scf[2]	Btu/scf * wet vol %	Mass Fraction (wet)	Spec. Volume[2] ft^3/lb	Spec. Volume VOC ft^3/lb
Water	18.02	0.0000%	0.00	0.0	0.0	0.00	21.06	
Hydrogen Sulfide	34.08	37.0907%	12.64	637.02	236.3	0.31	11.136	
Carbon Dioxide	44.01	62.5070%	27.51	0.0	0.0	0.68	8.623	
Nitrogen	28.01	0.0315%	0.01	0.0	0.0	0.00	13.547	
Oxygen	32.00	0.0000%	0.00	0.0	0.0	0.00	13.5	
Methane	16.04	0.3439%	0.06	1009.7	3.5	0.00	23.65	
Ethane	30.07	0.0227%	0.01	1768.7	0.4	0.00	12.62	
Propane	44.10	0.0006%	0.00	2517.2	0.0	0.00	8.606	0.766
i-Butane	58.12	0.0013%	0.00	3252.6	0.0	0.00	6.529	1.659
n-Butane	58.12	0.0001%	0.00	3262	0.0	0.00	6.529	0.128
i-Pentane	72.15	0.0000%	0.00	4007.7	0.0	0.00	4.26	0.000
Pentanes	72.15	0.0000%	0.00	4008.7	0.0	0.00	5.26	0.000
Hexanes+	86.18	0.0022%	0.00	4756.1	0.1	0.00	4.404	2.807
		100%	40.22		240.3	1.00		5.359
NMNEHC (VOC)		0.004%				0.0%		

1 1 Based on Analysis 07/1/2012, ARTESIA ACID GAS FLARE, unit 23.

2 Component HHVs and specific volumes obtained from Physical Properties of Hydrocarbons, API Research Project 44, Fig. 16-1, Rev. 1981.

Fuel Data

Flare Pilot	500	scf/hr	Design
	0.0005	MMscf/hr	
	1008.00	Btu/scf	Pipeline Gas, HHV
	0.50	MMBtu/hr	
Purge Gas	3.10	Mscf/day	Design
	0.129	Mscf/hr	Mscf/d / 24 hr/day
	1.29E-04	MMscf/hr	Mscf/hr / 1000
	1008.00	Btu/scf	Pipeline Gas, HHV
	0.13	MMBtu/hr	MMscf/hr * Btu/scf
Assist Gas			
	255.2	Btu/scf	Heating value of Pilot + Purge gas + Flared gas
	865.0	Btu/scf	target heat content
	1,000.0	Btu/scf	Assist gas-assumed sweet
	0.14	MMscf/hr	Assist gas volume
	144.1	MMBtu/hr	Assist gas heat input
*Assist gas - Annual**	57.7	MMscf/yr	Estimated Maximum annual SSM flow rate. Not a requested limit; for calculation only.

Note: Flared gas annual/ ratio of assist gas: flared gas hourly us‹ ex: 10.5 MMscf/yr / (1-.8054)

Flared Gas - Short Term	0.032	MMscf/hr	Effective hourly flowrate
	240	Btu/scf	Heating value calculated from gas compostion above.
	8	MMBtu/hr	Hourly heat rate = Heating value * Effective hourly flow rate.
Flared Gas - Annual	10.5	MMscf/yr	Estimated Maximum annual SSM flow rate. Not a requested limit; for calculation only.
Total	**152.4**	**MMBtu/hr**	**Pilot + Purge gas + Flared gas + Assist gas**

Stack Parameters

	1000	˚C	Exhaust temperature	Per NMAQB guidelines
	20	m/sec	Exhaust velocity	Per NMAQB guidelines
	70.6	ft	Flare height	
Pilot+ Purge Gas only				
	16.04	g/mol	Pilot & Purge gas molecular weight	Mol. wt. of methane, the dominant species
	44,394	cal/sec	Heat release (q)	MMBtu/hr * 10^6 * 252 cal/Btu ÷ 3600 sec/hr
	35,860		q_n	$q_n = q(1-0.048(MW)^{1/2})$
	0.1894	m	Effective stack diameter (D)	$D = (10^{-6}q_n)^{1/2}$
Flared Gas MW				
	40.22	g/mol	MW flare gas	
	16.04	g/mol	MW assist gas, flare gas, purge gas	
	0.03	MMscf/hr	vol flare gas	
	0.14	MMscf/hr	vol assist gas	
	0.00063	MMscf/hr	vol pilot + purge gas	
	7.26	g/mol	vol. weighted % flare gas	
	13.09	g/mol	vol. weighted % assist gas	
	0.06	g/mol	vol. weighted % pilot + purge gas	
Pilot+Flared Gas+ Assist gas	20.41	g/mol	weighted-averaged Flared gas molecular weight	Volume weighted mol. wt. of all components
	1.07E+07	cal/sec	Heat release (q)	MMBtu/hr * 10^6 * 252 cal/Btu ÷ 3600 sec/hr
	8.35E+06		q_n	$q_n = q(1-0.048(MW)^{1/2})$
	2.8905	m	Effective stack diameter (D)	$D = (10^{-6}q_n)^{1/2}$

DCP Midstream, LP - Artesia Gas Plant

Emergency Acid Gas Flare

Emission Unit: 23

Emission Rates

Pilot+ Purge Gas

NOx	CO	VOC	H_2S	SO_2	Units	
0.0680	0.3700				lb/MMBtu	AP-42 Table 13.5-1 (9/91) (Reformatted 1/95)
			4E-04		lb H_2S/Mscf	Purchased sweet natural gas fuel, 0.25 gr H_2S/100scf
			2.25E-04		lb H_2S/hr	H_2S rate * fuel usage
				7E-03	lb S/Mscf	Purchased sweet natural gas fuel, 5 gr S/100scf
				4E-03	lb SO_2/hr	SO_2 rate * fuel usage
		0.00%			mol%	Assume no VOC content in purchased fuel (methane)
		23.7			ft^3/lb	Specific volume (methane)
		0.00			lb/hr	vol. Gas * mole fraction / specific volume
100%	100%	100%	100%	100%	%	Safety Factor
0.1360	0.7400				lb/MMBtu	Unit emission rate with Safety Factor
0.086	**0.469**				lb/hr	lb/MMBtu * MMBtu/hr
		0.000	**9.0E-06**	**9.0E-03**	lb/hr	98% combustion H_2S; 100% conversion to SO_2
0.38	**2.06**	**0.000**	**3.9E-05**	**4.0E-02**	tpy	8760 hrs/yr

Assist gas

NOx	CO	VOC	H_2S	SO_2	Units	
0.0680	0.3700				lb/MMBtu	AP-42 Table 13.5-1 (9/91) (Reformatted 1/95)
			4E-04		lb H_2S/Mscf	Purchased sweet natural gas fuel, 0.25 gr H_2S/100scf
			5.15E-02		lb H_2S/hr	H_2S rate * fuel usage
				7E-03	lb S/Mscf	Purchased sweet natural gas fuel, 5 gr S/100scf
				1E+00	lb SO_2/hr	SO_2 rate * fuel usage
		0.00%			mol%	Assume no VOC content in purchased fuel (methane)
		23.7			ft^3/lb	Specific volume (methane)
		0.00			lb/hr	vol. Gas * mole fraction / specific volume
9.799	**53.318**				lb/hr	lb/MMBtu * MMBtu/hr
		0.000	**1.0E-03**	**1.0E+00**	lb/hr	98% combustion H_2S; 100% conversion to SO_2
1.96	**10.68**	**0.000**	**2.06E-04**	**0.21**	tpy	

Flared Gas

	NOx	CO	VOC	H_2S	SO_2	Units	
	0.0680	0.3700				lb/MMBtu	AP-42 Table 13.5-1 (9/91) (Reformatted 1/95)
			0.004%	37.09%		mol%	Flare Gas
55			5.359	11.136		ft^3/lb	Specific volume
			0.3	1,062.5		lb/hr	vol. Gas * mole fraction / specific volume
	0.52	2.84				lb/hr	lb/MMBtu * MMBtu/hr
	0.52	**2.84**	**0.3**	**21.2**	**2,000.0**	**lb/hr**	98% combustion H_2S; 100% conversion to SO_2
	0.09	**0.47**	**0.04**	**3.5**	**328.0**	**tpy**	

Acid Gas Flare	NOx	CO	VOC	H_2S	SO_2	Units
pilot + flared gas+Assist Gas	**10.4**	**56.6**	**0.005**	**21.3**	**2001.0**	lb/hr
	2.4	**13.2**	**0.00082**	**3.5**	**328.2**	tpy

GHG Emissions

	CO_2e Short Tons/yr		
CO_2	382	Eq 4-15	API Compendium
CH_4	3.8E-03	Eq 4-16	API Compendium
N_2O	1.7E-05	Eq 4-17	API Compendium
Total CO2e	**381.9**		

GHG Summary Page

Facility: Artesia Gas Plant

Emission Totals

Emission Unit	Description	CO_2 tonnes/year	N_2O[2] tonnes/year	CH_4[1] tonnes/year	CO_2e tonnes/year	CO_2 tons/year	N_2O[2] tons/year	CH_4[1] tons/year	CO_2e tons/year
10	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
11	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
12	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
13	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
14	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
15	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
16	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
17	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
19	Natural Gas Combustion	1423	2.68E-03	0.027	1424.0	1568	2.96E-03	0.030	1569.7
20	Natural Gas Combustion	17054	3.22E-02	0.32	17072.1	18799	3.55E-02	0.35	18818.8
25	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
26	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
27	Natural Gas Combustion	3030	5.72E-03	0.057	3033.6	3341	6.30E-03	0.063	3344.0
28	Natural Gas Combustion	17054	3.22E-02	0.32	17072.1	18799	3.55E-02	0.35	18818.8
30	Natural Gas Combustion	4791	9.04E-03	0.090	4795.9	5281	9.96E-03	0.100	5286.6
31	Natural Gas Combustion	4791	9.04E-03	0.090	4795.9	5281	9.96E-03	0.100	5286.6
32	Natural Gas Combustion	4791	9.04E-03	0.090	4795.9	5281	9.96E-03	0.100	5286.6
33	Natural Gas Combustion	4791	9.04E-03	0.090	4795.9	5281	9.96E-03	0.100	5286.6
34	Natural Gas Combustion	4791	9.04E-03	0.090	4795.9	5281	9.96E-03	0.100	5286.6
39	Natural Gas Combustion	4066	7.67E-03	0.077	4070.2	4482	8.45E-03	0.085	4486.7
40	Natural Gas Combustion	232	4.38E-04	0.0044	232.5	256.0	4.83E-04	0.0048	256.3
Total									**107166.6**

1 warming potential of CH4 is 25 times greater than CO2
2 warming potential of N2O is 298 times greater than CO2

Engine GHG Calculation

40 CFR 98 Subpart C TIER 1

Emission unit(s): 10-17, 25-27
Source description: 800 hp Compressor engine
Manufacturer: White Superior
Maximum fuel usage: 55.6 MMscf/yr

CO_2 Calculation[1] (Eq C-1)

Click here to view Table C-1 to Subpart C of Part 98.

$$CO_2 = 1 \times 10^{-3} \times \frac{55.60\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{53.02\ \text{kg CO2}}{\text{MMbtu}}$$

CO_2 = 3030 tonnes CO_2 / yr

Fuel usage carried forward from engine calculations in previous permit application.

CH_4 Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$CH_4 = 1 \times 10^{-3} \times \frac{55.60\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-3}\ \text{kg } CH_4}{\text{MMbtu}}$$

CH_4 = 5.7E-02 tonnes CH_4 / yr

Fuel usage carried forward from engine calculations in previous permit application.

N_2O Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$N_2O = 1 \times 10^{-3} \times \frac{55.60\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-4}\ \text{kg } N_2O}{\text{MMbtu}}$$

N_2O = 5.7E-03 tonnes N_2O / yr

Fuel usage carried forward from engine calculations in previous permit application.

Furnace GHG Calculation

40 CFR 98 Subpart C TIER 1

Emission unit(s): 19
Source description: Natural Gas Furnace
Manufacturer: Regen
Maximum fuel usage: 26.1 MMscf/yr

CO_2 Calculation[1] (Eq C-1)

Click here to view Table C-1 to Subpart C of Part 98.

$$CO_2 = 1 \times 10^{-3} \times \frac{26.10\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{53.02\ \text{kg CO2}}{\text{MMbtu}}$$

CO_2 = 1423 tonnes CO_2 / yr

Fuel usage carried forward from engine calculations in previous permit application.

CH_4 Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$CH_4 = 1 \times 10^{-3} \times \frac{26.10\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-3}\ \text{kg } CH_4}{\text{MMbtu}}$$

CH_4 = 2.7E-02 tonnes CH_4 / yr

Fuel usage carried forward from engine calculations in previous permit application.

N_2O Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$N_2O = 1 \times 10^{-3} \times \frac{26.10\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-4}\ \text{kg } N_2O}{\text{MMbtu}}$$

N_2O = 2.7E-03 tonnes N_2O / yr

Fuel usage carried forward from engine calculations in previous permit application.

Boiler GHG Calculation

40 CFR 98 Subpart C TIER 1

Emission unit(s): 20, 28
Source description: Natural Gas Boiler
Manufacturer: Wickes
Maximum fuel usage: 312.9 MMscf/yr

CO_2 Calculation[1] (Eq C-1)

Click here to view Table C-1 to Subpart C of Part 98.

$$CO_2 = 1 \times 10^{-3} \times \frac{312.90 \text{ MMscf}}{\text{yr}} \times \frac{1028 \text{ MMbtu}}{\text{MMscf}} \times \frac{53.02 \text{ kg CO2}}{\text{MMbtu}}$$

CO_2 = 17054 tonnes CO_2 / yr

Fuel usage carried forward from engine calculations in previous permit application.

CH_4 Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$CH_4 = 1 \times 10^{-3} \times \frac{312.90 \text{ MMscf}}{\text{yr}} \times \frac{1028 \text{ MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-3} \text{ kg } CH_4}{\text{MMbtu}}$$

CH_4 = 3.2E-01 tonnes CH_4 / yr

Fuel usage carried forward from engine calculations in previous permit application.

N_2O Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$N_2O = 1 \times 10^{-3} \times \frac{312.90 \text{ MMscf}}{\text{yr}} \times \frac{1028 \text{ MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-4} \text{ kg } N_2O}{\text{MMbtu}}$$

N_2O = 3.2E-02 tonnes N_2O / yr

Fuel usage carried forward from engine calculations in previous permit application.

Engine GHG Calculation

40 CFR 98 Subpart C TIER 1

Emission unit(s): 30-34
Source description: 1340 hp Compressor engine
Manufacturer: Caterpillar
Maximum fuel usage: 87.9 MMscf/yr

CO_2 Calculation[1] (Eq C-1)

Click here to view Table C-1 to Subpart C of Part 98.

$$CO_2 = 1 \times 10^{-3} \times \frac{87.90 \text{ MMscf}}{\text{yr}} \times \frac{1028 \text{ MMbtu}}{\text{MMscf}} \times \frac{53.02 \text{ kg CO2}}{\text{MMbtu}}$$

CO_2 = 4791 tonnes CO_2 / yr

Fuel usage carried forward from engine calculations in previous permit application.

CH_4 Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$CH_4 = 1 \times 10^{-3} \times \frac{87.90 \text{ MMscf}}{\text{yr}} \times \frac{1028 \text{ MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-3} \text{ kg } CH_4}{\text{MMbtu}}$$

CH_4 = 9.0E-02 tonnes CH_4 / yr

Fuel usage carried forward from engine calculations in previous permit application.

N_2O Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$N_2O = 1 \times 10^{-3} \times \frac{87.90 \text{ MMscf}}{\text{yr}} \times \frac{1028 \text{ MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-4} \text{ kg } N_2O}{\text{MMbtu}}$$

N_2O = 9.0E-03 tonnes N_2O / yr

Fuel usage carried forward from engine calculations in previous permit application.

Engine GHG Calculation

40 CFR 98 Subpart C TIER 1

Emission unit(s): 39
Source description: 1200 hp Compressor engine
Manufacturer: Waukesha
Maximum fuel usage: 74.6 MMscf/yr

CO_2 Calculation[1] (Eq C-1)

Click here to view Table C-1 to Subpart C of Part 98.

$$CO_2 = 1 \times 10^{-3} \times \frac{74.60\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{53.02\ \text{kg CO2}}{\text{MMbtu}}$$

CO_2 = 4066 tonnes CO_2 / yr

Fuel usage carried forward from engine calculations in previous permit application.

CH_4 Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$CH_4 = 1 \times 10^{-3} \times \frac{74.60\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-3}\ \text{kg } CH_4}{\text{MMbtu}}$$

CH_4 = 7.7E-02 tonnes CH_4 / yr

Fuel usage carried forward from engine calculations in previous permit application.

N_2O Calculation[2] (Eq C-8)

Click here to view Table C-1 to Subpart C of Part 98
Click here to view Table C-2 to Subpart C of Part 98

$$N_2O = 1 \times 10^{-3} \times \frac{74.60\ \text{MMscf}}{\text{yr}} \times \frac{1028\ \text{MMbtu}}{\text{MMscf}} \times \frac{1 \times 10^{-4}\ \text{kg } N_2O}{\text{MMbtu}}$$

N_2O = 7.7E-03 tonnes N_2O / yr

Fuel usage carried forward from engine calculations in previous permit application.

Section 7

Information Used To Determine Emissions

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

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

The following information was used to determine emissions:

- **<u>Units 10-17, 25-27 – White Superior 8G825 Compressor Engines</u>**
  - AP-42 Table 3.2-3
  - GRI-HAPCalc
  - 40 CFR Part 98 Tables C-1, C-2
- **<u>Unit 19 – Gas Furnace</u>**
  - AP-42 Tables 1.4-1 and 1.4-2
  - GRI-HAPCalc
  - 40 CFR Part 98 Tables C-1, C-2
- **<u>Units 20 and 28 – Wickes Boilers</u>**
  - AP-42 Tables 1.4-1 and 1.4-2
  - GRI-HAPCalc
  - 40 CFR Part 98 Tables C-1, C-2
- **<u>Units 30-34 – Caterpillar G3516 TALE Compressor Engines</u>**
  - AP-42 Table 3.2-2
  - AP-42 Tables 1.4-1 and 1.4-2
  - GRI-HAPCalc
  - 40 CFR Part 98 Tables C-1, C-2
- **<u>Unit 38 (FUG) – Facility-wide Fugitive Emissions</u>**
  - Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, November 1995, EPA-453/R-95-017
  - Inlet gas analysis dated 8/22/2012
- **<u>Unit 39 – Waukesha L7042GSI Compressor Engine</u>**
  - Manufacturer's data
  - AP-42 Table 3.2-3
  - GRI-HAPCalc
  - 40 CFR Part 98 Tables C-1, C-2
- **<u>Unit 40 – TEG Dehydrator Reboiler</u>**
  - AP-42 Tables 1.4-1 and 1.4-2
  - GRI-HAPCalc
  - 40 CFR Part 98 Tables C-1, C-2

- **Unit Load-1– Condensate Loading**
    - AP-42 Section 5.2
- **Units Haul-1 and Haul-2 – Haul Road Emissions**
    - AP-42 Section 13.2.2
    - WRAP Fugitive Dust Handbook, September 7, 2006 (Page 8)
- **Units CT-N and CT-S – Cooling Towers**
    - *"Effects of Pathogenic and Toxic Materials Transported Via Cooling Device Drift, Volume 1. Technical Report,"* EPA
    - AP-42 Section 13.4
- **Unit SSM**
    - **Plant Turnaround**
        - Inlet gas analysis dated 8/22/2012
    - **Plant Startup (Post-Turnaround)**
        - Inlet gas analysis dated 8/22/2012
    - **Condensate Tank Degassing (VRU Downtime)**
        - TANKS 4.09d
    - **Gas Piping Degassing (Meter Proving and Line Isolation)**
        - Inlet gas analysis dated 8/22/2012
    - **PIG Launcher Degassing**
        - Inlet gas analysis dated 8/22/2012
    - **Vacuum Trucks (Condensate Tank Cleanout)**
        - AP-42 Chapter 5.2
        - Inlet gas analysis dated 8/22/2012
    - **Engine Startup**
        - Inlet gas analysis dated 8/22/2012
    - **Compressor Engine Blowdown**
        - Inlet gas analysis dated 8/22/2012
    - **Emergency Wet Gas Flare**
        - Gas analysis dated 7/1/2012
        - AP-42 Table 13.5-1
        - API Compendium of Greenhouse Gas Emission Methodologies for the Oil and Natural Gas Industry, August 2009
    - **Acid Gas Flare**
        - Gas analysis dated 7/1/2012
        - AP-42 Table 13.5-1
        - API Compendium of Greenhouse Gas Emission Methodologies for the Oil and Natural Gas Industry, August 2009

Units 30-34

GRI-HAPCalc ® 3.01
Engines Report

Facility ID:	**DCP ARTESIA GP**	**Notes:**
Operation Type:	**GAS PLANT**	
Facility Name:	**DCP ARTESIA**	
User Name:		
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".*

Engine Unit

Unit Name: 3516LE

Hours of Operation:	8,760 Yearly
Rate Power:	1,340 hp
Fuel Type:	NATURAL GAS
Engine Type:	4-Stroke, Lean Burn
Emission Factor Set:	EPA > FIELD > LITERATURE
Additional EF Set:	-NONE-

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
Tetrachloroethane	0.0001	0.00000820 g/bhp-hr	EPA
Formaldehyde	2.2528	0.17425810 g/bhp-hr	EPA
Methanol	0.1067	0.00825090 g/bhp-hr	EPA
Acetaldehyde	0.3567	0.02759090 g/bhp-hr	EPA
1,3-Butadiene	0.0114	0.00088120 g/bhp-hr	EPA
Acrolein	0.2193	0.01696380 g/bhp-hr	EPA
Benzene	0.0188	0.00145220 g/bhp-hr	EPA
Toluene	0.0174	0.00134650 g/bhp-hr	EPA
Ethylbenzene	0.0017	0.00013100 g/bhp-hr	EPA
Xylenes(m,p,o)	0.0079	0.00060730 g/bhp-hr	EPA
2,2,4-Trimethylpentane	0.0107	0.00082510 g/bhp-hr	EPA
n-Hexane	0.0474	0.00366340 g/bhp-hr	EPA
Phenol	0.0010	0.00007920 g/bhp-hr	EPA
Styrene	0.0010	0.00007790 g/bhp-hr	EPA
Naphthalene	0.0032	0.00024550 g/bhp-hr	EPA
2-Methylnaphthalene	0.0014	0.00010960 g/bhp-hr	EPA
Acenaphthylene	0.0002	0.00001830 g/bhp-hr	EPA
Biphenyl	0.0090	0.00069970 g/bhp-hr	EPA
Acenaphthene	0.0001	0.00000410 g/bhp-hr	EPA
Fluorene	0.0002	0.00001870 g/bhp-hr	EPA
Phenanthrene	0.0004	0.00003430 g/bhp-hr	EPA
Ethylene Dibromide	0.0019	0.00014620 g/bhp-hr	EPA
Fluoranthene	0.0000	0.00000370 g/bhp-hr	EPA

Pyrene	0.0001	0.00000450	g/bhp-hr	EPA
Chrysene	0.0000	0.00000230	g/bhp-hr	EPA
Benzo(b)fluoranthene	0.0000	0.00000050	g/bhp-hr	EPA
Benzo(e)pyrene	0.0000	0.00000140	g/bhp-hr	EPA
Benzo(g,h,i)perylene	0.0000	0.00000140	g/bhp-hr	EPA
Vinyl Chloride	0.0006	0.00004920	g/bhp-hr	EPA
Methylene Chloride	0.0009	0.00006600	g/bhp-hr	EPA
1,1-Dichloroethane	0.0010	0.00007790	g/bhp-hr	EPA
1,3-Dichloropropene	0.0011	0.00008710	g/bhp-hr	EPA
Chlorobenzene	0.0013	0.00010030	g/bhp-hr	EPA
Chloroform	0.0012	0.00009410	g/bhp-hr	EPA
1,1,2-Trichloroethane	0.0014	0.00010500	g/bhp-hr	EPA
1,1,2,2-Tetrachloroethane	0.0017	0.00013200	g/bhp-hr	EPA
Carbon Tetrachloride	0.0016	0.00012110	g/bhp-hr	EPA
Total	3.0802			

Criteria Pollutants

PM	0.4261	0.03296090	g/bhp-hr	EPA
CO	13.5251	1.04620860	g/bhp-hr	EPA
NMEHC	5.0346	0.38944040	g/bhp-hr	EPA
NOx	174.0773	13.46539810	g/bhp-hr	EPA
SO2	0.0251	0.00194060	g/bhp-hr	EPA

Other Pollutants

Butryaldehyde	0.0043	0.00033330	g/bhp-hr	EPA
Chloroethane	0.0001	0.00000620	g/bhp-hr	EPA
Methane	53.3325	4.12542830	g/bhp-hr	EPA
Ethane	4.4799	0.34653600	g/bhp-hr	EPA
Propane	1.7877	0.13828440	g/bhp-hr	EPA
Butane	0.0231	0.00178550	g/bhp-hr	EPA
Cyclopentane	0.0097	0.00074920	g/bhp-hr	EPA
n-Pentane	0.1109	0.00858090	g/bhp-hr	EPA
Methylcyclohexane	0.0525	0.00405940	g/bhp-hr	EPA
1,2-Dichloroethane	0.0010	0.00007790	g/bhp-hr	EPA
1,2-Dichloropropane	0.0011	0.00008880	g/bhp-hr	EPA
n-Octane	0.0150	0.00115840	g/bhp-hr	EPA
1,2,3-Trimethylbenzene	0.0010	0.00007590	g/bhp-hr	EPA
1,2,4-Trimethylbenzene	0.0006	0.00004720	g/bhp-hr	EPA
1,3,5-Trimethylbenzene	0.0014	0.00011160	g/bhp-hr	EPA
n-Nonane	0.0047	0.00036300	g/bhp-hr	EPA
CO2	4,693.2617	363.03769350	g/bhp-hr	EPA

Unit 39

Unit Name: 7042

Hours of Operation:	8,760	Yearly
Rate Power:	1,200	hp
Fuel Type:	NATURAL GAS	
Engine Type:	4-Stroke, Rich Burn	
Emission Factor Set:	FIELD > EPA > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set

HAPs

Formaldehyde	1.1511	0.09942890	g/bhp-hr	GRI Field
Methanol	0.2315	0.02000000	g/bhp-hr	GRI Field
Acetaldehyde	0.1066	0.00920800	g/bhp-hr	EPA
1,3-Butadiene	0.0253	0.00218810	g/bhp-hr	EPA
Acrolein	0.1005	0.00867990	g/bhp-hr	EPA
Benzene	0.0604	0.00521450	g/bhp-hr	EPA
Toluene	0.0213	0.00184160	g/bhp-hr	EPA
Ethylbenzene	0.0009	0.00008180	g/bhp-hr	EPA
Xylenes(m,p,o)	0.0075	0.00064360	g/bhp-hr	EPA
Styrene	0.0005	0.00003930	g/bhp-hr	EPA
Naphthalene	0.0037	0.00032050	g/bhp-hr	EPA
Ethylene Dibromide	0.0008	0.00007030	g/bhp-hr	EPA
Vinyl Chloride	0.0003	0.00002370	g/bhp-hr	EPA
Methylene Chloride	0.0016	0.00013600	g/bhp-hr	EPA
1,1-Dichloroethane	0.0004	0.00003730	g/bhp-hr	EPA
1,3-Dichloropropene	0.0005	0.00004190	g/bhp-hr	EPA
Chlorobenzene	0.0005	0.00004260	g/bhp-hr	EPA
Chloroform	0.0005	0.00004520	g/bhp-hr	EPA
1,1,2-Trichloroethane	0.0006	0.00005050	g/bhp-hr	EPA
1,1,2,2-Tetrachloroethane	0.0010	0.00008350	g/bhp-hr	EPA
Carbon Tetrachloride	0.0007	0.00005840	g/bhp-hr	EPA
Total	1.7162			

Criteria Pollutants

PM	0.7416	0.06405970	g/bhp-hr	EPA
CO	167.8678	14.50000000	g/bhp-hr	GRI Field
NMEHC	1.1310	0.09769010	g/bhp-hr	EPA
NOx	211.8608	18.30000000	g/bhp-hr	GRI Field
SO2	0.0225	0.00194060	g/bhp-hr	EPA

Other Pollutants

Butryaldehyde	0.0019	0.00016040	g/bhp-hr	EPA
Methane	8.7879	0.75907880	g/bhp-hr	EPA
Ethane	2.6899	0.23234410	g/bhp-hr	EPA
1,2-Dichloroethane	0.0004	0.00003730	g/bhp-hr	EPA
1,2-Dichloropropane	0.0005	0.00004290	g/bhp-hr	EPA
CO2	4,202.9210	363.03769350	g/bhp-hr	EPA

Unit Name: 8G825

Units 10-17, 25-27

Hours of Operation:	8,760	Yearly
Rate Power:	800	hp
Fuel Type:	NATURAL GAS	
Engine Type:	4-Stroke, Rich Burn	
Emission Factor Set:	FIELD > EPA > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set

HAPs

Formaldehyde	0.7674	0.09942890	g/bhp-hr	GRI Field
Methanol	0.1544	0.02000000	g/bhp-hr	GRI Field
Acetaldehyde	0.0711	0.00920800	g/bhp-hr	EPA
1,3-Butadiene	0.0169	0.00218810	g/bhp-hr	EPA
Acrolein	0.0670	0.00867990	g/bhp-hr	EPA
Benzene	0.0402	0.00521450	g/bhp-hr	EPA
Toluene	0.0142	0.00184160	g/bhp-hr	EPA
Ethylbenzene	0.0006	0.00008180	g/bhp-hr	EPA
Xylenes(m,p,o)	0.0050	0.00064360	g/bhp-hr	EPA
Styrene	0.0003	0.00003930	g/bhp-hr	EPA
Naphthalene	0.0025	0.00032050	g/bhp-hr	EPA
Ethylene Dibromide	0.0005	0.00007030	g/bhp-hr	EPA
Vinyl Chloride	0.0002	0.00002370	g/bhp-hr	EPA
Methylene Chloride	0.0010	0.00013600	g/bhp-hr	EPA
1,1-Dichloroethane	0.0003	0.00003730	g/bhp-hr	EPA
1,3-Dichloropropene	0.0003	0.00004190	g/bhp-hr	EPA
Chlorobenzene	0.0003	0.00004260	g/bhp-hr	EPA
Chloroform	0.0003	0.00004520	g/bhp-hr	EPA
1,1,2-Trichloroethane	0.0004	0.00005050	g/bhp-hr	EPA
1,1,2,2-Tetrachloroethane	0.0006	0.00008350	g/bhp-hr	EPA
Carbon Tetrachloride	0.0005	0.00005840	g/bhp-hr	EPA
Total	1.1440			

Criteria Pollutants

PM	0.4944	0.06405970	g/bhp-hr	EPA
CO	111.9119	14.50000000	g/bhp-hr	GRI Field
NMEHC	0.7540	0.09769010	g/bhp-hr	EPA
NOx	141.2405	18.30000000	g/bhp-hr	GRI Field
SO2	0.0150	0.00194060	g/bhp-hr	EPA

Other Pollutants

Butryaldehyde	0.0012	0.00016040	g/bhp-hr	EPA
Methane	5.8586	0.75907880	g/bhp-hr	EPA
Ethane	1.7932	0.23234410	g/bhp-hr	EPA
1,2-Dichloroethane	0.0003	0.00003730	g/bhp-hr	EPA
1,2-Dichloropropane	0.0003	0.00004290	g/bhp-hr	EPA
CO2	2,801.9473	363.03769350	g/bhp-hr	EPA

Units 20, 28

GRI-HAPCalc ® 3.01
External Combustion Devices Report

Facility ID:	**DCP - ARTESIA GP**	**Notes:**
Operation Type:	**GAS PLANT**	
Facility Name:	**ARTESIA GAS PLANT**	
User Name:		
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: BOILERS

Hours of Operation:	8,760	Yearly
Heat Input:	36	MMBtu/hr
Fuel Type:	NATURAL GAS	
Device Type:	BOILER	
Emission Factor Set:	EPA > FIELD > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
3-Methylcholanthrene	0.0000	0.0000000018 lb/MMBtu	EPA
7,12-Dimethylbenz(a)anthracene	0.0000	0.0000000157 lb/MMBtu	EPA
Formaldehyde	0.0116	0.0000735294 lb/MMBtu	EPA
Methanol	0.0683	0.0004333330 lb/MMBtu	GRI Field
Acetaldehyde	0.0459	0.0002909000 lb/MMBtu	GRI Field
1,3-Butadiene	0.0000	0.0000001830 lb/MMBtu	GRI Field
Benzene	0.0003	0.0000020588 lb/MMBtu	EPA
Toluene	0.0005	0.0000033333 lb/MMBtu	EPA
Ethylbenzene	0.0000	0.0000000720 lb/MMBtu	GRI Field
Xylenes(m,p,o)	0.0002	0.0000010610 lb/MMBtu	GRI Field
2,2,4-Trimethylpentane	0.0051	0.0000323000 lb/MMBtu	GRI Field
n-Hexane	0.2783	0.0017647059 lb/MMBtu	EPA
Phenol	0.0000	0.0000000950 lb/MMBtu	GRI Field
Naphthalene	0.0001	0.0000005980 lb/MMBtu	EPA
2-Methylnaphthalene	0.0000	0.0000000235 lb/MMBtu	EPA
Acenaphthylene	0.0000	0.0000000018 lb/MMBtu	EPA
Biphenyl	0.0002	0.0000011500 lb/MMBtu	GRI Field
Acenaphthene	0.0000	0.0000000018 lb/MMBtu	EPA
Fluorene	0.0000	0.0000000027 lb/MMBtu	EPA
Anthracene	0.0000	0.0000000024 lb/MMBtu	EPA
Phenanthrene	0.0000	0.0000000167 lb/MMBtu	EPA
Fluoranthene	0.0000	0.0000000029 lb/MMBtu	EPA
Pyrene	0.0000	0.0000000049 lb/MMBtu	EPA
Benz(a)anthracene	0.0000	0.0000000018 lb/MMBtu	EPA
Chrysene	0.0000	0.0000000018 lb/MMBtu	EPA

Benzo(a)pyrene	0.0000	0.0000000012 lb/MMBtu	EPA
Benzo(b)fluoranthene	0.0000	0.0000000018 lb/MMBtu	EPA
Benzo(k)fluoranthene	0.0000	0.0000000018 lb/MMBtu	EPA
Benzo(g,h,i)perylene	0.0000	0.0000000012 lb/MMBtu	EPA
Indeno(1,2,3-c,d)pyrene	0.0000	0.0000000018 lb/MMBtu	EPA
Dibenz(a,h)anthracene	0.0000	0.0000000012 lb/MMBtu	EPA
Lead	0.0001	0.0000004902 lb/MMBtu	EPA
Total	0.4106		

Criteria Pollutants

VOC	0.8502	0.0053921569 lb/MMBtu	EPA
PM	1.1749	0.0074509804 lb/MMBtu	EPA
PM, Condensible	0.8812	0.0055882353 lb/MMBtu	EPA
PM, Filterable	0.2937	0.0018627451 lb/MMBtu	EPA
CO	12.9854	0.0823529410 lb/MMBtu	EPA
NMHC	1.3449	0.0085294118 lb/MMBtu	EPA
NOx	15.4588	0.0980392157 lb/MMBtu	EPA
SO2	0.0927	0.0005880000 lb/MMBtu	EPA

Other Pollutants

Dichlorobenzene	0.0002	0.0000011765 lb/MMBtu	EPA
Methane	0.3556	0.0022549020 lb/MMBtu	EPA
Acetylene	0.8407	0.0053314000 lb/MMBtu	GRI Field
Ethylene	0.0830	0.0005264000 lb/MMBtu	GRI Field
Ethane	0.4792	0.0030392157 lb/MMBtu	EPA
Propylene	0.1472	0.0009333330 lb/MMBtu	GRI Field
Propane	0.2473	0.0015686275 lb/MMBtu	EPA
Butane	0.3246	0.0020588235 lb/MMBtu	EPA
Cyclopentane	0.0064	0.0000405000 lb/MMBtu	GRI Field
Pentane	0.4019	0.0025490196 lb/MMBtu	EPA
n-Pentane	0.3154	0.0020000000 lb/MMBtu	GRI Field
Cyclohexane	0.0071	0.0000451000 lb/MMBtu	GRI Field
Methylcyclohexane	0.0267	0.0001691000 lb/MMBtu	GRI Field
n-Octane	0.0080	0.0000506000 lb/MMBtu	GRI Field
n-Nonane	0.0008	0.0000050000 lb/MMBtu	GRI Field
CO2	18,550.5882	117.6470588235 lb/MMBtu	EPA

Unit 19

Unit Name: FURNACE 19

Hours of Operation: 8,760 Yearly

Heat Input: 36 MMBtu/hr

Fuel Type: NATURAL GAS

Device Type: HEATER

Emission Factor Set: FIELD > EPA > LITERATURE

Additional EF Set: -NONE-

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
3-Methylcholanthrene	0.0000	0.0000000018 lb/MMBtu	EPA
7,12-Dimethylbenz(a)anthracene	0.0000	0.0000000157 lb/MMBtu	EPA
Formaldehyde	0.0111	0.0008440090 lb/MMBtu	GRI Field

Methanol	0.0127	0.0009636360	lb/MMBtu	GRI Field
Acetaldehyde	0.0097	0.0007375920	lb/MMBtu	GRI Field
1,3-Butadiene	0.0045	0.0003423350	lb/MMBtu	GRI Field
Benzene	0.0098	0.0007480470	lb/MMBtu	GRI Field
Toluene	0.0134	0.0010163310	lb/MMBtu	GRI Field
Ethylbenzene	0.0278	0.0021128220	lb/MMBtu	GRI Field
Xylenes(m,p,o)	0.0174	0.0013205140	lb/MMBtu	GRI Field
2,2,4-Trimethylpentane	0.0373	0.0028417580	lb/MMBtu	GRI Field
n-Hexane	0.0185	0.0014070660	lb/MMBtu	GRI Field
Phenol	0.0000	0.0000001070	lb/MMBtu	GRI Field
Styrene	0.0273	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
Total	0.1895			

Criteria Pollutants

VOC	0.0709	0.0053921569	lb/MMBtu	EPA
PM	0.0979	0.0074509804	lb/MMBtu	EPA
PM, Condensible	0.0734	0.0055882353	lb/MMBtu	EPA
PM, Filterable	0.0245	0.0018627451	lb/MMBtu	EPA
CO	0.4253	0.0323636360	lb/MMBtu	GRI Field
NMHC	0.1121	0.0085294118	lb/MMBtu	EPA
NOx	1.2748	0.0970167730	lb/MMBtu	GRI Field
SO2	0.0077	0.0005880000	lb/MMBtu	EPA

Other Pollutants

Dichlorobenzene	0.0000	0.0000011765	lb/MMBtu	EPA
Methane	0.1382	0.0105212610	lb/MMBtu	GRI Field
Acetylene	0.1840	0.0140000000	lb/MMBtu	GRI Field
Ethylene	0.0125	0.0009476310	lb/MMBtu	GRI Field
Ethane	0.0346	0.0026312210	lb/MMBtu	GRI Field
Propylene	0.0308	0.0023454550	lb/MMBtu	GRI Field
Propane	0.0140	0.0010686280	lb/MMBtu	GRI Field
Isobutane	0.0192	0.0014640770	lb/MMBtu	GRI Field
Butane	0.0181	0.0013766990	lb/MMBtu	GRI Field
Cyclopentane	0.0149	0.0011304940	lb/MMBtu	GRI Field
Pentane	0.0456	0.0034671850	lb/MMBtu	GRI Field

n-Pentane	0.0187	0.0014221310 lb/MMBtu	GRI Field
Cyclohexane	0.0121	0.0009183830 lb/MMBtu	GRI Field
Methylcyclohexane	0.0289	0.0022011420 lb/MMBtu	GRI Field
n-Octane	0.0375	0.0028538830 lb/MMBtu	GRI Field
1,2,3-Trimethylbenzene	0.0450	0.0034224540 lb/MMBtu	GRI Field
1,2,4-Trimethylbenzene	0.0450	0.0034224540 lb/MMBtu	GRI Field
1,3,5-Trimethylbenzene	0.0450	0.0034224540 lb/MMBtu	GRI Field
n-Nonane	0.0481	0.0036604170 lb/MMBtu	GRI Field
CO2	1,545.8824	117.6470588235 lb/MMBtu	EPA

Unit 40

Unit Name: TEG REBOIL

Hours of Operation: 8,760 Yearly

Heat Input: 0.50 MMBtu/hr

Fuel Type: NATURAL GAS

Device Type: BOILER

Emission Factor Set: EPA > FIELD > LITERATURE

Additional EF Set: -NONE-

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
7,12-Dimethylbenz(a)anthracene	0.0000	0.0000000157 lb/MMBtu	EPA
Formaldehyde	0.0002	0.0000735294 lb/MMBtu	EPA
Methanol	0.0009	0.0004333330 lb/MMBtu	GRI Field
Acetaldehyde	0.0006	0.0002909000 lb/MMBtu	GRI Field
1,3-Butadiene	0.0000	0.0000001830 lb/MMBtu	GRI Field
Benzene	0.0000	0.0000020588 lb/MMBtu	EPA
Toluene	0.0000	0.0000033333 lb/MMBtu	EPA
Ethylbenzene	0.0000	0.0000000720 lb/MMBtu	GRI Field
Xylenes(m,p,o)	0.0000	0.0000010610 lb/MMBtu	GRI Field
2,2,4-Trimethylpentane	0.0001	0.0000323000 lb/MMBtu	GRI Field
n-Hexane	0.0039	0.0017647059 lb/MMBtu	EPA
Phenol	0.0000	0.0000000950 lb/MMBtu	GRI Field
Naphthalene	0.0000	0.0000005980 lb/MMBtu	EPA
2-Methylnaphthalene	0.0000	0.0000000235 lb/MMBtu	EPA
Biphenyl	0.0000	0.0000011500 lb/MMBtu	GRI Field
Fluorene	0.0000	0.0000000027 lb/MMBtu	EPA
Anthracene	0.0000	0.0000000024 lb/MMBtu	EPA
Phenanthrene	0.0000	0.0000000167 lb/MMBtu	EPA
Fluoranthene	0.0000	0.0000000029 lb/MMBtu	EPA
Pyrene	0.0000	0.0000000049 lb/MMBtu	EPA
Lead	0.0000	0.0000004902 lb/MMBtu	EPA
Total	0.0057		
Criteria Pollutants			
VOC	0.0118	0.0053921569 lb/MMBtu	EPA
PM	0.0163	0.0074509804 lb/MMBtu	EPA
PM, Condensible	0.0122	0.0055882353 lb/MMBtu	EPA
PM, Filterable	0.0041	0.0018627451 lb/MMBtu	EPA
CO	0.1804	0.0823529410 lb/MMBtu	EPA
NMHC	0.0187	0.0085294118 lb/MMBtu	EPA
NOx	0.2147	0.0980392157 lb/MMBtu	EPA

SO2	0.0013	0.0005880000	lb/MMBtu	EPA

Other Pollutants

Dichlorobenzene	0.0000	0.0000011765	lb/MMBtu	EPA
Methane	0.0049	0.0022549020	lb/MMBtu	EPA
Acetylene	0.0117	0.0053314000	lb/MMBtu	GRI Field
Ethylene	0.0012	0.0005264000	lb/MMBtu	GRI Field
Ethane	0.0067	0.0030392157	lb/MMBtu	EPA
Propylene	0.0020	0.0009333330	lb/MMBtu	GRI Field
Propane	0.0034	0.0015686275	lb/MMBtu	EPA
Butane	0.0045	0.0020588235	lb/MMBtu	EPA
Cyclopentane	0.0001	0.0000405000	lb/MMBtu	GRI Field
Pentane	0.0056	0.0025490196	lb/MMBtu	EPA
n-Pentane	0.0044	0.0020000000	lb/MMBtu	GRI Field
Cyclohexane	0.0001	0.0000451000	lb/MMBtu	GRI Field
Methylcyclohexane	0.0004	0.0001691000	lb/MMBtu	GRI Field
n-Octane	0.0001	0.0000506000	lb/MMBtu	GRI Field
n-Nonane	0.0000	0.0000050000	lb/MMBtu	GRI Field
CO2	257.6471	117.6470588235	lb/MMBtu	EPA

98.36(e)(4)

Within 30 days of receipt of a written request from the Administrator, you shall submit the verification data and information described in paragraphs (e)(2)(iii), (e)(2)(v), and (e)(2)(vii) of this section.

[Amended at 75 FR page 79151, Dec. 17, 2010; 78 FR page 71950, Nov. 29, 2013]

Find Related Documents

§ 98.37 Records that must be retained.

In addition to the requirements of §98.3(g), you must retain the applicable records specified in §§98.34(f) and (g), 98.35(b), and 98.36(e).

Find Related Documents

§ 98.38 Definitions.

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

Table C-1 to Subpart C of Part 98 —Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Fuel type	Default high heat value	Default CO_2 emission factor
Coal and coke	mmBtu/short ton	kg CO_2/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_2/mmBtu
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products	mmBtu/gallon	kg CO_2/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) [1]	0.092	61.71
Propane [1]	0.091	62.87
Propylene [2]	0.091	67.77
Ethane [1]	0.068	59.60
Ethanol	0.084	68.44
Ethylene [2]	0.058	65.96
Isobutane [1]	0.099	64.94
Isobutylene [1]	0.103	68.86
Butane [1]	0.103	64.77
Butylene [1]	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_2/mmBtu
Municipal Solid Waste	9.95 [3]	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_2/mmBtu
Blast Furnace Gas	0.092×10^{-3}	274.32
Coke Oven Gas	0.599×10^{-3}	46.85
Propane Gas	2.516×10^{-3}	61.46
Fuel Gas [4]	1.388×10^{-3}	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Wood and Wood Residuals (dry basis) [5]	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_2/mmBtu
Landfill Gas	0.485×10^{-3}	52.07

Other Biomass Gases	0.655×10^{-3}	52.07
Biomass Fuels—Liquid	mmBtu/gallon	kg CO_2/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

[1] The HHV for components of LPG determined at 60 °F and saturation pressure with the exception of ethylene.

[2] Ethylene HHV determined at 41 °F (5 °C) and saturation pressure.

[3] 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.

[4] 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_2 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.

[5] 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.

[78 FR page 71950, Nov. 29, 2013]

Table C-2 to Subpart C of Part 98 —Default CH_4 and N_2O Emission Factors for Various Types of Fuel

Fuel type	Default CH_4 emission factor (kg CH_4/mmBtu)	Default N_2O emission factor (kg N_2O/mmBtu)
Coal and Coke (All fuel types in Table C-1)	1.1×10^{-02}	1.6×10^{-03}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum (All fuel types in Table C-1)	3.0×10^{-03}	6.0×10^{-04}
Fuel Gas	3.0×10^{-03}	6.0×10^{-04}
Municipal Solid Waste	3.2×10^{-02}	4.2×10^{-03}
Tires	3.2×10^{-02}	4.2×10^{-03}
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels—Solid (All fuel types in Table C-1, except wood and wood residuals)	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals	7.2×10^{-03}	3.6×10^{-03}
Biomass Fuels—Gaseous (All fuel types in Table C-1)	3.2×10^{-03}	6.3×10^{-04}
Biomass Fuels—Liquid (All fuel types in Table C-1)	1.1×10^{-03}	1.1×10^{-04}

ENGINE OPERATING DATA AND HEAT REJECTION
SUPERIOR 8G825

	PERCENT RATED LOAD	BMEP (PSI)	ENGINE SPEED - RPM			
			900	800	700	600
BRAKE HORSEPOWER (BHP)	110	117	880	782	684	586
	100	107	800	711	622	533
	75	80	600	533	467	400
	50	53	400	356	311	267
BRAKE SPECIFIC FUEL CONSUMPTION (BTU/BHP-HR)	110	117	—	—	—	—
	100	107	7750	7750	7800	7850
	75	80	8510	8550	8500	8500
	50	53	10150	10000	9900	9900
INTAKE AIR FLOW REQUIREMENT (SCFM)	110	117	1261	1150	1009	854
	100	107	1186	1055	927	791
	75	80	945	836	745	635
	50	53	727	636	566	482
EXHAUST FLOW (LB/MIN)	110	117	99	92	81	69
	100	107	96	85	75	64
	75	80	78	67	59	51
	50	53	59	51	46	39
EXHAUST TEMP. (±50F)	110	117	1330	1320	1305	1270
	100	107	1340	1315	1305	1250
	75	80	1310	1280	1225	1140
	50	53	1220	1190	1160	1110
JACKET WATER HEAT REJECTION (BTU/MIN)	110	117	29550	26550	23730	21360
	100	107	29100	26450	23730	21090
	75	80	28090	25100	22640	20000
	50	53	24090	21360	18636	16360
LUBE OIL HEAT REJECTION (BTU/MIN)	110	117	3600	3600	3600	3600
	100	107	3600	3600	3600	3500
	75	80	3600	3510	3400	3400
	50	53	3420	3240	3240	3200

NOTES :

1) FUEL CONSUMPTION BASED ON PIPELINE QUALITY FUEL AND ENGINE ADJUSTMENT FOR STANDARD EXHAUST EMISSION RATES, SUBJECT TO ±3% TOLERANCE FOR FACTORY TESTS.
2) HEAT REJECTION DATA ARE BASED ON NOMINAL 180F JACKET WATER OUTLET TEMPERATURE. REFER TO GENERAL DATA SECTION, PAGE GEN-21/9-88 FOR HEAT REJECTION ADJUSTMENT FACTORS DUE TO HOT WATER SYSTEMS OR EBULLIENT COOLING.
   HEAT REJECTION DATA ARE AVERAGE VALUES AND WILL VARY WITH OPERATING CONDITIONS AND AMBIENT TEMPERATURE. ADD RESERVE FACTOR FOR SIZING COOLING SYSTEMS. SUBTRACT 10% RESERVE FACTOR TO COMPUTE RECOVERABLE HEAT.

ECONOMY AND EMISSIONS CONTROL

SUPERIOR NATURALLY ASPIRATED ENGINES

6G825, 8G825, 12G825, 16G825

Data at 900 rpm and rated load.

CONFIGURATION	FUEL RATE (BTU/BHP-HR.)	EXHAUST EMISSIONS (GM/BHP-HR.) NOx	CO	NMHC
Typical Production	7750	15.0	1.8	0.2
Control I	8000	10.0(1)	10.0(1)	0.4
W/Converter System	8000	1.0	1.0 - 5.0(2)	0.3
W/Converter System	8000 - 8500(3)	0.75	1.0 - 5.0(2)	0.3

Qualifying Conditions:

1. Required operating parameters can be set manually, but for continuous operation at these levels, a feedback control system is recommended.
2. Amount of CO reduction is dependent on selection and complexity of converter system.
3. Exact bsfc depends on station conditions and the converter system selected to attain 0.75 gm/b-h of NOx.

White Superior 12G825

Percent Rated Load	BMEP	Rated Load Bhp	rpm	Exhaust Flow lb/min	Exhaust Temp F	NOx/CO/NMHC 2/2/1 gm/Bhp-hr	NOx/CO/NMHC 1/1/0.75 gm/Bhp-hr	NOx/CO/NMHC 0.3/0.5/0.8 gm/Bhp-hr	NOx/CO/NMHC 0.15/0.6/0.15 gm/Bhp-hr
100	107	1200	900	152	1240	ES-ASA	ES-NSA	NS-ASA	NS-NSA
100	107	1067	800	132	1200	ES-KSA	ES-ASA	NS-KSA	NS-ASA
100	107	933	700	112	1170	ES-ESA	ES-KSA	ES-SSA	NS-KSA
100	107	800	600	95	1130	ES-ISA	ES-ESA	ES-NSA	ES-SSA
75	80	900	900	123	1230	ES-KSA	ES-ASA	ES-SSA	NS-ASA
75	80	800	800	107	1165	ES-ESA	ES-KSA	ES-SSA	ES-SSA
75	80	700	700	91	1140	ES-ISA	ES-ESA	ES-NSA	ES-SSA
75	80	600	600	78	1080	ES-TSA	ES-ISA	ES-ASA	ES-NSA

White Superior 16G825

Percent Rated Load	BMEP	Rated Load Bhp	rpm	Exhaust Flow lb/min	Exhaust Temp F	NOx/CO/NMHC 2/2/1 gm/Bhp-hr	NOx/CO/NMHC 1/1/0.75 gm/Bhp-hr	NOx/CO/NMHC 0.3/0.5/0.8 gm/Bhp-hr	NOx/CO/NMHC 0.15/0.6/0.15 gm/Bhp-hr
100	107	1600	900	191	1330	ES-NSA	ES-SSA	NS-NSA	NS-SSA
100	107	1422	800	170	1310	ES-NSA	ES-NSA	NS-NSA	NS-NSA
100	107	1244	700	145	1254	ES-ASA	ES-NSA	NS-ESA	NS-NSA
100	107	1067	600	127	1250	ES-KSA	ES-ASA	ES-SSA	NS-NSA
75	80	1200	900	152	1310	ES-ASA	ES-NSA	NS-ASA	NS-NSA
75	80	1067	800	145	1290	ES-ASA	ES-ASA	NS-ASA	NS-NSA
75	80	933	700	116	1216	ES-ESA	ES-KSA	ES-SSA	NS-ASA
75	80	800	600	102	1200	ES-ISA	ES-ESA	ES-NSA	ES-SSA

White Superior Engine Emissions

Engine Model	NOx gm/Bhp-hr	CO gm/Bhp-hr	THC gm/Bhp-hr	NMHC gm/Bhp-hr
6G510 → 6G5110	15.0	15.0	2.0	0.5
6G825	15.0	15.0	2.0	0.5
8G825	15.0	15.0	2.0	0.5
12G825	15.0	15.0	2.0	0.5
16G825	15.0	15.0	2.0	0.5

DeNOx Catalysts for Rich-burn Natural Gas Engines

White Superior 6G510

Percent Rated Load	BMEP	Rated Load Bhp	rpm	Exhaust Flow lb/min	Exhaust Temp F	NOx/CO/NMHC 2/2/1 gm/Bhp-hr	NOx/CO/NMHC 1/1/0.75 gm/Bhp-hr	NOx/CO/NMHC 0.3/0.5/0.8 gm/Bhp-hr	NOx/CO/NMHC 0.15/0.6/0.15 gm/Bhp-hr
100	107	400	1000	54	1265	ES-HSA	ES-TSA	ES-ESA	ES-KSA
100	107	370	900	50	1250	ES-HSA	ES-HSA	ES-ISA	ES-KSA
100	107	328	800	44	1265	ES-HSA	ES-HSA	ES-ISA	ES-ESA
100	107	311	700	42	1250	ES-GSA	ES-HSA	ES-ISA	ES-ESA
100	107	265	600	38	1200	ES-GSA	ES-GSA	ES-TSA	ES-ISA
75	80	300	1000	44	1300	ES-HSA	ES-HSA	ES-ISA	ES-ESA
75	80	275	900	40	1265	ES-GSA	ES-HSA	ES-TSA	ES-ISA
75	80	245	800	36	1255	ES-GSA	ES-GSA	ES-TSA	ES-ISA
75	80	230	700	33	1220	ES-GSA	ES-GSA	ES-TSA	ES-ISA
75	80	200	600	29	1170	ES-GSA	ES-GSA	ES-HSA	ES-TSA

White Superior 6G825

Percent Rated Load	BMEP	Rated Load Bhp	rpm	Exhaust Flow lb/min	Exhaust Temp F	NOx/CO/NMHC 2/2/1 gm/Bhp-hr	NOx/CO/NMHC 1/1/0.75 gm/Bhp-hr	NOx/CO/NMHC 0.3/0.5/0.8 gm/Bhp-hr	NOx/CO/NMHC 0.15/0.6/0.15 gm/Bhp-hr
100	107	650	1000	88	1265	ES-ISA	ES-ESA	ES-NSA	ES-NSA
100	107	600	900	78	1250	ES-TSA	ES-ISA	ES-ASA	ES-NSA
100	107	533	800	66	1265	ES-TSA	ES-TSA	ES-KGA	ES-ASA
100	107	467	700	55	1250	ES-HSA	ES-TSA	ES-ESA	ES-KSA
100	107	400	600	47	1200	ES-HSA	ES-HSA	ES-ISA	ES-ESA
75	80	488	1000	71	1300	ES-TSA	ES-ISA	ES-ASA	ES-NSA
75	80	450	900	61	1265	ES-HSA	ES-TSA	ES-ESA	ES-ASA
75	80	400	800	54	1255	ES-HSA	ES-TSA	ES-ESA	ES-KSA
75	80	350	700	48	1220	ES-HSA	ES-HSA	ES-ISA	ES-ESA
75	80	300	600	39	1170	ES-GSA	ES-HSA	ES-TSA	ES-ISA

White Superior 8G825

Percent Rated Load	BMEP	Rated Load Bhp	rpm	Exhaust Flow lb/min	Exhaust Temp F	NOx/CO/NMHC 2/2/1 gm/Bhp-hr	NOx/CO/NMHC 1/1/0.75 gm/Bhp-hr	NOx/CO/NMHC 0.3/0.5/0.8 gm/Bhp-hr	NOx/CO/NMHC 0.15/0.6/0.15 gm/Bhp-hr
100	107	800	900	98	1340	ES-ISA	ES-ESA	ES-NSA	ES-SSA
100	107	711	800	85	1315	ES-ISA	ES-ISA	ES-NSA	ES-SSA
100	107	622	700	75	1305	ES-TSA	ES-TSA	ES-ASA	ES-NSA
100	107	533	600	64	1250	ES-TSA	ES-TSA	ES-KGA	ES-ASA
75	80	600	900	78	1310	ES-TSA	ES-ISA	ES-ASA	ES-NSA
75	80	533	800	67	1280	ES-TSA	ES-TSA	ES-KGA	ES-ASA
75	80	467	700	59	1225	ES-HSA	ES-TSA	ES-ESA	ES-ASA
75	80	400	600	51	1140	ES-HSA	ES-HSA	ES-ISA	ES-KSA

G3516

G3516 LE	Gas Industrial Engine Performance	CATERPILLAR

Engine Speed (rpm)	1400	Fuel	NAT GAS
Compression Ratio	8:1	LHV of Fuel (Btu/SCF)	920
Aftercooler Inlet Temperature (°F)	130	Fuel System	HPG IMPCO
Jacket Water Outlet Temperature (°F)	210	Air Fuel Ratio Control Required	
Ignition System	EIS	Minimum Fuel Pressure (psig)	35
Exhaust Manifold	WATER COOLED	Methane Number at Conditions Shown	80
Combustion System Type	LOW EMISSION	Rated Altitude (ft) at 77°F Design Temperature	5000

Engine Rating Data	% Load	100%	75%	50%
Engine Power (w/o fan)	bhp	1340	1005	670
Engine Data				
Specific Fuel Consumption (BSFC) (1)	Btu/bhp-hr	7546	7807	8286
Air Flow (Wet, @ 77°F, 28.8 in Hg)	SCFM	2885	2232	1413
Air Mass Flow (Wet)	lb/hr	12796	9897	6264
Compressor Out Pressure	in. HG (abs)	79.9	76.2	57.3
Compressor Out Temperature	°F	334	306	228
Inlet Manifold Pressure	in. HG (abs)	69.9	55	39.1
Inlet Manifold Temperature (10)	°F	139	137	136
Timing (11)	°BTDC	33	33	33
Exhaust Stack Temperature	°F	855	840	842
Exhaust Gas Flow (Wet, @ stack temperature, 29.7 in Hg)	CFM	7685	5880	3743
Exhaust Gas Mass Flow (Wet)	lb/hr	13292	10283	6536
Engine Emissions Data				
Nitrous Oxides (NOx as NO2) (9)	g/bhp-hr	1.5	1.5	1.5
(Corr. 15% 02)	ppm	110	104	107
Carbon Monoxide (CO) (9)	g/bhp-hr	1.9	2.0	1.9
(Corr. 15% 02)	ppm	226	224	225
Total Hydrocarbons (THC) (9)	g/bhp-hr	3.1	3.4	3.6
(Corr. 15% 02)	ppm	643	677	747
Non-Methane Hydrocarbons (NMHC) (9)	g/bhp-hr	0.46	0.51	0.54
(Corr. 15% 02)	ppm	46	47	51
Exhaust Oxygen (9)	%	8.3	8.1	7.8
Lambda		1.59	1.58	1.42
Engine Heat Balance Data				
Input Energy LHV (1)	Btu/min	168467	130723	92500
Work Output	Btu/min	56839	42629	28420
Heat Rejection to Jacket (2) (6)	Btu/min	47848	39982	34394
Heat Rejection to Atmosphere (Radiated) (4)	Btu/min	5313	4428	3543
Heat Rejection to Lube Oil (5)	Btu/min	0	0	0
Total Heat Rejection to Exhaust (to 77°F) (2)	Btu/min	48087	3664	23652
Heat Rejection to Exhaust (LHV to 350°F) (2)	Btu/min	30032	22558	14490
Heat Rejection to Aftercooler (3) (7) (8)	Btu/min	10380	7019	2491

Engine Noise Data - at 100% load

Noise - Mechanical @ 1 m	100	dB(A)
Noise - Exhaust @ 1.5 m	111	dB(A)

Fuel Usage Guide

Derate Factor / Engine Timing vs Methane Number

<30	30	35	40	45	50	55	60	65	70	75	80 to 100
0/–	0.90/19	0.90/21	0.90/22	1.0/23	1.0/24	1.0/26	1.0/27	1.0/28	1.0/30	1.0/31	1.0/33

Altitude Deration Factors

AIR INLET TEMP. (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.00	1.00	1.00	0.98	0.94	0.91	0.88	0.84	0.81	0.78	0.75	0.72	0.70
120	1.00	1.00	1.00	1.00	0.96	0.93	0.89	0.86	0.83	0.80	0.77	0.74	0.71
110	1.00	1.00	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75	0.72
100	1.00	1.00	1.00	1.00	1.00	0.96	0.92	0.89	0.86	0.82	0.79	0.76	0.73
90	1.00	1.00	1.00	1.00	1.00	0.98	0.94	0.91	0.87	0.84	0.81	0.78	0.75
80	1.00	1.00	1.00	1.00	1.00	0.99	0.96	0.92	0.89	0.85	0.82	0.79	0.76
70	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.94	0.90	0.87	0.84	0.81	0.77
60	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.96	0.92	0.89	0.85	0.82	0.79
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.94	0.90	0.87	0.84	0.80

ALTITUDE (FEET ABOVE SEA LEVEL)

Aftercooler Heat Rejection Factors

AIR INLET TEMP. (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
130	1.29	1.35	1.41	1.46	1.52	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58
120	1.22	1.28	1.33	1.39	1.45	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51
110	1.15	1.21	1.26	1.32	1.37	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
100	1.08	1.13	1.19	1.24	1.30	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
90	1.01	1.06	1.11	1.17	1.22	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
80	1.00	1.00	1.04	1.09	1.15	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
70	1.00	1.00	1.00	1.02	1.07	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
60	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

ALTITUDE (FEET ABOVE SEA LEVEL)

DM5155-00 Data is intended to be used with Gas Engine Performance Book Parameters—DM5900-00 on page 8

STANDARD EQUIPMENT

AIR CLEANER – Two, dry type with rain shield and service indicator.

BARRING DEVICE – Manual.

BEARINGS – Heavy duty, replaceable, precision type.

BREATHER – Closed system.

CONNECTING RODS – Drop forged steel, rifle drilled.

CONTROL SYSTEM – Pneumatic. Includes pilot operated valves for air start and prelube. Engine mounted control panel with two push button valves. Pilot operated air start valves omitted when starter is not furnished by Waukesha. Includes engine On/Off push button. One mounted on either side of the engine.

CRANKCASE – Integral crankcase and cylinder frame. Main bearing caps drilled and tapped for temperature sensors. Does not include sensors.

CRANKSHAFT – Counterweighted, forged steel, seven main bearings, and dynamically balanced.

CYLINDERS – Removable wet type cylinder liners, chrome plated on outer diameter. Induction hardened.

CYLINDER HEADS – Twelve interchangeable. Two hard faced intake and two hard faced exhaust valves per cylinder. Hard faced intake and exhaust valve seat inserts. Roller valve lifters and hydraulic push rods.

ENGINE ROTATION – Counterclockwise when facing flywheel.

ENGINE MONITORING DEVICES – Engine thermocouples, K–type, are wired to a bulk head connector *(GSI Engines)* or common junction box *(G Engines)* for jacket water temperature, lube oil temperature, and intake manifold temperature. Magnetic pickup wired for customer supplied tachometer. Lube oil pressure and intake manifold pressure sensing lines are terminated in a common bulk head. *GSI Engines* - 25 foot (7.6 m) customer interface and standard thermocouple harness are provided for making connections to a customer supplied panel.

FLYWHEEL – Approx. WR^2 = 155000 lb-in^2; with ring gear (208 teeth), machined to accept two drive adapters: 31.88″ (810 mm) pilot bore, 30.25″ (768 mm) bolt circle, (12) 0.75″–10 tapped holes; or 28.88″ (734 mm) pilot bore, 27.25″ (692 mm) bolt circle, (12) 0.625″–11 tapped holes and (12) 0.75″–10 tapped holes.

FUEL SYSTEM – Dual, natural gas, 4″ (102 mm) updraft. *GSI Engines* - Two Fisher 99, 2″ (51 mm) gas regulators, 25-50 psi (172-245 kPa) inlet pressure required. *G Engines* - Two Fisher Model S–201, 2″ (51 mm) gas regulators, 12 psi (83 kPa) maximum inlet pressure.

FLYWHEEL HOUSING – No. 00 SAE.

GOVERNOR – Woodward UG–8 LD hydraulic lever type, with friction type speed control. Mounted on right hand side.

IGNITION – Waukesha Custom Engine Control Ignition Module. Electronic digital ignition system. 24V DC power required.

LEVELING BOLTS

LIFTING EYES

LUBRICATION – Full pressure. Gear type pump. Full flow filter, 36 gallon (136 litres) capacity, not mounted. Includes flexible connections. Includes lube oil strainer, mounted on engine. Air/gas motor driven prelube pump. Requires final piping.

MANIFOLDS – Exhaust, (2) water cooled with single vertical 8 inch (203 mm) flange at rear, and flexible stainless steel exhaust connection.

OIL COOLER – With thermostatic temperature controller and pressure regulating valve. *GSI Engines* - Factory mounted. *G Engines* - Not mounted.

OIL PAN – Base type. 90 gallon (340 litres) capacity including filter and cooler.

PAINT – Oilfield orange primer.

PISTONS – Aluminum with floating pin. Standard 8:1 compression ratio. Oil cooled.

SHIPPING SKID – Steel for domestic truck or rail.

VIBRATION DAMPER – Viscous type. Guard included with remote mounted radiator or no radiator.

WATER CIRCULATING SYSTEM

Auxiliary Circuit – For oil cooler. Pump is belt driven from crankshaft pulley.

Engine Jacket – Belt driven water circulating pump, cluster type thermostatic temperature regulating valve, full flow bypass type. Flange connections and mating flanges for (2) 4″ (102 mm) inlets and (1) 5″ (127 mm) outlet.

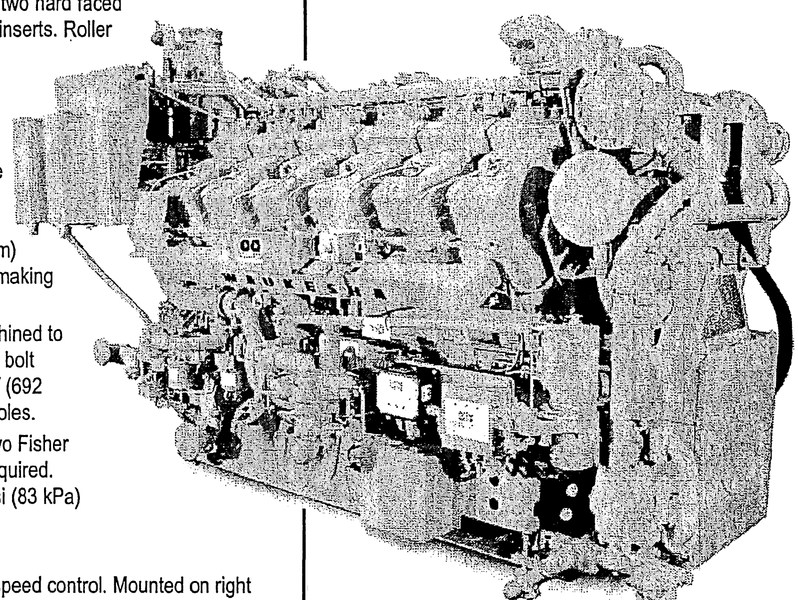
WAUKESHA CUSTOM ENGINE CONTROL, DETONATION SENSING MODULE (DSM) – Includes individual cylinder sensors. Compatible with Waukesha CEC Ignition Module only. Packager is responsible for 24V DC power supply and ground to the DSM. The DSM meets Canadian Standards Association Class I, Division 2, Group D hazardous location requirements. *GSI Engines* - Detonation Sensing Module, sensors and filter are mounted and wired. *G Engines* - Sensors are mounted and wired to engine junction box. Detonation Sensing Module, filter, one 11 ft. cable, two 15 ft. cables and one 20 ft. cable are shipped loose.

Waukesha®

VHP

L7042G/GSI

VHP™ Series Gas Engine
675 - 1547 BHP



Model L7042G Naturally Aspirated
Model L7042GSI Turbocharged and Intercooled, Twelve Cylinder, Four-Cycle Gas Engine

SPECIFICATIONS

Cylinders
V 12

Piston Displacement
7040 cu. in.
(115 L)

Bore & Stroke
9.375″ x 8.5″
(238 x 216 mm)

Compression Ratio
Standard 8:1
Optional 10:1

Jacket Water System Capacity
107 gal.
(405 L)

Lube Oil Capacity
90 gal.
(340 L)

Starting System
125 - 150 psi air/gas
24/32 V electric

Dry Weight
G Models
20,500 lb.
(9300 kg)
GSI Models
21,000 lb.
(9525 kg)

Waukesha Engine
ISO 9001
CERTIFIED

POWER RATINGS: L7042G/GSI VHP SERIES GAS ENGINES

Model	I.C. Water Inlet Temp. °F (°C) (Tcra)	C.R.	Brake Horsepower (kWb Output) 800 rpm	900 rpm	1000 rpm	1100 rpm	1200 rpm
L7042GSI	85° (29°)	8:1	1031 (769)	1160 (865)	1289 (961)	1418 (1057)	1547 (1154)
L7042GSI	130° (54°)	8:1	985 (735)	1108 (826)	1232 (919)	1355 (1010)	1478 (1102)
L7042G	—	10:1	732 (546)	818 (610)	896 (668)	966 (721)	1024 (764)
L7042G	—	8:1	675 (504)	748 (558)	810 (604)	866 (646)	912 (680)

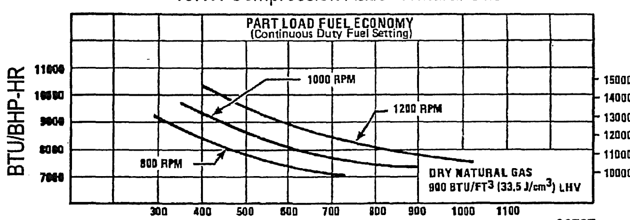
Rating Standard: All models: Ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and auxiliary water temperature Tcra (clause 10.1) as specified above limited to ± 10° F (± 5° C). Ratings are also valid for SAE J1349, BS5514, DIN6271 and AP17B-11C standard atmospheric conditions.

ISO Standard Power/Continuous Power Rating: The highest load and speed which can be applied 24 hours a day, seven days a week, 365 days per year except for normal maintenance. It is permissible to operate the engine at up to 10% overload, or maximum load indicated by the intermittent rating, whichever is lower, for two hours in each 24 hour period.

All natural gas engine ratings are based on a fuel of 900 Btu/ft³ (35.3 MJ/nm³) SLHV value, with a 91 Waukesha Knock Index®.

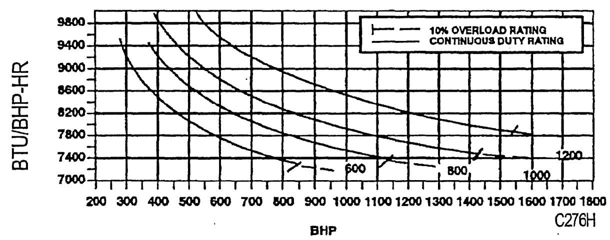
For conditions or fuels other than standard, the Waukesha Engine Sales Engineering Department.

L7042G Engine
Naturally Aspirated
10.1:1 Compression Ratio - Natural Gas



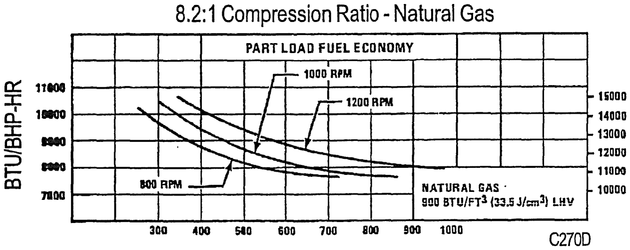
C272E

L7042GSI Engine
Turbocharged-Intercooled - 8:1 Compression Ratio
85° Intercooler Water



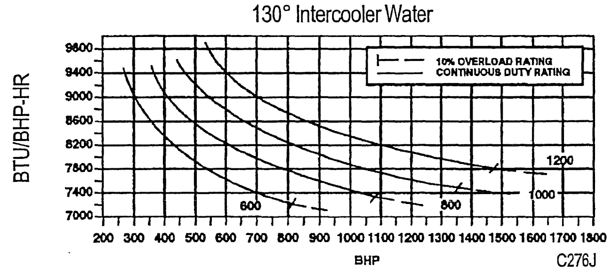
C276H

8.2:1 Compression Ratio - Natural Gas



C270D

130° Intercooler Water



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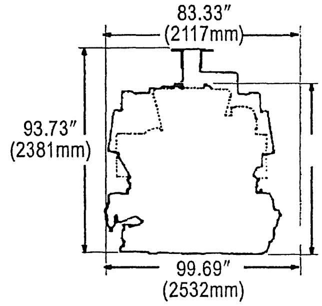

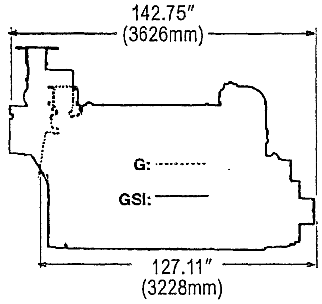

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AT-GL EMISSION LEVELS ‡

MODEL	CARBURETOR SETTING	GRAMS/BHP-HR				% OBSERVED DRY		MASS AFR (2)	VOLUME AFR (2)	EXCESS AIR RATIO
		NOx (1)	CO	NMHC (4)	THC	CO	O_2			
AT25GL	Standard	1.0	2.25	1.0	8.0	0.06	9.8	28.0:1	16.8:1	1.74
AT27GL	Standard	1.5	1.7	0.5	5.0	0.06	9.8	28.0:1	16.8:1	1.74
	Ultra Lean	1.25	1.5	0.4	3.5	0.05	11.2	32.0:1	19.2:1	2.00

‡ The AT-GL emission levels are based on 900 – 1000 rpm operation. For information at all other speeds contact Waukesha's Sales Engineering Department.

VHP EMISSION LEVELS

MODEL	CARBURETOR SETTING	GRAMS/BHP-HR				% OBSERVED DRY		MASS AFR (2)	VOLUME AFR (2)	EXCESS AIR RATIO
		NOx (1)	CO	NMHC (4)	THC	CO	O_2			
G, GSI	Lowest Manifold (Best Power)	8.5	32.0	0.35	2.3	1.15	0.30	15.5:1	9.3:1	0.97
	Equal NOx & CO	12.0	12.0	0.35	2.3	0.45	0.30	15.9:1	9.6:1	0.99
	Catalytic Conv. Input (3-way(3))	13.0	9.0	0.30	2.0	0.38	0.30	15.95:1	9.6:1	0.99
	Standard (Best Economy)	22.0	1.5	0.25	1.5	0.02	1.35	17.0:1	10.2:1	1.06
F3524GSI, L7044GSI	Equal NOx & CO	14.0	14.0	0.25	1.1	0.45	0.30	15.85:1	9.5:1	0.99
	Catalytic Conv. Input (3-way(3))	15.0	13.0	0.20	1.0	0.38	0.30	15.95:1	9.6:1	0.99
	Standard (Best Economy)	23.0	2.0	0.20	0.8	0.02	1.35	17.0:1	10.2:1	1.06
L5794GSI	Equal NOx & CO	13.5	13.5	0.45	3.0	0.45	0.30	15.85:1	9.5:1	0.99
	Catalytic Conv. Input (3-way(3))	14.5	11.0	0.45	2.9	0.38	0.30	15.95:1	9.6:1	0.99
	Standard (Best Economy)	22.0	3.0	0.35	2.4	0.02	1.35	17.0:1	10.2:1	1.06
GL	Standard	1.5	2.65	1.0	5.5	0.06	9.8	28.0:1	16.8:1	1.74
L5774LT#	Standard	2.6	2.0	0.60	4.0	0.04	8.0	24.7:1	14.8:1	1.54
L5794LT#	Standard	2.6	2.0	0.60	4.0	0.04	7.8	24.5:1	14.7:1	1.52

L5774LT and L5794LT emission levels are based on 1000 – 1200 rpm operation. For information at all other speeds contact Waukesha's Sales Engineering Department.

NOTE: The above tables indicate emission levels that are valid for new engines for the duration of the standard warranty period and are attainable by an engine in good operating condition running on commercial quality natural gas of 900 BTU/ft^3 (35.38 MJ/m^3 [25, V(0; 101.325)]) SLHV, Waukesha Knock Index™ of 91 or higher, 93% methane content by volume, and at ISO standard conditions. Emissions are based on standard engine timing at 91 WKI™ with an absolute humidity of 42 grains/lb. Refer to engine specific WKI™ Power & Timing curves for standard timing. Unless otherwise noted these emission levels can be achieved across the continuous duty speed range and from 75% to 110% of the ISO Standard Power (continuous duty) rating. ***Contact your local Waukesha representative or Waukesha's Sales Engineering Department for emission values which can be obtained on a case-by-case basis for specific ratings, fuels, and site conditions.***

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[j]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES (Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Acenaphthylene[k]	5.53 E-06	C
Acetaldehyde[k,l]	8.36 E-03	A
Acrolein[k,l]	5.14 E-03	A
Benzene[k]	4.40 E-04	A
Benzo(b)fluoranthene[k]	1.66 E-07	D
Benzo(e)pyrene[k]	4.15 E-07	D
Benzo(g,h,i)perylene[k]	4.14 E-07	D
Biphenyl[k]	2.12 E-04	D
Butane	5.41 E-04	D
Butyr/Isobutyraldehyde	1.01 E-04	C
Carbon Tetrachloride[k]	<3.67 E-05	E
Chlorobenzene[k]	<3.04 E-05	E
Chloroethane	1.87 E-06	D
Chloroform[k]	<2.85 E-05	E
Chrysene[k]	6.93 E-07	C
Cyclopentane	2.27 E-04	C
Ethane	1.05 E-01	C
Ethylbenzene[k]	3.97 E-05	B
Ethylene Dibromide[k]	<4.43 E-05	E
Fluoranthene[k]	1.11 E-06	C
Fluorene[k]	5.67 E-06	C
Formaldehyde[k,l]	5.28 E-02	A
Methanol[k]	2.50 E-03	B
Methylcyclohexane	1.23 E-03	C
Methylene Chloride[k]	2.00 E-05	C
n-Hexane[k]	1.11 E-03	C
n-Nonane	1.10 E-04	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene[k]	7.44 E-05	C
PAH[k]	2.69 E-05	D
Phenanthrene[k]	1.04 E-05	D
Phenol[k]	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene[k]	1.36 E-06	C
Styrene[k]	<2.36 E-05	E
Tetrachloroethane[k]	2.48 E-06	D
Toluene[k]	4.08 E-04	B
Vinyl Chloride[k]	1.49 E-05	C
Xylene[k]	1.84 E-04	B

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, “uncontrolled” means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, “uncontrolled” means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter $\leq$ 10 microns (μm) aerodynamic diameter. A “<“ sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})\ (\text{heat input, MMBtu/hr})\ (\text{1/operating HP, 1/hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and

h = heating value of natural gas (assume 1020 Btu/scf at 60°F).

[e] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content in natural gas of 2,000 gr/10^6scf.

[f] Emission factor for TOC is based on measured emission levels from 22 source tests.

[g] Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor. Measured emission factor for methane compares well with the calculated emission factor, 1.31 lb/MMBtu vs. 1.25 lb/MMBtu, respectively.

[h] VOC emission factor is based on the sum of the emission factors for all speciated organic compounds less ethane and methane.

[i] Considered $\leq$ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).

[j] PM Condensable = PM Condensable Inorganic + PM-Condensable Organic

[k] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

[l] For lean burn engines, aldehyde emissions quantification using CARB 430 may reflect interference with the sampling compounds due to the nitrogen concentration in the stack. The presented emission factor is based on FTIR measurements. Emissions data based on CARB 430 are available in the background report.

Table 3.2-3. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE RICH-BURN ENGINES[a]
(SCC 2-02-002-53)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	2.21 E+00	A
NO_x[c] <90% Load	2.27 E+00	C
CO[c] 90 - 105% Load	3.72 E+00	A
CO[c] <90% Load	3.51 E+00	C
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	3.58 E-01	C
Methane[g]	2.30 E-01	C
VOC[h]	2.96 E-02	C
PM10 (filterable)[i,j]	9.50 E-03	E
PM2.5 (filterable)[j]	9.50 E-03	E
PM Condensable[k]	9.91 E-03	E
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[l]	2.53 E-05	C
1,1,2-Trichloroethane[l]	<1.53 E-05	E
1,1-Dichloroethane	<1.13 E-05	E
1,2-Dichloroethane	<1.13 E-05	E
1,2-Dichloropropane	<1.30 E-05	E
1,3-Butadiene[l]	6.63 E-04	D
1,3-Dichloropropene[l]	<1.27 E-05	E
Acetaldehyde[l,m]	2.79 E-03	C
Acrolein[l,m]	2.63 E-03	C
Benzene[l]	1.58 E-03	B
Butyr/isobutyraldehyde	4.86 E-05	D
Carbon Tetrachloride[l]	<1.77 E-05	E

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x 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_x burners	50	D	84	B
Controlled - Low NO_x 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

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $lb/10^6$ 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.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_x emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_x emission factor.

[c] 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[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] 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 $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to 1b/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.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 \text{ scf}] = (3.67)$ (CON) (C)(D), where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, 4.2×10^4 $lb/10^6$ scf.

[c] All PM (total, condensible, 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_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible 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.

[d] Based on 100% conversion of fuel sulfur to SO_2.
Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

5.2 Transportation And Marketing Of Petroleum Liquids[1-3]

5.2.1 General

The transportation and marketing of petroleum liquids involve many distinct operations, each of which represents a potential source of evaporation loss. Crude oil is transported from production operations to a refinery by tankers, barges, rail tank cars, tank trucks, and pipelines. Refined petroleum products are conveyed to fuel marketing terminals and petrochemical industries by these same modes. From the fuel marketing terminals, the fuels are delivered by tank trucks to service stations, commercial accounts, and local bulk storage plants. The final destination for gasoline is usually a motor vehicle gasoline tank. Similar distribution paths exist for fuel oils and other petroleum products. A general depiction of these activities is shown in Figure 5.2-1.

5.2.2 Emissions And Controls

Evaporative emissions from the transportation and marketing of petroleum liquids may be considered, by storage equipment and mode of transportation used, in four categories:

1. Rail tank cars, tank trucks, and marine vessels: loading, transit, and ballasting losses.
2. Service stations: bulk fuel drop losses and underground tank breathing losses.
3. Motor vehicle tanks: refueling losses.
4. Large storage tanks: breathing, working, and standing storage losses. (See Chapter 7, "Liquid Storage Tanks".)

Evaporative and exhaust emissions are also associated with motor vehicle operation, and these topics are discussed in AP-42 *Volume II: Mobile Sources*.

5.2.2.1 Rail Tank Cars, Tank Trucks, And Marine Vessels -

Emissions from these sources are from loading losses, ballasting losses, and transit losses.

5.2.2.1.1 Loading Losses -

Loading losses are the primary source of evaporative emissions from rail tank car, tank truck, and marine vessel operations. Loading losses occur as organic vapors in "empty" cargo tanks are displaced to the atmosphere by the liquid being loaded into the tanks. These vapors are a composite of (1) vapors formed in the empty tank by evaporation of residual product from previous loads, (2) vapors transferred to the tank in vapor balance systems as product is being unloaded, and (3) vapors generated in the tank as the new product is being loaded. The quantity of evaporative losses from loading operations is, therefore, a function of the following parameters:

- Physical and chemical characteristics of the previous cargo;
- Method of unloading the previous cargo;
- Operations to transport the empty carrier to a loading terminal;
- Method of loading the new cargo; and
- Physical and chemical characteristics of the new cargo.

The principal methods of cargo carrier loading are illustrated in Figure 5.2-2, Figure 5.2-3, and Figure 5.2-4. In the splash loading method, the fill pipe dispensing the cargo is lowered only part way into the cargo tank. Significant turbulence and vapor/liquid contact occur during the splash 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 ±30 percent)[4] using the following expression:

$$L_L = 12.46 \frac{SPM}{T} \tag{1}$$

where:

L_L = loading loss, pounds per 1000 gallons (lb/10^3 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 (lb/lb-mole) (see Table 7.1-2)
T = temperature of bulk liquid loaded, °R (°F + 460)

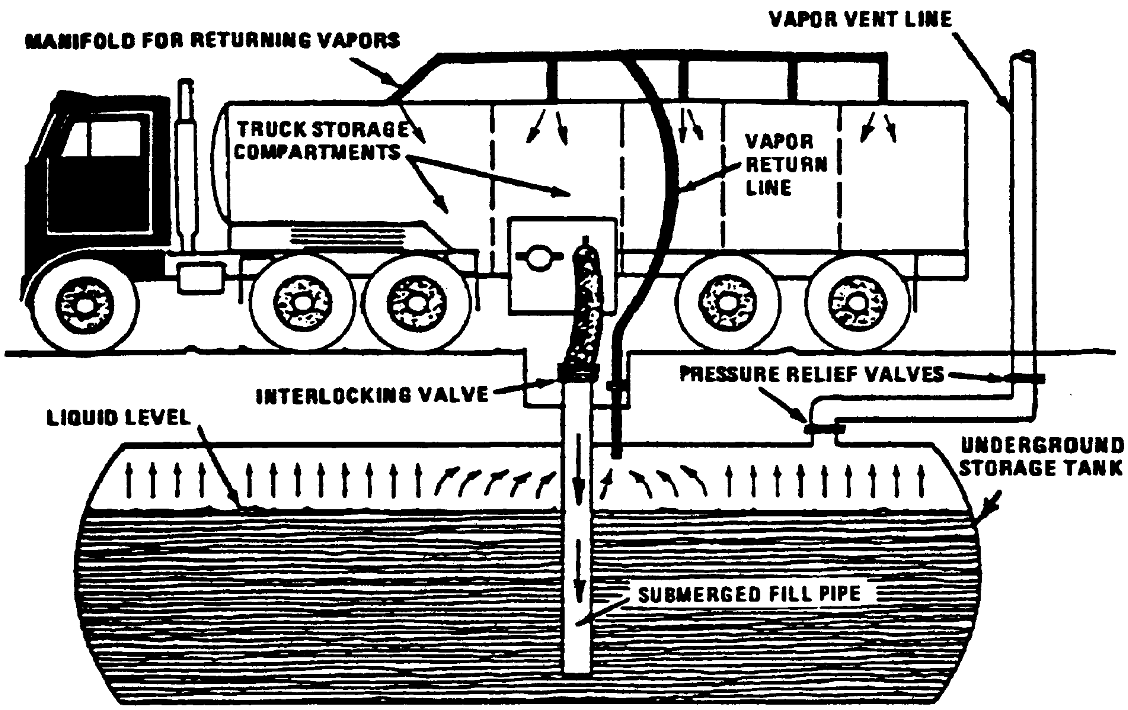

Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

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[a]	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

[a] 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.

13.2.2 Unpaved Roads

13.2.2.1 General

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

The particulate emission factors presented in the previous draft version of this section of AP-42, dated October 2001, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material[25]. EPA included these sources in the emission factor equation for unpaved public roads (equation 1b in this section) since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the unpaved public road emission factor equation only estimates particulate emissions from resuspended road surface material [23, 26]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [24]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on unpaved public roads. It also incorporates the decrease in exhaust emissions that has occurred since the unpaved public road emission factor equation was developed. The previous version of the unpaved public road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on source parameters that characterize the condition of a particular road and the associated vehicle traffic. Characterization of these source parameters allow for "correction" of emission estimates to specific road and traffic conditions present on public and industrial roadways.

Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [µm] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.

Since the silt content of a rural dirt road will vary with geographic location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Other variables are important in addition to the silt content of the road surface material. For example, at industrial sites, where haul trucks and other heavy equipment are common, emissions are highly correlated with vehicle weight. On the other hand, there is far less variability in the weights of cars and pickup trucks that commonly travel publicly accessible unpaved roads throughout the United States. For those roads, the moisture content of the road surface material may be more dominant in determining differences in emission levels between, for example a hot, desert environment and a cool, moist location.

The PM-10 and TSP emission factors presented below are the outcomes from stepwise linear regressions of field emission test results of vehicles traveling over unpaved surfaces. Due to a limited amount of information available for PM-2.5, the expression for that particle size range has been scaled against the result for PM-10. Consequently, the quality rating for the PM-2.5 factor is lower than that for the PM-10 expression.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\ (s/12)^a (W/3)^b \qquad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\ (s/12)^a (S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range as shown in Table 13.2.2-4

Table 13.2.2-4. EMISSION FACTOR FOR 1980'S VEHICLE FLEET EXHAUST, BRAKE WEAR AND TIRE WEAR

Particle Size Range[a]	*C*, Emission Factor for Exhaust, Brake Wear and Tire Wear[b] lb/VMT
$PM_{2.5}$	0.00036
PM_{10}	0.00047
PM_{30}[c]	0.00047

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.
[b] Units shown are pounds per vehicle mile traveled (lb/VMT).
[c] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

It is important to note that the vehicle-related source conditions refer to the average weight, speed, and number of wheels for all vehicles traveling the road. For example, if 98 percent of traffic on the road are 2-ton cars and trucks while the remaining 2 percent consists of 20-ton trucks, then the mean weight is 2.4 tons. More specifically, Equations 1a and 1b are *not* intended to be used to calculate a separate emission factor for each vehicle class within a mix of traffic on a given unpaved road. That is, in the example, one should *not* determine one factor for the 2-ton vehicles and a second factor for the 20-ton trucks. Instead, only one emission factor should be calculated that represents the "fleet" average of 2.4 tons for all vehicles traveling the road.

Moreover, to retain the quality ratings when addressing a group of unpaved roads, it is necessary that reliable correction parameter values be determined for the road in question. The field and laboratory procedures for determining road surface silt and moisture contents are given in AP-42 Appendices C.1 and C.2. Vehicle-related parameters should be developed by recording visual observations of traffic. In some cases, vehicle parameters for industrial unpaved roads can be determined by reviewing maintenance records or other information sources at the facility.

In the event that site-specific values for correction parameters cannot be obtained, then default values may be used.In the absence of site-specific silt content information, an appropriate mean value from Table 13.2.2-1 may be used as a default value, but the quality rating of the equation is reduced by two letters. Because of significant differences found between different types of road surfaces and between different areas of the country, use of the default moisture content value of 0.5 percent in Equation 1b is discouraged. The quality rating should be downgraded two letters when the default moisture content value is used. (It is assumed that readers addressing industrial roads have access to the information needed to develop average vehicle information in Equation 1a for their facility.)

The effect of routine watering to control emissions from unpaved roads is discussed below in Section 13.2.2.3, "Controls". However, all roads are subject to some natural mitigation because of rainfall and other precipitation. The Equation 1a and 1b emission factors can be extrapolated to annual average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:

$$E_{ext} = E\ [(365 - P)/365] \tag{2}$$

where:

E_{ext} = annual size-specific emission factor extrapolated for natural mitigation, lb/VMT

E = emission factor from Equation 1a or 1b

P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation (see below)

Figure 13.2.2-1 gives the geographical distribution for the mean annual number of "wet" days for the United States.

Equation 2 provides an estimate that accounts for precipitation on an annual average basis for the purpose of inventorying emissions. It should be noted that Equation 2 does not account for differences in the temporal distributions of the rain events, the quantity of rain during any event, or the potential for the rain to evaporate from the road surface. In the event that a finer temporal and spatial resolution is desired for inventories of public unpaved roads, estimates can be based on a more complex set of assumptions. These assumptions include:

1. The moisture content of the road surface material is increased in proportion to the quantity of water added;
2. The moisture content of the road surface material is reduced in proportion to the Class A pan evaporation rate;
3. The moisture content of the road surface material is reduced in proportion to the traffic volume; and
4. The moisture content of the road surface material varies between the extremes observed in the area. The CHIEF Web site (http://www.epa.gov/ttn/chief/ap42/ch13/related/c13s02-2.html) has a file which contains a spreadsheet program for calculating emission factors which are temporally and spatially resolved. Information required for use of the spreadsheet program includes monthly Class A pan evaporation values, hourly meteorological data for precipitation, humidity and snow cover, vehicle traffic information, and road surface material information.

It is emphasized that <u>the simple assumption underlying Equation 2 and the more complex set of assumptions underlying the use of the procedure which produces a finer temporal and spatial resolution</u> have not been verified in any rigorous manner. For this reason, the quality ratings for either approach should be downgraded one letter from the rating that would be applied to Equation 1.

13.2.2.3 Controls[18-22]

A wide variety of options exist to control emissions from unpaved roads. Options fall into the following three groupings:

1. <u>Vehicle restrictions</u> that limit the speed, weight or number of vehicles on the road;

2. Surface improvement, by measures such as (a) paving or (b) adding gravel or slag to a dirt road; and

3. Surface treatment, such as watering or treatment with chemical dust suppressants.

Available control options span broad ranges in terms of cost, efficiency, and applicability. For example, traffic controls provide moderate emission reductions (often at little cost) but are difficult to enforce. Although paving is highly effective, its high initial cost is often prohibitive. Furthermore, paving is not feasible for industrial roads subject to very heavy vehicles and/or spillage of material in transport. Watering and chemical suppressants, on the other hand, are potentially applicable to most industrial roads at moderate to low costs. However, these require frequent reapplication to maintain an acceptable level of control. Chemical suppressants are generally more cost-effective than water but not in cases of temporary roads (which are common at mines, landfills, and construction sites). In summary, then, one needs to consider not only the type and volume of traffic on the road but also how long the road will be in service when developing control plans.

Vehicle restrictions. These measures seek to limit the amount and type of traffic present on the road or to lower the mean vehicle speed. For example, many industrial plants have restricted employees from driving on plant property and have instead instituted bussing programs. This eliminates emissions due to employees traveling to/from their worksites. Although the heavier average vehicle weight of the busses increases the base emission factor, the decrease in vehicle-miles-traveled results in a lower overall emission rate.

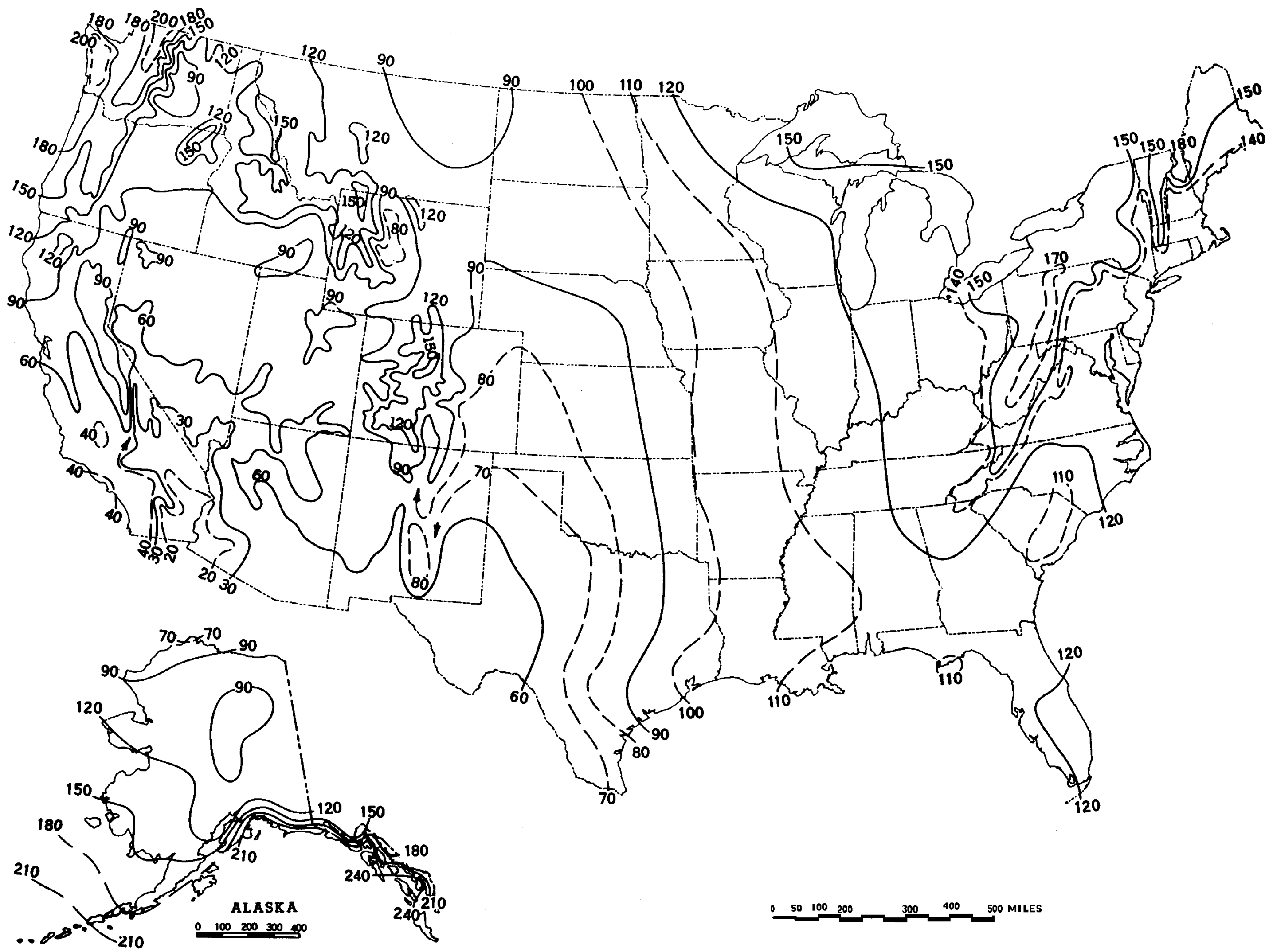

Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.

WRAP Fugitive Dust Handbook

Prepared for:

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Prepared by:

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4001 Whitesail Circle
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(WGA Contract No. 30204-111)

September 7, 2006

Fugitive Dust Control Measures Applicable for the WRAP Region

Source Category	Control Measure	Published PM10 Control Efficiency
Agricultural Tilling	Reduce tilling during high winds	1 – 5%
	Roughen surface	15 – 64%
	Modify equipment	50%
	Employ sequential cropping	50%
	Increase soil moisture	90%
	Use other conservation management practices	25 - 100%
Agricultural Harvesting	Limited activity during high winds	5 – 70%
	Modify equipment	50%
	Night farming	10%
	New techniques for drying fruit	25 –60%
Construction/Demolition	Water unpaved surfaces	10 – 74%
	Limit on-site vehicle speed to 15 mph	57%
	Apply dust suppressant to unpaved areas	84%
	Prohibit activities during high winds	98%
Materials Handling	Implement wet suppression	50 – 90%
	Erect 3-sided enclosure around storage piles	75%
	Cover storage pile with a tarp during high winds	90%
Paved Roads	Sweep streets	4 – 26%
	Minimize trackout	40 – 80%
	Remove deposits on road ASAP	> 90%
Unpaved Roads	Limit vehicle speed to 25 mph	44%
	Apply water	10 – 74%
	Apply dust suppressant	84%
	Pave the surface	>90%
Mineral Products Industry	Cyclone or muliclone	68 –79%
	Wet scrubber	78 –98%
	Fabric filter	99 – 99.8%
	Electrostatic precipitator	90 – 99.5%
Abrasive Blasting	Water spray	50 – 93%
	Fabric filter	> 95%
Livestock Husbandry	Daily watering of corrals and pens	> 10%
	Add wood chips or mulch to working pens	> 10%
Wind Erosion (agricultural, open area, and storage piles)	Plant trees or shrubs as a windbreak	25%
	Create cross-wind ridges	24 – 93%
	Erect artificial wind barriers	4 – 88%
	Apply dust suppressant or gravel	84%
	Revegetate; apply cover crop	90%
	Water exposed area before high winds	90%

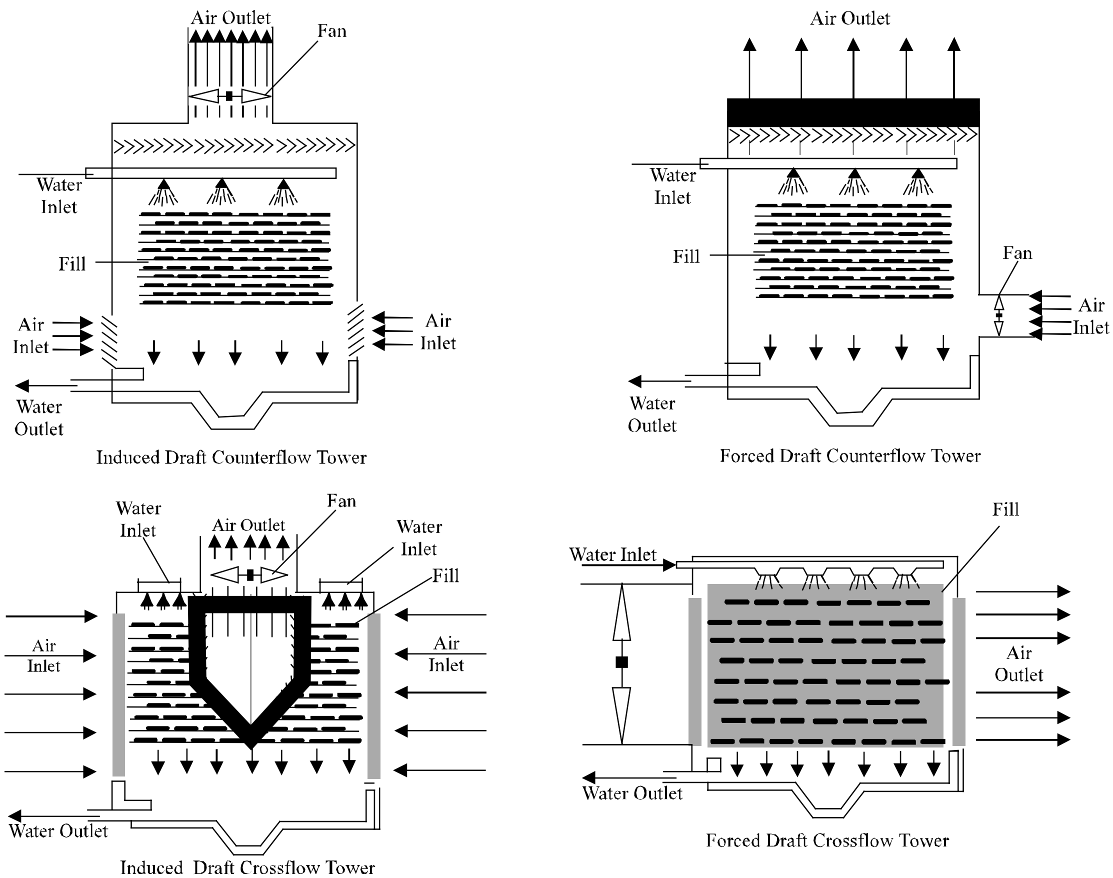


Figure 13.4-2. Mechanical draft cooling towers.

To reduce the drift from cooling towers, drift eliminators are usually incorporated into the tower design to remove as many droplets as practical from the air stream before exiting the tower. The drift eliminators used in cooling towers rely on inertial separation caused by direction changes while passing through the eliminators. Types of drift eliminator configurations include herringbone (blade-type), wave form, and cellular (or honeycomb) designs. The cellular units generally are the most efficient. Drift eliminators may include various materials, such as ceramics, fiber reinforced cement, fiberglass, metal, plastic, and wood installed or formed into closely spaced slats, sheets, honeycomb assemblies, or tiles. The materials may include other features, such as corrugations and water removal channels, to enhance the drift removal further.

Table 13.4-1 provides available particulate emission factors for wet cooling towers. Separate emission factors are given for induced draft and natural draft cooling towers. Several features in Table 13.4-1 should be noted. First, a *conservatively high* PM-10 emission factor can be obtained by (a) multiplying the total liquid drift factor by the total dissolved solids (TDS) fraction in the circulating water and (b) assuming that, once the water evaporates, all remaining solid particles are within the PM-10 size range.

Second, if TDS data for the cooling tower are not available, a source-specific TDS content can be estimated by obtaining the TDS data for the make-up water and multiplying them by the cooling tower cycles of concentration. The cycles of concentration ratio is the ratio of a measured

Table 13.4-1 (Metric And English Units). PARTICULATE EMISSIONS FACTORS FOR WET COOLING TOWERS[a]

Tower Type[d]	Total Liquid Drift[b] Circulating Water Flow[b]	Total Liquid Drift[b] g/daL	Total Liquid Drift[b] lb/10^3 gal	Total Liquid Drift[b] EMISSION FACTOR RATING	PM-10[c] g/daL[e]	PM-10[c] lb/10^3 gal	PM-10[c] EMISSION FACTOR RATING
Induced Draft (SCC 3-85-001-01, 3-85-001-20, 3-85-002-01)	0.020	2.0	1.7	D	0.023	0.019	E
Natural Draft (SCC 3-85-001-02, 3-85-002-02)	0.00088	0.088	0.073	E	ND	ND	—

[a] References 1-17. Numbers are given to 2 significant digits. ND = no data. SCC = Source Classification Code.
[b] References 2,5-7,9-10,12-13,15-16. Total liquid drift is water droplets entrained in the cooling tower exit air stream. Factors are for % of circulating water flow (10^{-2} L drift/L [10^{-2} gal drift/gal] water flow) and g drift/daL (lb drift/10^3 gal) circulating water flow. 0.12 g/daL = 0.1 lb/10^3 gal; 1 daL = 10^1 L.
[c] See discussion in text on how to use the table to obtain PM-10 emission estimates. Values shown above are the arithmetic average of test results from References 2,4,8, and 11-14, and they imply an effective TDS content of approximately 12,000 parts per million (ppm) in the circulating water.
[d] See Figure 13.4-1 and Figure 13.4-2. Additional SCCs for wet cooling towers of unspecified draft type are 3-85-001-10 and 3-85-002-10.
[e] Expressed as g PM-10/daL (lb PM-10/10^3 gal) circulating water flow.

parameter for the cooling tower water (such as conductivity, calcium, chlorides, or phosphate) to that parameter for the make-up water. This estimated cooling tower TDS can be used to calculate the PM-10 emission factor as above. If neither of these methods can be used, the arithmetic average PM-10 factor given in Table 13.4-1 can be used. Table 13.4-1 presents the arithmetic average PM-10 factor calculated from the test data in References 2, 4, 8, and 11 - 14. Note that this average corresponds to an effective cooling tower recirculating water TDS content of approximately 11,500 ppm for induced draft towers. (This can be found by dividing the total liquid drift factor into the PM-10 factor.)

As an alternative approach, if TDS data are unavailable for an induced draft tower, a value may be selected from Table 13.4-2 and then be combined with the total liquid drift factor in Table 13.4-1 to determine an apparent PM-10 factor.

As shown in Table 13.4-2, available data do not suggest that there is any significant difference between TDS levels in counter and cross flow towers. Data for natural draft towers are not available.

Since flares do not lend themselves to conventional emission testing techniques, only a few attempts have been made to characterize flare emissions. Recent EPA tests using propylene as flare gas indicated that efficiencies of 98 percent can be achieved when burning an offgas with at least 11,200 kJ/m^3 (300 Btu/ft^3). The tests conducted on steam-assisted flares at velocities as low as 39.6 meters per minute (m/min) (130 ft/min) to 1140 m/min (3750 ft/min), and on air-assisted flares at velocities of 180 m/min (617 ft/min) to 3960 m/min (13,087 ft/min) indicated that variations in incoming gas flow rates have no effect on the combustion efficiency. Flare gases with less than 16,770 kJ/m^3 (450 Btu/ft^3) do not smoke.

Table 13.5-1 presents flare emission factors, and Table 13.5-2 presents emission composition data obtained from the EPA tests.[1] Crude propylene was used as flare gas during the tests. Methane was a major fraction of hydrocarbons in the flare emissions, and acetylene was the dominant intermediate hydrocarbon species. Many other reports on flares indicate that acetylene is always formed as a stable intermediate product. The acetylene formed in the combustion reactions may react further with hydrocarbon radicals to form polyacetylenes followed by polycyclic hydrocarbons.[2]

In flaring waste gases containing no nitrogen compounds, NO is formed either by the fixation of atmospheric nitrogen (N) with oxygen (O) or by the reaction between the hydrocarbon radicals present in the combustion products and atmospheric nitrogen, by way of the intermediate stages, HCN, CN, and OCN.[2] Sulfur compounds contained in a flare gas stream are converted to SO_2 when burned. The amount of SO_2 emitted depends directly on the quantity of sulfur in the flared gases.

Table 13.5-1 (English Units). EMISSION FACTORS FOR FLARE OPERATIONS[a]

EMISSION FACTOR RATING: B

Component	Emission Factor ($lb/10^6$ Btu)
Total hydrocarbons[b]	0.14
Carbon monoxide	0.37
Nitrogen oxides	0.068
Soot[c]	0 - 274

[a] Reference 1. Based on tests using crude propylene containing 80% propylene and 20% propane.
[b] Measured as methane equivalent.
[c] Soot in concentration values: nonsmoking flares, 0 micrograms per liter (µg/L); lightly smoking flares, 40 µg/L; average smoking flares, 177 µg/L; and heavily smoking flares, 274 µg/L.

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-453/R-95-017
November 1995

Air

EPA

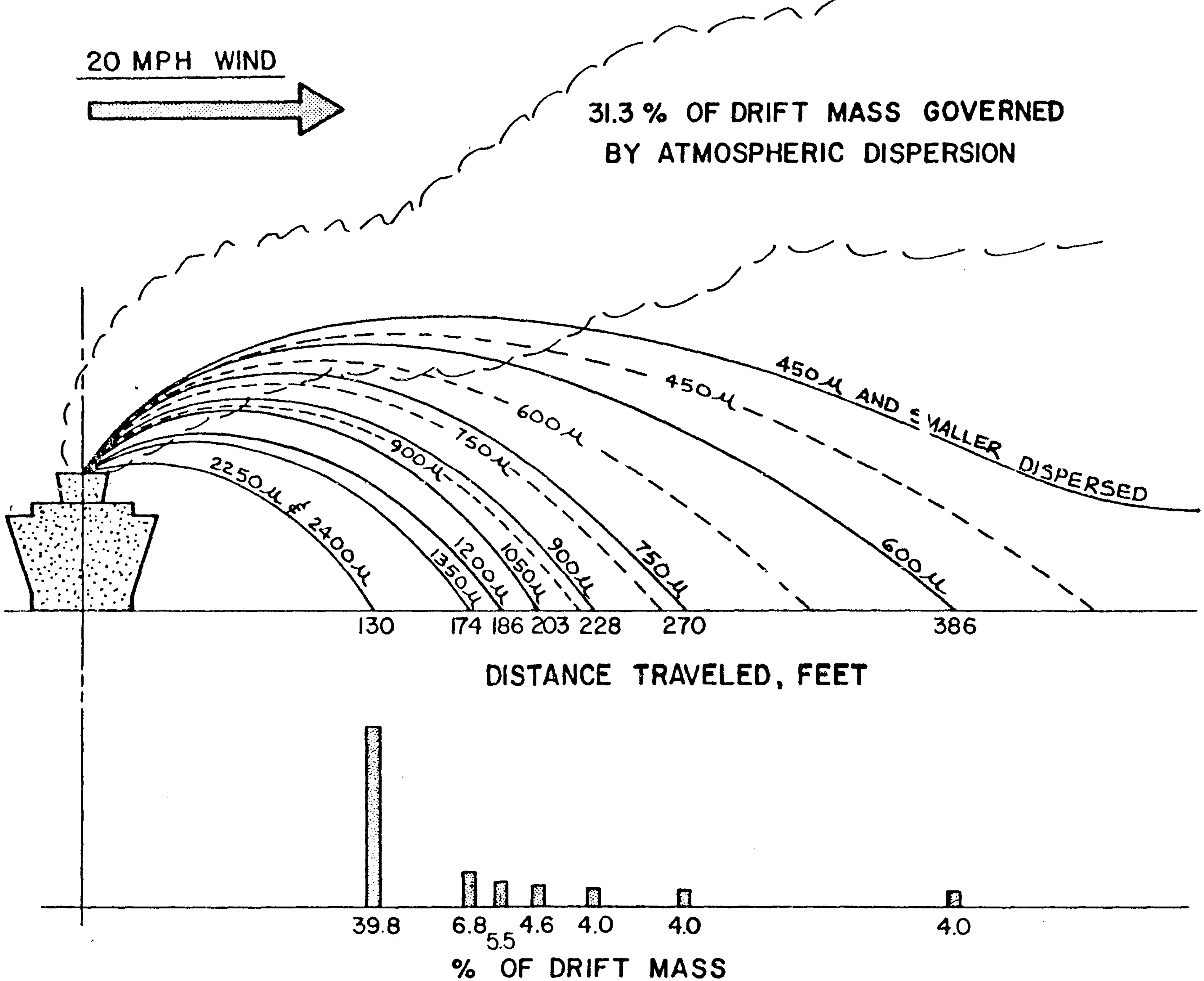
Protocol for Equipment Leak Emission Estimates

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

Equipment Type	Service[a]	Emission Factor (kg/hr/source)[b]
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[c]	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

[a]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.
[b]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.
[c]The "other" equipment type was derived from compressors, diaphrams, 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.

FIGURE 8



SOURCE: Wistrom and Ovard, 1973

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

Identification	
User Identification:	Artesia TK-48 and TK-49
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	Artesia Gas Plant 500 bbl Condensate Tanks
Tank Dimensions	
Shell Height (ft):	16.00
Diameter (ft):	15.00
Liquid Height (ft) :	16.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	21,150.74
Turnovers:	139.00
Net Throughput(gal/yr):	2,940,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Red/Primer
Shell Condition	Good
Roof Color/Shade:	Red/Primer
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	0.45
Slope (ft/ft) (Cone Roof)	0.06
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Roswell, New Mexico (Avg Atmospheric Pressure = 12.73 psia)

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

Artesia TK-48 and TK-49 - Vertical Fixed Roof Tank

		Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp	Vapor Pressure (psia)			Vapor Mol.	Liquid Mass	Vapor Mass	Mol.	Basis for Vapor Pressure
Mixture/Component	Month	Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Weight.	Fract.	Fract.	Weight	Calculations
Gasoline (RVP 10)	All	75.97	59.33	92.62	65.16	7.0037	5.1184	9.4041	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0378	0.0199	0.0685	120.1900	0.0250	0.0002	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.7899	1.1462	2.7058	78.1100	0.0180	0.0064	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.8385	1.1895	2.7536	84.1600	0.0024	0.0009	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1854	0.1060	0.3108	106.1700	0.0140	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.8567	1.8801	4.2122	86.1700	0.0100	0.0057	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isooctane									114.2200	0.0400	0.0000	114.22	
Isopropyl benzene						0.0855	0.0469	0.1490	120.2000	0.0050	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Toluene						0.5332	0.3233	0.8478	92.1300	0.0700	0.0074	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.9633	8.8718	8.8759	65.6132	0.7456	0.9766	89.36	
Xylene (-m)						0.1552	0.0883	0.2617	106.1700	0.0700	0.0022	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)

Artesia TK-48 and TK-49 - Vertical Fixed Roof Tank

Annual Emission Calcaulations	
Standing Losses (lb):	8,377.5758
Vapor Space Volume (cu ft):	1,086.7947
Vapor Density (lb/cu ft):	0.0804

Vapor Space Expansion Factor:	0.8621
Vented Vapor Saturation Factor:	0.3046
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,086.7947
Tank Diameter (ft):	15.0000
Vapor Space Outage (ft):	6.1500
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	10.0000
Roof Outage (ft):	0.1500
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1500
Roof Height (ft):	0.4500
Roof Slope (ft/ft):	0.0600
Shell Radius (ft):	7.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0804
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.0037
Daily Avg. Liquid Surface Temp. (deg. R):	535.6432
Daily Average Ambient Temp. (deg. F):	60.8167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	524.8267
Tank Paint Solar Absorptance (Shell):	0.8900
Tank Paint Solar Absorptance (Roof):	0.8900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,810.0000
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.8621
Daily Vapor Temperature Range (deg. R):	66.5852
Daily Vapor Pressure Range (psia):	4.2857
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.0037
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.1184
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	9.4041
Daily Avg. Liquid Surface Temp. (deg R):	535.6432
Daily Min. Liquid Surface Temp. (deg R):	518.9969
Daily Max. Liquid Surface Temp. (deg R):	552.2895
Daily Ambient Temp. Range (deg. R):	29.8333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3046
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	7.0037
Vapor Space Outage (ft):	6.1500
Working Losses (lb):	12,376.3524
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.0037
Annual Net Throughput (gal/yr.):	2,940,000.0000
Annual Turnovers:	139.0022
Turnover Factor:	0.3825
Maximum Liquid Volume (gal):	21,150.7406
Maximum Liquid Height (ft):	16.0000
Tank Diameter (ft):	15.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	20,753.9282

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

Emissions Report for: Annual

Artesia TK-48 and TK-49 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	12,376.35	8,377.58	20,753.93
Hexane (-n)	70.37	47.63	118.00
Benzene	79.36	53.72	133.08
Isooctane	0.00	0.00	0.00
Toluene	91.93	62.23	154.16
Ethylbenzene	6.39	4.33	10.72
Xylene (-m)	26.76	18.11	44.88
Isopropyl benzene	1.05	0.71	1.77
1,2,4-Trimethylbenzene	2.33	1.58	3.91
Cyclohexane	10.87	7.36	18.23
Unidentified Components	12,087.29	8,181.91	20,269.20

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

Identification

User Identification:	Artesia TK-50
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	500 bbl condensate tank

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	15.00
Liquid Height (ft) :	16.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	21,150.74
Turnovers:	119.14
Net Throughput(gal/yr):	2,520,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Red/Primer
Shell Condition	Good
Roof Color/Shade:	Red/Primer
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

Meterological Data used in Emissions Calculations: Roswell, New Mexico (Avg Atmospheric Pressure = 12.73 psia)

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

Artesia TK-50 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 10)	All	75.97	59.33	92.62	65.16	7.0037	5.1184	9.4041	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0378	0.0199	0.0685	120.1900	0.0250	0.0002	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.7899	1.1462	2.7058	78.1100	0.0180	0.0064	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.8385	1.1895	2.7536	84.1600	0.0024	0.0009	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1854	0.1060	0.3108	106.1700	0.0140	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.8567	1.8801	4.2122	86.1700	0.0100	0.0057	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isooctane									114.2200	0.0400	0.0000	114.22	
Isopropyl benzene						0.0855	0.0469	0.1490	120.2000	0.0050	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Toluene						0.5332	0.3233	0.8478	92.1300	0.0700	0.0074	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.9633	8.8718	8.8759	65.6132	0.7456	0.9766	89.36	
Xylene (-m)						0.1552	0.0883	0.2617	106.1700	0.0700	0.0022	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)

Artesia TK-50 - Vertical Fixed Roof Tank

Annual Emission Calcaulations	
Standing Losses (lb):	8,380.1674
Vapor Space Volume (cu ft):	1,087.8992
Vapor Density (lb/cu ft):	0.0804

Vapor Space Expansion Factor:	0.8621
Vented Vapor Saturation Factor:	0.3044
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,087.8992
Tank Diameter (ft):	15.0000
Vapor Space Outage (ft):	6.1563
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	10.0000
Roof Outage (ft):	0.1563
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1563
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	7.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0804
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.0037
Daily Avg. Liquid Surface Temp. (deg. R):	535.6432
Daily Average Ambient Temp. (deg. F):	60.8167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	524.8267
Tank Paint Solar Absorptance (Shell):	0.8900
Tank Paint Solar Absorptance (Roof):	0.8900
Daily Total Solar Insulation Factor (Btu/sqft day):	1,810.0000
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.8621
Daily Vapor Temperature Range (deg. R):	66.5852
Daily Vapor Pressure Range (psia):	4.2857
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.0037
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.1184
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	9.4041
Daily Avg. Liquid Surface Temp. (deg R):	535.6432
Daily Min. Liquid Surface Temp. (deg R):	518.9969
Daily Max. Liquid Surface Temp. (deg R):	552.2895
Daily Ambient Temp. Range (deg. R):	29.8333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3044
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	7.0037
Vapor Space Outage (ft):	6.1563
Working Losses (lb):	11,605.9410
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.0037
Annual Net Throughput (gal/yr.):	2,520,000.0000
Annual Turnovers:	119.1448
Turnover Factor:	0.4185
Maximum Liquid Volume (gal):	21,150.7406
Maximum Liquid Height (ft):	16.0000
Tank Diameter (ft):	15.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	19,986.1084

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

Emissions Report for: Annual

Artesia TK-50 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	11,605.94	8,380.17	19,986.11
Hexane (-n)	65.99	47.65	113.63
Benzene	74.42	53.74	128.15
Isooctane	0.00	0.00	0.00
Toluene	86.21	62.25	148.46
Ethylbenzene	5.99	4.33	10.32
Xylene (-m)	25.10	18.12	43.22
Isopropyl benzene	0.99	0.71	1.70
1,2,4-Trimethylbenzene	2.18	1.58	3.76
Cyclohexane	10.19	7.36	17.55
Unidentified Components	11,334.87	8,184.44	19,519.31

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

Identification

User Identification:	Artesia Gas Plant TK-C
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	30,000 gallon horizontal tank with blanket gas

Tank Dimensions

Shell Length (ft):	46.80
Diameter (ft):	13.00
Volume (gallons):	30,000.00
Turnovers:	231.00
Net Throughput(gal/yr):	6,930,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

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

Meterological Data used in Emissions Calculations: Roswell, New Mexico (Avg Atmospheric Pressure = 12.73 psia)

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

Artesia Gas Plant TK-C - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 10)	All	69.79	57.58	82.00	63.06	6.2483	4.9470	7.8093	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0300	0.0185	0.0471	120.1900	0.0250	0.0002	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5229	1.0917	2.0864	78.1100	0.0180	0.0061	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.5701	1.1342	2.1356	84.1600	0.0024	0.0008	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1514	0.0997	0.2246	106.1700	0.0140	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4547	1.7961	3.2991	86.1700	0.0100	0.0055	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isooctane									114.2200	0.0400	0.0000	114.22	
Isopropyl benzene						0.0688	0.0439	0.1051	120.2000	0.0050	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Toluene						0.4448	0.3060	0.6333	92.1300	0.0700	0.0069	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.0042	7.9473	7.9511	65.6364	0.7456	0.9779	89.36	
Xylene (-m)						0.1265	0.0830	0.1884	106.1700	0.0700	0.0020	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)

Artesia Gas Plant TK-C - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	17,440.3654
Vapor Space Volume (cu ft):	3,956.6058
Vapor Density (lb/cu ft):	0.0726
Vapor Space Expansion Factor:	0.5245
Vented Vapor Saturation Factor:	0.3172
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	3,956.6058
Tank Diameter (ft):	13.0000
Effective Diameter (ft):	27.8394
Vapor Space Outage (ft):	6.5000
Tank Shell Length (ft):	46.8000
Vapor Density	

Vapor Density (lb/cu ft):	0.0726
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.2483
Daily Avg. Liquid Surface Temp. (deg. R):	529.4625
Daily Average Ambient Temp. (deg. F):	60.8167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	522.7267
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,810.0000
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.5245
Daily Vapor Temperature Range (deg. R):	48.8472
Daily Vapor Pressure Range (psia):	2.8623
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.2483
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.9470
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.8093
Daily Avg. Liquid Surface Temp. (deg R):	529.4625
Daily Min. Liquid Surface Temp. (deg R):	517.2507
Daily Max. Liquid Surface Temp. (deg R):	541.6743
Daily Ambient Temp. Range (deg. R):	29.8333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3172
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.2483
Vapor Space Outage (ft):	6.5000
Working Losses (lb):	20,177.4899
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.2483
Annual Net Throughput (gal/yr.):	6,930,000.0000
Annual Turnovers:	231.0000
Turnover Factor:	0.2965
Tank Diameter (ft):	13.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	37,617.8553

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

Emissions Report for: Annual

Artesia Gas Plant TK-C - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	20,177.49	17,440.37	37,617.86
Hexane (-n)	110.50	95.51	206.01
Benzene	123.40	106.66	230.06
Isooctane	0.00	0.00	0.00
Toluene	140.15	121.14	261.29
Ethylbenzene	9.54	8.25	17.79
Xylene (-m)	39.86	34.46	74.32
Isopropyl benzene	1.55	1.34	2.89
1,2,4-Trimethylbenzene	3.37	2.92	6.29
Cyclohexane	16.96	14.66	31.62
Unidentified Components	19,732.16	17,055.44	36,787.60

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

Identification

User Identification:	Artesia GT-1
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	Gunbarrel tank 400 bbl

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	19.90
Avg. Liquid Height (ft):	9.93
Volume (gallons):	16,835.99
Turnovers:	174.63
Net Throughput(gal/yr):	2,940,000.00
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

Meterological Data used in Emissions Calculations: Roswell, New Mexico (Avg Atmospheric Pressure = 12.73 psia)

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

Artesia GT-1 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 10)	All	72.26	58.28	86.25	63.90	6.5422	5.0150	8.4192	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0329	0.0191	0.0549	120.1900	0.0250	0.0002	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.6255	1.1132	2.3184	78.1100	0.0180	0.0062	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.6733	1.1560	2.3675	84.1600	0.0024	0.0009	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1643	0.1022	0.2562	106.1700	0.0140	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.6096	1.8293	3.6427	86.1700	0.0100	0.0056	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isooctane									114.2200	0.0400	0.0000	114.22	
Isopropyl benzene						0.0751	0.0451	0.1211	120.2000	0.0050	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Toluene						0.4785	0.3128	0.7128	92.1300	0.0700	0.0071	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.3776	8.3080	8.3120	65.6272	0.7456	0.9774	89.36	
Xylene (-m)						0.1374	0.0850	0.2153	106.1700	0.0700	0.0020	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)

Artesia GT-1 - Vertical Fixed Roof Tank

Annual Emission Calcaulations	
Standing Losses (lb):	4,531.5455
Vapor Space Volume (cu ft):	1,153.0273
Vapor Density (lb/cu ft):	0.0756

Vapor Space Expansion Factor:	0.6455
Vented Vapor Saturation Factor:	0.2205
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,153.0273
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	10.1950
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	9.9300
Roof Outage (ft):	0.1250
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1250
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0756
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.5422
Daily Avg. Liquid Surface Temp. (deg. R):	531.9348
Daily Average Ambient Temp. (deg. F):	60.8167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	523.5667
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,810.0000
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.6455
Daily Vapor Temperature Range (deg. R):	55.9424
Daily Vapor Pressure Range (psia):	3.4042
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.5422
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.0150
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	8.4192
Daily Avg. Liquid Surface Temp. (deg R):	531.9348
Daily Min. Liquid Surface Temp. (deg R):	517.9492
Daily Max. Liquid Surface Temp. (deg R):	545.9204
Daily Ambient Temp. Range (deg. R):	29.8333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2205
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.5422
Vapor Space Outage (ft):	10.1950
Working Losses (lb):	10,230.0823
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.5422
Annual Net Throughput (gal/yr.):	2,940,000.0000
Annual Turnovers:	174.6259
Turnover Factor:	0.3385
Maximum Liquid Volume (gal):	16,835.9895
Maximum Liquid Height (ft):	19.9000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	14,761.6277

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

Emissions Report for: Annual

Artesia GT-1 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	10,230.08	4,531.55	14,761.63
Hexane (-n)	56.88	25.20	82.08
Benzene	63.77	28.25	92.02
Isooctane	0.00	0.00	0.00
Toluene	73.01	32.34	105.35
Ethylbenzene	5.01	2.22	7.23
Xylene (-m)	20.96	9.29	30.25
Isopropyl benzene	0.82	0.36	1.18
1,2,4-Trimethylbenzene	1.79	0.79	2.59
Cyclohexane	8.75	3.88	12.63
Unidentified Components	9,999.07	4,429.22	14,428.29

MOBILE ANALYTICAL LABS, INC.

P.O. BOX 69210
ODESSA, TEXAS 79769

GAS EXTENDED ANALYSIS

08/22/12 LAB # 12831

DCP MIDSTREAM
ARTESIA PLANT
HP INLET GAS
STATION NO. 04077-00

	MOL %	GPM
HYDROGEN SULFIDE	0.7499	0.000
NITROGEN	1.3733	0.000
METHANE	79.8997	0.000
CARBON DIOXIDE	0.8166	0.000
ETHANE	9.9094	2.644
PROPANE	4.3837	1.205
ISO-BUTANE	0.5636	0.184
N-BUTANE	1.2066	0.380
ISO-PENTANE	0.3046	0.111
N-PENTANE	0.2927	0.106
NEOHEXANE	0.0061	0.003
CYCLOPENTANE	0.0264	0.011
2-METHYLPENTANE	0.0644	0.027
3-METHYLPENTANE	0.0368	0.015
N-HEXANE	0.0764	0.031
METHYLCYCLOPENTANE	0.0405	0.014
BENZENE	0.0244	0.007
CYCLOHEXANE	0.0439	0.015
2-METHYLHEXANE	0.0153	0.007
3-METHYLHEXANE	0.0169	0.008
DIMETHYLCYCLOPENTANES	0.0213	0.009
N-HEPTANE	0.0226	0.010
METHYLCYCLOHEXANE	0.0380	0.015
TRIMETHYLCYCLOPENTANES	0.0023	0.001
TOLUENE	0.0158	0.005
2-METHYLHEPTANE	0.0112	0.006
3-METHYLHEPTANE	0.0038	0.002
DIMETHYLCYCLOHEXANES	0.0085	0.004
N-OCTANE	0.0054	0.003
ETHYL BENZENE	0.0010	0.000
M&P-XYLENES	0.0045	0.002
O-XYLENE	0.0008	0.000
C9 NAPHTHENES	0.0038	0.002
C9 PARAFFINS	0.0062	0.003
N-NONANE	0.0012	0.001
N-DECANE	0.0005	0.000
UNDECANE PLUS	0.0019	0.001
TOTALS	100.0000	4.832

SPECIFIC GRAVITY	0.715
GROSS DRY BTU/CU.FT.	1203.9
GROSS WET BTU/CU.FT.	1183.3
TOTAL MOL. WT.	20.647
MOL. WT. C6+	91.401
SP. GRAVITY C6+	3.582
MOL. WT. C7+	103.806
SP. GRAVITY C7+	4.385

BASIS: 14.65 PSIA @ 60 °F

NOTES:
SAMPLED 08/21/12 BY: SR
795 PSIG @ 98 °F
H2S = 7499 PPM
CYLINDER NO. 622
SPOT
ATMOS. TEMP. 88 °F
ATMOS. PRESS. 26.31 in. Hg

DISTRIBUTION
MS. DENA RAGSDALE

DCP Midstream, LP - Artesia Gas Plant

Emergency Wet Gas Flare

Emergency Wet Gas Flare Analysis

		Mol %											
Name	Date	Carbon Dioxide	Nitrogen	Methane	Ethane	Propane	iso-Butane	n-Butane	iso-Pentane	n-Pentane	Hexane	Hydrogen Sulfide	Oxygen
ARTESIA PLT 5# FLARE*	7/1/2012 12:00 AM	1.0534	1.7683	71.6031	12.2486	6.6464	0.9775	2.4062	0.7272	0.7169	1.438	0.4144	0

Used in calculation for Flare, Unit 22

DCP Midstream, LP - Artesia Gas Plant

Emergency Acid Gas Flare

Emergency Acid Gas Flare Analysis

		Mol %											
Name	Date	Carbon Dioxide	Nitrogen	Methane	Ethane	Propane	iso-Butane	n-Butane	iso-Pentane	n-Pentane	Hexane	Hydrogen Sulfide	Oxygen
ARTESIA ACID GAS FLARE*	7/1/2012 12:00 AM	62.507	0.0315	0.3439	0.0227	0.0006	0.0013	0.0001	0	0	0.0022	37.0907	0

Used in calculation for acid gas flare , Unit 23

Table 4-10. "Generic" Upstream Gas Composition

Gas Component	Raw or Produced Gas Composition [a] Volume (or mole) %	Gas Processing Plant Gas Composition [b] Volume (or mole) %
CH_4	80	91.9
Non-methane hydrocarbon	15 (C_2H_6) 5 (C_3H_8)	6.84 (MW unspecified)
N_2	-	0.68
CO_2	-	0.58

Footnotes and Sources:
[a] CAPP. *Calculating Greenhouse Gas Emissions*, Guide, 2003-003, Section 1.7.3, April 2003. More detailed speciation profiles can be found in *A National Inventory of Greenhouse Gas (GHG), Criteria Air Contaminant (CAC) and Hydrogen Sulfide (H_2S) Emissions by the Upstream Oil and Gas Industry*, *Volume 3: Methodology for Greenhouse Gases*. (CAPP, 2004)
[b] IPCC. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Volume 2, Chapter 4 (Fugitive Emissions), Table 4.2.4, 2006 Revised November 2008.

If the volume of hydrocarbons at the flare outlet is known, Equation 4-14 can be used to calculate CO_2 emissions:

$$E_{CO_2} = \left(HC \times CF_{HC} \times \frac{FE}{1\text{-}FE} \times \frac{44}{12} \right) + M_{CO_2} \qquad \text{(Equation 4-14)}$$

where

E_{CO_2} = CO_2 mass emission rate;
HC = flare hydrocarbon mass emission rate (from the flare);
CF_{HC} = carbon weight fraction in hydrocarbon;
FE = flare destruction efficiency;
44/12 = C to CO_2 conversion factor; and
M_{CO_2} = mass of CO_2 in flared stream based on CO_2 composition of the stream.

If measured emissions data are unavailable, CO_2 emissions from flares are based on an estimated 98% combustion efficiency for the conversion of the flare gas carbon to CO_2, as shown in Equation 4-15. This is consistent with published flare emission factors (E&P Forum, 1994), control device performance, and results from the more recent flare studies.

$$E_{CO_2} = \frac{\text{Volume}}{\text{flared}} \times \frac{\text{Molar volume}}{\text{conversion}} \times \text{MW } CO_2 \times \frac{\text{mass}}{\text{conversion}} \times$$

$$\left[\sum \left(\frac{\text{mole Hydrocarbon}}{\text{mole gas}} \times \frac{A \text{ mole C}}{\text{mole Hydrocarbon}} \times \frac{0.98 \text{ mole } CO_2 \text{ formed}}{\text{mole C combusted}} \right) + \frac{B \text{ mole } CO_2}{\text{mole gas}} \right]$$

(Equation 4-15)

where

Molar volume conversion = conversion from molar volume to mass (379.3 scf/lbmole or 23.685 m^3/kgmole);
MW CO_2 = CO_2 molecular weight;
Mass conversion = tonnes/2204.62lb or tonne/1000 kg;
A = the number of moles of Carbon for the particular hydrocarbon; and
B = the moles of CO_2 present in the flared gas stream.

Note that in both Equations 4-14 and 4-15, CO_2 present in the stream to the flare is emitted directly as CO_2. Neither the destruction efficiency nor the conversion of flare gas carbon to CO_2 apply to the CO_2 already contained in the flared stream.

For CH_4 emissions from flares, general industry practice assumes 0.5% residual, unburned CH_4 remaining in the flared gas for well designed and operated flares, such as in refineries. For production flares, where greater operational variability exists, CH_4 emissions may be based on an assumed value of 2% noncombusted. These recommendations are supported by published flare emission factors (EIIP Volume II, Table 10.2-1, September 1999) and endorsed by IPCC (IPCC, Volume 2, Chapter 4, 2006).[7] In the natural gas transmission, storage, and distribution sectors, flares are assumed to be similar to production flares (INGAA, Section 2.4, 2005).

The general equation for CH_4 emissions from flares is:

$$E_{CH_4} = V \times CH_4 \text{ Mole fraction} \times \% \text{ residual } CH_4 \times \frac{1}{\text{molar volume conversion}} \times MW_{CH_4}$$

(Equation 4-16)

where

E_{CH_4} = emissions of CH_4 (lb);
V = volume Flared (scf);
% residual CH_4 = noncombusted fraction of flared stream (default =0.5% or 2%);
Molar volume conversion = conversion from molar volume to mass, (379.3 scf/lbmole or 23.685 m^3/kgmole); and
MW CH_4 = CH_4 molecular weight.

Very little information is available for N_2O emissions from petroleum industry flares, but these emissions are likely negligible compared to CO_2 emissions from flares. Equation 4-17 provides a simple emission factor approach, based on N_2O emission factors provided in Tables 4-11 and 4-12 (IPCC, 2007). Factors provided in Table 4-11 should be applied to systems designed, operated and maintained to North American/Western European standards; Table 4-12 applies to systems in

[7] The revised IPCC methodology (IPCC, 2006) cites the API *Compendium* (API, 2004) as the reference for the 98% combustion efficiency of flared natural gas (IPCC, 2006, Volume 2, Chapter 4).

developing countries and countries with economies in transition. IPCC also provides CO_2 and CH_4 emission factors for the same flare sources.[8] These flare emission factors are based on the volume of production or throughput for different types of petroleum operations and are provided as an alternative to using the generic gas compositions from Table 4-10.

$$E_{N_2O} = V \times EF_{N_2O} \qquad \text{(Equation 4-17)}$$

where

E_{N_2O} = emissions of N_2O;
V = volume produced or refined (m^3, scf, or bb); and
EF_{N_2O} = N_2O emission factor.

[8] The refinery CH_4 flare emission factor is from Annex 3 of the EPA report, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* (EPA, 2009).

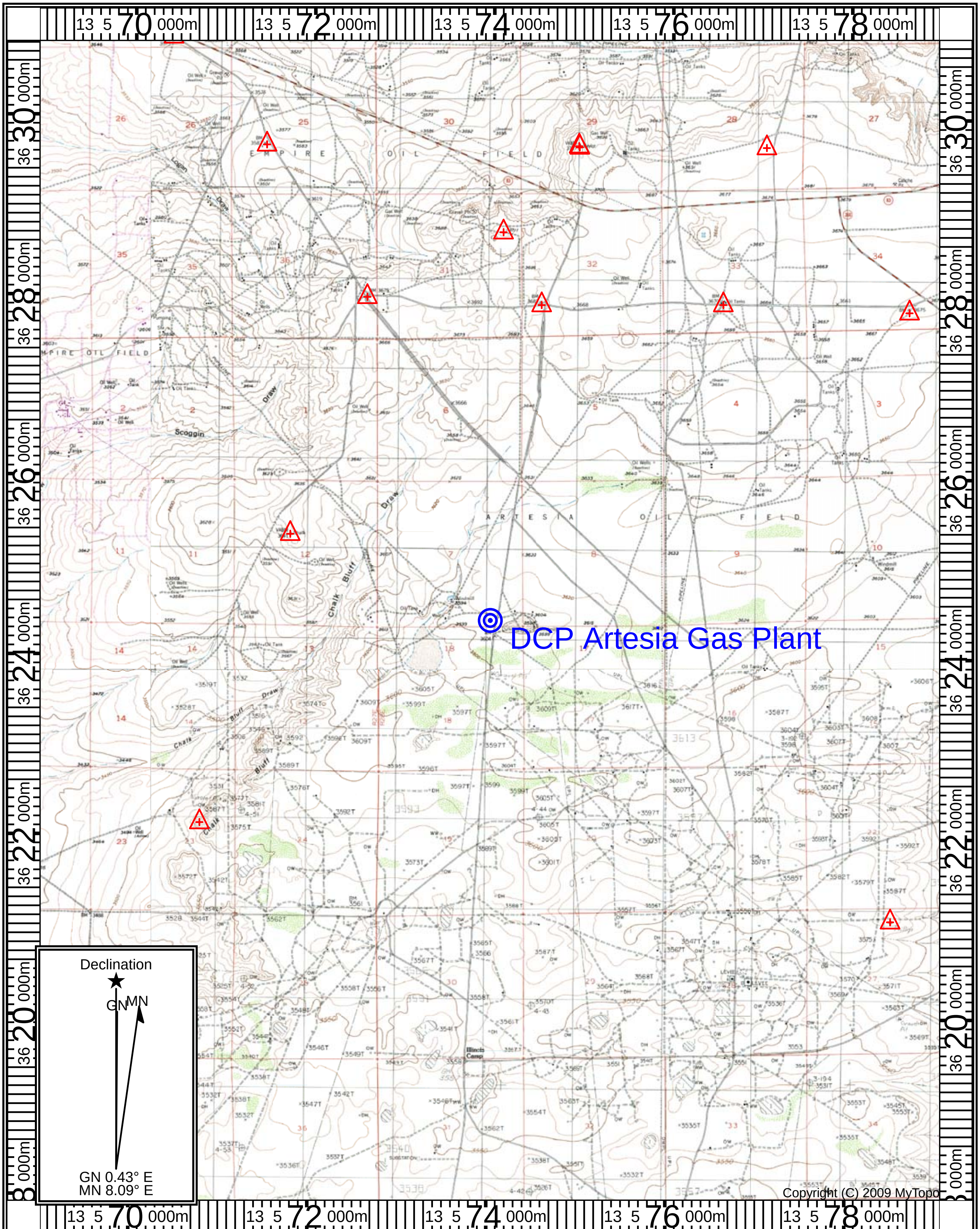
Section 8

Map(s)

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	

A map is attached.



Map Name: RED LAKE
Print Date: 09/25/12
Scale: 1 inch = 4,761 ft.
Map Center: 13 0573994 E 3624409 N
Horizontal Datum: WGS84

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")

☑ **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.

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.

N/A – Public Notice is not required for applications being submitted under 20.2.70 NMAC.

Section 10

Written Description of the Routine Operations of the Facility

---

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.

DCP's Artesia Gas Plant is a natural gas processing plant that sweetens and recovers liquids from sour natural gas. Artesia has a permitted throughput of 90 MMscf of natural gas per day.

As shown on the block flow diagram in Section 4, there are two types of sour natural gas sources entering the Artesia Plant: low pressure (LP) and high pressure (HP). Liquids are separated from the field gas and sent to a slop oil tank. The liquids are then further separated in the tank. Subsequently, the oil is sent to a storage tank and the water to the disposal system. The liquids from the HP receiver are routed to the existing stabilizer system. This stabilizer system consists of a feed tank for primary separation of water, hydrocarbon condensate, and gas, a stabilizer that heats the hydrocarbon liquid to reduce the vapor pressure of the liquid, and associated equipment. The stabilized condensate is then sent to storage (TK-C). Unit TK-C is a condensate storage tank with blanket gas. Residue gas is used as blanket gas within the tank because it creates an anaerobic environment within the system while at the same time not allowing for the formation of working and breathing emissions. The blanket gas is then combusted by the wet flare, unit 22. Water from the feed tank is routed to the disposal system and gas is routed to the low-pressure receiver. There are two 500 bbl offload tanks (TK-48 and 49), one free water knockout, one heater treater, and one 500 bbl sales tank (TK-50) to remove water from field liquids. The condensate from these tanks is hauled out by trucks, and these unpaved haul road emissions are accounted for under unit Haul 1. The crude oil is removed from the facility by trucks. The combined low-pressure inlet gas is then compressed to high pressure using compressor Unit 25, 26, 30-34, or 39. Utilities for the compression include jacket cooling water and lube oil storage.

The compressed gas is then combined with the high-pressure inlet gas from the HP receiver system and sent to the amine system for sweetening. An inlet coalescer removes liquids. The sweetening process occurs in the high-pressure contactor and uses an amine/water solution whose primary component is methydicthanol amine (MDEA) for removal of hydrogen sulfide and carbon dioxide from the gas. The rich amine is then regenerated using steam heat from the steam boilers (EU 20 and 28). Boiler treatment chemicals used in the steam system are stored in auxiliary storage tanks.

The regenerated or lean amine is then pumped back to the contactor vessel for continued sweetening of the gas. This project consolidates all treating in the high-pressure contactor for improved efficiency and process simplification, removing the low-pressure contactor and associated equipment from service. The MDEA supply for the amine system is stored in TK-12.

There are two gas streams out of the amine regeneration system. The first is the flash gas, which is a sour hydrocarbon gas stream. This stream is routed back to the LP receiver for recompression. The second gas stream is the acid gas product consisting of hydrogen sulfide, carbon dioxide, some hydrocarbons, and water. The acid gas enters the acid gas injection (AGI) system where it is compressed to reservoir pressure and injected back into the Devonian formation. SO_2 emissions from the AGI are essentially zero except during shutdowns of the acid gas injection system. During these periods the acid gas is flared (Unit 23).

The overhead gas from the high-pressure contactor is sweet gas. The sweet gas is next dehydrated in two process steps. The first step uses contact with triethylene glycol (TEG) in a contactor vessel to remove the bulk of the water. The pressure on the rich TEG from the contactor is reduced and flash gas evolving from the TEG flash tank is returned to low-pressure compression. The rich TEG is then regenerated with steam heat, the water vapor driven off, and the regenerated or lean TEG is then pumped back to the glycol contactor. The steam from the TEG regenerator, which contains various hydrocarbons including BTEX, is compressed in a vapor recovery unit and returned to low-pressure compression.

The second dehydration step uses molecular sieve to remove the rest of the water. The system has three process vessels containing molecular sieves. One vessel is on-line removing water from the gas in an adsorption process; while the second vessel is off-line being thermally regenerated with hot gas to remove water. The third molecular sieve vessel is available so that two vessels can be on-line drying the gas while the third is being regenerated. The regeneration gas is heated in the regeneration gas heater (Unit 19). A filter-coalescer removes entrained liquids upstream of the molecular sieve system. A gas cooler uses cooling water from the plant's remaining cooling water system to cool the gas. Gas leaving the mol sieve dehydrator will enter the glycol dehydrator (Unit Dehy-2). The gas leaving the glycol dehydrator will then be routed to the residue sales line.

The dry gas is then further cooled in the expander plant for recovery of natural gas liquids (NGL). The process was reconfigured in an enhanced Gas Subcooled Process (GSP) modification to replace two expander-compressors with a single larger unit. The GSP process previously added two new heat exchangers, an absorber column, and absorber column pumps. NGL from the expander plant is pumped to storage (TK-31, 32, 33, and 34).

Some of the gas chilling in the expander process is provided by a propane refrigeration system. This system uses two engine-driven refrigeration compressors (Units 10 and 11) for energy to reject heat from the process. Propane for the refrigeration system is stored on-site (Units TK-35 and 36). The remaining natural gas or residue gas is reheated in the expander process and sent to the recompression system. The gas is compressed back to high pressure by recompression units, which are engine-driven units (existing Units 12-17 and 27). A portion of the residue gas is used as regeneration gas in the molecular sieve system and then returned to the residue system. Some of the residue gas is used as fuel for the compressor engines and heaters.

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)**: Refer to Table 2-A**

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)

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.

A. This facility is:

- ☐ **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☑ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

B. **This facility [is or is not] one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions** for this modification are **[significant or not significant]. [Discuss why.] The "project" emissions listed below [do or do not] only result from changes described in this permit application, thus no emissions from other [revisions or modifications, past or future] to this facility. Also, specifically discuss whether this project results in "de-bottlenecking", or other associated emissions resulting in higher emissions. The project emissions (before netting) for this project are as follows [see Table 2 in 20.2.74.502 NMAC for a complete list of significance levels]:**

a. **NOx: XX.X TPY**
b. **CO: XX.X TPY**
c. **VOC: XX.X TPY**
d. **SOx: XX.X TPY**
e. **PM: XX.X TPY**
f. **PM10: XX.X TPY**
g. **PM2.5: XX.X TPY**
h. **Fluorides: XX.X TPY**
i. **Lead: XX.X TPY**
j. **Sulfur compounds (listed in Table 2): XX.X TPY**
k. **GHG: XX.X TPY**

C. **Netting [is required, and analysis is attached to this document.] OR [is not required (project is not significant)] OR [Applicant is submitting a PSD Major Modification and chooses not to net.]**

D. **BACT** is **[not required for this modification, as this application is a minor modification.] OR [required, as this application is a major modification. List pollutants subject to BACT review and provide a full top down BACT determination.]**

E. If this is an existing PSD major source, or any facility with emissions greater than 250 TPY (or 100 TPY for 20.2.74.501 Table 1 – PSD Source Categories), determine whether any permit modifications are related, or could be considered a single project with this action, and provide an explanation for your determination whether a PSD modification is triggered.

N/A – This application is being submitted under 20.2.70 NMAC.

Section 13

Determination of State & Federal Air Quality Regulations

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

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

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

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

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

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

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

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

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

Table for STATE REGULATIONS:

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	Artesia Gas Plant operates under P095-R3 and therefore this regulation applies.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	20.2.3 NMAC is a SIP approved regulation that limits the maximum allowable concentration of Total Suspended Particulates, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide.
20.2.7 NMAC	Excess Emissions	Yes	Facility	This regulation establishes requirements for the facility if operations at the facility result in any excess emissions. The owner or operator will operate the source at the facility having an excess emission, to the extent practicable, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions. The facility will also notify the NMED of any excess emission per 20.2.7.110 NMAC.
20.2.23 NMAC	Fugitive Dust Control	No	Facility	This regulation does not apply as this application is submitted under 20.2.70 NMAC and therefore exempt of this requirement. Sources exempt from 20.2.23 NMAC are activities and facilities subject to a permit issued pursuant to the NM Air Quality Control Act, the Mining Act, or the Surface Mining Act (20.2.23.108.B NMAC.
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	No	N/A	This facility does not have existing gas burning equipment having a heat input of greater than 1,000,000 million British Thermal Units per year per unit. The facility is not subject to this regulation and does not have emission sources that meet the applicability requirements under 20.2.33.108 NMAC.
20.2.34 NMAC	Oil Burning Equipment: NO_2	No	N/A	This facility does not have oil burning equipment having a heat input of greater than 1,000,000 million British Thermal Units per year per unit. The facility is not subject to this regulation and does not have emission sources that meet the applicability requirements under 20.2.34.108 NMAC.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	Yes	Facility	This facility is subject to the requirements of NMAC 20.2.35 for "Existing Natural Gas Processing Plants" though parts of the plant for which a modification commenced on or after July 1, 1974 may be "new".
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	Yes	Facility	This facility is subject to the requirements of NMAC 20.2.37 for "Existing Natural Gas Processing Plants" though parts of the plant for which a modification commenced on or after July 1, 1974 may be "new".
20.2.38 NMAC	Hydrocarbon Storage Facility	Yes	TK-48, TK-49, TK-50	The purpose of this regulation is to minimize hydrogen sulfide emissions from hydrocarbon storage facilities. Tanks TK-48, TK-49, and TK-50 meet the capacity and throughput requirements of this regulation and are therefore subject. These units comply by controlling emissions with a VRU. TK-C has a capacity of 12,600 gallons which does not meet the 20,000 gallon capacity threshold and is therefore not subject to this regulation.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	This regulation establishes sulfur emission standards for sulfur recovery plants which are not part of petroleum or natural gas processing facilities. This regulation does not apply to the facility because Artesia Gas Plant does not have a sulfur recovery plant.
20.2.61.109 NMAC	Smoke & Visible Emissions	No	N/A	This regulation establishes controls on smoke and visible emissions from certain sources, including stationary combustion equipment. Stationary combustion equipment at the facility is regulated by 20.2.37 NMAC. In accordance with 20.2.61.109, sources regulated by 20.2.37 are exempted from this regulation.
20.2.70 NMAC	Operating Permits	Yes	Facility	This regulation establishes requirements for obtaining an operating permit. Artesia is a Title V major source of NOx, CO, VOC, and SO2. The facility operates under Title V permit P095-R3.

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.71 NMAC	Operating Permit Fees	Yes	Facility	This regulation establishes a schedule of operating permit emission fees. The facility is subject to 20.2.70 NMAC and is therefore subject to requirements of this regulation.
20.2.72 NMAC	Construction Permits	Yes	Facility	This regulation establishes the requirements for obtaining a construction permit. The facility is a stationary source that has potential emission rates great than 10 pounds per hour or 25 tons per year of any regulated air contaminant for which there is a National or New Mexico Air Quality Standard. The facility has a construction permit (NSR Permit) 0434-M10-R2 to meet the requirements of this regulation.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	This regulation establishes emission inventory requirements. The facility meets the applicability requirements of 20.2.73.300 NMAC. The facility will meet all applicable reporting requirements under 20.2.73.300.B.1 NMAC.
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	Yes	Facility	This regulation establishes requirements for obtaining a PSD permit. This facility is a major source for PSD purposes and is in compliance with the applicable requirements of this regulation.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This regulation establishes the guidelines and requirements for construction permitting fees. This facility is subject to this regulation per 20.2.75.10.A, and will be required to submit a 500 dollar permit filing fee.
20.2.77 NMAC	New Source Performance	Yes	Units subject to 40 CFR 60	These units are stationary sources which are subject to the requirements of 40 CFR Part 60, as amended through September 23, 2013.
20.2.78 NMAC	Emission Standards for HAPS	No	Units Subject to 40 CFR 61	This regulation applies to all sources subject to a 40 CFR 60 regulation, as amended through December 31, 2010. Although this standard does not apply to this facility under routine operating conditions, in the case of asbestos demolition, Subpart M would apply.
20.2.79 NMAC	Permits – Nonattainment Areas	No	Facility	This regulation establishes the requirements for obtaining a nonattainment area permit. The facility is not located in a non-attainment area and therefore is not subject to this regulation.
20.2.80 NMAC	Stack Heights	No	N/A	This regulation establishes requirements for the evaluation of stack heights and other dispersion techniques. This regulation does not apply as all stacks at the facility follow good engineering practice.
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	Units Subject to 40 CFR 63	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63, as amended through August 29, 2013. MACT Subparts HH and ZZZZ apply.

Table for Applicable FEDERAL REGULATIONS:

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	NAAQS	Yes	Facility	This regulation defines national ambient air quality standards. The facility meets all applicable national ambient air quality standards for NOx, CO, SO2, H2S, PM10, and PM2.5 under this regulation.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	31, 32, 38, TK-48, TK-49, TK-50	This regulation defines general provisions for relevant standards that have been set under this part. This subpart applies as other NSPS subparts apply.
NSPS 40 CFR60.40a, Subpart Da	Subpart Da, Performance Standards for **Electric Utility Steam Generating Units**	No	N/A	This regulation establishes standards of performance for electric utility steam generating units. This regulation does not apply because the facility does not operate any electric utility steam generating units.
NSPS 40 CFR60.40b Subpart Db	**Electric Utility Steam Generating Units**	No	N/A	This regulation establishes standards of performance for industrial-commercial-institutional steam generating units. This regulation does not apply because the facility does not operate any industrial-commercial-institutional steam generating units.
40 CFR 60.40c, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	No	N/A	This regulation establishes standards of performance for small industrial-commercial-institutional steam generating units. This facility does not have steam-generating units and therefore this subpart does not apply.
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for **Storage Vessels for Petroleum Liquids** for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and **Prior** to July 23, 1984	No	N/A	This regulation establishes performance standards for storage vessels for petroleum liquids for which construction, reconstruction, or modification commenced after May 18, 1978, and prior to July 23, 1984. There are no petroleum liquid storage vessels which commenced construction, reconstruction, or modification after May 18, 1978, and prior to July 23, 1984. Accordingly, this regulation does not apply.
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** July 23, 1984	Yes	TK-48, TK-49, TK-50	This regulation establishes performance standards for storage vessels for volatile organic liquids for which construction, reconstruction, or modification commenced after July 23, 1984. This facility has storage vessels, TK-48, 49, and 50, each with a capacity greater than or equal to 75 cubic meters that are used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification commenced after July 23, 1984. Unit TK-C has a capacity of 48 cubic meters and is therefore not subject to the requirements of this regulation.
NSPS 40 CFR 60.330 Subpart GG	**Stationary Gas Turbines**	No	N/A	This regulation establishes standards of performance for stationary gas turbines with a heat input at a peak load equal to or greater than 10 MMBtu/hr based on the lower heating value of the fuel fired and have commenced construction, modification, or reconstruction after October 3, 1977. This regulation is not applicable as this facility does not have any stationary gas turbines.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
NSPS 40 CFR 60, Subpart KKK	Leaks of VOC from **Onshore Gas Plants**	Yes	38 (FUG-1)	This regulation defines standards of performance for equipment leaks of VOC emissions from onshore natural gas processing plants for which construction, reconstruction, or modification commenced after January 20, 1984, and on or before August 23, 2011. Any affected facility under paragraph (a) of this section that commences construction, reconstruction, or modification after January 20, 1984, is subject to the requirements of this subpart. 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 is an affected facility. 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.
NSPS 40 CFR Part 60 Subpart LLL	Standards of Performance for **Onshore Natural Gas Processing**: SO_2 Emissions	No	N/A	This regulation establishes standards of performance for SO_2 emissions from onshore natural gas processing for which construction, reconstruction, or modification of the amine sweetening unit commenced after January 20, 1984 and on or before August 23, 2011. This regulation is not applicable. The facility does have an affected unit (amine treater), but pursuant to 60.640(e) the provisions of this subpart do not apply as produced acid gas is completely re-injected into oil or gas bearing geologic strata via the AGI well.
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction commenced after August 23, 2011 and before September 18, 2015	No	N/A	The rule applies to “affected” facilities that are constructed, modified, or reconstructed after Aug 23, 2011 (40 CFR 60.5365): gas wells, including fractured and hydraulically refractured wells, centrifugal compressors, reciprocating compressors, pneumatic controllers, certain equipment at natural gas processing plants, sweetening units at natural gas processing plants, and storage vessels. If there is a standard or other requirement, then the facility is an “affected facility.” Currently there are standards for: gas wells (60.5375); centrifugal compressors (60.5380); reciprocating compressors (60.5385): controllers (60.5390); storage vessels (60.5395); equipment leaks (60.5400); sweetening units (60.5405). **The “affected facilities” at this facility were not constructed, modified, or reconstructed after August 23, 2011. This regulation does not apply.**
NSPS 40 CFR Part 60 Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015	No	N/A	This facility was built prior to the enactment date of this regulation.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	No	N/A	This facility does not have any IIII applicable engines.

FEDERAL REGU-LATIONS CITATION	**Title**	**Applies? Enter Yes or No**	**Unit(s) or Facility**	**JUSTIFICATION:**
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	Yes	31, 32	This regulation establishes standards of performance for stationary spark ignition combustion engines. Units 31 and 32 commenced construction after June 12, 2006 and were manufactured after January 1, 2008. Engines 39 and 10 commenced construction after June 12, 2006 but have maximum engine power less than 500 horsepower and were manufactured before July 1, 2007. These units are not subject to this regulation. All other engines at this facility are not subject to NSPS JJJJ as they commenced construction prior to June 12, 2006.
NSPS 40 CFR 60 Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units	No	N/A	N/A – this facility is not subject to this regulation.
NSPS 40 CFR 60 Subpart UUUU	Emissions Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units	No	N/A	N/A – this facility is not subject to this regulation.
NSPS 40 CFR 60, Subparts WWW, XXX, Cc, and Cf	Standards of performance for Municipal Solid Waste (MSW) Landfills	No	N/A	N/A – this facility is not subject to this regulation.
NESHAP 40 CFR 61 Subpart A	General Provisions	No	N/A	This part applies to the owner or operator of any stationary source for which a standard is prescribed under this part. Although this regulation does not apply during normal operation, this facility could emit hazardous air pollutants which are subject to the requirements of 40 CFR Part 61 as amended through November 30, 2006. In the case of asbestos demolition, one NESHAP could apply (see Subpart M below.)
NESHAP 40 CFR 61 Subpart E	National Emission Standards for **Mercury**	No	N/A	N/A – this facility is not subject to this regulation.
NESHAP 40 CFR 61 Subpart V	National Emission Standards for **Equipment Leaks** (Fugitive Emission Sources)	No	N/A	The provisions of this subpart apply to each of the following sources that are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart. VHAP service means a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight of VHAP. VHAP means a substance regulated under this subpart for which a standard for equipment leaks of the substance has been promulgated. Benzene is a VHAP (See 40 CFR 61 Subpart J). Artesia does not have equipment in VHAP service as determined according to the provisions of §61.245(d).
MACT 40 CFR 63, Subpart A	General Provisions	Yes	Dehy, Dehy-2, 10-17, 25-27, 30-34, 39	This regulation defines general provisions for relevant standards that have been set under this part. This regulation applies as MACT Subparts HH and ZZZZ apply.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
MACT 40 CFR 63.760 Subpart HH	**Oil and Natural Gas Production Facilities**	Yes	Dehy, Dehy-2	The glycol dehydrator (unit Dehy) at the Artesia Plant is a closed system with flash and regeneration gases routed to inlet compression for recycling thus meeting the requirements of this part. The ancillary equipment associated with this unit are subject to NSPS KKK and have no requirements under subpart HH. The glycol dehydrator (unit Dehy-2) that was added to the facility is a closed system and has a condenser and reboiler associated with the unit. Gas that is leaving the mol sieve dehydrator will enter the glycol dehydrator. Gas leaving the dehydrator will be routed to the residue gas line.
MACT 40 CFR 63 Subpart HHH	**Oil and Natural Gas Production Facilities**	No	N/A	This regulation establishes national emission standards for hazardous air pollutants from natural gas transmission and storage facilities. This regulation does not apply because this facility is not a natural gas transmission or storage facility as defined in this regulation [40 CFR Part 63.1270(a)]. This facility is also not a major source of HAPs.
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	Yes	10-17, 25-27, 30-34, 39	This regulation defines national emissions standards for HAPs for stationary reciprocating Internal Combustion Engines. Units 10, 31, 32, and 39 are new units at an area source of HAPs and subject to MACT ZZZZ, but pursuant to 63.6590(c), have no further requirements under this part by virtue of meeting the requirements under 40 CFR 60, Subpart JJJJ (if they are subject to NSPS JJJJ). As Units 10 and 39 are not subject to NSPS JJJJ, they have no requirements under NSPS JJJJ or MACT ZZZZ. All other stationary RICE are existing units at an area source of HAPS and subject to MACT ZZZZ. Pursuant to 40 CFR 63.6595(a), these units must comply with applicable emission limitation and operating limitations no later than October 19, 2013.
40 CFR 64	**Compliance Assurance Monitoring**	Yes	AGI well, 10-17, 25-27, 39	This regulation defines compliance assurance monitoring. In general terms, a CAM-affected unit must: • Be at a major source that is required to obtain a part 70 or 71 permit; • Be subject to an emission limit for a pollutant; • Use a control device to achieve compliance with that limit; and • Have a pre-control potential to emit for that pollutant greater than major source level. This regulation is applicable as the AGI well is subject to this part and has monitoring conditions specified in Operating Permit P095-R3. Stationary RICE Units 10 through 17, 25 through 27, and 39 are CAM affected units and have monitoring conditions specified in Operating Permit P095-R3.
40 CFR 68	**Chemical Accident Prevention**	Yes	Facility	The facility is an affected facility as it has quantities of materials regulated by 40 CFR Part 68 that are in excess of the triggering threshold. The facility maintains a current RMP for these chemicals.
Title IV – Acid Rain 40 CFR 72	**Acid Rain**	No	N/A	This part establishes the acid rain program. This facility is not an acid rain source. This regulation does not apply.
Title IV – Acid Rain 40 CFR 73	**Sulfur Dioxide** Allowance Emissions	No	N/A	This regulation establishes sulfur dioxide allowance emissions for certain types of facilities. This facility is not an acid rain source. This regulation does not apply.
Title IV-Acid Rain 40 CFR 75	**Continuous Emissions Monitoring**	No	N/A	This part establishes the acid rain program. This part does not apply because the facility is not covered by this regulation.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
Title IV – Acid Rain 40 CFR 76	**Acid Rain** Nitrogen Oxides **Emission Reduction Program**	No	N/A	This regulation establishes an acid rain nitrogen oxides emission reduction program. This regulation applies to each coal-fired utility unit that is subject to an acid rain emissions limitation or reduction requirement for SO2. This part does not apply because the facility does not operate any coal-fired units [40 CFR Part 76.1].
Title VI – 40 CFR 82	Protection of **Stratospheric Ozone**	No	N/A	Not Applicable –facility does not "service", "maintain" or "repair" class I or class II appliances nor "disposes" of the appliances. Note: Disposal definition in 82.152: Disposal means the process leading to and including: (1) The discharge, deposit, dumping or placing of any discarded appliance into or on any land or water; (2) The disassembly of any appliance for discharge, deposit, dumping or placing of its discarded component parts into or on any land or water; or (3) The disassembly of any appliance for reuse of its component parts. "Major maintenance, service, or repair means" any maintenance, service, or repair that involves the removal of any or all of the following appliance components: compressor, condenser, evaporator, or auxiliary heat exchange coil; or any maintenance, service, or repair that involves uncovering an opening of more than four (4) square inches of "flow area" for more than 15 minutes.

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☑ **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.

Startup and shutdown procedures are performed according to DCP guidelines and procedures. The procedures dictate a sequence of operations designed to minimize emissions from the facility during such activities. Equipment located at the plant is equipped with various safety devices that aid in preventing excess emissions to the atmosphere in the event of an operational emergency. In addition, the plant has a closed flare system to handle the gas diverted from the normal process in the event of a major equipment malfunction that would require a significant gas release. The two flares (plant and acid gas flare) operate with a constant natural gas pilot and purge gas. If an operational emergency occurs and emission rates from the facility exceed the allowable permitted rates, DCP will notify the NMED in accordance with 20.2.7 NMAC. DCP will endeavor to repair the equipment responsible for the exceedances as quickly as possible.

Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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

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

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

The term "alternative operating scenario" is not defined by regulation. DCP understands this term to apply to a source which may routinely operate with alternative fuels or processes in such a manner as to potentially affect emissions. Based on this understanding, this facility has no alternative operating scenarios.

Units at the facility may be shut down from time to time due to factors including but not limited to market demand, maintenance, malfunctions, and emergency shutdowns. Operating in alternative modes and temporary shutdowns are not alternative operating scenarios as DCP understands the term.

Section 16

Air Dispersion Modeling

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

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

Check each box that applies:

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

Modeling is not being submitted with the application pursuant to 20.2.70 NMAC. Air dispersion modeling for this facility was last submitted with the revision application of NSR permit NSR Permit 0434-M10.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Unit No.	Test Description	Test Dates		
10	Quarterly Portable Analyzer Test	11/10/2020	2/3/2021	5/5/2021
11	Quarterly Portable Analyzer Test	11/9/2020	2/17/2021	5/4/2021
12	Quarterly Portable Analyzer Test	9/22/2020	11/9/2020	6/10/2021
13	Quarterly Portable Analyzer Test	11/9/2020	2/3/2021	5/4/2021
14	Quarterly Portable Analyzer Test	11/9/2020	2/3/2021	5/4/2021
15	Quarterly Portable Analyzer Test	11/9/2020	2/3/2021	5/4/2021
16	Quarterly Portable Analyzer Test	11/9/2020	2/3/2021	5/4/2021
17	Quarterly Portable Analyzer Test	11/9/2020	2/3/2021	5/4/2021
18	No testing required			
19	No testing required			
20	No testing required			
22	No testing required			
23	No testing required			
25	Quarterly Portable Analyzer Test	No info	No info	No info
26	Quarterly Portable Analyzer Test	OOS	OOS	OOS
27	Quarterly Portable Analyzer Test	11/9/2020	2/4/2021	6/10/2021
28	No testing required			
30	Quarterly Portable Analyzer Test	11/10/2020	2/4/2021	5/4/2021
31	Quarterly Portable Analyzer Test	11/10/2020	2/4/2021	5/5/2021
32	Quarterly Portable Analyzer Test	11/10/2020	2/4/2021	5/5/2021
33	Quarterly Portable Analyzer Test	5/20/2020	8/19/2021	11/10/2021
34	Quarterly Portable Analyzer Test	11/10/2020	2/4/2021	6/10/2021
35	No testing required			
38	No testing required			
39	Quarterly Portable Analyzer Test	11/17/2020	2/4/2021	5/5/2021
GT-1	No testing required			
TK-17	No testing required			
TK-48	No testing required			
TK-49	No testing required			
TK-50	No testing required			
Truck	No testing required			

Section 19

Requirements for Title V Program

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.

Applicable. The AGI well, Units 10-17, 25-27, and 39 are subject to this part and has monitoring conditions specified in Operating Permit P095-R3.

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.

Based on information and belief formed after reasonable inquiry, DCP believes that the Artesia Gas Plant is in compliance with each applicable requirement identified in Section 13. In the event that DCP should discover new information affecting the compliance status of the facility, DCP will make appropriate notifications and/or take corrective actions. Pursuant to Condition A109.B of Permit **P095-R3**, DCP has certified to compliance with the terms and conditions of that permit. The most recent such certification was submitted by the June 1st deadline given in P095-R3. Since that time, DCP has continued to be in compliance with applicable requirements as described in Section 13.

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 facility will continue to be in compliance with requirements for which it is in compliance at the time of this permit application and will 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.

Compliance certification will be submitted annually, as required by Title V Permit P095-R3, Condition A109.B.

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).

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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.)

No 40 CFR 82 requirements apply to this facility.

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**.

No compliance plan required.

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 original RMP plan was submitted to EPA on 02/04/2011. An update was made to the plan on 06/15/2021.

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.)

No, the facility is not located within 80 km of any states, Bernalillo, Indian Tribes, or Pueblos.

19.9 - Responsible Official

Provide the Responsible Official as defined in 20.2.70.7.AD NMAC:
Randy Deluane, Vice President-Permian
5718 Westheimer Road, Suite 1900, Houston, TX 77057
(713) 268-7488

Section 20

Other Relevant Information

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.

There is no other relevant information.

Section 22: Certification

Company Name: _DCP OPERATING COMPANY, LP_

I, __Scot Millican___________, 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 17th day of _June_, _2021__, upon my oath or affirmation, before a notary of the State of

____New Mexico___________.

Scot Millican
*Signature

6-17-21
Date

_____Scot Millican______________________
Printed Name

__SENM Asset Director____
Title

Scribed and sworn before me on this 17th day of June, 2021.

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

11th day of May, 2024.

Karli D C
Notary's Signature

6-17-21
Date

Karli D Clarkston
Notary's Printed Name

Official Seal
KARLI D. CLARKSTON
Notary Public
State of New Mexico
My Commission Expires JAN 24

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