Mail Application To: 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		**For Department use only:** 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.: 1000397453 in the amount of 500.00 USD.

■ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance program (SBEAP) and qualifies for 50% of the normal application and permit fees. Enclosed is a check for 50% of the normal application fee which will be verified with the Small Business Certification Form for your company.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance Program (SBEAP) but does not qualify for 50% of the normal application and permit fees. To see if you qualify for SBEAP assistance and for the small business certification form go to https://www.env.nm.gov/aqb/sbap/small_business_criteria.html).

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.72.219.D 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.): 198	Updating Permit/NOI #: PSD-NM-0195-M39R4
1	Facility Name: Artesia Refinery	Plant primary SIC Code (4 digits): 2911	
		Plant NAIC code (6 digits): 324110	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): 501 E. Main St., Artesia, NM 88210		
2	Plant Operator Company Name: HollyFrontier Navajo Refining LLC	Phone/Fax: (575) 748-3311	
a	Plant Operator Address: P.O. Box 159, Artesia, NM 88211-0159		

b	Plant Operator's New Mexico Corporate ID or Tax ID: Tax ID is CRS # 02-488869-00-9	
3	Plant Owner(s) name(s): HollyFrontier Navajo Refining LLC	Phone/Fax: (575) 748-3311
a	Plant Owner(s) Mailing Address(s): P.O. Box 159, Artesia, NM 88211-0159	
4	Bill To (Company): HollyFrontier Navajo Refining LLC	Phone/Fax: (575) 746-5487 / (575) 746-5451
a	Mailing Address: P.O. Box 159, Artesia, NM 88211-0159	E-mail: Alena.miro@hollyfrontier.com
5	☐ Preparer: ■ Consultant: RTP Environmental Associates, Inc.	Phone/Fax: (919) 845-1422
a	Mailing Address: 304-A West Millbrook Road, Raleigh, NC 27609	E-mail: campbell@rtpenv.com
6	Plant Operator Contact: Alena Miro	Phone/Fax: (713) 865-6825
a	Address: P.O. Box 159, Artesia, NM 88211-0159	E-mail: Alena.miro@hollyfrontier.com
7	Air Permit Contact: Alena Miro	Title: Senior Environmental Engineer
a	E-mail: Alena.Miro@HollyFrontier.com	Phone/Fax: (713) 865-6825
b	Mailing Address: P.O. Box 159, Artesia, NM 88211-0159	
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):
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-051R3
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ■ No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ■ No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ■ Yes ☐ No	If yes, the permit No. is: PSD-NM-0195-M39R4
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ■ No	If yes, the register No. is:

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: N/A	Daily: N/A	Annually: N/A
b	Proposed	Hourly: N/A	Daily: N/A	Annually: N/A
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: N/A	Daily: N/A	Annually: N/A
b	Proposed	Hourly: N/A	Daily: N/A	Annually: N/A

Section 1-D: Facility Location Information

1	Section: 9	Range: 26E	Township: 17S	County: Eddy	Elevation (ft): 3,365
2	UTM Zone: ☐ 12 or ■ 13			Datum: ■ NAD 27 ☐ NAD 83 ☐ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 557,020			UTM N (in meters, to nearest 10 meters): 3,634,010	
b	**AND** Latitude (deg., min., sec.): 32°50'33.6"			Longitude (deg., min., sec.): 104°23'26.5"	
3	Name and zip code of nearest New Mexico town: Artesia 88210				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): Refinery is within Artesia city limits				
5	The facility is 0 miles East 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: Eddy County, Chaves County, Artesia				
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:				
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): 71 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: 12 m				
12	Method(s) used to delineate the Restricted Area: Fencing, walls, and gates "**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?				

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

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

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ■ Yes ☐ No If yes, specify:		
a	If yes, NOV date or description of issue: May 1, 2020 (EPA Region 6 NOV)		NOV Tracking No:
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ■ No If Yes, provide the 1c & 1d info below:		
c	Document Title: N/A	Date:	Requirement # (or page # and paragraph #):
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: Xcel Energy 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.) Parrish R. Miller (20.2.70.300.D.2 NMAC):	Phone: (575) 748-3311
a	R.O. Title: Vice President and Refinery Manager	R.O. e-mail: Parrish.miller@hollyfrontier.com
b	R. O. Address: P.O. Box 159, Artesia, NM 88211-0159	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):	Phone:
a	A. R.O. Title:	A. R.O. e-mail:
b	A. R. O. Address:	
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): HollyFrontier Navajo Refining LLC	
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.): HollyFrontier Corporation	
a	Address of Parent Company: 2828 N. Harwood, Suite 1300, Dallas, TX 75201	
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.): Holly Energy Partners	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations: Kawika Tupou (575) 746-5487	
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: Carlsbad Caverns National Park – 71 km, Salt Creek Wilderness Area – 71 km	

Section 1-I – Submittal Requirements

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

Hard Copy Submittal Requirements:

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

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

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

Electronic files sent by (check one):

☐ CD/DVD attached to paper application

■ secure electronic transfer. Air Permit Contact Name
James Nellessen
Air Quality Bureau - Air Permit Specialist, Advanced – Major Source Permits Section
New Mexico Environment Department
525 Camino de los Marquez, Suite 1, Santa Fe NM, 87505-1816
Phone number: 505-476-4300|Fx 505476-4375|direct # 476-4347
Email Joseph.kimbrell@state.nm.us

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.

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Table 2-A: Regulated Emission Sources

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

Unit Number[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.
B-0007	Boiler 7	Todd/John Zink burners	Unknown		215 MMBtu/hr (LHV Basis)	215 MMBtu/hr (LHV Basis)		2001	N/A	B-0007	10200701	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
B-0008	Boiler 8	Todd/John Zink burners	Unknown		215 MMBtu/hr (LHV Basis)	215 MMBtu/hr (LHV Basis)		2003	N/A	B-0008	10200701	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
B-0009	Boiler 9	Babcock & Wilcox	Unknown		220 MMBtu/hr (LHV Basis)	220 MMBtu/hr (LHV Basis)		2012	N/A	B-0009	10200701	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
B-0010	Boiler 10	-	-		10 MMBtu/hr (LHV Basis)	10 MMBtu/hr (LHV Basis)			N/A	B-0010	10200701	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0009	Unit 13 Naphtha Splitter Reboiler	Zeeco burners	GSFW-12 burners		44 MMBtu/hr (LHV Basis)	44 MMBtu/hr (LHV Basis)		1970	N/A	H-0009	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0011	Unit 21 Vacuum Unit Heater	John Zink burners	HEVD-14		38 MMBtu/hr (LHV Basis)	38 MMBtu/hr (LHV Basis)		est. 1972	N/A	H-0011	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0018	Unit 06 HDS Reboiler	Zeeco burners	GSFW-8 burners		32 MMBtu/hr (LHV Basis)	32 MMBtu/hr (LHV Basis)		est. 1976	N/A	H-0018	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0019	South Crude Charge Heater	Callidus Technologies, LLC burners	CUBL-8W burners		54 MMBtu/hr (LHV Basis)	54 MMBtu/hr (LHV Basis)		2005	N/A	H-0019	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0020	South Crude Charge Heater	Callidus Technologies, LLC burners	CUBL-12W burners		90 MMBtu/hr (LHV Basis)	90 MMBtu/hr (LHV Basis)		est. 1972	N/A	H-0020	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0028	Unit 21 Heater	John Zink burners	PSFG-12 burners		12.3 MMBtu/hr (LHV Basis)	12.3 MMBtu/hr (LHV Basis)		11/1/1993	N/A	H-0028	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0030	Unit 06 Charge Heater	John Zink burners	PSFG-16R burners		42 MMBtu/hr (LHV Basis)	42 MMBtu/hr (LHV Basis)		12/19/2001	N/A	H-0030	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0040	Unit 13 Charge Heater	John Zink burners	PSFG-16 burners		42 MMBtu/hr (LHV Basis)	42 MMBtu/hr (LHV Basis)		11/1/1997	N/A	H-0040	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0303	Unit 05 Charge Heater	John Zink burners	HEVD-Q-18 burners		11 MMBtu/hr (LHV Basis)	11 MMBtu/hr (LHV Basis)		1982	N/A	H-0303	30600106	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0312	Unit 10 FCC Feed Heater	John Zink burners	VYD-18 burners		35 MMBtu/hr (LHV Basis)	35 MMBtu/hr (LHV Basis)		1990	N/A	H-0312	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0352	Unit 70 CCR Reformer Heaters (previously 70-H1)	Callidus Technologies, LLC burners	CUBL-10W burners		63 MMBtu/hr (LHV)	63 MMBtu/hr (LHV)		est. 1990	N/A	H-0352	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0353	Unit 70 CCR Reformer Heaters (previously 70-H2)	Callidus Technologies, LLC burners	CUBL-10W burners		81 MMBtu/hr (LHV)	81 MMBtu/hr (LHV)		est. 1990	N/A	H-0353	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0354	Unit 70 CCR Reformer Heaters (previously 70-H3)	Callidus Technologies, LLC burners	CUBL-10W burners		56 MMBtu/hr (LHV)	56 MMBtu/hr (LHV)		est. 1990	N/A	H-0354	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0355	Unit 70 Stabilizer Reboiler Heater (previously 70H-4)	John Zink burners	Unknown		28 MMBtu/hr (LHV Basis)	28 MMBtu/hr (LHV Basis)		8/28/1990	N/A	H-0355	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0362	Unit 70 CCR Heater	Callidus Technologies, LLC burners	CUBL-8W burners		40 MMBtu/hr (LHV)	40 MMBtu/hr (LHV)		May-2006	N/A	H-0362	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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.
H-0363	Unit 70 CCR Heater	Callidus Technologies, LLC burners	CUBL-8W burners		50 MMBtu/hr (LHV)	50 MMBtu/hr (LHV)	 May-2006	N/A H-0363	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0364	Unit 70 CCR Heater	Callidus Technologies, LLC burners	CUBL-6W burners		35 MMBtu/hr (LHV)	35 MMBtu/hr (LHV)	 May-2006	N/A H-0364	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0421	Unit 44 Charge Heater	John Zink burners	LNC-PC-18 burners		27 MMBtu/hr (LHV Basis)	27 MMBtu/hr (LHV Basis)	 5/23/2001	N/A H-0421	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0464	SRU Hot Oil Heater	Callidus Technologies, LLC burners	LE-CSG-4W burners		9.6 MMBtu/hr (LHV Basis)	9.6 MMBtu/hr (LHV Basis)	 11/1/2003	N/A H-0464	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0600	Unit 09 Depropanizer Reboiler Heater	Callidus Technologies, LLC burners	CUBL-12W burners		84 MMBtu/hr (LHV Basis)	84 MMBtu/hr (LHV Basis)	 est. 1991	N/A H-0600	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0601	Unit 33 Charge Heater	Callidus Technologies, LLC burners	CUB-8P-CW burners		78 MMBtu/hr (LHV Basis)	78 MMBtu/hr (LHV Basis)	 2003	N/A H-0601	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-2421	Unit 45 Charge Heater	Zeeco, Inc. burners	GLSF-14 Round Flame "Free Jet" burners		27 MMBtu/hr (LHV Basis)	27 MMBtu/hr (LHV Basis)	 2006	N/A H-2421	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-2501	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	John Zink Company, LLC burners	COOLstar-18 burners		120 MMBtu/hr (LHV Basis)	120 MMBtu/hr (LHV Basis)	 2009	N/A H-2501	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-2601	Unit 26 RDU Reactor Heater	TBD	TBD		39 MMBtu/hr (LHV Basis)	39 MMBtu/hr (LHV Basis)	 2021	N/A H-2601	30600106	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-3101	SRU3 Hot Oil Heater	Callidus Technologies, LLC burners	Unknown		11 MMBtu/hr (LHV Basis)	11 MMBtu/hr (LHV Basis)	 2009	N/A H-3101	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-3402	Unit 34 Hydrocracker Reboiler 1	Callidus Technologies, LLC burners	LE-CSG-12W burners		52 MMBtu/hr (LHV Basis)	52 MMBtu/hr (LHV Basis)	 2009	N/A H-3402	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-3403	Unit 34 Hydrocracker Reactor Charge Heater	Callidus Technologies, LLC burners	CUBL-10W burners		32 MMBtu/hr (LHV Basis)	32 MMBtu/hr (LHV Basis)	 2011	N/A H-3403	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-5401	Unit 54 HDS Reactor Heater	Tulsa Heaters Inc.	TBD		19 MMBtu/hr (LHV Basis)	19 MMBtu/hr (LHV Basis)	 2016	N/A H-5401	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-8801	Unit 63 Hydrogen Plant Reformer Furnaces	Callidus Technologies, LLC burners	LE-CSG-12W-PSA burners		76 MMBtu/hr (LHV Basis)	76 MMBtu/hr (LHV Basis)	 3/1/2006	N/A H-8801	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-8802	Unit 63 Hydrogen Plant Reformer Furnaces	Callidus Technologies, LLC burners	LE-CSG-12W-PSA burners		76 MMBtu/hr (LHV Basis)	76 MMBtu/hr (LHV Basis)	 3/1/2006	N/A H-8802	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-9851	Unit 64 Hydrogen Plant Reformer	Callidus Technologies, LLC burners	CUBL-3WDF burners		337 MMBtu/hr (LHV Basis)	337 MMBtu/hr (LHV Basis)	 2009	N/A H-9851	30600106	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-0473 (SRU2 TGI)	SRU2 Tail Gas Incinerator				35 MMBtu/hr (LHV Basis)	35 MMBtu/hr (LHV Basis)	 Dec-2001	N/A H-0473 (SRU2 TGI)	30609904	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
H-3103 (SRU3 TGI)	SRU3 Tail Gas Incinerator	Callidus Technologies, LLC burners			10.2 MMBtu/hr (LHV Basis)	10.2 MMBtu/hr (LHV Basis)	 5/11/2009	N/A H-3103 (SRU3 TGI)	30609904	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FCC Regen	FCC Regenerator Scrubber	Exxon	IV		N/A	N/A	 est. 1979	N/A FCC Regen	30600201	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FL-400	North Plant Flare	N/A	N/A	N/A	N/A	N/A	 est. 1972	N/A FL-400	30600904	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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FL-401	South Plant Flare	N/A	N/A	N/A	N/A	N/A	 est. 1972	N/A FL-401	30600904	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FL-402	FCC Flare	N/A	N/A	N/A	N/A	N/A	 est. 1979	N/A FL-402	30600904	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FL-403	Alky Flare	N/A	N/A	N/A	N/A	N/A	 est. 1991	N/A FL-403	30600904	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FL-404	GOHT Flare	N/A	N/A	N/A	N/A	N/A	 2003	N/A FL-404	30600904	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FL-HEP-PORT	FL-HEP Portable Flare	N/A	N/A	N/A	N/A	N/A		N/A FL-HEP-PORT	30600904	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
MG-0001	Portable Air Compressor	Cummins	QSC 8.3, 44358719		280 HP	280 HP	 2012	N/A MG-0001	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
MG-0002	Portable Air Compressor	Cummins	QSC 8.3, 46338720		280 HP	280 HP	 2012	N/A MG-0002	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
MG-0003	Portable Air Compressor	Doosan/Cummins	QSB 4.5, 489581UKACF68		138 HP	138 HP	 2019	N/A MG-0003	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
MG-0004	Portable Fire Water Pump Engine	Caterpillar	C18, WJH07870		700 HP	700 HP	 Oct-2010	N/A MG-0004	20200102	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
SG-0100	UPS backup generator (exempt*)	Deutz	F4L912GEN/ WDZXL05.7010		52 HP	52 HP	1998 2002	N/A SG-0100	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
SG-0101	UPS backup generator (exempt*)	Deutz	F4L 1011 F/ EI97-68CA00-000-0053		54 HP	54 HP	1999 <2006	N/A SG-0101	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
SG-0102	Server Backup Generator (exempt*)	John Deere	4045HFS80		99 HP	99 HP	2018 	N/A SG-0102	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
FWG-0600	Fire Water Pump Engine	Clarke Diesel (John Deere)	JW6H-UFAD70/ RG6090L113548		376 HP	376 HP	 Nov-2012	N/A FWG-0600	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
FWG-0601	Fire Water Pump Engine	Clarke Diesel (John Deere)	JW6H-UFAD70/ RG6090L113561		376 HP	376 HP	 Nov-2012	N/A FWG-0601	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
FWG-0602	Fire Water Pump Engine	Clarke Diesel (John Deere)	JW6H-UFAD70/ RG6090L113574		376 HP	376 HP	 Nov-2012	N/A FWG-0602	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
FWG-0603	Fire Water Pump Engine	Clarke Diesel (John Deere)	JU6H-UFADX8/ PE6068L228486		305 HP	305 HP	 Apr-2013	N/A FWG-0603	20200102	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
E-8010	WWTP Emergency Engine	John Deere	6090HF485/ RG6090L101484		400 HP	400 HP	 Feb-2011	N/A E-8010	20200102	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
Y-0001	TCC Cooling Tower				5,000 gpm	5,000 gpm		N/A Y-0001	30600701	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
Y-0002	S. Alky Cooling Tower (Marley Cooling Tower)				5,000 gpm	5,000 gpm		N/A Y-0002	30600701	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
Y-0008	North Alky Cooling Tower				12,500 gpm	12,500 gpm		N/A Y-0008	30600701	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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Y-0011	FCC & NP Cooling Tower				30,000 gpm	30,000 gpm		N/A Y-0011	30600701	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
Y-0012	Hydrogen Plants Cooling Tower				10,000 gpm	10,000 gpm		N/A Y-0012	30600701	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
CT TT-0006	Unit 07 Amine W-0745 Cooling Tower				3,000 gpm	3,000 gpm		N/A CT TT-0006	30600701	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
Y-0026 (formerly Y-0014)	RDU Cooling Tower				2,500 gpm	2,500 gpm	2021	N/A Y-0026	30600701	□ Existing (unchanged) ■ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
Collection Sump	WW System Collection Sump				1,200 gpm	1,200 gpm		N/A Collection Sump	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-0845	Weir Box (WW)				1,200 gpm	1,200 gpm		D-8000/D-8001 D-8000/D-8001	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-0844	Stilling Well (WW)				1,200 gpm	1,200 gpm		D-8000/D-8001 D-8000/D-8001	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-0846	Stormwater Lift Station (SWLS)				1,200 gpm	1,200 gpm		D-8000/D-8001 D-8000/D-8001	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-0830	Stormwater Surge Tank (external floater)				109,660 bbl	109,660 bbl	1/1/2011	N/A T-0830	40301150	□ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit ■ To Be Modified □ To be Replaced		
S-1/T-1	Barscreen & Junction Box				1,200 gpm	1,200 gpm		D-829/D-830 D-829/D-830	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
API-894/ API-895	API Separators				1,200 gpm	1,200 gpm		D-829/D-830 D-829/D-830	30600503	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-0829	SRO Reject Tank				30,5000 bbl	30,5000 bbl	pre-1971	N/A T-0829	30600503	□ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit ■ To Be Modified □ To be Replaced		
T-801	Enhanced Biodgradation Tank				1,200 gpm	1,200 gpm	1987	N/A T-801	30600503	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-836	Enhanced Biodgradation Tank				1,200 gpm	1,200 gpm	1998	N/A T-836	30600503	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-805	Flocculator				1,200 gpm	1,200 gpm		N/A T-805	30600503	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
DAF T-896	DAF Unit T-896				1,200 gpm	1,200 gpm		N/A DAF T-896	30600503	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
DAF T-806	DAF Unit T-806				1,200 gpm	1,200 gpm		N/A DAF T-806	30600503	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
T-897	DAF Surge Open Sump				1,200 gpm	1,200 gpm		N/A T-897	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
D-810/811	Walnut Hull Filters				1,200 gpm	1,200 gpm		N/A D-810/811	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
D-808/809	Mechanical Filters				1,200 gpm	1,200 gpm		N/A D-808/809	30600503	□ Existing (unchanged) □ To be Removed ■ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		

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T-809	DAF Surge Tank				1,200 gpm	1,200 gpm		N/A T-809	30600503	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TLO-1	Asphalt Truck Loading and Off-Loading Rack				350 bbl/hr	350 bbl/hr		N/A TLO-1	40400150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TL-2	Asphalt Truck Loading Rack #2				300 bbl/hr	300 bbl/hr		N/A TL-2	40400150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TL-4	Fuels Truck Loading Rack				3,571 bbl/hr	3,571 bbl/hr		TL-4 VRU TL-4 VCU TL-4	40400150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TL-7	CBO/LCO Truck Loading Rack				681 bbl/hr	681 bbl/hr		N/A TL-7	40400150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
RLO-8	Railcar Loading and Off-Loading Rack				1,500 bbl/hr	1,500 bbl/hr		N/A RLO-8	40400150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
RLO-19	Railcar Loading and Off-Loading Rack				3,950 bbl/hr	3,950 bbl/hr		N/A RLO-19	40400150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TLO-20	Asphalt/Pitch Truck Loading Rack				600 bbl/hr	600 bbl/hr		N/A TLO-20	40400150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TRLO-9	Molten Sulfur Truck/Railcar Loading Rack				330 LTPD	330 LTPD		N/A TRLO-9	40400150	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-02-SP CRUDE	South Division Crude Unit						 2009	N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-05-KERO	Kerosene HDS Unit							N/A N/A	40388801	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-06-NHDU	Naphtha HDS Unit 06							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-07-N AMINE	Amine Unit-Treating/Regen. 2							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-07-SWS1	Sour Water Stripper							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-08-TRUCK RK	Loading Racks							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-10-FCC	FCC w/CVS							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-13-NHDU	Naphtha HDS Unit 13							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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.
FUG-19-NAPHTHA	Naptha Merox							N/A N/A	40388801	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-20-ISOM	BenFree Unit							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-21-SP VACUUM	Flasher/Vacuum Unit							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-25-ROSE-2	ROSE Unit							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-26-RDU	Renewable Diesel Unit						 2021	N/A N/A	40388801	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-29-BLENDER/TK FARM	Light Oil Tankage							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit						 2007	N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-33-DIST HDU	Diesel HDS Unit w/CVS							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-34-HYDROCRACKER	WX Hydrocracker						 2008	N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-35-SAT GAS	Saturates Gas Plant							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-36-RO	Reverse Osmosis							N/A N/A	40388801	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-37-NP-UT	North Plant Utilities							N/A N/A	40388801	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-41-PBC	PBC Unit							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-43-S ALKY	South Alky Unit (W-76)							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-54-PRIMEG	Prime G Unit						 2016	N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-63-H2 PLANT-1	Hydrogen Plant							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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.
FUG-64-H2 PLANT-2	Hydrogen Plant						 2008	N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-70-CCR	CCR Reformer (w/in battery limits)							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-73-SP UTIL	Utilities							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-80-WWTP CVS	Oil/Water Separator							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-LPG	LPG Storage System							N/A N/A	40388801	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-FUEL GAS	Fuel Gas Distribution System							N/A N/A	40388801	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-ASPHALT STG	Asphalt/Heavy Oil Storage							N/A N/A	40388801	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-RLO-ASPHALT	Asphalt/Pitch Loading Rack							N/A N/A	40388801	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FUG-RRTOTRUCK	Crude oil unloading system							N/A N/A	40388801	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
RW-6	HFR				200 bbl	200 bbl	 1978	N/A RW-6	40301099	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0011	INT				32,130 bbl	32,130 bbl	 pre-1973	N/A T-0011	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0012	INT				32,130 bbl	32,130 bbl	 pre-1973	N/A T-0012	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0020	INT				54,380 bbl	54,380 bbl	 10/1/2020	N/A T-0020	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0021	INT				54,380 bbl	54,380 bbl	 10/1/2020	N/A T-0021	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0022	INT				37,770 bbl	37,770 bbl	 10/1/2020	N/A T-0022	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0023	INT				37,770 bbl	37,770 bbl	 10/1/2020	N/A T-0023	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0040	CR				820 bbl	820 bbl	 pre-1973	N/A T-0040	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0041	CR				820 bbl	820 bbl	 1973	N/A T-0041	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0049	HFR				610 bbl	610 bbl	 pre-1971	Carbon Cannister T-0049	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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.
T-0055	CR				10,200 bbl	10,200 bbl		1979	N/A	T-0055	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0056	INT				11,600 bbl	11,600 bbl		pre-1971	N/A	T-0056	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0057	EXT				55,520 bbl	55,520 bbl		1981	N/A	T-0057	40301150	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0059	CR				5,140 bbl	5,140 bbl		pre-1973	N/A	T-0059	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0061	CR				10,490 bbl	10,490 bbl		pre-1973	N/A	T-0061	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0063	CR				10,910 bbl	10,910 bbl		pre-1973	N/A	T-0063	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0065	CR				10,490 bbl	10,490 bbl		1999	N/A	T-0065	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0075	CR				18,910 bbl	18,910 bbl		2003	N/A	T-0075	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0079	EXT				87,420 bbl	87,420 bbl		9/7/2008	N/A	T-0079	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0081	CR				65,870 bbl	65,870 bbl		2010	N/A	T-0081	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0082	CR				109,660 bbl	109,660 bbl		2010	N/A	T-0082	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0106	INT				25,120 bbl	25,120 bbl		pre-1971	N/A	T-0106	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0107	INT				25,120 bbl	25,120 bbl		pre-1971	N/A	T-0107	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0108	INT				25,120 bbl	25,120 bbl		pre-1971	N/A	T-0108	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0109	INT				25,120 bbl	25,120 bbl		pre-1971	N/A	T-0109	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0110	CR				57,100 bbl	57,100 bbl		pre-1971	N/A	T-0110	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0111	INT				10,080 bbl	10,080 bbl		pre-1973	N/A	T-0111	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0112	INT				9,670 bbl	9,670 bbl		pre-1973	N/A	T-0112	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0117	EXT				15,470 bbl	15,470 bbl		pre-1971	N/A	T-0117	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0124	INT				6,710 bbl	6,710 bbl		1981	N/A	T-0124	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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.
T-0400	CR				96,680 bbl	96,680 bbl		1983	N/A	T-0400	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0401	EXT				56,650 bbl	56,650 bbl		1982	N/A	T-0401	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0402	EXT				56,650 bbl	56,650 bbl		1983	N/A	T-0402	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0410	CR				34,920 bbl	34,920 bbl		1973	N/A	T-0410	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0411	EXT				55,950 bbl	55,950 bbl		pre-1971	N/A	T-0411	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0412	EXT				55,950 bbl	55,950 bbl		pre-1971	N/A	T-0412	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0413	INT				24,490 bbl	24,490 bbl		pre-1971	N/A	T-0413	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0415	INT				25,120 bbl	25,120 bbl		pre-1971	N/A	T-0415	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0417	INT				10,490 bbl	10,490 bbl		pre-1973	N/A	T-0417	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0418	INT				20,720 bbl	20,720 bbl		>2021	N/A	T-0418	40301150	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ■ To Be Modified ☐ To be Replaced		
T-0419	CR				11,000 bbl	11,000 bbl		pre-1973	N/A	T-0419	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0420	CR				10,490 bbl	10,490 bbl		pre-1973	N/A	T-0420	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0422	CR				10,490 bbl	10,490 bbl		pre-1973	N/A	T-0422	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0423	CR				10,490 bbl	10,490 bbl		pre-1971	N/A	T-0423	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0431	CR				53,180 bbl	53,180 bbl		pre-1973	N/A	T-0431	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0432	CR				53,180 bbl	53,180 bbl		pre-1972	N/A	T-0432	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0433	CR				80,420 bbl	80,420 bbl		pre-1973	N/A	T-0433	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0434	CR				80,420 bbl	80,420 bbl		1979	N/A	T-0434	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0435	EXT				5,040 bbl	5,040 bbl		1/1/1997	N/A	T-0435	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0437	EXT				90,640 bbl	90,640 bbl		Built 1976 Relocated 2009	N/A	T-0437	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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.
T-0438	CR				54,380 bbl	54,380 bbl	 6/1/1978	N/A T-0438	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0439	INT				108,740 bbl	108,740 bbl	 11/1/1978	N/A T-0439	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0450	EXT				80,570 bbl	80,570 bbl	 1/1/1997	N/A T-0450	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0451	INT				6,850 bbl	6,850 bbl	 1/1/2016	N/A T-0451	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0452	INT				6,850 bbl	6,850 bbl	 1/1/2016	N/A T-0452	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0737	EXT				22,210 bbl	22,210 bbl	 1/1/2009	N/A T-0737	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0802	EXT				11,330 bbl	11,330 bbl	 1/1/2002	N/A T-0802	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0814	CR				11,190 bbl	11,190 bbl	 2005	N/A T-0814	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0815	CR				80,930 bbl	80,930 bbl	 2005	N/A T-0815	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0821	EXT				78,580 bbl	78,580 bbl	 1/1/2016	N/A T-0821	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0834	EXT				40,420 bbl	40,420 bbl	 pre-1971	N/A T-0834	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0835	EXT				68,940 bbl	68,940 bbl	 pre-1973	N/A T-0835	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0838	CR				30,640 bbl	30,640 bbl	 4/1/1977	N/A T-0838	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-0914	CR				31,470 bbl	31,470 bbl	 2021	N/A T-0914	40301099	☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-1225	EXT				125,890 bbl	125,890 bbl	 2009	N/A T-1225	40301150	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
T-1227	CR				33,170 bbl	33,170 bbl	 2009	N/A T-1227	40301099	■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
TVCU	Floating Roof Tank Landings Vapor Combustion Unit (VCU)					52 lb/hr		N/A N/A	30205021	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
Pigging	Pigging Operations	N/A	N/A	N/A	N/A	N/A		N/A Pigging	2310021801	☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

* Standby generator engines satisfy the exempt equipment criteria at 20.2.72.202.B(3) NMAC. According to the application instructions, exempt engines shall be listed in Table 2-B rather than Table 2-A.
Based on informal guidance received from NMED AQB, Navajo is listing the engines in Table 2-A.

[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. / 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
G-2601	Emergency Generator	Caterpillar	G3512	1468	20.2.72.202.B.3		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				HP	N/A	2021	
G-2602	Emergency Generator	Caterpillar	G3512	1468	20.2.72.202.B.3		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				HP	N/A	2021	
RLO-26	RDU Railcar Loading and Off-Loading Rack			2,250	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				bbl/hr	N/A	2021	
FUG-26-RDU-LOVP	Renewable Diesel Unit - Low vapor Pressure				20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A	2021	
T-0001	DAF Waste Talon Tank				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0002	DAF Waste Talon Tank				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0003	DAF Waste Talon Tank				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0004	DAF Waste Talon Tank				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0026	Brine - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0028	Scrubber Lime - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0031	Spent Caustic - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0042	Pressurized - Naphthas				20.2.72.202.B.5		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0045	Pressurized - Propane/Butane				20.2.72.202.B.5		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		

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
T-0046	Pressurized - Isobutane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0064	Caustic - Inorganic				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0071	Pressurized - Propane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0072	Pressurized - Propane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0073	Pressurized - Propane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0074	Pressurized - Propane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0076	Pressurized - Propane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0114	Pressurized - n-Butane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0115	Pressurized - n-Butane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0116	Pressurized - Isobutane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0119	Pressurized - Isobutane				20.2.72.202.B.5 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0446	Calcium Chloride - Inorganic				20.2.72.202.B.2 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0447	Sulfuric Acid - Inorganic				20.2.72.202.B.2 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0448	Antiscalant - Inorganic				20.2.72.202.B.2 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0449	Cleaner - Inorganic				20.2.72.202.B.2 N/A		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
T-0453	Calcium Chloride - Inorganic				20.2.72.202.B.2 N/A		■ Existing (unchanged) ☐ To be Removed ☐ 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]	
T-0460	Sulfur - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0465	RO Water				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0466	RO Water				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0467	Sulfuric Acid - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0468	Brine - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0600	Soda Ash - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0803	DAF Waste - Wastewater				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0804	DAF Waste - Wastewater				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0807	Caustic - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0809	Wastewater				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0816	Amine			940	20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A		
T-0829	RO Reject Tank				20.2.72.202.B.2		☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0839	Condensate Water				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0840	Water				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0841	Calcium Chloride - Inorganic				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0891	Groundwater				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		

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-0892	Groundwater				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-0901	RDU Renewable Diesel			89,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0902	RDU Renewable Diesel			89,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0903	RDU Renewable Diesel			89,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0904	RDU Charge Tank			29,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0905	RDU Charge Tank			29,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0906	RDU Feed Tank			63,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0907	RDU Feed Tank			63,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0908	RDU Feed Tank			17,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0909	RDU Feed Tank			17,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0910	RDU Feed Tank			19,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0911	RDU Feed Tank			19,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0912	RDU Feed Tank			109,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0913	RDU Feed Tank			109,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-0929	RDU Rail Unloading Acumulation Tank			800	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A	2021	
T-0930	RDU Rail Unloading Acumulation Tank			800	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A	2021	

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-0931	RDU Rail Unloading Acumulation Tank			800	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A	2021	
T-0932	RDU Rail Unloading Acumulation Tank			800	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A	2021	
T-0933	RDU Rail Containment Tank - Feed			30,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A	2021	
T-0934	RDU Rail Containment Tank - Renewable Diesel			30,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A	2021	
T-0935	RDU Rail Containment Tank - Recovered Oil			1,000	20.2.72.202.B.2		☐ Existing (unchanged) ■ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				BBL	N/A	2021	
T-1221	RO Water				20.2.72.202.B.2		☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-1222	RO Water				20.2.72.202.B.2		☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
T-1223	Fresh Caustic - Inorganic			84,000	20.2.72.202.B.2		☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A		
T-1224	Filter Backwash - Wastewater				20.2.72.202.B.2		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
SSM Misc 1	Catalyst Handling				20.2.72.202.B.5		■ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		
-	Gas Fueling Tanks			500	20.2.72.202.B.5		☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A		
-	Diesel Fueling Tanks			500	20.2.72.202.B.5		☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				GAL	N/A		
-	Sampling Locations				20.2.72.202.B.5		☐ Existing (unchanged) ☐ To be Removed ■ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
					N/A		

[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
D-8000/8001	WW Collection System Carbon Canisters	Unknown	VOC	D-8000/8001	0.95	
D-0829/0830	APIs Carbon Canisters	Unknown	VOC	D-0829/0830	0.95	
FCC Scrubber	FCC Regenerator Tertiary Cylcones and Wet Gas Scrubber	Unknown	PM10 and SO_2	FCC Regerator vent	PM-85% & SO2-99%	
Chlorsorb	CCR Regenerator Vent Control		HAP and PM10	CCR Regenerator Vent	0.99	
FL-0400	North Plant Flare		VOC and H_2S	Refinery Process Units	0.98	
FL-0401	South Plant Flare		VOC and H_2S	Refinery Process Units	0.98	
FL-0402	FCC Flare		VOC and H_2S	Refinery Process Units	0.98	
FL-0403	Alky Flare		VOC	Refinery Process Units	0.98	
FL-0404	GOHT Flare		VOC and H_2S	Refinery Process Units	0.98	
H-0473 (SRU2 TGI)	SRU2 Tail Gas Incinerator		H2S	SRU1 and SRU2	0.98	
H-3103 (SRU3 TGI)	SRU3 Tail Gas Incinerator		H2S	SRU3	0.98	
SCR	Selective Catalytic Reduction		NOx	H-9851	0.64	
FL-HEP-PORT	Portable Flare for Holly Energy Partners (HEP) Pipeline Pigging		VOC	Pipeline Pigging Operations	0.98	
TL-4 VRU	John Zink Carbon Adsorption VRU		VOC	TL-4 Gasoline Loading	0.95	
TL-4 VCU	Backup of TL4-VRU		VOC	TL-4 Gasoline Loading	0.95	
T-0049	Tank T-0049 carbon canister		VOC	T-0049 Vent	0.95	
Tanks VCU	VCU for Tank Landings		VOC and H_2S	Floating tanks	0.95	
WWTP	Carbon Canisters at WWTP		VOC	WWTP	0.95	
Y-0011, Y-0012	Drift Eliminators on Cooling Towers (BACT)		PM	Y-001, Y-002	0*	
T-0737, T-1225	External Floating Roofs (BACT)		VOC	T-0737, T-1225	0*	
H-2501, H-3402, H-3101	Ultra-low NO_X burners		NO_X	H-2501, H-3402, H-3101	0*	

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

* Navajo interprets the undefined term "emissions control equipment" consistent with the definition of definition of the term "control device" in the federal Compliance Assurance Monitoring rule, 40 CFR § 64.2. Consistent with this interpretation, Navajo generally has listed only active control devices in this table and has not listed passive control measures that act to prevent pollutants from forming (such as the use of seals, lids, or roofs), use of low-polluting fuel or feedstocks, or the use of combustion or other process design features or characteristics (such as low-NOx burners). However, based on informal guidance from NMED AQB, and notwithstanding the application instructions, Navajo has listed in this table certain passive control measures which NMED has relied upon in establishing BACT.

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
Totals																		

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

[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
B-0007	12.90	56.50	19.67	86.16	1.29	5.64	8.04	13.94	1.78	7.80	1.78	7.80	1.78	7.80	-	-	-	-
B-0008	12.90	56.50	19.67	86.16	1.29	5.64	8.04	13.94	1.78	7.80	1.78	7.80	1.78	7.80	-	-	-	-
B-0009	4.89	21.41	9.04	39.61	0.98	4.28	2.89	12.67	1.82	7.98	1.82	7.98	1.82	7.98	-	-	-	-
H-0009	3.96	17.34	4.03	17.63	0.26	1.20	1.64	2.84	0.36	1.60	0.36	1.60	0.36	1.60	-	-	-	-
H-0011	9.52	31.73	3.48	15.30	0.23	1.00	1.42	2.46	0.31	1.38	0.31	1.38	0.31	1.38	-	-	-	-
H-0018	3.49	15.27	2.93	12.82	0.19	0.84	1.19	2.07	0.26	1.16	0.26	1.16	0.26	1.16	-	-	-	-
H-0019	2.90	12.46	4.94	21.64	0.32	1.42	2.02	3.50	0.45	2.00	0.45	2.00	0.45	2.00	-	-	-	-
H-0020	4.82	21.09	8.23	36.07	0.54	2.36	3.37	5.84	0.75	3.26	0.75	3.26	0.75	3.26	-	-	-	-
H-0028	2.17	9.50	1.13	4.93	0.07	0.32	0.46	0.80	0.10	0.45	0.10	0.45	0.10	0.45	-	-	-	-
H-0030	3.19	13.98	3.84	16.90	0.25	1.10	1.57	2.71	0.40	1.52	0.40	1.52	0.40	1.52	-	-	-	-
H-0040	3.78	16.56	3.84	16.90	0.25	1.10	1.57	2.71	0.40	1.52	0.40	1.52	0.40	1.52	-	-	-	-
H-0312	4.62	20.24	3.20	14.03	0.21	0.92	1.31	2.27	0.29	1.27	0.29	1.27	0.29	1.27	-	-	-	-
H-0352, H-0353, H-0354	9.00	39.42	18.30	80.15	1.20	5.25	8.07	15.56	1.70	7.25	1.70	7.25	1.70	7.25	-	-	-	-
H-0355	2.52	11.04	2.56	11.22	0.17	0.73	1.13	2.18	0.23	1.02	0.23	1.02	0.23	1.02	-	-	-	-
H-0362, H-0363, H-0364	6.88	30.11	11.44	50.09	0.75	3.28	5.04	9.73	1.03	4.53	1.03	4.53	1.03	4.53	-	-	-	-
H-0421	2.43	10.64	2.47	10.82	0.16	0.71	1.01	1.74	0.22	0.98	0.22	0.98	0.22	0.98	-	-	-	-
H-0464	0.52	2.29	0.88	3.85	0.06	0.25	0.36	0.62	0.08	0.40	0.08	0.40	0.08	0.40	-	-	-	-
H-0600	4.70	20.44	7.69	33.66	0.50	2.20	3.14	5.43	0.70	3.05	0.70	3.05	0.70	3.05	-	-	-	-
H-0601	3.51	15.37	7.14	31.26	0.47	2.05	2.91	5.04	0.65	2.83	0.65	2.83	0.65	2.83	-	-	-	-
H-2421	1.22	5.32	2.47	10.82	0.16	0.71	0.98	1.61	0.22	0.98	0.22	0.98	0.22	0.98	-	-	-	-
H-2501	3.60	15.77	7.20	31.54	0.72	3.15	4.35	7.19	0.99	4.35	0.99	4.35	0.99	4.35	-	-	-	-
H-3101	0.33	1.45	0.99	4.34	0.07	0.29	0.41	0.71	0.09	0.40	0.09	0.40	0.09	0.40	-	-	-	-
H-3402	1.56	6.83	4.68	20.50	0.31	1.36	1.89	3.12	0.43	1.89	0.43	1.89	0.43	1.89	-	-	-	-
H-3403	0.96	4.20	2.93	12.82	0.19	0.84	1.16	1.92	0.26	1.16	0.26	1.16	0.26	1.16	-	-	-	-
H-5401	0.77	3.38	0.64	2.82	0.12	0.51	0.72	1.25	0.16	0.70	0.16	0.70	0.16	0.70	-	-	-	-
H-8801/8802	8.66	37.95	13.91	60.91	0.91	3.99	2.85	4.96	1.26	5.51	1.26	5.51	1.26	5.51	-	-	-	-
H-9851	4.21	18.45	20.22	88.56	2.02	8.84	6.32	11.00	2.79	12.30	2.79	12.30	2.79	12.30	-	-	-	-
H-0473 (SRU2 TGI)	6.50	28.50	27.70	121.10	0.10	0.60	30.00	81.80	1.20	2.10	3.50	8.36	3.50	8.36	0.30	1.40	-	-
H-3103 (SRU3-TGI)	6.50	28.50	15.00	65.70	0.10	0.60	30.00	81.80	1.10	2.10	3.40	8.36	3.40	8.36	0.30	1.40	-	-
FCC REGEN	34.92	101.80	121.79	106.69	15.66	68.60	27.85	61.00	25.00	109.50	22.88	95.55	22.88	95.55	-	-	-	-
FL0400	3.47	5.45	14.23	22.35	26.01	32.70	4.48	3.92	-	-	-	-	-	-	0.05	0.04	-	-
FL0401	1.66	1.85	6.82	7.58	19.72	2.51	57.35	5.88	-	-	-	-	-	-	0.61	0.06	-	-
FL0402	8.11	2.21	33.29	9.08	98.18	7.72	98.54	5.58	-	-	-	-	-	-	1.05	0.06	-	-
FL0403	2.74	2.53	11.25	10.38	32.54	13.57	1.10	0.76	-	-	-	-	-	-	0.01	0.01	-	-
FL0404	11.70	23.49	48.01	96.40	160.50	99.85	39.92	11.14	-	-	-	-	-	-	0.42	0.12	-	-
MG-0001	1.84	8.06	1.61	7.06	1.84	8.06	3.48E-03	0.02	0.09	0.40	0.09	0.40	0.09	0.40	-	-	-	-
MG-0002	1.84	8.06	1.61	7.06	1.84	8.06	3.48E-03	0.02	0.09	0.40	0.09	0.40	0.09	0.40	-	-	-	-
MG-0003	0.09	0.40	1.13	4.97	0.04	0.19	1.72E-03	0.01	0.00	0.02	4.54E-03	0.02	#######	0.02	-	-	-	-
MG-0004	4.60	0.23	4.03	0.20	4.60	0.23	8.70E-03	4.35E-04	0.23	0.01	0.23	0.01	0.23	0.01	-	-	-	-

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
SG-0100	1.61	0.40	0.35	0.09	0.13	0.03	6.47E-04	1.62E-04	0.11	0.03	0.11	0.03	0.11	0.03	-	-	-	-
SG-0101	1.67	0.42	0.36	0.09	0.14	0.03	6.72E-04	1.68E-04	0.12	0.03	0.12	0.03	0.12	0.03	-	-	-	-
SG-0102	0.07	0.02	0.82	0.20	0.03	0.01	1.23E-03	3.08E-04	3.26E-03	8.16E-04	3.26E-03	8.16E-04	#######	8.16E-04	-	-	-	-
FWG-0600	2.49	0.12	2.16	0.11	2.49	0.12	4.68E-03	2.34E-04	0.12	0.01	0.12	0.01	0.12	0.01	-	-	-	-
FWG-0601	2.49	0.12	2.16	0.11	2.49	0.12	4.68E-03	2.34E-04	0.12	0.01	0.12	0.01	0.12	0.01	-	-	-	-
FWG-0602	2.49	0.12	2.16	0.11	2.49	0.12	4.68E-03	2.34E-04	0.12	0.01	0.12	0.01	0.12	0.01	-	-	-	-
FWG-0603	2.02	0.10	1.75	0.09	2.02	0.10	3.79E-03	1.90E-04	0.10	0.01	0.10	0.01	0.10	0.01	-	-	-	-
Y-0001	-	-	-	-	0.21	0.92	-	-	0.26	1.15	0.158	0.69	0.00059	0.00260	-	-	-	-
Y-0002	-	-	-	-	0.21	0.92	-	-	0.26	1.15	0.16	0.69	0.0006	0.003	-	-	-	-
Y-0008	-	-	-	-	0.53	2.30	-	-	0.61	2.68	0.37	1.62	0.0014	0.0061	-	-	-	-
Y-0011	-	-	-	-	1.26	5.52	-	-	0.53	2.30	0.32	1.38	0.0012	0.005	-	-	-	-
Y-0012	-	-	-	-	0.42	1.84	-	-	0.18	0.77	0.11	0.46	0.0004	0.0017	-	-	-	-
CT TT-0006	-	-	-	-	1.08	4.73	-	-	0.16	0.69	0.09	0.42	0.0004	0.002	-	-	-	-
Collection (collector sump, T-845 Weir Box, T-844 Stilling Well, T-0846 SWKS)					0.02	0.08												
T-0830 Stormwater Surge Tank					5.49E-04	2.40E-03												
S1/T1 API-894/API-895					1.37E-04	6.02E-04												
T-801/T-836					1.34	5.85												
T-805 Flocculator					0.00	0.01												
T-896/T-806 DAF					1.64	7.18												
T-897 DAF Surge Open Sump					0.01	0.02												
D-810/811 & D-808/809 Filters					1.08E-07	4.72E-07												
T-809 DAF Surge Tank					0.004	0.02												
TLO-1	-	-	-	-	14.57	14.46	-	-	-	-	-	-	-	-	0.01	0.01	-	-
TL-2	-	-	-	-	12.49	3.75	-	-	-	-	-	-	-	-	0.01	0.002	-	-
TL-4	-	-	-	-	4.50	4.81	-	-	-	-	-	-	-	-	0.02	0.03	-	-
TL-7	-	-	-	-	12.17	1.86	-	-	-	-	-	-	-	-	3.19E-05	4.88E-06	-	-
RLO-8	-	-	-	-	19.93	6.44	-	-	-	-	-	-	-	-	0.01	0.001	-	-
RLO-19	-	-	-	-	65.55	11.72	-	-	-	-	-	-	-	-	0.03	0.003	-	-
TLO-20	-	-	-	-	24.97	3.75	-	-	-	-	-	-	-	-	0.01	0.002	-	-
TRLO-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.005	0.02	-	-
TL4-VCU	1.97	1.23	1.97	1.22	0.050	0.0013	0.51	0.014	0.11	0.066	0.11	0.07	0.11	0.066	-	-	-	-
Fugitives					108.87	476.85												
Tanks						316.21									0.72	0.80		
Totals	**218.79**	**728.88**	**485.70**	**1,282.09**	**654.40**	**1,172.47**	**363.64**	**389.75**	**50.06**	**208.50**	**51.74**	**203.59**	**50.54**	**198.35**	**3.54**	**3.95**	**0.00**	**0.00**

[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).

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
SSM	215.87	21.73	1,483.31	87.83	1,701.98	85.58	1,454.18	17.42	5.16	0.37	19.32	0.41	19.32	0.41	14.74	0.27	-	-
Malfunction Cap	-	10.00	-	10.00	-	10.00	-	10.00	-	-	-	-	-	-	-	1.00		
Totals		**31.73**		**97.83**		**95.58**		**27.42**		**0.37**		**0.41**		**0.41**		**1.27**		**0.00**

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

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

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

■ 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	Height Above	Temp.	Flow Rate		Moisture by	Velocity	Inside Diameter (ft)
			(Yes or No)	Ground (ft)	(F)	(acfs)	(dscfs)	Volume (%)	(ft/sec)	
B0007	B-0007	V	No	75	275	1,036.39	747.33		47.90	5.25
B0008	B-0008	V	No	65	250	998.28	745.20		62.80	4.50
B0009	B-0009	V	No	60	300	936.11	652.82		47.70	5.00
H0009	H-0009	V	No	78	530	284.54	152.33		17.90	4.50
H0011	H-0011	V	No	80	850	326.56	132.12		26.00	4.00
H0018	H-0018	V	No	75	700	244.92	111.90		19.50	4.00
H0019	H-0019	V	No	156	450	321.54	187.27		21.40	4.38
H0020	H-0020	V	No	175	330	404.63	271.46		12.20	6.50
H0028	H-0028	V	No	50	850	105.21	42.57		18.80	2.67
H0030	H-0030	V	No	67	575	282.60	144.71		22.50	4.00
H0040	H-0040	V	No	101	590	286.37	144.55		22.80	4.00
H0312	H-0312	V	No	96	675	256.22	119.65		20.40	4.00
H0352_54	H-0352, H-0353, H-0354	V	No	211	300	991.68	691.56		16.50	8.75
H0355	H-0355	V	No	135	442	140.81	82.74		28.70	2.50
H0362_64	H-0362, H-0363, H-0364	V	No	206	338	650.06	431.74		16.90	7.00
H0421	H-0421	V	No	82	650	196.51	93.83		23.70	3.25
H0464	H-0464	V	No	80	450	56.99	33.19		9.60	2.75
H0600	H-0600	V	No	177	500	548.15	302.62		33.00	4.60
H0601	H-0601	V	No	131	300	384.73	268.30		11.60	6.50
H2421	H-2421	V	No	87	890	238.48	93.63		24.80	3.50
H2501	H-2501	V	No	168	710	914.42	414.23		19.00	7.83
H3101	H-3101	V	No	80	450	57.11	33.26		9.62	2.75
H3402	H-3402	V	No	67	575	350.42	179.44		27.90	4.00
H3403	H-3403	V	No	86	705	243.66	110.85		19.40	4.00
H5401	H-5401	V	No	83	643	62.21	29.89		8.81	3.00
H8801_02	H-8801, H-8802	V	No	130	600	869.60	434.80		75.40	3.83

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps	Height Above	Temp.	Flow Rate		Moisture by	Velocity	Inside Diameter (ft)
			(Yes or No)	Ground (ft)	(F)	(acfs)	(dscfs)	Volume (%)	(ft/sec)	
H9851	H-9851	V	No	176	350	1,868.30	1,222.47		23.80	10.00
H0473	H-0473 (SRU2 TGI)	V	No	150	1,150	555.15	182.75		44.20	4.00
H3103	H-3103 (SRU3 TGI)	V	No	150	1,200	626.74	200.11		49.90	4.00
FCCREGEN	FCC Regen	V	No	153	125	799.76	724.57		28.30	6.00
FL0400	FL-400	V	No	395	1,832	13,363.93	3,090.26		65.60	16.11
FL0401	FL-401	V	No	342	1,832	4,750.21	1,098.43		65.60	9.60
FL0402	FL-402	V	No	305	1,832	4,433.53	1,025.21		65.60	9.28
FL0403	FL-403	V	No	499	1,832	19,475.87	4,503.58		65.60	19.45
FL0404	FL-404	V	No	569	1,832	34,834.89	8,055.19		65.60	26.01
V0543	MG-0001	V	No	6	1,000	21.35	7.75		244.82	0.33
V0545	MG-0002	V	No	6	1,000	21.35	7.75		244.82	0.33
V0546	MG-0003	V	No	6	1,000	19.71	7.16		225.99	0.33
V0511	MG-0004	V	No	8	1,000	25.05	9.09		287.19	0.33
G0100	SG-0100	V	No	10	1,000	5.01	1.82		229.84	0.17
G0101	SG-0101	V	No	12	1,000	5.20	1.89		238.68	0.17
G0102	SG-0102	V	No	10	1,000	30.26	10.99		354.00	0.33
E0600W	FWG-0600	V	No	4	1,000	30.88	11.21		354.04	0.33
E0601M	FWG-0601	V	No	4	1,000	30.88	11.21		354.04	0.33
E0602E	FWG-0602	V	No	4	1,000	30.88	11.21		354.04	0.33
E0603	FWG-0603	V	No	4	1,000	25.05	9.09		287.19	0.33
Y0001	Y-0001	V	No	14	100	1,256.00	1,188.71		25.00	8.00
Y0002	Y-0002	V	No	14	100	1,256.00	1,188.71		25.00	8.00
Y0008	Y-0008	V	No	14	100	1,256.00	1,188.71		25.00	8.00
Y0011	Y-0011	V	No	14	100	1,256.00	1,188.71		25.00	8.00
Y0012	Y-0012	V	No	14	100	1,256.00	1,188.71		25.00	8.00
CTTT0006	CT TT-0006	V	No	14	100	1,256.00	1,188.71		25.00	8.00
TL4VCU	TL4-VCU	V	No	82	1,832	791.70	183.07		65.60	3.92
TVCU	TVCU	V	No	82	1,832	791.70	183.07		65.60	0.20

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Total HAPs		Ammonia ☐ HAP or ■TAP		Sulfuric Acid ☐ HAP or ■TAP		Acetaldehyde ■ HAP or ☐ TAP		Acrolein ■ HAP or ☐ TAP		Benzene ■ HAP or ☐ TAP		1,3-Butadiene ■ HAP or ☐ TAP		Carbon Disulfide ■ HAP or ☐ TAP		Ethylbenzene ■ 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
-	B-0007	4.4E-01	1.9E+00					-	-	-	-	4.9E-04	2.2E-03	-	-	-	-	-	-
-	B-0008	4.4E-01	1.9E+00					-	-	-	-	4.9E-04	2.2E-03	-	-	-	-	-	-
-	B-0009	4.5E-01	2.0E+00					-	-	-	-	5.0E-04	2.2E-03	-	-	-	-	-	-
-	H-0009	9.0E-02	3.9E-01					-	-	-	-	1.0E-04	4.4E-04	-	-	-	-	-	-
-	H-0011	7.8E-02	3.4E-01					-	-	-	-	8.7E-05	3.8E-04	-	-	-	-	-	-
-	H-0018	6.6E-02	2.9E-01					-	-	-	-	7.3E-05	3.2E-04	-	-	-	-	-	-
-	H-0019	1.1E-01	4.8E-01					-	-	-	-	1.2E-04	5.4E-04	-	-	-	-	-	-
-	H-0020	1.8E-01	8.1E-01					-	-	-	-	2.1E-04	9.0E-04	-	-	-	-	-	-
-	H-0028	2.5E-02	1.1E-01					-	-	-	-	2.8E-05	1.2E-04	-	-	-	-	-	-
-	H-0030	8.6E-02	3.8E-01					-	-	-	-	9.6E-05	4.2E-04	-	-	-	-	-	-
-	H-0040	8.6E-02	3.8E-01					-	-	-	-	9.6E-05	4.2E-04	-	-	-	-	-	-
-	H-0312	7.2E-02	3.1E-01					-	-	-	-	8.0E-05	3.5E-04	-	-	-	-	-	-
H0352_54	H-0352, H-0353, H-0354	4.1E-01	1.8E+00					-	-	-	-	4.6E-04	2.0E-03	-	-	-	-	-	-
-	H-0355	5.7E-02	2.5E-01					-	-	-	-	6.4E-05	2.8E-04	-	-	-	-	-	-
H0362_64	H-0362, H-0363, H-0364	2.6E-01	1.1E+00					-	-	-	-	2.9E-04	1.3E-03	-	-	-	-	-	-
-	H-0421	5.5E-02	2.4E-01					-	-	-	-	6.2E-05	2.7E-04	-	-	-	-	-	-
-	H-0464	2.0E-02	8.6E-02					-	-	-	-	2.2E-05	9.6E-05	-	-	-	-	-	-
-	H-0600	1.7E-01	7.5E-01					-	-	-	-	1.9E-04	8.4E-04	-	-	-	-	-	-
-	H-0601	1.6E-01	7.0E-01					-	-	-	-	1.8E-04	7.8E-04	-	-	-	-	-	-
-	H-2421	5.5E-02	2.4E-01					-	-	-	-	6.2E-05	2.7E-04	-	-	-	-	-	-
-	H-2501	2.5E-01	1.1E+00					-	-	-	-	2.7E-04	1.2E-03	-	-	-	-	-	-
-	H-3101	2.3E-02	9.9E-02					-	-	-	-	2.5E-05	1.1E-04	-	-	-	-	-	-
-	H-3402	1.1E-01	4.7E-01					-	-	-	-	1.2E-04	5.2E-04	-	-	-	-	-	-
-	H-3403	6.6E-02	2.9E-01					-	-	-	-	7.3E-05	3.2E-04	-	-	-	-	-	-
-	H-5401	4.0E-02	1.7E-01					-	-	-	-	4.4E-05	1.9E-04	-	-	-	-	-	-
H8801_02	H-8801/8802	3.1E-01	1.4E+00					-	-	-	-	3.5E-04	1.5E-03	-	-	-	-	-	-
-	H-9851	6.9E-01	3.0E+00	1.4E+00	6.1E+00			-	-	-	-	7.7E-04	3.4E-03	-	-	-	-	-	-
H0473	H-0473 (SRU2 TGI)	0.0E+00	0.0E+00			2.3E+00	6.3E+00	-	-	-	-	-	-	-	-	-	-	-	-
H3103	H-3103 (SRU3 TGI)	0.0E+00	0.0E+00			2.3E+00	6.3E+00	-	-	-	-	-	-	-	-	-	-	-	-
-	FCC Regen	2.9E+01	1.3E+02	1.6E+01	7.1E+01	2.1E+00	4.7E+00	2.4E-01	1.1E+00	7.7E-01	3.4E+00	7.3E-01	3.2E+00	8.9E-01	3.9E+00	3.0E-01	1.3E+00	1.1E-01	4.8E-01
-	MG-0001	8.3E-03	3.6E-02					1.7E-03	7.5E-03	2.1E-04	9.1E-04	2.1E-03	9.2E-03	8.8E-05	3.8E-04	-	-	0.0E+00	0.0E+00
-	MG-0002	8.3E-03	3.6E-02					1.7E-03	7.5E-03	2.1E-04	9.1E-04	2.1E-03	9.2E-03	8.8E-05	3.8E-04	-	-	0.0E+00	0.0E+00
-	MG-0003	4.1E-03	1.8E-02					8.5E-04	3.7E-03	1.0E-04	4.5E-04	1.0E-03	4.5E-03	4.3E-05	1.9E-04	-	-	0.0E+00	0.0E+00
-	MG-0004	2.1E-02	1.0E-03					4.3E-03	2.1E-04	5.2E-04	2.6E-05	5.2E-03	2.6E-04	2.2E-04	1.1E-05	-	-	0.0E+00	0.0E+00
-	SG-0100	1.5E-03	3.9E-04					3.2E-04	8.0E-05	3.8E-05	9.6E-06	3.9E-04	9.7E-05	1.6E-05	4.1E-06	-	-	0.0E+00	0.0E+00
-	SG-0101	1.6E-03	4.0E-04					3.3E-04	8.3E-05	4.0E-05	1.0E-05	4.0E-04	1.0E-04	1.7E-05	4.2E-06	-	-	0.0E+00	0.0E+00
-	SG-0102	2.9E-03	7.4E-04					6.1E-04	1.5E-04	7.3E-05	1.8E-05	7.4E-04	1.9E-04	3.1E-05	7.8E-06	-	-	0.0E+00	0.0E+00
-	FWG-0600	1.1E-02	5.6E-04					2.3E-03	1.2E-04	2.8E-04	1.4E-05	2.8E-03	1.4E-04	1.2E-04	5.9E-06	-	-	0.0E+00	0.0E+00
-	FWG-0601	1.1E-02	5.6E-04					2.3E-03	1.2E-04	2.8E-04	1.4E-05	2.8E-03	1.4E-04	1.2E-04	5.9E-06	-	-	0.0E+00	0.0E+00

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Formaldehyde ■ HAP or □ TAP		Hexane ■ HAP or □ TAP		Hydrogen Cyanide ■ HAP or □ TAP		Methylene Chloride ■ HAP or □ TAP		Phenol ■ HAP or □ TAP		Toluene ■ HAP or □ TAP		2,2,4-Trimethylpentane ■ HAP or □ TAP		Xylenes ■ 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
-	B-0007	1.8E-02	7.7E-02	4.2E-01	1.8E+00	-	-	-	-	-	-	8.0E-04	3.5E-03	-	-	-	-
-	B-0008	1.8E-02	7.7E-02	4.2E-01	1.8E+00	-	-	-	-	-	-	8.0E-04	3.5E-03	-	-	-	-
-	B-0009	1.8E-02	7.9E-02	4.3E-01	1.9E+00	-	-	-	-	-	-	8.1E-04	3.6E-03	-	-	-	-
-	H-0009	3.6E-03	1.6E-02	8.6E-02	3.8E-01	-	-	-	-	-	-	1.6E-04	7.1E-04	-	-	-	-
-	H-0011	3.1E-03	1.4E-02	7.5E-02	3.3E-01	-	-	-	-	-	-	1.4E-04	6.2E-04	-	-	-	-
-	H-0018	2.6E-03	1.1E-02	6.3E-02	2.7E-01	-	-	-	-	-	-	1.2E-04	5.2E-04	-	-	-	-
-	H-0019	4.4E-03	1.9E-02	1.1E-01	4.6E-01	-	-	-	-	-	-	2.0E-04	8.8E-04	-	-	-	-
-	H-0020	7.4E-03	3.2E-02	1.8E-01	7.7E-01	-	-	-	-	-	-	3.3E-04	1.5E-03	-	-	-	-
-	H-0028	1.0E-03	4.4E-03	2.4E-02	1.1E-01	-	-	-	-	-	-	4.6E-05	2.0E-04	-	-	-	-
-	H-0030	3.4E-03	1.5E-02	8.2E-02	3.6E-01	-	-	-	-	-	-	1.6E-04	6.8E-04	-	-	-	-
-	H-0040	3.4E-03	1.5E-02	8.2E-02	3.6E-01	-	-	-	-	-	-	1.6E-04	6.8E-04	-	-	-	-
-	H-0312	2.9E-03	1.3E-02	6.9E-02	3.0E-01	-	-	-	-	-	-	1.3E-04	5.7E-04	-	-	-	-
H0352_54	H-0352, H-0353, H-0354	1.6E-02	7.2E-02	3.9E-01	1.7E+00	-	-	-	-	-	-	7.4E-04	3.2E-03	-	-	-	-
-	H-0355	2.3E-03	1.0E-02	5.5E-02	2.4E-01	-	-	-	-	-	-	1.0E-04	4.5E-04	-	-	-	-
H0362_64	H-0362, H-0363, H-0364	1.0E-02	4.5E-02	2.5E-01	1.1E+00	-	-	-	-	-	-	4.6E-04	2.0E-03	-	-	-	-
-	H-0421	2.2E-03	9.7E-03	5.3E-02	2.3E-01	-	-	-	-	-	-	1.0E-04	4.4E-04	-	-	-	-
-	H-0464	7.8E-04	3.4E-03	1.9E-02	8.2E-02	-	-	-	-	-	-	3.6E-05	1.6E-04	-	-	-	-
-	H-0600	6.9E-03	3.0E-02	1.6E-01	7.2E-01	-	-	-	-	-	-	3.1E-04	1.4E-03	-	-	-	-
-	H-0601	6.4E-03	2.8E-02	1.5E-01	6.7E-01	-	-	-	-	-	-	2.9E-04	1.3E-03	-	-	-	-
-	H-2421	2.2E-03	9.7E-03	5.3E-02	2.3E-01	-	-	-	-	-	-	1.0E-04	4.4E-04	-	-	-	-
-	H-2501	9.8E-03	4.3E-02	2.4E-01	1.0E+00	-	-	-	-	-	-	4.4E-04	1.9E-03	-	-	-	-
-	H-3101	9.0E-04	3.9E-03	2.2E-02	9.4E-02	-	-	-	-	-	-	4.1E-05	1.8E-04	-	-	-	-
-	H-3402	4.2E-03	1.9E-02	1.0E-01	4.5E-01	-	-	-	-	-	-	1.9E-04	8.4E-04	-	-	-	-
-	H-3403	2.6E-03	1.1E-02	6.3E-02	2.7E-01	-	-	-	-	-	-	1.2E-04	5.2E-04	-	-	-	-
-	H-5401	1.6E-03	6.9E-03	3.8E-02	1.7E-01	-	-	-	-	-	-	7.2E-05	3.1E-04	-	-	-	-
H8801_02	H-8801/8802	1.2E-02	5.4E-02	3.0E-01	1.3E+00	-	-	-	-	-	-	5.6E-04	2.5E-03	-	-	-	-
-	H-9851	2.8E-02	1.2E-01	6.6E-01	2.9E+00	-	-	-	-	-	-	1.2E-03	5.5E-03	-	-	-	-
H0473	H-0473 (SRU2 TGI)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H3103	H-3103 (SRU3 TGI)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FCC Regen	4.6E-01	2.0E+00	-	-	2.1E+01	9.2E+01	1.9E+00	8.1E+00	1.2E+00	5.3E+00	1.4E+00	6.3E+00	-	-	1.1E-01	4.8E-01
-	MG-0001	2.6E-03	1.2E-02	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.2E-04	4.0E-03	0.0E+00	0.0E+00	6.4E-04	2.8E-03
-	MG-0002	2.6E-03	1.2E-02	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.2E-04	4.0E-03	0.0E+00	0.0E+00	6.4E-04	2.8E-03
-	MG-0003	1.3E-03	5.7E-03	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.5E-04	2.0E-03	0.0E+00	0.0E+00	3.1E-04	1.4E-03
-	MG-0004	6.6E-03	3.3E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-03	1.1E-04	0.0E+00	0.0E+00	1.6E-03	8.0E-05
-	SG-0100	4.9E-04	1.2E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-04	4.3E-05	0.0E+00	0.0E+00	1.2E-04	3.0E-05
-	SG-0101	5.1E-04	1.3E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-04	4.4E-05	0.0E+00	0.0E+00	1.2E-04	3.1E-05
-	SG-0102	9.4E-04	2.3E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-04	8.1E-05	0.0E+00	0.0E+00	2.3E-04	5.7E-05
-	FWG-0600	3.5E-03	1.8E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-03	6.2E-05	0.0E+00	0.0E+00	8.6E-04	4.3E-05
-	FWG-0601	3.5E-03	1.8E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-03	6.2E-05	0.0E+00	0.0E+00	8.6E-04	4.3E-05

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Total HAPs		Ammonia ☐ HAP or ■TAP		Sulfuric Acid ☐ HAP or ■TAP		Acetaldehyde ■ HAP or ☐ TAP		Acrolein ■ HAP or ☐ TAP		Benzene ■ HAP or ☐ TAP		1,3-Butadiene ■ HAP or ☐ TAP		Carbon Disulfide ■ HAP or ☐ TAP		Ethylbenzene ■ 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
-	FWG-0602	1.1E-02	5.6E-04					2.3E-03	1.2E-04	2.8E-04	1.4E-05	2.8E-03	1.4E-04	1.2E-04	5.9E-06	-	-	0.0E+00	0.0E+00
-	FWG-0603	9.0E-03	4.5E-04					1.9E-03	9.4E-05	2.3E-04	1.1E-05	2.3E-03	1.1E-04	9.5E-05	4.8E-06	-	-	0.0E+00	0.0E+00
-	Y-0001	1.2E-02	5.3E-02					-	-	-	-	1.6E-03	7.1E-03	7.6E-04	3.3E-03	-	-	2.2E-04	9.5E-04
-	Y-0002	1.2E-02	5.3E-02					-	-	-	-	1.6E-03	7.1E-03	7.6E-04	3.3E-03	-	-	2.2E-04	9.5E-04
-	Y-0008	3.0E-02	1.3E-01					-	-	-	-	4.0E-03	1.8E-02	1.9E-03	8.4E-03	-	-	5.4E-04	2.4E-03
-	Y-0011	7.3E-02	3.2E-01					-	-	-	-	9.7E-03	4.2E-02	4.6E-03	2.0E-02	-	-	1.3E-03	5.7E-03
-	Y-0012	2.4E-02	1.1E-01					-	-	-	-	3.2E-03	1.4E-02	1.5E-03	6.7E-03	-	-	4.3E-04	1.9E-03
-	CT TT-0006	6.3E-02	2.7E-01					-	-	-	-	8.3E-03	3.6E-02	3.9E-03	1.7E-02	-	-	1.1E-03	4.9E-03
-	Wastewater	2.4E+00	1.1E+01					-	-	-	-	3.2E-01	1.4E+00	-	-	6.2E-01	2.7E+00	2.6E-01	1.1E+00
-	TLO-1	5.7E-01	5.7E-01					-	-	-	-	4.8E-02	4.8E-02	-	-	-	-	3.8E-03	3.7E-03
-	TL-2	4.9E-01	1.5E-01					-	-	-	-	4.1E-02	1.2E-02	-	-	-	-	3.2E-03	9.7E-04
-	TL-4	4.8E-02	5.1E-02					-	-	-	-	5.7E-03	6.0E-03	-	-	-	-	4.3E-04	4.6E-04
-	TL-7	2.3E-03	3.7E-05					-	-	-	-	2.5E-04	5.0E-06	-	-	-	-	1.5E-04	2.6E-06
-	RLO-8	4.9E-01	1.2E-01					-	-	-	-	4.1E-02	9.8E-03	-	-	-	-	3.3E-03	8.0E-04
-	RLO-19	2.6E+00	2.2E-01					-	-	-	-	2.3E-01	2.4E-02	-	-	-	-	1.7E-02	1.5E-03
-	TLO-20	9.8E-01	1.5E-01					-	-	-	-	8.2E-02	1.2E-02	-	-	-	-	6.5E-03	9.7E-04
-	FUG-02-SP CRUDE	1.8E-01	7.7E-01					-	-	-	-	1.3E-02	5.5E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-02	5.7E-02
-	FUG-06-NHDU	5.0E-01	2.2E+00					-	-	-	-	4.9E-02	2.2E-01	0.0E+00	0.0E+00	5.2E-05	2.3E-04	2.4E-02	1.1E-01
-	FUG-07-N AMINE	0.0E+00	0.0E+00					-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-07-SWS1	0.0E+00	0.0E+00					-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-08-TRUCK RK	3.3E-01	1.4E+00					-	-	-	-	1.2E-02	5.1E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.1E-03	3.5E-02
-	FUG-09-N ALKY	1.8E+00	7.9E+00					-	-	-	-	1.5E-02	6.7E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-03	7.6E-03
-	FUG-10-FCC	1.3E+00	5.8E+00					-	-	-	-	4.7E-02	2.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-02	1.4E-01
-	FUG-13-NHDU	6.7E-01	2.9E+00					-	-	-	-	6.6E-02	2.9E-01	0.0E+00	0.0E+00	7.0E-05	3.1E-04	3.2E-02	1.4E-01
-	FUG-18-LSR MEROX TRT	2.9E-02	1.3E-01					-	-	-	-	1.0E-03	4.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.2E-04	3.2E-03
-	FUG-19-NAPHTHA	2.6E-02	1.1E-01					-	-	-	-	2.5E-03	1.1E-02	0.0E+00	0.0E+00	2.7E-06	1.2E-05	1.2E-03	5.4E-03
-	FUG-20-ISOM	1.6E-01	7.2E-01					-	-	-	-	1.1E-02	4.9E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.5E-03	3.7E-02
-	FUG-21-SP VACUUM	2.2E-02	9.5E-02					-	-	-	-	2.2E-02	9.5E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-25-ROSE-2	4.4E-04	1.9E-03					-	-	-	-	1.2E-05	5.1E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-05	5.9E-05
-	FUG-29-BLENDER/TK FARM	1.5E+00	6.5E+00					-	-	-	-	5.2E-02	2.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.7E-02	1.6E-01
-	FUG-30-SRU2/TGTU	0.0E+00	0.0E+00					-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-31-SRU3/TGTU3/TGI3	0.0E+00	0.0E+00					-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-33-DIST HDU	1.1E+00	4.9E+00					-	-	-	-	2.2E-01	9.5E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-02	1.2E-01
-	FUG-34-HYDROCRACKER	4.7E-01	2.1E+00					-	-	-	-	4.7E-02	2.0E-01	0.0E+00	0.0E+00	4.9E-05	2.2E-04	2.3E-02	1.0E-01
-	FUG-35-SAT GAS	5.5E-01	2.4E+00					-	-	-	-	5.4E-02	2.4E-01	0.0E+00	0.0E+00	5.7E-05	2.5E-04	2.6E-02	1.2E-01
-	FUG-36-RO	8.5E-03	3.7E-02					-	-	-	-	8.5E-04	3.7E-03	0.0E+00	0.0E+00	9.0E-07	3.9E-06	4.1E-04	1.8E-03
-	FUG-37-NP-UT	1.6E-01	7.1E-01					-	-	-	-	1.6E-02	7.0E-02	0.0E+00	0.0E+00	1.7E-05	7.5E-05	7.9E-03	3.4E-02
-	FUG-41-PBC	4.2E-02	1.8E-01					-	-	-	-	2.1E-03	9.2E-03	9.7E-04	4.2E-03	0.0E+00	0.0E+00	7.0E-03	3.1E-02
-	FUG-43-S ALKY	1.1E-01	4.6E-01					-	-	-	-	3.7E-03	1.6E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-03	1.1E-02
-	FUG-44-DIST-HDU	5.0E-01	2.2E+00					-	-	-	-	9.7E-02	4.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-02	5.3E-02

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Formaldehyde ■ HAP or □ TAP		Hexane ■ HAP or □ TAP		Hydrogen Cyanide ■ HAP or □ TAP		Methylene Chloride ■ HAP or □ TAP		Phenol ■ HAP or □ TAP		Toluene ■ HAP or □ TAP		2,2,4-Trimethylpentane ■ HAP or □ TAP		Xylenes ■ 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
-	FWG-0602	3.5E-03	1.8E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-03	6.2E-05	0.0E+00	0.0E+00	8.6E-04	4.3E-05
-	FWG-0603	2.9E-03	1.4E-04	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.0E-03	5.0E-05	0.0E+00	0.0E+00	7.0E-04	3.5E-05
-	Y-0001	-	-	8.8E-03	3.9E-02	-	-	-	-	-	-	6.0E-04	2.6E-03	1.1E-04	4.9E-04	3.5E-05	1.5E-04
-	Y-0002	-	-	8.8E-03	3.9E-02	-	-	-	-	-	-	6.0E-04	2.6E-03	1.1E-04	4.9E-04	3.5E-05	1.5E-04
-	Y-0008	-	-	2.2E-02	9.7E-02	-	-	-	-	-	-	1.5E-03	6.6E-03	2.8E-04	1.2E-03	8.8E-05	3.9E-04
-	Y-0011	-	-	5.3E-02	2.3E-01	-	-	-	-	-	-	3.6E-03	1.6E-02	6.7E-04	2.9E-03	2.1E-04	9.3E-04
-	Y-0012	-	-	1.8E-02	7.7E-02	-	-	-	-	-	-	1.2E-03	5.2E-03	2.2E-04	9.8E-04	7.1E-05	3.1E-04
-	CT TT-0006	-	-	4.5E-02	2.0E-01	-	-	-	-	-	-	3.1E-03	1.3E-02	5.7E-04	2.5E-03	1.8E-04	7.9E-04
-	Wastewater	1.2E-01	5.1E-01	-	-	-	-	2.6E-02	1.1E-01	-	-	5.0E-01	2.2E+00	-	-	5.6E-01	2.4E+00
-	TLO-1	-	-	4.7E-01	4.7E-01	-	-	-	-	-	-	3.1E-02	3.1E-02	6.0E-03	5.9E-03	9.4E-03	9.3E-03
-	TL-2	-	-	4.1E-01	1.2E-01	-	-	-	-	-	-	2.7E-02	8.1E-03	5.1E-03	1.5E-03	8.1E-03	2.4E-03
-	TL-4	-	-	6.4E-03	6.7E-03	-	-	-	-	-	-	5.6E-03	5.9E-03	2.4E-02	2.5E-02	6.6E-03	7.0E-03
-	TL-7	-	-	2.3E-04	3.4E-07	-	-	-	-	-	-	5.3E-04	1.4E-05	4.9E-04	7.2E-07	6.7E-04	1.4E-05
-	RLO-8	-	-	4.1E-01	9.7E-02	-	-	-	-	-	-	2.7E-02	6.5E-03	5.1E-03	1.2E-03	8.6E-03	2.3E-03
-	RLO-19	-	-	2.1E+00	1.8E-01	-	-	-	-	-	-	1.4E-01	1.2E-02	2.7E-02	2.4E-03	4.3E-02	3.8E-03
-	TLO-20	-	-	8.1E-01	1.2E-01	-	-	-	-	-	-	5.4E-02	8.1E-03	1.0E-02	1.5E-03	1.6E-02	2.4E-03
-	FUG-02-SP CRUDE	-	-	7.5E-02	3.3E-01	-	-	-	-	-	-	3.4E-02	1.5E-01	4.3E-03	1.9E-02	3.7E-02	1.6E-01
-	FUG-06-NHDU	-	-	2.4E-01	1.0E+00	-	-	-	-	-	-	1.2E-01	5.4E-01	1.9E-03	8.1E-03	6.2E-02	2.7E-01
-	FUG-07-N AMINE	-	-	0.0E+00	0.0E+00	-	-	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-07-SWS1	-	-	0.0E+00	0.0E+00	-	-	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-08-TRUCK RK	-	-	8.3E-03	3.6E-02	-	-	-	-	-	-	3.8E-02	1.7E-01	1.2E-01	5.4E-01	1.4E-01	6.1E-01
-	FUG-09-N ALKY	-	-	5.3E-03	2.3E-02	-	-	-	-	-	-	3.3E-02	1.5E-01	1.7E+00	7.7E+00	9.1E-03	4.0E-02
-	FUG-10-FCC	-	-	3.4E-02	1.5E-01	-	-	-	-	-	-	1.6E-01	6.8E-01	5.0E-01	2.2E+00	5.6E-01	2.5E+00
-	FUG-13-NHDU	-	-	3.2E-01	1.4E+00	-	-	-	-	-	-	1.7E-01	7.3E-01	2.5E-03	1.1E-02	8.4E-02	3.7E-01
-	FUG-18-LSR MEROX TRT	-	-	7.4E-04	3.2E-03	-	-	-	-	-	-	3.4E-03	1.5E-02	1.1E-02	4.8E-02	1.2E-02	5.4E-02
-	FUG-19-NAPHTHA	-	-	1.2E-02	5.3E-02	-	-	-	-	-	-	6.4E-03	2.8E-02	9.6E-05	4.2E-04	3.2E-03	1.4E-02
-	FUG-20-ISOM	-	-	1.3E-01	5.6E-01	-	-	-	-	-	-	1.3E-02	5.5E-02	3.2E-03	1.4E-02	4.8E-04	2.1E-03
-	FUG-21-SP VACUUM	-	-	0.0E+00	0.0E+00	-	-	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-25-ROSE-2	-	-	3.3E-04	1.4E-03	-	-	-	-	-	-	4.3E-05	1.9E-04	0.0E+00	0.0E+00	5.1E-05	2.2E-04
-	FUG-29-BLENDER/TK FARM	-	-	3.8E-02	1.7E-01	-	-	-	-	-	-	1.7E-01	7.6E-01	5.6E-01	2.5E+00	6.3E-01	2.8E+00
-	FUG-30-SRU2/TGTU	-	-	0.0E+00	0.0E+00	-	-	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-31-SRU3/TGTU3/TGI3	-	-	0.0E+00	0.0E+00	-	-	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-33-DIST HDU	-	-	7.2E-01	3.1E+00	-	-	-	-	-	-	1.0E-01	4.6E-01	1.2E-02	5.2E-02	3.9E-02	1.7E-01
-	FUG-34-HYDROCRACKER	-	-	2.2E-01	9.7E-01	-	-	-	-	-	-	1.2E-01	5.1E-01	1.8E-03	7.7E-03	5.9E-02	2.6E-01
-	FUG-35-SAT GAS	-	-	2.6E-01	1.1E+00	-	-	-	-	-	-	1.4E-01	6.0E-01	2.0E-03	9.0E-03	6.8E-02	3.0E-01
-	FUG-36-RO	-	-	4.0E-03	1.8E-02	-	-	-	-	-	-	2.1E-03	9.3E-03	3.2E-05	1.4E-04	1.1E-03	4.7E-03
-	FUG-37-NP-UT	-	-	7.7E-02	3.4E-01	-	-	-	-	-	-	4.0E-02	1.8E-01	6.1E-04	2.7E-03	2.0E-02	8.9E-02
-	FUG-41-PBC	-	-	1.6E-02	7.0E-02	-	-	-	-	-	-	1.6E-02	6.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	FUG-43-S ALKY	-	-	2.7E-03	1.2E-02	-	-	-	-	-	-	1.2E-02	5.4E-02	4.0E-02	1.7E-01	4.4E-02	1.9E-01
-	FUG-44-DIST-HDU	-	-	3.2E-01	1.4E+00	-	-	-	-	-	-	4.7E-02	2.1E-01	5.3E-03	2.3E-02	1.8E-02	7.7E-02

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Total HAPs		Ammonia ☐ HAP or ■TAP		Sulfuric Acid ☐ HAP or ■TAP		Acetaldehyde ■ HAP or ☐ TAP		Acrolein ■ HAP or ☐ TAP		Benzene ■ HAP or ☐ TAP		1,3-Butadiene ■ HAP or ☐ TAP		Carbon Disulfide ■ HAP or ☐ TAP		Ethylbenzene ■ 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
-	FUG-45-DIST-HDU	1.9E-01	8.5E-01					-	-	-	-	3.8E-02	1.7E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-03	2.0E-02
-	FUG-54-PRIMEG	7.5E-01	3.3E+00					-	-	-	-	2.6E-02	1.2E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-02	8.1E-02
-	FUG-70-CCR	1.4E+00	6.3E+00					-	-	-	-	5.0E-02	2.2E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.5E-02	1.5E-01
-	FUG-80-WWTP CVS	6.0E-02	2.6E-01					-	-	-	-	1.1E-02	4.6E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.1E-03	2.7E-02
-	T-0011	4.7E-02	1.3E-01					-	-	-	-	4.4E-03	1.2E-02	4.1E-03	1.2E-02	0.0E+00	0.0E+00	7.1E-04	2.0E-03
-	T-0012	4.6E-02	1.1E-01					-	-	-	-	4.3E-03	1.1E-02	4.0E-03	1.0E-02	0.0E+00	0.0E+00	7.0E-04	1.7E-03
-	T-0020	1.5E-02	3.4E-02					-	-	-	-	1.4E-03	3.2E-03	1.3E-03	3.0E-03	0.0E+00	0.0E+00	2.3E-04	5.2E-04
-	T-0021	1.5E-02	3.4E-02					-	-	-	-	1.4E-03	3.2E-03	1.3E-03	3.0E-03	0.0E+00	0.0E+00	2.3E-04	5.2E-04
-	T-0022	1.3E-02	3.0E-02					-	-	-	-	1.2E-03	2.8E-03	1.2E-03	2.6E-03	0.0E+00	0.0E+00	2.0E-04	4.5E-04
-	T-0023	1.3E-02	3.0E-02					-	-	-	-	1.2E-03	2.8E-03	1.2E-03	2.6E-03	0.0E+00	0.0E+00	2.0E-04	4.5E-04
-	T-0040	5.5E-06	3.2E-07					9.5E-07	5.6E-08	-	-	2.0E-07	1.2E-08	-	-	-	-	2.1E-09	1.2E-10
-	T-0041	5.5E-06	3.2E-07					9.5E-07	5.6E-08	-	-	2.0E-07	1.2E-08	-	-	-	-	2.1E-09	1.2E-10
-	T-0049	1.1E-02	1.5E-03					0.0E+00	0.0E+00	-	-	2.9E-03	4.0E-04	-	-	-	-	1.8E-04	2.5E-05
-	T-0055	1.3E-03	2.1E-05					2.3E-04	3.7E-06	-	-	4.9E-05	8.0E-07	-	-	-	-	5.0E-07	8.2E-09
-	T-0056	6.9E-03	6.3E-03					-	-	-	-	9.0E-04	8.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-04	2.9E-04
-	T-0059	5.3E-05	2.0E-05					0.0E+00	0.0E+00	-	-	5.6E-06	2.1E-06	-	-	-	-	3.3E-06	1.2E-06
-	T-0061	8.0E-05	9.7E-05					0.0E+00	0.0E+00	-	-	8.5E-06	1.0E-05	-	-	-	-	5.0E-06	6.1E-06
-	T-0063	2.3E-05	7.5E-06					0.0E+00	0.0E+00	-	-	3.3E-06	1.0E-06	-	-	-	-	1.7E-06	5.3E-07
-	T-0065	1.0E-03	7.5E-06					0.0E+00	0.0E+00	-	-	1.4E-04	1.0E-06	-	-	-	-	7.3E-05	5.3E-07
-	T-0075	1.0E-03	9.0E-06					0.0E+00	0.0E+00	-	-	1.4E-04	1.3E-06	-	-	-	-	7.3E-05	6.4E-07
-	T-0079	5.9E-02	1.6E-01					-	-	-	-	5.4E-03	1.4E-02	5.1E-03	1.4E-02	0.0E+00	0.0E+00	8.9E-04	2.4E-03
-	T-0081	4.7E+00	1.2E-02					0.0E+00	0.0E+00	-	-	3.9E-01	1.0E-03	-	-	-	-	3.1E-02	8.1E-05
-	T-0082	4.9E+00	5.8E-03					0.0E+00	0.0E+00	-	-	4.1E-01	4.8E-04	-	-	-	-	3.2E-02	3.8E-05
-	T-0106	5.2E-03	5.2E-03					-	-	-	-	1.4E-03	1.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.4E-05	8.4E-05
-	T-0107	1.1E-01	2.9E-01					-	-	-	-	8.9E-03	2.4E-02	8.8E-03	2.4E-02	0.0E+00	0.0E+00	2.3E-04	6.3E-04
-	T-0108	3.0E-02	1.1E-01					-	-	-	-	2.8E-03	1.0E-02	2.6E-03	9.5E-03	0.0E+00	0.0E+00	4.5E-04	1.7E-03
-	T-0109	4.4E-02	1.5E-01					-	-	-	-	4.1E-03	1.4E-02	3.8E-03	1.3E-02	0.0E+00	0.0E+00	6.7E-04	2.2E-03
-	T-0110	1.2E-01	1.3E-01					0.0E+00	0.0E+00	-	-	1.0E-02	1.1E-02	-	-	-	-	8.1E-04	8.3E-04
-	T-0111	2.6E-02	8.5E-02					-	-	-	-	2.4E-03	7.9E-03	2.3E-03	7.4E-03	0.0E+00	0.0E+00	3.9E-04	1.3E-03
-	T-0112	7.0E-03	2.5E-03					-	-	-	-	9.2E-04	3.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-04	1.2E-04

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Formaldehyde ■ HAP or □ TAP		Hexane ■ HAP or □ TAP		Hydrogen Cyanide ■ HAP or □ TAP		Methylene Chloride ■ HAP or □ TAP		Phenol ■ HAP or □ TAP		Toluene ■ HAP or □ TAP		2,2,4-Trimethylpentane ■ HAP or □ TAP		Xylenes ■ 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
-	FUG-45-DIST-HDU	-	-	1.2E-01	5.5E-01	-	-	-	-	-	-	1.8E-02	8.0E-02	2.1E-03	9.0E-03	6.9E-03	3.0E-02
-	FUG-54-PRIMEG	-	-	1.9E-02	8.3E-02	-	-	-	-	-	-	8.8E-02	3.8E-01	2.8E-01	1.2E+00	3.2E-01	1.4E+00
-	FUG-70-CCR	-	-	3.6E-02	1.6E-01	-	-	-	-	-	-	1.7E-01	7.3E-01	5.4E-01	2.4E+00	6.0E-01	2.6E+00
-	FUG-80-WWTP CVS	-	-	1.5E-02	6.5E-02	-	-	-	-	-	-	1.5E-02	6.5E-02	1.2E-03	5.4E-03	1.2E-02	5.4E-02
-	T-0011	-	-	6.9E-03	2.0E-02	-	-	-	-	-	-	1.1E-02	3.2E-02	1.5E-02	4.4E-02	4.4E-03	1.3E-02
-	T-0012	-	-	6.8E-03	1.7E-02	-	-	-	-	-	-	1.1E-02	2.7E-02	1.5E-02	3.8E-02	4.4E-03	1.1E-02
-	T-0020	-	-	2.2E-03	5.0E-03	-	-	-	-	-	-	3.6E-03	8.1E-03	4.9E-03	1.1E-02	1.4E-03	3.2E-03
-	T-0021	-	-	2.2E-03	5.0E-03	-	-	-	-	-	-	3.6E-03	8.1E-03	4.9E-03	1.1E-02	1.4E-03	3.2E-03
-	T-0022	-	-	1.9E-03	4.4E-03	-	-	-	-	-	-	3.1E-03	7.1E-03	4.3E-03	9.8E-03	1.2E-03	2.8E-03
-	T-0023	-	-	1.9E-03	4.4E-03	-	-	-	-	-	-	3.1E-03	7.1E-03	4.3E-03	9.8E-03	1.2E-03	2.8E-03
-	T-0040	-	-	0.0E+00	0.0E+00	-	-	-	-	4.3E-06	2.5E-07	4.2E-08	2.4E-09	0.0E+00	0.0E+00	6.8E-09	4.0E-10
-	T-0041	-	-	0.0E+00	0.0E+00	-	-	-	-	4.3E-06	2.5E-07	4.2E-08	2.4E-09	0.0E+00	0.0E+00	6.8E-09	4.0E-10
-	T-0049	-	-	6.3E-03	8.7E-04	-	-	-	-	0.0E+00	0.0E+00	1.2E-03	1.7E-04	1.3E-04	1.8E-05	3.3E-04	4.6E-05
-	T-0055	-	-	0.0E+00	0.0E+00	-	-	-	-	1.0E-03	1.7E-05	9.9E-06	1.6E-07	0.0E+00	0.0E+00	1.6E-06	2.7E-08
-	T-0056	-	-	8.5E-04	7.8E-04	-	-	-	-	-	-	4.2E-03	3.8E-03	9.7E-06	8.9E-06	6.2E-04	5.6E-04
-	T-0059	-	-	5.6E-06	2.1E-06	-	-	-	-	0.0E+00	0.0E+00	1.1E-05	4.3E-06	1.2E-05	4.5E-06	1.5E-05	5.7E-06
-	T-0061	-	-	8.6E-06	1.0E-05	-	-	-	-	0.0E+00	0.0E+00	1.7E-05	2.1E-05	1.8E-05	2.2E-05	2.3E-05	2.8E-05
-	T-0063	-	-	0.0E+00	0.0E+00	-	-	-	-	0.0E+00	0.0E+00	9.5E-06	3.0E-06	0.0E+00	0.0E+00	9.1E-06	2.9E-06
-	T-0065	-	-	0.0E+00	0.0E+00	-	-	-	-	0.0E+00	0.0E+00	4.2E-04	3.0E-06	0.0E+00	0.0E+00	4.0E-04	2.9E-06
-	T-0075	-	-	0.0E+00	0.0E+00	-	-	-	-	0.0E+00	0.0E+00	4.2E-04	3.6E-06	0.0E+00	0.0E+00	4.0E-04	3.5E-06
-	T-0079	-	-	8.6E-03	2.3E-02	-	-	-	-	-	-	1.4E-02	3.7E-02	1.9E-02	5.1E-02	5.5E-03	1.5E-02
-	T-0081	-	-	3.9E+00	1.0E-02	-	-	-	-	0.0E+00	0.0E+00	2.5E-01	6.7E-04	4.9E-02	1.3E-04	7.7E-02	2.0E-04
-	T-0082	-	-	4.1E+00	4.8E-03	-	-	-	-	0.0E+00	0.0E+00	2.7E-01	3.2E-04	5.1E-02	6.0E-05	8.1E-02	9.5E-05
-	T-0106	-	-	3.0E-03	3.0E-03	-	-	-	-	-	-	5.7E-04	5.7E-04	6.2E-05	6.2E-05	1.6E-04	1.6E-04
-	T-0107	-	-	8.7E-02	2.3E-01	-	-	-	-	-	-	3.3E-03	9.0E-03	1.3E-04	3.5E-04	0.0E+00	0.0E+00
-	T-0108	-	-	4.4E-03	1.6E-02	-	-	-	-	-	-	7.1E-03	2.6E-02	9.8E-03	3.6E-02	2.8E-03	1.0E-02
-	T-0109	-	-	6.5E-03	2.2E-02	-	-	-	-	-	-	1.0E-02	3.5E-02	1.4E-02	4.8E-02	4.1E-03	1.4E-02
-	T-0110	-	-	1.0E-01	1.0E-01	-	-	-	-	0.0E+00	0.0E+00	6.7E-03	6.9E-03	1.3E-03	1.3E-03	2.0E-03	2.1E-03
-	T-0111	-	-	3.8E-03	1.2E-02	-	-	-	-	-	-	6.1E-03	2.0E-02	8.5E-03	2.8E-02	2.4E-03	8.0E-03
-	T-0112	-	-	8.7E-04	3.1E-04	-	-	-	-	-	-	4.3E-03	1.5E-03	9.9E-06	3.6E-06	6.3E-04	2.3E-04

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Total HAPs		Ammonia ☐ HAP or ■ TAP		Sulfuric Acid ☐ HAP or ■ TAP		Acetaldehyde ■ HAP or ☐ TAP		Acrolein ■ HAP or ☐ TAP		Benzene ■ HAP or ☐ TAP		1,3-Butadiene ■ HAP or ☐ TAP		Carbon Disulfide ■ HAP or ☐ TAP		Ethylbenzene ■ 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
-	T-0117	1.7E-02	6.5E-03					-	-	-	-	2.3E-03	8.5E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.9E-04	3.0E-04
-	T-0124	3.0E-02	6.9E-02					-	-	-	-	2.8E-03	6.4E-03	2.6E-03	6.0E-03	0.0E+00	0.0E+00	4.6E-04	1.0E-03
-	T-0400	8.7E-01	5.2E-02					0.0E+00	0.0E+00	-	-	8.7E-01	5.2E-02	-	-	-	-	0.0E+00	0.0E+00
-	T-0401	8.9E-03	2.6E-02					-	-	-	-	8.2E-04	2.4E-03	7.7E-04	2.2E-03	0.0E+00	0.0E+00	1.3E-04	3.9E-04
-	T-0402	2.1E-02	3.6E-02					-	-	-	-	4.1E-03	6.9E-03	1.7E-03	2.9E-03	0.0E+00	0.0E+00	4.9E-04	8.3E-04
-	T-0410	2.1E+00	7.1E-02					0.0E+00	0.0E+00	-	-	1.8E-01	5.9E-03	-	-	-	-	1.4E-02	4.7E-04
-	T-0411	1.4E-01	3.5E-01					-	-	-	-	1.2E-02	2.9E-02	1.2E-02	2.9E-02	0.0E+00	0.0E+00	3.1E-04	7.6E-04
-	T-0412	2.0E-02	7.9E-03					-	-	-	-	2.7E-03	1.0E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.3E-04	3.6E-04
-	T-0413	2.2E-03	3.4E-04					-	-	-	-	2.1E-04	3.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-04	2.6E-05
-	T-0415	3.2E-02	7.0E-02					-	-	-	-	3.0E-03	6.5E-03	2.8E-03	6.1E-03	0.0E+00	0.0E+00	4.8E-04	1.1E-03
-	T-0417	4.1E-02	1.0E-01					-	-	-	-	3.8E-03	9.7E-03	3.5E-03	9.1E-03	0.0E+00	0.0E+00	6.2E-04	1.6E-03
-	T-0418	2.6E-03	3.7E-04					-	-	-	-	2.6E-04	3.7E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-04	2.9E-05
-	T-0419	2.6E-03	1.2E-04					0.0E+00	0.0E+00	-	-	7.5E-04	3.4E-05	-	-	-	-	1.7E-04	7.5E-06
-	T-0420	2.7E-01	2.7E-05					0.0E+00	0.0E+00	-	-	2.3E-02	2.2E-06	-	-	-	-	1.8E-03	1.8E-07
-	T-0422	4.6E-04	1.7E-04					0.0E+00	0.0E+00	-	-	4.9E-05	1.8E-05	-	-	-	-	2.9E-05	1.1E-05
-	T-0423	5.5E-04	2.1E-04					0.0E+00	0.0E+00	-	-	5.8E-05	2.2E-05	-	-	-	-	3.4E-05	1.3E-05
-	T-0431	3.0E-02	6.8E-04					0.0E+00	0.0E+00	-	-	3.2E-03	7.2E-05	-	-	-	-	1.9E-03	4.2E-05
-	T-0432	2.6E-02	9.4E-04					0.0E+00	0.0E+00	-	-	2.8E-03	1.0E-04	-	-	-	-	1.6E-03	5.9E-05
-	T-0433	1.1E-02	2.8E-02					0.0E+00	0.0E+00	-	-	1.1E-02	2.8E-02	-	-	-	-	0.0E+00	0.0E+00
-	T-0434	4.0E-02	1.6E-02					0.0E+00	0.0E+00	-	-	1.1E-02	4.5E-03	-	-	-	-	2.5E-03	1.0E-03
-	T-0435	2.5E-03	6.8E-03					-	-	-	-	6.6E-04	1.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-05	1.1E-04
-	T-0437	2.7E-02	5.2E-02					-	-	-	-	2.4E-03	4.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-04	5.0E-04
-	T-0438	2.2E-01	1.2E-02					0.0E+00	0.0E+00	-	-	2.2E-01	1.2E-02	-	-	-	-	0.0E+00	0.0E+00
-	T-0439	7.6E-02	1.6E-01					-	-	-	-	8.1E-03	1.7E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-04	8.9E-04
-	T-0450	1.1E-01	2.0E-01					-	-	-	-	1.2E-02	2.1E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.1E-04	1.1E-03
-	T-0451	3.4E-04	5.2E-05					-	-	-	-	9.7E-05	1.5E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-05	3.3E-06
-	T-0452	0.0E+00	0.0E+00					-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	T-0737	2.2E-03	6.0E-03					-	-	-	-	5.7E-04	1.6E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.5E-05	9.7E-05
-	T-0802	2.1E-03	6.7E-03					-	-	-	-	5.5E-04	1.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-05	1.1E-04
-	T-0814	9.4E-01	2.8E-01					0.0E+00	0.0E+00	-	-	7.9E-02	2.3E-02	-	-	-	-	6.2E-03	1.8E-03
-	T-0815	4.0E-02	6.4E-04					0.0E+00	0.0E+00	-	-	1.1E-02	1.8E-04	-	-	-	-	2.5E-03	4.0E-05
-	T-0821	2.6E-02	4.1E-02					-	-	-	-	5.0E-03	7.8E-03	2.1E-03	3.3E-03	0.0E+00	0.0E+00	6.0E-04	9.4E-04
-	T-0834	4.0E-04	5.1E-04					-	-	-	-	1.1E-04	1.4E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-05	3.2E-05
-	T-0835	1.4E-03	2.3E-04					-	-	-	-	3.9E-04	6.6E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.7E-05	1.5E-05
-	T-0838	1.1E-02	4.8E-04					0.0E+00	0.0E+00	-	-	3.1E-03	1.4E-04	-	-	-	-	6.8E-04	3.0E-05
-	T-1225	2.1E-02	8.3E-02					-	-	-	-	1.9E-03	7.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-04	8.0E-04
-	T-1227	1.8E+00	3.8E-01					0.0E+00	0.0E+00	-	-	1.5E-01	3.1E-02	-	-	-	-	1.2E-02	2.5E-03
Totals:		70.92	217.11	17.63	77.23	6.73	17.19	0.26	1.08	0.77	3.38	4.90	9.01	0.96	4.10	0.92	4.05	0.85	3.11

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

Stack No.	Unit No.(s)	Formaldehyde ■ HAP or ☐ TAP		Hexane ■ HAP or ☐ TAP		Hydrogen Cyanide ■ HAP or ☐ TAP		Methylene Chloride ■ HAP or ☐ TAP		Phenol ■ HAP or ☐ TAP		Toluene ■ HAP or ☐ TAP		2,2,4-Trimethylpentane ■ HAP or ☐ TAP		Xylenes ■ 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
-	T-0117	-	-	2.1E-03	8.0E-04	-	-	-	-	-	-	1.0E-02	3.9E-03	2.4E-05	9.2E-06	1.5E-03	5.8E-04
-	T-0124	-	-	4.4E-03	1.0E-02	-	-	-	-	-	-	7.2E-03	1.6E-02	9.9E-03	2.2E-02	2.9E-03	6.5E-03
-	T-0400	-	-	0.0E+00	0.0E+00	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	T-0401	-	-	1.3E-03	3.8E-03	-	-	-	-	-	-	2.1E-03	6.1E-03	2.9E-03	8.4E-03	8.4E-04	2.4E-03
-	T-0402	-	-	1.3E-02	2.2E-02	-	-	-	-	-	-	0.0E+00	0.0E+00	2.3E-04	3.9E-04	1.9E-03	3.2E-03
-	T-0410	-	-	1.7E+00	5.9E-02	-	-	-	-	0.0E+00	0.0E+00	1.2E-01	3.9E-03	2.2E-02	7.4E-04	3.5E-02	1.2E-03
-	T-0411	-	-	1.2E-01	2.8E-01	-	-	-	-	-	-	4.4E-03	1.1E-02	1.7E-04	4.2E-04	0.0E+00	0.0E+00
-	T-0412	-	-	2.5E-03	9.7E-04	-	-	-	-	-	-	1.2E-02	4.8E-03	2.9E-05	1.1E-05	1.8E-03	7.1E-04
-	T-0413	-	-	8.1E-04	1.3E-04	-	-	-	-	-	-	3.5E-04	5.4E-05	2.5E-04	3.8E-05	3.9E-04	6.0E-05
-	T-0415	-	-	4.7E-03	1.0E-02	-	-	-	-	-	-	7.5E-03	1.7E-02	1.0E-02	2.3E-02	3.0E-03	6.6E-03
-	T-0417	-	-	6.0E-03	1.5E-02	-	-	-	-	-	-	9.6E-03	2.5E-02	1.3E-02	3.4E-02	3.8E-03	9.8E-03
-	T-0418	-	-	9.7E-04	1.4E-04	-	-	-	-	-	-	4.2E-04	6.0E-05	2.9E-04	4.2E-05	4.6E-04	6.6E-05
-	T-0419	-	-	2.7E-04	1.2E-05	-	-	-	-	0.0E+00	0.0E+00	6.6E-04	3.0E-05	0.0E+00	0.0E+00	7.9E-04	3.6E-05
-	T-0420	-	-	2.2E-01	2.2E-05	-	-	-	-	0.0E+00	0.0E+00	1.5E-02	1.5E-06	2.8E-03	2.8E-07	4.4E-03	4.4E-07
-	T-0422	-	-	4.9E-05	1.9E-05	-	-	-	-	0.0E+00	0.0E+00	9.8E-05	3.7E-05	1.0E-04	3.9E-05	1.3E-04	4.9E-05
-	T-0423	-	-	5.9E-05	2.2E-05	-	-	-	-	0.0E+00	0.0E+00	1.2E-04	4.4E-05	1.2E-04	4.6E-05	1.5E-04	5.9E-05
-	T-0431	-	-	3.2E-03	7.2E-05	-	-	-	-	0.0E+00	0.0E+00	6.5E-03	1.5E-04	6.8E-03	1.5E-04	8.5E-03	1.9E-04
-	T-0432	-	-	2.8E-03	1.0E-04	-	-	-	-	0.0E+00	0.0E+00	5.6E-03	2.0E-04	5.9E-03	2.1E-04	7.4E-03	2.7E-04
-	T-0433	-	-	0.0E+00	0.0E+00	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	T-0434	-	-	4.2E-03	1.7E-03	-	-	-	-	0.0E+00	0.0E+00	1.0E-02	4.0E-03	0.0E+00	0.0E+00	1.2E-02	4.8E-03
-	T-0435	-	-	1.5E-03	3.9E-03	-	-	-	-	-	-	2.8E-04	7.5E-04	3.0E-05	8.1E-05	7.6E-05	2.0E-04
-	T-0437	-	-	2.2E-02	4.2E-02	-	-	-	-	-	-	1.9E-03	3.6E-03	3.1E-04	6.0E-04	6.7E-04	1.3E-03
-	T-0438	-	-	0.0E+00	0.0E+00	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	T-0439	-	-	6.0E-02	1.3E-01	-	-	-	-	-	-	6.1E-03	1.3E-02	1.2E-04	2.5E-04	9.9E-04	2.1E-03
-	T-0450	-	-	8.6E-02	1.6E-01	-	-	-	-	-	-	8.7E-03	1.6E-02	1.7E-04	3.1E-04	1.4E-03	2.6E-03
-	T-0451	-	-	3.5E-05	5.4E-06	-	-	-	-	-	-	8.6E-05	1.3E-05	0.0E+00	0.0E+00	1.0E-04	1.5E-05
-	T-0452	-	-	0.0E+00	0.0E+00	-	-	-	-	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
-	T-0737	-	-	1.2E-03	3.4E-03	-	-	-	-	-	-	2.4E-04	6.6E-04	2.6E-05	7.1E-05	6.5E-05	1.8E-04
-	T-0802	-	-	1.2E-03	3.8E-03	-	-	-	-	-	-	2.3E-04	7.4E-04	2.5E-05	8.0E-05	6.4E-05	2.0E-04
-	T-0814	-	-	7.8E-01	2.3E-01	-	-	-	-	0.0E+00	0.0E+00	5.1E-02	1.5E-02	9.8E-03	2.9E-03	1.5E-02	4.6E-03
-	T-0815	-	-	4.2E-03	6.7E-05	-	-	-	-	0.0E+00	0.0E+00	1.0E-02	1.6E-04	0.0E+00	0.0E+00	1.2E-02	1.9E-04
-	T-0821	-	-	1.6E-02	2.5E-02	-	-	-	-	-	-	0.0E+00	0.0E+00	2.8E-04	4.4E-04	2.3E-03	3.6E-03
-	T-0834	-	-	4.2E-05	5.3E-05	-	-	-	-	-	-	1.0E-04	1.3E-04	0.0E+00	0.0E+00	1.2E-04	1.5E-04
-	T-0835	-	-	1.4E-04	2.4E-05	-	-	-	-	-	-	3.5E-04	5.9E-05	0.0E+00	0.0E+00	4.1E-04	7.0E-05
-	T-0838	-	-	1.1E-03	5.0E-05	-	-	-	-	0.0E+00	0.0E+00	2.7E-03	1.2E-04	0.0E+00	0.0E+00	3.3E-03	1.4E-04
-	T-1225	-	-	1.7E-02	6.6E-02	-	-	-	-	-	-	1.5E-03	5.7E-03	2.5E-04	9.6E-04	5.3E-04	2.1E-03
-	T-1227	-	-	1.5E+00	3.1E-01	-	-	-	-	0.0E+00	0.0E+00	1.0E-01	2.1E-02	1.9E-02	3.9E-03	3.0E-02	6.2E-03
Totals:		0.79	3.38	24.48	35.32	21.02	92.06	1.88	8.25	1.22	5.32	4.78	15.72	4.23	17.28	3.84	15.06

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
B-0007	Refinery Fuel Gas	Process gas	749 Btu/scf	238.9 MMBtu/hr (HHV)	2,092,457 MMBtu/yr (HHV)	0.02	0
B-0008	Refinery Fuel Gas	Process gas	749 Btu/scf	238.9 MMBtu/hr (HHV)	2,092,457 MMBtu/yr (HHV)	0.02	0
B-0009	Refinery Fuel Gas	Process gas	845 Btu/scf	244.4 MMBtu/hr (HHV)	2,141,119 MMBtu/yr (HHV)	0.01	0
H-0009	Refinery Fuel Gas	Process gas	749 Btu/scf	48.9 MMBtu/hr (HHV)	428,224 MMBtu/yr (HHV)	0.02	0
H-0011	Refinery Fuel Gas	Process gas	749 Btu/scf	42.2 MMBtu/hr (HHV)	369,830 MMBtu/yr (HHV)	0.02	0
H-0018	Refinery Fuel Gas	Process gas	749 Btu/scf	35.6 MMBtu/hr (HHV)	311,436 MMBtu/yr (HHV)	0.02	0
H-0019	Refinery Fuel Gas	Process gas	749 Btu/scf	60.0 MMBtu/hr (HHV)	525,547 MMBtu/yr (HHV)	0.02	0
H-0020	Refinery Fuel Gas	Process gas	749 Btu/scf	100.0 MMBtu/hr (HHV)	875,912 MMBtu/yr (HHV)	0.02	0
H-0028	Refinery Fuel Gas	Process gas	749 Btu/scf	13.7 MMBtu/hr (HHV)	119,708 MMBtu/yr (HHV)	0.02	0
H-0030	Refinery Fuel Gas	Process gas	749 Btu/scf	46.7 MMBtu/hr (HHV)	408,759 MMBtu/yr (HHV)	0.02	0
H-0040	Refinery Fuel Gas	Process gas	749 Btu/scf	46.7 MMBtu/hr (HHV)	408,759 MMBtu/yr (HHV)	0.02	0
H-0312	Refinery Fuel Gas	Process gas	749 Btu/scf	38.9 MMBtu/hr (HHV)	340,633 MMBtu/yr (HHV)	0.02	0
H-0352, H-0353, H-0354	Refinery Fuel Gas	Process gas	749 Btu/scf	222.2 MMBtu/hr (HHV)	1,946,472 MMBtu/yr (HHV)	0.02	0
H-0355	Refinery Fuel Gas	Process gas	749 Btu/scf	31.1 MMBtu/hr (HHV)	272,506 MMBtu/yr (HHV)	0.02	0
H-0362, H-0363, H-0364	Refinery Fuel Gas	Process gas	749 Btu/scf	138.9 MMBtu/hr (HHV)	1,216,545 MMBtu/yr (HHV)	0.02	0
H-0421	Refinery Fuel Gas	Process gas	749 Btu/scf	30.0 MMBtu/hr (HHV)	262,774 MMBtu/yr (HHV)	0.02	0
H-0464	Refinery Fuel Gas	Process gas	749 Btu/scf	10.7 MMBtu/hr (HHV)	93,431 MMBtu/yr (HHV)	0.02	0
H-0600	Refinery Fuel Gas	Process gas	749 Btu/scf	93.3 MMBtu/hr (HHV)	817,518 MMBtu/yr (HHV)	0.02	0
H-0601	Refinery Fuel Gas	Process gas	749 Btu/scf	86.7 MMBtu/hr (HHV)	759,124 MMBtu/yr (HHV)	0.02	0
H-2421	Refinery Fuel Gas	Process gas	749 Btu/scf	30.0 MMBtu/hr (HHV)	262,774 MMBtu/yr (HHV)	0.02	0

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
H-2501	Refinery Fuel Gas	Process gas	749 Btu/scf	133.3 MMBtu/hr (HHV)	1,167,883 MMBtu/yr (HHV)	0.02	0
H-3101	Refinery Fuel Gas	Process gas	749 Btu/scf	12.2 MMBtu/hr (HHV)	107,056 MMBtu/yr (HHV)	0.02	0
H-3402	Refinery Fuel Gas	Process gas	749 Btu/scf	57.8 MMBtu/hr (HHV)	506,083 MMBtu/yr (HHV)	0.02	0
H-3403	Refinery Fuel Gas	Process gas	749 Btu/scf	35.6 MMBtu/hr (HHV)	311,436 MMBtu/yr (HHV)	0.02	0
H-5401	Refinery Fuel Gas	Process gas	749 Btu/scf	21.5 MMBtu/hr (HHV)	188,029 MMBtu/yr (HHV)	0.02	0
H-8801/8802	PSA OffGas & Refinery Fuel Gas	Process gas	PSA Offgas: 975 Btu/scf RFG: 749 Btu/scf	168.9 MMBtu/hr (HHV)	1,479,319 MMBtu/yr (HHV)	PSA Offgas: 0.0001 Btu/scf RFG: 0.02 Btu/scf	0
H-9851	PSA OffGas & Refinery Fuel Gas	Process gas	PSA Offgas: 975 Btu/scf RFG: 749 Btu/scf	374.4 MMBtu/hr (HHV)	3,279,805 MMBtu/yr (HHV)	PSA Offgas: 0.0001 Btu/scf RFG: 0.02 Btu/scf	0
MG-0001	Diesel	Refinery Product	137,000 Btu/scf	4.5 MMBtu/hr (HHV)	39,245 MMBtu/yr (HHV)	0.0015	0
MG-0002	Diesel	Refinery Product	137,000 Btu/gal	4.48 MMBtu/hr	39,245 MMBtu/yr	0.0015	0
MG-0003	Diesel	Refinery Product	137,000 Btu/scf	2.2 MMBtu/hr (HHV)	19,342 MMBtu/yr (HHV)	0.0015	0
MG-0004	Diesel	Refinery Product	137,000 Btu/gal	11.20 MMBtu/hr	98,112 MMBtu/yr	0.0015	0
SG-0100	Diesel	Refinery Product	137,000 Btu/scf	0.8 MMBtu/hr (HHV)	7,288 MMBtu/yr (HHV)	0.0015	0
SG-0101	Diesel	Refinery Product	137,000 Btu/gal	0.86 MMBtu/hr	7,569 MMBtu/yr	0.0015	0
SG-0102	Diesel	Refinery Product	137,000 Btu/scf	1.6 MMBtu/hr (HHV)	13,908 MMBtu/yr (HHV)	0.0015	0
FWG-0600	Diesel	Refinery Product	137,000 Btu/gal	6.02 MMBtu/hr	52,700 MMBtu/yr	0.0015	0
FWG-0601	Diesel	Refinery Product	137,000 Btu/scf	6.0 MMBtu/hr (HHV)	52,700 MMBtu/yr (HHV)	0.0015	0
FWG-0602	Diesel	Refinery Product	137,000 Btu/gal	6.02 MMBtu/hr	52,700 MMBtu/yr	0.0015	0
FWG-0603	Diesel	Refinery Product	137,000 Btu/scf	4.9 MMBtu/hr (HHV)	42,749 MMBtu/yr (HHV)	0.0015	0

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)
T-0011	40301150	High Vapor Pressure	Varies	5.60	62	72.5	9.1	100	11.1
T-0012	40301150	High Vapor Pressure	Varies	5.60	62	68.0	8.4	100	11.1
T-0020	40301150	High Vapor Pressure	Varies	5.60	62	65.7	8.1	100	11.1
T-0021	40301150	High Vapor Pressure	Varies	5.60	62	65.7	8.1	100	11.1
T-0022	40301150	High Vapor Pressure	Varies	5.60	62	65.7	8.0	100	11.1
T-0023	40301150	High Vapor Pressure	Varies	5.60	62	65.7	8.0	100	11.1
T-0040	40301099	Low Vapor Pressure	Varies	7.10	130	66.7	0.01	75	0.01
T-0041	40301099	Low Vapor Pressure	Varies	7.10	130	66.7	0.01	75	0.01
T-0049	40301099	Moderate Vapor Pressure	Varies	7.10	130	66.9	1.6	75	1.9
T-0055	40301099	Low Vapor Pressure	Varies	7.10	130	118.6	0.04	126	1.5
T-0056	40301150	Moderate Vapor Pressure	Varies	6.40	80	67.6	1.9	100	11.1
T-0059	40301099	Low Vapor Pressure	Varies	7.00	130	74.6	0.01	87	0.02
T-0061	40301099	Low Vapor Pressure	Varies	7.00	130	75.0	0.01	88	0.02
T-0063	40301099	Low Vapor Pressure	Varies	7.10	130	78.4	0.01	91	0.02
T-0065	40301099	Low Vapor Pressure	Varies	7.10	130	79.4	0.01	92	0.75
T-0075	40301099	Low Vapor Pressure	Varies	7.10	130	74.7	0.01	87	0.75
T-0079	40301150	High Vapor Pressure	Varies	5.60	62	72.8	9.1	100	11.1
T-0081	40301099	Low Vapor Pressure	Varies	Varies	84	208.3	0.004	330	0.75
T-0082	40301099	Low Vapor Pressure	Varies	Varies	84	173.7	0.001	321	0.75
T-0106	40301150	Moderate Vapor Pressure	Varies	5.60	66	70.7	7.0	100	11.1
T-0107	40301150	High Vapor Pressure	Varies	5.60	62	71.6	9.0	100	11.1
T-0108	40301150	High Vapor Pressure	Varies	5.60	62	79.4	10.3	100	11.1
T-0109	40301150	High Vapor Pressure	Varies	5.60	62	78.3	10.1	100	11.1
T-0110	40301099	Low Vapor Pressure	Varies	Varies	84	289.3	0.04	317	0.1
T-0111	40301150	High Vapor Pressure	Varies	5.60	62	77.9	10.0	100	11.1
T-0112	40301150	Moderate Vapor Pressure	Varies	6.40	80	67.2	1.9	100	11.1
T-0117	40301150	Moderate Vapor Pressure	Varies	6.40	80	67.7	1.9	100	11.1
T-0124	40301150	High Vapor Pressure	Varies	5.60	62	68.0	8.4	100	11.1
T-0400	40301099	Low Vapor Pressure	Varies	7.10	130	131.2	0.1	144	1.5

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)
T-0401	40301150	High Vapor Pressure	Varies	5.60	62	70.8	8.8	100	11.1
T-0402	40301150	Moderate Vapor Pressure	Varies	5.60	66	70.7	6.3	100	11.1
T-0410	40301099	Low Vapor Pressure	Varies	Varies	84	278.5	0.03	312	1.5
T-0411	40301150	High Vapor Pressure	Varies	5.60	62	68.3	8.4	100	11.1
T-0412	40301150	Moderate Vapor Pressure	Varies	6.40	80	68.3	1.9	100	11.1
T-0413	40301150	Moderate Vapor Pressure	Varies	7.00	130	72.9	0.5	100	11.1
T-0415	40301150	High Vapor Pressure	Varies	5.60	62	67.4	8.3	100	11.1
T-0417	40301150	High Vapor Pressure	Varies	5.60	62	71.3	8.9	100	11.1
T-0418	40301150	High Vapor Pressure	Varies	7.00	130	75.7	0.5	100	11.1
T-0419	40301099	Low Vapor Pressure	Varies	7.10	130	75.7	0.01	83	0.5
T-0420	40301099	Low Vapor Pressure	Varies	Varies	84	131.4	0.0002	339	0.2
T-0422	40301099	Low Vapor Pressure	Varies	7.00	130	99.8	0.03	106	0.03
T-0423	40301099	Low Vapor Pressure	Varies	7.00	130	106.4	0.03	113	0.04
T-0431	40301099	Low Vapor Pressure	Varies	7.10	130	177.8	0.2	266	0.8
T-0432	40301099	Low Vapor Pressure	Varies	7.10	130	186.5	0.2	259	0.7
T-0433	40301099	Low Vapor Pressure	Varies	7.10	130	120.7	0.1	130	0.1
T-0434	40301099	Moderate Vapor Pressure	Varies	7.10	130	65.9	0.3	72	0.75
T-0435	40301150	Moderate Vapor Pressure	Varies	5.60	66	66.7	6.6	100	11.1
T-0437	40301150	High Vapor Pressure	Varies	7.10	58	69.2	6.9	100	11.1
T-0438	40301099	Low Vapor Pressure	Varies	7.10	130	99.0	0.03	112	1.5
T-0439	40301150	Moderate Vapor Pressure	Varies	5.60	66	71.3	7.5	100	11.1
T-0450	40301150	Moderate Vapor Pressure	Varies	5.60	66	68.6	7.1	100	11.1
T-0451	40301150	Moderate Vapor Pressure	Varies	7.10	130	74.5	0.4	100	11.1
T-0452	40301150	Moderate Vapor Pressure	Varies	6.59	46.07	66.3	0.8	100	11.1
T-0737	40301150	Moderate Vapor Pressure	Varies	5.60	66	66.8	6.6	100	11.1
T-0802	40301150	Moderate Vapor Pressure	Varies	5.60	66	66.7	6.6	100	11.1
T-0814	40301099	Low Vapor Pressure	Varies	Varies	84	370.3	0.3	407	0.75
T-0815	40301099	Low Vapor Pressure	Varies	7.10	130	65.9	0.01	72	0.5
T-0821	40301150	Moderate Vapor Pressure	Varies	5.60	66	68.2	6.0	100	11.1
T-0834	40301150	Moderate Vapor Pressure	Varies	7.10	130	72.8	0.4	100	1.9
T-0835	40301150	Moderate Vapor Pressure	Varies	7.10	130	72.9	0.4	100	11.1
T-0838	40301099	Low Vapor Pressure	Varies	7.10	130	78.6	0.01	85	0.75
T-1225	40301150	High Vapor Pressure	Varies	7.10	58	69.3	6.9	100	11.1
T-1227	40301099	Low Vapor Pressure	Varies	Varies	84	385.3	0.4	450	0.75

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[1]		Diameter (M)	Vapor Space [2] (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			
T-0011	<1973	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	32,130	5,100	27.1	N/A	White	White	New	84,000,000	N/A
T-0012	<1973	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	32,130	5,100	27.1	N/A	White	White	New	84,000,000	N/A
T-0020	2020	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Shoe-mounted	IF	54,380	8,632	27.4	N/A	White	White	New	75,600,000	N/A
T-0021	2020	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Shoe-mounted	IF	54,380	8,632	27.4	N/A	White	White	New	75,600,000	N/A
T-0022	2020	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Shoe-mounted	IF	37,770	5,995	22.9	N/A	White	White	New	75,600,000	N/A
T-0023	2020	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Shoe-mounted	IF	37,770	5,995	22.9	N/A	White	White	New	75,600,000	N/A
T-0040	<1973	Low Vapor Pressure	N/A	FX	820	130	2.7	11.0	White	White	Aged	1,176,000	1,483
T-0041	1973	Low Vapor Pressure	N/A	FX	820	130	2.7	11.0	White	White	Aged	1,176,000	1,483
T-0049	1965	Moderate Vapor Pressure	N/A	FX	610	97	3.4	1.3	White	White	Aged	18,882,799	30,986
T-0055	1979	Low Vapor Pressure	N/A	FX	10,200	1,619	13.7	5.6	White	White	Average	45,728,406	4,747
T-0056	<1973	Moderate Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	11,600	1,841	14.6	N/A	White	White	Average	413,910,000	N/A
T-0059	<1973	Low Vapor Pressure	N/A	FX	5,140	816	10.7	4.7	Black	Black	Average	1,998,288	416
T-0061	<1973	Low Vapor Pressure	N/A	FX	10,490	1,665	15.2	4.7	Black	Black	Average	42,490,997	4,339
T-0063	<1973	Low Vapor Pressure	N/A	FX	10,910	1,732	15.5	4.7	Black	Black	Average	18,082,540	1,775
T-0065	1999	Low Vapor Pressure	N/A	FX	10,490	1,665	15.2	4.7	Black	Black	Average	18,082,540	1,846
T-0075	2003	Low Vapor Pressure	N/A	FX	18,910	3,002	19.8	5.1	Black	Black	Aged	18,082,540	1,020
T-0079	2008	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	87,420	13,876	38.1	N/A	White	White	New	242,760,000	N/A
T-0081	2010	Low Vapor Pressure	N/A	FX	65,870	10,456	33.1	6.4	Aluminum - Specular	Aluminum - Specular	Average	210,000,000	3,356
T-0082	2010	Low Vapor Pressure	N/A	FX	109,660	17,406	42.7	6.5	Aluminum - Specular	Aluminum - Specular	Average	252,000,000	2,418
T-0106	<1971	Moderate Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	25,120	3,987	20.4	N/A	White	White	New	100,380,000	N/A
T-0107	<1971	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	25,120	3,987	20.4	N/A	White	White	New	134,290,800	N/A
T-0108	<1951	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	25,120	3,987	20.4	N/A	White	White	Average	117,466,188	N/A
T-0109	<1971	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	25,120	3,987	20.4	N/A	White	White	Aged	144,984,000	N/A
T-0110	1929	Low Vapor Pressure	N/A	FX	57,100	9,063	32.9	5.7	Aluminum - Specular	Aluminum - Specular	Average	220,752,000	4,099
T-0111	<1973	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	10,080	1,600	14.9	N/A	White	White	Aged	59,430,000	N/A

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity[1]		Diameter (M)	Vapor Space [2] (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			
T-0112	<1973	Moderate Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	9,670	1,535	14.6	N/A	White	White	Average	1,260,000	N/A
T-0117	1960	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	15,470	2,456	14.6	N/A	White	White	New	54,264,000	N/A
T-0124	1981	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	6,710	1,065	12.2	N/A	White	White	New	96,936,000	N/A
T-0400	1983	Low Vapor Pressure	N/A	FX	96,680	15,346	36.6	7.7	Black	Black	Aged	306,600,000	3,309
T-0401	1982	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	FALSE	56,650	8,992	27.4	N/A	White	White	New	214,620,000	N/A
T-0402	1983	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	56,650	8,992	27.4	N/A	White	White	New	260,610,000	N/A
T-0410	1973	Low Vapor Pressure	N/A	FX	34,920	5,543	24.1	6.3	Aluminum - Specular	Aluminum - Specular	Average	220,752,000	6,653
T-0411	1951	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	55,950	8,881	30.5	N/A	White	White	Average	134,290,800	N/A
T-0412	1951	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	55,950	8,881	30.5	N/A	White	White	Average	54,264,000	N/A
T-0413	1960	Moderate Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	24,490	3,887	20.4	N/A	White	White	New	206,955,000	N/A
T-0415	1953	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	25,120	3,987	20.4	N/A	White	White	New	144,984,000	N/A
T-0417	<1973	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	10,490	1,665	15.2	N/A	White	White	Aged	59,430,000	N/A
T-0418	>2021	High Vapor Pressure	Primary Seal: Vapor-mounted Secondary Seal: Rim-mounted	IF	20,720	3,289	20.4	N/A	White	White	New	176,400,000	N/A
T-0419	<1973	Low Vapor Pressure	N/A	FX	11,000	1,746	16.2	4.4	White	White	Average	153,300,000	15,004
T-0420	<1973	Low Vapor Pressure	N/A	FX	10,490	1,665	15.2	4.7	Aluminum - Specular	Aluminum - Specular	Average	4,074,939	416
T-0422	<1973	Low Vapor Pressure	N/A	FX	10,490	1,665	15.2	4.7	White	White	New	42,086,320	4,298
T-0423	1970	Low Vapor Pressure	N/A	FX	10,490	1,665	15.2	4.7	White	White	New	42,490,997	4,339
T-0431	<1973	Low Vapor Pressure	N/A	FX	53,180	8,441	33.2	5.2	Aluminum - Specular	Aluminum - Specular	Average	16,556,400	332
T-0432	<1972	Low Vapor Pressure	N/A	FX	53,180	8,441	33.2	5.2	Aluminum - Specular	Aluminum - Specular	Average	19,370,988	388
T-0433	<1973	Low Vapor Pressure	N/A	FX	80,420	12,765	35.7	6.8	Rust - Red Iron Oxide	Rust - Red Iron Oxide	Aged	173,250,000	2,262
T-0434	1979	Moderate Vapor Pressure	N/A	FX	80,420	12,765	35.7	6.8	White	White	New	315,000,000	4,112
T-0435	1997	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	5,040	800	9.1	N/A	White	White	New	110,376,000	N/A
T-0437	Tank was built in 1976 and relocated in 2009	High Vapor Pressure	Primary Seal: Liquid-mounted Secondary Seal: Rim-mounted	EF	90,640	14,387	36.6	N/A	White	White	New	703,668,000	N/A
T-0438	1978	Low Vapor Pressure	N/A	FX	54,380	8,632	27.4	7.6	Black	Black	Aged	173,250,000	3,324
T-0439	1978	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	IF	108,740	17,260	39.6	N/A	White	White	Average	758,835,000	N/A
T-0450	1997	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	80,570	12,789	36.6	N/A	White	White	New	413,910,000	N/A
T-0451	2016	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	IF	6,850	1,087	10.7	N/A	Aluminum - Specular	Aluminum - Specular	Average	39,858,000	N/A
T-0452	2016	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	IF	6,850	1,087	10.7	N/A	White	White	Average	5,978,700	N/A

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity[(1)]		Diameter (M)	Vapor Space [(2)]	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)		(M)	Roof	Shell			
T-0737	2009	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	22,210	3,525	19.2	N/A	White	White	New	210,252,000	N/A
T-0802	2002	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	11,330	1,798	13.7	N/A	White	White	New	210,252,000	N/A
T-0814	2005	Low Vapor Pressure	N/A	FX	11,190	1,776	15.2	5.0	Aluminum - Specular	Aluminum - Specular	Average	141,120,000	13,450
T-0815	2005	Low Vapor Pressure	N/A	FX	80,930	12,846	35.4	6.9	White	White	New	1,096,095,000	14,201
T-0821	2016	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	78,580	12,473	32.3	N/A	White	White	Average	268,581,600	N/A
T-0834	1967	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: None	EF	40,420	6,416	25.9	N/A	White	White	Average	659,190,000	N/A
T-0835	<1973	Moderate Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	68,940	10,943	33.8	N/A	White	White	Average	659,190,000	N/A
T-0838	1977	Low Vapor Pressure	N/A	FX	30,640	4,863	22.6	6.3	White	White	New	659,190,000	22,644
T-1225	2009	High Vapor Pressure	Primary Seal: Mechanical Shoe Secondary Seal: Rim-mounted	EF	125,890	19,983	45.7	N/A	White	White	Average	1,600,452,000	N/A
T-1227	2009	Low Vapor Pressure	N/A	FX	33,170	5,265	23.5	6.3	Aluminum - Specular	Aluminum - Specular	Average	36,792,000	1,167

Notes:
(1) Tank shell capacity
(2) Vapor Space Outage (Hvo), per AP-42, Ch. 7.1 (6/20), Eq. 1-16

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

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
	Mechanical Shoe Seal	**Liquid-mounted resilient seal**	**Vapor-mounted resilient seal**	**Seal Type**		
FX: Fixed Roof	**A**: Primary only	**A**: Primary only	**A**: Primary only	**A**: Mechanical shoe, primary only	**WH**: White	Good
IF: Internal Floating Roof	**B**: Shoe-mounted secondary	**B**: Weather shield	**B**: Weather shield	**B**: Shoe-mounted secondary	**AS**: Aluminum (specular)	Poor
EF: External Floating Roof	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**C**: Rim-mounted secondary	**AD**: Aluminum (diffuse)	
P: Pressure					**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)**
Crude Oil	Mixed Hydrocarbons	Liquid	N/A-Varies	Butanes	Butanes	Gas	N/A-Varies
Casinghead Gas	Mixed Hydrocarbons	Liquid	N/A-Varies	Propanes	Propanes	Gas	N/A-Varies
Transmix	Mixed Hydrocarbons	Liquid	N/A-Varies	Liquified Petroleum Gas	Butanes, Propanes	Gas	N/A-Varies
Isobutane	Isobutane	Gas	N/A-Varies	Refinery Gas	Mixed Hydrocarbons	Gas	N/A-Varies
Raw Kerosenes	Mixed Hydrocarbons	Liquid	N/A-Varies	Kerosenes	Mixed Hydrocarbons	Liquid	N/A-Varies
Raw Jet Fuels	Mixed Hydrocarbons	Liquid	N/A-Varies	Jet Fuels	Mixed Hydrocarbons	Liquid	N/A-Varies
Naphthas	Mixed Hydrocarbons	Liquid	N/A-Varies	Naphthas	Mixed Hydrocarbons	Liquid	N/A-Varies
Raw Gasolines	Mixed Hydrocarbons	Liquid	N/A-Varies	Gasolines	Mixed Hydrocarbons	Liquid	N/A-Varies
Gas Oils	Mixed Hydrocarbons	Liquid	N/A-Varies	Diesel Fuels	Mixed Hydrocarbons	Liquid	N/A-Varies
Asphalts	Mixed Hydrocarbons	Liquid	N/A-Varies	Gas Oils	Mixed Hydrocarbons	Liquid	N/A-Varies
				Fuel Oils	Mixed Hydrocarbons	Liquid	N/A-Varies
				Asphalts	Mixed Hydrocarbons	Liquid	N/A-Varies
				Carbon Black Oil	Mixed Hydrocarbons	Liquid	N/A-Varies
				Pitch	Mixed Hydrocarbons	Liquid	N/A-Varies
				Sulfur	Sulfur	Liquid	N/A-Varies

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
FCC Regen	O2	Servomex	X 4902C1	04902C1-3747	< 15 sec		0-10%	0.0001	< 0.05%
FCC Regen	SO2	California Analytical	ZRF1AGY2-2EJYY	A2P0815T	0.25 sec		0-2,000 ppm	20 ppm	10 ppm
FCC Regen	CO/CO2	Servomex	Xentra 4904C1	04904C1-3746	< 30 sec		0-1000 ppm	2 ppm	2 ppm
FCC Regen	NOx	California Analytical	600-CLD Digital	PO2056	< 2 sec		0-300 ppm	3 ppm	1.5 ppm
H-2501	NOx/O2	Thermo Scientific	42ILS-ASSSSPCB	901534190	NOx < 2 sec O2 < 30 sec		NOx 0-50 ppm O2 0-10%	NOx 3 ppm O2 0.5 ppm zero gas	NOx 1.5 ppm O2 0.5 ppm zero gas
H-2501	CO	Thermo Scientific	48i-ANPCB	809828981	< 15 sec		0-2000 ppm	0.0001	< 0.05%
H-0473 (SRU2 TGI)	SO2	California Analytical	ZPA2	N8A0263	<=60 sec		0-2,500 ppm	25 ppm	17.5 ppm
H-0473 (SRU2 TGI)	O2	Servomex	04900C1	653036	< 15 sec		0-25%	0.0001	< 0.05%
H-3103 (SRU3 TGI)	SO2	California Analytical	ZRE-NDIR	A8K9291T	<=60 sec		0-2,500 ppm	25 ppm	17.5 ppm
H-3103 (SRU3 TGI)	O2	Servomex	04900C1	652878	< 15 sec		0-25%	0.0001	< 0.05%
H-0601	O2	Servomex	Xendos 2700	1362	< 15 sec		0-25%	0.0001	< 0.05%
H-3402	O2	Servomex	2700 PN 02710734	276	< 15 sec		0-25%	0.0001	< 0.05%
B-0009	O2/CO	Servomex	ServoPro-4900	04900C1-653783					
B-0009	CO2	Servomex	ServoPro-4900	04900C1-653788					
B-0009	NOx	California Analytical	600-CLD	A10011			0-300 ppm	3 ppm	1.5 ppm
B-0008	NOx	California Analytical	600-CLD	E05005	< 2 sec		0-300 ppm	3 ppm	1.5 ppm
B-0008	O2	Servomex	Xentra 4902C1	04900C1-3658	< 15 sec		0-10%	0.0001	< 0.05%
B-0007	NOx	California Analytical	600-CLD	E05004	< 2 sec		0-300 ppm	3 ppm	1.5 ppm
B-0007	O2	Servomex	Xentra 4902C1	04900C1-3657	< 15 sec		0-10%	0.0001	< 0.05%
H-8801/8802	O2	California Analytical	ZRE-NDIR	N4K1912	< 15 sec		0-10%	0.0001	< 0.05%
H-8801/8802	CO	same analyzer as above	"	"	< 30 sec		0-2000 ppm	0.5-2 ppm	0.5-2 ppm

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
H-8801/8802	NOx	same analyzer as above	"	"					
H-9851	O2	Servomex dual range	04900C1	653166	< 15 sec		0-10%	0.0001	< 0.05%
H-9851	CO	same analyzer as above	"	"	< 2 sec		0-2000 ppm	0.5-2 ppm	0.5-2 ppm
H-9851	NOx	California Analytical	600-CLD	W01040	< 2 sec		0-50 ppm	3 ppm	1.5 ppm
TL-4	VOC	Infrared Industries	IR8400D	4814	20 Seconds		0-2%		0.0706

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
HP Fuel Gas	H_2S	In the CCR division near D-0359 and near D-0770	ppmvd	0-300 ppm	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	3 hr rolling avg for regulatory requirement
LP Fuel Gas	H_2S	In the North division near D-0019	ppmvd	0-300 ppm	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	3 hr rolling avg for regulatory requirement
FL-0400	Vent Gas H2S Concentration	In the North Plant Flare header, downstream of the knockout drum	ppmvd	5-300	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	3 hr rolling avg for regulatory requirement
FL-0400	Vent Gas Total Sulfur Concentration	In the North Plant Flare header, downstream of the knockout drum	% v/v	0-50	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0400	Vent Gas Flow Velocity	In the North Plant Flare header, upstream of the flare stack, in a position that is representative of the total gas flow rate	ft/sec	0.1 - 328	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0400	Vent Gas Composition (Gas Chromatograph)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0400	Vent Gas Heating Value (Calorimeter)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	BTU/scf	0-2,000	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0400	Pilot Flame Presence	On pig pen building ~530 ft SW of flare	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0400	Assist Steam Flow Velocity	upstream of the control valves	lb/hr	0-37,000 lb/hr	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0400	Supplemental Gas Flow Velocity	upstream of the control valves	scfh	0-245,000 scfh	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0400	Visible Emissions Camera	On pig pen building ~530 ft SW of flare	visual	n/a	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	

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
FL-0401	Vent Gas H2S Concentration	In the South Plant Flare header, downstream of the knockout drum	ppmvd	5-300	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	3 hr rolling avg for regulatory requirement
FL-0401	Vent Gas Total Sulfur Concentration	In the South Plant Flare header, downstream of the knockout drum	% v/v	0-25	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0401	Vent Gas Flow Velocity	In the South Plant Flare header, upstream of the flare stack, in a position that is representative of the total gas flow rate	ft/sec	0.1 - 328	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0401	Vent Gas Composition (Gas Chromatograph)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	BTU/scf	0-2,000	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0401	Vent Gas Heating Value (Calorimeter)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0401	Pilot Flame Presence	On South control room ~370 ft SE of flare	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0401	Assist Steam Flow Velocity	upstream of the control valves	lb/hr	0-37,000 lb/hr	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0401	Supplemental Gas Flow Velocity	upstream of the control valves	scfh	0-245,000 scfh	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0401	Visible Emissions Camera	On South control room ~370 ft SE of flare	visual	n/a	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0402	Vent Gas H2S Concentration	In the FCCU Flare header, downstream of the knockout drum	ppmvd	5-300	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	3 hr rolling avg for regulatory requirement
FL-0402	Vent Gas Total Sulfur Concentration	In the FCCU Flare header, downstream of the knockout drum	% v/v	0-50	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	

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
FL-0402	Vent Gas Flow Velocity	In the FCCU Flare header, upstream of the flare stack, in a position that is representative of the total gas flow rate	ft/sec	0.1 - 328	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0402	Vent Gas Composition (Mass Spectrometer)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0402	Vent Gas Heating Value (Mass Spectrometer)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	BTU/scf	0-5,000	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0402	Pilot Flame Presence	On pig pen building ~340 ft SW of flare	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0402	Assist Steam Flow Velocity	upstream of the control valves	lb/hr	0-37,000 lb/hr	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0402	Supplemental Gas Flow Velocity	upstream of the control valves	scfh	0-245,000 scfh	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0402	Visible Emissions Camera	on pig per building ~340 ft SW of building	visual	n/a	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0403	Vent Gas Flow Velocity	In the FCCU Flare header, upstream of the flare stack, in a position that is representative of the total gas flow rate	ft/sec	0.1 - 328	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0403	Vent Gas Heating Value (Mass Spectrometer)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	BTU/scf	0-5,000	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0403	Pilot Flame Presence	On pig pen building ~530 ft SW of flare	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0403	Assist Steam Flow Velocity	maximum total steam rate 24,000 lbs-hr	lbs-hr	0-37,000 lb/hr	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	

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
FL-0403	Supplemental Gas Flow Velocity	maximum supplemental gas flow rate 245,000 scfh	scfh	0-245,000 scfh	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0403	Visible Emissions Camera	On pig pen building ~530 ft SW of flare	visual	n/a	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Vent Gas H2S Concentration	In the GOHT Flare header, downstream of the knockout drum	ppmvd	5-300	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Vent Gas Total Sulfur Concentration	In the GOHT Flare header, downstream of the knockout drum	% v/v	0-50	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Vent Gas Flow Velocity	In the GOHT Flare header, upstream of the flare stack, in a position that is representative of the total gas flow rate	ft/sec	0.1 - 328	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Vent Gas Composition (Gas Chromatograph)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	3 hr rolling avg for regulatory requirement
FL-0404	Vent Gas Heating Value (Calorimeter)	At the existing sample site ~200 ft from sampling cabinet in the flare line.	BTU/scf	0-5,000	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Pilot Flame Presence	On GOHT CMS shelter ~460 ft SE of flare	%	0-100%	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Assist Steam Flow Velocity	upstream of the control valves	lb/hr	0-37,000 lb/hr	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Supplemental Gas Flow Velocity	upstream of the control valves	scfh	0-245,000 scfh	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	
FL-0404	Visible Emissions Camera	On GOHT CMS shelter ~460 ft SE of flare	visual	n/a	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	per manufacturer's recommendation, industry practice and Navajo Refinery maintenance experience.	Datastream	

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**										
B-0007	**mass GHG**	136,084	1.4	6.9											136,092	
	CO_2e	136,084	412.4	173.0												136,669
B-0008	**mass GHG**	136,084	1.4	6.9											136,092	
	CO_2e	136,084	412.4	173.0												136,669
B-0009	**mass GHG**	139,248	1.4	7.1											139,257	
	CO_2e	139,248	422.0	177.0												139,847
H-0009	**mass GHG**	27,850	0.3	1.4											27,851	
	CO_2e	27,850	84.4	35.4												27,969
H-0011	**mass GHG**	24,052	0.2	1.2											24,053	
	CO_2e	24,052	72.9	30.6												24,155
H-0018	**mass GHG**	20,254	0.2	1.0											20,256	
	CO_2e	20,254	61.4	25.7												20,341
H-0019	**mass GHG**	34,179	0.3	1.7											34,181	
	CO_2e	34,179	103.6	43.4												34,326
H-0020	**mass GHG**	56,965	0.6	2.9											56,969	
	CO_2e	56,965	172.6	72.4												57,210
H-0028	**mass GHG**	7,785	0.1	0.4											7,786	
	CO_2e	7,785	23.6	9.9												7,819
H-0030	**mass GHG**	26,584	0.3	1.4											26,585	
	CO_2e	26,584	80.6	33.8												26,698
H-0040	**mass GHG**	26,584	0.3	1.4											26,585	
	CO_2e	26,584	80.6	33.8												26,698
H-0312	**mass GHG**	22,153	0.2	1.1											22,154	
	CO_2e	22,153	67.1	28.2												22,248
H-0352, H-0353, H-0354	**mass GHG**	126,589	1.3	6.4											126,597	
	CO2e	126,589	383.6	160.9												127,134
H-0355	**mass GHG**	17,723	0.2	0.9											17,724	
	CO_2e	17,723	53.7	22.5												17,799
H-0362, H-0363, H-0364	**mass GHG**	79,118	0.8	4.0											79,123	
	CO_2e	79,118	239.8	100.6												79,459
H-0421	**mass GHG**	17,090	0.2	0.9											17,091	
	CO_2e	17,090	51.8	21.7												17,163
H-0464	**mass GHG**	6,076	0.1	0.3											6,077	
	CO_2e	6,076	18.4	7.7												6,102
H-0600	**mass GHG**	53,168	0.5	2.7											53,171	
	CO_2e	53,168	161.1	67.6												53,396
H-0601	**mass GHG**	49,370	0.5	2.5											49,373	
	CO_2e	49,370	149.6	62.8												49,582
H-2421	**mass GHG**	17,090	0.2	0.9											17,091	
	CO_2e	17,090	51.8	21.7												17,163

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**										
H-2501	**mass GHG**	75,954	0.8	3.9											75,958	
	CO_2e	75,954	230.2	96.6												76,280
H-3101	**mass GHG**	6,962	0.1	0.4											6,963	
	CO2e	6,962	21.1	8.9												6,992
H-3402	**mass GHG**	32,913	0.3	1.7											32,915	
	CO_2e	32,913	99.7	41.8												33,055
H-3403	**mass GHG**	20,254	0.2	1.0											20,256	
	CO_2e	20,254	61.4	25.7												20,341
H-5401	**mass GHG**	12,229	0.1	0.6											12,229	
	CO_2e	12,229	37.1	15.5												12,281
H-8801/8802	**mass GHG**	96,208	1.0	4.9											96,214	
	CO_2e	96,208	291.6	122.3												96,622
H-9851	**mass GHG**	213,303	2.2	10.8											213,316	
	CO_2e	213,303	646.4	271.1												214,221
H-0473 (SRU2 TGI)	**mass GHG**	13,914													13,914	
	CO_2e	13,914														13,914
H-3103 (SRU3 TGI)	**mass GHG**	16,233													16,233	
	CO_2e	16,233														16,233
FCC Regen	**mass GHG**	430,013	2.5	12.6											430,028	
	CO_2e	430,013	749.0	314.7												431,077
FL-400	**mass GHG**	10,384	0.02	31											10,415	
	CO_2e	10,384	5.2	774.9												11,164
FL-401	**mass GHG**	3,523	0.01	10.5											3,534	
	CO_2e	3,523	1.7	262.9												3,788
FL-402	**mass GHG**	4,220	0.01	12.6											4,233	
	CO_2e	4,220	2.1	314.9												4,537
FL-403	**mass GHG**	4,824	0.01	14.4											4,839	
	CO_2e	4,824	2.4	360.0												5,187
FL-404	**mass GHG**	44,784	0.1	133.7											44,917	
	CO_2e	44,784	22.2	3,342.1												48,148
MG-0001	**mass GHG**	1,600	0.01	0.06											1,600	
	CO_2e	1,600	3.9	1.6												1,605
MG-0002	**mass GHG**	1,600	0.01	0.06											1,600	
	CO2e	1,600	3.9	1.6												1,605
MG-0003	**mass GHG**	788	0.01	0.03											788	
	CO_2e	788	1.9	0.8												791
MG-0004	**mass GHG**	46	0.0004	0.002											46	
	CO_2e	46	0.1	0.05												46

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**										
SG-0100	**mass GHG**	17	0.0001	0.001											17	
	CO_2e	17	0.04	0.02												17
SG-0101	**mass GHG**	18	0.0001	0.001											18	
	CO_2e	18	0.04	0.02												18
SG-0102	**mass GHG**	32	0.0003	0.001											32	
	CO_2e	32	0.1	0.03												32
FWG-0600	**mass GHG**	25	0.0002	0.001											25	
	CO_2e	25	0.1	0.02												25
FWG-0601	**mass GHG**	25	0.0002	0.001											25	
	CO_2e	25	0.1	0.02												25
FWG-0602	**mass GHG**	25	0.0002	0.001											25	
	CO_2e	25	0.1	0.02												25
FWG-0603	**mass GHG**	20	0.0002	0.001											20	
	CO_2e	20	0.05	0.02												20
TL-4 VCU	**mass GHG**	1,359	0.01	0.06											1,359	
	CO_2e	1,359	3.4	1.4												1,363
Fugitives	**mass GHG**	817	0.005	26.26											843	
	CO_2e	817	1.4	656.5												1,474
Tanks	**mass GHG**			6.05											6.0	
	CO_2e			151												151
FL-HEP-PORT	**mass GHG**	165	0.0003	0.54											166	
	CO2e	165	0.1	13.6												179
Tanks VCU	**mass GHG**	43	0.0002	0.001											43	
	CO_2e	43	0.1	0.03												43
Total	**mass GHG**	2,016,340	17.75	323.21											2,016,681	
	CO_2e	2,016,340	5,288.5	8,080.36												2,029,709

[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.

Facility Description / Process Summary

HollyFrontier Navajo Refining LLC ("Navajo") owns and operates the Artesia Refinery, located along Highway 82, partially within and partially outside of the city limits of Artesia, in Eddy County, New Mexico (see Section 8 Maps). The Artesia Refinery has a crude oil capacity of 100,000 barrel per day. The facility process units include atmospheric and vacuum distillation, fluid catalytic cracking ("FCC"), alkylation, isomerization, saturates gas plants, amine units, sulfur recovery units ("SRU"), and various hydrodesulphurization units ("HDS"). Products from the refining processes include, but are not limited to, gasoline of various grades, kerosene, diesel, liquefied petroleum gas ("LPG"), jet fuel (primarily JP-8), carbon black oil, and asphalt products.

The emissions from the refining processes include nitrogen oxides ("NO_X"), carbon monoxide ("CO"), volatile organic compounds ("VOCs"), sulfur dioxide ("SO_2"), particulate matter (i.e., PM, PM_{10}, and $PM_{2.5}$), hydrogen sulfide ("H_2S"), sulfuric acid mist ("SAM"), hazardous air pollutants ("HAPs,") and greenhouse gases ("GHG.")

Permit Application Summary

Navajo is submitting this application for a Significant Permit Revision of Permit No. PSD-NM-0195M39R4, in accordance with 20.2.72.219.D and 20.2.72.402 New Mexico Administrative Code ("NMAC"). This revision is necessary to adequately represent the operational conditions at the refinery, to update the calculations' methodology where appropriate and according to latest guidance published, and to update representations from previous submittals.

Specifically, with this application Navajo is seeking a number of separate and independent revisions as follows. Additional details regarding these changes are provided in Sections 6, 7, and 20 of this permit application.

1. Authorize changes in fuel composition for three process heaters.
2. Revise design heat inputs of, and make corresponding revisions to emission limits for, certain existing combustion units.
3. Revise emission limits for flares.
4. Reconcile emission calculations for the SRU tail gas incinerators ("TGI"), the fluidized catalytic cracking ("FCC") regenerator, and the cooling towers.
5. Reconcile emission calculations for truck and railcar loading.
6. Revise emission limits and representations of true vapor pressure for storage tanks and loading racks
7. Reflect retrofit of T-0418 with an internal floating roof consistent with the requirements of 40 CFR § 63.660.
8. Reduce emission limits for fugitive emissions from equipment leaks by 562 tons per year, as a result of more accurate component counts, and the use of appropriate control efficiencies required for compliance with 40 CFR 60, subpart GGGa.
9. Revise emission limits for wastewater treatment operations.
10. Revise the emission cap for malfunction events such that it applies both to flares and to other emissions units.
11. Remove from the permit emissions units that have been dismantled and emissions units associated with the Renewable Diesel Unit ("RDU"), as that unit is part of a separate stationary source covered by NSR Permit No. 9213.
12. Add startup, shutdown, and maintenance ("SSM") cap for all SSM activities.

Change to Facility's Operations and Emissions

The Artesia Refinery is and will continue to be a major source subject to the Prevention of Significant Deterioration ("PSD") regulations codified in NMAC 20.2.74 and in the federally approved State Implementation Plan for New Mexico.[1] Under the preconstruction permitting provisions of the PSD program, a PSD permit is required if a project at an existing major source is a "major modification" as defined in NMAC 20.2.74.7.AE.

All of the requested permit revisions other than the four separate proposed projects discussed below (involving storage tanks and loading racks, flares, hydrogen reformer furnaces, and the dissolved air flotation units) are reconciliations involving no physical changes in or changes in method of operation of the stationary source. These requested reconciliations do not constitute a "modification," a "project," or a "major modification," as these terms are defined in 20.2.72.7.P and 20.2.74.7.AQ and AE of NMAC respectively.

Storage tanks and loading racks. The first of the four projects covered by this permit application involves requested revisions to permit terms to allow increases in maximum vapor pressure of some petroleum liquids stored in fixed-roof and floating-roof storage vessels and loaded at loading racks. Navajo is conservatively treating these requested revisions to permit terms for tanks and loading racks as changes in method of operation constituting a single project for PSD purposes because these changes could be construed as being substantially related to one another.

This project will not cause a significant increase in emissions of any regulated NSR pollutant, as shown in Section 12.A; therefore, this project is not a major modification subject to PSD review.

Flares. The second of the four projects covered by this permit application involves requested increases in permitted emission rates for the refinery's five flares terms to allow for higher gas flow rates to the flares. Navajo is conservatively treating these higher flow rates and increased emission rates as being not unrelated to physical changes made to each of the flares. Specifically, in 2018, to facilitate continuous compliance with the minimum combustion efficiency requirements of MACT CC that took effect on January 30, 2019, Navajo installed new piping for supplemental gas to each flare, and in 2020, in order to improve control of supplemental gas flow to the flares, Navajo replaced the supplemental gas control valves. Navajo is conservatively treating the physical changes at all five flares as a single project for PSD purposes because these changes could be construed as being substantially related to one another. This project is not in any way technically or economically related to the requested changes at the storage tanks and loading racks and, therefore, each of these two independent projects is evaluated separately for purposes of determining applicability of the preconstruction PSD permitting program.[2]

The changes at the flares will cause significant increases in emissions of VOC, as shown in Section 12.A; therefore, this project constitutes a major modification subject to PSD review for VOC.

Hydrogen reformer furnaces. The third of the four projects covered by this permit application involves changes to the hydrogen reformer furnaces, H-8801/8802 and H-9851, to accommodate combustion of amine-treated refinery fuel gas. Navajo is conservatively treating the physical and operational changes at both furnaces as a single project for PSD purposes because these changes could be construed as being substantially related to one another. This project is not in any way technically or economically related to the requested changes at the storage tanks, loading racks, and flares. This independent project is, therefore, evaluated separately for purposes of determining applicability of the preconstruction PSD permitting program.

This project will not cause a significant increase in emissions of any regulated NSR pollutant, as shown in Section 12.A; therefore, this project is not a major modification subject to PSD review.

Dissolved air flotation units. The last of the four projects covered by this permit application involves requested revisions to permit terms to allow increased VOC emissions from the dissolved air flotation units. This project is not in any way technically or economically related to the requested changes at the storage tanks, loading racks, flares, and hydrogen reformer furnaces. This independent project is, therefore, evaluated separately for purposes of determining applicability of the preconstruction PSD permitting program.

[1] 40 CFR § 52.1620(c). The nonattainment New Source Review ("NSR") program codified at NMAC 20.2.79 and approved at 40 CFR § 52.1620(c) is not applicable because the Artesia Refinery is located in Eddy County, an area that is designated as unclassifiable or attainment with respect to all National Ambient Air Quality Standards. See, 40 CFR § 81.332.

[2] See, 20.2.74.7.AE and .AQ NMAC, establishing that PSD applicability is determined separately for each "project," where that term is defined as a single "physical change" or "change in method of operation." See, also, U.S. EPA's final rule regarding project aggregation, 83 *Fed. Reg.* 57324 at p. 57332, clarifying that projects are evaluated separately unless they are substantially related.

This project will not cause a significant increase in emissions of any regulated NSR pollutant, as shown in Section 12.A; therefore, this project is not a major modification subject to PSD review.

Retrospective PSD review. Several of the permit terms that are the subject of requested revisions in this permit application were imposed historically in conjunction with impact analyses performed with permitting actions for major modifications under the PSD program or in conjunction with PSD non-applicability determinations. Where applicable, these historical applicability analyses and impact analyses are updated in Section 20 of this permit application.

Startup, Shutdown, and Maintenance ("SSM") Routine or Predictable Emissions

SSM emissions are fully accounted for in this application consistent with NMED's *Implementation Guidance for Permitting SSM Emissions and Excess Emissions*, version 7, June 2012.[3] This application does not include any material changes to the manner in which SSM emissions are addressed, but it has been updated to include crude oil pigging activities. Details of SSM emissions calculations are discussed in Section 7.

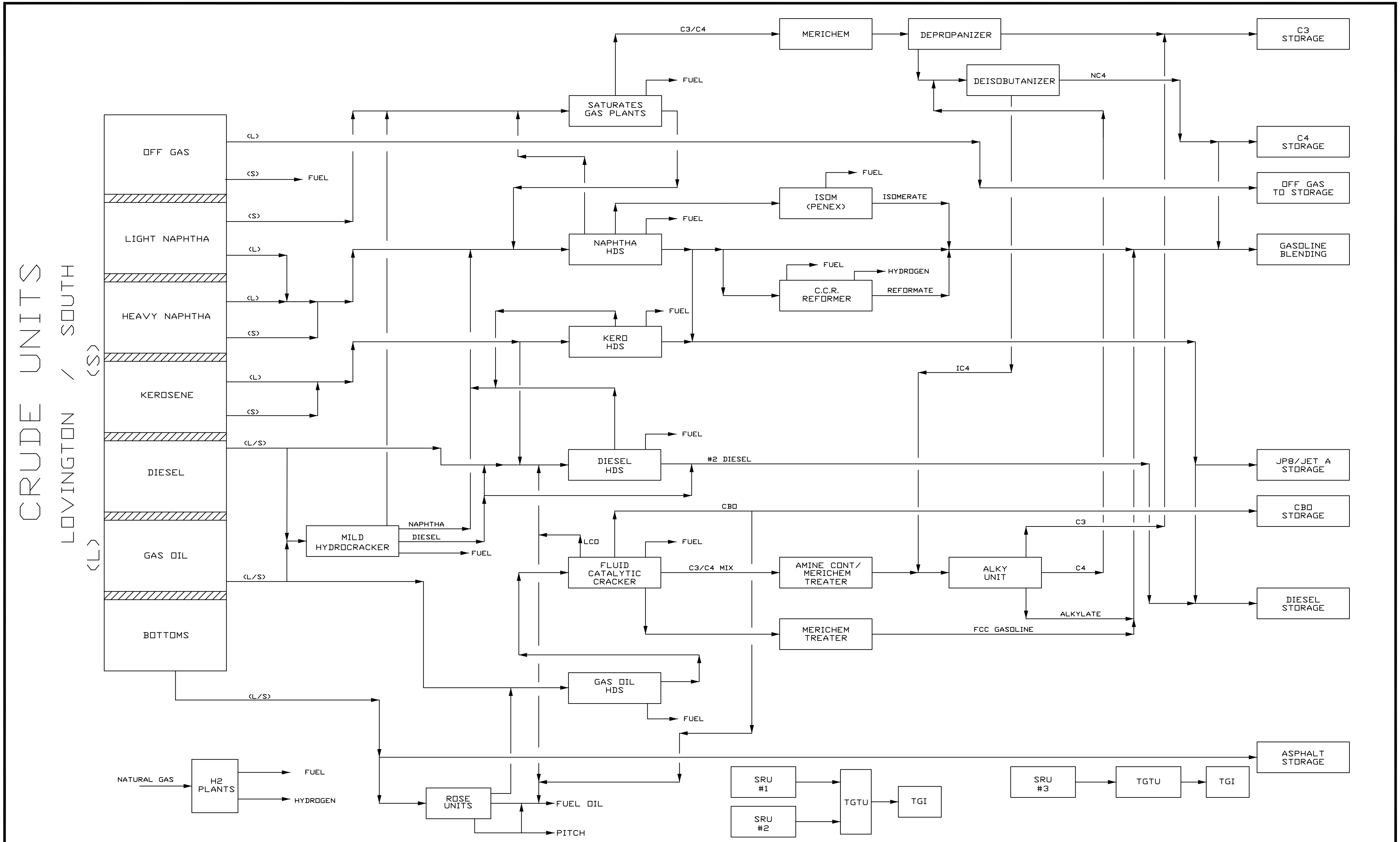
[3] Available at www.env.nm.gov/wp-content/uploads/sites/2/2017/06/AQBP_SSM_PERMITTING_IMPLEMENTATION_GUIDANCE_07Jun12.doc

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 for the refinery is included in this section.



NOTES

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
13	REVISED PER MC	DWW		6-19-08		
11	REVISED PER MC	DWW		05-14-07		
10	REVISED PER MPK (PRELIM)	DGJ		07-28-06		

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.
9	REVISED PER GKC	DGJ		02-10-06		
8	REVISED PER JLH	DGJ		02-26-04		
7	REVISED PER JER	DGJ		01-23-04		
6	REVISED PER SLB	DGJ	SLB	12-22-03		
5	REVISED PER SLB	DGJ	SLB	2-04-03		
4	REVISED PER RRH MARK-UP	BHR	DGJ	4-24-98		
3	UPDATED NOMENCLATURE	DLW	DGJ	9-9-94		
2	REDRAWN & UPDATED PER JLM	PETE	DJ	8-1-94		
1	UPDATED PER JLM	PETE		5-94		

DRAWING TITLE

SIMPLIFIED
BLOCK FLOW
NAV6076

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

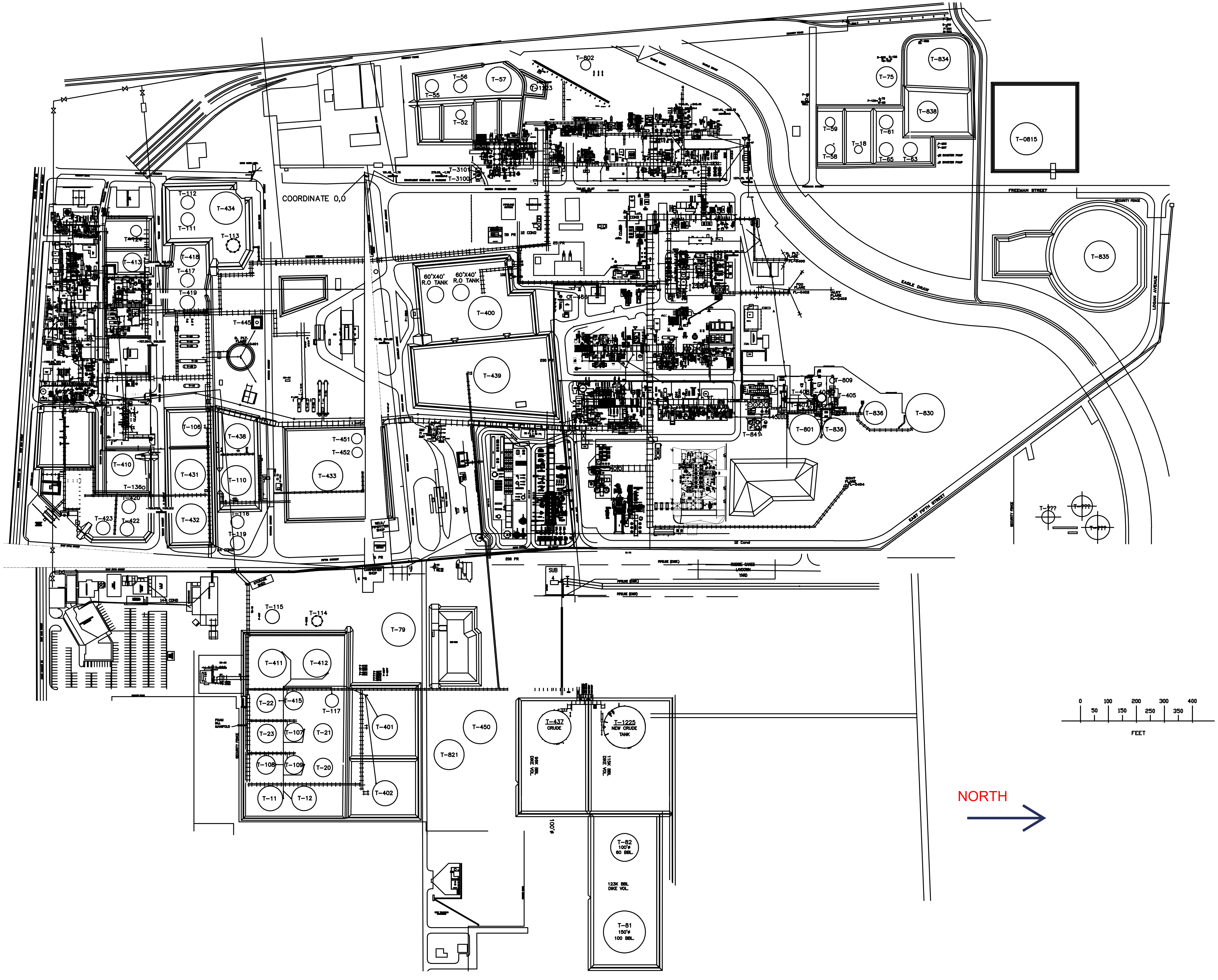
DRAWN BY	CHK'D BY	SCALE	
DGJ		NONE	
DATE	APPR BY	DRAWING NUMBER	REV.
08-01-94		55-V-1001-D-01	13

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 included in this section.



T-802
T-56
T-57
T-55
T-1123
T-52
T-834
T-75
T-838
T-59
T-18
T-61
T-58
T-65
T-63
T-0815
T-3101
T-3100
COORDINATE 0,0
T-112
T-434
T-111
T-113
T-124
T-413
T-418
T-417
T-419
T-445
FREEMAN STREET
EAGLE DRAW
LOGAN AVENUE
T-835
60"X40"
R.O TANK
60"X40"
R.O TANK
T-400
T-439
T-809
T-405
T-836
T-830
T-801
T-836
T-841
T-106
T-438
T-451
T-452
T-433
T-410
T-431
T-110
T-136
T-420
T-423
T-422
T-432
T-116
T-119
EAST FIFTH STREET
T-???
T-???
T-???
SUB
T-115
T-114
T-79
T-411
T-412
T-22
T-415
T-117
T-23
T-107
T-21
T-401
T-450
T-108
T-109
T-20
T-821
T-11
T-12
T-402
T-437
CRUDE
T-1225
NEW CRUDE
TANK
T-82
T-81
0
50
100
150
200
250
300
350
400
FEET
NORTH

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.

Attached are the emission calculations that were revised as part of this permit revision. Files containing emission calculations for all sources are included with the submitted electronic files.

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)

BOILERS AND HEATERS POTENTIAL TO EMIT

		Design Capacity (LHV)	Design Capacity (HHV)	Fuel Heat Content		Emission Factors[a]												Potential to Emit									
						CO		NO_X		PM/PM_{10} / $PM_{2.5}$	SO_2					VOC		CO		NO_X		PM/PM_{10}/ $PM_{2.5}$		SO_2		VOC	
ID	Description	MMBtu/hr	MMBtu/hr	Btu/scf @ 60 °F	Basis	lb/MMBtu		lb/MMBtu		lb/MMBtu	H2S max grH2S/dscf	non-H2S Sulfur Species max grS/dscf	H2S avg grH2S/dscf	non-H2S Sulfur Species avg. grS/dscf		lb/MMBtu		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
B-0007	Boiler 7	215.0	238.9	749	LHV	0.082		0.06	c	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		19.67	86.16	12.90	56.50	1.78	7.80	8.04	13.94	1.29	5.64
B-0008	Boiler 8	215.0	238.9	749	LHV	0.082		0.06	c	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		19.67	86.16	12.90	56.50	1.78	7.80	8.04	13.94	1.29	5.64
B-0009	Boiler 9	220.0	244.4	845	HHV	0.037	b	0.02	b	0.0075	0.035 grS/dscf		0.035 grS/dscf		g	0.0040	b	9.04	39.61	4.89	21.41	1.82	7.98	2.89	12.67	0.98	4.28
H-0009	Unit 13 Naphtha Splitter Reboiler	44.0	48.9	749	LHV	0.082		0.09	c	0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		4.03	17.63	3.96	17.34	0.36	1.60	1.64	2.84	0.26	1.20
H-0011	Unit 21 Vacuum Unit Heater	38.0	42.2	749	LHV	0.082		-	e	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		3.48	15.30	9.52	31.73	0.31	1.38	1.42	2.46	0.23	1.00
H-0018	Unit 06 HDS Reboiler	32.0	35.6	749	LHV	0.082		0.098		0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		2.93	12.82	3.49	15.27	0.26	1.16	1.19	2.07	0.19	0.84
H-0019	South Crude Charge Heater	54.0	60.0	749	LHV	0.082		0.0527	d	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		4.94	21.64	2.90	12.46	0.45	2.00	2.02	3.50	0.32	1.42
H-0020	South Crude Charge Heater	90.0	100.0	749	LHV	0.082		0.0535	d	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		8.23	36.07	4.82	21.09	0.75	3.26	3.37	5.84	0.54	2.36
H-0028	Unit 21 Heater	12.3	13.7	749	LHV	0.082		0.176	d	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		1.13	4.93	2.17	9.50	0.10	0.45	0.46	0.80	0.07	0.32
H-0030	Unit 06 Charge Heater	42.0	46.7	749	LHV	0.082		0.076	c	0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		3.84	16.90	3.19	13.98	0.40	1.52	1.57	2.71	0.25	1.10
H-0040	Unit 13 Charge Heater	42.0	46.7	749	LHV	0.082		0.09	c	0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		3.84	16.90	3.78	16.56	0.40	1.52	1.57	2.71	0.25	1.10
H-0312	Unit 10 FCC Feed Heater	35.0	38.9	749	LHV	0.082		0.132	c	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		3.20	14.03	4.62	20.24	0.29	1.27	1.31	2.27	0.21	0.92
H-0352, H-0353, H-0354	Unit 70 CCR Reformer Heaters	200.0	222.2	749	LHV	0.082		0.045	d	0.0075	0.10	0.01166	0.037	0.01166	f	0.0054		18.30	80.15	9.00	39.42	1.70	7.25	8.07	15.56	1.20	5.25
H-0355	Unit 70 Stabilizer Reboiler Heater	28.0	31.1	749	LHV	0.082		0.09	c	0.0075	0.10	0.01166	0.037	0.01166	f	0.0054		2.56	11.22	2.52	11.04	0.23	1.02	1.13	2.18	0.17	0.73
H-0362, H-0363, H-0364	Unit 70 CCR Heaters	125.0	138.9	749	LHV	0.082		0.055	d	0.0075	0.10	0.01166	0.037	0.01166	f	0.0054		11.44	50.09	6.88	30.11	1.03	4.53	5.04	9.73	0.75	3.28
H-0421	Unit 44 Charge Heater	27.0	30.0	749	LHV	0.082		0.09	c	0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		2.47	10.82	2.43	10.64	0.22	0.98	1.01	1.74	0.16	0.71
H-0464	SRU Hot Oil Heater	9.6	10.7	749	LHV	0.082		0.049		0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		0.88	3.85	0.52	2.29	0.08	0.40	0.36	0.62	0.06	0.25
H-0600	Unit 09 Depropanizer Reboiler Heater	84.0	93.3	749	LHV	0.082		0.05	b	0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		7.69	33.66	4.70	20.44	0.70	3.05	3.14	5.43	0.50	2.20
H-0601	Unit 33 Charge Heater	78.0	86.7	749	LHV	0.082		0.045	c	0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		7.14	31.26	3.51	15.37	0.65	2.83	2.91	5.04	0.47	2.05
H-2421	Unit 45 Charge Heater	27.0	30.0	749	LHV	0.082		0.045	c	0.0075	0.10	0.00079	0.037	0.00079	f	0.0054		2.47	10.82	1.22	5.32	0.22	0.98	0.98	1.61	0.16	0.71
H-2501	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	120.0	133.3	749	LHV	0.06	c	0.03	c	0.0075	0.10	0.00095	0.037	0.00095	f	0.0054		7.20	31.54	3.60	15.77	0.99	4.35	4.35	7.19	0.72	3.15
H-3101	SRU3 Hot Oil Heater	11.0	12.2	749	LHV	0.09	c	0.03	c	0.0075	0.10	0.00375	0.037	0.00375	f	0.0054		0.99	4.34	0.33	1.45	0.09	0.40	0.41	0.71	0.07	0.29
H-3402	Unit 34 Hydrocracker Reboiler 1	52.0	57.8	749	LHV	0.09	c	0.03	c	0.0075	0.10	0.00095	0.037	0.00095	f	0.0054		4.68	20.50	1.56	6.83	0.43	1.89	1.89	3.12	0.31	1.36
H-3403	Unit 34 Hydrocracker Reactor Charge Heater	32.0	35.6	749	LHV	0.082		0.03	c	0.0075	0.10	0.00095	0.037	0.00095	f	0.0054		2.93	12.82	0.96	4.20	0.26	1.16	1.16	1.92	0.19	0.84
H-5401	Unit 54 HDS Reactor Heater	19.3	21.5	749	LHV	0.03	b	0.04	d	0.0075	0.10	0.00391	0.037	0.00391	f	0.0054		0.64	2.82	0.77	3.38	0.16	0.70	0.72	1.25	0.12	0.51
H-8801/8802	Unit 63 Hydrogen Plant Reformer Furnaces	152.0	168.9	975	LHV	0.082		0.057	c	0.0075	-	0.00032	-	0.00032	h	0.0054		13.91	60.91	8.66	37.95	1.26	5.51	2.85	4.96	0.91	3.99
				749	LHV						0.10	0.00391	0.037	0.00391													
H-9851	Unit 64 Hydrogen Plant Reformer	337	374	975	LHV	0.060	c	0.0125	c	0.0075	-	0.00032	-	0.00032	h	0.0054		20.2	88.6	4.2	18.5	2.8	12.3	6.3	11.0	2.0	8.8
				749	LHV						0.10	0.00391	0.037	0.00391													

Notes:

a. Unless otherwise noted, the emission factors are from AP-42 Tables 1.4-1 and 1.4-2, dated 7/98. Factors are converted to lb/MMBtu by dividing by 1020 Btu/scf as specified in AP-42 and are based on HHV.

b. Based on manufacturer guarantee on HHV basis.

c. Based on manufacturer guarantee on LHV basis.

d. Factor based on performance testing and LHV basis.

e. Permitted NO_X emission factor based on AP-42 Section 1.4 dated 5/74: Hourly factor = 230 lb/MMscf and Annual = 175 lb/MMscf

f. Except as indicated, the hourly SO_2 emissions are calculated based on the NSPS Subpart J limit of 0.1 gr H2S/dscf (162 ppm H2S) on 3-hr rolling NSPS Ja limit and the annual SO2 emissions are calculated based on the NSPS Subpart Ja, 365-day calendar roliing average limit of 0.037 gr H2S/dscf (60 ppmv H2S), plus non-H2S species present in fuel gas as determined based on sampling data

g. Permitted emission factor of 0.035 gr S/scf fuel and a HHV of 845 Btu/scf.

h. H-8801, H-8802, and H-9851 will combust a mixture of PSA Offgas and amine-treated refinery fuel gas (RFG). It has been conservatively assumed 50/50 mix for SO2 emissions calculation.

BOILERS AND HEATERS POTENTIAL TO EMIT

Sample calculation for SO_2 emissions:

SO2 (lb/hr) = [gr_{H2S}/dscf * 1lb_{H2S}/7000 gr_{H2S} * 1$lbmole_{H2S}$/34 lb_{H2S} + gr_S/dscf * 1 lb_S/7000 gr_S * 1 $lbmole_S$/32 lb_S]* 64 lb_{SO2}/lbmoleSO2 * Heat Rate (MMBtu/hr) * 1000000 Btu/MMBtu / Fuel Heat Content (Btu/scf)

SO2 (tpy) = [gr_{H2S}/dscf * 1lb_{H2S}/7000 gr_{H2S} * 1$lbmole_{H2S}$/34 lb_{H2S} + gr_S/dscf * 1 lb_S/7000 gr_S * 1 $lbmole_S$/32 lb_S]* 64 lb_{SO2}/lbmoleSO2 * Heat Rate (MMBtu/hr) * 1000000 Btu/MMBtu / Fuel Heat Content (Btu/scf) * 8760 hr/yr * 1 ton_{SO2}/2000 lb_{SO2}

B-0007 SO2 Emissions = [0.10 grH2S/dscf * 1 lbH2S/7000 grH2S * 1 lbmoleH2S/34 lbH2S + 0.004 grS/dscf * 1 lbS/7000 grS * 1 lbmoleS/32 lbS] * 64 lbSO2/lbmoleSO2 * 215 MMBtu/hr *1,000,000 Btu/MMBtu / 749 Btu/scf = 8.0 lb/hr

B-0007 SO2 Emissions = [0.04 grH2S/dscf * 1 lbH2S/7000 grH2S * 1 lbmoleH2S/34 lbH2S + 0.004 grS/dscf * 1 lbS/7000 grS * 1 lbmoleS/32 lbS] * 64 lbSO2/lbmoleSO2 * 215 MMBtu/hr *1,000,000 Btu/MMBtu / 749 Btu/scf * 8760 hr/yr * 1 tonSO2/2000 lbSO2 = 13.9 tpy

H-9851 SO2 Emissions = [0.00032 grS/dscf * 1 lbS/7000 grS * 1 lbmoleS/32 lbS / 975 Btu/scf * 337 MMBtu/hr * 0.5 + (0.10 grH2S/dscf * 1 lbH2S/7000 grH2S * 1 lbmoleH2S/34 lbH2S + 0.004 grS/dscf * 1 lbS/7000 grS * 1 lbmoleS/32 lbS) * 749 Btu/scf * 337 MMBtu/hr * 0.5] * 64 lbSO2/lbmoleSO2 * 1,000,000 Btu/MMBtu = 6.3 lb/hr

H-9851 SO2 Emissions = [0.00032 grS/dscf * 1 lbS/7000 grS * 1 lbmoleS/32 lbS / 975 Btu/scf * 337 MMBtu/hr * 0.5 + (0.04 grH2S/dscf * 1 lbH2S/7000 grH2S * 1 lbmoleH2S/34 lbH2S + 0.004 grS/dscf * 1 lbS/7000 grS * 1 lbmoleS/32 lbS) * 749 Btu/scf * 337 MMBtu/hr * 0.5] * 64 lbSO2/lbmoleSO2 * 1,000,000 Btu/MMBtu * 8760 hr/yr * 1 tonSO2/2000 lbSO2 = 11.0 tpy

H-9851 SCR Ammonia Slip Emissions:

ID	Description	NH_3 Exhaust Conc. ppmv, wet basis	Exhaust Flow Rate scfm @ 60°F	NH_3 Emission Rate lb/hr	NH_3 Emission Rate ton/yr
H-9851	Unit 64 Hydrogen Plant Reformer	7	73,500	1.38	6.06

Sample calculation for NH_3 emissions:

NH3 Emissions H-9851 = 7 lbmol NH3 / 10^6 lbmol exhaust * 73,500 scf exhaust/min * 60 min/hr / 379 scf exhaust / lbmol * 17 lb NH3 / lbmol = 1.38 lb/hr

NH3 Emissions H-9851 = 1.38 lb/hr * 8760 hr/yr * 1 ton/2,000 lb = 6.06 ton/yr

BOILERS AND HEATERS POTENTIAL TO EMIT GHG

ID	Description	Design Capacity (LHV)	Design Capacity (HHV)	CO_2	CH_4	N_2O	GHG (as CO_2e)
			Tables C-1 and C-2 to 40 CFR 98, subpart C, Fuel Gas Emission Factor lb/mmBtu	130.07	0.007	0.001	
			Table A-1 TO 40 CFR 98, subpart A, Global Warming Potentials	1	25	298	
		MMBtu/hr	MMBtu/hr	ton/yr	ton/yr	ton/yr	ton/yr
B-0007	Boiler 7	215	239	136,084	6.9	1.4	136,669
B-0008	Boiler 8	215	239	136,084	6.9	1.4	136,669
B-0009	Boiler 9	220	244	139,248	7.1	1.4	139,847
H-0009	Unit 13 Naphtha Splitter Reboiler	44	49	27,850	1.4	0.3	27,969
H-0011	Unit 21 Vacuum Unit Heater	38	42	24,052	1.2	0.2	24,155
H-0018	Unit 06 HDS Reboiler	32	36	20,254	1.0	0.2	20,341
H-0019	South Crude Charge Heater	54	60	34,179	1.7	0.3	34,326
H-0020	South Crude Charge Heater	90	100	56,965	2.9	0.6	57,210
H-0028	Unit 21 Heater	12	14	7,785	0.4	0.1	7,819
H-0030	Unit 06 Charge Heater	42	47	26,584	1.4	0.3	26,698
H-0040	Unit 13 Charge Heater	42	47	26,584	1.4	0.3	26,698
H-0312	Unit 10 FCC Feed Heater	35	39	22,153	1.1	0.2	22,248
H-0352, H-0353, H-0354	Unit 70 CCR Reformer Heaters	200	222	126,589	6.4	1.3	127,134
H-0355	Unit 70 Stabilizer Reboiler Heater	28	31	17,723	0.9	0.2	17,799
H-0362, H-0363, H-0364	Unit 70 CCR Heaters	125	139	79,118	4.0	0.8	79,459
H-0421	Unit 44 Charge Heater	27	30	17,090	0.9	0.2	17,163
H-0464	SRU Hot Oil Heater	10	11	6,076	0.3	0.1	6,102
H-0600	Unit 09 Depropanizer Reboiler Heater	84	93	53,168	2.7	0.5	53,396
H-0601	Unit 33 Charge Heater	78	87	49,370	2.5	0.5	49,582
H-2421	Unit 45 Charge Heater	27	30	17,090	0.9	0.2	17,163
H-2501	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	120	133	75,954	3.9	0.8	76,280
H-3101	SRU3 Hot Oil Heater	11	12	6,962	0.4	0.1	6,992
H-3402	Unit 34 Hydrocracker Reboiler 1	52	58	32,913	1.7	0.3	33,055
H-3403	Unit 34 Hydrocracker Reactor Charge Heater	32	36	20,254	1.0	0.2	20,341
H-5401	Unit 54 HDS Reactor Heater	19	21	12,229	0.6	0.1	12,281
H-8801/8802	Unit 63 Hydrogen Plant Reformer Furnaces	152	169	96,208	4.9	1.0	96,622
H-9851	Unit 64 Hydrogen Plant Reformer	337	374	213,303	10.8	2.2	214,221
			TOTAL	**1,481,867**	**75.3**	**15.1**	**1,488,242**

BOILERS AND HEATERS POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Hexane)	**20.10**	**ton/yr**
Total HAPs	**21.06**	**ton/yr**

ID	Description	Design Capacity (LHV)	Design Capacity (HHV)	2-Methylnaphthalene		3-Methylcholanthrene		7,12-Dimethylbenz(a)anthracene		Acenaphthene		Acenaphthylene		Anthracene		Benz(a)anthracene	
			CAS No.	91-57-6		56-49-5		57-97-6		83-32-9		208-96-8		120-12-7		56-55-3	
	AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units		*Emission Factor lb/mmBtu*	2.4E-08		1.8E-09		1.6E-08		1.8E-09		1.8E-09		2.4E-09		1.8E-09	
		MMBtu/hr	MMBtu/hr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
B-0007	Boiler 7	215	239	5.6E-06	2.46E-05	4.2E-07	1.85E-06	3.7E-06	1.64E-05	4.2E-07	1.85E-06	4.2E-07	1.85E-06	5.6E-07	2.46E-06	4.2E-07	1.85E-06
B-0008	Boiler 8	215	239	5.6E-06	2.46E-05	4.2E-07	1.85E-06	3.7E-06	1.64E-05	4.2E-07	1.85E-06	4.2E-07	1.85E-06	5.6E-07	2.46E-06	4.2E-07	1.85E-06
B-0009	Boiler 9	220	244	5.8E-06	2.52E-05	4.3E-07	1.89E-06	3.8E-06	1.68E-05	4.3E-07	1.89E-06	4.3E-07	1.89E-06	5.8E-07	2.52E-06	4.3E-07	1.89E-06
H-0009	Unit 13 Naphtha Splitter Reboiler	44	49	1.2E-06	5.04E-06	8.6E-08	3.78E-07	7.7E-07	3.36E-06	8.6E-08	3.78E-07	8.6E-08	3.78E-07	1.2E-07	5.04E-07	8.6E-08	3.78E-07
H-0011	Unit 21 Vacuum Unit Heater	38	42	9.9E-07	4.35E-06	7.5E-08	3.26E-07	6.6E-07	2.90E-06	7.5E-08	3.26E-07	7.5E-08	3.26E-07	9.9E-08	4.35E-07	7.5E-08	3.26E-07
H-0018	Unit 06 HDS Reboiler	32	36	8.4E-07	3.66E-06	6.3E-08	2.75E-07	5.6E-07	2.44E-06	6.3E-08	2.75E-07	6.3E-08	2.75E-07	8.4E-08	3.66E-07	6.3E-08	2.75E-07
H-0019	South Crude Charge Heater	54	60	1.4E-06	6.18E-06	1.1E-07	4.64E-07	9.4E-07	4.12E-06	1.1E-07	4.64E-07	1.1E-07	4.64E-07	1.4E-07	6.18E-07	1.1E-07	4.64E-07
H-0020	South Crude Charge Heater	90	100	2.4E-06	1.03E-05	1.8E-07	7.73E-07	1.6E-06	6.87E-06	1.8E-07	7.73E-07	1.8E-07	7.73E-07	2.4E-07	1.03E-06	1.8E-07	7.73E-07
H-0028	Unit 21 Heater	12	14	3.2E-07	1.41E-06	2.4E-08	1.06E-07	2.1E-07	9.39E-07	2.4E-08	1.06E-07	2.4E-08	1.06E-07	3.2E-08	1.41E-07	2.4E-08	1.06E-07
H-0030	Unit 06 Charge Heater	42	47	1.1E-06	4.81E-06	8.2E-08	3.61E-07	7.3E-07	3.21E-06	8.2E-08	3.61E-07	8.2E-08	3.61E-07	1.1E-07	4.81E-07	8.2E-08	3.61E-07
H-0040	Unit 13 Charge Heater	42	47	1.1E-06	4.81E-06	8.2E-08	3.61E-07	7.3E-07	3.21E-06	8.2E-08	3.61E-07	8.2E-08	3.61E-07	1.1E-07	4.81E-07	8.2E-08	3.61E-07
H-0312	Unit 10 FCC Feed Heater	35	39	9.1E-07	4.01E-06	6.9E-08	3.01E-07	6.1E-07	2.67E-06	6.9E-08	3.01E-07	6.9E-08	3.01E-07	9.1E-08	4.01E-07	6.9E-08	3.01E-07
H-0352, H-0353, H-0354	Unit 70 CCR Reformer Heaters	200	222	5.2E-06	2.29E-05	3.9E-07	1.72E-06	3.5E-06	1.53E-05	3.9E-07	1.72E-06	3.9E-07	1.72E-06	5.2E-07	2.29E-06	3.9E-07	1.72E-06
H-0355	Unit 70 Stabilizer Reboiler Heater	28	31	7.3E-07	3.21E-06	5.5E-08	2.40E-07	4.9E-07	2.14E-06	5.5E-08	2.40E-07	5.5E-08	2.40E-07	7.3E-08	3.21E-07	5.5E-08	2.40E-07
H-0362, H-0363, H-0364	Unit 70 CCR Heaters	125	139	3.3E-06	1.43E-05	2.5E-07	1.07E-06	2.2E-06	9.54E-06	2.5E-07	1.07E-06	2.5E-07	1.07E-06	3.3E-07	1.43E-06	2.5E-07	1.07E-06
H-0421	Unit 44 Charge Heater	27	30	7.1E-07	3.09E-06	5.3E-08	2.32E-07	4.7E-07	2.06E-06	5.3E-08	2.32E-07	5.3E-08	2.32E-07	7.1E-08	3.09E-07	5.3E-08	2.32E-07
H-0464	SRU Hot Oil Heater	10	11	2.5E-07	1.10E-06	1.9E-08	8.24E-08	1.7E-07	7.33E-07	1.9E-08	8.24E-08	1.9E-08	8.24E-08	2.5E-08	1.10E-07	1.9E-08	8.24E-08
H-0600	Unit 09 Depropanizer Reboiler Heater	84	93	2.2E-06	9.62E-06	1.6E-07	7.21E-07	1.5E-06	6.41E-06	1.6E-07	7.21E-07	1.6E-07	7.21E-07	2.2E-07	9.62E-07	1.6E-07	7.21E-07
H-0601	Unit 33 Charge Heater	78	87	2.0E-06	8.93E-06	1.5E-07	6.70E-07	1.4E-06	5.95E-06	1.5E-07	6.70E-07	1.5E-07	6.70E-07	2.0E-07	8.93E-07	1.5E-07	6.70E-07
H-2421	Unit 45 Charge Heater	27	30	7.1E-07	3.09E-06	5.3E-08	2.32E-07	4.7E-07	2.06E-06	5.3E-08	2.32E-07	5.3E-08	2.32E-07	7.1E-08	3.09E-07	5.3E-08	2.32E-07
H-2501	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	120	133	3.1E-06	1.37E-05	2.4E-07	1.03E-06	2.1E-06	9.16E-06	2.4E-07	1.03E-06	2.4E-07	1.03E-06	3.1E-07	1.37E-06	2.4E-07	1.03E-06
H-3101	SRU3 Hot Oil Heater	11	12	2.9E-07	1.26E-06	2.2E-08	9.45E-08	1.9E-07	8.40E-07	2.2E-08	9.45E-08	2.2E-08	9.45E-08	2.9E-08	1.26E-07	2.2E-08	9.45E-08
H-3402	Unit 34 Hydrocracker Reboiler 1	52	58	1.4E-06	5.95E-06	1.0E-07	4.47E-07	9.1E-07	3.97E-06	1.0E-07	4.47E-07	1.0E-07	4.47E-07	1.4E-07	5.95E-07	1.0E-07	4.47E-07
H-3403	Unit 34 Hydrocracker Reactor Charge Heater	32	36	8.4E-07	3.66E-06	6.3E-08	2.75E-07	5.6E-07	2.44E-06	6.3E-08	2.75E-07	6.3E-08	2.75E-07	8.4E-08	3.66E-07	6.3E-08	2.75E-07
H-5401	Unit 54 HDS Reactor Heater	19	21	5.1E-07	2.21E-06	3.8E-08	1.66E-07	3.4E-07	1.47E-06	3.8E-08	1.66E-07	3.8E-08	1.66E-07	5.1E-08	2.21E-07	3.8E-08	1.66E-07
H-8801/8802	Unit 63 Hydrogen Plant Reformer Furnaces	152	169	4.0E-06	1.74E-05	3.0E-07	1.31E-06	2.6E-06	1.16E-05	3.0E-07	1.31E-06	3.0E-07	1.31E-06	4.0E-07	1.74E-06	3.0E-07	1.31E-06
H-9851	Unit 64 Hydrogen Plant Reformer	337	374	8.8E-06	3.86E-05	6.6E-07	2.89E-06	5.9E-06	2.57E-05	6.6E-07	2.89E-06	6.6E-07	2.89E-06	8.8E-07	3.86E-06	6.6E-07	2.89E-06
TOTAL (AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units)					**2.68E-04**		**2.01E-05**		**1.79E-04**		**2.01E-05**		**2.01E-05**		**2.68E-05**		**2.01E-05**

BOILERS AND HEATERS POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Hexane)	**20.10**	**ton/yr**
Total HAPs	**21.06**	**ton/yr**

				Benzene		Benzo(a)pyrene		Benzo(b)fluoranthene		Benzo(g,h,i)perylene		Benzo(k)fluoranthene		Chrysene		Dibenzo(a,h)anthracene		Dichlorobenzene		Fluoranthene	
			CAS No.	71-43-2		50-32-8		205-99-2		191-24-2		207-08-9		218-01-9		53-70-3		25321-22-6		206-44-0	
AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units			*Emission Factor lb/mmBtu*	2.1E-06		1.2E-09		1.8E-09		1.2E-09		1.8E-09		1.8E-09		1.2E-09		1.2E-06		2.9E-09	
ID	**Description**	**Design Capacity (LHV) MMBtu/hr**	**Design Capacity (HHV) MMBtu/hr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**
B-0007	Boiler 7	215	239	4.9E-04	2.15E-03	2.8E-07	1.23E-06	4.2E-07	1.85E-06	2.8E-07	1.23E-06	4.2E-07	1.85E-06	4.2E-07	1.85E-06	2.8E-07	1.23E-06	2.8E-04	1.23E-03	7.0E-07	3.08E-06
B-0008	Boiler 8	215	239	4.9E-04	2.15E-03	2.8E-07	1.23E-06	4.2E-07	1.85E-06	2.8E-07	1.23E-06	4.2E-07	1.85E-06	4.2E-07	1.85E-06	2.8E-07	1.23E-06	2.8E-04	1.23E-03	7.0E-07	3.08E-06
B-0009	Boiler 9	220	244	5.0E-04	2.20E-03	2.9E-07	1.26E-06	4.3E-07	1.89E-06	2.9E-07	1.26E-06	4.3E-07	1.89E-06	4.3E-07	1.89E-06	2.9E-07	1.26E-06	2.9E-04	1.26E-03	7.2E-07	3.15E-06
H-0009	Unit 13 Naphtha Splitter Reboiler	44	49	1.0E-04	4.41E-04	5.8E-08	2.52E-07	8.6E-08	3.78E-07	5.8E-08	2.52E-07	8.6E-08	3.78E-07	8.6E-08	3.78E-07	5.8E-08	2.52E-07	5.8E-05	2.52E-04	1.4E-07	6.30E-07
H-0011	Unit 21 Vacuum Unit Heater	38	42	8.7E-05	3.81E-04	5.0E-08	2.18E-07	7.5E-08	3.26E-07	5.0E-08	2.18E-07	7.5E-08	3.26E-07	7.5E-08	3.26E-07	5.0E-08	2.18E-07	5.0E-05	2.18E-04	1.2E-07	5.44E-07
H-0018	Unit 06 HDS Reboiler	32	36	7.3E-05	3.21E-04	4.2E-08	1.83E-07	6.3E-08	2.75E-07	4.2E-08	1.83E-07	6.3E-08	2.75E-07	6.3E-08	2.75E-07	4.2E-08	1.83E-07	4.2E-05	1.83E-04	1.0E-07	4.58E-07
H-0019	South Crude Charge Heater	54	60	1.2E-04	5.41E-04	7.1E-08	3.09E-07	1.1E-07	4.64E-07	7.1E-08	3.09E-07	1.1E-07	4.64E-07	1.1E-07	4.64E-07	7.1E-08	3.09E-07	7.1E-05	3.09E-04	1.8E-07	7.73E-07
H-0020	South Crude Charge Heater	90	100	2.1E-04	9.02E-04	1.2E-07	5.15E-07	1.8E-07	7.73E-07	1.2E-07	5.15E-07	1.8E-07	7.73E-07	1.8E-07	7.73E-07	1.2E-07	5.15E-07	1.2E-04	5.15E-04	2.9E-07	1.29E-06
H-0028	Unit 21 Heater	12	14	2.8E-05	1.23E-04	1.6E-08	7.04E-08	2.4E-08	1.06E-07	1.6E-08	7.04E-08	2.4E-08	1.06E-07	2.4E-08	1.06E-07	1.6E-08	7.04E-08	1.6E-05	7.04E-05	4.0E-08	1.76E-07
H-0030	Unit 06 Charge Heater	42	47	9.6E-05	4.21E-04	5.5E-08	2.40E-07	8.2E-08	3.61E-07	5.5E-08	2.40E-07	8.2E-08	3.61E-07	8.2E-08	3.61E-07	5.5E-08	2.40E-07	5.5E-05	2.40E-04	1.4E-07	6.01E-07
H-0040	Unit 13 Charge Heater	42	47	9.6E-05	4.21E-04	5.5E-08	2.40E-07	8.2E-08	3.61E-07	5.5E-08	2.40E-07	8.2E-08	3.61E-07	8.2E-08	3.61E-07	5.5E-08	2.40E-07	5.5E-05	2.40E-04	1.4E-07	6.01E-07
H-0312	Unit 10 FCC Feed Heater	35	39	8.0E-05	3.51E-04	4.6E-08	2.00E-07	6.9E-08	3.01E-07	4.6E-08	2.00E-07	6.9E-08	3.01E-07	6.9E-08	3.01E-07	4.6E-08	2.00E-07	4.6E-05	2.00E-04	1.1E-07	5.01E-07
H-0352, H-0353, H-0354	Unit 70 CCR Reformer Heaters	200	222	4.6E-04	2.00E-03	2.6E-07	1.14E-06	3.9E-07	1.72E-06	2.6E-07	1.14E-06	3.9E-07	1.72E-06	3.9E-07	1.72E-06	2.6E-07	1.14E-06	2.6E-04	1.14E-03	6.5E-07	2.86E-06
H-0355	Unit 70 Stabilizer Reboiler Heater	28	31	6.4E-05	2.81E-04	3.7E-08	1.60E-07	5.5E-08	2.40E-07	3.7E-08	1.60E-07	5.5E-08	2.40E-07	5.5E-08	2.40E-07	3.7E-08	1.60E-07	3.7E-05	1.60E-04	9.1E-08	4.01E-07
H-0362, H-0363, H-0364	Unit 70 CCR Heaters	125	139	2.9E-04	1.25E-03	1.6E-07	7.16E-07	2.5E-07	1.07E-06	1.6E-07	7.16E-07	2.5E-07	1.07E-06	2.5E-07	1.07E-06	1.6E-07	7.16E-07	1.6E-04	7.16E-04	4.1E-07	1.79E-06
H-0421	Unit 44 Charge Heater	27	30	6.2E-05	2.71E-04	3.5E-08	1.55E-07	5.3E-08	2.32E-07	3.5E-08	1.55E-07	5.3E-08	2.32E-07	5.3E-08	2.32E-07	3.5E-08	1.55E-07	3.5E-05	1.55E-04	8.8E-08	3.86E-07
H-0464	SRU Hot Oil Heater	10	11	2.2E-05	9.62E-05	1.3E-08	5.50E-08	1.9E-08	8.24E-08	1.3E-08	5.50E-08	1.9E-08	8.24E-08	1.9E-08	8.24E-08	1.3E-08	5.50E-08	1.3E-05	5.50E-05	3.1E-08	1.37E-07
H-0600	Unit 09 Depropanizer Reboiler Heater	84	93	1.9E-04	8.42E-04	1.1E-07	4.81E-07	1.6E-07	7.21E-07	1.1E-07	4.81E-07	1.6E-07	7.21E-07	1.6E-07	7.21E-07	1.1E-07	4.81E-07	1.1E-04	4.81E-04	2.7E-07	1.20E-06
H-0601	Unit 33 Charge Heater	78	87	1.8E-04	7.81E-04	1.0E-07	4.47E-07	1.5E-07	6.70E-07	1.0E-07	4.47E-07	1.5E-07	6.70E-07	1.5E-07	6.70E-07	1.0E-07	4.47E-07	1.0E-04	4.47E-04	2.5E-07	1.12E-06
H-2421	Unit 45 Charge Heater	27	30	6.2E-05	2.71E-04	3.5E-08	1.55E-07	5.3E-08	2.32E-07	3.5E-08	1.55E-07	5.3E-08	2.32E-07	5.3E-08	2.32E-07	3.5E-08	1.55E-07	3.5E-05	1.55E-04	8.8E-08	3.86E-07
H-2501	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	120	133	2.7E-04	1.20E-03	1.6E-07	6.87E-07	2.4E-07	1.03E-06	1.6E-07	6.87E-07	2.4E-07	1.03E-06	2.4E-07	1.03E-06	1.6E-07	6.87E-07	1.6E-04	6.87E-04	3.9E-07	1.72E-06
H-3101	SRU3 Hot Oil Heater	11	12	2.5E-05	1.10E-04	1.4E-08	6.30E-08	2.2E-08	9.45E-08	1.4E-08	6.30E-08	2.2E-08	9.45E-08	2.2E-08	9.45E-08	1.4E-08	6.30E-08	1.4E-05	6.30E-05	3.6E-08	1.57E-07
H-3402	Unit 34 Hydrocracker Reboiler 1	52	58	1.2E-04	5.21E-04	6.8E-08	2.98E-07	1.0E-07	4.47E-07	6.8E-08	2.98E-07	1.0E-07	4.47E-07	1.0E-07	4.47E-07	6.8E-08	2.98E-07	6.8E-05	2.98E-04	1.7E-07	7.44E-07
H-3403	Unit 34 Hydrocracker Reactor Charge Heater	32	36	7.3E-05	3.21E-04	4.2E-08	1.83E-07	6.3E-08	2.75E-07	4.2E-08	1.83E-07	6.3E-08	2.75E-07	6.3E-08	2.75E-07	4.2E-08	1.83E-07	4.2E-05	1.83E-04	1.0E-07	4.58E-07
H-5401	Unit 54 HDS Reactor Heater	19	21	4.4E-05	1.94E-04	2.5E-08	1.11E-07	3.8E-08	1.66E-07	2.5E-08	1.11E-07	3.8E-08	1.66E-07	3.8E-08	1.66E-07	2.5E-08	1.11E-07	2.5E-05	1.11E-04	6.3E-08	2.77E-07
H-8801/8802	Unit 63 Hydrogen Plant Reformer Furnaces	152	169	3.5E-04	1.52E-03	2.0E-07	8.70E-07	3.0E-07	1.31E-06	2.0E-07	8.70E-07	3.0E-07	1.31E-06	3.0E-07	1.31E-06	2.0E-07	8.70E-07	2.0E-04	8.70E-04	5.0E-07	2.18E-06
H-9851	Unit 64 Hydrogen Plant Reformer	337	374	7.7E-04	3.38E-03	4.4E-07	1.93E-06	6.6E-07	2.89E-06	4.4E-07	1.93E-06	6.6E-07	2.89E-06	6.6E-07	2.89E-06	4.4E-07	1.93E-06	4.4E-04	1.93E-03	1.1E-06	4.82E-06
TOTAL (AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units)					**0.02**		**1.34E-05**		**2.01E-05**		**1.34E-05**		**2.01E-05**		**2.01E-05**		**1.34E-05**		**0.01**		**3.35E-05**

BOILERS AND HEATERS POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Hexane) **20.10** **ton/yr**
Total HAPs **21.06** **ton/yr**

ID	Description	Design Capacity (LHV)	Design Capacity (HHV)	Fluorene		Formaldehyde		Hexane		Indeno(1,2,3-cd)pyrene		Naphthalene		Phenanathrene		Pyrene		Toluene		Arsenic	
			CAS No.	86-73-7		50-00-0		110-54-3		193-39-5		91-20-3		85-01-8		129-00-0		108-88-3		7440-38-2	
AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units			*Emission Factor lb/mmBtu*	2.7E-09		7.4E-05		1.8E-03		1.8E-09		6.0E-07		1.7E-08		4.9E-09		3.3E-06		2.0E-07	
		MMBtu/hr	MMBtu/hr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
B-0007	Boiler 7	215	239	6.6E-07	2.87E-06	1.8E-02	7.69E-02	4.2E-01	1.85E+00	4.2E-07	1.85E-06	1.4E-04	6.26E-04	4.0E-06	1.74E-05	1.2E-06	5.13E-06	8.0E-04	3.49E-03	4.7E-05	2.05E-04
B-0008	Boiler 8	215	239	6.6E-07	2.87E-06	1.8E-02	7.69E-02	4.2E-01	1.85E+00	4.2E-07	1.85E-06	1.4E-04	6.26E-04	4.0E-06	1.74E-05	1.2E-06	5.13E-06	8.0E-04	3.49E-03	4.7E-05	2.05E-04
B-0009	Boiler 9	220	244	6.7E-07	2.94E-06	1.8E-02	7.87E-02	4.3E-01	1.89E+00	4.3E-07	1.89E-06	1.5E-04	6.40E-04	4.1E-06	1.78E-05	1.2E-06	5.25E-06	8.1E-04	3.57E-03	4.8E-05	2.10E-04
H-0009	Unit 13 Naphtha Splitter Reboiler	44	49	1.3E-07	5.88E-07	3.6E-03	1.57E-02	8.6E-02	3.78E-01	8.6E-08	3.78E-07	2.9E-05	1.28E-04	8.1E-07	3.57E-06	2.4E-07	1.05E-06	1.6E-04	7.14E-04	9.6E-06	4.20E-05
H-0011	Unit 21 Vacuum Unit Heater	38	42	1.2E-07	5.08E-07	3.1E-03	1.36E-02	7.5E-02	3.26E-01	7.5E-08	3.26E-07	2.5E-05	1.11E-04	7.0E-07	3.08E-06	2.1E-07	9.06E-07	1.4E-04	6.16E-04	8.3E-06	3.63E-05
H-0018	Unit 06 HDS Reboiler	32	36	9.8E-08	4.27E-07	2.6E-03	1.14E-02	6.3E-02	2.75E-01	6.3E-08	2.75E-07	2.1E-05	9.31E-05	5.9E-07	2.60E-06	1.7E-07	7.63E-07	1.2E-04	5.19E-04	7.0E-06	3.05E-05
H-0019	South Crude Charge Heater	54	60	1.6E-07	7.21E-07	4.4E-03	1.93E-02	1.1E-01	4.64E-01	1.1E-07	4.64E-07	3.6E-05	1.57E-04	1.0E-06	4.38E-06	2.9E-07	1.29E-06	2.0E-04	8.76E-04	1.2E-05	5.15E-05
H-0020	South Crude Charge Heater	90	100	2.7E-07	1.20E-06	7.4E-03	3.22E-02	1.8E-01	7.73E-01	1.8E-07	7.73E-07	6.0E-05	2.62E-04	1.7E-06	7.30E-06	4.9E-07	2.15E-06	3.3E-04	1.46E-03	2.0E-05	8.59E-05
H-0028	Unit 21 Heater	12	14	3.8E-08	1.64E-07	1.0E-03	4.40E-03	2.4E-02	1.06E-01	2.4E-08	1.06E-07	8.2E-06	3.58E-05	2.3E-07	9.98E-07	6.7E-08	2.93E-07	4.6E-05	2.00E-04	2.7E-06	1.17E-05
H-0030	Unit 06 Charge Heater	42	47	1.3E-07	5.61E-07	3.4E-03	1.50E-02	8.2E-02	3.61E-01	8.2E-08	3.61E-07	2.8E-05	1.22E-04	7.8E-07	3.41E-06	2.3E-07	1.00E-06	1.6E-04	6.81E-04	9.1E-06	4.01E-05
H-0040	Unit 13 Charge Heater	42	47	1.3E-07	5.61E-07	3.4E-03	1.50E-02	8.2E-02	3.61E-01	8.2E-08	3.61E-07	2.8E-05	1.22E-04	7.8E-07	3.41E-06	2.3E-07	1.00E-06	1.6E-04	6.81E-04	9.1E-06	4.01E-05
H-0312	Unit 10 FCC Feed Heater	35	39	1.1E-07	4.68E-07	2.9E-03	1.25E-02	6.9E-02	3.01E-01	6.9E-08	3.01E-07	2.3E-05	1.02E-04	6.5E-07	2.84E-06	1.9E-07	8.35E-07	1.3E-04	5.68E-04	7.6E-06	3.34E-05
H-0352, H-0353, H-0354	Unit 70 CCR Reformer Heaters	200	222	6.1E-07	2.67E-06	1.6E-02	7.16E-02	3.9E-01	1.72E+00	3.9E-07	1.72E-06	1.3E-04	5.82E-04	3.7E-06	1.62E-05	1.1E-06	4.77E-06	7.4E-04	3.24E-03	4.4E-05	1.91E-04
H-0355	Unit 70 Stabilizer Reboiler Heater	28	31	8.5E-08	3.74E-07	2.3E-03	1.00E-02	5.5E-02	2.40E-01	5.5E-08	2.40E-07	1.9E-05	8.15E-05	5.2E-07	2.27E-06	1.5E-07	6.68E-07	1.0E-04	4.54E-04	6.1E-06	2.67E-05
H-0362, H-0363, H-0364	Unit 70 CCR Heaters	125	139	3.8E-07	1.67E-06	1.0E-02	4.47E-02	2.5E-01	1.07E+00	2.5E-07	1.07E-06	8.3E-05	3.64E-04	2.3E-06	1.01E-05	6.8E-07	2.98E-06	4.6E-04	2.03E-03	2.7E-05	1.19E-04
H-0421	Unit 44 Charge Heater	27	30	8.2E-08	3.61E-07	2.2E-03	9.66E-03	5.3E-02	2.32E-01	5.3E-08	2.32E-07	1.8E-05	7.86E-05	5.0E-07	2.19E-06	1.5E-07	6.44E-07	1.0E-04	4.38E-04	5.9E-06	2.58E-05
H-0464	SRU Hot Oil Heater	10	11	2.9E-08	1.28E-07	7.8E-04	3.43E-03	1.9E-02	8.24E-02	1.9E-08	8.24E-08	6.4E-06	2.79E-05	1.8E-07	7.79E-07	5.2E-08	2.29E-07	3.6E-05	1.56E-04	2.1E-06	9.16E-06
H-0600	Unit 09 Depropanizer Reboiler Heater	84	93	2.6E-07	1.12E-06	6.9E-03	3.01E-02	1.6E-01	7.21E-01	1.6E-07	7.21E-07	5.6E-05	2.44E-04	1.6E-06	6.81E-06	4.6E-07	2.00E-06	3.1E-04	1.36E-03	1.8E-05	8.01E-05
H-0601	Unit 33 Charge Heater	78	87	2.4E-07	1.04E-06	6.4E-03	2.79E-02	1.5E-01	6.70E-01	1.5E-07	6.70E-07	5.2E-05	2.27E-04	1.4E-06	6.33E-06	4.2E-07	1.86E-06	2.9E-04	1.27E-03	1.7E-05	7.44E-05
H-2421	Unit 45 Charge Heater	27	30	8.2E-08	3.61E-07	2.2E-03	9.66E-03	5.3E-02	2.32E-01	5.3E-08	2.32E-07	1.8E-05	7.86E-05	5.0E-07	2.19E-06	1.5E-07	6.44E-07	1.0E-04	4.38E-04	5.9E-06	2.58E-05
H-2501	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	120	133	3.7E-07	1.60E-06	9.8E-03	4.29E-02	2.4E-01	1.03E+00	2.4E-07	1.03E-06	8.0E-05	3.49E-04	2.2E-06	9.73E-06	6.5E-07	2.86E-06	4.4E-04	1.95E-03	2.6E-05	1.14E-04
H-3101	SRU3 Hot Oil Heater	11	12	3.4E-08	1.47E-07	9.0E-04	3.94E-03	2.2E-02	9.45E-02	2.2E-08	9.45E-08	7.3E-06	3.20E-05	2.0E-07	8.92E-07	6.0E-08	2.62E-07	4.1E-05	1.78E-04	2.4E-06	1.05E-05
H-3402	Unit 34 Hydrocracker Reboiler 1	52	58	1.6E-07	6.95E-07	4.2E-03	1.86E-02	1.0E-01	4.47E-01	1.0E-07	4.47E-07	3.5E-05	1.51E-04	9.6E-07	4.22E-06	2.8E-07	1.24E-06	1.9E-04	8.43E-04	1.1E-05	4.96E-05
H-3403	Unit 34 Hydrocracker Reactor Charge Heater	32	36	9.8E-08	4.27E-07	2.6E-03	1.14E-02	6.3E-02	2.75E-01	6.3E-08	2.75E-07	2.1E-05	9.31E-05	5.9E-07	2.60E-06	1.7E-07	7.63E-07	1.2E-04	5.19E-04	7.0E-06	3.05E-05
H-5401	Unit 54 HDS Reactor Heater	19	21	5.9E-08	2.58E-07	1.6E-03	6.91E-03	3.8E-02	1.66E-01	3.8E-08	1.66E-07	1.3E-05	5.62E-05	3.6E-07	1.57E-06	1.1E-07	4.61E-07	7.2E-05	3.13E-04	4.2E-06	1.84E-05
H-8801/8802	Unit 63 Hydrogen Plant Reformer Furnaces	152	169	4.6E-07	2.03E-06	1.2E-02	5.44E-02	3.0E-01	1.31E+00	3.0E-07	1.31E-06	1.0E-04	4.42E-04	2.8E-06	1.23E-05	8.3E-07	3.63E-06	5.6E-04	2.47E-03	3.3E-05	1.45E-04
H-9851	Unit 64 Hydrogen Plant Reformer	337	374	1.0E-06	4.50E-06	2.8E-02	1.21E-01	6.6E-01	2.89E+00	6.6E-07	2.89E-06	2.2E-04	9.81E-04	6.2E-06	2.73E-05	1.8E-06	8.04E-06	1.2E-03	5.47E-03	7.3E-05	3.22E-04
TOTAL (AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units)					**3.13E-05**		**0.84**		**20.10**		**2.01E-05**		**0.01**		**1.90E-04**		**5.58E-05**		**0.04**		**0.002**

BOILERS AND HEATERS POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Hexane)	**20.10**	**ton/yr**
Total HAPs	**21.06**	**ton/yr**

				Beryllium		**Cadmium**		**Chromium**		**Cobalt**		**Manganese**		**Mercury**		**Selenium**	
			CAS No.	7440-41-7		7440-43-9		7440-47-3		7440-48-4		7439-96-5		7439-97-6		7782-49-2	
	AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units		*Emission Factor lb/mmBtu*	1.2E-08		1.1E-06		1.4E-06		8.2E-08		3.7E-07		2.5E-07		2.4E-08	
ID	**Description**	**Design Capacity (LHV) MMBtu/hr**	**Design Capacity (HHV) MMBtu/hr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**	**lb/hr**	**ton/yr**
B-0007	Boiler 7	215	239	2.8E-06	1.23E-05	2.6E-04	1.13E-03	3.3E-04	1.44E-03	2.0E-05	8.62E-05	8.9E-05	3.90E-04	6.1E-05	2.67E-04	5.6E-06	2.46E-05
B-0008	Boiler 8	215	239	2.8E-06	1.23E-05	2.6E-04	1.13E-03	3.3E-04	1.44E-03	2.0E-05	8.62E-05	8.9E-05	3.90E-04	6.1E-05	2.67E-04	5.6E-06	2.46E-05
B-0009	Boiler 9	220	244	2.9E-06	1.26E-05	2.6E-04	1.15E-03	3.4E-04	1.47E-03	2.0E-05	8.82E-05	9.1E-05	3.99E-04	6.2E-05	2.73E-04	5.8E-06	2.52E-05
H-0009	Unit 13 Naphtha Splitter Reboiler	44	49	5.8E-07	2.52E-06	5.3E-05	2.31E-04	6.7E-05	2.94E-04	4.0E-06	1.76E-05	1.8E-05	7.98E-05	1.2E-05	5.46E-05	1.2E-06	5.04E-06
H-0011	Unit 21 Vacuum Unit Heater	38	42	5.0E-07	2.18E-06	4.6E-05	1.99E-04	5.8E-05	2.54E-04	3.5E-06	1.52E-05	1.6E-05	6.89E-05	1.1E-05	4.71E-05	9.9E-07	4.35E-06
H-0018	Unit 06 HDS Reboiler	32	36	4.2E-07	1.83E-06	3.8E-05	1.68E-04	4.9E-05	2.14E-04	2.9E-06	1.28E-05	1.3E-05	5.80E-05	9.1E-06	3.97E-05	8.4E-07	3.66E-06
H-0019	South Crude Charge Heater	54	60	7.1E-07	3.09E-06	6.5E-05	2.83E-04	8.2E-05	3.61E-04	4.9E-06	2.16E-05	2.2E-05	9.79E-05	1.5E-05	6.70E-05	1.4E-06	6.18E-06
H-0020	South Crude Charge Heater	90	100	1.2E-06	5.15E-06	1.1E-04	4.72E-04	1.4E-04	6.01E-04	8.2E-06	3.61E-05	3.7E-05	1.63E-04	2.5E-05	1.12E-04	2.4E-06	1.03E-05
H-0028	Unit 21 Heater	12	14	1.6E-07	7.04E-07	1.5E-05	6.45E-05	1.9E-05	8.22E-05	1.1E-06	4.93E-06	5.1E-06	2.23E-05	3.5E-06	1.53E-05	3.2E-07	1.41E-06
H-0030	Unit 06 Charge Heater	42	47	5.5E-07	2.40E-06	5.0E-05	2.20E-04	6.4E-05	2.81E-04	3.8E-06	1.68E-05	1.7E-05	7.61E-05	1.2E-05	5.21E-05	1.1E-06	4.81E-06
H-0040	Unit 13 Charge Heater	42	47	5.5E-07	2.40E-06	5.0E-05	2.20E-04	6.4E-05	2.81E-04	3.8E-06	1.68E-05	1.7E-05	7.61E-05	1.2E-05	5.21E-05	1.1E-06	4.81E-06
H-0312	Unit 10 FCC Feed Heater	35	39	4.6E-07	2.00E-06	4.2E-05	1.84E-04	5.3E-05	2.34E-04	3.2E-06	1.40E-05	1.4E-05	6.35E-05	9.9E-06	4.34E-05	9.1E-07	4.01E-06
H-0352, H-0353, H-0354	Unit 70 CCR Reformer Heaters	200	222	2.6E-06	1.14E-05	2.4E-04	1.05E-03	3.0E-04	1.34E-03	1.8E-05	8.01E-05	8.3E-05	3.63E-04	5.7E-05	2.48E-04	5.2E-06	2.29E-05
H-0355	Unit 70 Stabilizer Reboiler Heater	28	31	3.7E-07	1.60E-06	3.4E-05	1.47E-04	4.3E-05	1.87E-04	2.6E-06	1.12E-05	1.2E-05	5.08E-05	7.9E-06	3.47E-05	7.3E-07	3.21E-06
H-0362, H-0363, H-0364	Unit 70 CCR Heaters	125	139	1.6E-06	7.16E-06	1.5E-04	6.56E-04	1.9E-04	8.35E-04	1.1E-05	5.01E-05	5.2E-05	2.27E-04	3.5E-05	1.55E-04	3.3E-06	1.43E-05
H-0421	Unit 44 Charge Heater	27	30	3.5E-07	1.55E-06	3.2E-05	1.42E-04	4.1E-05	1.80E-04	2.5E-06	1.08E-05	1.1E-05	4.89E-05	7.6E-06	3.35E-05	7.1E-07	3.09E-06
H-0464	SRU Hot Oil Heater	10	11	1.3E-07	5.50E-07	1.2E-05	5.04E-05	1.5E-05	6.41E-05	8.8E-07	3.85E-06	4.0E-06	1.74E-05	2.7E-06	1.19E-05	2.5E-07	1.10E-06
H-0600	Unit 09 Depropanizer Reboiler Heater	84	93	1.1E-06	4.81E-06	1.0E-04	4.41E-04	1.3E-04	5.61E-04	7.7E-06	3.37E-05	3.5E-05	1.52E-04	2.4E-05	1.04E-04	2.2E-06	9.62E-06
H-0601	Unit 33 Charge Heater	78	87	1.0E-06	4.47E-06	9.3E-05	4.09E-04	1.2E-04	5.21E-04	7.1E-06	3.13E-05	3.2E-05	1.41E-04	2.2E-05	9.68E-05	2.0E-06	8.93E-06
H-2421	Unit 45 Charge Heater	27	30	3.5E-07	1.55E-06	3.2E-05	1.42E-04	4.1E-05	1.80E-04	2.5E-06	1.08E-05	1.1E-05	4.89E-05	7.6E-06	3.35E-05	7.1E-07	3.09E-06
H-2501	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	120	133	1.6E-06	6.87E-06	1.4E-04	6.30E-04	1.8E-04	8.01E-04	1.1E-05	4.81E-05	5.0E-05	2.18E-04	3.4E-05	1.49E-04	3.1E-06	1.37E-05
H-3101	SRU3 Hot Oil Heater	11	12	1.4E-07	6.30E-07	1.3E-05	5.77E-05	1.7E-05	7.35E-05	1.0E-06	4.41E-06	4.6E-06	1.99E-05	3.1E-06	1.36E-05	2.9E-07	1.26E-06
H-3402	Unit 34 Hydrocracker Reboiler 1	52	58	6.8E-07	2.98E-06	6.2E-05	2.73E-04	7.9E-05	3.47E-04	4.8E-06	2.08E-05	2.2E-05	9.43E-05	1.5E-05	6.45E-05	1.4E-06	5.95E-06
H-3403	Unit 34 Hydrocracker Reactor Charge Heater	32	36	4.2E-07	1.83E-06	3.8E-05	1.68E-04	4.9E-05	2.14E-04	2.9E-06	1.28E-05	1.3E-05	5.80E-05	9.1E-06	3.97E-05	8.4E-07	3.66E-06
H-5401	Unit 54 HDS Reactor Heater	19	21	2.5E-07	1.11E-06	2.3E-05	1.01E-04	2.9E-05	1.29E-04	1.8E-06	7.74E-06	8.0E-06	3.50E-05	5.5E-06	2.40E-05	5.1E-07	2.21E-06
H-8801/8802	Unit 63 Hydrogen Plant Reformer Furnaces	152	169	2.0E-06	8.70E-06	1.8E-04	7.98E-04	2.3E-04	1.02E-03	1.4E-05	6.09E-05	6.3E-05	2.76E-04	4.3E-05	1.89E-04	4.0E-06	1.74E-05
H-9851	Unit 64 Hydrogen Plant Reformer	337	374	4.4E-06	1.93E-05	4.0E-04	1.77E-03	5.1E-04	2.25E-03	3.1E-05	1.35E-04	1.4E-04	6.11E-04	9.5E-05	4.18E-04	8.8E-06	3.86E-05
TOTAL (AP-42, Ch. 1.4 (7/98) Table 1.4-3 HAPs for Natural Gas Combustion Units)					**1.34E-04**		**0.01**		**0.02**		**9.38E-04**		**0.004**		**0.003**		**2.68E-04**

SRUs POTENTIAL TO EMIT

Pollutant	MW	SRU2 TGI Stack Exhaust Flow Rate (1)		H-0473 (SRU2 TGI)			
		Maximum	Average	Concentration at max flow(2)	Concentration at average flow(2)	Potential to Emit	
		dscfm	dscfm	ppmvd	ppmvd	lb/hr	ton/yr
NOx	46	25,000	9,600	36	93	6.50	28.50
CO	28			250	650	27.70	121.10
VOC	44			0.4	2.0	0.10	0.60
SO2	64			118.1	192	30.00	81.80
H2S	34			1.9	5.8	0.30	1.40
SAM	98			-	-	2.30	6.26
PM	-			0.006 gr/dscf	0.006 gr/dscf	1.20	2.10
$PM_{10}/PM_{2.5}$	-			-	-	3.50	8.36

Pollutant	MW	SRU 3 TGI Stack Exhaust Flow Rate (1)		H-3103 (SRU3 TGI)			
		Maximum	Average	Concentration at max flow(2)	Concentration at average flow(2)	Potential to Emit	
		dscfm	dscfm	ppmvd	ppmvd	lb/hr	ton/yr
NOx	46	21,000	9,600	42	93	6.50	28.50
CO	28			161	352	15.00	65.70
VOC	44			0.1	2.0	0.10	0.60
SO2	64			140.8	192	30.00	81.80
H2S	34			2.1	5.8	0.30	1.40
SAM	98			-	-	2.30	6.26
PM	-			0.006 gr/dscf	0.006 gr/dscf	1.10	2.10
$PM_{10}/PM_{2.5}$	-			-	-	3.40	8.36

Notes
(1) TGI stack exhaust flow rate per operations (60°F and 1 atm)
(2) NO_X, CO, and VOC per site data. SO_2, and H_2S concentration per CEMS data. SAM assumed 5% conversion SO_2 to SO_3 and 100% SO_3 to H_2SO_4.
PM per AP-42, Ch. 8.13 (4/15), Chevron Texaco Pascagoula Refinery Emissions Test Data, 2007. $PM_{10}/PM_{2.5}$ assumed to be PM + SAM
(3) Standard molar volume at 60F 379.51 scf/lbmol

Sample Calculation H-0473 (SRU 2 TGI)
NOx = 25,000 scf/min * 60 min/hr * 1 lbmol/380 scf * 35.7/10^6 * 46 lb/lbmole = 6.5 lb/hr
NOx = 9,600 scf/min * 60 min/hr * 1 lbmol/380 scf * 93.0/10^6 * 46 lb/lbmole * 8760 hr/yr * 1 ton/2,000 lb = 28.5 lb/hr

SRU POTENTIAL TO EMIT GHG

Unit	Sour Gas Volumetric Flow Rate(1)	Molar Volume Conversion (MVC)(2)	Mole Fraction of Carbon (MFc)(3)	CO_2(4)	
	scf/yr	scf/kgmole	kgmolC/kgmolgas	metric tons/yr	ton/yr
H-0473 (SRU2 TGI)	1,200	836.6	0.20	12,623	13,914
H-3103 (SRU3 TGI)	1,400	836.6	0.20	14,726	16,233

Notes:
(1) Sour volumetric flow rate (amine acid gas and sour water gas) per Operation, Maintenance and Instruction Manuals, 2001
(2) Molar volume conversion factor (849.5 scf/kg-mole at 68 °F and 14.7 psia or 836.6 scf/kg-mole at 60 °F and 14.7 psia).
(3) Mole fraction of carbon in the sour gas fed to the sulfur recovery plant or the sour gas feed sent off-site for sulfur recovery (kg-mole C/kg-mole gas); default = 0.20.
(4) CO2 metric tons, per Eq. Y-12, subpart Y of Part 98. 1 metric ton = 1.10231 tons

FCC REGEN POTENTIAL TO EMIT

Calculation Basis:		Units
FCC Capacity	30,000	bbl/day
FCC Stack Exhaust Flow Rate	55,000	dscfm
Maximum Coke Burn Rate	25,000	lb/hr
Conversion Factor	379	scf/lbmol
Annual Hours of Operation	8,760	hr/yr

	Units	NO_X (1)	CO (2)	VOC (3)	SO_2 (4)	SAM (5)	PM (6)	PM_{10} (7)	$PM_{2.5}$ (7)
Molecular Weight	lb/lb-mol	46	28	-	64	98	-	-	-
Concentration for Maximum Hourly Emission Rate	ppmvd	87.3	500	-	50	-	-	-	-
Concentration for Annual Average Emission Rate	ppmvd	58.1	100	-	25	-	-	-	-
Maximum PM emission rate	lb/toncoke	-	-	-	-	-	2		
Maximum Hourly Emission Rate	lb/hr	34.92	121.79	15.66	27.85	2.13	25.00	22.88	22.88
Annual Average Emission Rate	ton/yr	101.80	106.69	68.60	61.00	4.67	109.50	95.55	68.81

Notes:

(1) Per Consent Decree NO_X max. hourly emissions based on 87.3 ppmvd at 0% O_2 on a 7-day rolling avg. basis, and annual avg. emissions based on 58.1 ppmvd at 0% O_2 on a 365-day rolling avg. basis

(2) Per NSPS Subpart J CO max. hourly emissions based on 500 ppvd at 0% O2 on a 1-hr avg. basis, and annual avg. emissions based on 100 ppmvd at 0% O2 on a 365-day rolling avg. basis

(3) VOC assumed to be 2 * sum of volatile and semi-volatile HAPs

(4) Per Consent Decree SO_2 max. hourly emissions based on 50 ppmvd at 0% O_2 on a 7-day rolling avg. basis, and annual avg. emissions based on 25 ppmvd at 0% O_2 on a 365-day rolling avg. basis

(5) SAM based on 5% oxidation SO_2 to SAM

(6) Per NSPS Subpart J PM 2.0 lb/ton of coke burn-off in the catalyst regenerator

(7) $PM_{10\ is}$ 83% of PM plus 100% SAM; PM2.5 is 83% of PM plus 100% SAM for maximum hourly calculation and 58.6% of PM plus 100% SAM for annual average

Sample Calculation:

NOx = 55,000 dscf/min * 60 min/hr * 1/379 scf/lbmol * 87.3/10^6 * 46lb/lbmol = 34.9 lb/hr

NOx = 55,000 dscf/min * 60 min/hr * 1/379 scf/lbmol * 58.1/10^6 * 46lb/lbmol * 8,760 hr/yr * 1 ton/2,000 lb = 101.8 ton/yr

FCC REGEN POTENTIAL TO EMIT GHG

GHG emissions associated with FCC are based on the maximum reported rate between 2011 and 2015 increased by 100% to estimate the potential to emit.

	Fugitive GHG TOTAL (ton/yr)			GHG (as CO_2e) (ton/yr)
	CO_2	CH_4	N_2O	
Table A-1 to 40 CFR 98, subpart A, Global Warming Potentials	1	25	298	
FCC	430,013	12.6	2.5	431,077

FCC REGEN POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Hydrogen cyanide)	**92.1**	**ton/yr**
Total HAPs	**127.7**	**ton/yr**

CAS No.	Compound	Emissions Factor (lb/klb coke burn-off)(1)	Emissions Factor (lb/MMbbl)(1)	Emissions Factor (lb/MMbbl)(2)	Emissions (lb/hr)	Emissions (ton/yr)
Volatile Organics						
75-07-0	Acetaldehyde	0.0013	20	194.3	0.2	1.1
67-64-1	Acetone	1.60E-04	2.4	468.6	0.6	2.6
107-02-8	Acrolein	6.60E-05	1	617.1	0.8	3.4
71-43-2	Benzene	1.10E-03	18	582.9	0.7	3.2
74-83-9	Bromomethane	1.40E-04	2.1	0	0.004	0.02
106-99-0	1,3-Butadiene	2.00E-06	0.033	708.6	0.9	3.9
100-41-4	Ethylbenzene	1.60E-05	0.24	86.9	0.1	0.5
50-00-0	Formaldehyde	0.016	260	365.5	0.5	2.0
75-09-2	Methylene chloride	4.40E-04	6.7	1,485.7	1.9	8.1
108-95-2	Phenol	5.70E-04	8.7	971.2	1.2	5.3
108-88-3	Toluene	2.10E-04	3.5	1,156.0	1.4	6.3
75-69-4	Trichlorofluoromethane	1.60E-04	2.4	0.0	0.0	0.0
1330-20-7	Xylene	2.10E-04	3.2	86.9	0.1	0.5
Semivolatile and Nonvolatile Organics(excluding dioxin/furans)						
83-32-9	Acenaphthene	2.20E-07	0.0033	0.04	4.6E-05	2.0E-04
208-96-8	Acenaphthylene	7.80E-06	0.13	0	2.0E-04	8.5E-04
120-12-7	Anthracene	6.70E-06	0.1	0.1	1.7E-04	7.3E-04
56-55-3	Benzo(a)anthracene	3.80E-08	0.00052	0.2	1.9E-04	8.2E-04
50-32-8	Benzo(a)pyrene	7.10E-07	0.011	0.02	2.2E-05	9.8E-05
205-99-2	Benzo(b)fluoranthene	2.40E-07	0.0035	0.02	2.2E-05	9.8E-05
192-97-2	Benzo(e)pyrene	3.30E-08	0.00045	0.02	2.2E-05	9.8E-05
191-24-2	Benzo(g,h,i)perylene	3.10E-07	0.0046	0.02	2.2E-05	9.8E-05
207-08-9	Benzo(k)fluoranthene	1.80E-07	0.0026	0.02	2.2E-05	9.8E-05
218-01-9	Chrysene	2.30E-07	0.0033	0.1	1.8E-04	7.7E-04
53-70-3	Dibenz(a,h)anthracene	2.80E-07	0.0042	0.02	2.2E-05	9.8E-05
206-44-0	Fluoranthene	6.10E-06	0.093	0.3	3.2E-04	1.4E-03
86-73-7	Fluorene	2.40E-06	0.037	0.02	6.0E-05	2.6E-04
193-39-5	Indeno(1,2,3-cd)pyrene	3.00E-07	0.0044	0.02	2.2E-05	9.8E-05
91-57-6	2-Methylnaphthalene	1.80E-06	0.026	0.02	4.5E-05	2.0E-04
91-20-3	Naphthalene	7.00E-05	1	0.2	1.8E-03	7.7E-03
85-01-8	Phenanthrene	1.60E-05	0.24	0.4	4.7E-04	2.0E-03
129-00-0	Pyrene	2.20E-07	0.0031	0.8	9.7E-04	4.3E-03
Dioxins/Furans						
57117-31-4	Pentachlorodibenzofurans	3.20E-11	5.50E-07	9.03E-07	1.1E-09	4.9E-09
57117-44-9	Hexachlorodibenzofuran	6.30E-11	1.10E-06	9.03E-07	1.6E-09	6.9E-09
35822-46-9	Heptachlorodibenzo-p-dioxin	5.60E-11	9.40E-07	4.91E-07	1.4E-09	6.1E-09
Inorganics						
7664-41-7	Ammonia	0.57	13,000	1,576	16.3	71.2
75-15-0	Carbon disulfide	3.70E-05	0.56	243	0.3	1.3
7647-01-0	Hydrogen chloride	0.11	1,800	275	2.8	12.0
74-90-8	Hydrogen cyanide	0.43	7,000	16,814	21.0	92.1
7439-97-6	Mercury(3)	6.00E-06	0.094	0.2	0.0002	0.001

Notes

(1) Emissions factors for CCU controlled for organics in pounds per thousand pounds of coke burn-off. April 2015 Emissions Estimation Protocol for Petroleum Refineries, Version 3

(2) Emissions factors based on ICR reported FCCU data and NPRA capacities

(3) Total mercury emissions factor. Elemental mercury emissions are approximately 80 percent of total mercury emissions and divalent (oxidized plus particulate) mercury emissions are approximately 20 percent of total mercury emissions.

FLARES POTENTIAL TO EMIT

Molar Volume:	385.3	scf/lbmol (STP 68°F and 14.7 psia)	
NOx Factor:	0.068	lb/MMBtu (HHV)	per EPA AP-42, Table 13.5-1, dated Feb. 2018
	0.076	lb/MMBtu (LHV)	HHV/LHV ratio of 1.111
CO Factor:	0.31	lb/MMBtu (LHV)	per EPA AP-42, Table 13.5-2, dated Feb. 2018
Flare VOC Eff:	98.0%		

Emission Calculations for Proposed Permit 0195-M40 Emission Limits - Normal Operations [a]

Flare ID	FLOW	VOC	S	NO_X	CO	VOC	SO_2	H_2S
	MMBtu/hr (LHV)	lb/hr	lbmol/hr	lb/hr				
FL-400	45.91	1,301	0.06989	3.47	14.23	26.01	4.48	0.05
FL-401	22.01	986	0.89514	1.66	6.82	19.72	57.35	0.61
FL-402	107.39	4,909	1.53806	8.11	33.29	98.18	98.54	1.05
FL-403	36.30	1,627	0.01717	2.74	11.25	32.54	1.10	0.01
FL-404	154.87	8,025	0.62308	11.70	48.01	160.50	39.92	0.42
SUM OF PROPOSED EMISSION LIMITS:				**27.69**	**113.61**	**336.95**	**201.38**	**2.14**
SUM OF CURRENT EMISSION LIMITS:				18.25	83.17	97.00	101.34	0
PROPOSED INCREASE IN SUM OF EMISSION LIMITS:				**9.44**	**30.44**	**239.95**	**100.04**	**2.14**
				tpy				
FL-400	16.46	373.3	0.01397	5.45	22.35	32.70	3.92	0.04
FL-401	5.59	28.7	0.02096	1.85	7.58	2.51	5.88	0.06
FL-402	6.69	88.1	0.01990	2.21	9.08	7.72	5.58	0.06
FL-403	7.65	154.9	0.00270	2.53	10.38	13.57	0.76	0.01
FL-404	70.99	1139.9	0.03969	23.49	96.40	99.85	11.14	0.12
SUM OF PROPOSED EMISSION LIMITS:				**35.53**	**145.80**	**156.35**	**27.28**	**0.29**
SUM OF CURRENT EMISSION LIMITS:				27.74	126.46	99.26	22.27	0
PROPOSED INCREASE IN SUM OF EMISSION LIMITS:				**7.79**	**19.34**	**57.09**	**5.01**	**0.29**

Notes:

a. Emission limits are based on flare monitoring data for October 2020 through March 2021. Inputs used in calculations above (e.g., MMBtu/hr, uncontrolled VOC, sulfur input) are for representation purposes only. They are not proposed limits.

FLARES POTENTIAL TO EMIT GHG [a]

CO_2 Emission Factor	60	kg/MMBtu (HHV)	40 CFR §98.253(b)(1), default flare gas
CH_4 Emission Factor	1.00E-03	kg/MMBtu (HHV)	Table C-2 to Subpart C to Part 98, Natural Gas
N_2O Emission Factor	1.00E-04	kg/MMBtu (HHV)	Table C-2 to Subpart C to Part 98, Natural Gas
Metric tons to short tons	1.10231	short ton/metric ton	Table A-2 to Subpart C of Part 98
Weight Fraction of Carbon in Flare Gas (f_{CH4})	0.40	kg/kg	40 CFR §98.253(b)(1), default flare gas
HHV/LHV Ratio	1.111		

GHG GWP		
CO_2	CH_4	N_2O
1	25	298

Potential to Emit:

Flare ID	FLOW (MMBtu/hr) (LHV)	CO_2	CH_4	N_2O	CO_2e
		TPY			
FL-400	16.461	10,384	31.0	0.02	11,164
FL-401	5.585	3,523	10.5	0.01	3,788
FL-402	6.690	4,220	12.6	0.01	4,537
FL-403	7.648	4,824	14.4	0.01	5,187
FL-404	70.994	44,784	133.7	0.1	48,148
				PROPOSED TOTAL:	72,824

Notes:

(1) GHG emissions conservatively calculated using 40 CFR Part 98, Subpart Y, Equation Y-2:

Eq. Y-2

$$CO_2 = 0.98 \times 0.001 \times \sum_{p=1}^{n} Flare_p \times HHV_p \times EF_{CO2}$$

Eq. Y-4

$$CH_4 = \left(CO_2 \times \frac{EF_{CH_4}}{EF_{CO_2}}\right) + \left(CO_2 \times \frac{0.02}{0.98} \times \frac{16}{44} \times f_{CH_4}\right)$$

Eq. Y-5

$$N_2O = CO_2 \times \frac{EF_{N_2O}}{EF_{CO_2}}$$

Where

$Flare_p$: volume of flare gas combusted (scf)

HHVp: Higher heating value for the flare gas combusted during measurement period (Btu/scf)

EF_{CO2}: default CO2 emissionf actor for flare gas:

EF_{CH4}: default emission factor for fuel gas for CH4, per Table C-2 to Part 98:

EF_{N2O}: default emission factor for fuel gas for N2O, per Table C-2 to Part 98:

f_{CH4}: weight fraction of carbon in the flare gas, monitored or default 0.4 $kg_{CCH4}/kg_{Cflaregas}$

ENGINES POTENTIAL TO EMIT

Engine	Description	HP	Operating Hours	BSFC (Btu/hp-hr)	Emission Factors, g/hp-hr					Potential to Emit										Emission Factors
										NO_X		CO		VOC		SO_2		$PM/PM_{10}/PM_{2.5}$		
					NO_X	CO	VOC	SO_2	$PM/PM_{10}/PM_{2.5}$	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	
MG-0001	Portable Air Compressor	280	8760	8,000	3.0	2.6	3.0	15 ppm	0.15	1.84	8.06	1.61	7.06	1.84	8.06	0.003	0.015	0.09	0.40	Note 1
MG-0002	Portable Air Compressor	280	8760	8,000	3.0	2.6	3.0	15 ppm	0.15	1.84	8.06	1.61	7.06	1.84	8.06	0.003	0.015	0.09	0.40	Note 1
MG-0003	Portable Air Compressor	138	8760	8,000	0.3	3.7	0.14	15 ppm	0.015	0.09	0.40	1.13	4.97	0.04	0.19	0.002	0.008	4.5E-03	0.02	Note 2
MG-0004	Portable Fire Water Pump Engine	700	100	8,000	3.0	2.6	3.0	15 ppm	0.15	4.60	0.23	4.03	0.20	4.60	0.23	0.009	0.000	0.23	0.01	Note 1
SG-0100	UPS backup generator (exempt*)	52	500	8,000	14.1	3.0	1.1	15 ppm	1.0	1.61	0.40	0.35	0.09	0.13	0.03	0.001	0.0002	0.11	0.03	Note 4
SG-0101	UPS backup generator (exempt*)	54	500	8,000	14.1	3.0	1.1	15 ppm	1.0	1.67	0.42	0.36	0.09	0.14	0.03	0.001	0.0002	0.12	0.03	Note 4
SG-0102	Server Backup Generator (exempt*)	99.23	500	8,000	0.3	3.7	0.14	15 ppm	0.015	0.07	0.02	0.82	0.20	0.03	0.01	0.001	0.0003	0.003	0.001	Note 2
FWG-0600	Fire Water Pump Engine	376	100	8,000	3.0	2.6	3.0	15 ppm	0.15	2.49	0.12	2.16	0.11	2.49	0.12	0.005	0.0002	0.12	0.01	Note 3
FWG-0601	Fire Water Pump Engine	376	100	8,000	3.0	2.6	3.0	15 ppm	0.15	2.49	0.12	2.16	0.11	2.49	0.12	0.005	0.0002	0.12	0.01	Note 3
FWG-0602	Fire Water Pump Engine	376	100	8,000	3.0	2.6	3.0	15 ppm	0.15	2.49	0.12	2.16	0.11	2.49	0.12	0.005	0.0002	0.12	0.01	Note 3
FWG-0603	Fire Water Pump Engine	305	100	8,000	3.0	2.6	3.0	15 ppm	0.15	2.02	0.10	1.75	0.09	2.02	0.10	0.004	0.0002	0.10	0.01	Note 3

Notes:

1. NSPS IIII, 40 CFR §89.112, Table 1
2. NSPS IIII, 40 CFR §1039.101 Table 1
3. NSPS IIII Table 4
4. AP-42 Table 3.3-1
5. SO2 based on fuel sulfur content

* Standby generator engines satisfy the exempt equipment criteria at 20.2.72.202.B(3) NMAC. According to the application instructions, exempt engines shall be listed in Table 2-B rather than Table 2-A.
Based on informal guidance received from NMED AQB, Navajo is listing the engines in Table 2-A.

Sample calculation for MG-0001:

NOx (lb/hr) = Emissions Factor (g/hp-hr) * Engine Rating (hp) * 1 lb/453.6 g = 3.0 g/hp-hr * 280 hp * 1 lb/453.6 g = 1.84 lb/hr
NOx (ton/yr) = NOx (lb/hr) * Operating Hours (hr/yr) * 1 ton/2,000 lb = 1.841 lb/hr * 8,760 hr/yr * 1 ton/2,000 lb = 8.06 ton/yr

ENGINES POTENTIAL TO EMIT GHG

					CO_2	CH_4	N_2O	GHG (as CO_2e)
Tables C-1 and C-2 to 40 CFR 98, subpart C, Distillate Fuel Oil No. 2 Emission Factor lb/mmBtu					163.05	0.007	0.001	
Tables C-1 and C-2 to 40 CFR 98, subpart C, Natural Gas Emission Factor lb/mmBtu					116.98	0.002	0.0002	
Table A-1 to 40 CFR 98, subpart A, Global Warming Potentials					1	25	298	
Engine	**Description**	**HP**	**Operating Hours**	**BSFC (Btu/hp-hr)**	**ton/yr**	**ton/yr**	**ton/yr**	**ton/yr**
MG-0001	Portable Air Compressor	280	8760	8,000	1,600	0.06	0.01	1,605
MG-0002	Portable Air Compressor	280	8760	8,000	1,600	0.06	0.01	1,605
MG-0003	Portable Air Compressor	138	8760	8,000	788	0.03	0.01	791
SG-0100	UPS backup generator (exempt*)	52	500	8,000	17	0.001	0.0001	17.0
SG-0101	UPS backup generator (exempt*)	54	500	8,000	18	0.001	0.0001	17.7
SG-0102	Server Backup Generator (exempt*)	99.23	500	8,000	32	0.001	0.0003	32.5
FWG-0600	Fire Water Pump Engine	376	100	8,000	25	0.001	0.0002	24.6
FWG-0601	Fire Water Pump Engine	376	100	8,000	25	0.001	0.0002	24.6
FWG-0602	Fire Water Pump Engine	376	100	8,000	25	0.001	0.0002	24.6
FWG-0603	Fire Water Pump Engine	305	100	8,000	20	0.001	0.0002	20.0
MG-0004	Portable Fire Water Pump Engine	700	100	8,000	46	0.002	0.0004	45.8
				TOTAL:	**4,194**	**0.2**	**0.03**	**4,208**

ENGINES POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Formaldehyde)	**0.03**	**ton/yr**
Total HAPs	**0.10**	**ton/yr**

					Benzene		Toluene		Xylenes		Acenaphthene		Acenaphthylene		Acetaldehyde		Acrolein	
				CAS No.	71-43-2		108-88-3		1330-20-7		83-32-9		208-96-8		75-07-0		107-02-8	
				AP-42, Ch. 3.3 (10/96), Table 3.3-2 HAPs for Diesel Engines Emission Factor lb/mmBtu	9.33E-04		4.09E-04		2.85E-04		<1.42E-06		<5.06E-06		7.67E-04		<9.25E-05	
				AP-42, Ch. 3.2 (7/00), Table 3.2-2. Uncontrolled Emission Factors for 4SLB Engines lb/mmBtu	4.40E-04		4.08E-04		1.84E-04		-		-		8.36E-03		5.14E-03	
Engine	**Description**	**HP**	**BSFC (Btu/hp-hr)**	**Operating Hours**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
MG-0001	Portable Air Compressor	280	8,000	8760	2.1E-03	9.2E-03	9.2E-04	4.0E-03	6.4E-04	2.8E-03	3.2E-06	1.4E-05	1.1E-05	5.0E-05	1.7E-03	7.5E-03	2.1E-04	9.1E-04
MG-0002	Portable Air Compressor	280	8,000	8760	2.1E-03	9.2E-03	9.2E-04	4.0E-03	6.4E-04	2.8E-03	3.2E-06	1.4E-05	1.1E-05	5.0E-05	1.7E-03	7.5E-03	2.1E-04	9.1E-04
MG-0003	Portable Air Compressor	138	8,000	8760	1.0E-03	4.5E-03	4.5E-04	2.0E-03	3.1E-04	1.4E-03	1.6E-06	6.9E-06	5.6E-06	2.4E-05	8.5E-04	3.7E-03	1.0E-04	4.5E-04
MG-0004	Portable Fire Water Pump E	700	8,000	100	5.2E-03	2.6E-04	2.3E-03	1.1E-04	1.6E-03	8.0E-05	8.0E-06	4.0E-07	2.8E-05	1.4E-06	4.3E-03	2.1E-04	5.2E-04	2.6E-05
SG-0100	UPS backup generator (exer	52	8,000	500	3.9E-04	9.7E-05	1.7E-04	4.3E-05	1.2E-04	3.0E-05	5.9E-07	1.5E-07	2.1E-06	5.3E-07	3.2E-04	8.0E-05	3.8E-05	9.6E-06
SG-0101	UPS backup generator (exer	54	8,000	500	4.0E-04	1.0E-04	1.8E-04	4.4E-05	1.2E-04	3.1E-05	6.1E-07	1.5E-07	2.2E-06	5.5E-07	3.3E-04	8.3E-05	4.0E-05	1.0E-05
SG-0102	Server Backup Generator (e	99.23	8,000	500	7.4E-04	1.9E-04	3.2E-04	8.1E-05	2.3E-04	5.7E-05	1.1E-06	2.8E-07	4.0E-06	1.0E-06	6.1E-04	1.5E-04	7.3E-05	1.8E-05
FWG-0600	Fire Water Pump Engine	376	8,000	100	2.8E-03	1.4E-04	1.2E-03	6.2E-05	8.6E-04	4.3E-05	4.3E-06	2.1E-07	1.5E-05	7.6E-07	2.3E-03	1.2E-04	2.8E-04	1.4E-05
FWG-0601	Fire Water Pump Engine	376	8,000	100	2.8E-03	1.4E-04	1.2E-03	6.2E-05	8.6E-04	4.3E-05	4.3E-06	2.1E-07	1.5E-05	7.6E-07	2.3E-03	1.2E-04	2.8E-04	1.4E-05
FWG-0602	Fire Water Pump Engine	376	8,000	100	2.8E-03	1.4E-04	1.2E-03	6.2E-05	8.6E-04	4.3E-05	4.3E-06	2.1E-07	1.5E-05	7.6E-07	2.3E-03	1.2E-04	2.8E-04	1.4E-05
FWG-0603	Fire Water Pump Engine	305	8,000	100	2.3E-03	1.1E-04	1.0E-03	5.0E-05	7.0E-04	3.5E-05	3.5E-06	1.7E-07	1.2E-05	6.2E-07	1.9E-03	9.4E-05	2.3E-04	1.1E-05
				TOTAL:		**0.02**		**0.01**		**0.01**		**3.65E-05**		**1.30E-04**		**0.02**		**0.002**

<u>Sample calculation for MG-0001:</u>

Benzene (lb/hr) = Emissions Factor (lb/mmBtu) * Engine Rating (hp) * 8,000 Btu/hp-hr * 1mmBtu/10^6 Btu = 0.000933 lb/mmBtu * 280 hp * 8,000 Btu/hp-hr * 1mmBtu/10^6 Btu = 0.002 lb/hr

Benzene (ton/yr) = Benzene (lb/hr) * Operating Hours (hr/yr) * 1 ton/2,000 lb = 0.002 lb/hr * 8,760 hr/yr * 1 ton/2,000 lb = 0.009 ton/yr

ENGINES POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Formaldehyde)	**0.03**	**ton/yr**
Total HAPs	**0.10**	**ton/yr**

					Anthracene		**Benzo(a)anthracene**		**Benzo(b)fluoranthene**		**Benzo(k)fluoranthene**		**Benzo(a)pyrene**		**Benzo(g,h,i)perylene**		**1,3-Butadiene**	
CAS No.					120-12-7		56-55-3		205-99-2		207-08-9		50-32-8		191-24-2		106-99-0	
AP-42, Ch. 3.3 (10/96), Table 3.3-2 HAPs for Diesel Engines Emission Factor lb/mmBtu					1.87E-06		1.68E-06		<9.91E-08		<1.55E-07		<1.88E-07		<4.89E-07		<3.91E-05	
AP-42, Ch. 3.2 (7/00), Table 3.2-2. Uncontrolled Emission Factors for 4SLB Engines lb/mmBtu					-		-		1.66E-07		-		-		4.14E-07		2.67E-04	
Engine	**Description**	**HP**	**BSFC (Btu/hp-hr)**	**Operating Hours**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
MG-0001	Portable Air Compressor	280	8,000	8760	4.2E-06	1.8E-05	3.8E-06	1.6E-05	2.2E-07	9.7E-07	3.5E-07	1.5E-06	4.2E-07	1.8E-06	1.1E-06	4.8E-06	8.8E-05	3.8E-04
MG-0002	Portable Air Compressor	280	8,000	8760	4.2E-06	1.8E-05	3.8E-06	1.6E-05	2.2E-07	9.7E-07	3.5E-07	1.5E-06	4.2E-07	1.8E-06	1.1E-06	4.8E-06	8.8E-05	3.8E-04
MG-0003	Portable Air Compressor	138	8,000	8760	2.1E-06	9.0E-06	1.9E-06	8.1E-06	1.1E-07	4.8E-07	1.7E-07	7.5E-07	2.1E-07	9.1E-07	5.4E-07	2.4E-06	4.3E-05	1.9E-04
MG-0004	Portable Fire Water Pump E	700	8,000	100	1.0E-05	5.2E-07	9.4E-06	4.7E-07	5.5E-07	2.8E-08	8.7E-07	4.3E-08	1.1E-06	5.3E-08	2.7E-06	1.4E-07	2.2E-04	1.1E-05
SG-0100	UPS backup generator (exer	52	8,000	500	7.8E-07	1.9E-07	7.0E-07	1.7E-07	4.1E-08	1.0E-08	6.4E-08	1.6E-08	7.8E-08	2.0E-08	2.0E-07	5.1E-08	1.6E-05	4.1E-06
SG-0101	UPS backup generator (exer	54	8,000	500	8.1E-07	2.0E-07	7.3E-07	1.8E-07	4.3E-08	1.1E-08	6.7E-08	1.7E-08	8.1E-08	2.0E-08	2.1E-07	5.3E-08	1.7E-05	4.2E-06
SG-0102	Server Backup Generator (e	99.23	8,000	500	1.5E-06	3.7E-07	1.3E-06	3.3E-07	7.9E-08	2.0E-08	1.2E-07	3.1E-08	1.5E-07	3.7E-08	3.9E-07	9.7E-08	3.1E-05	7.8E-06
FWG-0600	Fire Water Pump Engine	376	8,000	100	5.6E-06	2.8E-07	5.1E-06	2.5E-07	3.0E-07	1.5E-08	4.7E-07	2.3E-08	5.7E-07	2.8E-08	1.5E-06	7.4E-08	1.2E-04	5.9E-06
FWG-0601	Fire Water Pump Engine	376	8,000	100	5.6E-06	2.8E-07	5.1E-06	2.5E-07	3.0E-07	1.5E-08	4.7E-07	2.3E-08	5.7E-07	2.8E-08	1.5E-06	7.4E-08	1.2E-04	5.9E-06
FWG-0602	Fire Water Pump Engine	376	8,000	100	5.6E-06	2.8E-07	5.1E-06	2.5E-07	3.0E-07	1.5E-08	4.7E-07	2.3E-08	5.7E-07	2.8E-08	1.5E-06	7.4E-08	1.2E-04	5.9E-06
FWG-0603	Fire Water Pump Engine	305	8,000	100	4.6E-06	2.3E-07	4.1E-06	2.0E-07	2.4E-07	1.2E-08	3.8E-07	1.9E-08	4.6E-07	2.3E-08	1.2E-06	6.0E-08	9.5E-05	4.8E-06
				TOTAL:		**4.81E-05**		**4.32E-05**		**2.55E-06**		**3.99E-06**		**4.84E-06**		**1.26E-05**		**1.01E-03**

Sample calculation for MG-0001:

Benzene (lb/hr) = Emissions Factor (lb/mmBtu) * Engine Rating (hp) * 8,000 Btu/hp-hr

Benzene (ton/yr) = Benzene (lb/hr) * Operating Hours (hr/yr) * 1 ton/2,000 lb = 0.002 l

ENGINES POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Formaldehyde)	**0.03**	**ton/yr**
Total HAPs	**0.10**	**ton/yr**

					Chrysene		**Dibenz(a,h)anthracene**		**Fluoranthene**		**Fluorene**		**Formaldehyde**		**Indeno(1,2,3-cd)pyrene**		**Naphthalene**	
				CAS No.	218-01-9		53-70-3		206-44-0		86-73-7		50-00-0		193-39-5		91-20-3	
				AP-42, Ch. 3.3 (10/96), Table 3.3-2 HAPs for Diesel Engines Emission Factor lb/mmBtu	3.53E-07		<5.83E-07		7.61E-06		2.92E-05		1.18E-03		<3.75E-07		8.48E-05	
				AP-42, Ch. 3.2 (7/00), Table 3.2-2. Uncontrolled Emission Factors for 4SLB Engines lb/mmBtu	6.93E-07		-		1.11E-06		5.67E-06		5.28E-02		-		7.44E-05	
Engine	**Description**	**HP**	**BSFC (Btu/hp-hr)**	**Operating Hours**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
MG-0001	Portable Air Compressor	280	8,000	8760	7.9E-07	3.5E-06	1.3E-06	5.7E-06	1.7E-05	7.5E-05	6.5E-05	2.9E-04	2.6E-03	1.2E-02	8.4E-07	3.7E-06	1.9E-04	8.3E-04
MG-0002	Portable Air Compressor	280	8,000	8760	7.9E-07	3.5E-06	1.3E-06	5.7E-06	1.7E-05	7.5E-05	6.5E-05	2.9E-04	2.6E-03	1.2E-02	8.4E-07	3.7E-06	1.9E-04	8.3E-04
MG-0003	Portable Air Compressor	138	8,000	8760	3.9E-07	1.7E-06	6.4E-07	2.8E-06	8.4E-06	3.7E-05	3.2E-05	1.4E-04	1.3E-03	5.7E-03	4.1E-07	1.8E-06	9.4E-05	4.1E-04
MG-0004	Portable Fire Water Pump E	700	8,000	100	2.0E-06	9.9E-08	3.3E-06	1.6E-07	4.3E-05	2.1E-06	1.6E-04	8.2E-06	6.6E-03	3.3E-04	2.1E-06	1.1E-07	4.7E-04	2.4E-05
SG-0100	UPS backup generator (exer	52	8,000	500	1.5E-07	3.7E-08	2.4E-07	6.1E-08	3.2E-06	7.9E-07	1.2E-05	3.0E-06	4.9E-04	1.2E-04	1.6E-07	3.9E-08	3.5E-05	8.8E-06
SG-0101	UPS backup generator (exer	54	8,000	500	1.5E-07	3.8E-08	2.5E-07	6.3E-08	3.3E-06	8.2E-07	1.3E-05	3.2E-06	5.1E-04	1.3E-04	1.6E-07	4.1E-08	3.7E-05	9.2E-06
SG-0102	Server Backup Generator (e	99.23	8,000	500	2.8E-07	7.0E-08	4.6E-07	1.2E-07	6.0E-06	1.5E-06	2.3E-05	5.8E-06	9.4E-04	2.3E-04	3.0E-07	7.4E-08	6.7E-05	1.7E-05
FWG-0600	Fire Water Pump Engine	376	8,000	100	1.1E-06	5.3E-08	1.8E-06	8.8E-08	2.3E-05	1.1E-06	8.8E-05	4.4E-06	3.5E-03	1.8E-04	1.1E-06	5.6E-08	2.6E-04	1.3E-05
FWG-0601	Fire Water Pump Engine	376	8,000	100	1.1E-06	5.3E-08	1.8E-06	8.8E-08	2.3E-05	1.1E-06	8.8E-05	4.4E-06	3.5E-03	1.8E-04	1.1E-06	5.6E-08	2.6E-04	1.3E-05
FWG-0602	Fire Water Pump Engine	376	8,000	100	1.1E-06	5.3E-08	1.8E-06	8.8E-08	2.3E-05	1.1E-06	8.8E-05	4.4E-06	3.5E-03	1.8E-04	1.1E-06	5.6E-08	2.6E-04	1.3E-05
FWG-0603	Fire Water Pump Engine	305	8,000	100	8.6E-07	4.3E-08	1.4E-06	7.1E-08	1.9E-05	9.3E-07	7.1E-05	3.6E-06	2.9E-03	1.4E-04	9.2E-07	4.6E-08	2.1E-04	1.0E-05
				TOTAL:		**9.08E-06**		**1.50E-05**		**1.96E-04**		**0.001**		**0.03**		**9.65E-06**		**0.002**

<u>Sample calculation for MG-0001:</u>

Benzene (lb/hr) = Emissions Factor (lb/mmBtu) * Engine Rating (hp) * 8,000 Btu/hp-hr

Benzene (ton/yr) = Benzene (lb/hr) * Operating Hours (hr/yr) * 1 ton/2,000 lb = 0.002 l

ENGINES POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (Formaldehyde) 0.03 ton/yr

Total HAPs 0.10 ton/yr

					Phenanthrene		Pyrene		TOTAL PAH	
				CAS No.	85-01-8		129-00-0		PAH	
				AP-42, Ch. 3.3 (10/96), Table 3.3-2 HAPs for Diesel Engines Emission Factor lb/mmBtu	2.94E-05		4.78E-06		1.68E-04	
				AP-42, Ch. 3.2 (7/00), Table 3.2-2. Uncontrolled Emission Factors for 4SLB Engines lb/mmBtu	1.04E-05		-		2.69E-05	
Engine	**Description**	**HP**	**BSFC (Btu/hp-hr)**	**Operating Hours**	**lb/hr**	**tpy**	**lb/hr**	**tpy**	**lb/hr**	**tpy**
MG-0001	Portable Air Compressor	280	8,000	8760	6.6E-05	2.9E-04	1.1E-05	4.7E-05	3.8E-04	1.6E-03
MG-0002	Portable Air Compressor	280	8,000	8760	6.6E-05	2.9E-04	1.1E-05	4.7E-05	3.8E-04	1.6E-03
MG-0003	Portable Air Compressor	138	8,000	8760	3.2E-05	1.4E-04	5.3E-06	2.3E-05	1.9E-04	8.1E-04
MG-0004	Portable Fire Water Pump E	700	8,000	100	1.6E-04	8.2E-06	2.7E-05	1.3E-06	9.4E-04	4.7E-05
SG-0100	UPS backup generator (exer	52	8,000	500	1.2E-05	3.1E-06	2.0E-06	5.0E-07	7.0E-05	1.7E-05
SG-0101	UPS backup generator (exer	54	8,000	500	1.3E-05	3.2E-06	2.1E-06	5.2E-07	7.3E-05	1.8E-05
SG-0102	Server Backup Generator (e	99.23	8,000	500	2.3E-05	5.8E-06	3.8E-06	9.5E-07	1.3E-04	3.3E-05
FWG-0600	Fire Water Pump Engine	376	8,000	100	8.8E-05	4.4E-06	1.4E-05	7.2E-07	5.1E-04	2.5E-05
FWG-0601	Fire Water Pump Engine	376	8,000	100	8.8E-05	4.4E-06	1.4E-05	7.2E-07	5.1E-04	2.5E-05
FWG-0602	Fire Water Pump Engine	376	8,000	100	8.8E-05	4.4E-06	1.4E-05	7.2E-07	5.1E-04	2.5E-05
FWG-0603	Fire Water Pump Engine	305	8,000	100	7.2E-05	3.6E-06	1.2E-05	5.8E-07	4.1E-04	2.0E-05
				TOTAL:		**7.56E-04**		**1.23E-04**		**0.004**

<u>Sample calculation for MG-0001:</u>

Benzene (lb/hr) = Emissions Factor (lb/mmBtu) * Engine Rating (hp) * 8,000 Btu/hp-hr

Benzene (ton/yr) = Benzene (lb/hr) * Operating Hours (hr/yr) * 1 ton/2,000 lb = 0.002 l

COOLING TOWERS POTENTIAL TO EMIT

Cooling Tower	Description	Water Circulation Rate (gpm)	Annual Circulation Rate (MMgal/yr)	Annual Hours of Operation (hr/yr)	TDS (ppmw)(1)	Drift Eliminator Efficiency (% drift)	VOC Controlled (LDAR)?	VOC Emission Factor (lb/MMgal) (3)	Potential to Emit							
									PM(4)		PM_{10} (5)		$PM_{2.5}$ (5)		VOC	VOC
									lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Y-0001	TCC Cooling Tower	5,000	2,628	8760	3,500	0.003	Yes	0.7	0.26	1.15	0.158	0.69	0.0006	0.00260	0.21	0.92
Y-0002	S. Alky Cooling Tower (Marley Cooling Tower)	5,000	2,628	8760	3,500	0.003	Yes	0.7	0.26	1.15	0.16	0.69	0.001	0.00	0.21	0.92
Y-0008	North Alky Cooling Tower	12,500	6,570	8760	3,500	0.003	Yes	0.7	0.61	2.68	0.37	1.62	0.0014	0.006	0.53	2.30
Y-0011	FCC & NP Cooling Tower	30,000	15,768	8760	3,500	0.001	Yes	0.7	0.53	2.30	0.32	1.38	0.0012	0.005	1.26	5.52
Y-0012	Hydrogen Plants Cooling Tower	10,000	5,256	8760	3,500	0.001	Yes	0.7	0.18	0.77	0.11	0.46	0.0004	0.0017	0.42	1.84
CT TT-0006	Unit 07 Amine W-0745 Cooling Tower	3,000	1,576.8	8760	3,500	0.003	No	6	0.16	0.69	0.095	0.42	0.00036	0.0016	1.08	4.73
									2.00	**8.75**	**1.20**	**5.26**	**0.005**	**0.02**	**3.71**	**16.23**

Notes:

(1) Total dissolved solids (TDS) is based on cooling water sampling data.

(2) VOC emission factors are from AP-42 Table 5.1-3 (dated 4/15).

(3) PM emissions are calculated per AP-42 Section 13.4, dated January 1995.

(4) $PM_{2.5}$ and PM_{10} emissions are calculated in accordance with NMED's Technical Memorandum "Calculating TSP, PM-10 and PM-2.5 from Cooling Towers" dated 9/9/2013.

For a TDS of 3,5000 ppmw and per the size distribution table in the memorandum (average between 3,000 ppmw and 4,000 ppmw), the percents mass of total particulate emissions represented by PM2.5 and PM10 are as follows:

% Mass PM_{10} = 60.161

% Mass $PM_{2.5}$ = 0.226

Sample Calculations (CT Y-0001):

VOC = 5,000 gal/min * 60 min/hr * 1 lb/MMgal * 1 MMgal/10^6 gal = 0.21 lb/hr

PM = 5,000 galH2O/min * 60 min/hr * 8.34 lbH2O/galH2O * 3,500 lbTDS/ 10^6 lbH2O * 0.003 /100 = 0.26 lb/hr

PM10 = 0.26 lb/hr * 60.161 /100 = 0.16 lb/hr

PM2.5 = 0.26 lb/hr * 0.226 /100 = 0.0006 lb/hr

COOLING TOWERS POTENTIAL TO EMIT HAPs

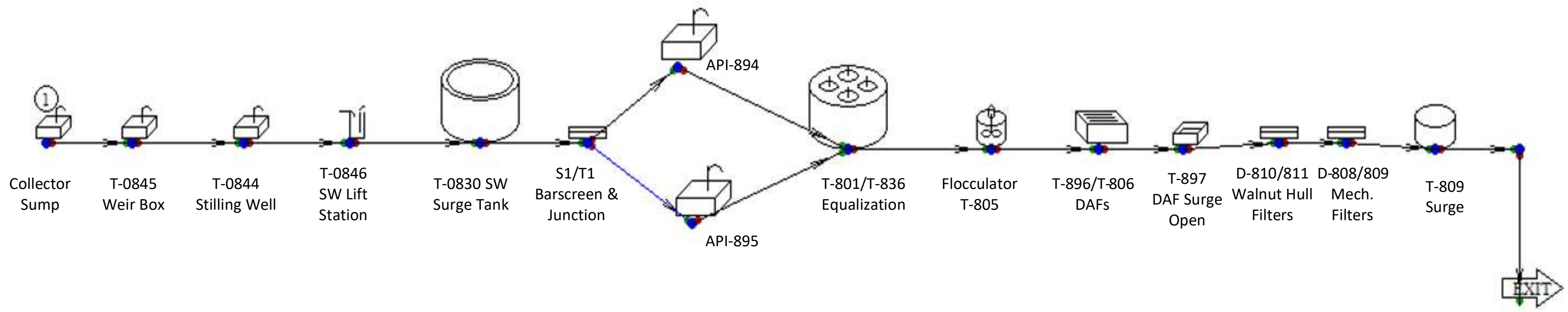
Maximum Individual HAPs (n-Hexane) 0.68 ton/yr
Total HAPs 1.04 ton/yr

		1,3-Butadiene		2,2,4-Trimethylpentane		Arsenic		Benzene		Cadmium		Chromium		Cumene		Ethylbenzene	
		106-99-0		540-84-1		7440-38-2		71-43-2		7440-43-9		7440-47-3		98-82-8		100-41-4	
API 4723A wt%	Hydrodesulfurization - Naphtha	0.36		0.05		4.87E-06		0.77		2.4E-07		3.0E-07		0.05		0.10	
Cooling Tower	**Description**	**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**
Y-0001	TCC Cooling Tower	7.6E-04	3.3E-03	1.1E-04	4.9E-04	1.0E-08	4.5E-08	1.6E-03	7.1E-03	5.0E-10	2.2E-09	6.3E-10	2.8E-09	1.0E-04	4.5E-04	2.2E-04	9.5E-04
Y-0002	S. Alky Cooling Tower (Marley Cooling Tower)	7.6E-04	3.3E-03	1.1E-04	4.9E-04	1.0E-08	4.5E-08	1.6E-03	7.1E-03	5.0E-10	2.2E-09	6.3E-10	2.8E-09	1.0E-04	4.5E-04	2.2E-04	9.5E-04
Y-0008	North Alky Cooling Tower	1.9E-03	8.4E-03	2.8E-04	1.2E-03	2.6E-08	1.1E-07	4.0E-03	1.8E-02	1.2E-09	5.4E-09	1.6E-09	6.9E-09	2.6E-04	1.1E-03	5.4E-04	2.4E-03
Y-0011	FCC & NP Cooling Tower	4.6E-03	2.0E-02	6.7E-04	2.9E-03	6.1E-08	2.7E-07	9.7E-03	4.2E-02	3.0E-09	1.3E-08	3.8E-09	1.7E-08	6.2E-04	2.7E-03	1.3E-03	5.7E-03
Y-0012	Hydrogen Plants Cooling Tower	1.5E-03	6.7E-03	2.2E-04	9.8E-04	2.0E-08	9.0E-08	3.2E-03	1.4E-02	9.9E-10	4.3E-09	1.3E-09	5.6E-09	2.1E-04	9.1E-04	4.3E-04	1.9E-03
CT TT-0006	Unit 07 Amine W-0745 Cooling Tower	3.9E-03	1.7E-02	5.7E-04	2.5E-03	5.3E-08	2.3E-07	8.3E-03	3.6E-02	2.5E-09	1.1E-08	3.3E-09	1.4E-08	5.3E-04	2.3E-03	1.1E-03	4.9E-03
	TOTAL		**0.06**		**0.01**		**7.9E-07**		**0.12**		**3.8E-08**		**4.9E-08**		**0.01**		**0.02**

COOLING TOWERS POTENTIAL TO EMIT HAPs

		Lead compounds		m-Xylene		Naphthalene		n-Hexane		Nickel		o-Xylene		p-Xylene		Toluene		Xylene (mixed isomers)	
		7439-92-1		108-38-3		91-20-3		110-54-3		7440-02-0		95-47-6		106-42-3		108-88-3		1330-20-7	
API 4723A wt%	Hydrodesulfurization - Naphtha	4.3E-07		0.33		0.02		4.21		2.0E-06		0.12		0.13		0.29		0.02	
Cooling Tower	**Description**	**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**
Y-0001	TCC Cooling Tower	9.1E-10	4.0E-09	6.9E-04	3.0E-03	3.2E-05	1.4E-04	8.8E-03	3.9E-02	4.2E-09	1.9E-08	2.4E-04	1.1E-03	2.8E-04	1.2E-03	6.0E-04	2.6E-03	3.5E-05	1.5E-04
Y-0002	S. Alky Cooling Tower (Marley Cooling Tower)	9.1E-10	4.0E-09	6.9E-04	3.0E-03	3.2E-05	1.4E-04	8.8E-03	3.9E-02	4.2E-09	1.9E-08	2.4E-04	1.1E-03	2.8E-04	1.2E-03	6.0E-04	2.6E-03	3.5E-05	1.5E-04
Y-0008	North Alky Cooling Tower	2.3E-09	1.0E-08	1.7E-03	7.5E-03	8.0E-05	3.5E-04	2.2E-02	9.7E-02	1.1E-08	4.6E-08	6.1E-04	2.7E-03	6.9E-04	3.0E-03	1.5E-03	6.6E-03	8.8E-05	3.9E-04
Y-0011	FCC & NP Cooling Tower	5.5E-09	2.4E-08	4.1E-03	1.8E-02	1.9E-04	8.4E-04	5.3E-02	2.3E-01	2.5E-08	1.1E-07	1.5E-03	6.4E-03	1.7E-03	7.3E-03	3.6E-03	1.6E-02	2.1E-04	9.3E-04
Y-0012	Hydrogen Plants Cooling Tower	1.8E-09	8.0E-09	1.4E-03	6.0E-03	6.4E-05	2.8E-04	1.8E-02	7.7E-02	8.5E-09	3.7E-08	4.9E-04	2.1E-03	5.5E-04	2.4E-03	1.2E-03	5.2E-03	7.1E-05	3.1E-04
CT TT-0006	Unit 07 Amine W-0745 Cooling Tower	4.7E-09	2.1E-08	3.5E-03	1.5E-02	1.6E-04	7.2E-04	4.5E-02	2.0E-01	2.2E-08	9.6E-08	1.3E-03	5.5E-03	1.4E-03	6.2E-03	3.1E-03	1.3E-02	1.8E-04	7.9E-04
	TOTAL		**7.0E-08**		**0.05**		**0.002**		**0.68**		**3.3E-07**		**0.02**		**0.02**		**0.05**		**0.003**

WASTEWATER SYSTEM POTENTIAL TO EMIT



NAVAJO REFINERY WASTEWATER PLANT LAYOUT

Wastewater System Characteristics		
Design Flow (gpm)	1,200	
Wastewater composition (ppm)		
Benzene	5.00	ToxChem Model
Ethylbenzene	3.10	ToxChem Model
Toluene	8.50	ToxChem Model
Xylene	7.10	ToxChem Model
Acetone	7.50	Sampling Data * 3
Carbon Disulfide	3.03	Sampling Data * 3
Methylene chloride	0.321	Sampling Data * 3
Naphthalene	1.341	Sampling Data * 3
1,3,5-Trimethylbenzene	2.913	Sampling Data * 3
n-Butylbenzene	1.143	Sampling Data * 3
Isopropylbenzene (Cumene)	0.15	Sampling Data * 3
1,2-Dichloroethene	0.423	Sampling Data * 3
Formaldehyde	100.5	Sampling Data * 3
n-Propylbenzene	0.6	Sampling Data * 3
sec-Butylbenzene	0.132	Sampling Data * 3

* Formaldehyde reacts in basic environments (in the presence of NaOH) to create equal molar amounts of sodium formate and methanol. pH is expected to be basic, thus Water9 modeled methanol at 100.5 ppmw

Water9 Output Summary Results by Unit

Units	Control	VOC Emissions		
		g/s	(lb/hr)	(ton/yr)
Collector Sump	95%	2.31E-03	1.84E-02	8.05E-02
T-0845 Weir Box				
T-0844 Stilling Well				
T-0846 Stormwater Lift Station (SWLS)				
T-0830 SW Surge Tank	-	6.91E-05	5.49E-04	2.40E-03
S1/T1 Barscreen & Junction Box	95%	1.73E-05	1.37E-04	6.02E-04
API T-894				
API T-895				
T-801/T-836 Equalization	-	1.68E-01	1.34	5.85
T-805 Flocculator	-	2.65E-04	2.11E-03	9.23E-03
T-896/T-806 DAF	-	2.06E-01	1.64	7.18
T-897 DAF Surge Open Sump	-	6.75E-04	5.36E-03	2.35E-02
D-810/811 Walnut Hull Filters	-	0.00E+00	0.00E+00	0.00E+00
D-808/809 Mechanical Filters	-	1.36E-08	1.08E-07	4.72E-07
T-809 Surge Tank	-	4.67E-04	3.70E-03	1.62E-02
TOTAL WASTEWATER SYSTEM		**0.38**	**3.00**	**13.16**

Notes:
(1) T-0845, T-0844, and T-0846 are controlled with carbon cannister D-8000/D-8001. S1/T1 routes through the APIs and API-894 and API-895 are controlled with carbon cannister D-0829/D-0830. A 95% control efficiency applied per 2015 Emissions Estimation Protocol for Petroleum Refineries, Table 3-2 - Carbon adsorption.

Water9 Output Summary Results by Pollutant

Pollutant	CAS No.	112(b) HAP?	Emissions		
			g/s	lb/hr	ton/yr
Benzene	71-43-2	Yes	0.04	0.32	1.39
Ethylbenzene	100-41-4	Yes	0.03	0.26	1.13
Toluene	108-88-3	Yes	0.06	0.50	2.20
Xylenes	1330-20-7	Yes	0.07	0.56	2.45
Propanone (acetone)	67-64-1	No	0.00	0.01	0.04
Carbon Disulfide	75-15-0	Yes	0.08	0.62	2.72
Methylene Chloride, dichlorom	75-09-2	Yes	0.00	0.03	0.11
Naphthalene	91-20-3	Yes	0.00	0.03	0.11
Trimethylbenzene (1,3,5)	108-67-8	No	0.02	0.16	0.72
Butyl Benzene	104-51-8	No	0.01	0.05	0.21
Cumene (isopropylbenzene)	98-82-8	Yes	0.00	0.01	0.06
Dichloroethylene(1,2) cis	156-59-2	No	0.03	0.23	0.99
Methanol	50-00-0	Yes	0.01	0.12	0.51
Propyle(-n) Benzene	103-65-1	No	0.01	0.08	0.33
sec Butylbenzene	135-98-8	No	0.01	0.08	0.33
TOTAL WASTEWATER SYSTEM			**0.38**	**3.04**	**13.31**

TRUCK AND RAILCAR LOADING POTENTIAL TO EMIT [a]

Petroleum Products Loading Racks

Loading Rack	Loading Rack Description	Material Loaded	Vapor Molecular Weight	Liquid Molecular Weight	Saturation Factor	Loading Temperature		Vapor Pressure at Loading Temperature[b]		H2S in Liquid[c]	H2S in Vapor[c]	Capture Ef. [d]	Control Ef. [e]	Loading Throughputs		Uncontrolled Loading Loss		Uncontrolled VOC Emissions		Controlled VOC Emissions per Commodity		Controlled VOC Emissions per Loading Rack [f,g]		Controlled H2S Emissions per Commodity[h]		Controlled H2S Emissions per Loading Rack [f,g]	
						Maximum Hourly	Annual Average	Maximum Hourly	Annual Average					Maximum Hourly	Annual Average	Maximum Hourly	Annual Average	Maximum Hourly	Annual Average	Maximum Hourly	Annual Average	Maximum Hourly	Annual Average	Maximum Hourly	Annual Average	Maximum Hourly	Annual Average
			M_V	M_L	S	T_{max}	T_{avg}	P_{max}	P_{avg}	$H2S_{liq}$	$H2S_{vap}$																
			lb/lbmol	lb/lbmol		°F	°F	psia	psia	ppmw	lb_{H2S}/lb_{vap}	%	%	bbl/hr	bbl/yr	lb/Mgal	lb/Mgal	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	84	1000	1.45	400	320	0.56	0.10					350	3,662,756	0.99	0.19	14.57	14.46	14.57	14.46	**14.57**	**14.46**	0.01	0.01	**0.01**	**0.01**
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	84	1000	1.45	400	320	0.56	0.10					300	950,000	0.99	0.19	12.49	3.75	12.49	3.75	**12.49**	**3.75**	0.01	0.002	**0.01**	**0.002**
TL-4	Fuels Truck Loading Rack [e, f]	Gasoline - MACT	Emissions based on 10 mg/L as required by MACT CC.											1,214	2,555,000					4.25	4.48	**4.50**	**4.81**	-	-	**0.02**	**0.03**
		Gasoline Uncontrolled	62	92	0.6	100	64	14.45	7.80			98.7%	95%	1,214	2,555,000	11.97	6.90	610.16	370.25								
		Diesel	130	188	0.6	100	64	0.02	0.01	3.54	0.09	98.7%	95%	2,000	17,520,000	0.04	0.01	3.22	5.04	0.20	0.31			0.02	0.03		
		Jet Fuel	130	162	0.6	100	64	0.03	0.01			98.7%	95%	357	1,021,718	0.05	0.02	0.73	0.37	0.05	0.02			-	-		
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	130	188	1.45	180	125	0.16	0.04	8.50	2.6E-06			300	500,808	0.59	0.18	7.48	1.84	7.48	1.84	**12.17**	**1.86**	1.96E-05	4.83E-06	**3.19E-05**	**4.88E-06**
		Light Cycle Oil	130	162	1.45	180	64	0.21	0.01	2.19	2.6E-06			381	20,119	0.76	0.04	12.17	0.02	12.17	0.02			3.19E-05	4.66E-08		
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	130	188	1.45	180	125	0.16	0.04	8.50	2.6E-06			800	455,488	0.59	0.18	19.93	1.68	19.93	1.68	**19.93**	**6.44**	5.23E-05	4.39E-06	**0.01**	**0.001**
		Diesel	130	188	1.45	100	64	0.02	0.01	3.54	2.6E-06			200	1,144,000	0.09	0.03	0.78	0.80	0.78	0.80			2.04E-06	2.09E-06		
		Jet Fuel	130	162	1.45	100	64	0.03	0.01					200	1,144,000	0.12	0.04	0.99	1.01	0.99	1.01			-	-		
		Asphalt	84	1000	1.45	400	320	0.56	0.10					300	750,000	0.99	0.19	12.49	2.96	12.49	2.96			0.01	0.001		
RLO-19	Railcar Loading and Off-Loading Rack [f]	Asphalt/Pitch	84	1000	1.45	400	320	0.56	0.10					1,575	1,394,250	0.99	0.19	65.55	5.50	65.55	5.50	**65.55**	**11.72**	0.03	0.003	**0.03**	**0.003**
		Gas Oil	130	188	1.45	100	64	0.03	0.01	1.34	2.6E-06			1,575	3,057,600	0.13	0.04	8.82	2.76	8.82	2.76			2.31E-05	7.24E-06		
		Fuel Oil	130	188	1.45	100	64	0.02	0.01	2.19	2.6E-06			800	4,968,600	0.09	0.03	3.11	3.45	3.11	3.45			8.16E-06	9.06E-06		
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	84	1000	1.45	400	320	0.56	0.10					600	950,000	0.99	0.19	24.97	3.75	24.97	3.75	**24.97**	**3.75**	0.01	0.002	**0.01**	**0.002**
																					TOTAL	**154.18**	**46.80**	**0.08**	**0.04**	**0.08**	**0.04**

Notes:

a. Loading emissions are calculated using AP-42, Ch. 5.2 (6/2008)

b. Vapor pressure calculated using Antoine Coefficients (Ch. 7.1 (6/2020) and maxium and annual average tempeatures during loading activities.

c. H2S in liquid per API 4723A. For asphalts, 500 ppm is used per David C. Trumbore, 1999 (asphalts/pitch).

H2S is limited at the loading racks for distillate products to no more than 10 ppmv in the vapor space

d. TL-4 vapors are captured and routed to a Vapor Recovery Unit (VRU) with a carbon adsorption system. A Vapor Combustion Unit (VCU) is used as an alternate control device. Captured efficiency is 98.7% per annual seal certification. Control efficiency per carbon adsorption and VCU manufacturer.

e. The gasoline loading controlled emissions are calculated based on MACT R (§63.422(b)) emission standard of 10 mg organic compounds per liter of gasoline loaded, as referenced by MACT CC (§63.650(a)).

Uncontrolled gasoline emissions are calculated as an input for the Vapor Combustion Unit (VCU) emissions calculation

f. For the Fuels Truck Loading Rack (TL-4), the maximum hourly emissions are calculated based on all materials being loaded concurrently. For the other racks, the maximum hourly emissions reflect only the highest-emitting material being loaded in any hour.

g. Annual controlled VOC emissions are calculated based on all materials being loaded, except for RLO-19, which reflect themaximum of the individual liquid values to reflect the physical limitations of the rack.

h. H2S emissions estimated using Raoult's Law

Sample Calculations for Diesel Loading at the Fuels Truck Loading Rack (TL-4):

Loading Loss (lb/Mgal) = 12.46 * S * P * M / T (AP-42 Ch. 5.2)

Diesel Max. Loading Loss = 12.46 * 0.6 * 0.02 psia * 130 lb/lbmole / 560 R = 0.04 lb/Mgal

Diesel Avg. Loading Loss = 12.46 * 0.6 * 0.01 psia * 130 lb/lbmole / 524 R = 0.02 lb/Mgal

Uncontrolled VOC Emissions = Throughput (bbl) * 42 gal/bbl * (Mgal/1000 gal) * (Average Loading Loss, lb/Mgal)

Diesel Max. Loading Uncontrolled VOC Emissions = 2,000 bbl/hr * 42gal/bbl * 1Mgal/1,000gal * 0.04 lb/Mgal = 3.22 lb/hr

Diesel Avg. Loading Uncontrolled VOC Emissions = 17,520,000 bbl/yr * 42gal/bbl * 1Mgal/1,000gal * 0.01 lb/Mgal * 1ton/2,000 lb = 5.04 lb/hr

Controlled VOC Emissions = Uncontrolled VOC Emissions * ((1 - % Capture Eff) + % Capt Eff * (1 - % Control Eff))

Diesel Max. Loading Controlled VOC Emissions = 3.22 lb/hr * ((1 - 0.99) + 0.99 * (1 - 0.95)) = 0.20 lb/hr

Diesel Avg. Loading Controlled VOC Emissions = 5.04 tpy * ((1 - 0.99) + 0.99 * (1 - 0.95)) = 0.31 tpy

Loading/Unloading Racks without emissions*

Loading Rack	Loading Rack Description	Material Loaded
TL-5	LPG Truck Loading Rack	LPG/PP mix
TLO-13	Butane Truck Loading & Off-Loading Rack	Butane
TLO-14	LPG Loading & Off-Loading Rack	LPG
TLO-17	Truck Off-Loading Rack	-
TO-10	Gasoline Blends Truck Off-Loading Rack	-
TO-11	Transmix Truck Off-Loading Rack	-
TO-12	HF Truck Off-Loading Rack	-
TO-15	Ethanol Truck Off-Loading Rack	-
TO-16	TEL Truck Off-Loading Rack	-
TO-18	Crude Truck Off-Loading Rack	-
TO-21	Gas Oil Truck Off-Loading for use with a	-
TO-3	Gas Oil Truck Off-Loading Rack	-
TO-6	Asphalt Truck Off-Loading Rack	-

*Unloading emissions occur at the storage tank.

TRUCK AND RAILCAR LOADING PTE HAPs

Maximum Individual HAPs (n-Hexane)	**1.00**	**ton/yr**
Total HAPs	**1.28**	**ton/yr**

							HAPs	**2,2,4-Trimethylpentane**			**Acenaphthene**		
							CAS No.	**540-84-1**			**83-32-9**		
							Pi°, psia	**0.79**			**4.3E-05**		
Loading Rack	**Loading Rack Description**	**Material Loaded**	**Surrogate for HAPs Speciation (API 4723A)**	**Vapor Molecular Weight, M_V (lb/lbmole)**	**Liquid Molecular Weight, M_L (lb/lbmole)**	**VOC (lb/hr) [b]**	**VOC (tpy)[b]**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	84	1,000	14.6	14.5	0.04	6.0E-03	5.9E-03	-	-	-
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	84	1,000	12.5	3.8	0.04	5.1E-03	1.5E-03	-	-	-
TL-4	Fuels Truck Loading Rack	Gasoline	Gasoline Blending - Reformulated Gasoline	62	92	4.3	4.5	0.56	0.024	0.025	-	-	-
		Diesel	Distillate Blending - Diesel Fuel	130	188	0.2	0.3	-	-	-	-	-	-
		Jet Fuel	Kerosene treating - Commercial Jet Fuel	130	162	0.05	0.02	2.2E-03	1.0E-06	5.2E-07	-	-	-
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	Fluid Catalytic Cracker - Heavy Cat Gas Oil	130	188	7.5	1.8	-	-	-	2.6E-07	2.0E-08	4.8E-09
		Light Cycle Oil	Fluid Catalytic Cracker - Ligh Cat Gas Oil	130	162	12.2	0.0	4.0E-03	4.9E-04	7.2E-07	8.7E-07	1.1E-07	1.6E-10
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	Fluid Catalytic Cracker - Heavy Cat Gas Oil	130	188	19.9	1.7	-	-	-	2.6E-07	5.2E-08	4.4E-09
		Diesel	Distillate Blending - Diesel Fuel	130	188	0.8	0.8	-	-	-	-	-	-
		Jet Fuel	Kerosene treating - Commercial Jet Fuel	130	162	1.0	1.0	2.2E-03	2.2E-05	2.3E-05	-	-	-
		Asphalt	Asphalt Plant - (Feed) Pitch	84	1,000	12.5	3.0	0.04	5.1E-03	1.2E-03	-	-	-
RLO-19	Railcar Loading and Off-Loading Rack	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	84	1,000	65.5	5.5	0.04	2.7E-02	2.3E-03	-	-	-
		Gas Oil	Vacuum Distillation - Light Vacuum Gas Oil	130	188	8.8	2.8	-	-	-	ND	-	-
		Fuel Oil	Fluid Catalytic Cracker - Ligh Cat Gas Oil	130	188	3.1	3.5	4.7E-03	1.5E-04	1.6E-04	1.0E-06	3.2E-08	3.5E-08
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	84	1,000	25.0	3.8	0.04	1.0E-02	1.5E-03	-	-	-
					TOTAL	187.8	46.8			**0.04**			**4.4E-08**

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity. API liquid wt% converted to vapor wt% using Raoults Law and the P_A 13.07 psia

b. Controlled VOC Emissions per Commodity as calculated in Truck and Railcar Loading Potential to Emit worksheet and using AP-42, Ch. 5.2 (6/2008)

<u>Sample Calculations for Gasoline Loading</u>

HAP Vapor wt% = HAP Liquid I wt% * Pi° / Pa * ML/Mv

2,2,4-Trimethylpentane Vapor wt% in Gasoline = 6.2 * 0.79 psia / 13.07 psia * 92lb/lbmole / 62 lb/lbmole = 0.56 wt%

HAPs Loss = VOC * HAP wt%

2,2,4-Trimethylpentane Emissions on Gasoline Loading = 4.3 lb/hr * 0.56/100 = 0.024 lb/hr

2,2,4-Trimethylpentane Emissions on Gasoline Loading = 4.5 ton/yr * 0.56/100 = 0.025 ton/yr

TRUCK AND RAILCAR LOADING PTE HAPs

			Acenaphthylene			Anthracene			Benz(a)anthracene			Benzene			Benzo(a)phenanthrene		
			208-96-8			120-12-7			56-55-3			71-43-2			218-01-9		
			9.3E-05			1.2E-05			4.1E-09			2.01			1.2E-10		
Loading Rack	Loading Rack Description	Material Loaded	Vapor wt%	lb/hr	tpy	Vapor wt%	lb/hr	tpy	Vapor wt%	lb/hr	tpy	Vapor wt%	lb/hr	tpy	Vapor wt%	lb/hr	tpy
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	-	-	-	3.0E-08	4.3E-09	4.3E-09	ND	-	-	0.33	0.05	0.05	3.1E-13	4.5E-14	4.5E-14
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	-	-	-	3.0E-08	3.7E-09	1.1E-09	ND	-	-	0.33	0.04	0.01	3.1E-13	3.9E-14	1.2E-14
TL-4	Fuels Truck Loading Rack	Gasoline	-	-	-	-	-	-	-	-	-	0.13	5.7E-03	6.0E-03	-	-	-
		Diesel	-	-	-	2.1E-06	4.3E-09	6.7E-09	-	-	-	4.9E-03	9.8E-06	1.5E-05	-	-	-
		Jet Fuel	-	-	-	-	-	-	-	-	-	1.9E-03	8.5E-07	4.4E-07	-	-	-
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	2.2E-08	1.6E-09	4.0E-10	4.7E-08	3.5E-09	8.7E-10	2.1E-11	1.6E-12	3.8E-13	2.5E-04	1.9E-05	4.7E-06	4.8E-13	3.6E-14	8.8E-15
		Light Cycle Oil	1.1E-07	1.4E-08	2.0E-11	2.9E-08	3.6E-09	5.2E-12	ND	-	-	1.9E-03	2.3E-04	3.4E-07	ND	-	-
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	2.2E-08	4.3E-09	3.6E-10	4.7E-08	9.4E-09	7.9E-10	2.1E-11	4.1E-12	3.5E-13	2.5E-04	5.1E-05	4.2E-06	4.8E-13	9.6E-14	8.0E-15
		Diesel	-	-	-	2.1E-06	1.6E-08	1.7E-08	-	-	-	4.9E-03	3.8E-05	3.9E-05	-	-	-
		Jet Fuel	-	-	-	-	-	-	-	-	-	1.9E-03	1.9E-05	1.9E-05	-	-	-
		Asphalt	-	-	-	3.0E-08	3.7E-09	8.8E-10	ND	-	-	0.33	0.04	0.01	3.1E-13	3.9E-14	9.1E-15
RLO-19	Railcar Loading and Off-Loading Rack	Asphalt/Pitch	-	-	-	3.0E-08	1.9E-08	1.6E-09	ND	-	-	0.33	0.22	0.02	3.1E-13	2.0E-13	1.7E-14
		Gas Oil	ND	-	-	3.6E-09	3.2E-10	1.0E-10	5.3E-13	4.6E-14	1.5E-14	0.20	1.8E-02	5.5E-03	5.0E-14	4.4E-15	1.4E-15
		Fuel Oil	1.3E-07	4.0E-09	4.5E-09	3.4E-08	1.1E-09	1.2E-09	ND	-	-	2.2E-03	6.9E-05	7.7E-05	ND	-	-
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	-	-	-	3.0E-08	7.4E-09	1.1E-09	ND	-	-	0.33	0.08	0.01	3.1E-13	7.7E-14	1.2E-14
					5.3E-09			**3.5E-08**			**7.5E-13**			**1.1E-01**			**1.1E-13**

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

b. Controlled VOC Emissions per Commodity as calculated in Tru

Sample Calculations for Gasoline Loading

HAP Vapor wt% = HAP Liquid I wt% * Pi° / Pa * ML/Mv

2,2,4-Trimethylpentane Vapor wt% in Gasoline = 6.2 * (

HAPs Loss = VOC * HAP wt%

2,2,4-Trimethylpentane Emissions on Gasoline Loading

2,2,4-Trimethylpentane Emissions on Gasoline Loading

TRUCK AND RAILCAR LOADING PTE HAPs

			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(e)pyrene			Benzo(g,h,i)perylene			Benzo(k)fluoranthene		
			50-32-8			205-99-2			192-97-2			191-24-2			207-08-9		
			1.1E-10			9.7E-09			1.1E-10			1.9E-12			1.9E-11		
Loading Rack	**Loading Rack Description**	**Material Loaded**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	ND	-	-	ND	-	-	-	-	-	5.0E-15	7.2E-16	7.2E-16	-	-	-
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	ND	-	-	ND	-	-	-	-	-	5.0E-15	6.2E-16	1.9E-16	-	-	-
TL-4	Fuels Truck Loading Rack	Gasoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Diesel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Jet Fuel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	6.2E-14	4.6E-15	1.1E-15	3.4E-12	2.5E-13	6.2E-14	5.6E-14	4.2E-15	1.0E-15	6.3E-16	4.7E-17	1.2E-17	2.8E-15	2.1E-16	5.2E-17
		Light Cycle Oil	ND	-	-	ND	-	-	ND	-	-	9.1E-16	1.1E-16	1.6E-19	ND	-	-
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	6.2E-14	1.2E-14	1.0E-15	3.4E-12	6.7E-13	5.6E-14	5.6E-14	1.1E-14	9.3E-16	6.3E-16	1.2E-16	1.0E-17	2.8E-15	5.6E-16	4.7E-17
		Diesel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Jet Fuel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Asphalt	ND	-	-	ND	-	-	-	-	-	5.0E-15	6.2E-16	1.5E-16	-	-	-
RLO-19	Railcar Loading and Off-Loading Rack	Asphalt/Pitch	ND	-	-	ND	-	-	-	-	-	5.0E-15	3.2E-15	2.7E-16	-	-	-
		Gas Oil	1.2E-14	1.0E-15	3.3E-16	7.9E-13	7.0E-14	2.2E-14	4.4E-14	3.9E-15	1.2E-15	6.0E-16	5.3E-17	1.7E-17	ND	-	-
		Fuel Oil	ND	-	-	ND	-	-	ND	-	-	1.1E-15	3.3E-17	3.6E-17	ND	-	-
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	ND	-	-	ND	-	-	-	-	-	5.0E-15	1.2E-15	1.9E-16	-	-	-
					2.5E-15			**1.4E-13**			**3.2E-15**			**1.6E-15**			**9.9E-17**

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

b. Controlled VOC Emissions per Commodity as calculated in Tru

Sample Calculations for Gasoline Loading

HAP Vapor wt% = HAP Liquid I wt% * Pi° / Pa * ML/Mv

2,2,4-Trimethylpentane Vapor wt% in Gasoline = 6.2 * (

HAPs Loss = VOC * HAP wt%

2,2,4-Trimethylpentane Emissions on Gasoline Loading

2,2,4-Trimethylpentane Emissions on Gasoline Loading

TRUCK AND RAILCAR LOADING PTE HAPs

			Biphenyl			Cumene			Ethylbenzene			Fluoranthene			Fluorene		
			92-52-4			98-82-8			100-41-4			206-44-0			86-73-7		
			1.9E-04			0.12			2.2E-01			1.8E-07			1.2E-05		
Loading Rack	**Loading Rack Description**	**Material Loaded**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	-	-	-	1.4E-03	2.0E-04	2.0E-04	2.6E-02	3.8E-03	3.7E-03	-	-	-	-	-	-
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	-	-	-	1.4E-03	1.7E-04	5.2E-05	2.6E-02	3.2E-03	9.7E-04	-	-	-	-	-	-
TL-4	Fuels Truck Loading Rack	Gasoline	ND	-	-	2.4E-04	1.0E-05	1.1E-05	1.0E-02	4.3E-04	4.5E-04	-	-	-	-	-	-
		Diesel	2.4E-07	4.8E-10	7.5E-10	2.8E-04	5.5E-07	8.7E-07	1.1E-03	2.2E-06	3.4E-06	-	-	-	-	-	-
		Jet Fuel	5.5E-08	2.5E-11	1.3E-11	9.8E-04	4.5E-07	2.3E-07	2.3E-03	1.0E-06	5.3E-07	-	-	-	-	-	-
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	1.5E-06	1.1E-07	2.8E-08	ND	-	-	1.3E-04	9.7E-06	2.4E-06	8.1E-10	6.1E-11	1.5E-11	9.1E-08	6.8E-09	1.7E-09
		Light Cycle Oil	6.5E-06	8.0E-07	1.2E-09	6.6E-05	8.0E-06	1.2E-08	1.1E-03	1.4E-04	2.0E-07	1.4E-11	1.7E-12	2.5E-15	1.5E-07	1.9E-08	2.8E-11
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	1.5E-06	3.0E-07	2.5E-08	ND	-	-	1.3E-04	2.6E-05	2.2E-06	8.1E-10	1.6E-10	1.4E-11	9.1E-08	1.8E-08	1.5E-09
		Diesel	2.4E-07	1.8E-09	1.9E-09	2.8E-04	2.2E-06	2.2E-06	1.1E-03	8.4E-06	8.6E-06	-	-	-	-	-	-
		Jet Fuel	5.5E-08	5.5E-10	5.6E-10	9.8E-04	9.7E-06	9.9E-06	2.3E-03	2.3E-05	2.3E-05	-	-	-	-	-	-
		Asphalt	-	-	-	1.4E-03	1.7E-04	4.1E-05	2.6E-02	3.2E-03	7.7E-04	-	-	-	-	-	-
RLO-19	Railcar Loading and Off-Loading Rack	Asphalt/Pitch	-	-	-	1.4E-03	9.0E-04	7.6E-05	2.6E-02	1.7E-02	1.4E-03	-	-	-	-	-	-
		Gas Oil	-	-	-	-	-	-	-	-	-	4.5E-11	4.0E-12	1.3E-12	4.2E-09	3.7E-10	1.2E-10
		Fuel Oil	7.6E-06	2.4E-07	2.6E-07	7.6E-05	2.4E-06	2.6E-06	1.3E-03	4.1E-05	4.5E-05	1.6E-11	5.1E-13	5.6E-13	1.8E-07	5.6E-09	6.2E-09
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	-	-	-	1.4E-03	3.4E-04	5.2E-05	2.6E-02	6.5E-03	9.7E-04	-	-	-	-	-	-
					3.2E-07			**4.5E-04**			**8.4E-03**			**3.0E-11**			**9.5E-09**

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

b. Controlled VOC Emissions per Commodity as calculated in Tru

Sample Calculations for Gasoline Loading

HAP Vapor wt% = HAP Liquid I wt% * Pi° / Pa * ML/Mv

2,2,4-Trimethylpentane Vapor wt% in Gasoline = 6.2 * (

HAPs Loss = VOC * HAP wt%

2,2,4-Trimethylpentane Emissions on Gasoline Loading

2,2,4-Trimethylpentane Emissions on Gasoline Loading

TRUCK AND RAILCAR LOADING PTE HAPs

			Indeno(1,2,3-cd)pyrene			Lead compounds			Methanol			Methyl tert-butyl ether			m-Xylene		
			193-39-5			7439-92-1			67-56-1			1634-04-4			108-38-3		
			2.4E-12			3.4E-02			2.70			5.30			0.16		
Loading Rack	**Loading Rack Description**	**Material Loaded**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	ND	-	-	3.9E-07	5.7E-08	5.7E-08	-	-	-	-	-	-	0.04	6.4E-03	6.4E-03
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	ND	-	-	3.9E-07	4.9E-08	1.5E-08	-	-	-	-	-	-	0.04	5.5E-03	1.7E-03
TL-4	Fuels Truck Loading Rack	Gasoline	-	-	-	ND	-	-	5.5E-03	2.4E-04	2.5E-04	3.7E-02	1.6E-03	1.6E-03	1.8E-04	7.7E-06	8.2E-06
		Diesel	-	-	-	-	-	-	-	-	-	-	-	-	2.4E-02	4.7E-05	7.4E-05
		Jet Fuel	-	-	-	-	-	-	-	-	-	-	-	-	3.8E-03	1.7E-06	8.9E-07
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	2.8E-16	2.1E-17	5.1E-18	2.9E-08	2.2E-09	5.4E-10	-	-	-	ND	-	-	2.0E-04	1.5E-05	3.6E-06
		Light Cycle Oil	ND	-	-	-	-	-	ND	-	-	ND	-	-	3.8E-03	4.7E-04	6.8E-07
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	2.8E-16	5.5E-17	4.7E-18	2.9E-08	5.8E-09	4.9E-10	-	-	-	ND	-	-	2.0E-04	3.9E-05	3.3E-06
		Diesel	-	-	-	-	-	-	-	-	-	-	-	-	0.02	1.8E-04	1.9E-04
		Jet Fuel	-	-	-	-	-	-	-	-	-	-	-	-	3.8E-03	3.8E-05	3.8E-05
		Asphalt	ND	-	-	3.9E-07	4.9E-08	1.2E-08	-	-	-	-	-	-	0.04	5.5E-03	1.3E-03
RLO-19	Railcar Loading and Off-Loading Rack	Asphalt/Pitch	ND	-	-	3.9E-07	2.6E-07	2.2E-08	-	-	-	-	-	-	0.04	0.03	2.4E-03
		Gas Oil	ND	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-
		Fuel Oil	ND	-	-	-	-	-	ND	-	-	ND	-	-	4.4E-03	1.4E-04	1.5E-04
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	ND	-	-	3.9E-07	9.8E-08	1.5E-08	-	-	-	-	-	-	0.04	1.1E-02	1.7E-03
					9.8E-18			**1.2E-07**			**2.5E-04**			**1.6E-03**			**0.01**

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

b. Controlled VOC Emissions per Commodity as calculated in Tru

Sample Calculations for Gasoline Loading

HAP Vapor wt% = HAP Liquid I wt% * Pi° / Pa * ML/Mv

2,2,4-Trimethylpentane Vapor wt% in Gasoline = 6.2 * (

HAPs Loss = VOC * HAP wt%

2,2,4-Trimethylpentane Emissions on Gasoline Loading

2,2,4-Trimethylpentane Emissions on Gasoline Loading

TRUCK AND RAILCAR LOADING PTE HAPs

			Naphthalene			n-Hexane			o-Xylene			Phenanthrene			p-Xylene		
			91-20-3			110-54-3			95-47-6			85-01-8			106-42-3		
			0.01			3.14			0.13			2.3E-06			0.17		
Loading Rack	**Loading Rack Description**	**Material Loaded**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**	**Vapor wt%**	**lb/hr**	**tpy**
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	5.9E-05	8.6E-06	8.5E-06	3.3E+00	0.47	0.47	-	-	-	1.4E-08	2.0E-09	2.0E-09	8.1E-03	1.2E-03	1.2E-03
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	5.9E-05	7.4E-06	2.2E-06	3.3E+00	0.41	0.12	-	-	-	1.4E-08	1.7E-09	5.1E-10	8.1E-03	1.0E-03	3.0E-04
TL-4	Fuels Truck Loading Rack	Gasoline	1.2E-04	5.0E-06	5.3E-06	1.5E-01	6.4E-03	6.7E-03	0.03	1.1E-03	1.2E-03	2.1E-10	9.1E-12	9.6E-12	9.7E-05	4.1E-06	4.3E-06
		Diesel	9.4E-05	1.9E-07	3.0E-07	1.8E-03	3.6E-06	5.6E-06	8.5E-05	1.7E-07	2.7E-07	4.4E-10	8.8E-13	1.4E-12	0.02	3.5E-05	5.5E-05
		Jet Fuel	9.8E-04	4.5E-07	2.3E-07	0.01	5.8E-06	2.9E-06	3.1E-02	1.4E-05	7.2E-06	-	-	-	0.01	4.7E-06	2.4E-06
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	1.9E-05	1.4E-06	3.6E-07	ND	-	-	1.3E-04	9.6E-06	2.4E-06	4.6E-08	3.5E-09	8.5E-10	2.1E-04	1.6E-05	3.8E-06
		Light Cycle Oil	2.7E-04	3.2E-05	4.7E-08	1.9E-03	2.3E-04	3.4E-07	7.7E-04	9.3E-05	1.4E-07	4.6E-08	5.6E-09	8.2E-12	1.4E-03	1.7E-04	2.5E-07
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	1.9E-05	3.9E-06	3.2E-07	ND	-	-	1.3E-04	2.6E-05	2.2E-06	4.6E-08	9.2E-09	7.8E-10	2.1E-04	4.1E-05	3.5E-06
		Diesel	9.4E-05	7.3E-07	7.5E-07	1.8E-03	1.4E-05	1.4E-05	8.5E-05	6.6E-07	6.8E-07	4.4E-10	3.4E-12	3.5E-12	1.7E-02	1.4E-04	1.4E-04
		Jet Fuel	9.8E-04	9.7E-06	9.9E-06	0.01	1.3E-04	1.3E-04	0.03	3.1E-04	3.1E-04	-	-	-	1.0E-02	1.0E-04	1.0E-04
		Asphalt	5.9E-05	7.4E-06	1.7E-06	3.26	4.1E-01	9.7E-02	-	-	-	1.4E-08	1.7E-09	4.0E-10	8.1E-03	1.0E-03	2.4E-04
RLO-19	Railcar Loading and Off-Loading Rack	Asphalt/Pitch	5.9E-05	3.9E-05	3.2E-06	3.26	2.1E+00	1.8E-01	-	-	-	1.4E-08	8.9E-09	7.4E-10	8.1E-03	5.3E-03	4.4E-04
		Gas Oil	ND	-	-	-	-	-	-	-	-	4.6E-09	4.1E-10	1.3E-10	-	-	-
		Fuel Oil	3.1E-04	9.6E-06	1.1E-05	2.2E-03	7.0E-05	7.7E-05	8.9E-04	2.8E-05	3.1E-05	5.4E-08	1.7E-09	1.9E-09	1.7E-03	5.2E-05	5.8E-05
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	5.9E-05	1.5E-05	2.2E-06	3.26	0.81	0.12	-	-	-	1.4E-08	3.4E-09	5.1E-10	8.1E-03	2.0E-03	3.0E-04
					4.6E-05			**1.00**			**1.5E-03**			**7.8E-09**			**2.8E-03**

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

b. Controlled VOC Emissions per Commodity as calculated in Tru

Sample Calculations for Gasoline Loading

HAP Vapor wt% = HAP Liquid I wt% * Pi° / Pa * ML/Mv

2,2,4-Trimethylpentane Vapor wt% in Gasoline = 6.2 * (

HAPs Loss = VOC * HAP wt%

2,2,4-Trimethylpentane Emissions on Gasoline Loading

2,2,4-Trimethylpentane Emissions on Gasoline Loading

TRUCK AND RAILCAR LOADING PTE HAPs

			Pyrene			Toluene			Xylene (mixed isomers)		
			129-00-0			108-88-3			1330-20-7		
			8.7E-08			0.60			0.20		
Loading Rack	Loading Rack Description	Material Loaded	Vapor wt%	lb/hr	tpy	Vapor wt%	lb/hr	tpy	Vapor wt%	lb/hr	tpy
TLO-1	Asphalt Truck Loading and Off-Loading Rack	Asphalt/Pitch	-	-	-	0.22	0.03	0.03	0.06	9.4E-03	9.3E-03
TL-2	Asphalt Truck Loading Rack #2	Asphalt/Pitch	-	-	-	0.22	0.03	0.01	0.06	8.1E-03	2.4E-03
TL-4	Fuels Truck Loading Rack	Gasoline	-	-	-	0.13	0.01	0.01	0.16	0.01	0.01
		Diesel	-	-	-	4.3E-03	8.7E-06	1.4E-05	0.01	1.0E-05	1.6E-05
		Jet Fuel	-	-	-	3.9E-03	1.8E-06	9.1E-07	0.03	1.6E-05	8.1E-06
TL-7	CBO/LCO Truck Loading Rack	Carbon Black Oil	1.6E-09	1.2E-10	2.9E-11	7.4E-04	5.5E-05	1.4E-05	7.0E-04	5.3E-05	1.3E-05
		Light Cycle Oil	6.7E-11	8.1E-12	1.2E-14	0.00	4.7E-04	6.9E-07	0.01	6.2E-04	9.1E-07
RLO-8	Railcar Loading and Off-Loading Rack	Carbon Black Oil	1.6E-09	3.1E-10	2.6E-11	7.4E-04	1.5E-04	1.2E-05	7.0E-04	1.4E-04	1.2E-05
		Diesel	-	-	-	4.3E-03	3.4E-05	3.4E-05	0.01	4.0E-05	4.1E-05
		Jet Fuel	-	-	-	0.004	3.9E-05	4.0E-05	0.03	3.4E-04	3.5E-04
		Asphalt	-	-	-	0.22	0.03	0.01	0.06	8.1E-03	1.9E-03
RLO-19	Railcar Loading and Off-Loading Rack	Asphalt/Pitch	-	-	-	0.22	0.14	0.01	0.06	0.04	0.004
		Gas Oil	4.6E-11	4.0E-12	1.3E-12	-	-	-	-	-	-
		Fuel Oil	7.8E-11	2.4E-12	2.7E-12	0.00	1.4E-04	1.6E-04	0.01	1.8E-04	2.0E-04
TLO-20	Asphalt/Pitch Truck Loading Rack	Asphalt/Pitch	-	-	-	0.22	0.05	0.01	0.06	0.02	0.002
					5.9E-11			**0.07**			**0.03**

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

b. Controlled VOC Emissions per Commodity as calculated in Tru

Sample Calculations for Gasoline Loading

HAP Vapor wt% = HAP Liquid I wt% * Pi° / Pa * ML/Mv

2,2,4-Trimethylpentane Vapor wt% in Gasoline = 6.2 * (

HAPs Loss = VOC * HAP wt%

2,2,4-Trimethylpentane Emissions on Gasoline Loading

2,2,4-Trimethylpentane Emissions on Gasoline Loading

TRLO-9 POTENTIAL TO EMIT
Molten Sulfur Truck/Railcar Loading & Off-Loading Rack

Scrubber Emissions

Loading Rack	Loading Rack Description	Material Loaded	Stack Diameter	Exhaust Temp.	Exhaust Flow Rate		Exhaust H_2S Concentration	H_2S Emissions Max. Hourly	H_2S Emissions Annual Average
			ft	°F	acfm	scfh	ppmv	lb/hr	tpy
TRLO-9	Molten Sulfur Truck/Railcar Loading Rack	Molten Sulfur	0.33	130	500	26,846	2	0.005	0.02

Notes

Standard Volume = 385.3 scf/lbmol

H_2S Molecular Weight = 34.1 lb/lbmol

Fugitive Loading Emissions

Loading Rack	Loading Rack Description	Material Loaded	Loading Throughputs Maximum Hourly	Loading Throughputs Annual Average	Sulfur Specific Gravity	Molten Sulfur Density	H_2S	Loading Rack Temp.	Vapor Pressure of H_2S(1)	Liquid H_2S in Sulfur Stream (X_{H2S})(2)	Vapor H_2S in Sulfur Stream (Y_{H2S})(3)	Standard Molar Volume(4)	Volume of Sulfur Vapor Displaced (5)		Volume of H_2S Vapor Displaced (6)		Load Rack Scrubber Capture Eff.	H_2S Emissions Max. Hourly	H_2S Emissions Annual Average
			gal/hr	LTPD		lb/ft^3	ppmw	°C	bar	ft^3_{H2S} / ft^3_S	ft^3_{H2S} / ft^3_S	ft^3/lbmol	ft^3_S/hr	ft^3_S/yr	ft^3_{H2S}/hr	ft^3_{H2S}/yr	%	lb/hr	tpy
TRLO-9	Molten Sulfur Truck/Railcar Loading Rack	Molten Sulfur	34,500	330	1.8	112.3	100	140.6	162	0.0001	0.02	611.5	4,612	2,402,623	77.9	40,597	99.0%	0.043	0.011

Notes

(1) Vapor pressure of H2S per Stull, Daniel R., Vapor Pressure of Pure Substances. Organic and Inorganic Compounds, Ind. Eng. Chem., 1947, 39, 4, 517-540. https://webbook.nist.gov/cgi/cbook.cgi?ID=C7783064&Mask=4&Type=ANTOINE&Plot=on

Log10(P°) = A - B/(T + C), P in bar and T in K

A= 4.52887 unitless

B= 958.587 unitless

C= -0.539 K

(2) Liquid H2S in Sulfur Stream X_{H2S} = H_2S (ppmw)/10^6 * MW_S/MW_{H2S}

H_2S Molecular Weight = 34.1 lb/lbmol

Sulfur Molecular Weight = 32.1 lb/lbmol

(3) Vapor H2S in Sulfur Stream Y_{H2S} = P_{H2S}/P_{atm} * X_{H2S}

Atmospheric Pressure 0.9 bar Carlsbad, NM - Nearest Class II site

(4) Standard molar volume n/v = R*T/P

(5) Volume of Sulfur Vapor Displaced (ft^3/hr) = Sulfur Production (gal/hr) * Specific Gravity * 8.34 lb/gal / Sulfur Density (lb/ft^3)

Volume of Sulfur Vapor Displaced (ft^3/yr) = Sulfur Production (LT/day) * 2,240 lb/LT * 365 day/yr / Sulfur Density (lb/ft^3)

(6) Volume of H_2S Vapor Displaced (ft^3_{H2S}/hr) = Volume of Sulfur Vapor Displaced (ft^3_S/hour) x Y_{H2S} ($ft^3_{H2}S$ /ft^3_S)

Volume of H_2S Vapor Displaced (ft^3_{H2S}/yr) = Volume of Sulfur Vapor Displaced (ft^3_S/yr) x Y_{H2S} ($ft^3_{H2}S$ /ft^3_S)

(7) Maximum Hourly H_2S Emissions = Volume of H_2S Vapor Displaced (ft^3/hr) / Standard Molar Volume (ft^3/lbmol) * MW_{H2S} (lb/lbmol)

Annual Avg. H_2S Emissions = Volume of H_2S Vapor Displaced (ft^3/yr) / Standard Molar Volume (ft^3/lbmol) * MW_{H2S} (lb/lbmol) * 1 ton/2,000 lb

TL-4 VAPOR COMBUSTION UNIT (VCU) POTENTIAL TO EMIT

Pollutant	Emissions Factors		Reference
	Assist Gas/ Pilot Gas (lb/MMscf)	HC Vapors (lb/MMBtu)	
NO_X	100	0.14	Assist Gas/Pilot Gas EF per AP-42, Ch. 1.4 (7/98), Table 1.4-1 Small Boilers (<100 MMBtu/hr), uncontrolled. HC EF per VCU manufacturer specifications.
CO	84	0.14	
VOC	5.5	Note b	Assist Gas/Pilot Gas EF per AP-42, Ch. 1.4 (7/98), Table 1.4-1 Small Boilers (<100 MMBtu/hr), uncontrolled. HC DRE per VCU manufacturer specifications.
SO_2	20 gr/100scf		PSD-NM-0195-M39R1. C101.G Natural Gas definition
$PM/PM_{10}/PM_{2.5}$	7.6	0.0075	EF per AP-42, Ch. 1.4 (7/98), Table 1.4-2 PM (Total). The lb/MMscf EF is converted to lb/MMBtu by dividing by the average heating content, 1020 Btu/scf, of the natural gas basis for the EF.

Streams to VCU [a]	Heat Content-HHV)	Flow to VCU		Heat Input to VCU		NO_X Emissions		CO Emissions		$PM/PM_{10}/PM_{2.5}$ Emissions		VOC Emissions		SO_2 Emissions	
	(Btu/scf or Btu/lb)	(scfm or lb/hr)	(MMscf/yr or ton/yr)	(MMBtu/hr)	(MMBtu/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Scenario 1 - Maximum Assist Gas Only															
Assist Gas	1,020 Btu/scf	150 scfm	--	9.18	--	0.90	--	0.76	--	0.07	--	0.05	--	0.51	--
Scenario 2 - Maximum Loading Throughputs, No Assist Gas															
Pilot Gas	1,020 Btu/scf	0.9 scfm	0.5 MMscf/yr	0.06	482.5	0.005	0.02	0.005	0.02	0.0004	0.002	0.0003	0.001	0.003	0.014
Gasoline Vapor	23,214 Btu/lb	602.2 lb/hr	365.4 ton/yr	13.98	16,966	1.96	1.19	1.96	1.19	0.104	0.06	Note b	Note b	--	--
Diesel Vapor	19,718 Btu/lb	3.2 lb/hr	5.0 ton/yr	0.06	196.2	0.01	0.01	0.01	0.01	0.0005	0.001	Note b	Note b	--	--
Jet Fuel Vapor	19,286 Btu/lb	0.7 lb/hr	0.4 ton/yr	0.01	14.2	0.002	0.001	0.002	0.001	0.0001	0.0001	Note b	Note b	--	--
				Scenario 2 Subtotals =		1.97	1.23	1.97	1.22	0.11	0.07	0.0003	0.001	0.003	0.01
Potential to Emit = Maximum of Scenarios 1 or 2 =						**1.97**	**1.23**	**1.97**	**1.22**	**0.11**	**0.07**	**0.05**	**0.001**	**0.51**	**0.01**

Notes:

a. Scenarios 1 and 2 reflect the two Vapor Combustion Unit (VCU) operating scenarios with the highest hourly products-of-combustion emissions. Scenario 1 reflects when the VCU is receiving minimal, if any, heat input contribution from the loading vapors and therefore assist gas flow is required. In actual operations, Scenario 1 will occur for a limited number of minutes each hour and at less than maximum assist gas flow. The Scenario 1 hourly emissions are conservatively calculated assuming maximum assist gas flow occurring continuously for an entire hour. Scenario 2 reflects maximum loading vapors to the VCU when no assist gas is required. "Flow to VCU" conservatively reflects the total calculated uncontrolled loading emissions routed to the VCU (98.7% of uncontrolled loading losses).

b. VOC losses from HC routed to the VCU are captured at Loading Potential to Emit calculation sheet for TL-4

Sample Calculations:

Gasoline Vapor Flow = (Uncontrolled Loading Emissions, lb/hr) from Fuels Truck Loading Rack Potential to Emit-VOC calculations
= 602.2 lb/hr

Gasoline Heat Input = Heat Content (Btu/lb)* Gasoline Vapor Flow (lb/hr) * 1MMBtu/10^6 Btu
= 23,214Btu/lb * 602.2 lb/hr * 1 MMBtu/1,000,000 Btu = 13.98 MMBtu/hr

Gasoline NOx = Emission Factor (lb/MMBtu) * Gasoline Heat Input (MMBtu/hr)
= 0.14 lb/MMBtu * 13.98 MMBtu/hr = 1.96 lb/hr

Assist Gas SO_2 = Assist Gas Flow (scf/min)* 60 min/hr * cscf/100 scf * Natural Gas Sulfur Content (gr/100scf) * 1 lb/7,000 gr * 64 lbSO2/32 lbS
150 scf/min * 60 min/hr * 1 cscf/100 scf * 20 gr/100scf * 1 lb/7,000 gr * 64 lbSO2/32 lbS = 0.51 lb/hr

TL-4 VCU POTENTIAL TO EMIT GHG

Streams to VCU	Heat Input to VCU	Emission Factors (lb/MMBtu)[a]			Annual Emissions (ton/yr)			GHG (as CO2e)
	(MMBtu/yr)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	
	Table A-1 TO 40 CFR 98, subpart A, Global Warming Potentials				**1**	**25**	**298**	
Pilot Gas	482.5	116.98	0.002	0.0002	28.2	5.3E-04	5.3E-05	28.2
Gasoline Vapor	16,966.5	154.81	0.007	0.001	1,313	0.06	0.01	1,318
Diesel Vapor	196.2	163.05	0.007	0.001	16.0	6.5E-04	1.3E-04	16.0
Jet Fuel Vapor	14.2	159.22	0.007	0.001	1.1	4.7E-05	9.4E-06	1.1
					1,358.6	**0.06**	**0.01**	**1,363**

Notes:

a. Emission factors from Tables C-1 and C-2 to 40 CFR 98, subpart C, for corresponsing products

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT

				Valves						Flanges		Pump Seals			
				Gas		Light Liquid		Heavy Liquid		All		Light Liquid		Heavy Liquid	
				Non-Monitored	Monitored	Non-Monitored	Monitored	Non-Monitored	Monitored	Non-Monitored	Monitored	Non-Monitored	Monitored	Non-Monitored	Monitored
			Emission Factor (lb/hr-cpte)/Control Efficiency ***(1),(2)***	0.059	96%	0.024	95%	0.0005	0%	0.00055	81%	0.251	88%	0.046	0%
UNIT ID	**PROCESS UNIT**	**Regulatory Applicability**	**LDAR Database**	**COMPONENT COUNTS**											
FUG-02-SP CRUDE	South Division Crude Unit	-	02-CRUDE	-	409	-	1,710	-	-	2,766	-	-	21	-	-
FUG-06-NHDU	Naphtha HDS Unit 06	-	06-NDU	-	257	-	676	-	-	2,110	-	-	13	-	-
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	-	07-AMINE	-	340	-	1,318	-	-	1,415	-	-	25	-	-
FUG-07-SWS1	Sour Water Stripper	-	07-SWS	-	107	-	37	6	-	217	-	-	2	-	-
FUG-08-TRUCK RK	Loading Racks	-	08-TRUCK	-	22	-	415	-	-	1,051	-	-	13	-	-
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	-	09-N-ALK	-	256	-	1,505	-	-	952	-	-	24	-	-
FUG-10-FCC	FCC w/CVS	-	10-FCCU	-	763	-	826	-	-	4,091	-	-	21	-	-
FUG-13-NHDU	Naphtha HDS Unit 13	-	13-NHD	-	671	-	880	-	-	1,146	-	-	21	-	-
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	-	18-MEROX	-	-	-	-	-	-	-	-	-	-	-	-
FUG-19-NAPHTHA	Naptha Merox	QQQ	19-NAPH	-	-	-	-	-	-	-	-	-	-	-	-
FUG-20-ISOM	BenFree Unit	-	20-ISOM	-	2	-	396	-	-	173	-	-	2	-	-
FUG-21-SP VACUUM	Flasher/Vacuum Unit	-	21-VAC	-	142	-	133	-	-	699	-	-	6	-	-
FUG-25-ROSE-2	ROSE Unit	-	25-ROSE	-	199	-	584	-	-	1,796	-	-	6	-	-
FUG-29-BLENDER/TK FARM	Light Oil Tankage	-	29-BLEND 08-TK-FA 03-ROSE	-	61	-	2,028	-	-	2,260	-	-	57	-	-
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	-	30-SRU-2 12-TGTU	-	156	-	274	45	-	403	-	-	8	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	-	31-SRU-3	-	195	-	281	-	-	769	-	-	8	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	-	33-DHDU	-	576	-	289	473	-	1,835	-	-	6	7	-
FUG-34-HYDROCRACKER	WX Hydrocracker	-	34-MHU	-	291	-	213	-	-	779	-	-	6	-	-
FUG-35-SAT GAS	Saturates Gas Plant	-	35-SAT-G 16-SKID	-	185	-	659	-	-	1,596	-	-	9	-	-
FUG-36-RO	Reverse Osmosis	QQQ	36-RO	-	-	-	-	-	-	-	-	-	-	-	-
FUG-37-NP-UT	North Plant Utilities	QQQ	37-NP-UT	-	-	-	-	-	-	-	-	-	-	-	-
FUG-41-PBC	PBC Unit	-	41-PBC	-	38	-	135	-	-	440	-	-	2	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	-	43-W76	-	-	-	-	-	-	-	-	-	-	-	-
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	-	44-DHDU	-	536	-	125	6	-	1,268	-	-	5	-	-
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	-	45-DHDU	-	109	-	140	-	-	349	-	-	2	-	-
FUG-54-PRIMEG	Prime G Unit	-	54-PRIME	-	708	-	635	119	-	1,133	-	-	8	2	-
FUG-63-H2 PLANT-1	Hydrogen Plant	-	63-HYDRO	-	-	-	-	-	-	-	-	-	-	-	-
FUG-64-H2 PLANT-2	Hydrogen Plant	-	64-HYDRO	-	-	-	-	-	-	-	-	-	-	-	-
FUG-70-CCR	CCR Reformer (w/in battery limits)	-	70-CCR	-	1,306	-	726	6	-	2,828	-	-	14	-	-
FUG-73-SP UTIL	Utilities	-	73-SP-UT	-	-	-	-	-	-	-	-	-	-	-	-
FUG-80-WWTP CVS	Oil/Water Separator	-	80-WWTP	-	72	-	183	-	-	846	-	-	13	-	-
FUG-LPG	LPG Storage System	-	08-LPG-S	-	41	-	261	-	-	662	-	-	3	-	-
			TOTAL	**0**	**7,442**	**0**	**14,429**	**655**	**0**	**31,584**	**0**	**0**	**295**	**9**	**0**

Notes:

(1) Emission factors (lb/hr-cpte) per "Protocol for Equipment Leak Estimates," EPA-453/R-95-017, Table 2-2 "Refinery Average Emission Factors", November 1995

(2) Control efficiency per "Protocol for Equipment Leak Estimates," EPA-453/R-95-017, Table 5-3 "Control Effectiveness for an LDAR Program at a Refinery Process Unit", Nov. 1995; and TCEQ Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance - APDG 6422 - June 2018

(3) Maximum VOC% applies to all stream unless otherwise specified.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT

				Agitators		Relief Valves		Compressor Seals		Sampling Connections		WW Drain System	
				Light Liquid		All		Gas		All		All	
				Non-Monitored	Monitored	Non-Monitored	Monitored	Non-Monitored	Monitored	Non-Monitored	Monitored	Non-Monitored	Monitored
			Emission Factor (lb/hr-cpte)/Control Efficiency (1),(2)	0.251	0%	0.353	97%	1.402	95%	0.033	0%	0.0705	50%
UNIT ID	**PROCESS UNIT**	**Regulatory Applicability**	**LDAR Database**	**COMPONENT COUNTS**									
FUG-02-SP CRUDE	South Division Crude Unit	-	02-CRUDE	-	-	-	11	-	2	-	5	-	62
FUG-06-NHDU	Naphtha HDS Unit 06	-	06-NDU	-	-	-	18	-	-	-	2	-	25
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	-	07-AMINE	-	-	-	22	-	-	-	8	-	58
FUG-07-SWS1	Sour Water Stripper	-	07-SWS	-	-	-	3	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	-	08-TRUCK	-	1	-	13	-	1	-	-	-	-
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	-	09-N-ALK	-	-	-	26	-	-	-	14	-	55
FUG-10-FCC	FCC w/CVS	-	10-FCCU	-	-	-	11	-	1	-	-	-	62
FUG-13-NHDU	Naphtha HDS Unit 13	-	13-NHD	-	-	-	26	-	-	-	9	-	30
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	-	18-MEROX	-	-	-	-	-	-	-	-	-	5
FUG-19-NAPHTHA	Naptha Merox	QQQ	19-NAPH	-	-	-	-	-	-	-	-	-	6
FUG-20-ISOM	BenFree Unit	-	20-ISOM	-	-	-	15	-	-	-	5	-	21
FUG-21-SP VACUUM	Flasher/Vacuum Unit	-	21-VAC	-	-	-	3	-	2	-	1	-	32
FUG-25-ROSE-2	ROSE Unit	-	25-ROSE	-	-	-	6	-	-	-	7	-	56
FUG-29-BLENDER/TK FARM	Light Oil Tankage	-	29-BLEND 08-TK-FA 03-ROSE	-	2	-	18	-	-	-	2	-	76
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	-	30-SRU-2 12-TGTU	-	-	-	10	-	-	-	1	-	40
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	-	31-SRU-3	-	-	-	9	-	-	-	1	-	31
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	-	33-DHDU	-	-	5	22	-	4	-	4	-	79
FUG-34-HYDROCRACKER	WX Hydrocracker	-	34-MHU	-	-	-	5	-	-	-	4	-	61
FUG-35-SAT GAS	Saturates Gas Plant	-	35-SAT-G 16-SKID	-	-	-	14	-	-	-	8	-	49
FUG-36-RO	Reverse Osmosis	QQQ	36-RO	-	-	-	-	-	-	-	-	-	2
FUG-37-NP-UT	North Plant Utilities	QQQ	37-NP-UT	-	-	-	-	-	-	-	-	-	38
FUG-41-PBC	PBC Unit	-	41-PBC	-	-	-	1	-	-	-	-	-	7
FUG-43-S ALKY	South Alky Unit (W-76)	-	43-W76	-	-	-	-	-	-	-	-	-	18
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	-	44-DHDU	-	-	-	15	-	-	-	-	-	41
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	-	45-DHDU	-	-	-	2	-	-	-	2	-	21
FUG-54-PRIMEG	Prime G Unit	-	54-PRIME	-	-	-	14	-	1	1	8	-	16
FUG-63-H2 PLANT-1	Hydrogen Plant	-	63-HYDRO	-	-	-	-	-	-	-	-	-	16
FUG-64-H2 PLANT-2	Hydrogen Plant	-	64-HYDRO	-	-	-	-	-	-	-	-	-	36
FUG-70-CCR	CCR Reformer (w/in battery limits)	-	70-CCR	-	-	-	36	-	4	-	6	-	52
FUG-73-SP UTIL	Utilities	-	73-SP-UT	-	-	-	-	-	-	-	-	-	8
FUG-80-WWTP CVS	Oil/Water Separator	-	80-WWTP	-	-	-	19	-	-	-	-	-	44
FUG-LPG	LPG Storage System	-	08-LPG-S	-	-	-	10	-	-	-	-	-	-
			TOTAL	**0**	**3**	**5**	**329**	**0**	**15**	**1**	**87**	**0**	**1,047**

Notes:

(1) Emission factors (lb/hr-cpte) per "Protocol for Equipment Leak Estimates," EPA-453/R-95-017, Table 2-2 "Refinery Average Emission Factors", November 1995

(2) Control efficiency per "Protocol for Equipment Leak Estimates," EPA-453/R-95-017, Table 5-3 "Control Effectiveness for an LDAR Program at a Refinery Process Unit", Nov. 1995; and TCEQ Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance - APDG 6422 - June 2018

(3) Maximum VOC% applies to all stream unless otherwise specified.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT

			Emission Factor (lb/hr-cpte)/Control Efficiency (1),(2)	EMISSIONS (lb/hr)								VOC Content(3)	VOC Content(3)	VOC Emissions	
UNIT ID	PROCESS UNIT	Regulatory Applicability	LDAR Database	Valves	Flanges	Pump Seals	Agitators	Relief Valves	Compressor Seals	Sampling Connections	WW Drain	%	%	(lb/hr)	(tons/yr)
FUG-02-SP CRUDE	South Division Crude Unit	-	02-CRUDE	3.021	1.524	0.633	-	0.116	0.140	0.165	2.187	100%		7.79	34.11
FUG-06-NHDU	Naphtha HDS Unit 06	-	06-NDU	1.420	1.163	0.392	-	0.190	-	0.066	0.882	100%		4.11	18.02
FUG-07-N AMINE	Amine Unit-Treating/Regen. 2	-	07-AMINE	2.387	0.780	0.754	-	0.233	-	0.265	2.046	100%		6.46	28.31
FUG-07-SWS1	Sour Water Stripper	-	07-SWS	0.300	0.120	0.060	-	0.032	-	-	-	100%		0.51	2.24
FUG-08-TRUCK RK	Loading Racks	-	08-TRUCK	0.551	0.579	0.392	0.251	0.138	0.070	-	-	100%		1.98	8.68
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	-	09-N-ALK	2.413	0.525	0.724	-	0.275	-	0.463	1.940	100%		6.34	27.77
FUG-10-FCC	FCC w/CVS	-	10-FCCU	2.796	2.255	0.633	-	0.116	0.070	-	2.187	100%		8.06	35.29
FUG-13-NHDU	Naphtha HDS Unit 13	-	13-NHD	2.643	0.632	0.633	-	0.275	-	0.298	1.058	100%		5.54	24.26
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	-	18-MEROX	-	-	-	-	-	-	-	0.176	100%		0.18	0.77
FUG-19-NAPHTHA	Naptha Merox	QQQ	19-NAPH	-	-	-	-	-	-	-	0.212	100%		0.21	0.93
FUG-20-ISOM	BenFree Unit	-	20-ISOM	0.481	0.095	0.060	-	0.159	-	0.165	0.741	100%		1.70	7.45
FUG-21-SP VACUUM	Flasher/Vacuum Unit	-	21-VAC	0.495	0.385	0.181	-	0.032	0.140	0.033	1.129	100%		2.40	10.49
FUG-25-ROSE-2	ROSE Unit	-	25-ROSE	1.172	0.990	0.181	-	0.063	-	0.231	1.975	100%		4.61	20.21
FUG-29-BLENDER/TK FARM	Light Oil Tankage	-	29-BLEND 08-TK-FA 03-ROSE	2.581	1.246	1.719	0.503	0.190	-	0.066	2.681	100%		8.99	39.36
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	-	30-SRU-2 12-TGTU	0.721	0.222	0.241	-	0.106	-	0.033	1.411	100%		2.73	11.97
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	-	31-SRU-3	0.798	0.424	0.241	-	0.095	-	0.033	1.093	100%		2.69	11.76
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	-	33-DHDU	1.948	1.011	0.505	-	1.996	0.280	0.132	2.787	100%		8.66	37.93
FUG-34-HYDROCRACKER	WX Hydrocracker	-	34-MHU	0.944	0.429	0.181	-	0.053	-	0.132	2.152	100%		3.89	17.04
FUG-35-SAT GAS	Saturates Gas Plant	-	35-SAT-G 16-SKID	1.229	0.880	0.271	-	0.148	-	0.265	1.728	100%		4.52	19.80
FUG-36-RO	Reverse Osmosis	QQQ	36-RO	-	-	-	-	-	-	-	0.071	100%		0.07	0.31
FUG-37-NP-UT	North Plant Utilities	QQQ	37-NP-UT	-	-	-	-	-	-	-	1.340	100%		1.34	5.87
FUG-41-PBC	PBC Unit	-	41-PBC	0.252	0.243	0.060	-	0.011	-	-	0.247	100%		0.81	3.56
FUG-43-S ALKY	South Alky Unit (W-76)	-	43-W76	-	-	-	-	-	-	-	0.635	100%		0.63	2.78
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	-	44-DHDU	1.420	0.699	0.151	-	0.159	-	-	1.446	100%		3.87	16.97
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	-	45-DHDU	0.426	0.192	0.060	-	0.021	-	0.066	0.741	100%		1.51	6.60
FUG-54-PRIMEG	Prime G Unit	-	54-PRIME	2.497	0.624	0.334	-	0.148	0.070	0.298	0.564	100%		4.54	19.86
FUG-63-H2 PLANT-1	Hydrogen Plant	-	63-HYDRO	-	-	-	-	-	-	-	0.564	100%		0.56	2.47
FUG-64-H2 PLANT-2	Hydrogen Plant	-	64-HYDRO	-	-	-	-	-	-	-	1.270	100%		1.27	5.56
FUG-70-CCR	CCR Reformer (w/in battery limits)	-	70-CCR	3.962	1.559	0.422	-	0.381	0.280	0.198	1.834	100%		8.64	37.83
FUG-73-SP UTIL	Utilities	-	73-SP-UT	-	-	-	-	-	-	-	0.282	100%		0.28	1.24
FUG-80-WWTP CVS	Oil/Water Separator	-	80-WWTP	0.390	0.466	0.392	-	0.201	-	-	1.552	100%		3.00	13.15
FUG-LPG	LPG Storage System	-	08-LPG-S	0.410	0.365	0.090	-	0.106	-	-	-	100%		0.97	4.26
			TOTAL	**35.256**	**17.407**	**9.313**	**0.754**	**5.245**	**1.052**	**2.910**	**36.931**			**108.87**	**476.85**

Notes:

(1) Emission factors (lb/hr-cpte) per "Protocol for Equipment Leak Estimates," EPA-453/R-95-017, Table 2-2 "Refinery Average Emission Factors", November 1995

(2) Control efficiency per "Protocol for Equipment Leak Estimates," EPA-453/R-95-017, Table 5-3 "Control Effectiveness for an LDAR Program at a Refinery Process Unit", Nov. 1995; and TCEQ Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance - APDG 6422 - June 2018

(3) Maximum VOC% applies to all stream unless otherwise specified.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT GHG

$$CH_4 = (0.4 \times N_{CD} + 0.2 \times N_{PU1} + 0.1 \times N_{PU2} + 4.3 \times N_{H2} + 6 \times N_{FGS}) \quad \text{(Eq. Y-21)}$$

CH_4 = Annual methane emissions from equipment leaks (metric tons/yr).
N_{CD} = Number of atmospheric crude distillation columns at the facility.
N_{PU1} = Cumulative number of catalytic cracking units, coking units, hydrocracking, and full-range distillation columns at the facility.
N_{PU2} = Cumulative number of hydrotreating/hydrorefining units, catalytic reforming units, and visbreaking units at the facility.
N_{H2} = Total number of hydrogen plants at the facility.
N_{FGS} = Total number of fuel gas systems at the facility.

Variable	Number of Units	Unit Descriptions
N_{CD}	1	South Division Crude Unit 02
N_{PU1}	9	FCC Unit 10, Rose Unit 25, and Hydrocracker Unit 34. Sat Gas Unit 35 - 4 columns, PBC Unit 41 - 2 columns.
N_{PU2}	10	Kerosene HDS Unit 05, Naphtha HDS Units 06 and 13, Merox/Merichem Treating Unit 18, Diesel HDS Unit 33, GOH Unit 44, GOH Unit 45, CCR Unit 70, Skid Treaters Unit 16, and Prime G Unit 54.
N_{H2}	2	Hydrogen Units 63 and 64.
N_{FGS}	2	Unit 7 HP and LP systems

CH_4 = **23.8 metric tons/yr**
26.2 tons/yr

The CCR catalytic reforming unit only has fugitive emission sources reported in the permit. Additional GHG emissions associated with catalyst regeneration is included with the fugitive emissions. The maximum reported rate between 2011 and 2015 was increased by 100% to estimate the potential to emit.

	Fugitive GHG TOTAL (ton/yr)			**GHG (as CO_2e) (ton/yr)**
	CO_2	**CH_4**	**N_2O**	
Table A-1 to 40 CFR 98, subpart A, Global Warming Potentials	1	25	298	
Fugitive Components	-	26.23	-	656
CCR	816.52	0.024	0.005	819
Total	**816.52**	**26.26**	**0.005**	**1,474**

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

Maximum Individual HAPs (2,2,4-Trimethylpentane) 16.85 ton/yr

Total HAPs 49.42 ton/yr

						1,3-Butadiene			2,2,4-Trimethylpentane			Acenaphthene		
						106-99-0			540-84-1			83-32-9		
UNIT ID	**PROCESS UNIT**	**LDAR Database**	**Surrogate**	**VOC (lb/hr)**	**VOC (tpy)**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	Supply System - Crude Oil	7.8	34.1	ND	-	-	5.5E-02	4.3E-03	1.9E-02	5.9E-04	4.6E-05	2.0E-04
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	Atmospheric Distillation - Straight Run Naphtha	4.1	18.0	ND	-	-	4.5E-02	1.9E-03	8.1E-03	ND	-	-
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	Amine Treating - Sour Gas	6.5	28.3	ND	-	-	-	-	-	-	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	Amine Treating - Sour Gas	0.5	2.2	ND	-	-	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	Gasoline Blending - Reformulated Gasoline	2.0	8.7	ND	-	-	6.2E+00	1.2E-01	5.4E-01	-	-	-
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	Alkylation - Alkylate/NOT C4 Olefin feed	6.3	27.8	-	-	-	2.8E+01	1.7E+00	7.7E+00	-	-	-
FUG-10-FCC	FCC w/CVS	10-FCCU	Gasoline Blending - Reformulated Gasoline	8.1	35.3	ND	-	-	6.2E+00	5.0E-01	2.2E+00	-	-	-
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	Atmospheric Distillation - Straight Run Naphtha	5.5	24.3	ND	-	-	4.5E-02	2.5E-03	1.1E-02	ND	-	-
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	Gasoline Blending - Reformulated Gasoline	0.2	0.8	ND	-	-	6.2E+00	1.1E-02	4.8E-02	-	-	-
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	Atmospheric Distillation - Straight Run Naphtha	0.2	0.9	ND	-	-	4.5E-02	9.6E-05	4.2E-04	ND	-	-
FUG-20-ISOM	BenFree Unit	20-ISOM	Catalytic Isomerization - Isom Naphtha/Isomerate	1.7	7.5	-	-	-	1.9E-01	3.2E-03	1.4E-02	-	-	-
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	Vacuum Distillation - Light Vacuum Gas Oil	2.4	10.5	-	-	-	-	-	-	ND	-	-
FUG-25-ROSE-2	ROSE Unit	25-ROSE	Asphalt Plant - Asphalt	4.6	20.2	ND	-	-	ND	-	-	-	-	-
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND 08-TK-FA 03-ROSE	Gasoline Blending - Reformulated Gasoline	9.0	39.4	ND	-	-	6.2E+00	5.6E-01	2.5E+00	-	-	-
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2 12-TGTU	Amine Treating - Sour Gas	2.7	12.0	ND	-	-	-	-	-	-	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	Amine Treating - Sour Gas	2.7	11.8	ND	-	-	-	-	-	-	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	Catalytic Hydrocracker - Light H/C Distillate	8.7	37.9	-	-	-	1.4E-01	1.2E-02	5.2E-02	-	-	-
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	Atmospheric Distillation - Straight Run Naphtha	3.9	17.0	ND	-	-	4.5E-02	1.8E-03	7.7E-03	ND	-	-
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G 16-SKID	Atmospheric Distillation - Straight Run Naphtha	4.5	19.8	ND	-	-	4.5E-02	2.0E-03	9.0E-03	ND	-	-
FUG-36-RO	Reverse Osmosis	36-RO	Atmospheric Distillation - Straight Run Naphtha	0.1	0.3	ND	-	-	4.5E-02	3.2E-05	1.4E-04	ND	-	-
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	Atmospheric Distillation - Straight Run Naphtha	1.3	5.9	ND	-	-	4.5E-02	6.1E-04	2.7E-03	ND	-	-
FUG-41-PBC	PBC Unit	41-PBC	Catalytic Isomerization - Isobutane	0.8	3.6	1.2E-01	9.7E-04	4.2E-03	-	-	-	-	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	Gasoline Blending - Reformulated Gasoline	0.6	2.8	ND	-	-	6.2E+00	4.0E-02	1.7E-01	-	-	-
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	Catalytic Hydrocracker - Light H/C Distillate	3.9	17.0	-	-	-	1.4E-01	5.3E-03	2.3E-02	-	-	-
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	Catalytic Hydrocracker - Light H/C Distillate	1.5	6.6	-	-	-	1.4E-01	2.1E-03	9.0E-03	-	-	-
FUG-54-PRIMEG	Prime G Unit	54-PRIME	Gasoline Blending - Reformulated Gasoline	4.5	19.9	ND	-	-	6.2E+00	2.8E-01	1.2E+00	-	-	-
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO	N/A	0.6	2.5									
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO	N/A	1.3	5.6									
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	Gasoline Blending - Reformulated Gasoline	8.6	37.8	ND	-	-	6.2E+00	5.4E-01	2.4E+00	-	-	-
FUG-73-SP UTIL	Utilities	73-SP-UT	N/A	0.3	1.2									
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	Various Units - Slop Oil	3.0	13.1	ND	-	-	4.1E-02	1.2E-03	5.4E-03	3.0E-02	8.9E-04	3.9E-03
FUG-LPG	LPG Storage System	08-LPG-S	N/A	1.0	4.3									
			TOTAL		476.8			4.2E-03			1.7E+01			4.1E-03

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

			Acenaphthylene			Anthracene			Antimony			Arsenic			Benz(a)anthracene			Benzene		
			208-96-8			120-12-7			7440-36-0			7440-38-2			56-55-3			71-43-2		
UNIT ID	PROCESS UNIT	LDAR Database	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	4.1E-04	3.2E-05	1.4E-04	3.8E-04	2.9E-05	1.3E-04	4.1E-05	3.2E-06	1.4E-05	6.5E-06	5.0E-07	2.2E-06	2.9E-03	2.3E-04	1.0E-03	1.6E-01	1.3E-02	5.5E-02
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	ND	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	1.2E+00	4.9E-02	2.2E-01
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8E-01	1.2E-02	5.1E-02
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4E-01	1.5E-02	6.7E-02
FUG-10-FCC	FCC w/CVS	10-FCCU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8E-01	4.7E-02	2.1E-01
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	ND	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	1.2E+00	6.6E-02	2.9E-01
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8E-01	1.0E-03	4.5E-03
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	ND	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	1.2E+00	2.5E-03	1.1E-02
FUG-20-ISOM	BenFree Unit	20-ISOM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.6E-01	1.1E-02	4.9E-02
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	ND	-	-	2.8E-03	6.7E-05	2.9E-04	-	-	-	4.6E-06	1.1E-07	4.8E-07	1.2E-03	2.8E-05	1.2E-04	9.0E-01	2.2E-02	9.5E-02
FUG-25-ROSE-2	ROSE Unit	25-ROSE	-	-	-	ND	-	-	2.1E-04	9.7E-06	4.2E-05	ND	-	-	ND	-	-	2.5E-04	1.2E-05	5.1E-05
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND 08-TK-FA 03-ROSE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8E-01	5.2E-02	2.3E-01
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2 12-TGTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5E+00	2.2E-01	9.5E-01
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	ND	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	1.2E+00	4.7E-02	2.0E-01
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G 16-SKID	ND	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	1.2E+00	5.4E-02	2.4E-01
FUG-36-RO	Reverse Osmosis	36-RO	ND	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	1.2E+00	8.5E-04	3.7E-03
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	ND	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	1.2E+00	1.6E-02	7.0E-02
FUG-41-PBC	PBC Unit	41-PBC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6E-01	2.1E-03	9.2E-03
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8E-01	3.7E-03	1.6E-02
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5E+00	9.7E-02	4.3E-01
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.5E+00	3.8E-02	1.7E-01
FUG-54-PRIMEG	Prime G Unit	54-PRIME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8E-01	2.6E-02	1.2E-01
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO																		
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO																		
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8E-01	5.0E-02	2.2E-01
FUG-73-SP UTIL	Utilities	73-SP-UT																		
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	1.7E-02	5.2E-04	2.3E-03	1.1E-01	3.2E-03	1.4E-02	ND	-	-	ND	-	-	1.1E-03	3.2E-05	1.4E-04	3.5E-01	1.1E-02	4.6E-02
FUG-LPG	LPG Storage System	08-LPG-S																		
					2.4E-03			1.4E-02			5.6E-05			2.7E-06			0.001			3.74

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

			Benzo(a)phenanthrene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(e)pyrene			Benzo(g,h,i)perylene			Biphenyl		
			218-01-9			50-32-8			205-99-2			192-97-2			191-24-2			92-52-4		
UNIT ID	PROCESS UNIT	LDAR Database	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	1.1E-03	8.4E-05	3.7E-04	2.9E-03	2.3E-04	1.0E-03	4.1E-03	3.2E-04	1.4E-03	8.0E-04	6.2E-05	2.7E-04	3.3E-04	2.6E-05	1.1E-04	2.4E-02	1.9E-03	8.2E-03
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	1.6E-02	6.6E-04	2.9E-03
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0E-02	6.3E-04	2.8E-03
FUG-10-FCC	FCC w/CVS	10-FCCU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	1.6E-02	8.9E-04	3.9E-03
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	1.6E-02	3.4E-05	1.5E-04
FUG-20-ISOM	BenFree Unit	20-ISOM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9E-02	8.3E-04	3.7E-03
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	3.8E-03	9.0E-05	3.9E-04	1.0E-03	2.4E-05	1.1E-04	7.4E-04	1.8E-05	7.8E-05	3.6E-03	8.6E-05	3.8E-04	2.8E-03	6.7E-05	2.9E-04	-	-	-
FUG-25-ROSE-2	ROSE Unit	25-ROSE	ND	-	-	ND	-	-	ND	-	-	-	-	-	2.8E-03	1.3E-04	5.7E-04	ND	-	-
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND 08-TK-FA 03-ROSE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2 12-TGTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	1.6E-02	6.2E-04	2.7E-03
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G 16-SKID	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	1.6E-02	7.2E-04	3.2E-03
FUG-36-RO	Reverse Osmosis	36-RO	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	1.6E-02	1.1E-05	4.9E-05
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	ND	-	-	ND	-	-	ND	-	-	ND	-	-	ND	-	-	1.6E-02	2.1E-04	9.4E-04
FUG-41-PBC	PBC Unit	41-PBC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-54-PRIMEG	Prime G Unit	54-PRIME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO																		
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO																		
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
FUG-73-SP UTIL	Utilities	73-SP-UT																		
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	8.5E-04	2.5E-05	1.1E-04	9.6E-04	2.9E-05	1.3E-04	1.5E-03	4.4E-05	1.9E-04	1.4E-03	4.2E-05	1.9E-04	ND	-	-	1.4E+00	4.2E-02	1.9E-01
FUG-LPG	LPG Storage System	08-LPG-S																		
					0.001			0.001			0.002			8.4E-04			0.001			0.21

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

			Cadmium			Carbon disulfide			Carbonyl sulfide			Chromium			Cobalt			Cresol (mixed isomers)		
			7440-43-9			75-15-0			463-58-1			7440-47-3			7440-48-4			1319-77-3		
UNIT ID	PROCESS UNIT	LDAR Database	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	2.9E-07	2.2E-08	9.8E-08	ND	-	-	ND	-	-	5.7E-06	4.5E-07	2.0E-06	ND	-	-	-	-	-
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	-	-	-	1.3E-03	5.2E-05	2.3E-04	-	-	-	-	-	-	-	-	-	-	-	-
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	-	-	-	-	-	-	1.2E-02	7.7E-04	3.4E-03	-	-	-	-	-	-	-	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	-	-	-	-	-	-	1.2E-02	6.1E-05	2.7E-04	-	-	-	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	-	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-10-FCC	FCC w/CVS	10-FCCU	-	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	-	-	-	1.3E-03	7.0E-05	3.1E-04	-	-	-	-	-	-	-	-	-	-	-	-
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	-	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	-	-	-	1.3E-03	2.7E-06	1.2E-05	-	-	-	-	-	-	-	-	-	-	-	-
FUG-20-ISOM	BenFree Unit	20-ISOM	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	ND	-	-	-	-	-	-	-	-	5.7E-05	1.4E-06	6.0E-06	-	-	-	-	-	-
FUG-25-ROSE-2	ROSE Unit	25-ROSE	4.0E-05	1.8E-06	8.0E-06	ND	-	-	ND	-	-	2.5E-05	1.1E-06	5.0E-06	2.8E-05	1.3E-06	5.7E-06	-	-	-
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND	-	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-
		08-TK-FA																		
		03-ROSE																		
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2	-	-	-	-	-	-	1.2E-02	3.3E-04	1.4E-03	-	-	-	-	-	-	-	-	-
		12-TGTU																		
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	-	-	-	-	-	-	1.2E-02	3.2E-04	1.4E-03	-	-	-	-	-	-	-	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	-	-	-	1.3E-03	4.9E-05	2.2E-04	-	-	-	-	-	-	-	-	-	-	-	-
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G	-	-	-	1.3E-03	5.7E-05	2.5E-04	-	-	-	-	-	-	-	-	-	-	-	-
		16-SKID																		
FUG-36-RO	Reverse Osmosis	36-RO	-	-	-	1.3E-03	9.0E-07	3.9E-06	-	-	-	-	-	-	-	-	-	-	-	-
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	-	-	-	1.3E-03	1.7E-05	7.5E-05	-	-	-	-	-	-	-	-	-	-	-	-
FUG-41-PBC	PBC Unit	41-PBC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	-	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-54-PRIMEG	Prime G Unit	54-PRIME	-	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO																		
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO																		
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	-	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	-	-	-
FUG-73-SP UTIL	Utilities	73-SP-UT																		
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	3.2E-05	9.5E-07	4.2E-06	ND	-	-	ND	-	-	3.2E-05	9.5E-07	4.1E-06	ND	-	-	7.4E-02	2.2E-03	9.8E-03
FUG-LPG	LPG Storage System	08-LPG-S																		
					1.2E-05			0.001			6.5E-03			1.7E-05			5.7E-06			9.8E-03

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

			Cumene			Dibenzo(a,h)anthracene			Ethylbenzene			Fluoranthene			Fluorene			Lead compounds		
			98-82-8			53-70-3			100-41-4			206-44-0			86-73-7			7439-92-1		
UNIT ID	**PROCESS UNIT**	**LDAR Database**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	2.4E-02	1.9E-03	8.2E-03	3.1E-04	2.4E-05	1.1E-04	1.7E-01	1.3E-02	5.7E-02	4.2E-04	3.3E-05	1.4E-04	3.4E-03	2.7E-04	1.2E-03	1.6E-07	1.2E-08	5.5E-08
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	1.3E-01	5.4E-03	2.4E-02	ND	-	-	5.9E-01	2.4E-02	1.1E-01	ND	-	-	ND	-	-	-	-	-
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	1.7E-02	3.4E-04	1.5E-03	-	-	-	4.1E-01	8.1E-03	3.5E-02	-	-	-	-	-	-	ND	-	-
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	2.5E-02	1.6E-03	6.8E-03	-	-	-	2.8E-02	1.7E-03	7.6E-03	-	-	-	-	-	-	-	-	-
FUG-10-FCC	FCC w/CVS	10-FCCU	1.7E-02	1.4E-03	6.1E-03	-	-	-	4.1E-01	3.3E-02	1.4E-01	-	-	-	-	-	-	ND	-	-
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	1.3E-01	7.3E-03	3.2E-02	ND	-	-	5.9E-01	3.2E-02	1.4E-01	ND	-	-	ND	-	-	-	-	-
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	1.7E-02	3.1E-05	1.3E-04	-	-	-	4.1E-01	7.2E-04	3.2E-03	-	-	-	-	-	-	ND	-	-
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	1.3E-01	2.8E-04	1.2E-03	ND	-	-	5.9E-01	1.2E-03	5.4E-03	ND	-	-	ND	-	-	-	-	-
FUG-20-ISOM	BenFree Unit	20-ISOM	1.0E-01	1.8E-03	7.7E-03	-	-	-	5.0E-01	8.5E-03	3.7E-02	-	-	-	-	-	-	-	-	-
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	-	-	-	ND	-	-	-	-	-	2.3E-03	5.5E-05	2.4E-04	3.3E-03	7.8E-05	3.4E-04	ND	-	-
FUG-25-ROSE-2	ROSE Unit	25-ROSE	ND	-	-	-	-	-	2.9E-04	1.3E-05	5.9E-05	-	-	-	-	-	-	6.1E-05	2.8E-06	1.2E-05
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND 08-TK-FA 03-ROSE	1.7E-02	1.6E-03	6.8E-03	-	-	-	4.1E-01	3.7E-02	1.6E-01	-	-	-	-	-	-	ND	-	-
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2 12-TGTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	4.0E-02	3.5E-03	1.5E-02	-	-	-	3.1E-01	2.7E-02	1.2E-01	-	-	-	-	-	-	-	-	-
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	1.3E-01	5.1E-03	2.2E-02	ND	-	-	5.9E-01	2.3E-02	1.0E-01	ND	-	-	ND	-	-	-	-	-
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G 16-SKID	1.3E-01	5.9E-03	2.6E-02	ND	-	-	5.9E-01	2.6E-02	1.2E-01	ND	-	-	ND	-	-	-	-	-
FUG-36-RO	Reverse Osmosis	36-RO	1.3E-01	9.2E-05	4.0E-04	ND	-	-	5.9E-01	4.1E-04	1.8E-03	ND	-	-	ND	-	-	-	-	-
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	1.3E-01	1.8E-03	7.7E-03	ND	-	-	5.9E-01	7.9E-03	3.4E-02	ND	-	-	ND	-	-	-	-	-
FUG-41-PBC	PBC Unit	41-PBC	2.5E-02	2.0E-04	8.7E-04	-	-	-	8.6E-01	7.0E-03	3.1E-02	-	-	-	-	-	-	-	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	1.7E-02	1.1E-04	4.8E-04	-	-	-	4.1E-01	2.6E-03	1.1E-02	-	-	-	-	-	-	ND	-	-
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	4.0E-02	1.6E-03	6.8E-03	-	-	-	3.1E-01	1.2E-02	5.3E-02	-	-	-	-	-	-	-	-	-
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	4.0E-02	6.1E-04	2.7E-03	-	-	-	3.1E-01	4.7E-03	2.0E-02	-	-	-	-	-	-	-	-	-
FUG-54-PRIMEG	Prime G Unit	54-PRIME	1.7E-02	7.8E-04	3.4E-03	-	-	-	4.1E-01	1.9E-02	8.1E-02	-	-	-	-	-	-	ND	-	-
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO																		
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO																		
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	1.7E-02	1.5E-03	6.5E-03	-	-	-	4.1E-01	3.5E-02	1.5E-01	-	-	-	-	-	-	ND	-	-
FUG-73-SP UTIL	Utilities	73-SP-UT																		
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	3.1E-02	9.2E-04	4.0E-03	ND	-	-	2.0E-01	6.1E-03	2.7E-02	5.4E-03	1.6E-04	7.2E-04	4.3E-02	1.3E-03	5.7E-03	ND	-	-
FUG-LPG	LPG Storage System	08-LPG-S																		
					0.19			1.1E-04			1.45			1.1E-03			0.007			1.2E-05

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

			Manganese			Mercury compounds			Methanol			Methyl tert-butyl ether			m-Xylene			Naphthalene		
			7439-96-5			7439-97-6			67-56-1			1634-04-4			108-38-3			91-20-3		
UNIT ID	PROCESS UNIT	LDAR Database	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	6.4E-06	5.0E-07	2.2E-06	3.2E-07	2.5E-08	1.1E-07	ND	-	-	-	-	-	4.7E-01	3.6E-02	1.6E-01	2.3E-02	1.8E-03	7.8E-03
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	-	-	-	4.0E-08	1.6E-09	7.2E-09	5.6E-02	2.3E-03	1.0E-02	8.8E-02	3.6E-03	1.6E-02	2.1E+00	8.8E-02	3.9E-01	5.2E-03	2.1E-04	9.3E-04
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	-	-	-	-	-	-	1.8E-02	3.6E-04	1.6E-03	6.1E-02	1.2E-03	5.3E-03	1.0E-02	2.0E-04	8.7E-04	1.9E-01	3.8E-03	1.6E-02
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	-	-	-	-	-	-	ND	-	-	8.0E-02	5.0E-03	2.2E-02	1.6E-01	1.0E-02	4.4E-02	5.1E-02	3.2E-03	1.4E-02
FUG-10-FCC	FCC w/CVS	10-FCCU	-	-	-	-	-	-	1.8E-02	1.5E-03	6.4E-03	6.1E-02	4.9E-03	2.1E-02	1.0E-02	8.1E-04	3.5E-03	1.9E-01	1.5E-02	6.7E-02
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	-	-	-	4.0E-08	2.2E-09	9.7E-09	5.6E-02	3.1E-03	1.3E-02	8.8E-02	4.8E-03	2.1E-02	2.1E+00	1.2E-01	5.2E-01	5.2E-03	2.9E-04	1.3E-03
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	-	-	-	-	-	-	1.8E-02	3.2E-05	1.4E-04	6.1E-02	1.1E-04	4.7E-04	1.0E-02	1.8E-05	7.7E-05	1.9E-01	3.4E-04	1.5E-03
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	-	-	-	4.0E-08	8.5E-11	3.7E-10	5.6E-02	1.2E-04	5.1E-04	8.8E-02	1.9E-04	8.1E-04	2.1E+00	4.5E-03	2.0E-02	5.2E-03	1.1E-05	4.8E-05
FUG-20-ISOM	BenFree Unit	20-ISOM	-	-	-	-	-	-	-	-	-	-	-	-	3.8E-01	6.5E-03	2.8E-02	2.7E-02	4.5E-04	2.0E-03
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	ND	-	-	ND	-	-	ND	-	-	ND	-	-	-	-	-	ND	-	-
FUG-25-ROSE-2	ROSE Unit	25-ROSE	-	-	-	-	-	-	ND	-	-	ND	-	-	1.5E-02	6.9E-04	3.0E-03	ND	-	-
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND 08-TK-FA 03-ROSE	-	-	-	-	-	-	1.8E-02	1.6E-03	7.1E-03	6.1E-02	5.5E-03	2.4E-02	1.0E-02	9.0E-04	3.9E-03	1.9E-01	1.7E-02	7.5E-02
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2 12-TGTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	1.3E+00	1.1E-01	4.9E-01	-	-	-
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	-	-	-	4.0E-08	1.6E-09	6.8E-09	5.6E-02	2.2E-03	9.5E-03	8.8E-02	3.4E-03	1.5E-02	2.1E+00	8.3E-02	3.6E-01	5.2E-03	2.0E-04	8.8E-04
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G 16-SKID	-	-	-	4.0E-08	1.8E-09	7.9E-09	5.6E-02	2.5E-03	1.1E-02	8.8E-02	4.0E-03	1.7E-02	2.1E+00	9.7E-02	4.2E-01	5.2E-03	2.3E-04	1.0E-03
FUG-36-RO	Reverse Osmosis	36-RO	-	-	-	4.0E-08	2.8E-11	1.2E-10	5.6E-02	3.9E-05	1.7E-04	8.8E-02	6.2E-05	2.7E-04	2.1E+00	1.5E-03	6.6E-03	5.2E-03	3.7E-06	1.6E-05
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	-	-	-	4.0E-08	5.4E-10	2.3E-09	5.6E-02	7.4E-04	3.3E-03	8.8E-02	1.2E-03	5.1E-03	2.1E+00	2.9E-02	1.3E-01	5.2E-03	6.9E-05	3.0E-04
FUG-41-PBC	PBC Unit	41-PBC	-	-	-	-	-	-	-	-	-	-	-	-	1.3E+00	1.0E-02	4.4E-02	-	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	-	-	-	-	-	-	1.8E-02	1.1E-04	5.0E-04	6.1E-02	3.9E-04	1.7E-03	1.0E-02	6.3E-05	2.8E-04	1.9E-01	1.2E-03	5.3E-03
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	1.3E+00	5.0E-02	2.2E-01	-	-	-
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	-	-	-	-	-	-	-	-	-	-	-	-	1.3E+00	1.9E-02	8.4E-02	-	-	-
FUG-54-PRIMEG	Prime G Unit	54-PRIME	-	-	-	-	-	-	1.8E-02	8.2E-04	3.6E-03	6.1E-02	2.8E-03	1.2E-02	1.0E-02	4.5E-04	2.0E-03	1.9E-01	8.6E-03	3.8E-02
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO																		
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO																		
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	-	-	-	-	-	-	1.8E-02	1.6E-03	6.8E-03	6.1E-02	5.3E-03	2.3E-02	1.0E-02	8.6E-04	3.8E-03	1.9E-01	1.6E-02	7.2E-02
FUG-73-SP UTIL	Utilities	73-SP-UT																		
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	-	-	-	-	-	-	3.5E-01	1.1E-02	4.6E-02	ND	-	-	1.3E+00	3.8E-02	1.6E-01	8.6E-02	2.6E-03	1.1E-02
FUG-LPG	LPG Storage System	08-LPG-S																		
					2.2E-06			1.4E-07			0.12			0.19			3.09			0.31

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

			n-Hexane			Nickel			o-Xylene			Phenanthrene			p-Xylene			Pyrene		
			110-54-3			7440-02-0			95-47-6			85-01-8			106-42-3			129-00-0		
UNIT ID	PROCESS UNIT	LDAR Database	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy	wt%	lb/hr	tpy
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	9.6E-01	7.5E-02	3.3E-01	1.8E-03	1.4E-04	6.1E-04	2.4E-02	1.9E-03	8.2E-03	-	-	-	1.1E-01	8.6E-03	3.8E-02	9.2E-04	7.2E-05	3.2E-04
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	5.7E+00	2.4E-01	1.0E+00	ND	-	-	7.1E-01	2.9E-02	1.3E-01	ND	-	-	7.2E-01	2.9E-02	1.3E-01	ND	-	-
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	4.2E-01	8.3E-03	3.6E-02	-	-	-	1.8E+00	3.5E-02	1.6E-01	8.0E-04	1.6E-05	7.0E-05	5.0E-03	9.9E-05	4.3E-04	-	-	-
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	8.3E-02	5.3E-03	2.3E-02	-	-	-	1.2E-01	7.5E-03	3.3E-02	-	-	-	8.6E-02	5.5E-03	2.4E-02	-	-	-
FUG-10-FCC	FCC w/CVS	10-FCCU	4.2E-01	3.4E-02	1.5E-01	-	-	-	1.8E+00	1.4E-01	6.3E-01	8.0E-04	6.5E-05	2.8E-04	5.0E-03	4.0E-04	1.8E-03	-	-	-
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	5.7E+00	3.2E-01	1.4E+00	ND	-	-	7.1E-01	3.9E-02	1.7E-01	ND	-	-	7.2E-01	4.0E-02	1.7E-01	ND	-	-
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	4.2E-01	7.4E-04	3.2E-03	-	-	-	1.8E+00	3.2E-03	1.4E-02	8.0E-04	1.4E-06	6.2E-06	5.0E-03	8.8E-06	3.9E-05	-	-	-
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	5.7E+00	1.2E-02	5.3E-02	ND	-	-	7.1E-01	1.5E-03	6.5E-03	ND	-	-	7.2E-01	1.5E-03	6.6E-03	ND	-	-
FUG-20-ISOM	BenFree Unit	20-ISOM	7.6E+00	1.3E-01	5.6E-01	-	-	-	8.1E-01	1.4E-02	6.0E-02	ND	-	-	4.4E-01	7.5E-03	3.3E-02	-	-	-
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	-	-	-	2.0E-05	4.8E-07	2.1E-06	-	-	-	1.8E-02	4.3E-04	1.9E-03	-	-	-	4.7E-03	1.1E-04	5.0E-04
FUG-25-ROSE-2	ROSE Unit	25-ROSE	7.1E-03	3.3E-04	1.4E-03	9.7E-03	4.5E-04	2.0E-03	3.0E-04	1.4E-05	6.1E-05	ND	-	-	7.9E-04	3.6E-05	1.6E-04	-	-	-
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND 08-TK-FA 03-ROSE	4.2E-01	3.8E-02	1.7E-01	-	-	-	1.8E+00	1.6E-01	7.0E-01	8.0E-04	7.2E-05	3.2E-04	5.0E-03	4.5E-04	2.0E-03	-	-	-
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2 12-TGTU	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	8.3E+00	7.2E-01	3.1E+00	-	-	-	7.6E-01	6.6E-02	2.9E-01	-	-	-	5.3E-01	4.6E-02	2.0E-01	-	-	-
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	5.7E+00	2.2E-01	9.7E-01	ND	-	-	7.1E-01	2.7E-02	1.2E-01	ND	-	-	7.2E-01	2.8E-02	1.2E-01	ND	-	-
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G 16-SKID	5.7E+00	2.6E-01	1.1E+00	ND	-	-	7.1E-01	3.2E-02	1.4E-01	ND	-	-	7.2E-01	3.2E-02	1.4E-01	ND	-	-
FUG-36-RO	Reverse Osmosis	36-RO	5.7E+00	4.0E-03	1.8E-02	ND	-	-	7.1E-01	5.0E-04	2.2E-03	ND	-	-	7.2E-01	5.1E-04	2.2E-03	ND	-	-
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	5.7E+00	7.7E-02	3.4E-01	ND	-	-	7.1E-01	9.5E-03	4.1E-02	ND	-	-	7.2E-01	9.6E-03	4.2E-02	ND	-	-
FUG-41-PBC	PBC Unit	41-PBC	2.0E+00	1.6E-02	7.0E-02	-	-	-	7.6E-01	6.2E-03	2.7E-02	-	-	-	5.9E-01	4.8E-03	2.1E-02	-	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	4.2E-01	2.7E-03	1.2E-02	-	-	-	1.8E+00	1.1E-02	5.0E-02	8.0E-04	5.1E-06	2.2E-05	5.0E-03	3.2E-05	1.4E-04	-	-	-
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	8.3E+00	3.2E-01	1.4E+00	-	-	-	7.6E-01	3.0E-02	1.3E-01	-	-	-	5.3E-01	2.1E-02	9.0E-02	-	-	-
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	8.3E+00	1.2E-01	5.5E-01	-	-	-	7.6E-01	1.1E-02	5.0E-02	-	-	-	5.3E-01	8.0E-03	3.5E-02	-	-	-
FUG-54-PRIMEG	Prime G Unit	54-PRIME	4.2E-01	1.9E-02	8.3E-02	-	-	-	1.8E+00	8.1E-02	3.6E-01	8.0E-04	3.6E-05	1.6E-04	5.0E-03	2.3E-04	9.9E-04	-	-	-
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO																		
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO																		
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	4.2E-01	3.6E-02	1.6E-01	-	-	-	1.8E+00	1.5E-01	6.8E-01	8.0E-04	6.9E-05	3.0E-04	5.0E-03	4.3E-04	1.9E-03	-	-	-
FUG-73-SP UTIL	Utilities	73-SP-UT																		
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	4.9E-01	1.5E-02	6.5E-02	5.4E-04	1.6E-05	7.2E-05	3.2E-01	9.6E-03	4.2E-02	7.3E-02	2.2E-03	9.5E-03	-	-	-	ND	-	-
FUG-LPG	LPG Storage System	08-LPG-S																		
					11.67			0.003			3.84			0.01			1.07			0.001

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FUGITIVE PIPING COMPONENT POTENTIAL TO EMIT HAPs

			Selenium			Toluene			Xylene (mixed isomers)		
			7782-49-2			108-88-3			1330-20-7		
UNIT ID	**PROCESS UNIT**	**LDAR Database**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**	**wt%**	**lb/hr**	**tpy**
FUG-02-SP CRUDE	South Division Crude Unit	02-CRUDE	6.9E-06	5.4E-07	2.4E-06	4.3E-01	3.4E-02	1.5E-01	4.8E-01	3.7E-02	1.6E-01
FUG-06-NHDU	Naphtha HDS Unit 06	06-NDU	-	-	-	3.0E+00	1.2E-01	5.4E-01	1.5E+00	6.2E-02	2.7E-01
FUG-07-N AMINE	Amine Unit-Treating/Regen. [2]	07-AMINE	-	-	-	-	-	-	-	-	-
FUG-07-SWS1	Sour Water Stripper	07-SWS	-	-	-	-	-	-	-	-	-
FUG-08-TRUCK RK	Loading Racks	08-TRUCK	-	-	-	1.9E+00	3.8E-02	1.7E-01	7.0E+00	1.4E-01	6.1E-01
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	09-N-ALK	-	-	-	5.3E-01	3.3E-02	1.5E-01	1.4E-01	9.1E-03	4.0E-02
FUG-10-FCC	FCC w/CVS	10-FCCU	-	-	-	1.9E+00	1.6E-01	6.8E-01	7.0E+00	5.6E-01	2.5E+00
FUG-13-NHDU	Naphtha HDS Unit 13	13-NHD	-	-	-	3.0E+00	1.7E-01	7.3E-01	1.5E+00	8.4E-02	3.7E-01
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	18-MEROX	-	-	-	1.9E+00	3.4E-03	1.5E-02	7.0E+00	1.2E-02	5.4E-02
FUG-19-NAPHTHA	Naptha Merox	19-NAPH	-	-	-	3.0E+00	6.4E-03	2.8E-02	1.5E+00	3.2E-03	1.4E-02
FUG-20-ISOM	BenFree Unit	20-ISOM	-	-	-	7.4E-01	1.3E-02	5.5E-02	2.8E-02	4.8E-04	2.1E-03
FUG-21-SP VACUUM	Flasher/Vacuum Unit	21-VAC	-	-	-	-	-	-	-	-	-
FUG-25-ROSE-2	ROSE Unit	25-ROSE	ND	-	-	9.3E-04	4.3E-05	1.9E-04	1.1E-03	5.1E-05	2.2E-04
FUG-29-BLENDER/TK FARM	Light Oil Tankage	29-BLEND 08-TK-FA 03-ROSE	-	-	-	1.9E+00	1.7E-01	7.6E-01	7.0E+00	6.3E-01	2.8E+00
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	30-SRU-2 12-TGTU	-	-	-	-	-	-	-	-	-
FUG-31-SRU3/TGTU3/TGI3	SRU3 Unit	31-SRU-3	-	-	-	-	-	-	-	-	-
FUG-33-DIST HDU	Diesel HDS Unit w/CVS	33-DHDU	-	-	-	1.2E+00	1.0E-01	4.6E-01	4.6E-01	3.9E-02	1.7E-01
FUG-34-HYDROCRACKER	WX Hydrocracker	34-MHU	-	-	-	3.0E+00	1.2E-01	5.1E-01	1.5E+00	5.9E-02	2.6E-01
FUG-35-SAT GAS	Saturates Gas Plant	35-SAT-G 16-SKID	-	-	-	3.0E+00	1.4E-01	6.0E-01	1.5E+00	6.8E-02	3.0E-01
FUG-36-RO	Reverse Osmosis	36-RO	-	-	-	3.0E+00	2.1E-03	9.3E-03	1.5E+00	1.1E-03	4.7E-03
FUG-37-NP-UT	North Plant Utilities	37-NP-UT	-	-	-	3.0E+00	4.0E-02	1.8E-01	1.5E+00	2.0E-02	8.9E-02
FUG-41-PBC	PBC Unit	41-PBC	-	-	-	1.9E+00	1.6E-02	6.8E-02	-	-	-
FUG-43-S ALKY	South Alky Unit (W-76)	43-W76	-	-	-	1.9E+00	1.2E-02	5.4E-02	7.0E+00	4.4E-02	1.9E-01
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	44-DHDU	-	-	-	1.2E+00	4.7E-02	2.1E-01	4.6E-01	1.8E-02	7.7E-02
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	45-DHDU	-	-	-	1.2E+00	1.8E-02	8.0E-02	4.6E-01	6.9E-03	3.0E-02
FUG-54-PRIMEG	Prime G Unit	54-PRIME	-	-	-	1.9E+00	8.8E-02	3.8E-01	7.0E+00	3.2E-01	1.4E+00
FUG-63-H2 PLANT-1	Hydrogen Plant	63-HYDRO									
FUG-64-H2 PLANT-2	Hydrogen Plant	64-HYDRO									
FUG-70-CCR	CCR Reformer (w/in battery limits)	70-CCR	-	-	-	1.9E+00	1.7E-01	7.3E-01	7.0E+00	6.0E-01	2.6E+00
FUG-73-SP UTIL	Utilities	73-SP-UT									
FUG-80-WWTP CVS	Oil/Water Separator	80-WWTP	ND	-	-	5.0E-01	1.5E-02	6.5E-02	4.1E-01	1.2E-02	5.4E-02
FUG-LPG	LPG Storage System	08-LPG-S									
					2.4E-06			6.62			11.95

Notes:

a. HAP Speciation per API 4723A for each surrogate commodity.

FIXED ROOF TANKS POTENTIAL TO EMIT

AP-42 Chapter 7.1 Organic Liquid Storage Tanks (06/2020)

Tank ID	Stored Commodity: CHEMICAL NAME FOR VOC LOSSES CALCULATION	Stored Commodity: CHEMICAL NAME FOR HAPs LOSSES SPECIATION	Most Volatile Category of Allowable Liquids to be Stored	Regulatory Vapor Pressure Limitation (MACT CC, NSPS K, Ka, Kb)	MACT CC Group	Maximum Hourly Throughput Q_H bbl/hr	Net Throughput Q bbl/yr	H2S in Liquid $H2S_{liq}$ ppm
								API 4723A
T-0040	Spent Caustic	Caustic Treating - Spent Caustic	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	240	28,000	-
T-0041	Spent Caustic	Caustic Treating - Spent Caustic	Low VP	No limit (NSPS K/Ka, HAPs<4wt%, V<40,000gal)	Group 2	240	28,000	-
T-0049	Slop Oil	Various Units - Slop Oil	Moderate VP	TVP < 1.9 psia (MACT CC, HAPs>4wt%, V>20,000 gal)	Group 2	300	449,590	3,200
T-0055	Stripped Sour Water	Caustic Treating - Spent Caustic	Low VP	TVP < 1.5 psia (NSPS K/Ka, HAPs<4wt%, V>40,000gal)	Group 2	420	1,088,772	-
T-0059	Light Cycle Oil (LCO)	Fluid Catalytic Cracker - Light Cat Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	120	47,578	2.19
T-0061	Light Cycle Oil (LCO)	Fluid Catalytic Cracker - Light Cat Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	180	1,011,690	2.19
T-0063	Heavy Cycle Oil (HCO)	Fluid Catalytic Cracker - Heavy Cat Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	600	430,537	8.50
T-0065	Heavy Cycle Oil (HCO)	Fluid Catalytic Cracker - Heavy Cat Gas Oil	Low VP	TVP < 0.75 psia (NSPS Kb, HAPs<4wt%, V>40,000gal)	Group 2	600	430,537	8.50
T-0075	Heavy Cycle Oil (HCO)	Fluid Catalytic Cracker - Heavy Cat Gas Oil	Low VP	TVP < 0.75 psia (NSPS Kb, HAPs<4wt%, V>40,000gal)	Group 2	600	430,537	8.50
T-0081	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	Low VP	TVP < 0.75 psia (NSPS Kb, HAPs<4wt%, V>40,000gal)	Group 2	2,400	5,000,000	500
T-0082	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	Low VP	TVP < 0.75 psia (NSPS Kb, HAPs<4wt%, V>40,000gal)	Group 2	2,400	6,000,000	500
T-0110	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	600	5,256,000	500
T-0400	Gas Oil	Vacuum Distillation - Light Vacuum Gas Oil	Low VP	TVP < 1.5 psia (NSPS K/Ka, HAPs<4wt%, V>40,000gal)	Group 2	2,400	7,300,000	1.34
T-0410	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	Low VP	TVP < 1.5 psia (NSPS K/Ka, HAPs<4wt%, V>40,000gal)	Group 2	600	5,256,000	500
T-0419	No. 2 Fuel Oil (Diesel)	Distillate Blending - Diesel Fuel	Low VP	TVP < 0.5 psia (MACT CC, HAPs>4wt%, V>40,000 gal)	Group 2	240	3,650,000	3.54
T-0420	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	600	97,022	500
T-0422	Light Cycle Oil (LCO)	Fluid Catalytic Cracker - Light Cat Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	600	1,002,055	2.19
T-0423	Light Cycle Oil (LCO)	Fluid Catalytic Cracker - Light Cat Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	600	1,011,690	2.19
T-0431	Fuel Oil	Fluid Catalytic Cracker - Light Cat Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	1,600	394,200	2.19
T-0432	Fuel Oil	Fluid Catalytic Cracker - Light Cat Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	1,600	461,214	2.19
T-0433	Straight Run Gas Oil	Vacuum Distillation - Light Vacuum Gas Oil	Low VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	600	4,125,000	1.34
T-0434	Straight Run Diesel	Distillate Blending - Diesel Fuel	Low VP	TVP < 0.75 psia (MACT CC, HAPs>4wt%, V>40,000 gal)	Group 2	2,400	7,500,000	3.54
T-0438	Straight Run Gas Oil	Vacuum Distillation - Light Vacuum Gas Oil	Low VP	TVP < 1.5 psia (NSPS K/Ka, HAPs<4wt%, V>40,000gal)	Group 2	600	4,125,000	1.34
T-0814	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	Low VP	TVP < 0.75 psia (NSPS Kb, HAPs<4wt%, V>40,000gal)	Group 2	600	3,360,000	500
T-0815	No. 2 Fuel Oil (Diesel)	Distillate Blending - Diesel Fuel	Low VP	TVP < 0.5 psia (MACT CC, HAPs>4wt%, V>40,000 gal)	Group 2	3,600	26,097,500	3.54
T-0838	No. 2 Fuel Oil (Diesel)	Distillate Blending - Diesel Fuel	Low VP	TVP < 0.75 psia (MACT CC, HAPs>4wt%, V>40,000 gal)	Group 2	660	15,695,000	3.54
T-1227	Asphalt/Pitch	Asphalt Plant - (Feed) Pitch	Low VP	TVP < 0.75 psia (NSPS Kb, HAPs<4wt%, V>40,000gal)	Group 2	1,200	876,000	500

	TANK CHARACTERISTICS								TANK PAINT				CHEMICAL PROPERTIES					
Tank ID	Tank Type	Tank Insulated	Tank Construction	Tank Diameter	Tank Shell Height	Tank Effective Diameter (HFR ONLY)	Effective Tank Height (HFR ONLY)	Shell Capacity	Tank Shell Paint	Tank Roof Paint	Shell Paint Condition	Roof Paint Condition	Product Category	Liquid Molecular Weight	Vapor Molecular Weight	Density of the Liquid	Stock Vapor Density (P_{VA})	Stock Vapor Density (TVP Limit)
				D	H_S	D_E	H_E							M_L	M_V	W_L	W_V	
				ft	ft	ft	ft	gallons						lb/lbmole	lb/lbmole	lb/gal	lb/ft3	lb/ft^3
	CR DM HFR	YES-ALL-CTE YES-ALL-CYCLE YES-SHELL NO	Riveted-Bolted Welded	HFR: diam of vertical cross-section	HFR: length	AP-42 Ch. 7.1 Eq. 1-14	AP-42 Ch. 7.1 Eq. 1-15				New Average Aged	New Average Aged	Crude Oil Petroleum Stock Organic Liquids				AP-42, Ch. 7.1, Eq. 1-22	AP-42, Ch. 7.1, Eq. 1-22
T-0040	CR	NO	-	9.0	72.0	-	-	34,440	White	White	Aged	Aged	Petroleum Stock	188	130	7.10	1.9E-04	2.4E-04
T-0041	CR	NO	-	9.0	72.0	-	-	34,440	White	White	Aged	Aged	Petroleum Stock	188	130	7.10	1.9E-04	2.4E-04
T-0049	HFR	NO	-	11.0	36.0	22.5	8.6	25,620	White	White	Aged	Aged	Petroleum Stock	188	130	7.10	3.6E-02	4.4E-02
T-0055	CR	NO	-	45.0	36.0	-	-	428,400	White	White	Average	Average	Petroleum Stock	188	130	7.10	8.2E-04	3.3E-02
T-0059	CR	NO	-	35.0	30.0	-	-	215,880	Black	Black	Average	Average	Petroleum Stock	162	130	7.00	3.0E-04	4.3E-04
T-0061	CR	NO	-	50.0	30.0	-	-	440,580	Black	Black	Average	Average	Petroleum Stock	162	130	7.00	3.0E-04	4.4E-04
T-0063	CR	NO	-	51.0	30.0	-	-	458,220	Black	Black	Average	Average	Petroleum Stock	188	130	7.10	2.6E-04	3.8E-04
T-0065	CR	NO	-	50.0	30.0	-	-	440,580	Black	Black	Average	Average	Petroleum Stock	188	130	7.10	2.7E-04	1.7E-02
T-0075	CR	NO	-	65.0	32.0	-	-	794,220	Black	Black	Aged	Aged	Petroleum Stock	188	130	7.10	2.3E-04	1.7E-02
T-0081	CR	YES-ALL-CTE	-	108.5	40.0	-	-	2,766,540	Aluminum - Specular	Aluminum - Specular	Average	Average	Asphalt/Pitch	1,000	84	-	4.1E-05	8.8E-03
T-0082	CR	YES-ALL-CTE	-	140.0	40.0	-	-	4,605,720	Aluminum - Specular	Aluminum - Specular	Average	Average	Asphalt/Pitch	1,000	84	-	1.3E-05	9.3E-03
T-0110	CR	YES-ALL-CTE	-	108.0	35.0	-	-	2,398,200	Aluminum - Specular	Aluminum - Specular	Average	Average	Asphalt/Pitch	1,000	84	-	4.6E-04	9.3E-04
T-0400	CR	NO	-	120.0	48.0	-	-	4,060,560	Black	Black	Aged	Aged	Petroleum Stock	188	130	7.10	1.7E-03	3.2E-02
T-0410	CR	YES-ALL-CTE	-	79.0	40.0	-	-	1,466,640	Aluminum - Specular	Aluminum - Specular	Average	Average	Asphalt/Pitch	1,000	84	-	3.4E-04	1.6E-02
T-0419	CR	NO	-	53.0	28.0	-	-	462,000	White	White	Average	Average	Petroleum Stock	188	130	7.10	2.4E-04	1.1E-02
T-0420	CR	YES-ALL-CTE	-	50.0	30.0	-	-	440,580	Aluminum - Specular	Aluminum - Specular	Average	Average	Asphalt/Pitch	1,000	84	-	2.5E-06	2.0E-03
T-0422	CR	NO	-	50.0	30.0	-	-	440,580	White	White	New	New	Petroleum Stock	162	130	7.00	6.3E-04	7.6E-04
T-0423	CR	NO	-	50.0	30.0	-	-	440,580	White	White	New	New	Petroleum Stock	162	130	7.00	7.5E-04	9.0E-04
T-0431	CR	YES-ALL-CTE	-	109.0	32.0	-	-	2,233,560	Aluminum - Specular	Aluminum - Specular	Average	Average	Petroleum Stock	188	130	7.10	2.9E-03	1.6E-02
T-0432	CR	YES-ALL-CTE	-	109.0	32.0	-	-	2,233,560	Aluminum - Specular	Aluminum - Specular	Average	Average	Petroleum Stock	188	130	7.10	3.5E-03	1.4E-02
T-0433	CR	NO	-	117.0	42.0	-	-	3,377,640	Rust - Red Iron Oxide	Rust - Red Iron Oxide	Aged	Aged	Petroleum Stock	188	130	7.10	1.3E-03	1.7E-03
T-0434	CR	NO	-	117.0	42.0	-	-	3,377,640	White	White	New	New	Petroleum Stock	188	130	7.10	8.0E-03	1.7E-02
T-0438	CR	NO	-	90.0	48.0	-	-	2,283,960	Black	Black	Aged	Aged	Petroleum Stock	188	130	7.10	6.8E-04	3.3E-02
T-0814	CR	YES-ALL-CTE	-	50.0	32.0	-	-	469,980	Aluminum - Specular	Aluminum - Specular	Average	Average	Asphalt/Pitch	1,000	84	-	2.9E-03	7.1E-03
T-0815	CR	NO	-	116.0	43.0	-	-	3,399,060	White	White	New	New	Petroleum Stock	188	130	7.10	1.8E-04	1.2E-02
T-0838	CR	NO	-	74.0	40.0	-	-	1,286,880	White	White	New	New	Petroleum Stock	188	130	7.10	2.7E-04	1.7E-02
T-1227	CR	YES-ALL-CTE	-	77.0	40.0	-	-	1,393,140	Aluminum - Specular	Aluminum - Specular	Average	Average	Asphalt/Pitch	1,000	84	-	3.9E-03	6.9E-03

	METEOROLOGICAL DATA					TANK TEMPERATURE VARIABLES											
Tank ID	Average Wind Speed	Atmosph. Pressure	Daily Maximum Ambient Temp.	Daily Minimum Ambient Temp.	Daily Total Solar Insulation Factor	Tank Shell Surface Solar Absorptance	Tank Roof Surface Solar Absorptance	Daily Average Temp.	Liquid Bulk Temp. based on Ambient Met Data	Monthly Liquid Bulk Temperature Monitored	Liquid Bulk Temp.	Daily Average Liquid Surface Temp.	Average Vapor Temp.	Daily Temp. Range	Avg. Daily Vapor Temp. Range	Daily Maximum Liquid Surface Temp.	Daily Minimum Liquid Surface Temp.
	v	P_A	T_{AX}	T_{AN}	I	α_S	α_R	T_{AA}	T_B (AP-42)	T_B (Monitored)	T_B	T_{LA}	T_V	ΔT_A	ΔT_V	T_{LX}	T_{LN}
	mph	psia	°F	°F	Btu/ft^2d	unitless	unitless	°R	°R	°R	°R	°R	°R	°R	°R	°R	°R
						AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Eq. 1-30	AP-42, Ch. 7.1, Eq. 1-31	Ops Data	Max. Monitored vs AP-42 Estimate	AP-42, Ch. 7.1, T_B Full-Insul Eq. 1-29 Shell-Insul Eq. 1-27 Non-Insul	AP-42, Ch. 7.1, T_B Full-Insul Eq. 1-34 Shell-Insul Eq. 1-32 Non-Insul	AP-42, Ch. 7.1, Eq. 1-11	AP-42, Ch. 7.1, Eq. 1-6 Non-Insul Eq. 1-8 Shell-Insul ΔT_V = 0 Full-Insul and Constant Temp Eq. 8-1 Full-Insul and Cycle Temp	AP-42, Chp 7.1, Fig 7.1-17 For Full-Insul $T_{LX} = T_{BX}$	AP-42, Chp 7.1, Fig 7.1-17 For Full-Insul $T_{LN} = T_{BN}$
T-0040	9.0	13.1	77.9	50.0	1,711.9	0.34	0.34	523.6	525.4	524.57	525.4	526.4	527.4	27.9	34.2	535.0	517.9
T-0041	9.0	13.1	77.9	50.0	1,711.9	0.34	0.34	523.6	525.4	524.57	525.4	526.4	527.4	27.9	34.2	535.0	517.9
T-0049	9.0	13.1	77.9	50.0	1,711.9	0.34	0.34	523.6	525.4	524.57	525.4	526.6	527.9	27.9	33.6	535.0	518.2
T-0055	9.0	13.1	77.9	50.0	1,711.9	0.25	0.25	523.6	524.9	610.38	610.4	578.3	546.3	27.9	29.2	585.6	571.0
T-0059	9.0	13.1	77.9	50.0	1,711.9	0.97	0.97	523.6	528.6	529.54	529.5	534.3	539.0	27.9	50.2	546.8	521.7
T-0061	9.0	13.1	77.9	50.0	1,711.9	0.97	0.97	523.6	528.6	529.54	529.5	534.7	540.0	27.9	50.7	547.4	522.1
T-0063	9.0	13.1	77.9	50.0	1,711.9	0.97	0.97	523.6	528.6	534.88	534.9	538.1	541.3	27.9	50.7	550.8	525.4
T-0065	9.0	13.1	77.9	50.0	1,711.9	0.97	0.97	523.6	528.6	536.56	536.6	539.1	541.7	27.9	50.7	551.8	526.5
T-0075	9.0	13.1	77.9	50.0	1,711.9	0.97	0.97	523.6	528.6	459.70	528.6	534.4	540.2	27.9	50.9	547.2	521.7
T-0081	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	668.03	668.0	668.0	668.0	27.9	-	789.2	769.4
T-0082	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	633.37	633.4	633.4	633.4	27.9	-	780.5	731.2
T-0110	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	749.02	749.0	749.0	749.0	27.9	-	776.4	756.1
T-0400	9.0	13.1	77.9	50.0	1,711.9	0.97	0.97	523.6	528.6	616.00	616.0	590.9	565.9	27.9	51.2	603.7	578.1
T-0410	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	738.22	738.2	738.2	738.2	27.9	-	771.5	748.6
T-0419	9.0	13.1	77.9	50.0	1,711.9	0.25	0.25	523.6	524.9	539.24	539.2	535.4	531.6	27.9	28.4	542.5	528.3
T-0420	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	591.10	591.1	591.1	591.1	27.9	-	799.0	589.0
T-0422	9.0	13.1	77.9	50.0	1,711.9	0.17	0.17	523.6	524.5	579.06	579.1	559.5	540.0	27.9	26.2	566.1	553.0
T-0423	9.0	13.1	77.9	50.0	1,711.9	0.17	0.17	523.6	524.5	589.55	589.6	566.1	542.6	27.9	26.2	572.6	559.5
T-0431	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	637.50	637.5	637.5	637.5	27.9	-	725.9	620.6
T-0432	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	646.24	646.2	646.2	646.2	27.9	-	718.4	643.6
T-0433	9.0	13.1	77.9	50.0	1,711.9	0.50	0.50	523.6	526.2	604.85	604.8	580.4	556.0	27.9	36.0	589.4	571.4
T-0434	9.0	13.1	77.9	50.0	1,711.9	0.17	0.17	523.6	524.5	459.70	524.5	525.6	526.7	27.9	25.2	531.9	519.3
T-0438	9.0	13.1	77.9	50.0	1,711.9	0.97	0.97	523.6	528.6	567.35	567.3	558.7	550.1	27.9	50.8	571.4	546.0
T-0814	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	829.95	830.0	830.0	830.0	27.9	-	866.6	832.4
T-0815	9.0	13.1	77.9	50.0	1,711.9	0.17	0.17	523.6	524.5	459.70	524.5	525.6	526.7	27.9	25.2	531.9	519.3
T-0838	9.0	13.1	77.9	50.0	1,711.9	0.17	0.17	523.6	524.5	544.82	544.8	538.3	531.8	27.9	26.0	544.8	531.8
T-1227	9.0	13.1	77.9	50.0	1,711.9	0.44	0.44	523.6	525.9	845.04	845.0	845.0	845.0	27.9	-	909.4	839.9

Tank ID	TANK PRESSURE VARIABLES				BREATHER VENT SETTINGS			STANDING LOSSES							
	True Vapor Pressure at Daily Avg Temp. (T_{LA})	True Vapor Pressure at Daily Max. Liq. Surface Temp (T_{LX})	True Vapor Pressure at Daily Min. Liq. Surface Temp (T_{LN})	Avg. Daily Vapor Pressure Range	Breather Vent Pressure Setting	Breather Vent Vacuum Setting	Breather Vent Pressure Setting Range	Avg. Liquid Height	Tank Roof Height	Roof Outage	Vapor Space Outage	Volume of the Vapor Space	Vapor Space Expansion Factor	Vented Vapor Saturation Factor	Standing Loss
	P_{VA}	P_{VX}	P_{VN}	ΔP_V	P_{BP}	P_{BV}	ΔP_B	H_L	H_R	H_{RO}	H_{VO}	V_V	K_E	K_S	L_S
	psia	psia	psia	psia	psig	psig	psia	ft	ft	ft	ft	ft^3	unitless	unitless	lb/yr
	AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq Trumbore Asphalts			AP-42, Ch. 7.1, Eq. 1-9 §7.1.3.8.4	AP-42 Ch. 7.1, Note to Eq. 1-10	AP-42 Ch. 7.1, Note to Eq. 1-10	AP-42, Ch. 7.1, Eq. 1-10	AP-42, Ch. 7.1 Eq. 1-16	AP-42, Ch. 7.1, Eq. 1-18 for CR, Eq. 1-20 for DR	AP-42, Ch. 7.1, Eq. 1-17 for CR, Eq. 1-18 for DR	AP-42, Ch. 7.1 Eq. 1-16	AP-42, Ch. 7.1, Eq. 1-3	AP-42, Ch. 7.1 Eq. 1-5	AP-42, Ch. 7.1 Eq. 1-21	AP-42, Ch. 7.1, Eq. 1-2
T-0040	0.008	0.011	0.006	0.004	0.03	(0.03)	0.1	36.0	0.28	0.09	36.1	2,296	0.061	1.0	9.3
T-0041	0.008	0.011	0.006	0.004	0.03	(0.03)	0.1	36.0	0.28	0.09	36.1	2,296	0.061	1.0	9.3
T-0049	1.557	1.876	1.285	0.592	0.03	(0.03)	0.1	18.0	-	-	4.3	1,711	0.110	0.7	1,809.2
T-0055	0.037	0.045	0.030	0.014	0.03	(0.03)	0.1	18.0	1.41	0.47	18.5	29,373	0.047	1.0	397.0
T-0059	0.013	0.019	0.009	0.011	0.03	(0.03)	0.1	15.0	1.09	0.36	15.4	14,782	0.090	1.0	142.5
T-0061	0.013	0.020	0.009	0.011	0.03	(0.03)	0.1	15.0	1.56	0.52	15.5	30,475	0.091	1.0	300.3
T-0063	0.012	0.017	0.008	0.009	0.03	(0.03)	0.1	15.0	1.59	0.53	15.5	31,728	0.090	1.0	270.5
T-0065	0.012	0.018	0.008	0.010	0.03	(0.03)	0.1	15.0	1.56	0.52	15.5	30,475	0.090	1.0	267.2
T-0075	0.010	0.015	0.007	0.008	0.03	(0.03)	0.1	16.0	2.03	0.68	16.7	55,340	0.091	1.0	426.6
T-0081	0.004	0.122	0.075	-	0.03	(0.03)	0.1	20.0	3.39	1.13	21.1	195,368	-	1.0	-
T-0082	0.001	0.099	0.026	-	0.03	(0.03)	0.1	20.0	4.38	1.46	21.5	330,325	-	1.0	-
T-0110	0.044	0.089	0.053	-	0.03	(0.03)	0.1	17.5	3.38	1.13	18.6	170,621	-	1.0	-
T-0400	0.080	0.113	0.055	0.058	0.03	(0.03)	0.1	24.0	3.75	1.25	25.3	285,571	0.086	0.9	13,871.3
T-0410	0.032	0.079	0.043	-	0.03	(0.03)	0.1	20.0	2.47	0.82	20.8	102,067	-	1.0	-
T-0419	0.011	0.013	0.009	0.005	0.03	(0.03)	0.1	14.0	1.66	0.55	14.6	32,105	0.049	1.0	138.8
T-0420	0.000	0.153	0.000	-	0.03	(0.03)	0.1	15.0	1.56	0.52	15.5	30,475	-	1.0	-
T-0422	0.028	0.034	0.023	0.011	0.03	(0.03)	0.1	15.0	1.56	0.52	15.5	30,475	0.043	1.0	293.9
T-0423	0.034	0.040	0.028	0.012	0.03	(0.03)	0.1	15.0	1.56	0.52	15.5	30,475	0.043	1.0	347.0
T-0431	0.154	0.845	0.105	-	0.03	(0.03)	0.1	16.0	3.41	1.14	17.1	159,896	-	0.9	-
T-0432	0.186	0.743	0.176	-	0.03	(0.03)	0.1	16.0	3.41	1.14	17.1	159,896	-	0.9	-
T-0433	0.059	0.076	0.045	0.031	0.03	(0.03)	0.1	21.0	3.66	1.22	22.2	238,881	0.060	0.9	6,261.8
T-0434	0.348	0.410	0.294	0.116	0.03	(0.03)	0.1	21.0	3.66	1.22	22.2	238,881	0.052	0.7	25,871.3
T-0438	0.031	0.045	0.021	0.025	0.03	(0.03)	0.1	24.0	2.81	0.94	24.9	158,646	0.088	1.0	3,333.4
T-0814	0.305	0.643	0.322	-	0.03	(0.03)	0.1	16.0	1.56	0.52	16.5	32,439	-	0.8	-
T-0815	0.008	0.010	0.006	0.003	0.03	(0.03)	0.1	21.5	3.63	1.21	22.7	239,989	0.044	1.0	685.0
T-0838	0.012	0.014	0.010	0.005	0.03	(0.03)	0.1	20.0	2.31	0.77	20.8	89,332	0.044	1.0	378.5
T-1227	0.418	0.750	0.376	-	0.03	(0.03)	0.1	20.0	2.41	0.80	20.8	96,868	-	0.7	-

Tank ID	WORKING LOSSESS											CONTROL EFFICIENCY	MAXIMUM HOURLY FIXED ROOF LOSSES	TOTAL FIXED ROOF TANKS LOSSES	VOC Emissions		H2S Emissions		HAPs Emissions	
	Sum of Increases in Liquid Level	Max. Hourly Working Loss Throughput	Net Working Loss Throughput	Maximum Liquid Height	Minimum Liquid Height	Turnovers per Year	Working Losss Turnover (Saturation) Factor	Working Loss Product Factor	Vent Setting Correction Factor	Working Loss Max. Hourly	Working Loss									
	$\sum H_{QI}$		V_Q	H_{LX}	H_{LN}	N	K_N	K_P	K_B		L_W			LT						
	ft/yr	ft^3/hr	ft^3/yr	ft	ft	unitless	unitless	unitless	unitless	lb/hr	lb/yr		lb/hr	lb/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
	AP-42, Ch. 7.1 Eq. 1-37	AP-42, Ch. 7.1 Eq. 1-38/1-39	AP-42, Ch. 7.1 Eq. 1-38/1-39	AP-42, Ch. 7.1 Eq. 1-37 Notes	AP-42, Ch. 7.1 Eq. 1-37 Notes	AP-42, Ch. 7.1 Eq. 1-36	AP-42, Ch. 7.1 Eq. 1-35 Notes	AP-42, Ch. 7.1 Eq. 1-35 Notes	AP-42, Ch. 7.1 Eq. 1-41 Eq. 1-40	AP-42, Ch. 7.1 Eq. 1-35	AP-42, Ch. 7.1 Eq. 1-35		AP-42, Ch. 7.1 Eq. 1-35 @P_{VX}, K_N=1 with control	AP-42, Ch. 7.1 Eq. 1-1	AP-42 Ch. 7.1 David T Trumbore Asphalt/Pitch		Raoults Law		Raoults Law	
T-0040	2,470.9	1,348	157,192	71.0	1.0	35.3	1.0	1.0	1.0	0.33	29.1	-	0.33	38.5	0.33	0.02	-	-	4.08E-04	2.39E-05
T-0041	2,470.9	1,348	157,192	71.0	1.0	35.3	1.0	1.0	1.0	0.33	29.1	-	0.33	38.5	0.33	0.02	-	-	4.08E-04	2.39E-05
T-0049	6,373.7	1,684	2,524,001	8.6	-	737.8	0.2	1.0	1.0	73.44	18,702.1	95%	3.67	1,025.6	3.67	0.51	3.88E-01	4.45E-02	0.02	0.002
T-0055	3,843.2	2,358	6,112,364	35.0	1.0	113.0	0.4	1.0	1.0	78.43	2,159.4	-	78.43	2,556.4	78.43	1.28	-	-	0.10	0.002
T-0059	277.6	674	267,104	29.0	1.0	9.9	1.0	1.0	1.0	0.29	79.0	-	0.29	221.5	0.29	0.11	1.82E-05	5.66E-06	7.12E-05	2.70E-05
T-0061	2,892.6	1,011	5,679,630	29.0	1.0	103.3	0.5	1.0	1.0	0.45	778.4	-	0.45	1,078.7	0.45	0.54	2.78E-05	2.76E-05	1.09E-04	1.31E-04
T-0063	1,183.2	3,368	2,417,033	29.0	1.0	42.3	0.9	1.0	1.0	1.29	553.0	-	1.29	823.5	1.29	0.41	3.61E-04	9.49E-05	3.06E-05	9.79E-06
T-0065	1,231.0	3,368	2,417,033	29.0	1.0	44.0	0.8	1.0	1.0	56.50	552.3	-	56.50	819.5	56.50	0.41	1.59E-02	9.44E-05	0.001	9.74E-06
T-0075	728.4	3,368	2,417,033	31.0	1.0	24.3	1.0	1.0	1.0	56.65	563.9	-	56.65	990.6	56.65	0.50	1.59E-02	1.14E-04	0.001	1.18E-05
T-0081	3,035.9	13,474	28,070,000	39.0	1.0	79.9	0.5	1.0	1.0	118.41	626.0	-	118.41	626.0	118.41	0.31	5.92E-02	1.56E-04	4.73	0.01
T-0082	2,188.2	13,474	33,684,000	39.0	1.0	57.6	0.7	1.0	1.0	124.89	293.3	-	124.89	293.3	124.89	0.15	6.24E-02	7.33E-05	4.98	0.01
T-0110	3,221.0	3,368	29,507,184	34.0	1.0	97.6	0.5	1.0	1.0	3.13	6,375.8	-	3.13	6,375.8	3.13	3.19	1.57E-03	1.59E-03	0.12	0.13
T-0400	3,623.6	13,474	40,982,200	47.0	1.0	78.8	0.5	1.0	1.0	432.68	38,228.3	-	432.68	52,099.5	432.68	26.05	1.91E-02	9.46E-04	0.87	0.05
T-0410	6,019.8	3,368	29,507,184	39.0	1.0	158.4	0.4	1.0	1.0	53.58	3,598.8	-	53.58	3,598.8	53.58	1.80	2.68E-02	9.00E-04	2.14	0.07
T-0419	9,288.0	1,347	20,491,100	27.0	1.0	357.2	0.3	1.0	1.0	15.35	1,256.3	-	15.35	1,395.1	15.35	0.70	1.79E-03	6.69E-05	0.01	4.09E-04
T-0420	277.4	3,368	544,684	29.0	1.0	9.9	1.0	1.0	1.0	6.83	1.4	-	6.83	1.4	6.83	0.00	3.42E-03	3.38E-07	0.27	2.70E-05
T-0422	2,865.1	3,368	5,625,538	29.0	1.0	102.3	0.5	1.0	1.0	2.55	1,625.9	-	2.55	1,919.8	2.55	0.96	1.59E-04	4.91E-05	6.20E-04	2.34E-04
T-0423	2,892.6	3,368	5,679,630	29.0	1.0	103.3	0.5	1.0	1.0	3.04	1,953.1	-	3.04	2,300.1	3.04	1.15	1.89E-04	5.88E-05	7.39E-04	2.80E-04
T-0431	237.2	8,982	2,213,039	31.0	1.0	7.9	1.0	1.0	1.0	144.21	6,477.1	-	144.21	6,477.1	144.21	3.24	1.04E-02	1.92E-04	0.04	9.15E-04
T-0432	277.5	8,982	2,589,255	31.0	1.0	9.2	1.0	1.0	1.0	125.04	9,030.0	-	125.04	9,030.0	125.04	4.51	9.04E-03	2.68E-04	0.04	0.001
T-0433	2,153.9	3,368	23,157,750	41.0	1.0	53.8	0.7	1.0	1.0	5.60	21,563.2	-	5.60	27,825.0	5.60	13.91	2.48E-04	5.05E-04	0.01	0.03
T-0434	3,916.3	13,474	42,105,000	41.0	1.0	97.9	0.5	1.0	1.0	232.44	159,403.1	-	232.44	185,274.4	232.44	92.64	2.72E-02	8.89E-03	0.14	0.05
T-0438	3,640.2	3,368	23,157,750	47.0	1.0	79.1	0.5	1.0	1.0	111.27	8,576.0	-	111.27	11,909.3	111.27	5.95	4.92E-03	2.16E-04	0.22	0.01
T-0814	9,606.9	3,368	18,863,040	31.0	1.0	320.2	0.3	1.0	1.0	23.83	14,133.5	-	23.83	14,133.5	23.83	7.07	1.19E-02	3.53E-03	0.95	0.28
T-0815	13,863.3	20,210	146,511,365	42.0	1.0	338.1	0.3	1.0	1.0	232.44	6,766.6	-	232.44	7,451.7	232.44	3.73	2.72E-02	3.57E-04	0.14	0.002
T-0838	20,487.1	3,705	88,111,730	39.0	1.0	539.1	0.2	1.0	1.0	63.31	5,233.4	-	63.31	5,612.0	63.31	2.81	7.40E-03	2.69E-04	0.04	0.002
T-1227	1,056.1	6,737	4,917,864	39.0	1.0	27.8	1.0	1.0	1.0	46.80	19,049.2	-	46.80	19,049.2	46.80	9.52	2.34E-02	4.76E-03	1.87	0.38
														MAX. HOURLY, lb/hr	**1,943**		**0.72**		**16.68**	
														ANNUAL, tpy		**181.48**		**0.07**		**1.04**

FIXED ROOF TANKS POTENTIAL TO EMIT HAPs

Maximum individual HAPs (n-Hexane), tpy = 0.72
Total HAPS, tpy = 1.04

	2,2,4-Trimethylpentane	Acenaphthene	Acenaphthylene	Acetaldehyde	Anthracene	Benz(a)anthracene	Benzene	Benzo(a)phenanthrene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(e)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Biphenyl	Cresol (mixed isomers)	Cumene	Ethylbenzene	Fluoranthene	Fluorene
CAS No.	540-84-1	83-32-9	208-96-8	75-07-0	120-12-7	56-55-3	71-43-2	218-01-9	50-32-8	205-99-2	192-97-2	191-24-2	207-08-9	92-52-4	1319-77-3	98-82-8	100-41-4	206-44-0	86-73-7
Pi°, psia	7.85E-01	4.26E-05	9.28E-05	1.74E+01	1.16E-05	4.06E-09	2.01E+00	1.21E-10	1.06E-10	9.67E-09	1.10E-10	1.93E-12	1.87E-11	1.93E-04	3.48E-03	1.20E-01	2.17E-01	1.78E-07	1.16E-05
Tank	**Speciated Potential to Emit, tpy**																		
T-0040	-	-	1.20E-11	5.57E-08	-	-	1.20E-08	4.74E-21	5.65E-21	-	-	-	-	-	6.94E-10	3.57E-10	1.23E-10	-	-
T-0041	-	-	1.20E-11	5.57E-08	-	-	1.20E-08	4.74E-21	5.65E-21	-	-	-	-	-	6.94E-10	3.57E-10	1.23E-10	-	-
T-0049	1.83E-05	7.12E-10	9.06E-10	-	6.91E-10	2.44E-15	3.99E-04	5.81E-17	5.77E-17	7.96E-15	8.82E-17	-	-	1.55E-07	1.47E-07	2.08E-06	2.49E-05	5.51E-13	2.86E-10
T-0055	-	-	8.00E-10	3.70E-06	-	-	7.96E-07	3.15E-19	3.76E-19	-	-	-	-	-	4.61E-08	2.38E-08	8.19E-09	-	-
T-0059	4.48E-06	9.66E-10	1.24E-10	-	3.26E-11	-	2.12E-06	-	-	-	-	1.01E-18	-	7.25E-09	-	7.26E-08	1.25E-06	1.55E-14	1.72E-10
T-0061	2.18E-05	4.71E-09	6.02E-10	-	1.59E-10	-	1.03E-05	-	-	-	-	4.90E-18	-	3.53E-08	-	3.54E-07	6.08E-06	7.57E-14	8.36E-10
T-0063	-	1.08E-09	8.93E-11	-	1.94E-10	8.55E-14	1.04E-06	1.98E-15	2.54E-16	1.39E-14	2.29E-16	2.57E-18	1.16E-17	6.26E-09	-	-	5.33E-07	3.34E-12	3.73E-10
T-0065	-	1.08E-09	8.88E-11	-	1.93E-10	8.51E-14	1.04E-06	1.97E-15	2.53E-16	1.38E-14	2.28E-16	2.56E-18	1.15E-17	6.23E-09	-	-	5.30E-07	3.32E-12	3.71E-10
T-0075	-	1.30E-09	1.07E-10	-	2.33E-10	1.03E-13	1.26E-06	2.38E-15	3.06E-16	1.67E-14	2.76E-16	3.10E-18	1.39E-17	7.52E-09	-	-	6.41E-07	4.02E-12	4.48E-10
T-0081	1.28E-04	-	-	-	9.30E-11	-	1.03E-03	9.65E-16	-	-	-	1.55E-17	-	-	-	4.31E-06	8.10E-05	-	-
T-0082	6.02E-05	-	-	-	4.36E-11	-	4.83E-04	4.52E-16	-	-	-	7.26E-18	-	-	-	2.02E-06	3.80E-05	-	-
T-0110	1.31E-03	-	-	-	9.47E-10	-	1.05E-02	9.83E-15	-	-	-	1.58E-16	-	-	-	4.39E-05	8.25E-04	-	-
T-0400	-	-	-	-	9.40E-10	1.37E-13	5.23E-02	1.31E-14	3.09E-15	2.07E-13	1.15E-14	1.57E-16	-	-	-	-	-	1.18E-11	1.09E-09
T-0410	7.39E-04	-	-	-	5.34E-10	-	5.93E-03	5.55E-15	-	-	-	8.91E-17	-	-	-	2.48E-05	4.66E-04	-	-
T-0419	-	-	-	-	1.48E-08	-	3.41E-05	-	-	-	-	-	-	1.66E-09	-	1.93E-06	7.54E-06	-	-
T-0420	2.78E-07	-	-	-	2.01E-13	-	2.23E-06	2.09E-18	-	-	-	3.35E-20	-	-	-	9.32E-09	1.75E-07	-	-
T-0422	3.88E-05	8.37E-09	1.07E-09	-	2.83E-10	-	1.84E-05	-	-	-	-	8.73E-18	-	6.28E-08	-	6.29E-07	1.08E-05	1.35E-13	1.49E-09
T-0423	4.65E-05	1.00E-08	1.28E-09	-	3.38E-10	-	2.20E-05	-	-	-	-	1.05E-17	-	7.53E-08	-	7.54E-07	1.30E-05	1.61E-13	1.78E-09
T-0431	1.52E-04	3.28E-08	4.19E-09	-	1.11E-09	-	7.20E-05	-	-	-	-	3.42E-17	-	2.46E-07	-	2.46E-06	4.24E-05	5.27E-13	5.82E-09
T-0432	2.12E-04	4.57E-08	5.84E-09	-	1.54E-09	-	1.00E-04	-	-	-	-	4.76E-17	-	3.43E-07	-	3.44E-06	5.91E-05	7.35E-13	8.12E-09
T-0433	-	-	-	-	5.02E-10	7.32E-14	2.79E-02	6.98E-15	1.65E-15	1.10E-13	6.13E-15	8.37E-17	-	-	-	-	-	6.32E-12	5.82E-10
T-0434	-	-	-	-	1.96E-06	-	4.53E-03	-	-	-	-	-	-	2.20E-07	-	2.56E-04	1.00E-03	-	-
T-0438	-	-	-	-	2.15E-10	3.13E-14	1.20E-02	2.99E-15	7.07E-16	4.73E-14	2.62E-15	3.58E-17	-	-	-	-	-	2.70E-12	2.49E-10
T-0814	2.90E-03	-	-	-	2.10E-09	-	2.33E-02	2.18E-14	-	-	-	3.50E-16	-	-	-	9.73E-05	1.83E-03	-	-
T-0815	-	-	-	-	7.89E-08	-	1.82E-04	-	-	-	-	-	-	8.85E-09	-	1.03E-05	4.03E-05	-	-
T-0838	-	-	-	-	5.94E-08	-	1.37E-04	-	-	-	-	-	-	6.66E-09	-	7.75E-06	3.03E-05	-	-
T-1227	3.91E-03	-	-	-	2.83E-09	-	3.14E-02	2.94E-14	-	-	-	4.72E-16	-	-	-	1.31E-04	2.47E-03	-	-
Sum HAPs, tpy	**9.54E-03**	**1.07E-07**	**1.51E-08**	**3.81E-06**	**2.13E-06**	**5.17E-13**	**1.70E-01**	**9.74E-14**	**6.32E-15**	**4.17E-13**	**2.10E-14**	**1.48E-15**	**3.70E-17**	**1.18E-06**	**1.94E-07**	**5.89E-04**	**6.94E-03**	**3.37E-11**	**2.16E-08**

Raoult's Law
$P_i = x_i * TVP_i$
$P_i = y_i * TVP$
$y_i = x_i * TVP_i/TVP$

Liquid molar fraction $xi\ (mole_i/mole_T) = mi\ (g_i/g_T) * MW_{liq}\ (g_T/moles_T) / MW_i\ (g_i/moles_i) = wt\%_{liq} * MW_{liq}/MW_i$

Gas molar fraction $yi\ (mole_i/mole_T) = mi\ (g_i/g_T) * MW_{vap}\ (g_T/moles_T) / MW_i\ (g_i/moles_i) = wt\%_{vap} * MW_{vap}/MW_i$

$yi = xi * TVPi/TVP$
$wt\%_{vap} * MW_{vap}/MWi = wt\%_{liq} * MW_{liq}/MW_i * TVPi/TVP$
$wt\%_{vap} = wt\%_{liq} * TVP_i/TVP * MW_{liq}/MW_{vap}$

	Indeno(1,2,3-cd)pyrene	Lead compounds	m-Cresol	Methanol	Methyl ethyl ketone	Methyl isobutyl ketone	m-Xylene	Naphthalene	n-Hexane	o-Cresol	o-Xylene	PAH Total	Phenanthrene	Phenol	p-Xylene	Pyrene	Toluene	Xylene (mixed isomers)
CAS No.	193-39-5	7439-92-1	108-39-4	67-56-1	78-93-3	108-10-1	108-38-3	91-20-3	110-54-3	95-48-7	95-47-6	PAH	85-01-8	108-95-2	106-42-3	129-00-0	108-88-3	1330-20-7
Pi°, psia	2.42E-12	3.42E-02	2.13E-03	2.70E+00	1.75E+00	3.85E-01	1.60E-01	5.44E-03	3.14E+00	3.48E-03	1.29E-01	1.93E-12	2.34E-06	8.42E-03	1.71E-01	8.70E-08	6.00E-01	1.96E-01
Tank																		
T-0040	-	-	-	2.35E-05	6.82E-08	2.91E-08	-	3.21E-13	-	3.95E-11	3.15E-10	-	7.77E-17	2.53E-07	-	-	2.44E-09	4.02E-10
T-0041	-	-	-	2.35E-05	6.82E-08	2.91E-08	-	3.21E-13	-	3.95E-11	3.15E-10	-	7.77E-17	2.53E-07	-	-	2.44E-09	4.02E-10
T-0049	-	-	8.96E-08	5.35E-04	-	-	1.14E-04	2.66E-07	8.75E-04	1.46E-07	2.34E-05	-	9.64E-11	-	-	-	1.69E-04	4.59E-05
T-0055	-	-	-	1.56E-03	4.54E-06	1.93E-06	-	2.13E-11	-	2.62E-09	2.09E-08	-	5.16E-15	1.68E-05	-	-	1.62E-07	2.67E-08
T-0059	-	-	-	-	-	-	4.23E-06	2.95E-07	2.14E-06	-	8.49E-07	-	5.14E-11	-	1.59E-06	7.41E-14	4.28E-06	5.65E-06
T-0061	-	-	-	-	-	-	2.06E-05	1.44E-06	1.04E-05	-	4.13E-06	-	2.50E-10	-	7.74E-06	3.61E-13	2.09E-05	2.75E-05
T-0063	1.15E-18	1.20E-10	-	-	-	-	8.04E-07	7.96E-08	-	-	5.30E-07	-	1.91E-10	-	8.57E-07	6.39E-12	3.03E-06	2.90E-06
T-0065	1.14E-18	1.19E-10	-	-	-	-	8.00E-07	7.92E-08	-	-	5.28E-07	-	1.90E-10	-	8.53E-07	6.35E-12	3.02E-06	2.89E-06
T-0075	1.38E-18	1.44E-10	-	-	-	-	9.67E-07	9.57E-08	-	-	6.38E-07	-	2.30E-10	-	1.03E-06	7.68E-12	3.65E-06	3.49E-06
T-0081	-	1.23E-09	-	-	-	-	1.38E-04	1.85E-07	1.02E-02	-	-	-	4.23E-11	-	2.52E-05	-	6.74E-04	2.02E-04
T-0082	-	5.76E-10	-	-	-	-	6.47E-05	8.65E-08	4.78E-03	-	-	-	1.98E-11	-	1.18E-05	-	3.16E-04	9.48E-05
T-0110	-	1.25E-08	-	-	-	-	1.41E-03	1.88E-06	1.04E-01	-	-	-	4.31E-10	-	2.57E-04	-	6.86E-03	2.06E-03
T-0400	-	-	-	-	-	-	-	-	-	-	-	-	1.20E-09	-	-	1.19E-11	-	-
T-0410	-	7.07E-09	-	-	-	-	7.94E-04	1.06E-06	5.87E-02	-	-	-	2.43E-10	-	1.45E-04	-	3.87E-03	1.16E-03
T-0419	-	-	-	-	-	-	1.65E-04	6.55E-07	1.25E-05	-	5.96E-07	1.81E-15	3.07E-12	-	1.21E-04	-	3.02E-05	3.59E-05
T-0420	-	2.66E-12	-	-	-	-	2.99E-07	3.99E-10	2.21E-05	-	-	-	9.15E-14	-	5.45E-08	-	1.46E-06	4.38E-07
T-0422	-	-	-	-	-	-	3.67E-05	2.55E-06	1.85E-05	-	7.36E-06	-	4.46E-10	-	1.38E-05	6.42E-13	3.71E-05	4.90E-05
T-0423	-	-	-	-	-	-	4.40E-05	3.06E-06	2.22E-05	-	8.82E-06	-	5.34E-10	-	1.65E-05	7.69E-13	4.45E-05	5.87E-05
T-0431	-	-	-	-	-	-	1.44E-04	1.00E-05	7.25E-05	-	2.88E-05	-	1.74E-09	-	5.39E-05	2.51E-12	1.45E-04	1.92E-04
T-0432	-	-	-	-	-	-	2.00E-04	1.39E-05	1.01E-04	-	4.02E-05	-	2.43E-09	-	7.52E-05	3.51E-12	2.03E-04	2.67E-04
T-0433	-	-	-	-	-	-	-	-	-	-	-	-	6.41E-10	-	-	6.34E-12	-	-
T-0434	-	-	-	-	-	-	2.19E-02	8.70E-05	1.66E-03	-	7.91E-05	2.40E-13	4.08E-10	-	1.61E-02	-	4.01E-03	4.76E-03
T-0438	-	-	-	-	-	-	-	-	-	-	-	-	2.75E-10	-	-	2.71E-12	-	-
T-0814	-	2.78E-08	-	-	-	-	3.12E-03	4.17E-06	2.30E-01	-	-	-	9.55E-10	-	5.69E-04	-	1.52E-02	4.57E-03
T-0815	-	-	-	-	-	-	8.79E-04	3.50E-06	6.67E-05	-	3.18E-06	9.65E-15	1.64E-11	-	6.48E-04	-	1.61E-04	1.92E-04
T-0838	-	-	-	-	-	-	6.62E-04	2.64E-06	5.02E-05	-	2.40E-06	7.27E-15	1.24E-11	-	4.88E-04	-	1.21E-04	1.44E-04
T-1227	-	3.74E-08	-	-	-	-	4.20E-03	5.62E-06	3.11E-01	-	-	-	1.29E-09	-	7.67E-04	-	2.05E-02	6.16E-03
Sum HAPs, tpy	**3.66E-18**	**8.70E-08**	**8.96E-08**	**2.15E-03**	**4.67E-06**	**1.99E-06**	**3.39E-02**	**1.39E-04**	**7.22E-01**	**1.49E-07**	**2.01E-04**	**2.59E-13**	**1.17E-08**	**1.73E-05**	**1.93E-02**	**4.92E-11**	**5.24E-02**	**2.00E-02**

FLOATING ROOF TANKS (EXT, INT) POTENTIAL TO EMIT

AP-42 Chapter 7.1 Organic Liquid Storage Tanks (06/2020)

Tank ID	Stored Commodity		Most Volatile Category of Allowable Liquids to be Stored	Regulatory Vapor Pressure Limitation (MACT CC, NSPS K, Ka, Kb)	MACT CC Group	Maximum Hourly Throughput	Net Throughput	Are Seal Gap Is Maintained with Gaps < 1/8 in.?	H2S in Liquid
	CHEMICAL NAME FOR VOC LOSSES CALCULATION	CHEMICAL NAME FOR HAPs LOSSES SPECIATION				Q_H	Q		$H2S_{liq}$
						bbl/hr	bbl/yr		ppm
								No - Avg. Fitting Yes - Tight Fitting	API 4723A
T-0011	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	624.29	2,000,000	Avg. Fitting	-
T-0012	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	624.29	2,000,000	Avg. Fitting	-
T-0020	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	624.29	1,800,000	Avg. Fitting	-
T-0021	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	624.29	1,800,000	Avg. Fitting	-
T-0022	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	624.29	1,800,000	Avg. Fitting	-
T-0023	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	624.29	1,800,000	Avg. Fitting	-
T-0056	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	600.00	9,855,000	Avg. Fitting	-
T-0079	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	5,200.00	5,780,000	Avg. Fitting	-
T-0106	Sour Water	Various Units - Slop Oil	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	2,400.00	2,390,000	Avg. Fitting	3,200
T-0107	Gasolines & Gasoline Blendstocks	Atmospheric Distillation - Straight Run Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	1200	3,197,400	Avg. Fitting	0.035
T-0108	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	300.00	2,796,814	Avg. Fitting	-
T-0109	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	1,200.00	3,452,000	Avg. Fitting	-
T-0111	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	600.00	1,415,000	Avg. Fitting	-
T-0112	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	600.00	30,000	Avg. Fitting	-
T-0117	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	2,400.00	1,292,000	Avg. Fitting	-
T-0124	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	1,200.00	2,308,000	Avg. Fitting	-
T-0401	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	600.00	5,110,000	Avg. Fitting	-
T-0402	Light Cat Naphtha	Fluid Catalytic Cracker - Cracked Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	600.00	6,205,000	Avg. Fitting	0.80
T-0411	Gasolines & Gasoline Blendstocks	Atmospheric Distillation - Straight Run Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	2400	3,197,400	Avg. Fitting	0.03

FLOATING ROOF TANKS (EXT, INT) POTENTIAL TO EMIT

AP-42 Chapter 7.1 Organic Liquid Storage Tanks (06/2020)

Tank ID	Stored Commodity		Most Volatile Category of Allowable Liquids to be Stored	Regulatory Vapor Pressure Limitation (MACT CC, NSPS K, Ka, Kb)	MACT CC Group	Maximum Hourly Throughput	Net Throughput	Are Seal Gap Is Maintained with Gaps < 1/8 in.?	H2S in Liquid
	CHEMICAL NAME FOR VOC LOSSES CALCULATION	CHEMICAL NAME FOR HAPs LOSSES SPECIATION				Q_H	Q		$H2S_{liq}$
						bbl/hr	bbl/yr		ppm
								No - Avg. Fitting Yes - Tight Fitting	API 4723A
T-0412	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	2,520.00	1,292,000	Avg. Fitting	-
T-0413	Straight Run Kerosene	Atmospheric Distillation - Straight Run Kerosene	High VP	No limit (Pre-NSPS, HAPs<4wt%)	Group 2	2,520.00	4,927,500	Avg. Fitting	-
T-0415	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	2,160.00	3,452,000	Avg. Fitting	-
T-0417	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	1,200.00	1,415,000	Avg. Fitting	-
T-0418	Straight Run Kerosene	Atmospheric Distillation - Straight Run Kerosene	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 2	240.00	4,200,000	Avg. Fitting	-
T-0435	Sour Water	Various Units - Slop Oil	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	300.00	2,628,000	Avg. Fitting	3,200
T-0437	Crude Oil	Supply System - Crude Oil	High VP	TVP < 11.1 psia (NSPS Kb, HAPs<4wt%,V>20,000gal)	Group 2	4,200.00	16,754,000	Avg. Fitting	12.50
T-0439	Sour Naphtha	Atmospheric Distillation - Straight Run Naphtha	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	4,200.00	18,067,500	Avg. Fitting	1.67
T-0450	Sour Naphtha	Atmospheric Distillation - Straight Run Naphtha	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	5,200.00	9,855,000	Avg. Fitting	1.67
T-0451	Straight Run Diesel	Distillate Blending - Diesel Fuel	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 2	225.71	949,000	Avg. Fitting	3.54
T-0452	Ethanol	-	High VP	TVP < 11.1 psia (NSPS Kb, HAPs<4wt%,V>20,000gal)	Group 2	1,024.29	142,350	Avg. Fitting	-
T-0737	Sour Water	Various Units - Slop Oil	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	572.00	5,006,000	Avg. Fitting	3,200
T-0802	Sour Water	Various Units - Slop Oil	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	572.00	5,006,000	Avg. Fitting	3,200
T-0821	Light Cat Naphtha	Fluid Catalytic Cracker - Cracked Gasoline	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 1	730.00	6,394,800	Avg. Fitting	0.80
T-0834	Straight Run Diesel	Distillate Blending - Diesel Fuel	Moderate VP	TVP < 1.9 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 2	660.00	15,695,000	Avg. Fitting	3.54
T-0835	Straight Run Diesel	Distillate Blending - Diesel Fuel	High VP	TVP < 11.1 psia (MACT CC, HAPs>4wt%, V>20,000gal)	Group 2	960.00	15,695,000	Avg. Fitting	3.54
T-1225	Crude Oil	Supply System - Crude Oil	High VP	TVP < 11.1 psia (NSPS Kb, HAPs<4wt%,V>20,000gal)	Group 2	1,714.29	38,106,000	Avg. Fitting	12.50

Tank ID	TANK CHARACTERISTICS								TANK CHARACTERISTICS						
	Tank Type	Tank Diameter	Tank Shell Height	Shell Capacity	Tank Insulated	Tank Construction	Deck Construction	Deck Type	Deck Type (EFR)	Rim Seal System Primary Seal	Rim Seal System Secondary Seal	Deck Seam Type	Deck Seam Length	Self or Column Supported Roof?	Column Construction Details
		D	H_S										L_{seam}		
		ft	ft	gallons									ft		
	INT EXT EXT-GEO EXT-CR				YES-ALL-CTE YES-ALL-CYCLE YES-SHELL NO	Riveted-Bolted Welded	Riveted-Bolted Welded	Continous Sheet Panel Unknown	Steel Peripheral Pontoon (SPP) Steel Double Deck (SDD)	Mechanical Shoe Liquid-mounted Vapor-mounted	None Shoe-mounted Rim-mounted	5 ft wide; 6 ft wide; 7 ft wide; 5 x 7.5 ft rectangular; 5 x 12 ft rectangular Unknown		Self-Supported Column	9"x7" built-up columns 8" diameter pipe columns Tank Specific Unknown
T-0011	INT	89.00	29.00	1,349,460	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0012	INT	89.00	29.00	1,349,460	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0020	INT	90.00	48.00	2,283,960	NO	Welded	Welded	Unknown	SPP	Mechanical Shoe	Shoe-mounted	Unknown	-	Column	Unknown
T-0021	INT	90.00	48.00	2,283,960	NO	Welded	Welded	Unknown	SPP	Mechanical Shoe	Shoe-mounted	Unknown	-	Column	Unknown
T-0022	INT	75.00	48.00	1,586,340	NO	Welded	Welded	Unknown	SPP	Mechanical Shoe	Shoe-mounted	Unknown	-	Column	Unknown
T-0023	INT	75.00	48.00	1,586,340	NO	Welded	Welded	Unknown	SPP	Mechanical Shoe	Shoe-mounted	Unknown	-	Column	Unknown
T-0056	INT	48.00	36.00	487,200	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0079	EXT	125.00	40.00	3,671,640	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0106	INT	67.00	40.00	1,055,040	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0107	INT	67.00	40.00	1,055,040	NO	Welded	Riveted-Bolted	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0108	INT	67.00	40.00	1,055,040	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0109	INT	67.00	40.00	1,055,040	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0111	INT	49.00	30.00	423,360	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0112	INT	48.00	30.00	406,140	NO	Welded	Riveted-Bolted	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0117	EXT	48.00	48.00	649,740	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0124	INT	40.00	30.00	281,820	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0401	EXT-GEO	90.00	50.00	2,379,300	NO	Welded	Welded	Unknown	SPP	Mechanical Shoe	Rim-mounted	Unknown	-	Self-Supporte	-
T-0402	EXT	90.00	50.00	2,379,300	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0411	EXT	100.00	40.00	2,349,900	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-

Tank ID	TANK CHARACTERISTICS									TANK CHARACTERISTICS					
	Tank Type	Tank Diameter D ft	Tank Shell Height H_S ft	Shell Capacity gallons	Tank Insulated	Tank Construction	Deck Construction	Deck Type	Deck Type (EFR)	Rim Seal System Primary Seal	Rim Seal System Secondary Seal	Deck Seam Type	Deck Seam Length L_{seam} ft	Self or Column Supported Roof?	Column Construction Details
	INT EXT EXT-GEO EXT-CR				YES-ALL-CTE YES-ALL-CYCLE YES-SHELL NO	Riveted-Bolted Welded	Riveted-Bolted Welded	Continous Sheet Panel Unknown	Steel Peripheral Pontoon (SPP) Steel Double Deck (SDD)	Mechanical Shoe Liquid-mounted Vapor-mounted	None Shoe-mounted Rim-mounted	5 ft wide; 6 ft wide; 7 ft wide; 5 x 7.5 ft rectangular; 5 x 12 ft rectangular Unknown		Self-Supported Column	9"x7" built-up columns 8" diameter pipe columns Tank Specific Unknown
T-0412	EXT	100.00	40.00	2,349,900	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0413	INT	67.00	39.00	1,028,580	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0415	INT	67.00	40.00	1,055,040	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0417	INT	50.00	30.00	440,580	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0418	INT	67.00	33.00	870,240	NO	Welded	Welded	Unknown	SPP	Vapor-mounted	Rim-mounted	Unknown	-	Column	Unknown
T-0435	EXT	30.00	40.00	211,680	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0437	EXT	120.00	45.00	3,806,880	NO	Welded	Welded	-	SPP	Liquid-mounted	Rim-mounted	-	-	-	-
T-0439	INT	130.00	46.00	4,567,080	NO	Welded	Welded	Unknown	SPP	Mechanical Shoe	Rim-mounted	Unknown	-	Column	Unknown
T-0450	EXT	120.00	40.00	3,383,940	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0451	INT	35.00	40.00	287,700	YES-ALL-CTE	Welded	Welded	Unknown	SPP	Mechanical Shoe	Rim-mounted	Unknown	-	Column	Unknown
T-0452	INT	35.00	40.00	287,700	NO	Welded	Welded	Unknown	SPP	Mechanical Shoe	Rim-mounted	Unknown	-	Column	Unknown
T-0737	EXT	63.00	40.00	932,820	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0802	EXT	45.00	40.00	475,860	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0821	EXT	106.00	50.00	3,300,360	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-0834	EXT	85.00	40.00	1,697,640	NO	Welded	Welded	-	SPP	Mechanical Shoe	None	-	-	-	-
T-0835	EXT	111.00	40.00	2,895,480	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-
T-1225	EXT	150.00	40.00	5,287,380	NO	Welded	Welded	-	SPP	Mechanical Shoe	Rim-mounted	-	-	-	-

Tank ID	TANK PAINT					CHEMICAL PROPERTIES				METEOROLOGICAL DATA				
	Tank Shell Paint	Tank Roof Paint	Shell Paint Condition	Roof Paint Condition	Internal Shell Condition	Product Category	Liquid Molecular Weight	Vapor Molecular Weight	Density of the Liquid	Average Wind Speed	Atmosph. Pressure	Daily Maximum Ambient Temp.	Daily Minimum Ambient Temp.	Daily Total Solar Insulation Factor
							M_L	M_V	W_L	v	P_A	T_{AX}	T_{AN}	I
							lb/lbmole	lb/lbmole	lb/gal	mph	psia	°F	°F	Btu/ft^2d
			New Average Aged	New Average Aged	Light Rust Dense Rust Gunite Lining	Organic Liquids Crude Oil Petroleum Stock								
T-0011	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0012	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0020	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0021	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0022	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0023	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0056	White	White	Average	Average	Light Rust	Petroleum Stock	120	80	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0079	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0106	White	White	New	New	Light Rust	Crude Oil	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0107	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0108	White	White	Average	Average	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0109	White	White	Aged	Aged	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0111	White	White	Aged	Aged	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0112	White	White	Average	Average	Light Rust	Petroleum Stock	120	80	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0117	White	White	New	New	Light Rust	Petroleum Stock	120	80	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0124	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0401	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0402	White	White	New	New	Light Rust	Petroleum Stock	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0411	White	White	Average	Average	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9

Tank ID	TANK PAINT					CHEMICAL PROPERTIES				METEOROLOGICAL DATA				
	Tank Shell Paint	Tank Roof Paint	Shell Paint Condition	Roof Paint Condition	Internal Shell Condition	Product Category	Liquid Molecular Weight	Vapor Molecular Weight	Density of the Liquid	Average Wind Speed	Atmosph. Pressure	Daily Maximum Ambient Temp.	Daily Minimum Ambient Temp.	Daily Total Solar Insulation Factor
							M_L	M_V	W_L	v	P_A	T_{AX}	T_{AN}	I
							lb/lbmole	lb/lbmole	lb/gal	mph	psia	°F	°F	Btu/ft^2d
			New Average Aged	New Average Aged	Light Rust Dense Rust Gunite Lining	Organic Liquids Crude Oil Petroleum Stock								
T-0412	White	White	Average	Average	Light Rust	Petroleum Stock	120	80	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0413	White	White	New	New	Light Rust	Petroleum Stock	162	130	7.00	9.0	13.1	77.9	50.0	1,711.9
T-0415	White	White	New	New	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0417	White	White	Aged	Aged	Light Rust	Petroleum Stock	92	62	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0418	White	White	New	New	Light Rust	Petroleum Stock	162	130	7.00	9.0	13.1	77.9	50.0	1,711.9
T-0435	White	White	New	New	Light Rust	Crude Oil	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0437	White	White	New	New	Light Rust	Crude Oil	207	58	7.10	9.0	13.1	77.9	50.0	1,711.9
T-0439	White	White	Average	Average	Light Rust	Petroleum Stock	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0450	White	White	New	New	Light Rust	Petroleum Stock	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0451	Aluminum - Specular	Aluminum - Specular	Average	Average	Light Rust	Petroleum Stock	188	130	7.10	9.0	13.1	77.9	50.0	1,711.9
T-0452	White	White	Average	Average	Light Rust	Organic Liquids	-	46	6.59	9.0	13.1	77.9	50.0	1,711.9
T-0737	White	White	New	New	Light Rust	Crude Oil	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0802	White	White	New	New	Light Rust	Crude Oil	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0821	White	White	Average	Average	Light Rust	Petroleum Stock	92	66	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0834	White	White	Average	Average	Light Rust	Petroleum Stock	188	130	7.10	9.0	13.1	77.9	50.0	1,711.9
T-0835	White	White	Average	Average	Light Rust	Petroleum Stock	188	130	7.10	9.0	13.1	77.9	50.0	1,711.9
T-1225	White	White	Average	Average	Light Rust	Crude Oil	207	58	7.10	9.0	13.1	77.9	50.0	1,711.9

Tank ID	TANK TEMPERATURE VARIABLES							TANK PRESSURE VARIABLES			
	Tank Shell Surface Solar Absorptance	Tank Roof Surface Solar Absorptance	Daily Average Temp.	Liquid Bulk Temp. based on Ambient Met Data	Monthly Liquid Bulk Temperature Monitored	Liquid Bulk Temp.	Daily Average Liquid Surface Temp.	Max. True Vapor Pressure	True Vapor Pressure at Daily Avg Temp. (T_{LA})	Vapor Pressure Function (P_{VA})	Vapor Pressure Function (TVP Limit)
	α_S	α_R	T_{AA}	T_B (AP-42)	T_B (Monitored)	T_B	T_{LA}	P_{vmax}	P_{VA}	P*	P*max
	unitless	unitless	°R	°R	°R	°R	°R	psia	psia	unitless	unitless
	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Eq. 1-30	AP-42, Ch. 7.1, Eq. 1-31 INT, EXT-GEO, EXT-CR Eq. 2-8 EXT w/ SPP Eq. 2-11 EXT w/ SDD	Ops Data	Max. Monitored vs AP-42 Estimate	AP-42, Ch. 7.1, Eq. 2-5 INT, EXT-GEO, EXT-CR Eq. 2.7 EXT w/ SPP Eq. 2-10 EXT w/ SDD		AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42 Ch. 7.1 Eq. 2-4	AP-42 Ch. 7.1 Eq. 2-4
T-0011	0.17	0.17	523.6	524.5	534.38	534.4	532.2	11.1	9.1	0.289	0.441
T-0012	0.17	0.17	523.6	524.5	527.71	527.7	527.7	11.1	8.4	0.251	0.441
T-0020	0.17	0.17	523.6	524.5	-	524.5	525.4	11.1	8.1	0.235	0.441
T-0021	0.17	0.17	523.6	524.5	-	524.5	525.4	11.1	8.1	0.235	0.441
T-0022	0.17	0.17	523.6	524.5	-	524.5	525.4	11.1	8.0	0.235	0.441
T-0023	0.17	0.17	523.6	524.5	-	524.5	525.4	11.1	8.0	0.235	0.441
T-0056	0.25	0.25	523.6	524.9	526.74	526.7	527.3	11.1	1.9	0.039	0.441
T-0079	0.17	0.17	523.6	525.9	545.55	545.5	532.5	11.1	9.1	0.292	0.441
T-0106	0.17	0.17	523.6	524.5	532.10	532.1	530.4	11.1	7.0	0.191	0.441
T-0107	0.17	0.17	523.6	524.5	533.57	533.6	531.3	11.1	9.0	0.281	0.441
T-0108	0.25	0.25	523.6	524.9	544.62	544.6	539.1	11.1	10.3	0.366	0.441
T-0109	0.34	0.34	523.6	525.4	542.01	542.0	538.0	11.1	10.1	0.352	0.441
T-0111	0.34	0.34	523.6	525.4	541.40	541.4	537.6	11.1	10.0	0.347	0.441
T-0112	0.25	0.25	523.6	524.9	525.91	525.9	526.9	11.1	1.9	0.039	0.441
T-0117	0.17	0.17	523.6	525.2	528.39	528.4	527.4	11.1	1.9	0.039	0.441
T-0124	0.17	0.17	523.6	524.5	528.23	528.2	527.7	11.1	8.4	0.252	0.441
T-0401	0.17	0.17	523.6	524.5	532.24	532.2	530.5	11.1	8.8	0.274	0.441
T-0402	0.17	0.17	523.6	525.5	538.33	538.3	530.4	11.1	6.3	0.163	0.441
T-0411	0.25	0.25	523.6	526.7	525.12	526.7	528.0	11.1	8.4	0.254	0.441

Tank ID	TANK TEMPERATURE VARIABLES							TANK PRESSURE VARIABLES			
	Tank Shell Surface Solar Absorptance	Tank Roof Surface Solar Absorptance	Daily Average Temp.	Liquid Bulk Temp. based on Ambient Met Data	Monthly Liquid Bulk Temperature Monitored	Liquid Bulk Temp.	Daily Average Liquid Surface Temp.	Max. True Vapor Pressure	True Vapor Pressure at Daily Avg Temp. (T_{LA})	Vapor Pressure Function (P_{VA})	Vapor Pressure Function (TVP Limit)
	α_S	α_R	T_{AA}	T_B (AP-42)	T_B (Monitored)	T_B	T_{LA}	P_{vmax}	P_{VA}	P*	P*max
	unitless	unitless	°R	°R	°R	°R	°R	psia	psia	unitless	unitless
	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Eq. 1-30	AP-42, Ch. 7.1, Eq. 1-31 INT, EXT-GEO, EXT-CR Eq. 2-8 EXT w/ SPP Eq. 2-11 EXT w/ SDD	Ops Data	Max. Monitored vs AP-42 Estimate	AP-42, Ch. 7.1, Eq. 2-5 INT, EXT-GEO, EXT-CR Eq. 2.7 EXT w/ SPP Eq. 2-10 EXT w/ SDD		AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42 Ch. 7.1 Eq. 2-4	AP-42 Ch. 7.1 Eq. 2-4
T-0412	0.25	0.25	523.6	526.7	526.39	526.7	528.0	11.1	1.9	0.040	0.441
T-0413	0.17	0.17	523.6	524.5	535.45	535.5	532.6	11.1	0.5	0.009	0.441
T-0415	0.17	0.17	523.6	524.5	527.18	527.2	527.1	11.1	8.3	0.247	0.441
T-0417	0.34	0.34	523.6	525.4	531.21	531.2	531.0	11.1	8.9	0.278	0.441
T-0418	0.17	0.17	523.6	524.5	539.63	539.6	535.4	11.1	0.5	0.010	0.441
T-0435	0.17	0.17	523.6	525.0	524.57	525.0	526.4	11.1	6.6	0.173	0.441
T-0437	0.17	0.17	523.6	525.8	533.44	533.4	528.9	11.1	6.9	0.184	0.441
T-0439	0.25	0.25	523.6	524.9	531.80	531.8	531.0	11.1	7.5	0.209	0.441
T-0450	0.17	0.17	523.6	525.9	531.26	531.3	528.3	11.1	7.1	0.194	0.441
T-0451	0.44	0.44	523.6	525.9	534.20	534.2	534.2	11.1	0.4	0.008	0.441
T-0452	0.25	0.25	523.6	524.9	515.12	524.9	526.0	11.1	0.8	0.016	0.441
T-0737	0.17	0.17	523.6	525.4	524.57	525.4	526.5	11.1	6.6	0.174	0.441
T-0802	0.17	0.17	523.6	525.2	524.57	525.2	526.4	11.1	6.6	0.174	0.441
T-0821	0.25	0.25	523.6	526.6	520.65	526.6	527.9	11.1	6.0	0.153	0.441
T-0834	0.25	0.25	523.6	526.6	541.9	541.9	532.5	1.9	0.4	0.008	0.039
T-0835	0.25	0.25	523.6	526.8	542.05	542.1	532.6	11.1	0.4	0.008	0.441
T-1225	0.25	0.25	523.6	527.1	530.25	530.3	529.0	11.1	6.9	0.185	0.441

Tank ID	RIM SEAL LOSSES							DECK FITTING LOSSES			DECK SEAM LOSSES (IFR)			
	Zero Wind Speed Rim Seal Loss Factor	Wind Speed Dependent Rim Seal Loss Factor	Seal-Related Wind Speed Exponent	Average Ambient Wind Speed at the Tank Site	Product Factor	Rim Seal Loss Max Hourly	Rim Seal Loss	Total Deck Fitting Loss Factor	Deck Fitting Loss Max Hourly	Deck Fitting Loss	Deck Seam Loss per Unit Seam Length Factor	Deck Seam Length Factor	Deck Seam Loss Max Hourly	Deck Seam Loss
	K_{Ra}	K_{Rb}	n	v_{tank}	K_C		L_R	$F_F = \sum(N_{Fi} * K_{fi})$		L_F	K_D	S_D		L_D
	lbmole/ft*yr	lbmole/(mph)^{n}ft*yr	unitless	mph	unitless	lb/hr	lb/month	lbmole/yr	lb/hr	lb/month	lbmole/ft-yr	ft/ft^2	lb/hr	lb/month
	AP-42 CH. 7.1 Table 7.1-8 Varies if fittings are avg. or tight	AP-42 CH. 7.1 Table 7.1-8 Varies if fittings are avg. or tight	AP-42 CH. 7.1 Table 7.1-8 Varies if fittings are avg. or tight	AP-42 Ch. 7.1 Eq. 2-3 Note 1	AP-42 Ch. 7.1 Eq. 2-3 Notes	AP-42 Ch. 7.1 Eq. 2-3	AP-42 Ch. 7.1 Eq. 2-3	AP-42, Ch. 7.1, Eq. 2-14	AP-42, Ch. 7.1, Eq. 2-13	AP-42, Ch. 7.1, Eq. 2-13	AP-42, Ch. 7.1, Eq. 2-18 Note	AP-42, Ch. 7.1, Eq. 2-18 Notes	AP-42, Ch. 7.1, Eq. 2-18	AP-42, Ch. 7.1, Eq. 2-18
T-0011	2.20	0.003	4.3	-	1.0	0.61	3,510.1	568.5	1.77	10,190.9	-	-	-	-
T-0012	2.20	0.003	4.3	-	1.0	0.61	3,051.0	560.6	1.75	8,734.9	-	-	-	-
T-0020	1.60	0.300	1.6	-	1.0	0.45	2,098.3	89.3	0.28	1,300.8	-	-	-	-
T-0021	1.60	0.300	1.6	-	1.0	0.45	2,098.3	89.3	0.28	1,300.8	-	-	-	-
T-0022	1.60	0.300	1.6	-	1.0	0.37	1,746.6	80.3	0.25	1,168.3	-	-	-	-
T-0023	1.60	0.300	1.6	-	1.0	0.37	1,746.6	80.3	0.25	1,168.3	-	-	-	-
T-0056	2.20	0.003	4.3	-	1.0	0.43	332.4	292.9	1.18	921.8	-	-	-	-
T-0079	0.60	0.400	1.0	9.0	1.0	1.64	9,551.7	346.1	1.08	6,272.3	-	-	-	-
T-0106	2.20	0.003	4.3	-	0.4	0.20	742.2	340.3	0.45	1,713.3	-	-	-	-
T-0107	2.20	0.003	4.3	-	1.0	0.46	2,568.9	614.2	1.92	10,704.3	0.14	0.20	0.39	2,191
T-0108	2.20	0.003	4.3	-	1.0	0.46	3,348.8	340.3	1.06	7,730.6	-	-	-	-
T-0109	2.20	0.003	4.3	-	1.0	0.46	3,219.6	538.3	1.68	11,757.4	-	-	-	-
T-0111	2.20	0.003	4.3	-	1.0	0.34	2,319.0	292.9	0.91	6,300.2	-	-	-	-
T-0112	2.20	0.003	4.3	-	1.0	0.43	328.8	236.9	0.95	737.5	0.14	0.20	0.26	201
T-0117	0.60	0.400	1.0	9.0	1.0	0.81	637.9	751.3	3.02	2,368.1	-	-	-	-
T-0124	2.20	0.003	4.3	-	1.0	0.27	1,373.7	340.3	1.06	5,311.8	-	-	-	-
T-0401	0.60	0.400	1.0	-	1.0	0.17	916.9	77.2	0.24	1,311.2	-	-	-	-
T-0402	0.60	0.400	1.0	9.0	1.0	1.26	4,070.7	334.3	1.11	3,586.1	-	-	-	-
T-0411	0.60	0.400	1.0	9.0	1.0	1.32	6,630.5	775.2	2.42	12,190.6	-	-	-	-

	RIM SEAL LOSSES							DECK FITTING LOSSES			DECK SEAM LOSSES (IFR)			
Tank ID	Zero Wind Speed Rim Seal Loss Factor	Wind Speed Dependent Rim Seal Loss Factor	Seal-Related Wind Speed Exponent	Average Ambient Wind Speed at the Tank Site	Product Factor	Rim Seal Loss Max Hourly	Rim Seal Loss	Total Deck Fitting Loss Factor	Deck Fitting Loss Max Hourly	Deck Fitting Loss	Deck Seam Loss per Unit Seam Length Factor	Deck Seam Length Factor	Deck Seam Loss Max Hourly	Deck Seam Loss
	K_{Ra}	K_{Rb}	n	v_{tank}	K_C		L_R	$F_F = \sum(N_{Fi} * K_{fi})$		L_F	K_D	S_D		L_D
	lbmole/ft*yr	lbmole/(mph)^{n}ft*yr	unitless	mph	unitless	lb/hr	lb/month	lbmole/yr	lb/hr	lb/month	lbmole/ft-yr	ft/ft^2	lb/hr	lb/month
	AP-42 CH. 7.1 Table 7.1-8 Varies if fittings are avg. or tight	AP-42 CH. 7.1 Table 7.1-8 Varies if fittings are avg. or tight	AP-42 CH. 7.1 Table 7.1-8 Varies if fittings are avg. or tight	AP-42 Ch. 7.1 Eq. 2-3 Note 1	AP-42 Ch. 7.1 Eq. 2-3 Notes	AP-42 Ch. 7.1 Eq. 2-3	AP-42 Ch. 7.1 Eq. 2-3	AP-42, Ch. 7.1, Eq. 2-14	AP-42, Ch. 7.1, Eq. 2-13	AP-42, Ch. 7.1, Eq. 2-13	AP-42, Ch. 7.1, Eq. 2-18 Note	AP-42, Ch. 7.1, Eq. 2-18 Notes	AP-42, Ch. 7.1, Eq. 2-18	AP-42, Ch. 7.1, Eq. 2-18
T-0412	0.60	0.400	1.0	9.0	1.0	1.70	1,347.8	775.2	3.12	2,478.0	-	-	-	-
T-0413	2.20	0.003	4.3	-	1.0	0.96	174.5	664.3	4.35	786.5	-	-	-	-
T-0415	2.20	0.003	4.3	-	1.0	0.46	2,259.8	300.8	0.94	4,611.2	-	-	-	-
T-0417	2.20	0.003	4.3	-	1.0	0.34	1,896.3	506.2	1.58	8,725.9	-	-	-	-
T-0418	2.20	0.003	4.3	-	1.0	0.96	187.6	885.3	5.79	1,126.9	-	-	-	-
T-0435	0.60	0.400	1.0	9.0	0.4	0.17	578.6	301.1	0.40	1,377.4	-	-	-	-
T-0437	0.30	0.600	0.3	9.0	0.4	0.20	749.1	885.3	1.03	3,781.6	-	-	-	-
T-0439	0.60	0.400	1.0	-	1.0	0.26	1,078.3	784.6	2.61	10,846.2	-	-	-	-
T-0450	0.60	0.400	1.0	9.0	1.0	1.68	6,480.9	741.7	2.46	9,499.9	-	-	-	-
T-0451	0.60	0.400	1.0	-	1.0	0.14	23.1	271.4	1.78	298.5	-	-	-	-
T-0452	0.60	0.400	1.0	-	1.0	0.05	15.4	271.4	0.63	198.7	-	-	-	-
T-0737	0.60	0.400	1.0	9.0	0.4	0.35	1,218.5	86.6	0.12	397.2	-	-	-	-
T-0802	0.60	0.400	1.0	9.0	0.4	0.25	869.1	61.2	0.08	280.5	-	-	-	-
T-0821	0.60	0.400	1.0	9.0	1.0	1.48	4,503.5	426.6	1.42	4,298.7	-	-	-	-
T-0834	5.80	0.300	2.1	9.0	1.0	1.80	3,255.9	764.3	0.45	805.1	-	-	-	-
T-0835	0.60	0.400	1.0	9.0	1.0	3.06	493.6	751.3	4.92	792.4	-	-	-	-
T-1225	0.60	0.400	1.0	9.0	0.4	0.74	2,710.5	756.3	0.88	3,241.3	-	-	-	-

Tank ID	WORKING (WITHDRAWAL) LOSSES						MAXIMUM FLOATING ROOF TANKS VOC LOSSES	TOTAL FLOATING ROOF TANKS VOC LOSSES	VOC Emissions		H2S Emissions		HAPs Emissions	
	Sum of the Decreases in Liquid Level	Shell Clingage Factor	No. of Roof Support Columns	Effective Column Diameter	Working (Withdrawal) Loss Max Hourly	Working (Withdrawal) Loss								
	ΣH_{QD}	C_S	N_C	F_C		L_W		L_T						
	ft/month	bbl/1,000 ft^2	ft	ft	lb/hr	lb/month	lb/hr	lb/month	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
	AP-42, Ch. 7.1, Eq. 2-20	AP-42, Ch. 7.1, Table 7.1-10	Site-Specific If unknown AP-42 Ch. 7.1 Eq. 2-19 Note 3 Table 7.1-11 (IFR)	AP-42, Ch. 7.1, Eq. 2-19 Note 4		AP-42, Ch. 7.1, Eq. 2-19	AP-42, Ch. 7.1 Eq. 2-1 & 2-2 (@ P*max)	AP-42, Ch. 7.1 Eq. 2-1 & 2-2			Raoults Law		Raoults Law	
T-0011	1,804.8	0.0015	6.0	1.0	0.06	190.0	2.44	13,891	2.44	6.95	-	-	0.05	0.14
T-0012	1,804.8	0.0015	6.0	1.0	0.06	190.0	2.42	11,976	2.42	5.99	-	-	0.05	0.12
T-0020	1,588.4	0.0015	1.0	1.0	0.06	160.2	0.78	3,559	0.78	1.78	-	-	0.02	0.04
T-0021	1,588.4	0.0015	1.0	1.0	0.06	160.2	0.78	3,559	0.78	1.78	-	-	0.02	0.04
T-0022	2,287.3	0.0015	1.0	1.0	0.07	192.6	0.69	3,108	0.69	1.55	-	-	0.01	0.03
T-0023	2,287.3	0.0015	1.0	1.0	0.07	192.6	0.69	3,108	0.69	1.55	-	-	0.01	0.03
T-0056	30,574.3	0.0015	1.0	1.0	0.12	1,897.4	1.72	3,152	1.72	1.58	-	-	0.01	0.01
T-0079	2,644.2	0.0015	-	-	0.33	366.3	3.05	16,190	3.05	8.10	-	-	0.06	0.16
T-0106	3,805.7	0.0060	1.0	1.0	1.15	1,147.1	1.80	3,603	1.80	1.80	9.17E-05	1.51E-01	0.01	0.01
T-0107	5,091.3	0.0015	7.0	1.0	0.16	417.5	2.93	15,881	2.93	7.94	1.71E-09	7.64E-06	0.11	0.30
T-0108	4,453.4	0.0015	1.0	1.0	0.04	335.6	1.56	11,415	1.56	5.71	-	-	0.03	0.11
T-0109	5,496.7	0.0015	7.0	1.0	0.16	450.8	2.30	15,428	2.30	7.71	-	-	0.05	0.16
T-0111	4,212.6	0.0015	1.0	1.0	0.10	233.4	1.35	8,853	1.35	4.43	-	-	0.03	0.09
T-0112	93.1	0.0015	1.0	1.0	0.12	5.8	1.75	1,273	1.75	0.64	-	-	0.01	0.003
T-0117	4,008.3	0.0015	-	-	0.45	243.7	4.29	3,250	4.29	1.62	-	-	0.02	0.01
T-0124	10,310.9	0.0015	1.0	1.0	0.24	468.5	1.58	7,154	1.58	3.58	-	-	0.03	0.07
T-0401	4,509.4	0.0015	-	-	0.05	449.7	0.46	2,678	0.46	1.34	-	-	0.01	0.03
T-0402	5,475.7	0.0015	-	-	0.05	546.1	2.42	8,203	2.42	4.10	3.07E-08	8.52E-05	0.03	0.05
T-0411	2,285.5	0.0015	-	-	0.19	253.3	3.92	19,074	3.92	9.54	2.30E-09	9.18E-06	0.15	0.36

Tank ID	WORKING (WITHDRAWAL) LOSSES: Sum of the Decreases in Liquid Level	Shell Clingage Factor	No. of Roof Support Columns	Effective Column Diameter	Working (Withdrawal) Loss Max Hourly	Working (Withdrawal) Loss	MAXIMUM FLOATING ROOF TANKS VOC LOSSES	TOTAL FLOATING ROOF TANKS VOC LOSSES	VOC Emissions		H2S Emissions		HAPs Emissions	
	ΣH_{QD}	C_S	N_C	F_C		L_W		L_T						
	ft/month	bbl/1,000 ft^2	ft	ft	lb/hr	lb/month	lb/hr	lb/month	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
	AP-42, Ch. 7.1, Eq. 2-20	AP-42, Ch. 7.1, Table 7.1-10	Site-Specific If unknown AP-42 Ch. 7.1 Eq. 2-19 Note 3 Table 7.1-11 (IFR)	AP-42, Ch. 7.1, Eq. 2-19 Note 4		AP-42, Ch. 7.1, Eq. 2-19	AP-42, Ch. 7.1 Eq. 2-1 & 2-2 (@ P*max)	AP-42, Ch. 7.1 Eq. 2-1 & 2-2			Raoults Law		Raoults Law	
T-0412	923.5	0.0015	-	-	0.23	117.0	5.05	3,943	5.05	1.97	-	-	0.03	0.01
T-0413	7,846.2	0.0015	7.0	1.0	0.41	804.3	5.72	1,765	5.72	0.88	-	-	0.003	0.0004
T-0415	5,496.7	0.0015	1.0	1.0	0.26	414.2	1.66	7,285	1.66	3.64	-	-	0.03	0.07
T-0417	4,045.7	0.0015	1.0	1.0	0.19	228.7	2.12	10,851	2.12	5.43	-	-	0.04	0.11
T-0418	6,687.8	0.0015	1.0	1.0	0.04	630.0	6.79	1,944	6.79	0.97	-	-	0.003	0.0004
T-0435	20,872.1	0.0060	-	-	0.32	2,775.6	0.88	4,732	0.88	2.37	4.51E-05	1.98E-01	0.004	0.01
T-0437	8,316.5	0.0060	-	-	1.41	5,608.7	2.64	10,139	2.64	5.07	1.35E-06	4.24E-03	0.03	0.05
T-0439	7,641.8	0.0015	8.0	1.0	0.27	1,168.6	3.14	13,093	3.14	6.55	8.34E-08	2.86E-04	0.08	0.17
T-0450	4,891.9	0.0015	-	-	0.34	650.5	4.49	16,631	4.49	8.32	1.19E-07	3.63E-04	0.11	0.21
T-0451	5,537.5	0.0015	1.0	1.0	0.07	280.1	1.98	602	1.98	0.30	1.16E-07	2.89E-05	0.001	0.0002
T-0452	830.6	0.0015	1.0	1.0	0.28	39.0	0.96	253	0.96	0.13	-	-	-	-
T-0737	9,015.6	0.0060	-	-	0.29	2,517.7	0.76	4,133	0.76	2.07	3.85E-05	1.73E-01	0.003	0.01
T-0802	17,670.5	0.0060	-	-	0.40	3,524.8	0.74	4,674	0.74	2.34	3.75E-05	1.95E-01	0.003	0.01
T-0821	4,068.2	0.0015	-	-	0.05	477.9	2.96	9,280	2.96	4.64	3.74E-08	9.64E-05	0.03	0.05
T-0834	15,527.7	0.0015	-	-	0.08	1,854.4	2.32	5,915	2.32	2.96	1.36E-07	2.84E-04	0.001	0.002
T-0835	9,105.4	0.0015	-	-	0.09	1,420.0	8.06	2,706	8.06	1.35	4.71E-07	1.30E-04	0.005	0.001
T-1225	12,105.8	0.0060	-	-	0.46	10,205.2	2.08	16,157	2.08	8.08	1.06E-06	6.75E-03	0.02	0.09
								MAX. HOURLY, lb/hr	**89.29**		**2.16E-04**		**1.09**	
								ANNUAL, tpy		**134.73**		**0.73**		**2.53**

FLOATING ROOF TANKS (EXT, INT) LANDING - TANKS STARTUP AND SHUTDOWN EMISSIONS

Maximum individual HAPs (n-Hexane), tpy = 0.06
Total HAPS (assumes 51.5% tanks landed per year) , 0.08

HAPs	1,3-Butadiene	2,2,4-Trimethylpentane	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzene	Benzo(a)phenanthrene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(e)pyrene	Benzo(g,h,i)perylene	Biphenyl	Cresol (mixed isomers)	Cumene	Ethylbenzene	Fluoranthene	Fluorene	Lead compounds
CAS No.	106-99-0	540-84-1	83-32-9	208-96-8	120-12-7	56-55-3	71-43-2	218-01-9	50-32-8	205-99-2	192-97-2	191-24-2	92-52-4	1319-77-3	98-82-8	100-41-4	206-44-0	86-73-7	7439-92-1
Pi°, psia	57.00	0.79	4.26E-05	9.28E-05	1.16E-05	4.06E-09	2.01	1.21E-10	1.06E-10	9.67E-09	1.10E-10	1.93E-12	1.93E-04	0.00	0.12	0.22	1.78E-07	1.16E-05	0.03
Tank	**Speciated Potential to Emit, tpy**																		
T-0011	6.47E-04	2.44E-03	-	-	3.61E-13	-	6.90E-04	-	-	-	-	-	2.54E-09	-	6.28E-06	1.13E-04	-	-	-
T-0012	6.12E-04	2.31E-03	-	-	3.42E-13	-	6.53E-04	-	-	-	-	-	2.41E-09	-	5.95E-06	1.07E-04	-	-	-
T-0020	6.09E-04	2.29E-03	-	-	3.40E-13	-	6.50E-04	-	-	-	-	-	2.40E-09	-	5.92E-06	1.06E-04	-	-	-
T-0021	6.09E-04	2.29E-03	-	-	3.40E-13	-	6.50E-04	-	-	-	-	-	2.40E-09	-	5.92E-06	1.06E-04	-	-	-
T-0022	4.23E-04	1.59E-03	-	-	2.36E-13	-	4.51E-04	-	-	-	-	-	1.66E-09	-	4.11E-06	7.36E-05	-	-	-
T-0023	4.23E-04	1.59E-03	-	-	2.36E-13	-	4.51E-04	-	-	-	-	-	1.66E-09	-	4.11E-06	7.36E-05	-	-	-
T-0056	-	3.30E-07	-	-	-	-	3.07E-05	-	-	-	-	-	-	-	1.08E-06	1.08E-05	-	-	-
T-0079	1.40E-03	5.27E-03	-	-	7.82E-13	-	1.49E-03	-	-	-	-	-	5.51E-09	-	1.36E-05	2.44E-04	-	-	-
T-0106	-	1.69E-07	6.59E-12	8.38E-12	6.39E-12	2.26E-17	3.69E-06	5.37E-19	5.33E-19	7.36E-17	8.16E-19	-	1.43E-09	1.36E-09	1.92E-08	2.30E-07	5.09E-15	2.64E-12	-
T-0107	6.52E-04	9.60E-06	-	-	-	-	6.59E-04	-	-	-	-	-	-	-	1.69E-06	1.72E-05	-	-	-
T-0108	3.99E-04	1.50E-03	-	-	2.23E-13	-	4.25E-04	-	-	-	-	-	1.57E-09	-	3.87E-06	6.95E-05	-	-	-
T-0109	3.94E-04	1.48E-03	-	-	2.20E-13	-	4.20E-04	-	-	-	-	-	1.55E-09	-	3.83E-06	6.86E-05	-	-	-
T-0111	2.10E-04	7.89E-04	-	-	1.17E-13	-	2.24E-04	-	-	-	-	-	8.25E-10	-	2.04E-06	3.65E-05	-	-	-
T-0112	-	3.29E-07	-	-	-	-	3.06E-05	-	-	-	-	-	-	-	1.07E-06	1.08E-05	-	-	-
T-0117	-	3.31E-07	-	-	-	-	3.08E-05	-	-	-	-	-	-	-	1.08E-06	1.08E-05	-	-	-
T-0124	1.24E-04	4.66E-04	-	-	6.90E-14	-	1.32E-04	-	-	-	-	-	4.86E-10	-	1.20E-06	2.15E-05	-	-	-
T-0401	6.48E-04	2.44E-03	-	-	3.61E-13	-	6.91E-04	-	-	-	-	-	2.55E-09	-	6.29E-06	1.13E-04	-	-	-
T-0402	2.40E-04	3.22E-05	8.48E-12	8.25E-11	-	-	5.68E-04	-	-	-	-	-	4.17E-10	-	2.43E-06	6.86E-05	-	-	-
T-0411	1.37E-03	2.02E-05	-	-	-	-	1.39E-03	-	-	-	-	-	-	-	3.55E-06	3.62E-05	-	-	-
T-0412	-	1.43E-06	-	-	-	-	1.33E-04	-	-	-	-	-	-	-	4.68E-06	4.69E-05	-	-	-
T-0413	-	3.54E-06	-	-	-	-	3.09E-06	-	-	-	-	-	3.04E-11	-	3.19E-07	2.42E-06	-	-	-
T-0415	3.45E-04	1.30E-03	-	-	1.92E-13	-	3.67E-04	-	-	-	-	-	1.36E-09	-	3.35E-06	6.00E-05	-	-	-
T-0417	2.01E-04	7.58E-04	-	-	1.12E-13	-	2.15E-04	-	-	-	-	-	7.92E-10	-	1.96E-06	3.51E-05	-	-	-
T-0418	-	3.79E-06	-	-	-	-	3.31E-06	-	-	-	-	-	3.25E-11	-	3.42E-07	2.59E-06	-	-	-
T-0435	-	3.29E-08	1.29E-12	1.63E-12	1.25E-12	4.41E-18	7.20E-07	1.05E-19	1.04E-19	1.44E-17	1.59E-19	-	2.79E-10	2.64E-10	3.75E-09	4.49E-08	9.93E-16	5.16E-13	-
T-0437	-	2.13E-06	1.24E-12	1.88E-12	2.14E-13	5.85E-16	1.60E-05	6.40E-18	1.53E-17	1.96E-15	4.33E-18	3.12E-20	2.28E-10	-	1.42E-07	1.79E-06	3.66E-15	1.96E-12	2.69E-13
T-0439	-	2.86E-05	-	-	-	-	1.94E-03	-	-	-	-	-	2.49E-09	-	1.27E-05	1.02E-04	-	-	-
T-0450	-	2.40E-05	-	-	-	-	1.63E-03	-	-	-	-	-	2.10E-09	-	1.06E-05	8.61E-05	-	-	-
T-0451	-	-	-	-	4.45E-10	-	1.03E-06	-	-	-	-	-	4.99E-11	-	5.80E-08	2.27E-07	-	-	-
T-0452	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-0737	-	1.45E-07	5.67E-12	7.22E-12	5.51E-12	1.95E-17	3.18E-06	4.62E-19	4.59E-19	6.34E-17	7.02E-19	-	1.23E-09	1.17E-09	1.65E-08	1.98E-07	4.38E-15	2.28E-12	-
T-0802	-	7.42E-08	2.89E-12	3.68E-12	2.81E-12	9.92E-18	1.62E-06	2.36E-19	2.34E-19	3.23E-17	3.58E-19	-	6.28E-10	5.95E-10	8.43E-09	1.01E-07	2.24E-15	1.16E-12	-
T-0821	3.03E-04	4.06E-05	1.07E-11	1.04E-10	-	-	7.17E-04	-	-	-	-	-	5.27E-10	-	3.07E-06	8.66E-05	-	-	-
T-0834	-	-	-	-	2.84E-09	-	6.55E-06	-	-	-	-	-	3.18E-10	-	3.70E-07	1.45E-06	-	-	-
T-0835	-	-	-	-	4.88E-09	-	1.13E-05	-	-	-	-	-	5.48E-10	-	6.37E-07	2.49E-06	-	-	-
T-1225	-	3.31E-06	1.92E-12	2.92E-12	3.33E-13	9.09E-16	2.49E-05	9.94E-18	2.38E-17	3.04E-15	6.73E-18	4.84E-20	3.54E-10	-	2.21E-07	2.78E-06	5.69E-15	3.05E-12	4.18E-13
Sum HAPs, tpy	**9.61E-03**	**2.67E-02**	**3.88E-11**	**2.12E-10**	**8.19E-09**	**1.55E-15**	**1.47E-02**	**1.77E-17**	**4.04E-17**	**5.18E-15**	**1.31E-17**	**7.96E-20**	**3.84E-08**	**3.38E-09**	**1.12E-04**	**1.72E-03**	**2.21E-14**	**1.16E-11**	**6.87E-13**

Raoult's Law
$P_i = x_i * TVP_i$
$P_i = y_i * TVP$
$y_i = x_i * TVP_i/TVP$

Liquid molar fraction $xi\ (mole_i/mole_T) = mi\ (g_i/g_T) * MW_{liq}\ (g_T/moles_T)\ /\ MW_i\ (g_i/moles_i) = wt\%_{liq} * MW_{liq}/MW_i$

Gas molar fraction $yi\ (mole_i/mole_T) = mi\ (g_i/g_T) * MW_{vap}\ (g_T/moles_T)\ /\ MW_i\ (g_i/moles_i) = wt\%_{vap} * MW_{vap}/MW_i$

$yi = xi * TVPi/TVP$
$wt\%_{vap} * MW_{vap}/MWi = wt\%_{liq} * MW_{liq}/MW_i * TVPi/TVP$
$wt\%_{vap} = wt\%_{liq} * TVP_i/TVP * MW_{liq}/MW_{vap}$

FLOATING ROOF TANKS (EXT, INT) LANDING - TANKS STARTUP AND SHUTDOWN EMISSIONS

m-Cresol	Mercury compounds	Methanol	Methyl tert butyl ether	m-Xylene	Naphthalene	n-Hexane	o-Cresol	o-Xylene	PAH Total	Phenanthrene	p-Xylene	Pyrene	Styrene	Toluene	Xylene (mixed isomers)
108-39-4	7439-97-6	67-56-1	1634-04-4	108-38-3	91-20-3	110-54-3	95-48-7	95-47-6	30-31-1	85-01-8	106-42-3	129-00-0	100-42-5	108-88-3	1330-20-7
2.13E-03	2.32E-05	2.70	5.30	0.16	0.01	3.14	3.48E-03	0.13	1.93E-12	2.34E-06	0.17	8.70E-08	0.12	0.60	0.20
-	-	6.29E-06	4.36E-05	1.32E-04	3.18E-07	1.09E-03	-	8.49E-05	1.78E-16	8.32E-14	8.28E-05	-	1.06E-05	1.76E-03	7.00E-04
-	-	5.95E-06	4.13E-05	1.25E-04	3.01E-07	1.03E-03	-	8.04E-05	1.68E-16	7.88E-14	7.83E-05	-	1.01E-05	1.67E-03	6.63E-04
-	-	5.92E-06	4.11E-05	1.24E-04	3.00E-07	1.03E-03	-	7.99E-05	1.67E-16	7.83E-14	7.79E-05	-	1.00E-05	1.66E-03	6.59E-04
-	-	5.92E-06	4.11E-05	1.24E-04	3.00E-07	1.03E-03	-	7.99E-05	1.67E-16	7.83E-14	7.79E-05	-	1.00E-05	1.66E-03	6.59E-04
-	-	4.11E-06	2.85E-05	8.62E-05	2.08E-07	7.12E-04	-	5.55E-05	1.16E-16	5.44E-14	5.41E-05	-	6.94E-06	1.15E-03	4.58E-04
-	-	4.11E-06	2.85E-05	8.62E-05	2.08E-07	7.12E-04	-	5.55E-05	1.16E-16	5.44E-14	5.41E-05	-	6.94E-06	1.15E-03	4.58E-04
-	-	9.68E-06	1.94E-05	1.53E-05	-	2.88E-05	-	1.20E-07	-	-	1.34E-05	-	-	1.42E-04	2.09E-05
-	-	1.36E-05	9.44E-05	2.86E-04	6.89E-07	2.36E-03	-	1.84E-04	3.85E-16	1.80E-13	1.79E-04	-	2.30E-05	3.82E-03	1.52E-03
8.28E-10	-	4.95E-06	-	1.05E-06	2.46E-09	8.09E-06	1.35E-09	2.17E-07	-	8.92E-13	-	-	-	1.56E-06	4.25E-07
-	4.84E-15	-	-	4.35E-05	-	6.43E-03	-	1.43E-05	-	-	1.54E-05	-	-	2.45E-04	-
-	-	3.88E-06	2.69E-05	8.14E-05	1.96E-07	6.72E-04	-	5.23E-05	1.10E-16	5.13E-14	5.10E-05	-	6.55E-06	1.09E-03	4.32E-04
-	-	3.83E-06	2.66E-05	8.04E-05	1.94E-07	6.64E-04	-	5.17E-05	1.08E-16	5.07E-14	5.04E-05	-	6.47E-06	1.07E-03	4.27E-04
-	-	2.04E-06	1.41E-05	4.28E-05	1.03E-07	3.53E-04	-	2.75E-05	5.77E-17	2.70E-14	2.68E-05	-	3.44E-06	5.71E-04	2.27E-04
-	-	9.65E-06	1.93E-05	1.52E-05	-	2.87E-05	-	1.19E-07	-	-	1.34E-05	-	-	1.41E-04	2.08E-05
-	-	9.71E-06	1.94E-05	1.53E-05	-	2.89E-05	-	1.20E-07	-	-	1.34E-05	-	-	1.42E-04	2.09E-05
-	-	1.20E-06	8.34E-06	2.52E-05	6.09E-08	2.08E-04	-	1.62E-05	3.40E-17	1.59E-14	1.58E-05	-	2.03E-06	3.37E-04	1.34E-04
-	-	6.29E-06	4.37E-05	1.32E-04	3.19E-07	1.09E-03	-	8.50E-05	1.78E-16	8.33E-14	8.28E-05	-	1.06E-05	1.76E-03	7.01E-04
-	-	-	5.91E-04	9.92E-05	2.43E-07	1.78E-03	-	6.01E-06	-	-	4.78E-05	-	-	-	2.65E-04
-	1.02E-14	-	-	9.15E-05	-	1.35E-02	-	3.02E-05	-	-	3.24E-05	-	-	5.16E-04	-
-	-	4.20E-05	8.42E-05	6.63E-05	-	1.25E-04	-	5.20E-07	-	-	5.82E-05	-	-	6.14E-04	9.07E-05
-	-	-	-	2.30E-06	1.08E-06	1.17E-05	-	-	-	-	1.17E-06	-	-	5.04E-06	5.57E-06
-	-	3.35E-06	2.32E-05	7.03E-05	1.70E-07	5.81E-04	-	4.52E-05	9.48E-17	4.43E-14	4.41E-05	-	5.66E-06	9.39E-04	3.73E-04
-	-	1.96E-06	1.36E-05	4.11E-05	9.91E-08	3.39E-04	-	2.64E-05	5.54E-17	2.59E-14	2.58E-05	-	3.31E-06	5.49E-04	2.18E-04
-	-	-	-	2.47E-06	1.16E-06	1.25E-05	-	-	-	-	1.26E-06	-	-	5.40E-06	5.97E-06
1.62E-10	-	9.66E-07	-	2.05E-07	4.80E-10	1.58E-06	2.64E-10	4.23E-08	-	1.74E-13	-	-	-	3.05E-07	8.29E-08
-	3.64E-16	-	-	3.67E-06	6.10E-09	1.48E-04	-	1.52E-07	-	-	9.33E-07	3.95E-15	-	1.27E-05	4.58E-06
-	7.47E-16	1.20E-04	3.73E-04	2.76E-04	2.27E-08	1.45E-02	-	7.31E-05	-	-	9.85E-05	-	-	1.46E-03	2.38E-04
-	6.29E-16	1.01E-04	3.14E-04	2.32E-04	1.91E-08	1.22E-02	-	6.15E-05	-	-	8.29E-05	-	-	1.23E-03	2.00E-04
-	-	-	-	4.96E-06	1.97E-08	3.76E-07	-	1.79E-08	5.44E-17	9.25E-14	3.65E-06	-	-	9.09E-07	1.08E-06
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.13E-10	-	4.26E-06	-	9.06E-07	2.12E-09	6.97E-06	1.17E-09	1.87E-07	-	7.68E-13	-	-	-	1.35E-06	3.66E-07
3.64E-10	-	2.17E-06	-	4.62E-07	1.08E-09	3.55E-06	5.95E-10	9.51E-08	-	3.92E-13	-	-	-	6.87E-07	1.87E-07
-	-	-	7.46E-04	1.25E-04	3.06E-07	2.25E-03	-	7.59E-06	-	-	6.03E-05	-	-	-	3.35E-04
-	-	-	-	3.16E-05	1.26E-07	2.40E-06	-	1.14E-07	3.47E-16	5.89E-13	2.33E-05	-	-	5.79E-06	6.88E-06
-	-	-	-	5.44E-05	2.17E-07	4.13E-06	-	1.97E-07	5.97E-16	1.02E-12	4.01E-05	-	-	9.98E-06	1.19E-05
-	5.65E-16	-	-	5.71E-06	9.47E-09	2.30E-04	-	2.36E-07	-	-	1.45E-06	6.14E-15	-	1.97E-05	7.12E-06
2.07E-09	**1.73E-14**	**3.74E-04**	**2.64E-03**	**2.52E-03**	**6.69E-06**	**6.31E-02**	**3.38E-09**	**1.12E-03**	**2.94E-15**	**4.83E-12**	**1.41E-03**	**1.01E-14**	**1.16E-04**	**2.37E-02**	**8.86E-03**

TANKS POTENTIAL TO EMIT GHG

$$CH_4 = 0.1 \times Q_{Ref}$$

CH_4	6.05	ton/yr	1.10231 tons/metric ton, Table A-2 to Subpart A of Part 98
CH_4	5.49	metric ton/yr	40 CFR §98.253(m)(1) equation Y-22 annual methane emissions from storage tanks
EF	0.10	metric ton_{CH4}/MMbbl	40 CFR §98.253(m)(1) default emission factor for storage tanks
Q_{ref}	54.86	MMbbl/yr	Quantity of crude oil plus the quantity of intermediate products received from off site that are processed at the facility

SSM POTENTIAL TO EMIT SUMMARY

Unit No.	Description	NO_X		CO		VOC		SO_2		PM		PM_{10}		$PM_{2.5}$		H_2S	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
SSM H-9851	Startup and Shutdown Emissions from Unit 64 Hydrogen Plant Reformer (SCR downtime)	11.23	1.35	20.22	2.43	2.02	0.24	6.32	0.30	2.79	0.33	2.79	0.33	2.79	0.33	-	-
SSM H-0473 (SRU2 TGI)	Startup and Shutdown Emissions from the SRU2 TGI	6.50	0.03	27.70	0.12	0.10	4.50E-04	135.00	0.38	1.20	0.0054	11.53	0.03	11.53	0.03	1.44	4.00E-03
SSM H-3103 (SRU3 TGI)	Startup and Shutdown Emissions from the SRU3 TGI	6.50	0.03	15.00	0.07	0.10	4.50E-04	50.00	0.23	1.10	0.0050	4.93	0.02	4.93	0.02	0.53	2.39E-03
SSM Flare Cap	Emissions from venting MSS activity gases to FL-400, FL-401, FL-402, FL-403, or FL-404	162.90	18.30	1,243.00	77.00	1,376.3	68.70	1,133.40	14.90							12.04	0.16
SSM FL-HEP-PORT	Holly Energy Partners (HEP) control flare for pipeline mainteance and pigging activities	11.56	0.09	50.12	0.38	106.70	0.80	0.11	8.24E-04							1.19E-03	8.93E-06
SSM Tanks	Storage tanks (roof landings)					51.90	8.09									0.02	3.60E-03
SSM T-0737	Sour water tank roof landing					0.24	4.24E-03									0.02	7.33E-04
SSM Tank VCU	Floating roof tanks landings control	0.17	0.037	0.17	0.033	2.60	0.21	0.05	0.017	9.39E-03	2.50E-03	9.39E-03	2.50E-03	9.39E-03	2.50E-03	1.24E-03	9.26E-05
SSM Misc 1	Catalyst handling activities									*Exempt*							
SSM Misc 2	Low-emitting maintenance activities	17.00	1.90	127.10	7.80	137.70	6.90	129.30	1.60	0.06	0.02	0.06	0.02	0.06	0.02	0.70	0.10
SSM Pigging	Crude Oil Pigging					24.57	0.64										
SSM Cap		**215.87**	**21.73**	**1,483.31**	**87.83**	**1,701.98**	**85.58**	**1,454.18**	**17.42**	**5.16**	**0.37**	**19.32**	**0.41**	**19.32**	**0.41**	**14.74**	**0.27**
Malfunction Cap			**10.00**		**10.00**		**10.00**		**10.00**		**-**		**-**		**-**		**1.00**
	TOTAL		**31.73**		**97.83**		**95.58**		**27.42**		**0.37**		**0.41**		**0.41**		**1.27**

H-9851 STARTUP AND SHUTDOWN EMISSIONS

Routine or Predictable Startup, Shtudown, and Scheduled Maintenance (SSM) Emissions

ID	Description	Design Capacity (LHV)	Design Capacity (HHV)	Emission Factors[a]												SSM Potential to Emit									
				CO		NO_X		PM/PM_{10} / $PM_{2.5}$	SO_2					VOC		CO		NO_X		$PM/PM_{10}/PM_{2.5}$		SO_2		VOC	
		MMBtu/hr	MMBtu/hr	lb/MMBtu		lb/MMBtu		lb/MMBtu	H2S max gr/dscf	non-H2S Sulfur Species max gr/dscf	H2S avg gr/dscf	non-H2S Sulfur Species avg. gr/dscf		lb/MMBtu		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
H-9851	Unit 64 Hydrogen Plant Reformer	337	374	0.060	b	0.03	b	0.0075	-	0.00032	-	0.00032	c	0.0054		20.2	2.4	11.2	1.3	2.8	0.3	6.3	0.3	2.0	0.2
									0.10	0.00391	0.037	0.00391													

Notes:

a. Unless otherwise noted, the emission factors are from AP-42 Tables 1.4-1 and 1.4-2, dated 7/98. Factors are converted to lb/MMBtu by dividing by 1020 Btu/scf as specified in AP-42 and are based on HHV.

b. Based on manufacturer guarantee on LHV basis.

c. H-9851 will combust a mixture of PSA Offgas and amine-treated refinery fuel gas (RFG). It has been conservatively assumed 50/50 mix for SO2 emissions calculation.

d. Expected annual hours during H-9851 SCR downtime (SSM hours per year) = 240

SRUs STARTUP AND SHUTDOWN EMISSIONS

		H-0473 (SRU2 TGI)		H-3103 (SRU3 TGI)	
		Startup	Shutdown	Startup	Shutdown
Sulfur Feed	lbmol/event	52.7	9.6	19.5	6.2
Duration	hr/event	1	8	1	8
Sulfur Recovery Efficiency		96%		96%	
Unconverted H2S		2%	2%	2%	2%

Pollutant	MW	H-0473 (SRU2 TGI)					
		Startup		Shutdown		SSM	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
NOx	46	6.5	0.003	6.5	0.03	6.5	0.03
CO	28	27.7	0.01	27.7	0.11	27.7	0.12
VOC	44	0.1	0.0001	0.1	0.0004	0.1	4.50E-04
SO2	64	135.0	0.1	77.0	0.3	135.0	0.4
H2S	34	1.4	0.001	0.8	0.003	1.4	4.00E-03
SAM	98	10.3	0.01	5.9	0.02	10.3	0.03
PM	-	1.2	0.001	1.2	0.005	1.2	0.01
$PM_{10}/PM_{2.5}$	-	11.5	0.01	7.1	0.03	11.5	0.03

Pollutant	MW	H-3103 (SRU3 TGI)					
		Startup		Shutdown		SSM	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
NOx	46	6.5	0.003	6.5	0.03	6.5	0.03
CO	28	15.0	0.01	15.0	0.06	15.0	0.07
VOC	44	0.1	0.0001	0.1	0.0004	0.1	4.50E-04
SO2	64	50.0	0.03	50.0	0.2	50.0	0.2
H2S	34	0.5	0.0003	0.5	0.002	0.5	2.39E-03
SAM	98	3.8	0.002	3.8	0.02	3.8	0.02
PM	-	1.1	0.001	1.1	0.004	1.1	0.005
$PM_{10}/PM_{2.5}$	-	4.9	0.002	4.9	0.02	4.9	0.02

Notes

(1) NO_X, CO, VOC and PM emissions during SSM are expected to be within the proposed limits for normal operations

(2) SAM assumed 5% conversion SO2 to SO3 and 100% SO3 to H2SO4. $PM_{10}/PM_{2.5}$ assumed to be PM + SAM

Sample Calculation H-0473 (SRU 2 TGI)

Hourly SO2 Startup = 52.7 lbmol/event / 1 hr/event * 64 lb/lbmol * (1 - 0.96) = 135.0 lb/hr
Annual SO2 Startup = 135.0 lb/hr * 1 hr/event * 1 event/yr * 1 ton/2,000 lb = 0.1 ton/yr
Hourly SO2 Shutdown = 9.6 lbmol/event / 8 hr/event * 64 lb/lbmol = 77.0 lb/hr
Annual SO2 Shutdown = 77.0 lb/hr * 8 hr/event * 1 event/yr * 1 ton/2,000 lb = 0.3 ton/yr

Hourly H2S Startup = 52.7 lbmol/event / 1 hr/event * 34 lb/lbmol * (1 - 0.96) * 0.02 = 1.4 lb/hr
Annual H2S Startup = 1.4 lb/hr * 1 hr/event * 1 event/yr * 1 ton/2,000 lb = 0.001 ton/yr
Hourly H2S Shutdown = 9.6 lbmol/event / 8 hr/event * 34 lb/lbmol * 0.02 = 0.8 lb/hr
Annual H2S Startup = 0.8 lb/hr * 8 hr/event * 1 event/yr * 1 ton/2,000 lb = 0.003 ton/yr

FLARES STARTUP AND SHUTDOWN EMISSIONS

FLARES SSM

Emission Calculations for Proposed Permit 0195-M40 Emission Limits - SSM

	NO_X	CO	VOC	SO_2	H_2S
	lb/hr				
PROPOSED SSM CAP:	**162.9**	**1,243.0**	**1,376.3**	**1,133.4**	**12.0**
CURRENT SSM CAP:	162.9	1,243.0	1,376.3	1,133.4	0.4
PROPOSED CAP INCREASE:	**0.0**	**0.0**	**0.0**	**0.0**	**11.6**
	tpy				
PROPOSED SSM CAP:	**18.3**	**77.0**	**68.7**	**14.9**	**0.2**
CURRENT SSM CAP:	18.3	77.0	68.7	14.9	0.1
PROPOSED CAP INCREASE:	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**

FL-HEP-PORT STARTUP AND SHUTDOWN EMISSIONS

Holly Energy Partners (HEP) control flare for pipeline mainteance and pigging activities

Parameter	Value	Units	Reference
Flaring Event Duration	15.00	hr	
Flaring Flowrate ($Flare_p$)	2,500,000	scf	Total estimated flow to flare per event
	170	MMBtu/hr (HHV)	MMBtu/hr = Flow (scf/event) / Duration (hr/event) *
	162	MMBtu/hr (LHV)	Heat Content (Btu/scf) * 1 MMBtu/1,000,000 Btu
Natural gas heat content (HHV_p)	1,020	Btu/scf (HHV)	
	970	Btu/scf (LHV)	
Flare Destruction Efficiency	98%		
NO_X Emission Factor	0.068	lb/MMBtu (HHV)	AP-42, Ch. 13.5 (2/2018), Table 13.5-1
CO Emission Factor	0.31	lb/MMBtu (LHV)	AP-42, Ch. 13.5 (2/2018), Table 13.5-2
VOC Emission Factor	0.66	lb/MMBtu (LHV)	AP-42, Ch. 13.5 (2/2018), Table 13.5-2
H_2S in Natural Gas	0.25	gr/100 dscf	
CO_2 Emission Factor	60	kg/MMBtu (HHV)	40 CFR §98.253(b)(1), default flare gas
CH_4 Emission Factor	1.00E-03	kg/MMBtu (HHV)	Table C-2 to Subpart C to Part 98, Natural Gas
N_2O Emission Factor	1.00E-04	kg/MMBtu (HHV)	Table C-2 to Subpart C to Part 98, Natural Gas
Metric tons to short tons	1.10231	short ton/metric ton	Table A-2 to Subpart C of Part 98
Weight Fraction of Carbon in Flare Gas (f_{CH4})	0.40	kg/kg	40 CFR §98.253(b)(1), default flare gas
CO_2 GWP	1		Table A-1 to Subpart C of Part 98
CH_4 GWP	25		Table A-1 to Subpart C of Part 98
N_2O GWP	298		Table A-1 to Subpart C of Part 98

Flare	NOx		CO		VOC		SO2		H_2S		CO2	CH4	N2O	CO2e
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
FL-HEP-PORT	11.56	0.09	50.12	0.38	106.70	0.80	0.1	0.001	1.19E-03	8.93E-06	165.3	0.54	3.04E-04	179.0

Notes:

(1) GHG emissions per 40 CFR Part 98, Subpart Y:

Eq. Y-2
$$CO_2 = 0.98 \times 0.001 \times \sum_{p=1}^{n} Flare_p \times HHV_p \times EF_{CO2}$$

Eq. Y-4
$$CH_4 = \left(CO_2 \times \frac{EF_{CH_4}}{EF_{CO_2}}\right) + \left(CO_2 \times \frac{0.02}{0.98} \times \frac{16}{44} \times f_{CH_4}\right)$$

Eq. Y-5
$$N_2O = CO_2 \times \frac{EF_{N_2O}}{EF_{CO_2}}$$

<u>Where</u>

$Flare_p$: volume of flare gas combusted (scf)

HHVp: Higher heating value for the flare gas combusted during measurement period (Btu/scf)

EF_{CO2}: default CO2 emissionf actor for flare gas:

EF_{CH4}: default emission factor for fuel gas for CH4, per Table C-2 to Part 98:

EF_{N2O}: default emission factor for fuel gas for N2O, per Table C-2 to Part 98:

f_{CH4}: weight fraction of carbon in the flare gas, monitored or default 0.4 $kg_{CCH4}/kg_{Cflaregas}$

FLOATING ROOF TANKS (EXT, INT) LANDING - TANKS STARTUP AND SHUTDOWN EMISSIONS

AP-42 Chapter 7.1 Organic Liquid Storage Tanks (06/2020)

Tank ID	Stored Commodity		H2S in Liquid	Type of Landing	Number of Days Tank Stands Idle	Deck Leg Height at the Tank Shell	Height of Liquid at the Tank Shell	VCU Capture Efficiency
	CHEMICAL NAME FOR VOC LOSSES CALCULATION	CHEMICAL NAME FOR HAPs LOSSES SPECIATION	$H2S_{liq}$		n_d	h_d	h_l	
			ppm		days/event	ft	ft	%
			API 4723A	Full Heel Partial Heel Drain Dry		Gauge Height - Height Roof Landed	AP-42 Ch. 7.1 Table 7.1-4 Figure 7.1-23 Figure 7.1-24	
T-0011	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0012	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0020	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0021	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0022	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0023	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0056	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	-	Drain Dry	1.00	6.00	0.25	
T-0079	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0106	Sour Water	Various Units - Slop Oil	3,200	Drain Dry	1.00	6.00	0.25	98.7%
T-0107	Gasolines & Gasoline Blendstocks	Atmospheric Distillation - Straight Run Gasoline	0.03	Drain Dry	1.00	6.00	0.25	
T-0108	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0109	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0111	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0112	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	-	Drain Dry	1.00	6.00	0.25	
T-0117	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	-	Drain Dry	1.00	6.00	0.25	
T-0124	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0401	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	

FLOATING ROOF TANKS (EXT, INT) LANDING - TANKS STARTUP AND SHUTDOWN EMISSIONS

AP-42 Chapter 7.1 Organic Liquid Storage Tanks (06/2020)

Tank ID	Stored Commodity		H2S in Liquid	Type of Landing	Number of Days Tank Stands Idle	Deck Leg Height at the Tank Shell	Height of Liquid at the Tank Shell	VCU Capture Efficiency
	CHEMICAL NAME FOR VOC LOSSES CALCULATION	CHEMICAL NAME FOR HAPs LOSSES SPECIATION	$H2S_{liq}$		n_d	h_d	h_l	
			ppm		days/event	ft	ft	%
			API 4723A	Full Heel Partial Heel Drain Dry		Gauge Height - Height Roof Landed	AP-42 Ch. 7.1 Table 7.1-4 Figure 7.1-23 Figure 7.1-24	
T-0402	Light Cat Naphtha	Fluid Catalytic Cracker - Cracked Gasoline	0.80	Drain Dry	1.00	6.00	0.25	
T-0411	Gasolines & Gasoline Blendstocks	Atmospheric Distillation - Straight Run Gasoline	0.03	Drain Dry	1.00	6.00	0.25	
T-0412	Sweet Naphtha	Catalytic Hydrocracker - Heavy H/C Naphtha	-	Drain Dry	1.00	6.00	0.25	
T-0413	Straight Run Kerosene	Atmospheric Distillation - Straight Run Kerosene	-	Drain Dry	1.00	6.00	0.25	
T-0415	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0417	Gasolines & Gasoline Blendstocks	Gasoline Blending - Conventional Gasoline	-	Drain Dry	1.00	6.00	0.25	
T-0418	Straight Run Kerosene	Atmospheric Distillation - Straight Run Kerosene	-	Drain Dry	1.00	6.00	0.25	
T-0435	Sour Water	Various Units - Slop Oil	3,200	Drain Dry	1.00	6.00	0.25	98.7%
T-0437	Crude Oil	Supply System - Crude Oil	12.50	Drain Dry	1.00	6.00	0.25	98.7%
T-0439	Sour Naphtha	Atmospheric Distillation - Straight Run Naphtha	1.67	Drain Dry	1.00	6.00	0.25	
T-0450	Sour Naphtha	Atmospheric Distillation - Straight Run Naphtha	1.67	Drain Dry	1.00	6.00	0.25	
T-0451	Straight Run Diesel	Distillate Blending - Diesel Fuel	3.54	Drain Dry	1.00	6.00	0.25	
T-0452	Ethanol	-	-	Drain Dry	1.00	6.00	0.25	
T-0737	Sour Water	Various Units - Slop Oil	3,200	Drain Dry	1.00	6.00	0.25	98.7%
T-0802	Sour Water	Various Units - Slop Oil	3,200	Drain Dry	1.00	6.00	0.25	98.7%
T-0821	Light Cat Naphtha	Fluid Catalytic Cracker - Cracked Gasoline	0.80	Drain Dry	1.00	6.00	0.25	
T-0834	Straight Run Diesel	Distillate Blending - Diesel Fuel	3.54	Drain Dry	1.00	6.00	0.25	
T-0835	Straight Run Diesel	Distillate Blending - Diesel Fuel	3.54	Drain Dry	1.00	6.00	0.25	
T-1225	Crude Oil	Supply System - Crude Oil	12.50	Drain Dry	1.00	6.00	0.25	98.7%

Tank ID	TANK CHARACTERISTICS						TANK PAINT				
	Tank Type	Tank Insulated	Tank Construction	Tank Diameter	Tank Shell Height	Shell Capacity	Tank Shell Paint	Tank Roof Paint	Shell Paint Condition	Roof Paint Condition	Internal Shell Condition
				D	H_S						
				ft	ft	gallons					
	CR DM HFR	YES-ALL-CTE YES-ALL-CYCLE YES-SHELL NO	Riveted-Bolted Welded	HFR: diam of vertical cross-section	HFR: length				New Average Aged	New Average Aged	Light Rust Dense Rust Gunite Lining
T-0011	INT	NO	Welded	89.0	29.0	1,349,460	White	White	New	New	Light Rust
T-0012	INT	NO	Welded	89.0	29.0	1,349,460	White	White	New	New	Light Rust
T-0020	INT	NO	Welded	90.0	48.0	2,283,960	White	White	New	New	Light Rust
T-0021	INT	NO	Welded	90.0	48.0	2,283,960	White	White	New	New	Light Rust
T-0022	INT	NO	Welded	75.0	48.0	1,586,340	White	White	New	New	Light Rust
T-0023	INT	NO	Welded	75.0	48.0	1,586,340	White	White	New	New	Light Rust
T-0056	INT	NO	Welded	48.0	36.0	487,200	White	White	Average	Average	Light Rust
T-0079	EXT	NO	Welded	125.0	40.0	3,671,640	White	White	New	New	Light Rust
T-0106	INT	NO	Welded	67.0	40.0	1,055,040	White	White	New	New	Light Rust
T-0107	INT	NO	Welded	67.0	40.0	1,055,040	White	White	New	New	Light Rust
T-0108	INT	NO	Welded	67.0	40.0	1,055,040	White	White	Average	Average	Light Rust
T-0109	INT	NO	Welded	67.0	40.0	1,055,040	White	White	Aged	Aged	Light Rust
T-0111	INT	NO	Welded	49.0	30.0	423,360	White	White	Aged	Aged	Light Rust
T-0112	INT	NO	Welded	48.0	30.0	406,140	White	White	Average	Average	Light Rust
T-0117	EXT	NO	Welded	48.0	48.0	649,740	White	White	New	New	Light Rust
T-0124	INT	NO	Welded	40.0	30.0	281,820	White	White	New	New	Light Rust
T-0401	EXT-GEO	NO	Welded	90.0	50.0	2,379,300	White	White	New	New	Light Rust

Tank ID	TANK CHARACTERISTICS						TANK PAINT				
	Tank Type	Tank Insulated	Tank Construction	Tank Diameter	Tank Shell Height	Shell Capacity	Tank Shell Paint	Tank Roof Paint	Shell Paint Condition	Roof Paint Condition	Internal Shell Condition
				D	H_S						
				ft	ft	gallons					
	CR DM HFR	YES-ALL-CTE YES-ALL-CYCLE YES-SHELL NO	Riveted-Bolted Welded	HFR: diam of vertical cross-section	HFR: length				New Average Aged	New Average Aged	Light Rust Dense Rust Gunite Lining
T-0402	EXT	NO	Welded	90.0	50.0	2,379,300	White	White	New	New	Light Rust
T-0411	EXT	NO	Welded	100.0	40.0	2,349,900	White	White	Average	Average	Light Rust
T-0412	EXT	NO	Welded	100.0	40.0	2,349,900	White	White	Average	Average	Light Rust
T-0413	INT	NO	Welded	67.0	39.0	1,028,580	White	White	New	New	Light Rust
T-0415	INT	NO	Welded	67.0	40.0	1,055,040	White	White	New	New	Light Rust
T-0417	INT	NO	Welded	50.0	30.0	440,580	White	White	Aged	Aged	Light Rust
T-0418	INT	NO	Welded	67.0	33.0	870,240	White	White	New	New	Light Rust
T-0435	EXT	NO	Welded	30.0	40.0	211,680	White	White	New	New	Light Rust
T-0437	EXT	NO	Welded	120.0	45.0	3,806,880	White	White	New	New	Light Rust
T-0439	INT	NO	Welded	130.0	46.0	4,567,080	White	White	Average	Average	Light Rust
T-0450	EXT	NO	Welded	120.0	40.0	3,383,940	White	White	New	New	Light Rust
T-0451	INT	YES-ALL-CTE	Welded	35.0	40.0	287,700	Aluminum - Specular	Aluminum - Specular	Average	Average	Light Rust
T-0452	INT	NO	Welded	35.0	40.0	287,700	White	White	Average	Average	Light Rust
T-0737	EXT	NO	Welded	63.0	40.0	932,820	White	White	New	New	Light Rust
T-0802	EXT	NO	Welded	45.0	40.0	475,860	White	White	New	New	Light Rust
T-0821	EXT	NO	Welded	106.0	50.0	3,300,360	White	White	Average	Average	Light Rust
T-0834	EXT	NO	Welded	85.0	40.0	1,697,640	White	White	Average	Average	Light Rust
T-0835	EXT	NO	Welded	111.0	40.0	2,895,480	White	White	Average	Average	Light Rust
T-1225	EXT	NO	Welded	150.0	40.0	5,287,380	White	White	Average	Average	Light Rust

Tank ID	CHEMICAL PROPERTIES				METEOROLOGICAL DATA				
	Product Category	Liquid Molecular Weight	Vapor Molecular Weight	Density of the Liquid	Average Wind Speed	Atmosph. Pressure	Daily Maximum Ambient Temp.	Daily Minimum Ambient Temp.	Daily Total Solar Insulation Factor
		M_L	M_V	W_L	v	P_A	T_{AX}	T_{AN}	I
		lb/lbmole	lb/lbmole	lb/gal	mph	psia	°F	°F	Btu/ft^2d
	Crude Oil Petroleum Stock Organic Liquids								
T-0011	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0012	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0020	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0021	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0022	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0023	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0056	Petroleum Stock	120.0	80.0	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0079	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0106	Crude Oil	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0107	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0108	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0109	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0111	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0112	Petroleum Stock	120.0	80.0	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0117	Petroleum Stock	120.0	80.0	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0124	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0401	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9

Tank ID	CHEMICAL PROPERTIES				METEOROLOGICAL DATA				
	Product Category	Liquid Molecular Weight	Vapor Molecular Weight	Density of the Liquid	Average Wind Speed	Atmosph. Pressure	Daily Maximum Ambient Temp.	Daily Minimum Ambient Temp.	Daily Total Solar Insulation Factor
		M_L	M_V	W_L	v	P_A	T_{AX}	T_{AN}	I
		lb/lbmole	lb/lbmole	lb/gal	mph	psia	°F	°F	Btu/ft^2d
	Crude Oil Petroleum Stock Organic Liquids								
T-0402	Petroleum Stock	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0411	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0412	Petroleum Stock	120.0	80.0	6.40	9.0	13.1	77.9	50.0	1,711.9
T-0413	Petroleum Stock	162.0	130.0	7.00	9.0	13.1	77.9	50.0	1,711.9
T-0415	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0417	Petroleum Stock	92.0	62.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0418	Petroleum Stock	162.0	130.0	7.00	9.0	13.1	77.9	50.0	1,711.9
T-0435	Crude Oil	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0437	Crude Oil	207.0	58.0	7.10	9.0	13.1	77.9	50.0	1,711.9
T-0439	Petroleum Stock	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0450	Petroleum Stock	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0451	Petroleum Stock	188.0	130.0	7.10	9.0	13.1	77.9	50.0	1,711.9
T-0452	Organic Liquids	-	46.1	6.59	9.0	13.1	77.9	50.0	1,711.9
T-0737	Crude Oil	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0802	Crude Oil	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0821	Petroleum Stock	92.0	66.0	5.60	9.0	13.1	77.9	50.0	1,711.9
T-0834	Petroleum Stock	188.0	130.0	7.10	9.0	13.1	77.9	50.0	1,711.9
T-0835	Petroleum Stock	188.0	130.0	7.10	9.0	13.1	77.9	50.0	1,711.9
T-1225	Crude Oil	207.0	58.0	7.10	9.0	13.1	77.9	50.0	1,711.9

Tank ID	TANK TEMPERATURE VARIABLES											
	Tank Shell Surface Solar Absorptance	Tank Roof Surface Solar Absorptance	Daily Average Temp.	Liquid Bulk Temp. based on Ambient Met Data	Monthly Liquid Bulk Temperature Monitored	Liquid Bulk Temp.	Daily Average Liquid Surface Temp.	Average Vapor Temp.	Daily Temp. Range	Avg. Daily Vapor Temp. Range	Daily Maximum Liquid Surface Temp.	Daily Minimum Liquid Surface Temp.
	α_S	α_R	T_{AA}	T_B (AP-42)	T_B (Monitored)	T_B	T_{LA}	T_V	ΔT_A	ΔT_V	T_{LX}	T_{LN}
	unitless	unitless	°R	°R	°R	°R	°R	°R	°R	°R	°R	°R
	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Eq. 1-30	AP-42, Ch. 7.1, Eq. 1-31	Ops Data	Max. Monitored vs AP-42 Estimate	AP-42, Ch. 7.1, TB Full-Insul Eq. 1-29 Shell-Insul Eq. 1-27 Non-Insul	AP-42, Ch. 7.1, TB Full-Insul Eq. 1-34 Shell-Insul Eq. 1-32 Non-Insul	AP-42, Ch. 7.1, Eq. 1-11	AP-42, Ch. 7.1, Eq. 1-6 Non-Insul Eq. 1-8 Shell-Insul ΔTV = 0 Full-Insul and Constant Temp Eq. 8-1 Full-Insul and Cycle Temp	AP-42, Chp 7.1, Fig 7.1-17 For Full-Insul TLX = TBX	AP-42, Chp 7.1, Fig 7.1-17 For Full-Insul TLN = TBN
T-0011	0.17	0.17	523.6	524.5	534.38	534.4	532.1	529.7	27.9	25.0	538.3	525.8
T-0012	0.17	0.17	523.6	524.5	527.71	527.7	527.7	527.7	27.9	25.0	533.9	521.4
T-0020	0.17	0.17	523.6	524.5	-	524.5	525.5	526.5	27.9	25.9	532.0	519.0
T-0021	0.17	0.17	523.6	524.5	-	524.5	525.5	526.5	27.9	25.9	532.0	519.0
T-0022	0.17	0.17	523.6	524.5	-	524.5	525.5	526.4	27.9	26.3	532.1	518.9
T-0023	0.17	0.17	523.6	524.5	-	524.5	525.5	526.4	27.9	26.3	532.1	518.9
T-0056	0.25	0.25	523.6	524.9	526.74	526.7	527.4	528.0	27.9	29.0	534.7	520.1
T-0079	0.17	0.17	523.6	524.5	545.55	545.5	539.4	533.2	27.9	25.0	545.6	533.1
T-0106	0.17	0.17	523.6	524.5	532.10	532.1	530.2	528.4	27.9	26.2	536.8	523.7
T-0107	0.17	0.17	523.6	524.5	533.57	533.6	531.1	528.7	27.9	26.2	537.7	524.6
T-0108	0.25	0.25	523.6	524.9	544.62	544.6	538.7	532.7	27.9	28.6	545.8	531.5
T-0109	0.34	0.34	523.6	525.4	542.01	542.0	537.7	533.4	27.9	31.4	545.6	529.9
T-0111	0.34	0.34	523.6	525.4	541.40	541.4	537.3	533.2	27.9	31.4	545.2	529.4
T-0112	0.25	0.25	523.6	524.9	525.91	525.9	527.0	528.0	27.9	28.7	534.1	519.8
T-0117	0.17	0.17	523.6	524.5	528.39	528.4	527.7	527.0	27.9	27.3	534.5	520.9
T-0124	0.17	0.17	523.6	524.5	528.23	528.2	527.7	527.2	27.9	26.7	534.4	521.0
T-0401	0.17	0.17	523.6	524.5	532.24	532.2	530.4	528.5	27.9	26.0	536.9	523.9

Tank ID	TANK TEMPERATURE VARIABLES											
	Tank Shell Surface Solar Absorptance	Tank Roof Surface Solar Absorptance	Daily Average Temp.	Liquid Bulk Temp. based on Ambient Met Data	Monthly Liquid Bulk Temperature Monitored	Liquid Bulk Temp.	Daily Average Liquid Surface Temp.	Average Vapor Temp.	Daily Temp. Range	Avg. Daily Vapor Temp. Range	Daily Maximum Liquid Surface Temp.	Daily Minimum Liquid Surface Temp.
	α_S	α_R	T_{AA}	T_B (AP-42)	T_B (Monitored)	T_B	T_{LA}	T_V	ΔT_A	ΔT_V	T_{LX}	T_{LN}
	unitless	unitless	°R	°R	°R	°R	°R	°R	°R	°R	°R	°R
	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Table 7.1-6	AP-42, Ch. 7.1, Eq. 1-30	AP-42, Ch. 7.1, Eq. 1-31	Ops Data	Max. Monitored vs AP-42 Estimate	AP-42, Ch. 7.1, TB Full-Insul Eq. 1-29 Shell-Insul Eq. 1-27 Non-Insul	AP-42, Ch. 7.1, TB Full-Insul Eq. 1-34 Shell-Insul Eq. 1-32 Non-Insul	AP-42, Ch. 7.1, Eq. 1-11	AP-42, Ch. 7.1, Eq. 1-6 Non-Insul Eq. 1-8 Shell-Insul ΔTV = 0 Full-Insul and Constant Temp Eq. 8-1 Full-Insul and Cycle Temp	AP-42, Chp 7.1, Fig 7.1-17 For Full-Insul TLX = TBX	AP-42, Chp 7.1, Fig 7.1-17 For Full-Insul TLN = TBN
T-0402	0.17	0.17	523.6	524.5	538.33	538.3	534.2	530.0	27.9	26.0	540.7	527.7
T-0411	0.25	0.25	523.6	524.9	525.12	525.1	526.6	528.1	27.9	28.0	533.6	519.6
T-0412	0.25	0.25	523.6	524.9	526.39	526.4	527.4	528.5	27.9	28.0	534.4	520.4
T-0413	0.17	0.17	523.6	524.5	535.45	535.5	532.3	529.2	27.9	26.1	538.9	525.8
T-0415	0.17	0.17	523.6	524.5	527.18	527.2	527.2	527.1	27.9	26.2	533.7	520.6
T-0417	0.34	0.34	523.6	525.4	531.21	531.2	531.0	530.7	27.9	31.4	538.8	523.1
T-0418	0.17	0.17	523.6	524.5	539.63	539.6	535.1	530.6	27.9	25.8	541.6	528.7
T-0435	0.17	0.17	523.6	524.5	524.57	524.6	525.3	526.1	27.9	27.9	532.3	518.4
T-0437	0.17	0.17	523.6	524.5	533.44	533.4	531.4	529.3	27.9	25.3	537.7	525.1
T-0439	0.25	0.25	523.6	524.9	531.80	531.8	531.0	530.2	27.9	27.8	537.9	524.0
T-0450	0.17	0.17	523.6	524.5	531.26	531.3	530.0	528.8	27.9	25.0	536.3	523.7
T-0451	0.44	0.44	523.6	525.9	534.20	534.2	534.2	534.2	27.9	11.4	543.9	532.5
T-0452	0.25	0.25	523.6	524.9	515.12	524.9	526.1	527.3	27.9	29.8	533.6	518.7
T-0737	0.17	0.17	523.6	524.5	524.57	524.6	525.5	526.4	27.9	26.3	532.1	518.9
T-0802	0.17	0.17	523.6	524.5	524.57	524.6	525.4	526.3	27.9	27.0	532.2	518.7
T-0821	0.25	0.25	523.6	524.9	520.65	524.9	526.4	527.9	27.9	28.2	533.5	519.4
T-0834	0.25	0.25	523.6	524.9	541.90	541.9	537.2	532.6	27.9	28.2	544.3	530.2
T-0835	0.25	0.25	523.6	524.9	542.05	542.1	537.6	533.2	27.9	27.8	544.6	530.7
T-1225	0.25	0.25	523.6	524.9	530.25	530.3	530.1	530.0	27.9	27.4	537.0	523.3

Tank ID	TANK PRESSURE VARIABLES					HEEL PARAMETERS CALCULATION							
	True Vapor Pressure at Daily Avg Temp. (T_{LA})	True Vapor Pressure at Daily Max. Liq. Surface Temp (T_{LX})	True Vapor Pressure at Daily Min. Liq. Surface Temp (T_{LN})	Avg. Daily Vapor Pressure Range	Vapor Pressure Function	Slope of Tank Bottom	Effective Liquid Height During Roof Landing	Vapor Space Height under Landed Floating Roof	Volume of the Vapor Space	Vapor Space Expansion Factor	Filling Saturation Factor	Vented Vapor Saturation Factor
	P_{VA}	P_{VX}	P_{VN}	ΔP_V	P*	S_B	h_{le}	hv	V_V	K_E	Sat	K_S
	psia	psia	psia	psia	unitless	ft/ft	ft	ft	ft^3	unitless	unitless	unitless
	AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42, Ch. 7.1, Eq. 1-9 §7.1.3.8.4	AP-42 Ch. 7.1 Eq. 3-9	SB < 0 (Cone-Up) SB = 0 (Flat) SB > 0 (Cone-Down)	AP-42 Ch. 7.1 Table 7.1-4	AP-42 Ch. 7.1 Table 7.1-4	AP-42, Ch. 7.1, Eq. 3-22	AP-42, Ch. 7.1 Eq. 1-5	AP-42, Ch. 7.1, Tables 7.1-17 7.1-18 and 7.1-19	AP-42, Ch. 7.1 Table 7.1-17 Eq. 1-21 Hvo=hv
T-0011	9.07	10.12	8.11	2.01	0.29	-	0.25	5.75	35,772	0.550	0.2	0.15
T-0012	8.39	9.38	7.49	1.89	0.25	-	0.25	5.75	35,772	0.452	0.2	0.15
T-0020	8.07	9.06	7.16	1.90	0.24	-	0.25	5.75	36,580	0.430	0.2	0.15
T-0021	8.07	9.06	7.16	1.90	0.24	-	0.25	5.75	36,580	0.430	0.2	0.15
T-0022	8.06	9.07	7.14	1.93	0.24	-	0.25	5.75	25,403	0.435	0.2	0.15
T-0023	8.06	9.07	7.14	1.93	0.24	-	0.25	5.75	25,403	0.435	0.2	0.15
T-0056	1.91	2.23	1.63	0.60	0.04	-	0.25	5.75	10,405	0.109	0.2	0.15
T-0079	10.31	11.10	9.24	1.86	0.37	-	0.25	5.75	70,563	0.719	0.2	0.15
T-0106	7.02	7.81	6.28	1.53	0.19	-	0.25	5.75	20,273	0.302	0.2	0.15
T-0107	8.93	10.01	7.93	2.08	0.28	-	0.25	5.75	20,273	0.551	0.2	0.15
T-0108	10.18	11.10	8.98	2.12	0.36	-	0.25	5.75	20,273	0.787	0.2	0.15
T-0109	10.02	11.10	8.72	2.38	0.35	-	0.25	5.75	20,273	0.837	0.2	0.15
T-0111	9.95	11.10	8.66	2.44	0.34	-	0.25	5.75	10,843	0.840	0.2	0.15
T-0112	1.89	2.20	1.61	0.59	0.04	-	0.25	5.75	10,405	0.107	0.2	0.15
T-0117	1.92	2.22	1.65	0.57	0.04	-	0.25	5.75	10,405	0.103	0.2	0.15
T-0124	8.39	9.45	7.43	2.02	0.25	-	0.25	5.75	7,226	0.482	0.2	0.15
T-0401	8.80	9.87	7.83	2.04	0.27	-	0.25	5.75	36,580	0.528	0.2	0.15

Tank ID	TANK PRESSURE VARIABLES					HEEL PARAMETERS CALCULATION						
	True Vapor Pressure at Daily Avg Temp. (T_{LA})	True Vapor Pressure at Daily Max. Liq. Surface Temp (T_{LX})	True Vapor Pressure at Daily Min. Liq. Surface Temp (T_{LN})	Avg. Daily Vapor Pressure Range	Vapor Pressure Function	Slope of Tank Bottom	Effective Liquid Height During Roof Landing	Vapor Space Height under Landed Floating Roof	Volume of the Vapor Space	Vapor Space Expansion Factor	Filling Saturation Factor	Vented Vapor Saturation Factor
	P_{VA}	P_{VX}	P_{VN}	ΔP_V	P*	S_B	h_{le}	hv	V_V	K_E	Sat	K_S
	psia	psia	psia	psia	unitless	ft/ft	ft	ft	ft^3	unitless	unitless	unitless
	AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42, Ch. 7.1, Eq. 1-25 Petroleum Eq. 1-26 Org Liq	AP-42, Ch. 7.1, Eq. 1-9 §7.1.3.8.4	AP-42 Ch. 7.1 Eq. 3-9	SB < 0 (Cone-Up) SB = 0 (Flat) SB > 0 (Cone-Down)	AP-42 Ch. 7.1 Table 7.1-4	AP-42 Ch. 7.1 Table 7.1-4	AP-42, Ch. 7.1, Eq. 3-22	AP-42, Ch. 7.1 Eq. 1-5	AP-42, Ch. 7.1, Tables 7.1-17 7.1-18 and 7.1-19	AP-42, Ch. 7.1 Table 7.1-17 Eq. 1-21 Hvo=hv
T-0402	6.75	7.59	5.98	1.62	0.18	-	0.25	5.75	36,580	0.304	0.2	0.15
T-0411	8.23	9.32	7.24	2.08	0.24	-	0.25	5.75	45,160	0.483	0.2	0.15
T-0412	1.91	2.21	1.64	0.58	0.04	-	0.25	5.75	45,160	0.105	0.2	0.15
T-0413	0.46	0.55	0.39	0.15	0.01	-	0.25	5.75	20,273	0.061	0.2	0.15
T-0415	8.31	9.34	7.37	1.97	0.25	-	0.25	5.75	20,273	0.463	0.2	0.15
T-0417	8.90	10.21	7.72	2.49	0.28	-	0.25	5.75	11,290	0.656	0.2	0.15
T-0418	0.50	0.58	0.42	0.16	0.01	-	0.25	5.75	20,273	0.061	0.2	0.15
T-0435	6.46	7.26	5.73	1.53	0.17	-	0.25	5.75	4,064	0.285	0.2	0.15
T-0437	7.15	7.93	6.43	1.50	0.20	-	0.25	5.75	65,031	0.300	0.2	0.15
T-0439	7.48	8.47	6.58	1.89	0.21	-	0.25	5.75	76,321	0.391	0.2	0.15
T-0450	7.35	8.23	6.54	1.68	0.20	-	0.25	5.75	65,031	0.341	0.2	0.15
T-0451	0.43	0.55	0.42	0.14	0.01	-	0.25	5.75	5,532	0.032	0.2	0.15
T-0452	0.81	1.03	0.63	0.41	0.02	-	0.25	5.75	5,532	0.090	0.2	0.15
T-0737	6.48	7.24	5.79	1.44	0.17	-	0.25	5.75	17,924	0.269	0.2	0.15
T-0802	6.47	7.25	5.77	1.48	0.17	-	0.25	5.75	9,145	0.276	0.2	0.15
T-0821	5.84	6.66	5.10	1.56	0.15	-	0.25	5.75	50,742	0.270	0.2	0.15
T-0834	0.47	0.56	0.39	0.17	0.01	-	0.25	5.75	32,628	0.066	0.2	0.15
T-0835	0.47	0.56	0.40	0.17	0.01	-	0.25	5.75	55,642	0.065	0.2	0.15
T-1225	7.00	7.84	6.24	1.59	0.19	-	0.25	5.75	101,611	0.315	0.2	0.15

Tank ID	ROOF LANDING LOSSES FOR ALL DRAIN-DRY TANKS			TOTAL ROOF LANDING LOSSES	REFILLING LOSSES			VOC Emissions	VOC Emissions	H2S Emissions	H2S Emissions	HAPs Emissions
	Clingage Factor	Limit on Standing Idle Loss (Clingage)	Standing Idle Loss (Clingage)		Filling Saturation Correction Factor for Wind	Limit on Filling Loss	Filling Loss					
	C_S	L_{SLmax}	$L_{SLclingage}$	L_{TL}	C_{sf}	L_{FLmax}	L_{FL}					
	bbl/1000 ft^2	lb/event	lb/event	lb/event	unitless	lb/event	lb/event	lb/hr	ton/event	lb/hr	ton/event	ton/event
	AP-42 Ch. 7.1 Table 7.1-10	AP-42 Ch. 7.1 Table 7.1-19 Eq. 3-15	AP-42 Ch. 7.1 Table 7.1-19 Eq. 3-11	AP-42 Ch. 7.1 Eq. 3-1	AP-42, Ch. 7.1, Table 7.1-18 Eq. 3-21	AP-42, Ch. 7.1, Table 7.1-17 Eq. 3-16					Raoults Law	Raoults Law
T-0011	0.15	2,148.1	219.5	219.5	1.00	-	555.7	23.2	0.4	-	-	7.81E-03
T-0012	0.15	1,987.3	219.5	219.5	1.00	-	514.1	21.4	0.4	-	-	7.39E-03
T-0020	0.15	1,953.4	224.4	224.4	1.00	-	505.3	21.1	0.4	-	-	7.35E-03
T-0021	0.15	1,953.4	224.4	224.4	1.00	-	505.3	21.1	0.4	-	-	7.35E-03
T-0022	0.15	1,355.5	155.9	155.9	1.00	-	350.6	14.6	0.3	-	-	5.10E-03
T-0023	0.15	1,355.5	155.9	155.9	1.00	-	350.6	14.6	0.3	-	-	5.10E-03
T-0056	0.15	169.4	73.0	73.0	1.00	-	43.8	3.0	0.1	-	-	2.92E-04
T-0079	0.15	4,814.9	433.0	433.0	1.00	-	1,245.5	51.9	0.8	-	-	1.69E-02
T-0106	0.60	1,002.4	497.5	497.5	1.00	-	259.3	0.3	0.005	2.48E-02	8.42E-04	2.04E-05
T-0107	0.15	1,197.9	124.4	124.4	1.00	-	309.9	12.9	0.2	1.38E-05	3.41E-07	8.08E-03
T-0108	0.15	1,366.5	124.4	124.4	1.00	-	353.5	14.7	0.2	-	-	4.81E-03
T-0109	0.15	1,344.4	124.4	124.4	1.00	-	347.8	14.5	0.2	-	-	4.75E-03
T-0111	0.15	713.9	66.5	66.5	1.00	-	184.7	7.7	0.1	-	-	2.53E-03
T-0112	0.15	167.8	73.0	73.0	1.00	-	43.4	3.0	0.1	-	-	2.91E-04
T-0117	0.15	170.5	73.0	73.0	1.00	-	44.1	3.0	0.1	-	-	2.93E-04
T-0124	0.15	401.5	44.3	44.3	1.00	-	103.9	4.3	0.1	-	-	1.49E-03
T-0401	0.15	2,131.4	224.4	224.4	1.00	-	551.4	23.0	0.4	-	-	7.81E-03

Tank ID	ROOF LANDING LOSSES FOR ALL DRAIN-DRY TANKS			TOTAL ROOF LANDING LOSSES	REFILLING LOSSES			VOC Emissions	VOC Emissions	H2S Emissions	H2S Emissions	HAPs Emissions
	Clingage Factor	Limit on Standing Idle Loss (Clingage)	Standing Idle Loss (Clingage)		Filling Saturation Correction Factor for Wind	Limit on Filling Loss	Filling Loss					
	C_S	L_{SLmax}	$L_{SLclingage}$	L_{TL}	C_{sf}	L_{FLmax}	L_{FL}					
	bbl/1000 ft^2	lb/event	lb/event	lb/event	unitless	lb/event	lb/event	lb/hr	ton/event	lb/hr	ton/event	ton/event
	AP-42 Ch. 7.1 Table 7.1-10	AP-42 Ch. 7.1 Table 7.1-19 Eq. 3-15	AP-42 Ch. 7.1 Table 7.1-19 Eq. 3-11	AP-42 Ch. 7.1 Eq. 3-1	AP-42, Ch. 7.1, Table 7.1-18 Eq. 3-21	AP-42, Ch. 7.1, Table 7.1-17 Eq. 3-16					Raoults Law	Raoults Law
T-0402	0.15	1,738.9	224.4	224.4	1.00	-	449.8	18.7	0.3	4.52E-04	1.58E-05	3.70E-03
T-0411	0.15	2,460.0	277.1	277.1	1.00	-	636.3	26.5	0.5	2.66E-05	7.29E-07	1.70E-02
T-0412	0.15	736.0	316.7	316.7	1.00	-	190.4	13.2	0.3	-	-	1.27E-03
T-0413	0.15	130.8	130.8	130.8	1.00	-	33.8	5.5	0.082	-	-	3.63E-05
T-0415	0.15	1,115.2	124.4	124.4	1.00	-	288.5	12.0	0.2	-	-	4.16E-03
T-0417	0.15	665.0	69.3	69.3	1.00	-	172.0	7.2	0.1	-	-	2.43E-03
T-0418	0.15	140.1	140.1	140.1	1.00	-	36.3	5.8	0.1	-	-	3.88E-05
T-0435	0.60	185.1	99.8	99.8	1.00	-	47.9	0.05	0.0010	4.63E-03	1.66E-04	3.98E-06
T-0437	0.60	2,879.5	2,023.5	2,023.5	1.00	-	744.9	1.1	0.02	1.02E-03	3.07E-05	1.90E-04
T-0439	0.15	4,022.9	468.3	468.3	1.00	-	1,040.6	43.4	0.8	2.10E-03	6.39E-05	1.92E-02
T-0450	0.15	3,367.3	399.0	399.0	1.00	-	871.0	36.3	0.6	1.74E-03	5.40E-05	1.61E-02
T-0451	0.15	33.4	33.4	33.4	1.00	-	8.6	1.4	0.02	1.55E-04	7.04E-05	1.23E-05
T-0452	0.00	22.0	0.4	0.4	1.00	-	5.7	0.2	0.003	-	-	0.00E+00
T-0737	0.60	818.9	439.9	439.9	1.00	-	211.8	0.2	0.004	2.05E-02	7.33E-04	1.76E-05
T-0802	0.60	417.2	224.4	224.4	1.00	-	107.9	0.1	0.002	1.04E-02	3.74E-04	8.97E-06
T-0821	0.15	2,087.6	311.3	311.3	1.00	-	540.0	22.5	0.4	4.87E-04	2.06E-05	4.68E-03
T-0834	0.15	212.7	212.7	212.7	1.00	-	55.0	8.9	0.1	1.03E-03	4.33E-04	7.86E-05
T-0835	0.15	366.3	366.3	366.3	1.00	-	94.8	15.3	0.2	1.79E-03	7.43E-04	1.35E-04
T-1225	0.60	4,407.0	3,161.8	3,161.8	1.00	-	1,140.0	1.7	0.03	1.57E-03	4.79E-05	2.95E-04
MAX HOURLY (assumes only one landing at time), lb/hr								**51.9**		**0.02**		
ANNUAL, tpy									**8.09**		**0.004**	**0.16**

FLOATING ROOF TANKS (EXT, INT) POTENTIAL TO EMIT HAPs

Maximum individual HAPs (n-Hexane), tpy = **1.14**

Total HAPS, tpy = **2.53**

HAPs	1,3-Butadiene	2,2,4-Trimethylpentane	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzene	Benzo(a)phenanthrene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(e)pyrene	Benzo(g,h,i)perylene	Biphenyl	Cresol (mixed isomers)	Cumene	Ethylbenzene	Fluoranthene	Fluorene	Lead compounds	m-Cresol
CAS No.	106-99-0	540-84-1	83-32-9	208-96-8	120-12-7	56-55-3	71-43-2	218-01-9	50-32-8	205-99-2	192-97-2	191-24-2	92-52-4	1319-77-3	98-82-8	100-41-4	206-44-0	86-73-7	7439-92-1	108-39-4
Pi°, psia	57.00	0.79	4.26E-05	9.28E-05	1.16E-05	4.06E-09	2.01	1.21E-10	1.06E-10	9.67E-09	1.10E-10	1.93E-12	1.93E-04	0.00	0.12	0.22	1.78E-07	1.16E-05	0.03	2.13E-03
Tank	**Speciated Potential to Emit, tpy**																			
T-0011	1.16E-02	4.36E-02	-	-	6.47E-12	-	1.24E-02	-	-	-	-	-	4.56E-08	-	1.13E-04	2.02E-03	-	-	-	-
T-0012	1.00E-02	3.76E-02	-	-	5.58E-12	-	1.07E-02	-	-	-	-	-	3.93E-08	-	9.71E-05	1.74E-03	-	-	-	-
T-0020	2.97E-03	1.12E-02	-	-	1.66E-12	-	3.17E-03	-	-	-	-	-	1.17E-08	-	2.89E-05	5.17E-04	-	-	-	-
T-0021	2.97E-03	1.12E-02	-	-	1.66E-12	-	3.17E-03	-	-	-	-	-	1.17E-08	-	2.89E-05	5.17E-04	-	-	-	-
T-0022	2.59E-03	9.76E-03	-	-	1.45E-12	-	2.77E-03	-	-	-	-	-	1.02E-08	-	2.52E-05	4.52E-04	-	-	-	-
T-0023	2.59E-03	9.76E-03	-	-	1.45E-12	-	2.77E-03	-	-	-	-	-	1.02E-08	-	2.52E-05	4.52E-04	-	-	-	-
T-0056	-	8.92E-06	-	-	-	-	8.29E-04	-	-	-	-	-	-	-	2.91E-05	2.92E-04	-	-	-	-
T-0079	1.35E-02	5.09E-02	-	-	7.54E-12	-	1.44E-02	-	-	-	-	-	5.31E-08	-	1.31E-04	2.35E-03	-	-	-	-
T-0106	-	6.18E-05	2.41E-09	3.07E-09	2.34E-09	8.27E-15	1.35E-03	1.97E-16	1.95E-16	2.69E-14	2.99E-16	-	5.24E-07	4.96E-07	7.03E-06	8.42E-05	1.86E-12	9.68E-10	-	3.03E-07
T-0107	2.38E-02	3.51E-04	-	-	-	-	2.41E-02	-	-	-	-	-	-	-	6.17E-05	6.30E-04	-	-	-	-
T-0108	9.53E-03	3.59E-02	-	-	5.32E-12	-	1.02E-02	-	-	-	-	-	3.75E-08	-	9.25E-05	1.66E-03	-	-	-	-
T-0109	1.29E-02	4.85E-02	-	-	7.19E-12	-	1.37E-02	-	-	-	-	-	5.06E-08	-	1.25E-04	2.24E-03	-	-	-	-
T-0111	7.39E-03	2.78E-02	-	-	4.12E-12	-	7.88E-03	-	-	-	-	-	2.91E-08	-	7.18E-05	1.29E-03	-	-	-	-
T-0112	-	3.60E-06	-	-	-	-	3.35E-04	-	-	-	-	-	-	-	1.17E-05	1.18E-04	-	-	-	-
T-0117	-	9.20E-06	-	-	-	-	8.55E-04	-	-	-	-	-	-	-	3.00E-05	3.01E-04	-	-	-	-
T-0124	5.97E-03	2.25E-02	-	-	3.33E-12	-	6.37E-03	-	-	-	-	-	2.35E-08	-	5.80E-05	1.04E-03	-	-	-	-
T-0401	2.24E-03	8.41E-03	-	-	1.25E-12	-	2.38E-03	-	-	-	-	-	8.79E-09	-	2.17E-05	3.89E-04	-	-	-	-
T-0402	2.92E-03	3.92E-04	1.03E-10	1.00E-09	-	-	6.91E-03	-	-	-	-	-	5.08E-09	-	2.96E-05	8.34E-04	-	-	-	-
T-0411	2.86E-02	4.22E-04	-	-	-	-	2.90E-02	-	-	-	-	-	-	-	7.41E-05	7.57E-04	-	-	-	-
T-0412	-	1.12E-05	-	-	-	-	1.04E-03	-	-	-	-	-	-	-	3.64E-05	3.65E-04	-	-	-	-
T-0413	-	3.79E-05	-	-	-	-	3.32E-05	-	-	-	-	-	3.26E-10	-	3.42E-06	2.59E-05	-	-	-	-
T-0415	6.08E-03	2.29E-02	-	-	3.39E-12	-	6.48E-03	-	-	-	-	-	2.39E-08	-	5.91E-05	1.06E-03	-	-	-	-
T-0417	9.06E-03	3.41E-02	-	-	5.05E-12	-	9.66E-03	-	-	-	-	-	3.56E-08	-	8.80E-05	1.58E-03	-	-	-	-
T-0418	-	4.18E-05	-	-	-	-	3.65E-05	-	-	-	-	-	3.59E-10	-	3.77E-06	2.86E-05	-	-	-	-
T-0435	-	8.12E-05	3.17E-09	4.03E-09	3.07E-09	1.09E-14	1.78E-03	2.58E-16	2.56E-16	3.54E-14	3.92E-16	-	6.88E-07	6.52E-07	9.24E-06	1.11E-04	2.45E-12	1.27E-09	-	3.98E-07
T-0437	-	6.00E-04	3.48E-10	5.30E-10	6.04E-11	1.65E-13	4.51E-03	1.80E-15	4.31E-15	5.52E-13	1.22E-15	8.78E-18	6.43E-08	-	4.00E-05	5.05E-04	1.03E-12	5.53E-10	7.58E-11	-
T-0439	-	2.48E-04	-	-	-	-	1.68E-02	-	-	-	-	-	2.16E-08	-	1.10E-04	8.88E-04	-	-	-	-
T-0450	-	3.15E-04	-	-	-	-	2.14E-02	-	-	-	-	-	2.74E-08	-	1.39E-04	1.13E-03	-	-	-	-
T-0451	-	-	-	-	6.37E-09	-	1.47E-05	-	-	-	-	-	7.15E-10	-	8.31E-07	3.25E-06	-	-	-	-
T-0452	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-0737	-	7.10E-05	2.77E-09	3.52E-09	2.69E-09	9.49E-15	1.55E-03	2.26E-16	2.24E-16	3.09E-14	3.43E-16	-	6.01E-07	5.69E-07	8.07E-06	9.66E-05	2.14E-12	1.11E-09	-	3.48E-07
T-0802	-	8.02E-05	3.13E-09	3.98E-09	3.04E-09	1.07E-14	1.75E-03	2.55E-16	2.53E-16	3.50E-14	3.88E-16	-	6.80E-07	6.44E-07	9.12E-06	1.09E-04	2.42E-12	1.26E-09	-	3.94E-07
T-0821	3.30E-03	4.43E-04	1.17E-10	1.14E-09	-	-	7.82E-03	-	-	-	-	-	5.74E-09	-	3.34E-05	9.44E-04	-	-	-	-
T-0834	-	-	-	-	6.27E-08	-	1.45E-04	-	-	-	-	-	7.03E-09	-	8.17E-06	3.20E-05	-	-	-	-
T-0835	-	-	-	-	2.87E-08	-	6.62E-05	-	-	-	-	-	3.21E-09	-	3.74E-06	1.46E-05	-	-	-	-
T-1225	-	9.56E-04	5.55E-10	8.44E-10	9.63E-11	2.63E-13	7.18E-03	2.87E-15	6.86E-15	8.79E-13	1.94E-15	1.40E-17	1.02E-07	-	6.38E-05	8.04E-04	1.64E-12	8.81E-10	1.21E-10	-
Sum HAPs, tpy	**1.58E-01**	**3.78E-01**	**1.26E-08**	**1.81E-08**	**1.09E-07**	**4.67E-13**	**2.33E-01**	**5.61E-15**	**1.21E-14**	**1.56E-12**	**4.58E-15**	**2.28E-17**	**3.12E-06**	**2.36E-06**	**1.68E-03**	**2.54E-02**	**1.15E-11**	**6.04E-09**	**1.97E-10**	**1.44E-06**

Raoult's Law
$P_i = x_i * TVP_i$
$P_i = y_i * TVP$
$y_i = x_i * TVP_i/TVP$

Liquid molar fraction $xi\ (mole_i/mole_T) = mi\ (g_i/g_T) * MW_{liq}\ (g_T/moles_T) / MW_i\ (g_i/moles_i) = wt\%_{liq} * MW_{liq}/MW_i$

Gas molar fraction $yi\ (mole_i/mole_T) = mi\ (g_i/g_T) * MW_{vap}\ (g_T/moles_T) / MW_i\ (g_i/moles_i) = wt\%_{vap} * MW_{vap}/MW_i$

$yi = xi * TVPi/TVP$
$wt\%_{vap} * MW_{vap}/MWi = wt\%_{liq} * MW_{liq}/MW_i * TVPi/TVP$
$wt\%_{vap} = wt\%_{liq} * TVP_i/TVP * MW_{liq}/MW_{vap}$

HAPs	Mercury compounds	Methanol	Methyl tert butyl ether	m-Xylene	Naphthalene	n-Hexane	o-Cresol	o-Xylene	PAH Total	Phenanthrene	p-Xylene	Pyrene	Styrene	Toluene	Xylene (mixed isomers)
CAS No.	7439-97-6	67-56-1	1634-04-4	108-38-3	91-20-3	110-54-3	95-48-7	95-47-6	PAH	85-01-8	106-42-3	129-00-0	100-42-5	108-88-3	1330-20-7
Pi°, psia	2.32E-05	2.70	5.30	0.16	0.01	3.14	3.48E-03	0.13	1.93E-12	2.34E-06	0.17	8.70E-08	0.12	0.60	0.20
Tank															
T-0011	-	1.13E-04	7.82E-04	2.36E-03	5.71E-06	1.95E-02	-	1.52E-03	3.19E-15	1.49E-12	1.48E-03	-	1.90E-04	3.16E-02	1.26E-02
T-0012	-	9.71E-05	6.74E-04	2.04E-03	4.92E-06	1.68E-02	-	1.31E-03	2.75E-15	1.29E-12	1.28E-03	-	1.64E-04	2.72E-02	1.08E-02
T-0020	-	2.89E-05	2.00E-04	6.06E-04	1.46E-06	5.01E-03	-	3.90E-04	8.17E-16	3.82E-13	3.80E-04	-	4.88E-05	8.10E-03	3.22E-03
T-0021	-	2.89E-05	2.00E-04	6.06E-04	1.46E-06	5.01E-03	-	3.90E-04	8.17E-16	3.82E-13	3.80E-04	-	4.88E-05	8.10E-03	3.22E-03
T-0022	-	2.52E-05	1.75E-04	5.29E-04	1.28E-06	4.37E-03	-	3.40E-04	7.13E-16	3.34E-13	3.32E-04	-	4.26E-05	7.07E-03	2.81E-03
T-0023	-	2.52E-05	1.75E-04	5.29E-04	1.28E-06	4.37E-03	-	3.40E-04	7.13E-16	3.34E-13	3.32E-04	-	4.26E-05	7.07E-03	2.81E-03
T-0056	-	2.61E-04	5.23E-04	4.12E-04	-	7.78E-04	-	3.23E-06	-	-	3.62E-04	-	-	3.82E-03	5.64E-04
T-0079	-	1.31E-04	9.11E-04	2.76E-03	6.65E-06	2.28E-02	-	1.77E-03	3.72E-15	1.74E-12	1.73E-03	-	2.22E-04	3.68E-02	1.46E-02
T-0106	-	1.81E-03	-	3.85E-04	9.01E-07	2.96E-03	4.96E-07	7.93E-05	-	3.26E-10	-	-	-	5.73E-04	1.56E-04
T-0107	1.77E-13	-	-	1.59E-03	-	2.35E-01	-	5.24E-04	-	-	5.63E-04	-	-	8.98E-03	-
T-0108	-	9.26E-05	6.42E-04	1.94E-03	4.69E-06	1.61E-02	-	1.25E-03	2.62E-15	1.23E-12	1.22E-03	-	1.56E-04	2.60E-02	1.03E-02
T-0109	-	1.25E-04	8.68E-04	2.63E-03	6.34E-06	2.17E-02	-	1.69E-03	3.54E-15	1.66E-12	1.65E-03	-	2.11E-04	3.51E-02	1.39E-02
T-0111	-	7.18E-05	4.98E-04	1.51E-03	3.64E-06	1.25E-02	-	9.70E-04	2.03E-15	9.50E-13	9.45E-04	-	1.21E-04	2.01E-02	8.00E-03
T-0112	-	1.06E-04	2.11E-04	1.66E-04	-	3.14E-04	-	1.31E-06	-	-	1.46E-04	-	-	1.54E-03	2.28E-04
T-0117	-	2.69E-04	5.40E-04	4.25E-04	-	8.02E-04	-	3.33E-06	-	-	3.73E-04	-	-	3.94E-03	5.81E-04
T-0124	-	5.80E-05	4.03E-04	1.22E-03	2.94E-06	1.01E-02	-	7.84E-04	1.64E-15	7.68E-13	7.64E-04	-	9.80E-05	1.63E-02	6.46E-03
T-0401	-	2.17E-05	1.51E-04	4.56E-04	1.10E-06	3.77E-03	-	2.93E-04	6.15E-16	2.88E-13	2.86E-04	-	3.67E-05	6.09E-03	2.42E-03
T-0402	-	-	7.19E-03	1.21E-03	2.95E-06	2.17E-02	-	7.32E-05	-	-	5.81E-04	-	-	-	3.22E-03
T-0411	2.13E-13	-	-	1.91E-03	-	2.82E-01	-	6.30E-04	-	-	6.76E-04	-	-	1.08E-02	-
T-0412	-	3.27E-04	6.55E-04	5.15E-04	-	9.73E-04	-	4.05E-06	-	-	4.53E-04	-	-	4.78E-03	7.05E-04
T-0413	-	-	-	2.47E-05	1.16E-05	1.26E-04	-	-	-	-	1.26E-05	-	-	5.40E-05	5.97E-05
T-0415	-	5.91E-05	4.10E-04	1.24E-03	2.99E-06	1.02E-02	-	7.98E-04	1.67E-15	7.82E-13	7.78E-04	-	9.98E-05	1.66E-02	6.58E-03
T-0417	-	8.80E-05	6.11E-04	1.85E-03	4.46E-06	1.53E-02	-	1.19E-03	2.49E-15	1.16E-12	1.16E-03	-	1.49E-04	2.47E-02	9.80E-03
T-0418	-	-	-	2.72E-05	1.28E-05	1.38E-04	-	-	-	-	1.39E-05	-	-	5.95E-05	6.58E-05
T-0435	-	2.38E-03	-	5.06E-04	1.18E-06	3.89E-03	6.51E-07	1.04E-04	-	4.29E-10	-	-	-	7.52E-04	2.04E-04
T-0437	1.02E-13	-	-	1.03E-03	1.72E-06	4.17E-02	-	4.27E-05	-	-	2.63E-04	1.11E-12	-	3.58E-03	1.29E-03
T-0439	6.48E-15	1.04E-03	3.24E-03	2.40E-03	1.97E-07	1.25E-01	-	6.34E-04	-	-	8.55E-04	-	-	1.26E-02	2.07E-03
T-0450	8.23E-15	1.33E-03	4.11E-03	3.04E-03	2.50E-07	1.59E-01	-	8.05E-04	-	-	1.09E-03	-	-	1.61E-02	2.63E-03
T-0451	-	-	-	7.10E-05	2.83E-07	5.38E-06	-	2.57E-07	7.79E-16	1.32E-12	5.23E-05	-	-	1.30E-05	1.55E-05
T-0452	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-0737	-	2.08E-03	-	4.42E-04	1.03E-06	3.40E-03	5.69E-07	9.10E-05	-	3.75E-10	-	-	-	6.57E-04	1.78E-04
T-0802	-	2.35E-03	-	5.00E-04	1.17E-06	3.84E-03	6.43E-07	1.03E-04	-	4.24E-10	-	-	-	7.43E-04	2.02E-04
T-0821	-	-	8.13E-03	1.37E-03	3.34E-06	2.46E-02	-	8.28E-05	-	-	6.58E-04	-	-	-	3.65E-03
T-0834	-	-	-	6.98E-04	2.78E-06	5.29E-05	-	2.53E-06	7.66E-15	1.30E-11	5.14E-04	-	-	1.28E-04	1.52E-04
T-0835	-	-	-	3.19E-04	1.27E-06	2.42E-05	-	1.16E-06	3.50E-15	5.96E-12	2.35E-04	-	-	5.86E-05	6.96E-05
T-1225	1.63E-13	-	-	1.65E-03	2.74E-06	6.64E-02	-	6.81E-05	-	-	4.19E-04	1.77E-12	-	5.70E-03	2.06E-03
Sum HAPs, tpy	**6.70E-13**	**1.29E-02**	**3.13E-02**	**3.90E-02**	**9.32E-05**	**1.14E+00**	**2.36E-06**	**1.63E-02**	**3.93E-14**	**1.59E-09**	**2.00E-02**	**2.89E-12**	**1.63E-03**	**3.46E-01**	**1.26E-01**

TANK LANDINGS VAPOR COMBUSTION UNIT (TVCU) - STARTUP AND SHUTDOWN EMISSIONS

Pollutant	Emissions Factors		Reference
	Assist Gas/ Pilot Gas (lb/MMscf)	HC Vapors (lb/MMBtu)	
NO_X	100	0.14	Assist Gas/Pilot Gas EF per AP-42, Ch. 1.4 (7/98), Table 1.4-1 Small Boilers (<100 MMBtu/hr), uncontrolled. HC EF per VCU manufacturer specifications.
CO	84	0.14	
VOC	5.5	95%	Assist Gas/Pilot Gas EF per AP-42, Ch. 1.4 (7/98), Table 1.4-1 Small Boilers (<100 MMBtu/hr), uncontrolled. HC DRE per VCU manufacturer specifications.
SO_2	20 gr/100scf	95%	PSD-NM-0195-M39R1. C101.G Natural Gas definition
$PM/PM_{10}/PM_{2.5}$	7.6	0.0075	EF per AP-42, Ch. 1.4 (7/98), Table 1.4-2 PM (Total). The lb/MMscf EF is converted to lb/MMBtu by dividing by the average heating content, 1020 Btu/scf, of the natural gas basis for the EF.

Streams to VCU [a]	Heat Content-HHV)	Flow to VCU VOC Losses to VCU [b,c]		H_2S Losses to VCU		Heat Input to VCU		NO_X Emissions		CO Emissions		$PM/PM_{10}/PM_{2.5}$ Emissions		VOC Emissions		SO_2 Emissions		H_2S Emissions	
	(Btu/scf, Btu/lb, or MMBtu/bbl)	(scfm or lb/hr)	(MMscf/yr or ton/yr)	lb/hr	ton/yr	(MMBtu/hr)	(MMBtu/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)
Assist Gas/Pilot Gas	1,020 Btu/scf	0.9 scfm	0.5 MMscf/yr			0.06	482.50	5.40E-03	2.37E-02	4.54E-03	1.99E-02	4.10E-04	1.80E-03	2.97E-04	1.30E-03	3.09E-03	1.35E-02		
Gasolines & Gasoline Blendstocks	23,214 Btu/lb	51.9 lb/hr	4.89 ton/yr	0.00003	0.000001	1.20	227.19	1.69E-01	1.59E-02	1.69E-01	1.59E-02	8.98E-03	8.46E-04	2.59E+00	2.45E-01	5.01E-05	2.01E-06	1.33E-06	5.35E-08
Crude Oil	5.69 MMBtu/bbl	1.7 lb/hr	0.05 ton/yr	0.0016	0.0001	0.03	0.53	4.58E-03	3.70E-05	4.58E-03	3.70E-05	2.44E-04	1.97E-06	8.56E-02	2.30E-03	2.95E-03	1.48E-04	7.86E-05	3.93E-06
Light Cat Naphtha	23,214 Btu/lb	22.5 lb/hr	0.76 ton/yr	0.0005	0.00004	0.52	35.42	7.31E-02	2.48E-03	7.31E-02	2.48E-03	3.89E-03	1.32E-04	1.13E+00	3.81E-02	9.15E-04	6.84E-05	2.43E-05	1.82E-06
Sour Naphtha	23,214 Btu/lb	43.4 lb/hr	1.39 ton/yr	0.0021	0.0001	1.01	64.51	1.41E-01	4.52E-03	1.41E-01	4.52E-03	7.50E-03	2.40E-04	2.17E+00	6.95E-02	3.95E-03	2.22E-04	1.05E-04	5.89E-06
Sweet Naphtha	20,313 Btu/lb	13.2 lb/hr	0.43 ton/yr	-	-	0.27	17.41	3.75E-02	1.22E-03	3.75E-02	1.22E-03	2.00E-03	6.49E-05	6.60E-01	2.14E-02	-	-	-	-
Gas Oil	21,127 Btu/lb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Straight Run Diesel	19,718 Btu/lb	15.3 lb/hr	0.39 ton/yr	0.0018	0.0012	0.30	15.20	4.21E-02	1.06E-03	4.21E-02	1.06E-03	2.24E-03	5.66E-05	7.63E-01	1.93E-02	3.36E-03	2.34E-03	8.93E-05	6.23E-05
Straight Run Kerosene	19,286 Btu/lb	5.8 lb/hr	0.17 ton/yr	-	-	0.11	6.58	1.58E-02	4.60E-04	1.58E-02	4.60E-04	8.39E-04	2.45E-05	2.92E-01	8.53E-03	-	-	-	-
Sour Water	26,786 Btu/lb	0.3 lb/hr	0.01 ton/yr	0.025	0.002	0.01	0.66	1.01E-03	4.60E-05	1.01E-03	4.60E-05	5.38E-05	2.45E-06	1.35E-02	6.14E-04	4.66E-02	3.98E-03	1.24E-03	1.06E-04
MAX HOURLY (assumes only one landing at time), lb/hr								**0.17**		**0.17**		**9.39E-03**		**2.60**		**0.05**		**1.24E-03**	
ANNUAL (assumes 51.5% tanks landed per year), tpy									**0.04**		**0.03**		**2.50E-03**		**0.21**		**0.02**		**9.26E-05**

Notes:

a. VCU may be used for the control of floating roof tanks landings. Temporary units may be rented or brought onsite as necessary

b. HC losses will not occur simoultanously.

c. A maximum annual of 51.5% landings will occur

Sample Calculations:

Gasoline Vapor Flow = (Uncontrolled Loading Emissions, lb/hr) from Fuels Truck Loading Rack Potential to Emit-VOC calculations
= 51.9 lb/hr

Gasoline Heat Input = Heat Content (Btu/lb)* Gasoline Vapor Flow (lb/hr) * 1MMBtu/10^6 Btu
= 23,214Btu/lb * 51.9 lb/hr * 1 MMBtu/1,000,000 Btu = 1.20 MMBtu/hr

Gasoline NOx = Emission Factor (lb/MMBtu) * Gasoline Heat Input (MMBtu/hr)
= 0.14 lb/MMBtu * 1.20 MMBtu/hr = 0.17 lb/hr

TVCU POTENTIAL TO EMIT GHG

Streams to VCU	Heat Input to VCU	Emission Factors (kg/MMBtu)[a]			Emission Factors (lb/MMBtu)[a]			Annual Emissions (ton/yr)			GHG (as CO2e)
	(MMBtu/yr)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	
	Table A-1 TO 40 CFR 98, subpart A, Global Warming Potentials							1	25	298	
Pilot Gas	482.50	53.06	0.001	0.0001	116.98	0.002	0.0002	28.2	5.3E-04	5.3E-05	28.25
Gasolines & Gasoline Blendstocks	227.19	70.22	0.003	0.001	154.81	0.007	0.001	17.6	7.5E-04	1.5E-04	17.65
Crude Oil	0.53	74.54	0.003	0.001	164.33	0.007	0.001	0.0	1.7E-06	3.5E-07	0.04
Light Cat Naphtha	35.42	68.02	0.003	0.001	149.96	0.007	0.001	2.7	1.2E-04	2.3E-05	2.67
Sour Naphtha	64.51	68.02	0.003	0.001	149.96	0.007	0.001	4.8	2.1E-04	4.3E-05	4.85
Sweet Naphtha	17.41	68.02	0.003	0.001	149.96	0.007	0.001	1.3	5.8E-05	1.2E-05	1.31
Gas Oil	0.00	75.10	0.003	0.001	165.56	0.007	0.001	0.0	0.0E+00	0.0E+00	0.00
Straight Run Diesel	15.20	73.96	0.003	0.001	163.05	0.007	0.001	1.2	5.0E-05	1.0E-05	1.24
Straight Run Kerosene	6.58	75.20	0.003	0.001	165.78	0.007	0.001	0.5	2.2E-05	4.4E-06	0.55
Sour Water	0.66	75.10	0.003	0.001	165.56	0.007	0.001	0.1	2.2E-06	4.3E-07	0.05
							TOTAL	**42.8**	**0.001**	**0.0002**	**42.86**

Notes:

a. Emission factors from Tables C-1 and C-2 to 40 CFR 98, subpart C, for corresponsing products

CATALYST HANDLING STARTUP AND SHUTDOWN EMISSIONS (SSM MISC1)

(Exempt)

$E(lb/ton) = k\ (0.0032) * (U/5)^{1.3} / (M/2)^{1.4}$ AP-42, Ch. 13.2.4 (11/06)

U, mean wind speed =	9.04	mph (annual average for Carlsbad, NM in AP-42 Table 7.1-9.)
M, material moisture content =	1	%
2015 Catalyst Handling Weight =	1,118	tons

Pollutant	k	Emission Factor	2015	PTE[a]
	Dimensionless	lb/ton	tpy	tpy
PM	0.74	0.0135	0.008	0.015
PM10	0.35	0.0064	0.004	0.007
PM2.5	0.053	0.0010	0.001	0.001

a. PTE 2x the 2015 Rate.

Actuals from 2015:

Unit	Vessel	Task	Start	End	Weight (lbs)	Hours
33	D-0662	Unloading	1/14/15 2:00	1/15/15 8:00	307,725	30
33	D-0663	Unloading	1/14/15 4:00	1/15/15 10:00	282,153	30
33	D-0661	Unloading	1/15/15 6:00	1/16/15 12:00	164,519	30
33	D-0663	Loading	1/17/15 4:30	1/17/15 16:45	188,102	12.2
33	D-0662	Loading	1/18/15 10:20	1/18/15 19:45	205,150	9.4
33	D-0661	Loading	1/20/15 17:00	1/20/15 23:45	109,679	6.8
09	D-626	Unloading	2/17/15 0:00	2/18/15 0:00	9,000	24
09	D-626	Loading	2/20/15 0:00	2/21/15 0:00	9,000	24
09	D-627	Unloading	2/24/15 0:00	2/25/15 0:00	9,000	24
09	D-627	Loading	2/25/15 0:00	2/26/15 0:00	9,000	24
09	D-626	Loading	5/30/15 0:00	5/31/15 0:00	8,820	24
09	D-627	Unloading	6/3/15 0:00	6/4/15 0:00	13,230	24
09	D-627	Loading	6/4/15 0:00	6/5/15 0:00	8,820	24
09	D-626	Unloading	7/28/15 0:00	7/29/15 0:00	13,230	24
09	D-626	Loading	7/30/15 0:00	7/31/15 0:00	8,820	24
63	D-8801/2	Unloading	8/4/15 2:00	8/4/15 14:00	33,641	12
63	H-8801/2	Unloading	8/4/15 6:00	8/7/15 6:00	98,040	72
63	D-8801/2	Loading	8/4/15 14:00	8/5/15 2:00	22,427	12
09	D-627	Unloading	8/5/15 0:00	8/6/15 0:00	13,230	24
63	D-8803	Unloading	8/5/15 10:00	8/5/15 22:00	78,456	12
63	D-8803	Loading	8/5/15 22:00	8/6/15 12:00	52,304	14
09	D-627	Loading	8/7/15 0:00	8/8/15 0:00	8,820	24
63	H-8801/2	Loading	8/7/15 6:00	8/9/15 10:00	65,360	52
13	D-0042	Unloading	8/25/15 0:00	8/26/15 0:00	11,496	24
13	D-0042	Loading	9/2/15 0:00	9/3/15 0:00	7,664	24
20	D-0282	Unloading	10/19/15 21:00	10/21/15 14:00	43,886	41
20	D-0282	Loading	10/21/15 14:00	10/23/15 17:00	34,776	51
09	D-626	Unloading	10/26/15 0:00	10/27/15 0:00	13,230	24
09	D-626	Loading	10/27/15 0:00	10/28/15 0:00	8,820	24
6	D-0063	Unloading	11/3/15 2:00	11/3/15 14:00	36,580	12
6	D-0063	Loading	11/4/15 2:00	11/4/15 16:00	31,139	14
09	D-627	Unloading	11/8/15 0:00	11/9/15 0:00	13,230	24
09	D-627	Loading	11/9/15 0:00	11/10/15 0:00	8,820	24
45	D-2479	Unloading	12/12/15 20:00	12/17/15 13:00	169,572	113
45	D-2479	Loading	12/19/15 7:00	12/21/15 3:00	124,038	44
09	D-626	Unloading	12/31/15 0:00	1/1/16 0:00	13,230	24
				TOTAL:	**2,235,006**	**999**

CRUDE OIL LINE PIGGING

Chamber Length, L	20	ft	Field specification
Chamber Diameter, D	1.33	ft	Field specification
Chamber Volume, V	27.93	ft3	V = pi()/4*D^2*L
Chamber Gage Pressure, P	100	psig	Field specification
Chamber Temperature, T	529.67	°R	Field specification
Molecular Weight of Gas Mixture, MW	50	lb/lbmol	AP-42, Ch. 7.1(6/20) Table 7.1-2
Compressibility Factor, C_Z	1		
Pressurized Density, ρ_{press}	1.01	lb/ft^3	ρ_{press}=(P+14.7)*MW/(10.73*T*C_Z)
Atmospheric Density, ρ_{atm}	0.13	lb/ft^3	ρ_{atm}=14.7*MW/(10.73*T*C_Z)
Delta Density, $\Delta\rho$	0.88	lb/ft^3	$\Delta\rho = \rho_{press} - \rho_{atm}$
Amount of Gas Vented per Event, m_E	24.57	lbs	m_E = $\Delta\rho$ * V
# of Events	52		
# of Purges per Event	1		
Event Duration	1	hr	
Controlled? (Y/N)	No		
Control Type	n/a		
Control Efficiency	0%		
Total Amount of Gas Vented, m_T	1,278	lb/yr	m_T = m_E * # Events * # Purges/Event * (1 - Control Eff)
Total VOC Weight Fraction	100%		
VOC Hourly Emissions	24.57	lb/hr	VOC Hourly Emissions = m_E * VOC% / Event Duration
VOC Annual Emissions	0.64	tpy	VOC Annual Emissions = m_T * VOC% * 1 ton/2000 lb

Section 7

Information Used To Determine Emissions

Information Used to Determine Emissions shall include the following:

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

The information used to determine emissions is as follows:

ROUTINE OPERATIONS

- **Boilers and Heaters**
  - NO_X emissions from boilers and heaters are based on each unit design capacity, 8,760 hours per year operation, and the manufacturers' guaranteed NO_X emissions except as follows:
    - NO_X emissions from South Crude Charge Heaters H-0019 and H-0020, Unit 21 Heater H-0028, Unit 54 HDS Reactor Heater H-5401, Unit 70 CCR Reformer Heaters H-0352, H-0353, and H-0354, Unit 70 CCR Heaters H-0362, H-0363, and H-0364, are estimated using stack testing data.
    - NO_X emissions from H-8001/8002 are based on CEMS data.
    - NO_X emissions Unit 21 Vacuum Unit Heater H-0011 are estimated using NO_X emission factor from AP-42, Section 1.4 (5/74).
  - CO (except as noted below), VOC (except as noted below), and $PM/PM_{10}/PM_{2.5}$ emissions are based on each unit design capacity, 8,760 hours per year operation, in combination with emission factors from AP-42, Section 1.4 (7/98) Tables 1.4-1 and 1.4-2.
    - CO emissions from Boiler B-0009, Unit 25 ROSE Unit No. 2 Hot Oil Heater H-2501, Unit 54 HDS Reactor Heater H-5401, and Unit 64 Hydrogen Plant Reformer H-9851 are based on the manufacturers' guaranteed CO emissions.
    - VOC emissions from Boiler B-0009 is based on manufacturer's guaranteed VOC emissions.
  - SO_2 emissions, except as noted below, are based on the NSPS subpart Ja limit of 162 ppm_{H2S} (0.1 gr_{H2S}/dscf) on 3-hr rolling, and the NSPS Ja limit of 60 $ppmv_{H2S}$ (0.037 gr_{H2S}/dscf) on a 365-day calendar rolling average limit plus non-H_2S species present in the refinery fuel gas ("RFG") as determined based on sampling data.
    - B-0009 SO_2 emissions calculated as currently authorized: 0.035 gr_S/scf fuel and a HHV of 845 Btu/scf.
    - H-8801, H-8802, and H-9851 will combust a mixture of PSA Offgas and amine-treated RFG. It has been conservatively assumed 50/50 mix for SO_2 emissions calculation.

  - HAPs emissions are based on each unit design capacity, 8,760 hours per year operation, and AP-42, Section 1.4 (7/98), Table 1.4-3 emissions factors.
  - Ammonia slip emissions from Unit 64 Hydrogen Plant Reformer Heater H-9851 are based on 7 parts per million volume ("ppmv,") wet basis slip, and the heater exhaust flow rate of 73,500 standard cubic feet per minute.
  - GHG emissions are based on Tables C-1 and C-2 to Subpart C of Part 98 emission factors for fuel gas, and Table A-1 to Subpart A of Part 98 global warning potentials.

- **SRU2 TGI (H-0473) and SRU3 TGI (H-3103)**

  - NO_X, CO, and VOC emissions are based on the tail gas incinerators maximum and average exhaust flow rate and estimated pollutant concentrations.
  - SO_2 and H_2S emissions are based on the tail gas incinerator maximum and average exhaust flow rate and continuous emission monitoring ("CEMS") data for SO_2 and continuous monitoring for H_2S.
  - SAM emissions from the SRUs are conservatively assumed to be equal to a 5% oxidation of SO_2 emissions. No reduction of the SO_2 emissions due to the conversion to SAM is proposed.
  - PM emissions are based on the tail gas incinerators maximum and average exhaust flow rate and the Chevron Pascagoula Refinery Emissions Test Data (2007) as included in AP-42, Chapter 8.13 (4/15.) $PM_{10}/PM_{2.5}$ emissions are conservatively assumed to be equal to the sum of PM and SAM emissions.
  - GHG emissions from the SRUs are based on maximum sour gas volumetric flow rate to each SRU 2 and SRU3 and Subpart Y to Part 98 default mole fraction of carbon in the sour gas.

- **FCC Regen**

  - NO_X emissions from the FCC are calculated based on the FCC stack exhaust flow rate and the Artesia Refinery's Consent Decree NO_X maximum hourly emission limit of 87.3 ppmvd at 0% oxygen on a 7-day rolling average basis, and an annual limit of 58.1 ppmvd at 0% oxygen on a 365-day rolling average basis.
  - CO emissions from the FCC are calculated based on the FCC stack exhaust flow rate and NSPS Subpart J maximum hourly emissions standard of 500 ppmvd at 0% oxygen on a 1-hr average basis (40 CFR §§ 60.103(a) and 60.106(d)), and an annual emissions standard of 100 ppmvd at 0% oxygen on a 365-day rolling average basis (PSD-NM-0195-M39R4 A211.A(2)(b).)
  - VOC emissions from the FCC are conservatively assumed to be 200% of the semi volatile and volatile HAPs.
  - SO_2 emissions from the FCC are calculated based on the FCC stack exhaust flow rate and the Artesia Refinery's Consent Decree SO_2 maximum hourly emission limit of 50 ppmvd at 0% oxygen, on a 7-day rolling average basis, and annual average limit of 25 ppmvd at 0% oxygen on a 365-day rolling avg. basis.
  - SAM emissions from the FCC are conservatively assumed to be equal to a 5% oxidation of SO_2 emissions. No reduction of the SO_2 emissions due to the conversion to SAM is proposed.
  - PM emissions are calculated based on the FCC maximum coke burn rate and NSPS Subpart J maximum hourly emission rate of 2 lb/ per ton of coke burn-off in the catalyst regenerator (§60.102(a)(1.)) $PM_{10}/PM_{2.5}$ emissions are conservatively assumed to be equal to the sum of 83% of PM and 100% of SAM emissions. For annual PM2.5 is assumed to be 58.6% of PM and 100% of SAM.
  - HAPs emissions are conservatively calculated using the worst-case emission factor as published in "Emissions Estimation Protocol for Petroleum Refineries, Version 3" (April 2015) and the highest reported emissions factor based on ICR reported FCCU data and NPRA capacities, and the FCC capacity and maximum coke burn rate.
  - GHG emissions associated with FCC are based on the maximum reported rate between 2011 and 2015 (calculated according to Subpart Y of Part 98) increased by 100% to estimate the potential to emit.

- **Flares**

  - Emissions of CO and NO_X from the flares (FL-0400 North Plant Flare, FL-0401 South Plant Flare, FL-0402 FCC Flare, FL-0403 Alky Flare, and FL-0404 GOHT Flare) are based on heat input to the flare in combination with emission factors from AP-42, Section 13.5 (2/18), Tables 13.5-1 and 13.5-2 respectively. Heat input is based on flare monitoring data required by NSPS Ja (i.e., 40 CFR Part 60, Subpart Ja).

  - Emissions of VOC and SO_2 from the flares (FL-0400 North Plant Flare, FL-0401 South Plant Flare, FL-0402 FCC Flare, FL-0403 Alky Flare, and FL-0404 GOHT Flare) are based on mass balance calculations and flare monitoring data required by NSPS Ja (i.e., 40 CFR Part 60, Subpart Ja).
  - GHG emissions are calculated using 40 CFR 98, Subpart Y, equations Y-1b, Y-4 and Y-5 for flares.

- **Engines**
  - NO_X, CO, VOC and $PM/PM_{10}/PM_{2.5}$ emissions are based on each engine horsepower rating, hours of operation, and:
    - 40 CFR §89.112, Table 1 emission standards[4] in accordance with 40 CFR §60.4204(b) for engines with a rating less than 3,000 hp, with a displacement less than 10 liters per cylinder, and manufactured prior to 2014 (i.e., portable air compressors MG-0001 and MG-0002, portable fire water pump engine MG-0004, and server backup generator SG-0102.)
    - 40 CFR §1039.101 emission standards in accordance with 40 CFR §60.4204(b) for engines with a rating less than 3,000 hp, with a displacement less than 10 liters per cylinder, and manufactured after 2014 (i.e., portable air compressor MG-0003.)
    - Table 4 to Subpart IIII of Part 60 emission standards per 40 CFR §60.4205(c) for firewater pump engines (i.e., FWG-0600, FWG-0601, FWG-0602, and FWG-0603.)
    - AP-42, Chapter 3.3 (10/96), Table 3.3-1 emission factors for engines manufactured prior to 2005 (i.e., UPS backup generators SG-0100 and SG-0101.)
  - SO_2 emissions are based on each engine horsepower rating, hours of operation, and on a maximum sulfur content of 15 parts per million sulfur content in diesel oil per 40 CFR §§ 60.4207 and 1090.305.
  - HAPs emissions are based on each engine horsepower rating in combination with emission factors from AP-42, Section 3.3 (10/96), Table 3.3-2 for diesel-fired engines.
  - GHG emissions are based on Tables C-1 and C-2 to Subpart C of Part 98 emission factors for distillate fuel oil No. 2, and Table A-1 to Subpart A of Part 98 global warming potentials.

- **Cooling Towers**
  - $PM/PM_{10}/PM_{2.5}$ emissions from the cooling towers are based on each cooling tower water circulation rate, annual hours of operation, total dissolved solids water concentration, and drift eliminator efficiency, in accordance with AP-42, Chapter 13.4 (1/95.). $PM_{10}/PM_{2.5}$ emissions are calculated in accordance with NMED's Technical Memorandum "Calculating TSP, PM-10 and PM-2.5 from Cooling Towers" dated 9/9/2013.
  - VOC emissions from the cooling towers are based on each cooling tower water circulation rate and AP-42, Chapter 5.1 (4/15) Table 5.1-3 emission factor.
  - HAPs emissions are estimated assuming a worst-case HAP content in the VOC emitted at the cooling towers equivalent to the HAPs content in naphtha. The HAPs liquid weight percent was defined in accordance with the American Petroleum Institute ("API") Standard 4723-A "*Refinery Stream Composition Data Update to Speciation data in API 4723*" (12/2018)

- **Wastewater**
  - VOC emissions are estimated using EPA Water9 V.3, and wastewater stream composition as determined from ToxChem and analytical data.

- **Truck and Rail Loading**
  - VOC loading losses from truck and railcar loading racks are based on maximum hourly and average annual loading throughputs, the commodities chemical specifications, type of loading, and in accordance with AP-42, Chapter 5.2 (6/2008).
  - For gasoline loading at TL-4, VOC loading losses are based on 10 milligrams of total organic compounds per liter of gasoline loaded standard in 40 CFR §63.422(b) as required by Subpart CC to Part 63 (§63.650(a))
  - H_2S from molten sulfur loading at TRLO-9 is based on sulfur production, loading rack capacity, loading temperatures, H_2S expected concentration in molten sulfur, Raoult's Law, and efficiency of proposed controls.
  - HAPs emissions are estimated assuming a worst-case HAP content in each loaded commodity. The HAPs liquid weight percent was defined in accordance with the API Standard 4723-A "*Refinery Stream*

[4] A conversion factor of 1 hp = 0.7457 kW was used to convert emission standards in g/kWhr to g/hp-hr.

Composition Data Update to Speciation data in API 4723" (12/2018.) Raoult's Law is used to estimate vapor weight percent from liquid weight percent.

- **Truck Loading Rack TL-4 Vapor Combustion Unit ("VCU")**
    - NOx, CO, and VOC emissions from the combustion of assist gas/pilot gas are based on a maximum flow to the VCU and AP-42, Section 1.4 (7/98), Table 1.4-1 small uncontrolled boilers.
    - NO_X, CO, and VOC emissions from the combustion of hydrocarbon vapors are based on a maximum flow to the VCU and the manufacturer specifications.
    - $PM/PM_{10}/PM_{2.5}$ emissions from the combustion of assist gas/pilot gas and hydrocarbon vapors are based on a maximum flow to the VCU and AP-42, Section 1.4 (7/98), Table 1.4-1 small uncontrolled boilers.
    - SO_2 emissions are based on the maximum flow to the VCU and a maximum of 20 grains per 100 scf of gas per PSD-NM-0195-M39R4, C101.G Natural Gas definition.
    - GHG emissions are based on Tables C-1 and C-2 to Subpart C of Part 98 emission factors as applicable to each stream, and Table A-1 to Subpart A of Part 98 global warning potentials.
- **Fugitives**
    - VOC emissions from equipment component leaks are based on the facilities latest Leak Detection and Repair ("LDAR") component counts, and the emission factors published in the "Protocol for Equipment Leak Estimates," EPA-453/R-95-017 (November 1995), Table 2-2 "*Refinery Average Emission Factors*", and the control efficiencies in Table 5-3 "*Control Effectiveness for an LDAR Program at a Refinery Process Unit*", and the Texas Commission on Environmental Quality ("TCEQ") Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance - APDG 6422 - June 2018.
    - HAPs emissions are estimated assuming a worst-case HAP content in each process stream. The HAPs liquid weight percent was defined in accordance with the API Standard 4723-A "*Refinery Stream Composition Data Update to Speciation data in API 4723*" (12/2018.) Raoult's Law is used to estimate vapor weight percent from liquid weight percent.
    - GHG emissions from fugitive piping components are based on Subpart Y to Part 98, equation Y-21. The CCR catalytic reforming unit only has fugitive emission sources reported in the permit. Additional GHG emissions associated with catalyst regeneration is included with the fugitive emissions. The maximum reported rate between 2011 and 2015 was increased by 100% to estimate the potential to emit.
- **Storage Tanks**
    - VOC losses from fixed roof and floating roof tanks during tank routine operations and routine and predictable SSM are calculated based on annual tank throughputs, tanks construction specifications, stored commodities chemical specifications, and AP-42, Chapter 7.1 (6/2020) methodology and factors. The stored commodities chemical specifications were developed based on published data (i.e., AP-42, Chapter 7.1 (6/2020), API Manual of Petroleum Measurement Standards Chapter 19.4 (6/2017),) average storage temperatures, and facility analytical data.
    - HAPs emissions are estimated assuming a worst-case HAP content in each stored commodity. The HAPs liquid weight percent was defined in accordance with the API Standard 4723-A "*Refinery Stream Composition Data Update to Speciation data in API 4723*" (12/2018.) Raoult's Law is used to estimate vapor weight percent from liquid weight percent.
    - GHG emissions from storage tanks are based on Subpart Y to Part 98, equation Y-22.

STARTUP, SHUTDOWN, AND MAINTENANCE (SSM)

- **Unit 64 Hydrogen Plant Reformer H-9851 SSM**
    - CO, VOC, $PM/PM_{10}/PM_{2.5}$ and SO_2 emissions from H-9851 are expected to remain consistent with routine operations emissions. Therefore, the same calculation methodology is used for estimating emissions for these pollutants during SSM of H-9851.
    - During SSM, H-9851 selective catalytic reduction ("SCR") control for NO_X emissions will only achieve 0.03 lb/MMBtu NO_X per manufacturer specifications. Emissions for SSM may occur for no more than 240 hours per year.

- **SRU2 ((H-0473) and SRU3 (H-3103) SSM**
  - Routine or predictable SSM emissions are not expected to differ from routine emissions for NO_X, CO, VOC and PM. SO_2 and H_2S emissions are based on the expected sulfur feed per event during startup and shutdown, and the duration of each event.
- **Flares SSM**
  - SSM Flare emissions are calculated in the same manner as routine emissions, using flare stream monitoring required by NSPS Ja (i.e., 40 CFR Part 60, Subpart Ja).
- **SSM FL-HEP-PORT**
  - Emissions of NO_X, CO, and VOC from the FL-HEP-PORT flare are based on a maximum flaring flowrate per event and emission factors from AP-42, Section 13.5 (2/18), Tables 13.5-1 and 13.5-2 respectively. Heat input is based on a default 1,020 Btu/scf (HHV) for natural gas.
  - Emissions of SO_2 and H_2S are based on a maximum flaring flowrate per event and 0.25 grains of sulfur per dry standard cubic foot expected in natural gas.
  - GHG emissions are calculated using 40 CFR 98, Subpart Y, equation Y-2, Y-4 and Y-5 for CO_2, CH_4, and N_2O respectively, and 40 CFR §98.253(b)(1) CO_2 emission factor for flares, and Table C-2 to Part 98, Subpart C, default emission factors for CH_4 and N_2O for natural gas.
- **Tanks SSM**
  - Emissions for routine and predictable SSM from floating roof storage tanks were calculated using AP-42, Chapter 7 drain dry landings equations, as summarized in Table 7.1-19. During SSM activities, all standing liquid in the tank is removed. A small layer of liquid of approximately 3 inches may remain clinging, which is further reduced with a pump until suction is lost and the tank is safe to entry. Landing emissions from all internal and external floating roof tanks were estimated assuming 1 day landing event, and 0.25 ft of liquid at the tank shell.
- **Floating Roof Tanks Landings Vapor Combustion Unit ("VCU")**

  During certain floating roof tank landings, a temporary VCU may be brought onsite to control losses from the roof landing activities. Emissions from combustion at the VCU are estimated as follows:

  - NOx, CO, and VOC emissions from the combustion of assist gas/pilot gas are based on a maximum flow to the VCU and AP-42, Section 1.4 (7/98), Table 1.4-1 small uncontrolled boilers.
  - NO_X, CO, and VOC emissions from the combustion of hydrocarbon vapors are based on a maximum flow to the VCU and the manufacturer specifications.
  - $PM/PM_{10}/PM_{2.5}$ emissions from the combustion of assist gas/pilot gas and hydrocarbon vapors are based on a maximum flow to the VCU and AP-42, Section 1.4 (7/98), Table 1.4-1 small uncontrolled boilers.
  - SO_2 emissions are based on the maximum flow to the VCU and a maximum of 20 grains per 100 scf of gas per PSD-NM-0195-M39R4, C101.G Natural Gas definition.
  - GHG emissions are based on Tables C-1 and C-2 to Subpart C of Part 98 emission factors as applicable to each stream, and Table A-1 to Subpart A of Part 98 global warning potentials.
- **SSM MISC 1 – Catalyst Handling**
  - Emissions of PM, PM_{10} and $PM_{2.5}$ are calculated using AP-42, Chapter 13.2.4 (11/06) and the expected amount of annual catalyst handling, based on double the amount handled in 2015.
  - The catalyst handling potential to emit is no more than one-half (1/2) ton per year of PM, PM_{10} and $PM_{2.5,}$ and therefore, emissions from this activity are exempt per 20.2.72.202.B(5) NMAC.
- **SSM MISC 2 – Low Emitting Activities**
  - Low-Emitting Maintenance Activities such as de-inventorying small equipment, clearing piping associated with emission units, and routine maintenance activities such as heat exchanger repair. Emissions are estimated as ten percent of the historical emissions from flares and the TGI.

- **<u>Crude Oil Pipeline Pigging Activities</u>**
    - Emissions from pigging activities in the crude oil pipelines are expected to occur weekly. Prior to blowdown, chamber is expected to be at approximately 100 psig and 70 degrees Fahrenheit. Annual mass emissions from each depressurization event is calculated assuming ideal gas law mass balance.

Information Used to Determine Emissions

- Boilers and Heaters
- SRU
- FCC Regen
- Flares
- Engines
- Cooling Towers
- Fugitives

Boilers and Heaters

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 1b/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.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylcholanthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
207-08-9	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D
74-98-6	Propane	1.6E+00	E

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	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 $1b/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.
[b] Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.
[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.
[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.

TABLE 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
7440-38-2	Arsenic[b]	2.0E-04	E
7440-39-3	Barium	4.4E-03	D
7440-41-7	Beryllium[b]	<1.2E-05	E
7440-43-9	Cadmium[b]	1.1E-03	D
7440-47-3	Chromium[b]	1.4E-03	D
7440-48-4	Cobalt[b]	8.4E-05	D
7440-50-8	Copper	8.5E-04	C
7439-96-5	Manganese[b]	3.8E-04	D
7439-97-6	Mercury[b]	2.6E-04	D
7439-98-7	Molybdenum	1.1E-03	D
7440-02-0	Nickel[b]	2.1E-03	C
7782-49-2	Selenium[b]	<2.4E-05	E
7440-62-2	Vanadium	2.3E-03	D
7440-66-6	Zinc	2.9E-02	E

[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. Emission factors preceeded by a less-than symbol are based on method detection limits. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by l6. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020.

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

NO_X Emissions
Unit 21 Vacuum Unit Heater H-0011

1.4 NATURAL GAS COMBUSTION

Revised by Thomas Lahre

1.4.1 General [1,2]

Natural gas has become one of the major fuels used throughout the country. It is used mainly for power generation, for industrial process steam and heat production, and for domestic and commercial space heating. The primary component of natural gas is methane, although varying amounts of ethane and smaller amounts of nitrogen, helium, and carbon dioxide are also present. The average gross heating value of natural gas is approximately 1050 Btu/stdft^3 (9350 kcal/Nm^3), varying generally between 1000 and 1100 Btu/stdft^3 (8900 to 9800 kcal/ Nm^3).

Because natural gas in its original state is a gaseous, homogenous fluid, its combustion is simple and can be precisely controlled. Common excess air rates range from 10 to 15 percent; however, some large units operate at excess air rates as low as 5 percent to maximize efficiency and minimize nitrogen oxide (NO_x) emissions.

1.4.2 Emissions and Controls [3-16]

Even though natural gas is considered to be a relatively clean fuel, some emissions can occur from the combustion reaction. For example, improper operating conditions, including poor mixing, insufficient air, etc., may cause large amounts of smoke, carbon monoxide, and hydrocarbons to be produced. Moreover, because a sulfur-containing mercaptan is added to natural gas for detection purposes, small amounts of sulfur oxides will also be produced in the combustion process.

Nitrogen oxides are the major pollutants of concern when burning natural gas. Nitrogen oxide emissions are a function of the temperature in the combustion chamber and the rate of cooling of the combustion products. Emission levels generally vary considerably with the type and size of unit and are also a function of loading.

In some large boilers, several operating modifications have been employed for NO_x control. Staged combustion, for example, including off-stoichiometric firing and/or two-stage combustion, can reduce NO_x emissions by 30 to 70 percent. In off-stoichiometric firing, also called "biased firing," some burners are operated fuel-rich, some fuel-lean, while others may supply air only. In two-staged combustion, the burners are operated fuel-rich (by introducing only 80 to 95 percent stoichiometric air) with combustion being completed by air injected above the flame zone through second-stage "NO-ports." In staged combustion, NO_x emissions are reduced because the bulk of combustion occurs under fuel-rich, reducing conditions.

Other NO_x-reducing modifications include low excess air firing and flue gas recirculation. In low excess air firing, excess air levels are kept as low as possible without producing unacceptable levels of unburned combustibles (carbon monoxide, hydrocarbons, and smoke) and/or other operational problems. This technique can reduce NO_x emissions by 10 to 30 percent primarily because of the lack of availability of oxygen during combustion. Flue gas recirculation into the primary combustion zone, because the flue gas is relatively cool and oxygen deficient, can also lower NO_x emissions by 20 to 60 percent depending on the amount of gas recirculated. At present only a few systems have this capability, however.

Combinations of the above combustion modifications may also be employed to further reduce NO_x emissions. In some boilers, for instance, NO_x reductions as high as 70 to 90 percent have been produced as a result of employing several of these techniques simultaneously. In general, however, because the net effect of any of these combinations varies greatly, it is difficult to predict what the overall reductions will be in any given unit.

Emission factors for natural gas combustion are presented in Table 1.4-1. Flue gas cleaning equipment has not been utilized to control emissions from natural gas combustion equipment.

Table 1.4-1. EMISSION FACTORS FOR NATURAL-GAS COMBUSTION
EMISSION FACTOR RATING: A

	Type of unit					
	Power plant		Industrial process boiler		Domestic and commercial heating	
Pollutant	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$
Particulates[a]	5-15	80-240	5-15	80-240	5-15	80-240
Sulfur oxides (SO_2)[b]	0.6	9.6	0.6	9.6	0.6	9.6
Carbon monoxide[c]	17	272	17	272	20	320
Hydrocarbons (as CH_4)[d]	1	16	3	48	8	128
Nitrogen oxides (NO_2)[e]	700[f-h]	11,200[f-h]	(120-230)[i]	(1920-3680)[i]	(80-120)[j]	(1280-1920)[j]

[a]References 4,7,8,12.
[b]Reference 4 (based on an average sulfur content of natural gas of 2000 gr/10^6 stdft^3 (4600 g/10^6 Nm^3).
[c]References 5, 8-12.
[d]References 8, 9, 12.
[e]References 3-9, 12-16.
[f] Use 300 lb/10^6 stdft^3 (4800 kg/10^6 Nm^3) for tangentially fired units.
[g]At reduced loads, multiply this factor by the load reduction coefficient given in Figure 1.4-1.
[h]See text for potential NO_x reductions due to combustion modifications. Note that the NO_x reduction from these modifications will also occur at reduced load conditions.
[i] This represents a typical range for many industrial boilers. For large industrial units (> 100 MMBtu/hr) use the NO_x factors presented for power plants.
[j] Use 80 (1280) for domestic heating units and 120 (1920) for commercial units.

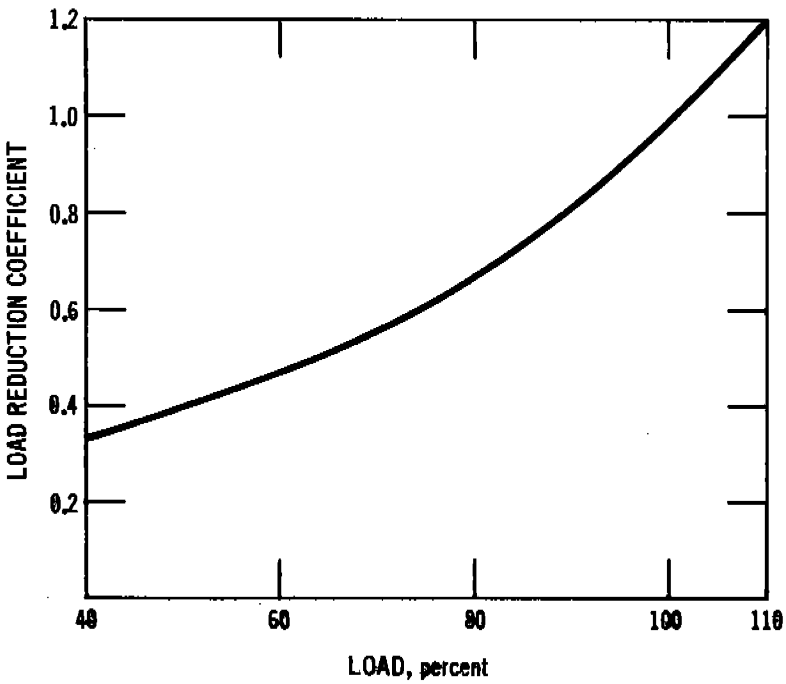


Figure 1.4-1. Load reduction coefficient as function of boiler load. (Used to determine NO_x reductions at reduced loads in large boilers.)

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Sulfur Recovery Units

EMISSIONS TEST REPORT

For Particulate Matter and Gaseous Pollutants
on
Sulfur Recovery Units 2 and 3

Designated as F-2745 and F2765

at the
ChevronTexaco Pascagoula Refinery

Located in
Pascagoula, Mississippi

Prepared for
CHEVRON PRODUCTS USA

TRC Project No. 155910
Test Date: November 27 and 28, 2007

Summary of Results
F-2745

Plant: **Chevron Pascagoula**
Location: Pascagoula, MS
Source: F-2745
Technicians: **JPB, MAB, DM**

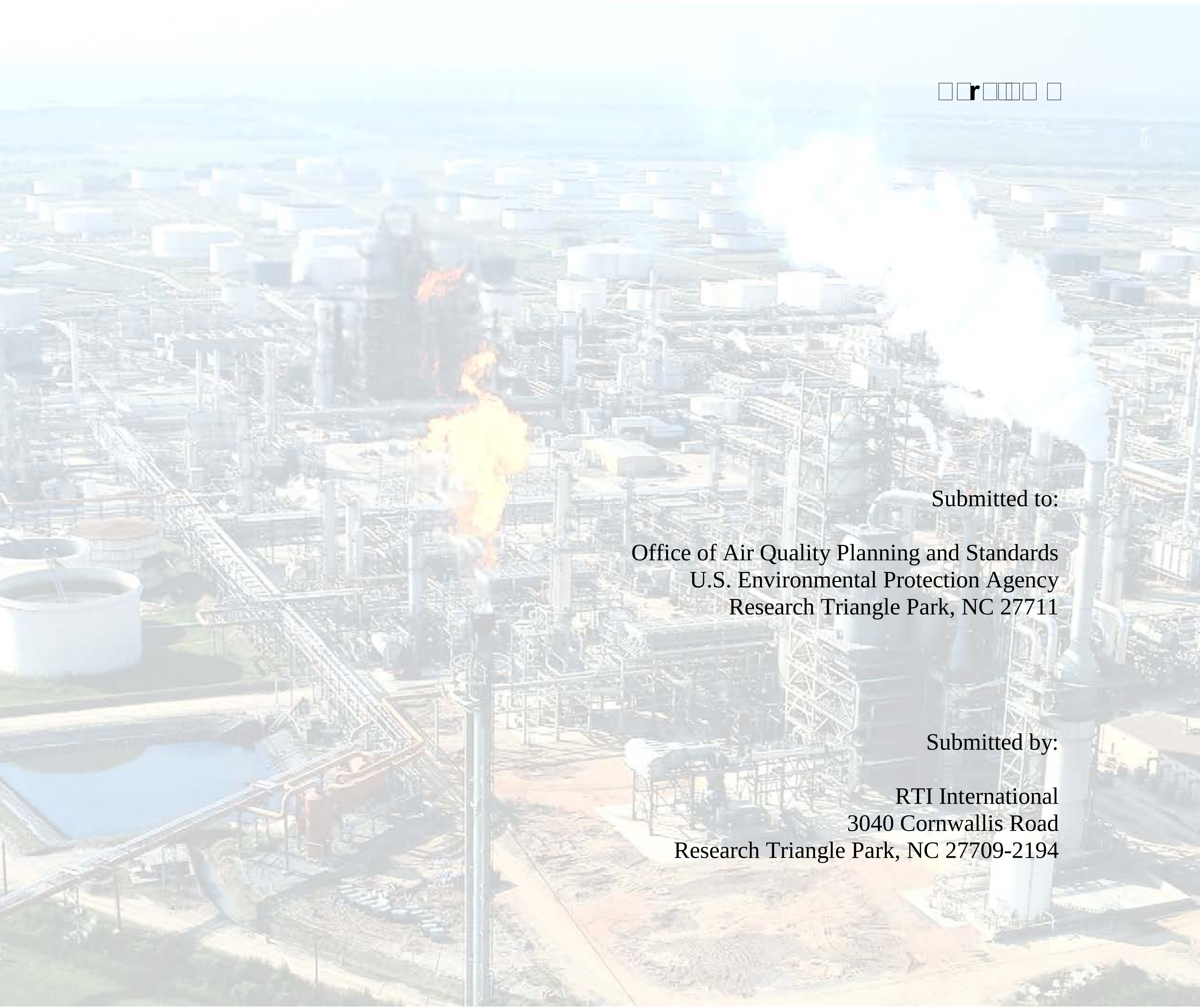
Test Run Designation	**Run 1**	**Run 2**	**Run 3**	
Date	11/27/2007	11/27/2007	11/27/2007	
Start Time (24 hr)	15:52	17:40	19:15	
Stop Time (24 hr)	16:52	18:40	20:15	
Stack Gas Sampling Data				
Box No.	2	4	2	
Sample Time Length (min)	60	60	60	
Atmospheric Pressure (" Hg)	30.38	30.36	30.38	
Avg. Stack Temperature (°F)	846	829	843	
Avg. Meter Temperature (°F)	75.7	73.0	72.2	
Average $\sqrt{\Delta P}$	0.081	0.085	0.087	
Average ΔH	1.89	3.13	3.25	
Sample Volume at STP (DSCF)	44.097	58.668	59.523	
Moisture (% volume)	2.01	2.81	6.85	
Dry Gas Fraction (unitless)	0.980	0.972	0.931	
Molecular Weight (lb/lb-mole)	28.615	28.524	28.077	
Static Pressure (in. H2O)	-1.13	-1.13	-1.13	
Stack Velocity (ft/min @ stack conditions)	430	446	465	
Stack Flow, dry (DSCFH)	1.17E+06	1.22E+06	1.21E+06	
% Isokinetic	78.3	100.0	102.5	
Emissions Results				**Averages**
O2 (%)	5.38	5.31	5.22	5.30
CO2 (%)	3.86	3.85	3.81	3.84
NOx (ppmv)	23.70	21.15	23.16	22.67
CO (ppmv	40.11	36.72	37.62	38.15
SO2 (ppmv)	39.16	38.58	36.31	38.02
SO2 (ppmv) (@ 0% O2)	52.73	51.72	48.40	50.95
Calculated Mass Emissions				
NOx (lbs/hr)	3.31	3.08	3.34	3.24
CO (lbs/hr)	3.41	3.25	3.30	3.32
SO2 (lbs/hr)	7.62	7.81	7.28	7.57
NOx (tons/yr)	14.51	13.48	14.62	14.21
CO (tons/yr)	14.95	14.25	14.46	14.56
SO2 (tons/yr)	33.36	34.22	31.89	33.15
Calculated Particulate Emissions				
Filterable Particulate Matter Collected (g)	0.0211	0.0085	0.0273	0.0190
Filterable Analysis (lb/dscf)	1.05E-06	3.21E-07	1.01E-06	7.95E-07
Filterable Analysis (lb/hr)	1.23	0.39	1.22	0.95
Filterable Analysis (tons/yr)	5.40	1.71	5.34	4.15

Testing by TRC, Austin, Texas

FCC Regen

April 2015

Emissions Estimation Protocol for Petroleum Refineries



Version 3

Submitted to:

Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Submitted by:

RTI International
3040 Cornwallis Road
Research Triangle Park, NC 27709-2194

[illegible]

For most organic HAP (e.g., formaldehyde, benzene, benzo[a]pyrene, dioxin/furans) and other pollutants such as hydrogen cyanide and Hg, default emissions factors may be all that are available. When direct emissions monitoring or site-specific emissions factors are not available, then the default emissions factors presented in **Table 5-4** should be used to calculate the emissions from the CCU regenerator vent. Note that all CCU are considered "controlled for organics" if they meet the 500 ppmv CO emissions limit.

[illegible]

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The emission factors presented in Table 5-4 are based primarily on the emission data collected to support the Refinery MACT 2 rule; however, emissions factors for hydrogen cyanide and mercury were updated based on source tests conducted in response to EPA's 2011 ICR for the petroleum refining industry. While there appear to be slight differences in how outlier and non-detect values were handled, the emission factors in Table 5-4 agree well with the average emission factors developed by Bertrand and Siegell (2002).

Based on the lack of data for PAH and furan emissions, the emissions estimates for these compounds have high uncertainties, likely an order-of-magnitude either high or low. The California Air Resources Board (CARB), with EPA's support, conducted an emissions source test at a complete combustion FCCU (without a post-combustion device). The only dioxin isomer detected in all runs was octachloro-dibenzo-p-dioxin (OCDD); octachloro-dibenzo-furan (OCDF) and heptachloro-dibenzo-p-dioxin (hepta-CDD) were detected in one run. All dioxin/furan quantities that were detected were detected at levels below the method quantitation limit for the analysis. All polychlorinated biphenyls (PCBs) isomers were below detection limits. This additional source test was not included in the development of the Petroleum Refinery MACT II emissions factors, but it confirms low emissions of dioxins/furans and PCBs from the CCU catalyst regenerator vent.

5.2 Fluid Coking Units

Coking units use heat to thermally crack heavy hydrocarbon streams to form lighter, more useful distillates such as heating oils or gasoline. There are three basic types of coking units: traditional fluid coking units, flexicoking units, and delayed coking units. Traditional fluid coking units are one of the largest vent emissions sources at a refinery, being comparable to emissions from the CCU regenerator. However, there are only a handful of traditional fluid coking units currently in operation in the United States. Flexicoking units, which are also rare, do not have a direct atmospheric vent. Instead, these units produce a low heating value syngas that can be subsequently used as fuel in process heaters or boilers. Emissions from the combustion of flexicoking syngas should be determined using the methods described

Technical Memorandum

TO: Brenda Shine, Environmental Engineer
Refining and Chemicals Group, SPPD (E143-01)

FROM: Eric Goehl, Environmental Protection Specialist
Refining and Chemicals Group, SPPD (E143-01)

DATE: October 16, 2012

SUBJECT: Summary of Fluid Catalytic Cracking Unit Emission Source Test Reports

I. Purpose

The objective of this document is to provide a summary of the Fluid Catalytic Cracking Unit (FCCU) emission source test reports received by the EPA from the 2011 Information Collection Request (ICR) of the Petroleum Refinery industry.

II. Background

On April 1, 2011, the EPA sent an ICR to facilities in the U.S. petroleum refining industry. The ICR was comprehensive and designed to collect information on processing characteristics, crude slate characteristics, emissions inventories and source testing to bolster our current data and fill known data gaps. The ICR had four components: (1) a questionnaire on processes and controls to be completed by all petroleum refineries (Component 1); (2) an emissions inventory to be developed by all petroleum refineries using the emissions estimation protocol developed for this effort (Component 2); (3) distillation feed sampling and analysis to be conducted by all petroleum refineries (Component 3); and (4) emissions source testing to be completed in accordance with an EPA-approved protocol for specific sources at specific petroleum refineries (Component 4).

Component 4 of the ICR required source testing for twelve different types of emission sources or units: fluid catalytic cracking units (FCCU), thermal catalytic cracking units, catalytic reforming units, sulfur recovery units, delayed coking units, fluid coking units, hydrocracking units, hydrogen plants, asphalt blowing units, fuel gas systems, cooling water systems, and wastewater treatment systems. This memorandum summarizes the results of the FCCU sources tests. A similar memorandum is available for the other sources required to be tested as a result of this ICR. Facilities often claimed specific process information as CBI, and included that information in the CBI version of the emission source test report stored in the EPA's CBI office in Research Triangle Park, NC. However, emissions data cannot be claimed as CBI. This memorandum summarizes and presents only non-CBI data.

III. Source-specific Testing Program

Below is a list of the ten facilities required to perform an emission source test on their FCCU.

- Marathon Oil – Robinson, IL (IL2A0420)
- Flint Hills – Rosemount, MN (MN2B0720)
- Motiva – Norco, LA (LA3C0630)
- Citgo – Lake Charles, LA (LA3C0560)
- Hovensa – St. Croix, USVI (VI6A1530)
- Valero – Port Arthur, TX (TX3B1250)
- Chevron – Barbers Point, HI (HI5A0380)
- BP – Whiting, IN (IN2A0440)
- ExxonMobil – Torrance, CA (CA5A0190)
- Sunoco – Philadelphia, PA (PA1A1030)

Owners or operators of the FCCU at these facilities were required to test for:

- Speciated volatile organic hazardous air pollutants (HAP)
- Speciated semi-volatile organic HAP
- Total hydrocarbons, methane, and ethane
- Aldehydes
- Carbon monoxide
- Dioxins, furans, and polychlorinated biphenyls
- Hydrogen chloride, chlorine, hydrogen fluoride, and hydrogen cyanide
- Mercury (speciated)
- Hexavalent chromium and multiple metals
- Particulate matter (PM, $PM_{2.5}$ filterable, and PM condensable) and ammonia
- NO_X, SO_2, O_2, CO_2, moisture, and gas flow rate.

The EPA required that the data collected from the emission source testing to be reported using the EPA Electronic Reporting Tool (ERT). The ERT is a Microsoft® Access database application. If the facility conducted testing using a method not currently supported by the ERT, the facility was required to report the results in the Refinery Testing Supplement, a Microsoft® Excel spreadsheet. After completing the Refinery Testing Supplement, the refineries were also to submit an electronic copy of the emission test report, preferably in PDF format.

IV. Results

A summary of the emission results for the FCCU are provided in attached spreadsheet. In order to better characterize the reported data from the emission test reports, detection level information was provided in the attached summary spreadsheet. The following designations were used to describe the detection levels of the reported emissions data.

- DLL = Detection Level Limited = 1 or 2 runs below detection limit
- BDL = Below Detection Limit = All three runs are below detection limit
- No designation = All three runs are above detection limit

While reviewing the reported FCCU test data for Motiva in Norco, LA, we found conflicting data between the Refinery Testing Supplement and the PDF emission test report. A phone call to the facility clarified that the information contained in the PDF emission test report reflected the correct data.

CAS #	Compound	CA5A0190 - ExxonMobil Torrance CA		IN2A0440 - BP Whiting, IN		LA3C0630 - Motiva Norco LA		IL2A0420 - Marathon Robinson, IL		VI6A1530 - Hovensa Christiansted, USVI		TX3B1250 - Valero Port Arthur, TX		PA1A1030 - Sunoco Philadelphia, PA		LA3C0560 - Citgo Lake Charles, LA		MN2B0720 - Flint Hills Rosemount, MN		HI5A0380 - Chevron Kapolei, HI	
		Detection Level (DL)	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr
75-07-0	Acetaldehyde		8.00E-02		8.40E-01	BDL	1.90E-01		3.62E-03		2.52E-02		4.04E-01		3.31E-03	DLL	6.27E-04	BDL	6.80E-04	BDL	1.70E-01
50-00-0	Formaldehyde		1.34E+00		2.10E-01	DLL	4.70E-02		2.05E-03	DLL	1.55E-01	BDL	5.99E-02		1.08E-02		5.91E-03			BDL	2.00E-02
74-90-8	Hydrogen cyanide		1.20E+01		4.60E-01	BDL	7.00E-01		2.07E+00		1.05E+02		4.20E+01	BDL	0.00E+00		3.22E+01		3.33E+00		5.36E+00
	Propanal				3.70E-01	BDL	2.50E-01		2.83E-03		1.10E-03	DLL	4.39E-02		0.00E+00				6.73E-04	BDL	1.80E-01
7647-01-0	Hydrogen Chloride		1.01E+00		3.55E-01		2.36E-01		3.12E-02		9.90E-01	BDL	7.20E-02	DLL	7.78E-01		1.96E-01				5.75E-02
7782-50-5	Chlorine	BDL	2.00E-02		5.20E-02			BDL	1.70E-03	BDL	1.00E-02	BDL	3.57E-02	BDL	0.00E+00		1.30E+00			BDL	2.90E-03
7782-41-4	Hydrogen Fluoride	BDL	2.00E-02		1.40E-02		3.63E-02	BDL	2.02E-03	BDL	3.00E-02	BDL	9.85E-03	BDL	0.00E+00	BDL	2.60E-02				1.49E-02
	VOLATILE ORGANIC HAP																				
67-64-1	Acetone		1.68E+00		3.79E+00	BDL	8.20E-04		2.86E+00	BDL	1.57E+00		8.85E+01			DLL	4.89E-01		7.00E-01	BDL	4.10E-01
750-05-8	Acetonitrile		3.70E-01	BDL	1.20E-01	BDL	1.88E-03	BDL	2.85E-01	BDL	1.93E+00	DLL	3.62E-01			BDL	6.06E-01	BDL	2.80E-01		data rejected
107-02-8	Acrolein	BDL	2.30E-01	BDL	1.20E-01	BDL	6.77E-04	BDL	2.85E-01			DLL	1.60E-01	BDL	0.00E+00	BDL	2.59E-01	BDL	4.13E-01	BDL	5.40E-01
107-13-1	Acrylonitrile	BDL	2.30E-01	BDL	1.19E-01	BDL	7.34E-04	BDL	2.85E-01	BDL	1.38E+00	DLL	1.92E-01			BDL	2.55E-01	BDL	2.30E-01	BDL	1.10E-02
71-43-2	Benzene	BDL	2.30E-01	BDL	1.22E-01	BDL	6.60E-04	BDL	2.85E-01	BDL	4.39E-01	BDL	1.49E-01		2.40E-01	BDL	2.32E-01	BDL	4.93E-01	BDL	5.10E-01
106-99-0	1,3-Butadiene	BDL	2.40E-01	BDL	1.22E-01	BDL	5.79E-04	BDL	2.85E-01	BDL	8.57E-01	BDL	7.50E-01	BDL	0.00E+00	BDL	2.66E-01	BDL	4.00E-01	BDL	6.20E-01
75-15-0	Carbon Disulfide	BDL	2.30E-01	BDL	1.19E-01	BDL	4.60E-04	BDL	2.85E-01			BDL	1.49E-01	DDL	1.29E+00	DLL	1.28E-01	BDL	1.73E-01	BDL	1.40E-01
108-90-7	Chlorobenzene	BDL	2.30E-01	BDL	1.22E-01	BDL	5.80E-03	BDL	2.85E-01	BDL	8.63E-01	BDL	1.49E-01	BDL	0.00E+00	BDL	7.00E-03	BDL	6.53E-02	BDL	1.10E-02
98-82-8	Cumene (Isopropylbenzene)	BDL	2.30E-01	BDL	1.22E-01	BDL	4.36E-03	BDL	2.85E-01	BDL	1.84E+00	BDL	1.49E-01	BDL	0.00E+00	BDL	5.00E-03	BDL	4.73E-02	BDL	1.10E-02
106-93-4	1,2-Dibromoethane	BDL	2.30E-01	DLL	1.42E-01	BDL	1.41E-03	BDL	2.85E-01	BDL	4.00E+00	BDL	1.49E-01			BDL	3.17E-01	BDL	1.27E+00	BDL	1.30E+00
100-41-4	Ethylbenzene	BDL	2.30E-01	BDL	1.22E-01	BDL	4.45E-03	BDL	2.85E-01	BDL	5.43E-01	BDL	1.49E-01	BDL	0.00E+00	BDL	6.00E-03	BDL	4.83E-02	BDL	1.10E-02
110-54-3	Hexane	BDL	2.30E-01	BDL	1.19E-01	BDL	6.60E-04	BDL	2.85E-01	BDL	2.20E+00	BDL	1.49E-01	BDL	0.00E+00	BDL	2.15E-01	DLL	5.80E-01	BDL	4.40E-01
108-10-1	Methyl iso-Butyl Ketone	BDL	2.30E-01	BDL	1.23E-01			BDL	2.85E-01	BDL	1.43E+00	BDL	1.44E-01	BDL	0.00E+00	BDL	5.00E-03	BDL	5.00E-02	BDL	8.90E-03
1634-04-4	Methyl t-Butyl Ether (MTBE)	BDL	2.30E-01	BDL	1.19E-01			BDL	2.85E-01	BDL	1.36E+00	BDL	1.49E-01			BDL	5.00E-03	BDL	4.73E-02	BDL	7.80E-03
75-09-2	Methylene Chloride	BDL	2.30E-01	BDL	1.20E-01	BDL	2.68E-03		3.64E-01	BDL	2.61E+00		1.43E+00	BDL	0.00E+00	DLL	8.97E-01	DLL	2.51E+00	BDL	1.30E+00
98-95-3	Nitrobenzene	BDL	1.17E+00	BDL	6.30E-01	BDL	6.96E-03	BDL	1.42E+00			BDL	7.46E-01				7.00E-03	BDL	7.20E-02	BDL	1.30E-02
79-46-9	2-Nitropropane	BDL	2.30E-01	BDL	1.22E-01	BDL	6.05E-02	BDL	2.85E-01	BDL	3.19E+00	BDL	1.49E-01			DLL	8.00E-03	BDL	4.40E-01	BDL	1.10E-02
109-66-0	Pentane	BDL	2.30E-01	BDL	1.22E-01	BDL	6.63E-04	BDL	2.85E-01	BDL	1.84E+00	BDL	7.76E-01			BDL	2.14E-01	BDL	4.90E-01	BDL	7.90E-01
100-42-5	Styrene	BDL	2.30E-01	BDL	1.22E-01	BDL	4.83E-03	BDL	2.85E-01	BDL	1.81E+00	BDL	1.49E-01			BDL	6.00E-03	BDL	5.23E-02	BDL	8.60E-02
127-18-4	Tetrachloroethene	BDL	2.30E-01	BDL	1.22E-01	BDL	1.42E-03	BDL	2.85E-01	BDL	2.37E+00	BDL	1.49E-01	BDL	0.00E+00	BDL	2.81E-01	BDL	1.28E+00	BDL	2.30E+00
108-88-3	Toluene	BDL	2.30E-01	BDL	1.23E-01	BDL	7.37E-04	BDL	2.85E-01	BDL	2.40E+00	BDL	1.50E-01		6.13E+00	DLL	2.26E-01	BDL	5.63E-01	BDL	8.60E-01
79-01-6	Trichloroethene	BDL	2.30E-01	BDL	1.23E-01	BDL	1.34E-03	BDL	2.85E-01	BDL	6.71E-01	BDL	1.50E-01			BDL	3.48E-01	BDL	1.21E+00	BDL	7.60E-01
540-84-1	2,2,4-Trimethylpentane	BDL	2.30E-01	BDL	1.22E-01			BDL	2.85E-01	BDL	2.04E+00	BDL	1.49E-01			BDL	4.00E-03	BDL	4.10E-02	BDL	7.00E-03
1330-20-7	Xylene			BDL	1.22E-01					BDL	5.43E-01	BDL	1.49E-01	BDL	0.00E+00	BDL	1.10E-02	BDL	9.60E-02		
	o-Xylene	BDL	2.30E-01			BDL	4.52E-03	BDL	2.85E-01					BDL	0.00E+00					BDL	1.00E-02
	m&p-Xylenes	BDL	2.30E-01			BDL	4.40E-03	BDL	2.85E-01					BDL	0.00E+00					BDL	1.00E-02
	Total VOC as propane									BDL	5.24E+01										
	SVOC														1.93E-08						
83-32-9	Acenaphthene	BDL	1.92E-06		1.35E-05	BDL	1.48E-05	BDL	7.48E-06	BDL	1.18E-04	DLL	1.11E-04			BDL	1.06E-04	BDL	1.60E-05	BDL	2.10E-06
209-96-8	Acenaphthylene	DLL	8.95E-06		8.03E-06	BDL	1.49E-05		9.31E-06	BDL	1.12E-04	BDL	1.42E-04			BDL	3.37E-05	BDL	1.60E-05	BDL	2.10E-06
62-53-3	Aniline	BDL	3.60E-04	BDL	3.07E-04	BDL	1.03E-03	BDL	2.13E-04		4.78E-01	BDL	2.89E-07			BDL	5.09E-04	BDL	5.70E-03	BDL	5.20E-04
120-12-7	Anthracene		1.72E-06		1.67E-06	BDL	1.49E-05		3.73E-06		7.57E-04	DLL	2.28E-05			BDL	3.37E-05	DLL	1.60E-05	BDL	2.10E-06
92-87-5	Benzidine	BDL	7.40E-03	BDL	6.31E-03	BDL	3.39E-02	BDL	4.49E-03	BDL	1.28E+00	BDL	5.94E-06			BDL	5.21E-05	BDL	1.90E-01		data rejected
56-55-3	Benzo(a)Anthracene	BDL	7.79E-07	BDL	9.60E-07			BDL	6.82E-07		9.40E-04	BDL	8.78E-07			BDL	1.51E-04	DLL	1.60E-05	BDL	2.10E-06
205-99-2	Benzo(b)Fluoranthene	BDL	7.79E-07	BDL	1.38E-06	BDL	1.48E-05	BDL	4.26E-06	BDL	1.12E-04	BDL	6.75E-07			BDL	2.76E-05	DLL	1.60E-05	BDL	2.10E-06
207-08-9	Benzo(k)Fluoranthene	BDL	7.79E-07	BDL	1.00E-06	BDL	1.48E-05	DLL	6.98E-07	BDL	1.12E-04	BDL	6.26E-07			BDL	4.14E-05	DLL	1.60E-05	BDL	2.10E-06
191-24-2	Benzo(ghi)Perylene		1.52E-06	BDL	6.60E-07	BDL	1.48E-05	BDL	4.73E-07	BDL	1.12E-04	DLL	3.04E-06			BDL	1.00E-04	BDL	1.60E-05	BDL	2.10E-06
50-32-8	Benzo(a)Pyrene	BDL	7.79E-07	BDL	6.60E-07	BDL	1.48E-05	BDL	4.73E-07	BDL	1.12E-04	BDL	8.05E-06			BDL	9.35E-05	DLL	1.60E-05	BDL	2.10E-06
192-97-2	Benzo(e)Pyrene	BDL	7.79E-07	BDL	2.16E-06	BDL	1.48E-05	BDL	1.62E-06	BDL	1.12E-04	DLL	1.31E-05			BDL	3.07E-05	DLL	1.60E-05	BDL	2.10E-06
92-52-4	Biphenyl		2.18E-04		1.16E-03	BDL	1.48E-05		3.00E-04	BDL	5.62E-02	BDL	9.08E-05			BDL	3.07E-05	BDL	8.20E-03	BDL	2.10E-04
1319-77-3	Cresols			BDL	1.29E-03						6.49E+00						1.80E-02	DLL	1.00E-02		
218-01-9	Chrysene*		1.70E-06		2.93E-06	BDL	1.48E-05		1.21E-05		8.80E-04	BDL	1.31E-06			BDL	1.07E-04	DLL	1.60E-05	BDL	2.10E-06
53-70-3	Dibenzo(a,h)Anthracene*	BDL	7.79E-07	BDL	7.70E-07	BDL	1.48E-05	BDL	4.73E-07	BDL	1.12E-04	BDL	7.29E-07			BDL	9.12E-05	BDL	1.60E-05	BDL	2.10E-06
132-64-9	Dibenzofuran	BDL	4.48E-04	BDL	3.82E-04	BDL	1.02E-03		3.69E-04	BDL	3.87E-02	BDL	3.60E-07			BDL	7.74E-05	BDL	5.60E-03	BDL	1.40E-04
192-65-4	Dibenzo(a,e)pyrene			BDL	6.60E-07	BDL	1.48E-05	BDL	4.73E-07	BDL	2.25E-04	BDL	6.26E-07					BDL	8.20E-05	BDL	2.10E-06
119-90-4	3,3'-Dimethoxybenzidine	BDL	5.65E-03	BDL	4.82E-03	BDL	1.48E-03	BDL	3.43E-03	BDL	1.12E+00	BDL	4.54E-06			BDL	3.07E-05	BDL	8.20E-03		data rejected
60-11-7	Dimethylaminobenzene	BDL	3.90E-04	BDL	3.32E-05	BDL	1.48E-03	BDL	2.37E-04	BDL	3.55E-02	BDL	3.13E-07			BDL	3.07E-05	BDL	8.20E-03	BDL	2.10E-04
57-97-6	7,12-Dimethybenz(a)anthracene			BDL	6.60E-07	BDL	5.09E-03	BDL	4.73E-07	BDL	2.25E-04	BDL	6.26E-07			BDL	3.07E-05	BDL	3.30E-05	BDL	2.10E-06
119-93-7	3,3'-Dimethylbenzidine	BDL	5.65E-03	BDL	4.82E-03	BDL	1.60E-02	BDL	3.43E-03	BDL	6.06E-01	BDL	4.54E-06			BDL	3.07E-05	BDL	8.80E-02		data rejected
122-09-8	a,a-Dimethylphenethylamine	BDL	2.34E-03	BDL	1.99E-03	BDL	1.48E-03	BDL	1.42E-03	BDL	2.81E-01	BDL	1.88E-06			BDL	3.07E-05	BDL	8.20E-03		data rejected
105-67-9	2,4-Dimethylphenol	BDL	5.07E-04	BDL	4.32E-04	BDL	1.08E-03	BDL	3.08E-04		4.29E-01	BDL	4.07E-07			DLL	8.45E-04	BDL	5.90E-03	BDL	1.50E-04
206-44-0	Fluoranthene		6.72E-06		1.00E-05		3.82E-05		4.89E-05		1.58E-03		9.79E-06			BDL	3.07E-05		3.60E-05	BDL	2.10E-06
86-73-7	Fluorene	DLL	4.87E-06		1.75E-05	DLL	1.78E-05	BDL	3.51E-05	BDL	1.12E-04	DLL	4.98E-05			BDL	3.99E-05	DLL	1.60E-05		3.41E-06
193-39-5	Indeno(1,2,3-cd)Pyrene	BDL	7.79E-07	BDL	9.40E-07	BDL	1.48E-05	BDL	4.73E-07	BDL	1.12E-04	BDL	5.58E-06			BDL	9.66E-05	DLL	1.60E-05	BDL	2.10E-06
78-59-1	Isophorone	BDL	4.38E-04	BDL	3.74E-04	BDL	1.11E-03	BDL	2.60E-04	BDL	4.20E-02	BDL	3.52E-07			BDL	2.22E-05	BDL	6.10E-03	BDL	1.60E-04
56-49-5	3-Methylcholanthrene			BDL	6.64E-07	BDL	1.48E-05	BDL	4.73E-07	BDL	2.25E-04	BDL	6.26E-07			BDL	3.07E-05	BDL	8.20E-05	BDL	2.10E-06
91-57-6	2-Methylnaphthalene		6.16E-05		5.89E-04		3.23E-05		2.44E-05	BDL	1.20E-04		7.41E-05			BDL	5.06E-05		3.40E-05		6.98E-06
95-48-7	2-Methylphenol	BDL	4.09E-04					BDL	2.48E-04			DLL	4.26E-06							BDL	1.40E-04
106-44-5/108	4-Methylphenol & 3-Methylphenol	BDL	1.10E-03					BDL	6.62E-04			BDL	1.27E-06							BDL	1.20E-04
91-20-3	Naphthalene		1.62E-04		3.22E-04		3.24E-04		7.93E-03		2.52E-04		2.80E-04			BDL	1.33E-04		5.90E-04		9.98E-05
198-55-0	Perylene	BDL	7.79E-07	BDL	6.64E-07	BDL	1.48E-05	BDL	4.73E-07	BDL	1.12E-04	BDL	6.21E-07			BDL	3.07E-05	DLL	1.60E-05	BDL	2.10E-06
85-01-8	Phenanthrene		4.23E-05		5.11E-05	BDL	3.62E-05		3.05E-04		2.33E-03		6.31E-05			BDL	1.21E-04		2.70E-05		2.53E-06
108-95-2	Phenol	BDL	1.26E-03		1.46E-03	BDL	5.79E-03	BDL	2.04E-03		6.07E+00		1.21E-06			DLL	1.31E-02	DLL	5.30E-03		1.12E-03
106-50-3	1,4-Phenylenediamine	BDL	3.51E-03	BDL	2.99E-03	BDL	1.48E-03	BDL	2.13E-03	BDL	2.81E-01	BDL	2.82E-06			BDL	2.98E-05	BDL	8.20E-03		data rejected

CAS #	Compound	CA5A0190 - ExxonMobil Torrance CA		IN2A0440 - BP Whiting, IN		LA3C0630 - Motiva Norco LA		IL2A0420 - Marathon Robinson, IL		VI6A1530 - Hovensa Christiansted, USVI		TX3B1250 - Valero Port Arthur, TX		PA1A1030 - Sunoco Philadelphia, PA		LA3C0560 - Citgo Lake Charles, LA		MN2B0720 - Flint Hills Rosemount, MN		HI5A0380 - Chevron Kapolei, HI	
		Detection Level (DL)	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr
129-00-0	Pyrene		6.83E-06		1.06E-05		8.65E-05	BDL	2.49E-05		4.87E-03	DLL	2.26E-06			BDL	3.68E-05		7.30E-05	BDL	2.10E-06
95-53-4	o-Toluidine	BDL	9.74E-04	BDL	8.31E-04	BDL	1.48E-03	BDL	5.91E-04	BDL	1.10E-01	BDL	7.82E-07			BDL	3.07E-05	BDL	8.20E-03	BDL	2.10E-04
	Total PAHs							BDL	8.72E-03												
	METALS																				
7400-36-0	Antimony	BDL	2.86E-04		3.12E-04	DLL	3.47E-03	BDL	2.21E-03		2.00E-03	BDL	3.59E-05			BDL	3.43E-04				8.44E-05
7440-38-2	Arsenic	BDL	2.45E-04	BDL	2.10E-04	BDL	3.31E-04	BDL	1.94E-04		2.00E-04	BDL	1.44E-04			BDL	5.44E-04			DLL	6.80E-04
7440-41-7	Beryllium	BDL	2.45E-04	BDL	5.26E-05	BDL	8.28E-05	BDL	4.46E-05	BDL	1.00E-05	BDL	3.59E-05			DLL	3.91E-06			DLL	5.00E-06
7440-43-9	Cadmium	BDL	2.45E-04		1.19E-03	BDL	8.30E-05	BDL	2.68E-05		2.00E-04		8.35E-04			DLL	5.37E-05			DLL	4.40E-06
7440-47-3	Chromium		1.09E-03		2.44E-03		7.30E-04	BDL	1.29E-03		1.40E-03		4.21E-04			DLL	1.11E-03				4.07E-04
7439-92-1	Lead	DLL	4.64E-04		3.11E-03	BDL	1.66E-04		1.15E-03		1.90E-03		2.16E-04			DLL	6.27E-04				1.50E-04
7439-96-5	Manganese		7.54E-04		9.46E-04		3.84E-03		2.40E-03		6.30E-03		6.71E-04				7.70E-04				9.88E-04
7440-02-0	Nickel	DLL	6.08E-04		3.33E-03		1.14E-02		4.61E-03		5.30E-03		1.11E-03				2.18E-03				1.63E-02
7782-22-4	Selenium	DLL	9.66E-04	BDL	5.26E-04	DLL	1.02E-03	BDL	7.29E-04		1.40E-03	BDL	3.59E-04			DLL	9.53E-04			DLL	3.80E-04
7440-48-4	Cobalt				3.39E-04		8.11E-04	BDL	2.06E-04		1.00E-03		5.82E-05			BDL	1.69E-04				1.08E-03
18540-29-9	Hexavalent Chromium	BDL	1.13E-04	BDL	8.00E-03		1.64E-03	BDL	8.14E-05	DLL	9.00E-04	BDL	3.24E-04		1.74E-04	BDL	2.04E-04	DLL	4.03E-05		-
	Oxidized/organic Mercury	BDL	2.72E-04		6.78E-05	BDL	1.20E-05	DLL	7.24E-05		2.92E-05		1.90E-05			DLL	1.54E-06			DLL	1.50E-05
	Total Mercury	BDL	8.51E-04	BDL	1.98E-04	DLL	3.87E-05	BDL	1.91E-04			BDL	1.81E-04								
7439-97-6	Elemental Mercury	BDL	5.71E-04	BDL	1.19E-04		2.42E-05		1.04E-04		2.55E-04	BDL	1.52E-04		7.09E-04	DLL	3.86E-05	DLL	2.73E-05	DLL	3.00E-05
7664-41-7	Ammonia		5.49E+00		4.50E-01	DLL	2.70E-01		7.23E-01		9.85E+00		5.22E-01	BDL	0.00E+00		6.39E-01		5.50E+00		1.20E-01
630-08-0	Carbon Monoxide		7.86E+01				3.23E+00				3.73E+01		3.22E+00		2.36E+01		2.11E+01				1.26E+01
7782-50-5	Chlorine				5.20E-02			BDL	1.73E-03												
67-56-1	Methanol	BDL	5.87E-01		4.86E+01				7.67E+00		1.80E-01		5.49E-01			DLL	5.86E-01	DLL	1.33E+00	BDL	2.80E-02
74-82-8	Methane		3.45E+01	BDL	7.00E-02	BDL	1.10E-01		8.00E-01		4.10E-01		4.73E-01		2.49E+00		7.77E-01		3.50E-01	BDL	8.15E-02
74-84-0	Ethane		1.21E+01	BDL	8.00E-02	BDL	2.60E-01	BDL	1.00E-01		7.68E-01	BDL	8.05E-01		1.26E+01		1.25E+00	BDL	3.40E-01	BDL	4.70E-01
75-69-4	Trichlorofluoromethane																				
74-83-9	Bromomethane																				
10102-43-9	Nitrogen Oxides		2.52E+01				1.59E+02				2.16E+01		9.53E+00		1.26E+01		1.01E+01				1.67E+01
	Sulfur Dioxide		2.84E+01				4.15E+01				2.84E+00	DLL	9.38E-01		2.70E+01		Reported a negative 0.01				6.80E+00
	PARTICULATE MATTER																				
	Condensible Inorganic (aqueous) PM		1.99E+01				2.05E+01								3.29E+01						1.59E+00
	Condensible Organic Particulate Matter		9.10E-01				1.26E+00								1.32E+00						9.16E-02
	Condensible Particulate Matter				9.49E+00				8.53E+00		2.28E+01		2.29E+00				2.61E+00				
	Filterable Particulate		1.26E+00				2.17E+01		2.27E+01		1.54E+01		6.22E+00		8.20E+01						4.45E+00
	Filterable PM2.5				1.32E+01																2.42E+00
	Total PM2.5		2.10E+01		2.27E+01																4.10E+00
	Total PM						4.35E+01		3.12E+01		3.82E+01		8.51E+00		1.16E+02		4.23E+00				
	TOTAL PCBs																				
	Total PCBs				3.10E-07			BDL	2.17E-08			BDL	6.51E-09								
	PCB TEQs								1.65E-10												
	DIOXIN AND FURANS																				
	2,3,3',4,4',5,5'-HpCB (PCB189)	BDL	1.01E-09		2.73E-09					BDL	3.92E-10	BDL	6.92E-11			BDL	3.38E-10			BDL	3.00E-10
	2,3,3',4,4',5'-HxCB (PCB157)	DLL	5.42E-10		2.09E-09					DLL	2.37E-10	BDL	1.42E-10			BDL	3.54E-10			BDL	5.70E-10
	2,3,3,4,4,5-HxCB (PCB156)		1.82E-09		7.50E-09						6.27E-10	BDL	1.48E-10				1.08E-08			DLL	5.70E-10
	2,3,3',4,4'-PeCB (PCB105)		1.25E-08		6.14E-08					DLL	5.14E-09	DLL	6.77E-10				8.98E-08			BDL	3.57E-09
	2,3',4,4',5,5'-HxCB (PCB167)	DLL	8.42E-10		5.88E-09					DLL	3.26E-10	BDL	1.67E-10				2.69E-08			BDL	3.30E-10
	2,3,4,4',5-PeCB (PCB114)	BDL	8.62E-10		5.40E-09					BDL	4.42E-10	BDL	9.44E-11			DLL	8.30E-09			BDL	2.80E-10
	2,3',4,4',5-PeCB (PCB118)		3.22E-08		1.71E-07						1.19E-08	DLL	1.78E-09				3.01E-07				1.02E-08
	2',3,4,4',5-PeCB (PCB123)	DLL	1.40E-09		1.68E-08					DLL	6.17E-10	BDL	1.51E-10				2.85E-07			BDL	4.70E-10
	2,3,4,6,7,8-HxCDF			DLL	2.19E-09							DLL	1.74E-10			BDL	6.97E-10			BDL	1.80E-10
	2,3,7,8-TCDD	BDL	6.79E-10	DLL	6.30E-10	BDL	3.19E-10					BDL	1.83E-10			BDL	3.82E-10			BDL	6.80E-10
	2,3,7,8-TCDF				3.42E-09	BDL	4.77E-10					BDL	2.19E-10			DLL	5.44E-10			BDL	4.30E-10
	3,3',4,4',5,5'-HxCB (PCB169)	BDL	1.14E-09		9.42E-10					BDL	3.19E-10	BDL	2.80E-09			BDL	3.91E-10			BDL	3.40E-10
	3,3',4,4',5-PeCB (PCB126)	BDL	6.00E-10		3.39E-09					BDL	4.30E-10	BDL	1.67E-10			BDL	3.43E-10			BDL	3.00E-10
	3,3',4,4'-TCB (PCB77)		6.71E-09		2.90E-08					DLL	5.90E-09	DLL	2.60E-10			DLL	7.39E-09				9.10E-10
	3,4,4',5-TCB (PCB81)	DLL	4.28E-10		3.69E-09					DLL	5.88E-10	BDL	1.06E-10			DLL	5.75E-09			BDL	3.10E-10
	OCDD				4.96E-09	BDL	1.16E-09										1.45E-08			DLL	1.88E-09
	OCDF	BDL	1.77E-09	DLL	7.00E-09	BDL	5.58E-10					BDL	2.66E-10			DLL	2.22E-09			DLL	4.06E-09
	1,2,3,6,7,8-HxCDF	BDL	3.45E-10									BDL	1.44E-10			BDL	6.42E-10			DLL	2.00E-10
	1,2,3,4,6,7,8-HpCDD	BDL	8.65E-10		2.77E-09	BDL	3.96E-10					BDL	4.33E-10			BDL	7.12E-10			DLL	4.30E-10
	2,3,4,7,8-PeCDF	BDL	5.09E-10	DLL	3.39E-09	BDL	4.77E-10					DLL	3.76E-10			BDL	5.93E-10			DLL	2.20E-10
	1,2,3,4,6,7,8-HpCDF	DLL	5.59E-10	DLL	3.49E-09	BDL	3.24E-10					DLL	2.64E-10								1.39E-09
	1,2,3,4,7,8,9-HpCDF	BDL	8.58E-10	DLL	7.57E-09	BDL	3.33E-10					DLL	1.45E-10			DLL	1.14E-09			DLL	4.50E-10
	1,2,3,4,7,8-HxCDD	BDL	6.11E-10	DLL	4.75E-10	BDL	3.15E-10					BDL	1.71E-10			BDL	9.40E-10			BDL	3.30E-10
	1,2,3,4,7,8-HxCDF				3.32E-09	BDL	2.88E-10					BDL	1.32E-10			BDL	6.93E-10			DLL	2.80E-10
	1,2,3,6,7,8-HxCDD	BDL	6.21E-10	DLL	8.15E-10	BDL	3.15E-10					BDL	1.69E-10			BDL	8.88E-10			DLL	4.00E-10
	1,2,3,7,8,9-HxCDD	BDL	6.72E-10	DLL	1.09E-09	BDL	2.88E-10					BDL	1.67E-10			BDL	9.16E-10			DLL	3.30E-10
	1,2,3,7,8,9-HxCDF	BDL	4.50E-10	DLL	5.37E-09	BDL	3.60E-10					BDL	1.26E-10			BDL	8.26E-10			BDL	2.10E-10
	1,2,3,7,8-PeCDD	BDL	7.53E-10	DLL	9.59E-10	BDL	2.88E-10					BDL	3.49E-10			BDL	6.27E-10			BDL	3.10E-10
	1,2,3,7,8-PeCDF			DLL	6.28E-09	BDL	2.97E-10					BDL	3.01E-10			BDL	5.80E-10			BDL	2.80E-10
	Total HpCDD				4.62E-09	BDL	3.96E-10						5.17E-10							DLL	4.30E-10

CAS #	Compound	CA5A0190 - ExxonMobil Torrance CA		IN2A0440 - BP Whiting, IN		LA3C0630 - Motiva Norco LA		IL2A0420 - Marathon Robinson, IL		VI6A1530 - Hovensa Christiansted, USVI		TX3B1250 - Valero Port Arthur, TX		PA1A1030 - Sunoco Philadelphia, PA		LA3C0560 - Citgo Lake Charles, LA		MN2B0720 - Flint Hills Rosemount, MN		HI5A0380 - Chevron Kapolei, HI	
		Detection Level (DL)	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr	DL	lb/hr
	Other HpCDF																			DLL	4.44E-10
	Total HpCDF			DLL	1.41E-08	BDL	3.51E-10					DLL	3.31E-10							DLL	2.23E-09
	Other HxCDD																			DLL	1.77E-09
	Total HxCDD				5.68E-09	BDL	3.15E-10					BDL	1.71E-10							DLL	2.84E-09
	Other HxCDF																			DLL	3.15E-10
	Total HxCDF				2.50E-08	BDL	3.06E-10					DLL	3.65E-10							DLL	7.90E-10
	Other PeCDD																			DLL	1.45E-10
	Total PeCDD				7.05E-09	BDL	5.67E-10					BDL	3.49E-10							DLL	4.41E-10
	Other PeCDF																			DLL	3.38E-10
	Total PeCDF			DLL	3.69E-08	BDL	5.76E-10					DLL	4.95E-10							DLL	7.90E-10
	Other TCDD																			DLL	8.90E-12
	Total TCDD				8.89E-09	BDL	2.97E-10					DLL	4.50E-10							DLL	6.90E-10
	Other TCDF																			DLL	0.00E+00
	Total TCDF				9.19E-08	BDL	8.46E-10					BDL	2.19E-10							BDL	4.30E-10
	Total Dioxins and Furans			DLL	2.52E-07						1.41E-08		5.80E-09								
	Total PCDD/F					BDL	5.77E-09		2.18E-08												
	Total PCDD/F TEQ								3.69E-09												
	Total Dioxins										7.20E-09									DLL	6.29E-09
	Total Furans										6.89E-09									DLL	8.29E-09
	Total Hydrocarbon		1.01E+02												7.61E-01		3.19E+00				

Flares

Table 13.5-1 (English Units). THC, NOx AND SOOT EMISSIONS FACTORS FOR FLARE OPERATIONS FOR CERTAIN CHEMICAL MANUFACTURING PROCESSES[a]

Pollutant	SCC[e]	Emissions Factor Value	Emissions Factor Units	Grade or Representativeness
THC, elevated flares[c]	30190099; 30119701; 30119705; 30119709; 30119741	0.14[b,f]	lb/10^6 Btu	B
THC, enclosed ground flares[g,h] Low Percent Load[i]		8.37[j] or 3.88e-3[f]	lb/10^6 scf gas burned lb/10^6 Btu heat input	Moderately
THC, enclosed ground flares[g,h] Normal to High Percent Load[i]		2.56[j] or 1.20e-3[f]	lb/10^6 scf gas burned lb/10^6 Btu heat input	Moderately
Nitrogen oxides, elevated flares[d]		0.068[b,k]	lb/10^6 Btu	B
Soot, elevated flares[d]		0 – 274[b]	μg/L	B

[a] All of the emissions factors in this table represent the emissions exiting the flare. Since the flare is not the originating source of the THC emissions, but rather the device controlling these pollutants routed from a process at the facility, the emissions factors are representative of controlled emissions rates for THC. These values are not representative of the uncontrolled THC routed to the flare from the associated process, and as such, they may not be appropriate for estimating the uncontrolled THC emissions or potential to emit from the associated process.

[b] Reference 1. Based on tests using crude propylene containing 80% propylene and 20% propane.

[c] Measured as methane equivalent. The THC emissions factor may not be appropriate for reporting volatile organic compounds (VOC) emissions when a VOC emissions factor exists.

[d] 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.

[e] See Table 13.5-4 for a description of these SCCs.

[f] Factor developed using the lower (net) heating value of the vent gas.

[g] THC measured as propane by US EPA Method 25A.

[h] These factors apply to well operated ground flares achieving at least 98% destruction efficiency and operating in compliance with the current General Provisions requirements of 40 CFR Part 60, i.e. >200 btu/scf net heating value in the vent gas and less than the specified maximum exit velocity. The emissions factor data set had an average destruction efficiency of 99.99%. Based on tests using pure propylene fuel. References 12 through 33 and 39 through 45.

[i] The dataset for these tests were broken into four different test conditions: ramping back and forth between 0 and 30% of load; ramping back and forth between 30% and 70% of load; ramping back and forth between 70% and 100% of load; and a fixed rate maximum load condition. Analyses determined that only the first condition was statistically different. Low percent load is represented by a unit operating at approximately less than 30% of maximum load.

[j] Heat input is an appropriate basis for combustion emissions factor. However, based on available data, heat input data is not always known, but gas flowrate is generally available. Therefore, the emissions factor is presented in two different forms.

[k] Factor developed using the higher (gross) heating value of the vent gas.

Table 13.5-2 (English Units). VOC and CO EMISSIONS FACTORS FOR ELEVATED FLARE OPERATIONS FOR CERTAIN REFINERY AND CHEMICAL MANUFACTURING PROCESSES[a,b]

<table>
<tr><th>Pollutant</th><th>SCC[e]</th><th>Emissions Factor (lb/10^6 Btu)[f]</th><th>Representativeness</th></tr>
<tr><td>Volatile organic compounds[c]</td><td rowspan="2">30190099;
30600904;
30119701;
30119705;
30119709;
30119741;
30119799;
30130115;
30600201;
30600401;
30600508;
30600903;
30600999;
30601701;
30601801;
30688801;
40600240</td><td>0.66</td><td>Poorly</td></tr>
<tr><td>Carbon monoxide[d]</td><td>0.31</td><td>Poorly</td></tr>
</table>

[a] The emissions factors in this table represent the emissions exiting the flare. Since the flare is not the originating source of the VOC emissions, but rather the device controlling these pollutants routed from a process at the facility, the emissions factor is representative of controlled emissions rates for VOC. This values is not representative of the uncontrolled VOC routed to the flare from the associated process, and as such, it may not be appropriate for estimating the uncontrolled VOC emissions or potential to emit from the associated process.

[b] These factors apply to well operated flares achieving at least 98% destruction efficiency and operating in compliance with the current General Provisions requirements of 40 CFR Part 60, i.e. >300 btu/scf net heating value in the vent gas and less than the specified maximum flare tip velocity. The VOC emissions factor data set had an average destruction efficiency of 98.9%, and the CO emissions factor data set had an average destruction efficiency of 99.1% (based on test reports where destruction efficiency was provided). These factors are based on steam-assisted and air-assisted flares burning a variety of vent gases.

[c] References 4 through 9 and 11.

[d] References 1, 4 through 8, and 11.

[e] See Table 13.5-4 for a description of these SCCs.

[f] Factor developed using the lower (net) heating value of the vent gas.

Engines

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO_x	0.011	1.63	0.031	4.41	D
CO	6.96 E-03[d]	0.99[d]	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.
[b] PM-10 = particulate matter less than or equal to 10 μm aerodynamic diameter. All particulate is assumed to be $\leq$ 1 μm in size.
[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.
[d] Instead of 0.439 lb/hp-hr (power output) and 62.7 lb/mmBtu (fuel input), the correct emissions factors values are 6.96 E-03 lb/hp-hr (power output) and 0.99 lb/mmBtu (fuel input), respectively. This is an editorial correction. March 24, 2009

Table 3.3-2. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR UNCONTROLLED DIESEL ENGINES[a]

EMISSION FACTOR RATING: E

Pollutant	Emission Factor (Fuel Input) (lb/MMBtu)
Benzene[b]	9.33 E-04
Toluene[b]	4.09 E-04
Xylenes[b]	2.85 E-04
Propylene	2.58 E-03
1,3-Butadiene[b,c]	<3.91 E-05
Formaldehyde[b]	1.18 E-03
Acetaldehyde[b]	7.67 E-04
Acrolein[b]	<9.25 E-05
Polycyclic aromatic hydrocarbons (PAH)	
Naphthalene[b]	8.48 E-05
Acenaphthylene	<5.06 E-06
Acenaphthene	<1.42 E-06
Fluorene	2.92 E-05
Phenanthrene	2.94 E-05
Anthracene	1.87 E-06
Fluoranthene	7.61 E-06
Pyrene	4.78 E-06
Benzo(a)anthracene	1.68 E-06
Chrysene	3.53 E-07
Benzo(b)fluoranthene	<9.91 E-08
Benzo(k)fluoranthene	<1.55 E-07
Benzo(a)pyrene	<1.88 E-07
Indeno(1,2,3-cd)pyrene	<3.75 E-07
Dibenz(a,h)anthracene	<5.83 E-07
Benzo(g,h,l)perylene	<4.89 E-07
TOTAL PAH	1.68 E-04

[a] Based on the uncontrolled levels of 2 diesel engines from References 6-7. Source Classification Codes 2-02-001-02, 2-03-001-01. To convert from lb/MMBtu to ng/J, multiply by 430.
[b] Hazardous air pollutant listed in the *Clean Air Act*.
[c] Based on data from 1 engine.

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 ≤ 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.

Cooling Towers

Table 5.1-3 (Metric And English Units). FUGITIVE EMISSION FACTORS FOR PETROLEUM REFINERIES[a]

EMISSION FACTOR RATING: D

Emission Source	Emission Factor Units	Emission Factors		Applicable Control Technology
		Uncontrolled Emissions	Controlled Emissions	
Cooling towers[b]	kg/10^6 L cooling water	0.7	0.08	Minimization of hydrocarbon leaks into cooling water system; monitoring of cooling water for hydrocarbons
	lb/10^6 gal cooling water	6	0.7	Minimization of hydrocarbon leaks into cooling water system; monitoring of cooling water for hydrocarbons
Oil/water separators[c]	kg/10^3 L waste water	0.6	0.024	Covered separators and/or vapor recovery systems
	lb/10^3 gal waste water	5	0.2	Covered separators and/or vapor recovery systems
Storage	See Chapter 7 - Liquid Storage Tanks			
Loading	See Section 5.2 - Transportation And Marketing Of Petroleum Liquids			

[a] References 2,4,12-13.

[b] If cooling water rate is unknown (in liters or gallons) assume it is 40 times the refinery feed rate (in liters or gallons). Refinery feed rate is defined as the crude oil feed rate to the atmospheric distillation column. 1 bbl (oil) = 42 gallons (gal), 1 m^3 = 1000 L.

[c] If waste water flow rate to oil/water separators is unknown (in liters or gallons) assume it is 0.95 times the refinery feed rate (in liters or gallons). Refinery feed rate is defined as the crude oil feed rate to the atmospheric distillation column. 1 bbl (oil) = 42 gal, 1 m^3 = 1000 L.

Fugitives

EPA-453/R-95-017

1995 Protocol for Equipment Leak Emission Estimates

Emission Standards Division

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

November 1995

TABLE 2-2. REFINERY AVERAGE EMISSION FACTORS[a]

Equipment type	Service	Emission factor (kg/hr/source)[b]
Valves	Gas	0.0268
	Light liquid	0.0109
	Heavy liquid	0.00023
Pump seals[c]	Light liquid	0.114
	Heavy liquid	0.021
Compressor seals	Gas	0.636
Pressure relief valves	Gas	0.16
Connectors	All	0.00025
Open-ended lines	All	0.0023
Sampling connections	All	0.0150

[a]Source: Reference 2.

[b]These factors are for non-methane organic compound emission rates.

[c]The light liquid pump seal factor can be used to estimate the leak rate from agitator seals.

TABLE 5-3. CONTROL EFFECTIVENESS FOR AN LDAR PROGRAM AT A REFINERY PROCESS UNIT

Equipment type and service	Control effectiveness (%)		
	Monthly monitoring 10,000 ppmv leak definition	Quarterly monitoring 10,000 ppmv leak definition	HON reg neg[a]
Valves - gas	88	70	96
Valves - light liquid	76	61	95
Pumps - light liquid	68	45	88
Connectors - all	b	b	81

[a] Control effectiveness attributable to the requirements of the proposed hazardous organic NESHAP equipment leak negotiated regulation are estimated based on equipment-specific leak definitions and performance levels.

[b] Data are not available to estimate control effectiveness.

Air Permit Technical Guidance for Chemical Sources

Fugitive Guidance

APDG 6422

Air Permits Division Texas Commission on Environmental Quality

June 2018

Table V: Control Efficiencies for LDAR

Equipment/Service	28M	28RCT	28VHP	28MID	28LAER	28CNTQ	28CNTA	28PI	28AVO[9]
Valves[1]									97%
Gas/Vapor	75%	97%	97%	97%	97%			30%	
Light Liquid	75%	97%	97%	97%	97%			30%	
Heavy Liquid[5]	0%[6]	0%[6]	0%[6]	0%[6]	30%[6, 8]			30%[8]	
Pumps[1]									93%
Light Liquid	75%	75%	85%	93%	93%			30%	
Heavy Liquid[5]	0%	0%[7]	0%[7]	0%[8, 10]	30%[8]			30%[8]	
Flanges/Connectors[1]	30%	30%	30%	30%				30%	97%
Gas/Vapor					97%	97%	75%		
Light Liquid					97%	97%	75%		
Heavy Liquid[8]					30%	30%	30%		
Compressors[1]	75%	75%	85%	95%	95%			30%	95%
Relief Valves[1, 2] (Gas/Vapor)	75%	97%	97%	97%	97%			30%	97%
Sampling Connection[3] (pounds per hour per sample taken)	0%	0%	0%	0%	0%			0%	0%
Open Ended Lines[1, 4]									

It should be noted in the application and added to the permit conditions if any of the footnotes are applicable. For example, if components in heavy liquid service are monitored, then the application should include the monitored concentration and the concentration of saturation, in ppmv and such monitoring will be added as a separate condition.

Endnotes Table V

1 **Control efficiencies apply only to components that are actually monitored. Control efficiencies do not apply to components that are difficult or unsafe-to-monitor on the standard schedule. However, difficult-to-monitor gas or light liquid valves under the 28RCT, 28VHP, 28MID, or 28LAER programs that are monitored once per year may apply a 75% reduction credit.**

2 **100% control may be taken if a relief valve vents to an operating control device or if it is equipped with a rupture disc and a pressure-sensing device between the valve and disc to monitor for disc integrity. For new facilities, BACT guidelines generally require that all relief valves vent to a control device. When there are safety reasons that the relief valve cannot achieve 100% control, the relief valve can be monitored under the LDAR programs for the credit listed. This monitoring must be performed regardless of whether the relief valve is considered accessible, difficult-to-monitor or unsafe-to-monitor. Relief valves that do not achieve 100% control should not be built in locations that are unsafe-to-monitor.**

3 **Sampling connection control efficiencies are covered under other equipment and services. Sampling emissions are based on the number of samples taken per year as opposed to the number of connections. Fugitives for a closed loop sampling system are based on the component count.**

4 **Good design criteria for special chemicals handling and most LDAR programs require open-ended lines to be equipped with an appropriately sized cap, blind flange, plug, or a second valve. If so equipped, open-ended lines may be given a 100% control credit. Regardless of the lines given 100% credit, these lines should be mentioned in permit applications. Exceptions to the LDAR program criteria may be made for safety reasons with the approval of TCEQ management.**

5 Monitoring components in heavy liquid service using an instrument is not required by any of the 28 Series LDAR programs. If monitored with an instrument, the applicant must demonstrate that the VOC being monitored has sufficient vapor pressure to allow for reduction credit. Monitoring near or below background concentration is unreasonable and additional credit is not given for monitoring generic VOC below 500 ppmv. Credit will be given in cases where a specific compound is monitored below 500 ppmv when sufficient demonstration has been made of the ability to monitor at the specified concentration and there is no concern about the monitoring concentration being close to the background concentration. No credit may be taken if the concentration at saturation is below the leak definition of the monitoring program (i.e. (0.044 psia/14.7 psia) x 10^6 = 2,993 ppmv versus leak definition = 10,000 ppmv).

6 If the concentration at saturation is greater than the leak definition. Contact the TCEQ to determine whether valves in heavy liquid service may be given a 97% credit if monitored at 500 ppmv

7 If the concentration at saturation is greater than the leak definition. Contact the TCEQ to determine whether pumps in heavy liquid service may be given a 85% reduction credit if monitored at 2,000 ppmv.

8 Ultra heavy liquid with a vapor pressure < 0.0147 psia at operating temperature may receive higher emission reduction credit (matching the credit of 28AVO) provided a 28PI inspection program is performed on these components.

9 Audio, Visual and Olfactory (AVO) – AVO credit is based on the chemical constituent, not vapor pressure or service type. This program (28AVO) is approved for chlorine, ammonia, hydrogen sulfide, hydrogen fluoride, mercaptans, and hydrogen cyanide only.

10 If the concentration at saturation is greater than the leak definition. Contact the TCEQ to determine whether pumps in heavy liquid service may be given a 93% credit if monitored at 500 ppmv.

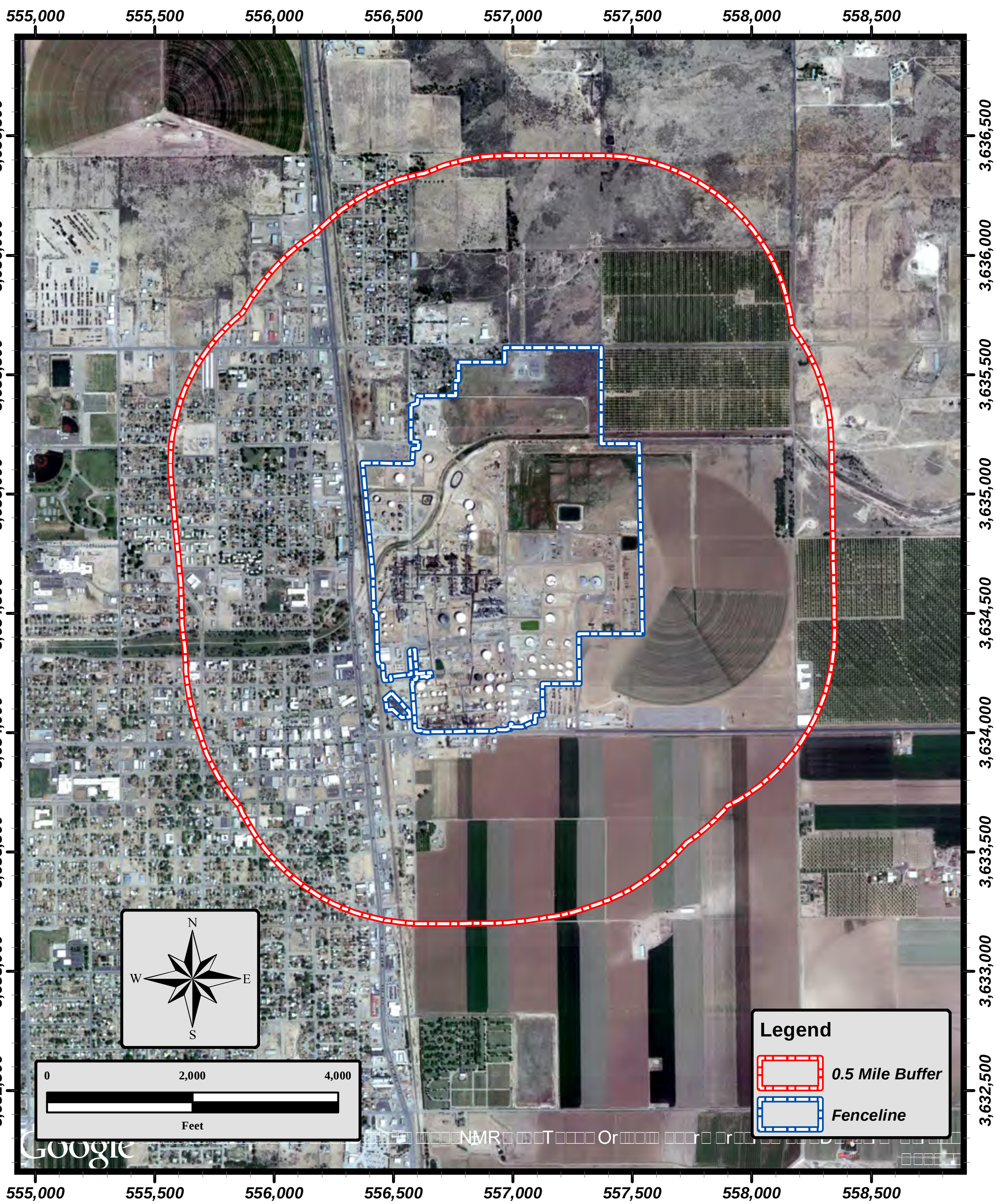
Section 8

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	

Three maps are included in this section. Figure 1 is a map of the refinery and surrounding area. Figure 2 depicts the city limits of Artesia. Figure 3 shows the location of the refinery flares.



Grid Presented is UTM Zone 13, NAD 1983

FIGURE 1 AREA MAP

Artesia Refinery
Artesia, New Mexico

from USGS Quadrangle Artesia, New Mexico
Ground Condition Depicted May 2014
Digital Data Courtesy of Google Earth

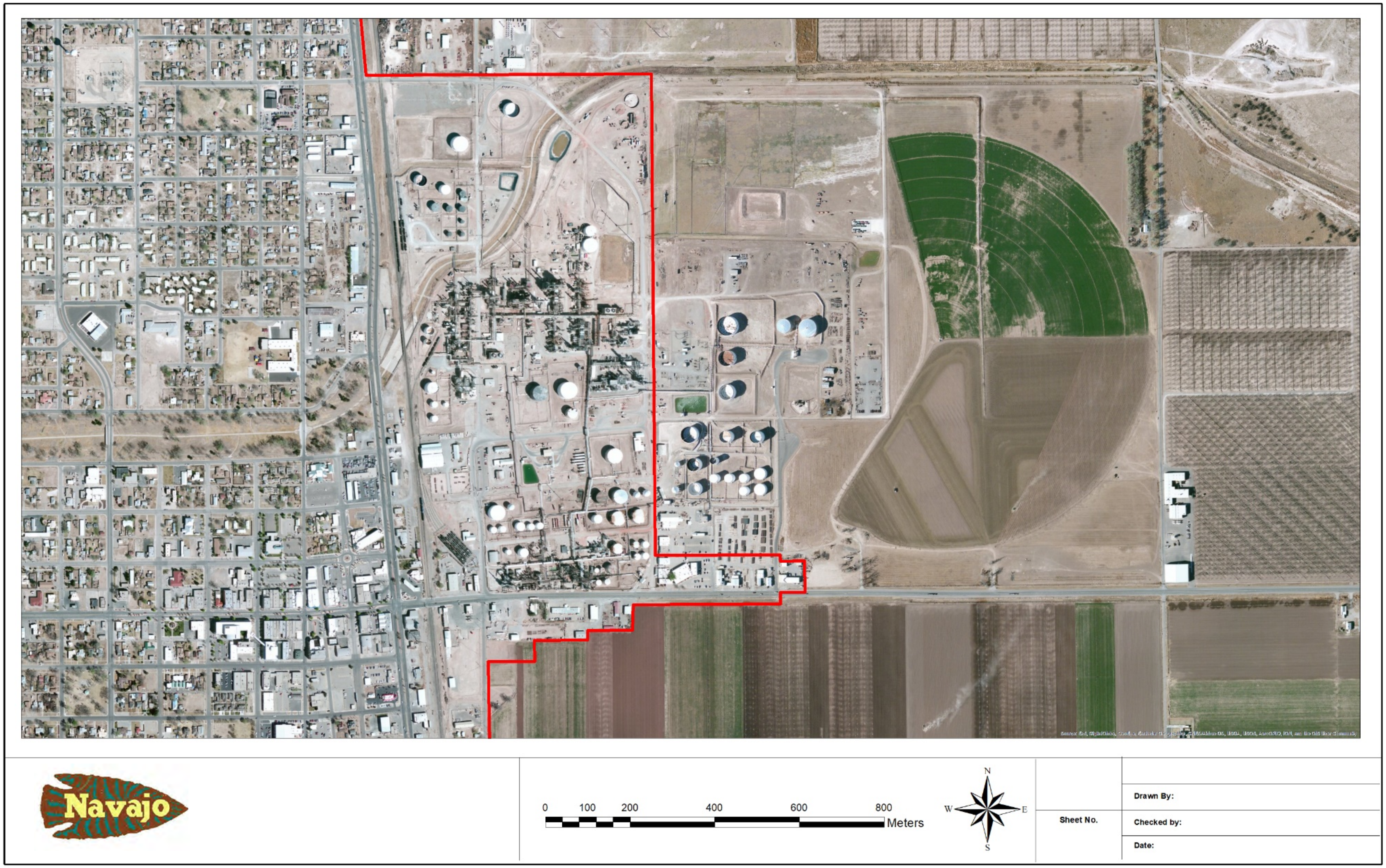


FIGURE 2 – CITY LIMITS OF ARTESIA

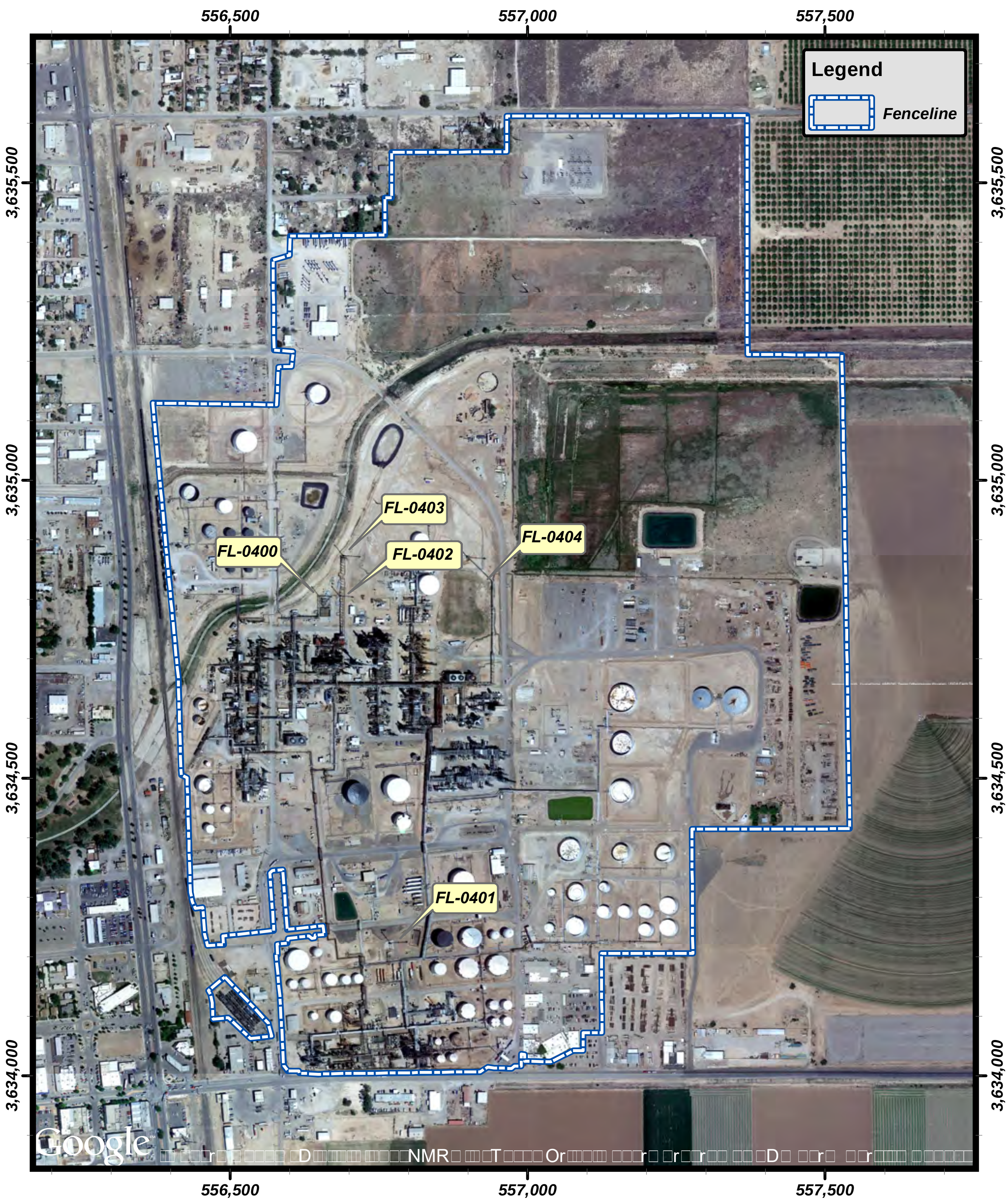


FIGURE 3 UNIT LOCATION MAP

Artesia Refinery
Artesia, New Mexico

from USGS Quadrangle Artesia, New Mexico
Ground Condition Depicted May 2014
Digital Data Courtesy of Google Earth

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.

7020 2450 0000 2145 2190

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Airgas USA LLC
PO Box 1152
Tulsa, OK 74101-1152

AMM 8/25/21

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Artesia Alfalfa Growers Assoc
PO Box 930
Artesia, NM 88211-0930

AMM 8/25/21

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Amanda Rose Munoz
604 E Richey
Artesia, NM 88210

AMM 8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Artesia Lumber Company
PO Box 5564
Midland, TX 79701-5564

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AUG 2

Arriola, Eleazar Hernandez
1914 Pine Street
Artesia, NM 88210

AMM 8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7020 2450 0000 2145 2244

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AUG 2 2021

Artesia Metals Inc
PO Box 957
Artesia, NM 88211-0957

AMM 8/25/21

for Instructions

7020 2450 0000 2145 2251

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AUG 25

BAAR LLC
410 E Main Street
Artesia, NM 88210

AMM 8/25/21

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BNSF Railway Company
PO Box 961089
Fort Worth, TX 76161

AMM 8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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BAAR LLC
8005 CR 6920
Lubbock, TX 79407

AMM 8/25/21

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AUG 25 2021

Buddy L & Brenda J Simmons
420 E Quail
Artesia, NM 88210

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Bell Gas Inc
PO Box 490
Roswell, NM 88202-0490

AMM 8/25/21

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CE & Wanda La Rue
3717 Manor Circle
Artesia, NM 88210

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Chanda Hawkins
169 E Blevins Rd
Artesia, NM 88210

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Claudia E Martinez
510 E Richey Avenue
Artesia, NM 88210

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Caza Ranches LLC
PO Box 658
Artesia, NM 88211-0658

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Corinne B Grace Trust
Western Commerce Bank Trustees
PO Box 1358
Carlsbad, NM 88221-1358

AMM 8/25/21

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Chase Farms, Richard L Chase
PO Box 658
Artesia, NM 88211-0658

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David L & Debi M Sant
PO Box 306
Hagerman, NM 88232

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USPS 8821C

DOC Properties LLC
813 N Washington Ave
Roswell, NM 88201

AMM 8/25/21

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Garcia, Jose Angel Guillermo &
Pando, Marisela
2011 N Oak St
Artesia, NM 88210

AMM 8/25/21

for Instructions

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AUG 2

Donald H Kiddy
7366 S Platte Canyon Drive
Littleton, CO 80123

AMM 8/25/21

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AUG 25 2021
USPS 8821

Gas Well Services Inc
26 E Compress Rd
Artesia, NM 88210

AMM 8/25/21

for Instructions

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Donald R & David Golemon
602 E Richey Ave
Artesia, NM 88210

AMM 8/25/21

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AUG 2 2021
USPS 882

Gene G & Yolanda Burgos
404 E Quail
Artesia, NM 88210

AMM 8/25/21

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GG Armstrong & Son
PO Box 1973
Roswell, NM 88202-1973

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James L & Leah J Joseph
PO Box 157
Artesia, NM 88211-0157

AMM 8/25/21

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USPS

Grace, Winston & Maria Christina
4940 NM 65th Ave
Lauderhill, FL 33319

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Jesus M & Maria Mascorro
1416 N Freeman Ave
Artesia, NM 88210

AMM 8/25/21

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JD Gilbert, Jr RC Hoelscher &
Karen Schroeder
2139 Spring Creek Rd
Lebanon, TN 37087

AMM 8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7020 2450 0000 2145 2138

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AUG 2

Johnny W & Terry J Fowler
PO Box 1223
Artesia, NM 88211-1223

AMM 8/25/21

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Josephine Wooten
1802 Standridge St
Killeen, TX 76543

AMM 8/25/21

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☐ Adult Signature Restricted Delivery $
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Murdock Machine Shop Inc
PO Box 1438
Artesia, NM 88211-1438

AMM 8/25/21

for Instructions

7020 2450 0000 2145 2152

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☐ Adult Signature Required $
☐ Adult Signature Restricted Delivery $
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Lupe L & Lupe A Hernandez
414 E Quail Street
Artesia, NM 88210

AMM 8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7020 2450 0000 2145 2183

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☐ Adult Signature Required $
☐ Adult Signature Restricted Delivery $
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Oscar & Mary Helen Sosa
612 N 14th St
Artesia, NM 88210

AMM 8/25/21

for Instructions

7020 2450 0000 2145 2169

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☐ Adult Signature Required $
☐ Adult Signature Restricted Delivery $
Postage
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Manuel, Clotilde & Manuel D
Fuentes
410 S Freeman Avenue
Artesia, NM 88210

AMM 8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7020 2450 0000 2145 1971

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Pedro A & Maria E Ruiz
1611 N Freeman Avenue
Artesia, NM 88210

AMM 8/25/21

for Instructions

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Prideco LLC
c/o McJunkin Red Man Corporation
PO Box 513
Charleston, WV 25322-0513

AMM 8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Reydesel Flores
206 E Grand
Artesia, NM 88210

AMM 8/25/21

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Raul V Chavarria
PO Box 1507
ARTESIA, NM 88211-1507

AMM 8/25/21

for Instructions

7020 2450 0000 2145 2022

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Rolando P Chavarria Sr
421 E Quail Street
Artesia, NM 88210

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Raul V Chavarria
1601 W Centre Ave Apt B1
Artesia, NM 88210

AMM 8/25/21

for Instructions

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Schlumberger Technology Corp
PO Box 2629
Addison, TX 75001-2629

AMM 8/25/21

See Reverse for Instructions

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Southwestern Public Service Co
ATTN: Property Tax Dept
PO Box 1979
Denver, CO 80201

AMM 8/25/21

See Reverse for Instructions

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Sue C Pemberton
PO Box 914
Artesia, NM 88211-0914

AMM 8/25/21

for Instructions

7020 2450 0000 2145 2053

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ARTESIA Postmark Here AUG 2 2021

Stephen Earl & Jana S Borland
PO Box 371
Artesia, NM 88211-0371

AMM 8/25/21

for Instructions

7020 2450 0000 2145 2107

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Sybill Smith
R252 N Haldeman Rural Rd
Artesia, NM 88210

AMM 8/25/21

for Instructions

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Steven B Haines
11032 Lovington Hwy
Artesia, NM 88210

AMM 8/25/21

for Instructions

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Postmark Here AUG 2021

Timmy K & Teresa L Baize
210 S Roselawn Ave
Artesia, NM 88210

AMM 8/25/21

for Instructions

7020 2450 0000 2145 1773

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Ms. Aubrey Hobson
City of Artesia – City Clerk
511 W Texas Avenue
Artesia, NM 88210

AMM
8/25/21

See Reverse for Instructions

7020 2450 0000 2145 1780

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AUG 2 2021

Ms. Cindy Fuller
Chaves County, County Clerk
#1 St. Mary's Place, Suite 110
Roswell, NM 88203

AMM
8/25/21

See Reverse for Instructions

7020 2450 0000 2145 2077

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AUG 2 2021

Toolpushers Supply Co
PO Drawer 2360
Casper, WY 82602-2360

AMM
8/25/21

for Instructions

7020 2450 0000 2145 1797

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AUG 2 2021

Ms. Darlene Rosprim
Eddy County, County Clerk
325 S Main Street
Carlsbad, NM 88220

AMM
8/25/21

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

General Posting of Notices – Certification

I, Suzanne Garcia, the undersigned, certify that on **August 25, 2021,** posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the **City of Artesia** in **Eddy** County, State of New Mexico on the following dates:

1. Artesia Refinery (August 25, 2021)
2. Artesia City Hall (August 25, 2021)
3. Artesia Public Library (August 25, 2021)
4. Artesia Post Office (August 25, 2021)

Signed this 25 day of August , 2021 .

Suzanne Garcia
Signature

08/25/2021
Date

Suzanne Garcia
Printed Name

Administrative Assistant, Lead
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

HOLLYFRONTIER.

August 23, 2021

Ms. Aubrey Hobson
City of Artesia - City Clerk
511 W. Texas Avenue
Artesia, NM 88210

Certified Mail/Return Receipt No.
7020 2450 0000 2145 1773

Re: Public Notice
Application for a PSD Major Air Permit Modification for Artesia Refinery
HollyFrontier Navajo Refining LLC
Artesia, Eddy County, New Mexico

Dear Ms. Hobson,

HollyFrontier Navajo Refining LLC ("Navajo") announces its application submittal to the New Mexico Environment Department ("NMED") for a significant permit revision of the Artesia Refinery permit PSD-NM-0195M39R3. The expected date of application submittal to the Air Quality Bureau is September 02, 2021.

The exact location for the facility known as, Artesia Refinery, is at 501 E. Main St., Artesia, NM 88210. The approximate location of this facility is less than 0.5 miles east of the intersection of E. Main St. and S. 1st St. in Eddy County.

Navajo is submitting this application for a significant permit revision of Permit No. PSD-NM-0195M39R3, in accordance with 20.2.72.219.D New Mexico Administrative Code. This revision is necessary to adequately represent the operational conditions at the refinery, to update the calculations' methodology where appropriate and according to latest guidance published, and to update representations from previous submittals.

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and may change slightly during the course of the Department's review:

Pollutant	pph	tpy
Nitrogen Oxides (NO_x)	456.40	798.60
Carbon Monoxide (CO)	2,067.40	1,448.90
Volatile Organic Compounds (VOC)	2,460.50	1,325.70
Sulfur Dioxide (SO_2)	2,050.00	438.30
Particulate Matter (PM)	58.00	219.40
Particulate Matter 10 microns or less (PM_{10})	85.50	214.30
Particulate Matter 2.5microns or less ($PM_{2.5}$)	84.20	208.80
Hydrogen Sulfide (H_2S)	20.40	5.90
Lead (Pb)	0.00	0.00
Total sum of all Hazardous Air Pollutants (HAPs)	74.50	228.00
Ammonia (NH_3)	18.60	81.10
Sulfuric Acid (H_2SO_4)	7.10	18.10
Green House Gas Emissions as Total CO_2e	0.00	10,783,565.30

HollyFrontier Navajo Refining LLC
501 East Main • Artesia, NM 88210
(575) 748-3311 • http://www.hollyfrontier.com

The standard operating schedule of the facility is and will continue to be continuous 24 hours per day, 7 days a week, and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is: HollyFrontier Navajo Refining LLC, P.O. Box 159, Artesia, NM 88211-0159.

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Atención

Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, relativo a las emisiones producidas por una industria en este área. Si usted desea información en español, por favor comuníquese con esta oficina en el teléfono 505-476-5557.

Sincerely,

Kawika Tupou
Environmental Manager
HollyFrontier Navajo Refining LLC
501 E. Main Street
Artesia, NM 88210

cc:
Eddy County, Darlene Rosprim, County Clerk
Chaves County, Cindy Fuller, County Clerk
NMED, Melinda Owens, via email to Melinda.Owens@state.nm.us
NMED, Joe Kimbrell, via email to Joseph.Kimbrell@state.nm.us
HollyFrontier, P. Miller, T. Wheeler, S. Gokhale, A. Miro

Notice of Non-Discrimination

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Kathryn Becker, Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

HOLLYFRONTIER.

August 23, 2021

Ms. Cindy Fuller
Chaves County, County Clerk
#1 St. Mary's Place, Suite 110
Roswell, NM 88203

Certified Mail/Return Receipt No.
7020 2450 0000 2145 1780

Re: Public Notice
Application for a PSD Major Air Permit Modification for Artesia Refinery
HollyFrontier Navajo Refining LLC
Artesia, Eddy County, New Mexico

Dear Ms. Fuller,

HollyFrontier Navajo Refining LLC ("Navajo") announces its application submittal to the New Mexico Environment Department ("NMED") for a significant permit revision of the Artesia Refinery permit PSD-NM-0195M39R3. The expected date of application submittal to the Air Quality Bureau is September 2, 2021.

The exact location for the facility known as, Artesia Refinery, is at 501 E. Main St., Artesia, NM 88210. The approximate location of this facility is less than 0.5 miles east of the intersection of E. Main St. and S. 1st St. in Eddy County.

Navajo is submitting this application for a significant permit revision of Permit No. PSD-NM-0195M39R3, in accordance with 20.2.72.219.D New Mexico Administrative Code. This revision is necessary to adequately represent the operational conditions at the refinery, to update the calculations' methodology where appropriate and according to latest guidance published, and to update representations from previous submittals.

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Nitrogen Oxides (NO_x)	456.40	798.60
Carbon Monoxide (CO)	2,067.40	1,448.90
Volatile Organic Compounds (VOC)	2,460.50	1,325.70
Sulfur Dioxide (SO_2)	2,050.00	438.30
Particulate Matter (PM)	58.00	219.40
Particulate Matter 10 microns or less (PM_{10})	85.50	214.30
Particulate Matter 2.5microns or less ($PM_{2.5}$)	84.20	208.80
Hydrogen Sulfide (H_2S)	20.40	5.90
Lead (Pb)	0.00	0.00
Total sum of all Hazardous Air Pollutants (HAPs)	74.50	228.00
Ammonia (NH_3)	18.60	81.10
Sulfuric Acid (H_2SO_4)	7.10	18.10
Green House Gas Emissions as Total CO_2e	0.00	10,783,565.30

HollyFrontier Navajo Refining LLC
501 East Main • Artesia, NM 88210
(575) 748-3311 • http://www.hollyfrontier.com

The standard operating schedule of the facility is and will continue to be continuous 24 hours per day, 7 days a week, and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is: HollyFrontier Navajo Refining LLC, P.O. Box 159, Artesia, NM 88211-0159.

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

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Atención

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Sincerely,

Kawika Tupou
Environmental Manager
HollyFrontier Navajo Refining LLC
501 E. Main Street
Artesia, NM 88210

cc:

City of Artesia, Aubrey Hobson, City Clerk
Eddy County, Darlene Rosprim, County Clerk
NMED, Melinda Owens, via email to Melinda.Owens@state.nm.us
NMED, Joe Kimbrell, via email to Joseph.Kimbrell@state.nm.us
HollyFrontier, P. Miller, T. Wheeler, S. Gokhale, A. Miro

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HOLLYFRONTIER.

August 23, 2021

Ms. Darlene Rosprim
Eddy County, County Clerk
325 S. Main Street
Carlsbad, NM 88220

Certified Mail/Return Receipt No.
7020 2450 0000 2145 1797

Re: Public Notice
Application for a PSD Major Air Permit Modification for Artesia Refinery
HollyFrontier Navajo Refining LLC
Artesia, Eddy County, New Mexico

Dear Ms. Fuller,

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HollyFrontier Navajo Refining LLC
501 East Main • Artesia, NM 88210
(575) 748-3311 • http://www.hollyfrontier.com

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Sincerely,

Kawika Tupou
Environmental Manager
HollyFrontier Navajo Refining LLC
501 E. Main Street
Artesia, NM 88210

cc:

City of Artesia, Aubrey Hobson, City Clerk
Chaves County, Cindy Fuller, County Clerk
NMED, Melinda Owens, via email to Melinda.Owens@state.nm.us
NMED, Joe Kimbrell, via email to Joseph.Kimbrell@state.nm.us
HollyFrontier, P. Miller, T. Wheeler, S. Gokhale, A. Miro

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HOLLYFRONTIER®

August 23, 2021

Neighbor of Navajo Refinery
Located @
501 East Main Street
Artesia, NM 88210

Re: Public Notice
Application for a PSD Major Air Permit Modification for Artesia Refinery
HollyFrontier Navajo Refining LLC
Artesia, Eddy County, New Mexico

Dear Neighbor,

HollyFrontier Navajo Refining LLC ("Navajo") announces its application submittal to the New Mexico Environment Department ("NMED") for a significant permit revision of the Artesia Refinery permit PSD-NM-0195M39R3. The expected date of application submittal to the Air Quality Bureau is September 02, 2021.

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Sulfur Dioxide (SO_2)	2,050.00	438.30
Particulate Matter (PM)	58.00	219.40
Particulate Matter 10 microns or less (PM_{10})	85.50	214.30
Particulate Matter 2.5microns or less ($PM_{2.5}$)	84.20	208.80
Hydrogen Sulfide (H_2S)	20.40	5.90
Lead (Pb)	0.00	0.00
Total sum of all Hazardous Air Pollutants (HAPs)	74.50	228.00
Ammonia (NH_3)	18.60	81.10
Sulfuric Acid (H_2SO_4)	7.10	18.10
Green House Gas Emissions as Total CO_2e	0.00	10,783,565.30

The standard operating schedule of the facility is and will continue to be continuous 24 hours per day, 7 days a week, and a maximum of 52 weeks per year.

The owner and/or operator of the Facility is: HollyFrontier Navajo Refining LLC, P.O. Box 159, Artesia, NM 88211-0159.

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Atención

Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, relativo a las emisiones producidas por una industria en este área. Si usted desea información en español, por favor comuníquese con esta oficina en el teléfono 505-476-5557.

Sincerely,

Kawika Tupou
Environmental Manager
HollyFrontier Navajo Refining LLC
501 E. Main Street
Artesia, NM 88210

cc:

City of Artesia, Aubrey Hobson, City Clerk
Chaves County, Cindy Fuller, County Clerk
Eddy County, Darlene Rosprim, County Clerk
NMED, Melinda Owens, via email to Melinda.Owens@state.nm.us
NMED, Joe Kimbrell, via email to Joseph.Kimbrell@state.nm.us
HollyFrontier, P. Miller, T. Wheeler, S. Gokhale, A. Miro

Notice of Non-Discrimination

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Kathryn Becker, Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

Submittal of Public Service Announcement – Certification

I, Alena Miro, the undersigned, certify that on **August 26, 2021,** submitted a public service announcement to **Pecos Valley Broadcasting Company** that serves the City of **Artesia**, **Eddy** County, New Mexico, in which the source is or is proposed to be located and that **Pecos Valley Broadcasting Company RESPONDED THAT IT WOULD AIR THE ANNOUNCEMENT.**

Signed this 26 day of August, 2021.

Signature

Date 8/26/2021

Alena Miro
Printed Name

Environmental Engineer
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Affidavit of Publication

No. 25857

State of New Mexico Publisher

County of Eddy:

Danny Scott Danny Scott

being duly sworn sayes that he is the **Publisher**

of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached

Legal Ad

was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for 1 Consecutive weeks/day on the same day as follows:

First Publication	August 26, 2021
Second Publication	
Third Publication	
Fourth Publication	
Fifth Publication	
Sixth Publication	
Seventh Publication	

Subscribed and sworn before me this 26th day of August 2021

OFFICIAL SEAL
Latisha Romine
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 5/12/2023

Latisha Romine

Latisha Romine
Notary Public, Eddy County, New Mexico

Copy of Publication:

Legal Notice

NOTICE

HollyFrontier Navajo Refining LLC ("Navajo") announces application submittal to the New Mexico Environment De-partment ("NMED") for a significant permit revision of th Artesia Refinery permit PSD-NM-0195M39R3. The expec ed date of application submittal to the Air Quality Bureau September 2, 2021.

The exact location for the facility known as, Artesia Refine is at 501 E. Main St., Artesia, NM 88210. The approximate location of this facility is less than 0.5 miles east of the inte section of E. Main St. and S. 1st St. in Eddy County.

Navajo is submitting this application for a significant perm revision of Permit No. PSD-NM-0195M39R3, in accordan with 20.2.72.219.D New Mexico Administrative Code. Thi revision is necessary to adequately represent the operation conditions at the refinery, to update the calculations' meth-odology where appropriate and according to latest guidanc published, and to update representations from previous su mittals.

The estimated maximum quantities of any regulated air co taminant will be as follows in pound per hour (pph) and to per year (tpy) and may change slightly during the course o the Department's review:

Pollutant	pph	tpy
Nitrogen Oxides (NOx)	456.40	798.6
Carbon Monoxide (CO)	2,067.40	1,448.
Volatile Organic Compounds (VOC)	2,460.50	1,325.
Sulfur Dioxide (SO2)	2,050.00	438.3
Particulate Matter (PM)	58.00	219.4
Particulate Matter 10 microns or less (PM10)	85.50	214.3
Particulate Matter 2.5microns or less (PM2.5)	84.20	208.8
Hydrogen Sulfide (H2S)	20.40	5.90
Lead (Pb)	0.00	0.00
Total sum of all Hazardous Air Pollutants (HAPs)	74.50	228.0
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Sulfuric Acid (H2SO4)	7.10	18.10
Green House Gas Emissions as Total CO2e	0.00	10,783,565

The standard operating schedule of the facility is and will c tinue to be continuous 24 hours per day, 7 days a week, an maximum of 52 weeks per year.

The owner and/or operator of the Facility is: HollyFrontier Navajo Refining LLC, P.O. Box 159, Artesia, NM 88211-01

If you have any comments about the construction or opera tion of this facility, and you want your comments to be ma as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Ma ager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Ot comments and questions may be submitted verbally.

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Published in the Artesia Daily Press, Artesia, N.M., Aug. 2 2021 Legal No. 25857.

Affidavit of Publication

No.

State of New Mexico Publisher

County of Eddy:

Danny Scott Danny Scott

being duly sworn sayes that he is the **Publisher**

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Subscribed and sworn before me this 26th day of August 2021

OFFICIAL SEAL
Latisha Romine
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 5/12/2023

Latisha Romine

Latisha Romine
Notary Public, Eddy County, New Mexico

Copy of Publication:

NOTICE

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Pollutant	pph	tp
Nitrogen Oxides (NOx)	456.40	798
Carbon Monoxide (CO)	2,067.40	1,4
Volatile Organic Compounds (VOC)	2,460.50	1,3
Sulfur Dioxide (SO2)	2,050.00	438
Particulate Matter (PM)	58.00	219
Particulate Matter 10 microns or less (PM10)	85.50	214
Particulate Matter 2.5microns or less (PM2.5)	84.20	208
Hydrogen Sulfide (H2S)	20.40	5.9
Lead (Pb)	0.00	0.0
Total sum of all Hazardous Air Pollutants (HAPs)	74.50	228
Ammonia (NH3)	18.60	81.1
Sulfuric Acid (H2SO4)	7.10	18.1
Green House Gas Emissions as Total CO2e	0.00	10,783,5

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The owner and/or operator of the Facility is: HollyFronti Navajo Refining LLC, P.O. Box 159, Artesia, NM 88211-

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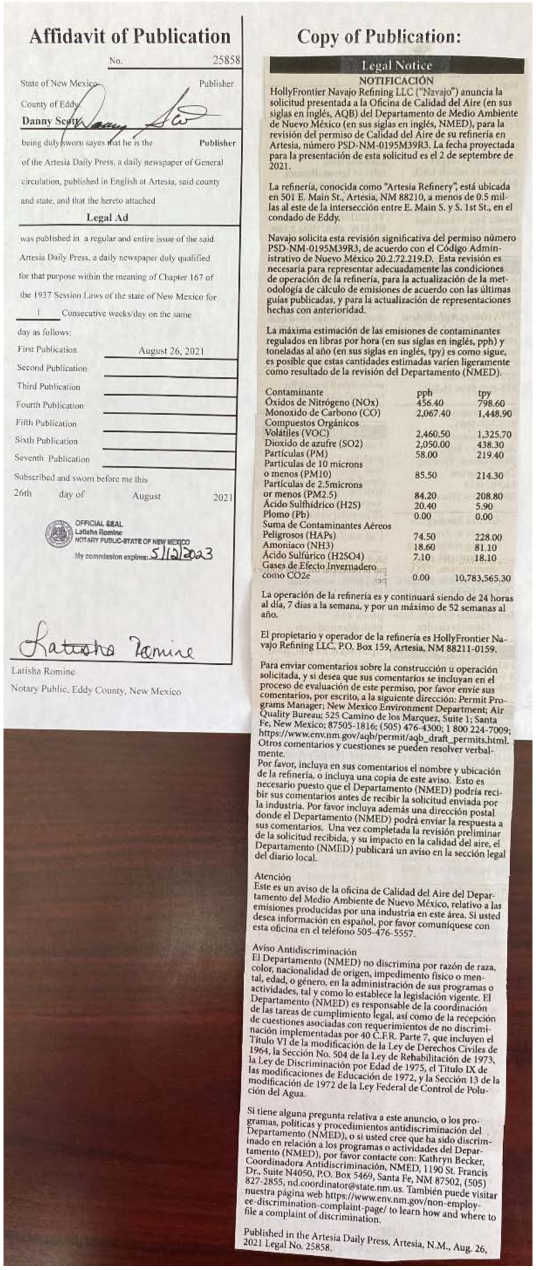
NEWSPAPER ENGLISH



Affidavit of Publication

No. 25858

State of New Mexico Publisher

County of Eddy

Danny Scott [signature]

being duly sworn sayes that he is the **Publisher**

of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached

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First Publication August 26, 2021

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Sixth Publication

Seventh Publication

Subscribed and sworn before me this 26th day of August 2021

OFFICIAL SEAL
Latisha Romine
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 5/12/2023

Latisha Romine [signature]

Latisha Romine

Notary Public, Eddy County, New Mexico

Copy of Publication:

Legal Notice

NOTIFICACIÓN

HollyFrontier Navajo Refining LLC ("Navajo") anuncia la solicitud presentada a la Oficina de Calidad del Aire (en sus siglas en inglés, AQB) del Departamento de Medio Ambiente de Nuevo México (en sus siglas en inglés, NMED), para la revisión del permiso de Calidad del Aire de su refinería en Artesia, número PSD-NM-0195M39R3. La fecha proyectada para la presentación de esta solicitud es el 2 de septembre de 2021.

La refinería, conocida como "Artesia Refinery", está ubicada en 501 E. Main St., Artesia, NM 88210, a menos de 0.5 millas al este de la intersección entre E. Main S. y S. 1st St., en el condado de Eddy.

Navajo solicita esta revisión significativa del permiso número PSD-NM-0195M39R3, de acuerdo con el Código Administrativo de Nuevo México 20.2.72.219.D. Esta revisión es necesaria para representar adecuadamente las condiciones de operación de la refinería, para la actualización de la metodología de cálculo de emisiones de acuerdo con las últimas guías publicadas, y para la actualización de representaciones hechas con anterioridad.

La máxima estimación de las emisiones de contaminantes regulados en libras por hora (en sus siglas en inglés, pph) y toneladas al año (en sus siglas en inglés, tpy) es como sigue, es posible que estas cantidades estimadas varíen ligeramente como resultado de la revisión del Departamento (NMED).

Contaminante	pph	tpy
Óxidos de Nitrógeno (NOx)	456.40	798.60
Monoxido de Carbono (CO)	2,067.40	1,448.90
Compuestos Orgánicos Volátiles (VOC)	2,460.50	1,325.70
Dioxido de azufre (SO2)	2,050.00	438.30
Particulas (PM)	58.00	219.40
Particulas de 10 microns o menos (PM10)	85.50	214.30
Partículas de 2.5microns or menos (PM2.5)	84.20	208.80
Ácido Sulfhídrico (H2S)	20.40	5.90
Plomo (Pb)	0.00	0.00
Suma de Contaminantes Aéreos Peligrosos (HAPs)	74.50	228.00
Amoniaco (NH3)	18.60	81.10
Ácido Sulfúrico (H2SO4)	7.10	18.10
Gases de Efecto Invernadero como CO2e	0.00	10,783,565.30

La operación de la refinería es y continuará siendo de 24 horas al día, 7 días a la semana, y por un máximo de 52 semanas al año.

El propietario y operador de la refinería es HollyFrontier Navajo Refining LLC, P.O. Box 159, Artesia, NM 88211-0159.

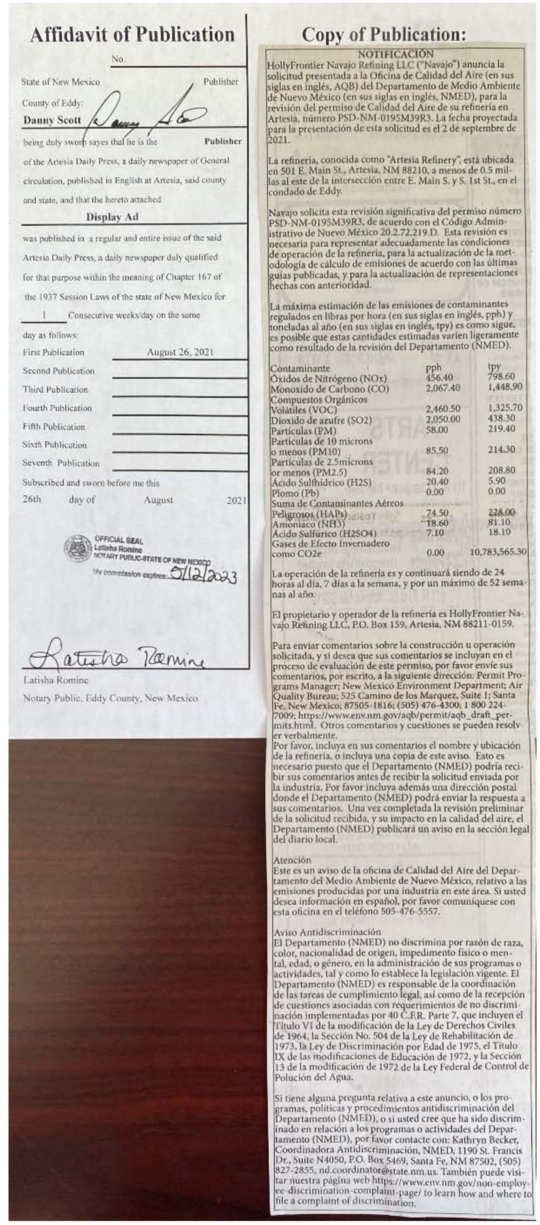
Para enviar comentarios sobre la construcción u operación solicitada, y si desea que sus comentarios se incluyan en el proceso de evaluación de este permiso, por favor envíe sus comentarios, por escrito, a la siguiente dirección: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Otros comentarios y cuestiones se pueden resolver verbalmente.
Por favor, incluya en sus comentarios el nombre y ubicación de la refinería, o incluya una copia de este aviso. Esto es necesario puesto que el Departamento (NMED) podría recibir sus comentarios antes de recibir la solicitud enviada por la industria. Por favor incluya además una dirección postal donde el Departamento (NMED) podrá enviar la respuesta a sus comentarios. Una vez completada la revisión preliminar de la solicitud recibida, y su impacto en la calidad del aire, el Departamento (NMED) publicará un aviso en la sección legal del diario local.

Atención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, relativo a las emisiones producidas por una industria en este área. Si usted desea información en español, por favor comuníquese con esta oficina en el teléfono 505-476-5557.

Aviso Antidiscriminación
El Departamento (NMED) no discrimina por razón de raza, color, nacionalidad de origen, impedimento físico o mental, edad, o género, en la administración de sus programas o actividades, tal y como lo establece la legislación vigente. El Departamento (NMED) es responsable de la coordinación de las tareas de cumplimiento legal, así como de la recepción de cuestiones asociadas con requerimientos de no discriminación implementadas por 40 C.F.R. Parte 7, que incluyen el Título VI de la modificación de la Ley de Derechos Civiles de 1964, la Sección No. 504 de la Ley de Rehabilitación de 1973, la Ley de Discriminación por Edad de 1975, el Título IX de las modificaciones de Educación de 1972, y la Sección 13 de la modificación de 1972 de la Ley Federal de Control de Polución del Agua.

Si tiene alguna pregunta relativa a este anuncio, o los programas, políticas y procedimientos antidiscriminación del Departamento (NMED), o si usted cree que ha sido discriminado en relación a los programas o actividades del Departamento (NMED), por favor contacte con: Kathryn Becker, Coordinadora Antidiscriminación, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. También puede visitar nuestra página web https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

Published in the Artesia Daily Press, Artesia, N.M., Aug. 26, 2021 Legal No. 25858.



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Latisha Romine

Notary Public, Eddy County, New Mexico

Copy of Publication:

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Atención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, relativo a las emisiones producidas por una industria en este área. Si usted desea información en español, por favor comuníquese con esta oficina en el teléfono 505-476-5557.

Aviso Antidiscriminación
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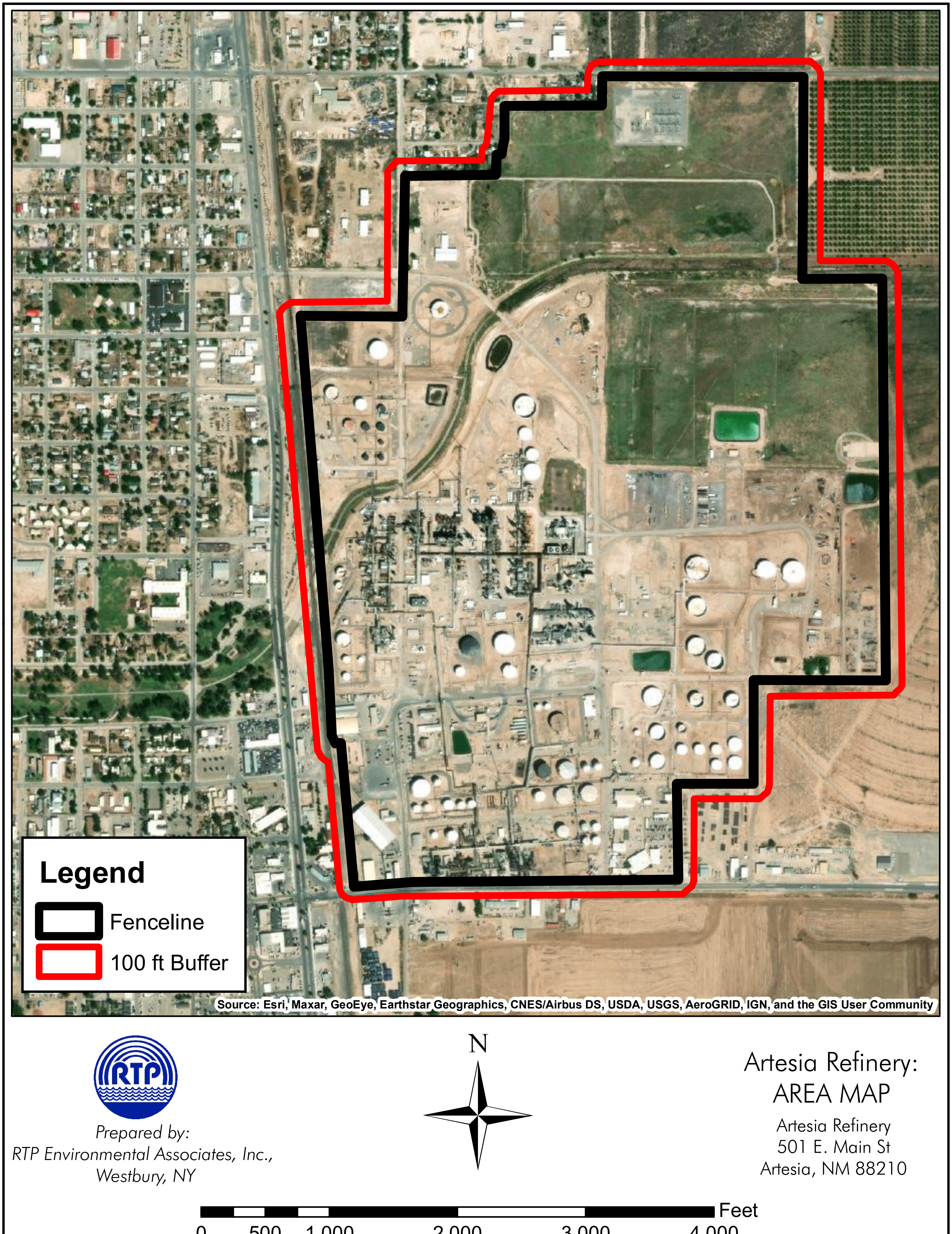

Prepared by:
RTP Environmental Associates, Inc.,
Westbury, NY

Artesia Refinery: AREA MAP

Artesia Refinery
501 E. Main St
Artesia, NM 88210

Section 10

Written Description of the Routine Operations of the Facility

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

The Artesia Refinery operates one crude oil distillation unit and various downstream process units to produce various petroleum products. The Artesia Refinery processes crude oil, as well as intermediates, received from outside sources such as Navajo's Lovington Refinery and other third-party sources. The crude oil, and other intermediates, enter the Artesia Refinery via pipeline, truck, or rail. The Artesia Refinery produces liquefied petroleum gases ("LPG"), kerosene, diesel fuel, various grades of gasoline, carbon black oil , gas oils, fuel oils, asphalt, pitch, and molten sulfur. For its own use, the Artesia Refinery produces refinery fuel gas, hydrogen, nitrogen, and steam.

This permit application proposes reconciliation of several emission limits to reflect updated calculation methods and requests authorization of certain physical changes and changes in method of operation. These changes—to accommodate use of different refinery fuel gas streams in three process furnaces, to increase the maximum vapor pressure of some petroleum liquids stored in storage vessels and loaded at loading racks, to reflect addition of supplemental gas piping and increased gas flow to the flares; and to accommodate an increase in the VOC concentration in the wastewater entering the dissolved air flotation units—will not affect the routine operations of the Artesia Refinery as described above.

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)**:**

The stationary source that is the subject of this permit application comprises all pollutant-emitting activities at the Artesia Refinery owned and operated by HollyFrontier Navajo Refining LLC's Artesia Refinery.

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):

The stationary source that is the subject of this permit application comprises all pollutant-emitting activities at the Artesia Refinery owned and operated by HollyFrontier Navajo Refining LLC's Artesia Refinery. Also evaluated in this section is a separate but adjacent stationary source owned in part by Artesia Renewable Diesel Company LLC ("ARDC") and in part by Artesia PTU LLC ("APTU").

The Renewable Diesel Unit ("RDU") owned and operated by ARDC and the Pretreatment Unit ("PTU") owned and operated by APTU will carry a Standard Industrial Classification ("SIC") major group different from the SIC major group carried by Navajo Artesia Refinery, and thus are not in the same industrial grouping, and therefore constitute a stand-alone stationary source separate from the Refinery. The Navajo Artesia Refinery falls within SIC Major Group 29 (Petroleum Refining and Related Industries), and specifically, SIC code 2911 (Petroleum Refining). Unlike the Navajo Artesia Refinery, the RDU and the PTU will not be engaged in in petroleum refining and will not produce refined petroleum products through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking, or other processes. As a result, the RDU and PTU will not fall within the petroleum refining SIC code of 2911.

Rather, because of the raw materials used and the resulting non-petroleum-based renewable diesel product, the RDU is properly classified in SIC Major Group 28 (Chemicals and Allied Products), with the specific SIC code of 2869 (Industrial Organic Chemicals, Not Elsewhere Classified). Regarding the PTU, this unit will serve as an auxiliary establishment to the RDU, because, based on current plans, it will be primarily engaged in producing goods or providing services for other establishments of the same company, rather than for the general public or for other business units. The SIC Manual prescribes that auxiliary establishments are classified on the basis of the primary activity of the operating establishment(s) they serve. The PTU is therefore properly assigned a SIC code based on the primary economic activity of the establishment that it supports, namely, SIC Major Group 28 and SIC code 2869, corresponding to the production of renewable diesel.

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 one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions** for each of the four projects for which authorization is requested in this permit application are evaluated below. Each project is reviewed separately because the projects are not substantially related to one another as explained in detail in Section 3.

Loading Racks and Storage Tanks

The project involving fixed-roof and floating-roof storage tanks and loading racks involves only existing emission units; therefore, the emissions increase is calculated as the sum of the difference between the projected actual emissions and the baseline actual emissions, for each affected loading rack and tank according to 20.2.74.200.D(3) NMAC. The only regulated NSR pollutants emitted in appreciable quantities by these existing emissions units are VOC and H_2S. The baseline period selected for the VOC and H_2S emissions analysis is calendar years 2018-2019. The emissions increase from the project is summarized in the table below.

Emissions Unit Description	VOC				H_2S			
	BAE (tpy)	PAE (tpy)	Excludable Increase (tpy)	Project Related Increase (tpy)	BAE (tpy)	PAE (tpy)	Excludable Increase (tpy)	Project Related Increase (tpy)
Loading Racks	5.34	46.80	9.61	31.85	-	0.04	-	0.04
Fixed Roof Tanks*	208.33	182.54	1.55	-27.33	-	0.07	-	0.07
External Floating Roof Tanks	50.46	65.94	0.21	15.27	0.39	0.58	0.002	0.19
Internal Floating Roof Tanks	54.52	74.10	0.80	18.78	0.11	0.15	0.0002	0.04
TOTAL	**318.65**	**369.37**	**12.16**	**38.56**	**0.50**	**0.84**	**0.003**	**0.34**

* T-0418 is included with the fixed roof tanks, but will be an internal floating roof tank following the retrofit described in this permit application.

Accordingly, emissions increases for all regulated pollutants are less than the PSD significant levels:

a. NOx: 0.0 TPY (< 40 TPY)
b. CO: 0.0 TPY (< 100 TPY)
c. VOC: 38.56 TPY (< 40 TPY)
d. SOx: 0.0 TPY (< 40 TPY)
e. PM: 0.0 TPY (< 25 TPY)
f. PM10: 0.0 TPY (< 15 TPY)
g. PM2.5: 0.0 TPY (< 10 TPY)
h. Fluorides: 0.0 TPY (< 3 TPY)
i. Lead: 0.0 TPY (< 0.6 TPY)
j. H2S: 0.34 TPY (< 10 TPY)
k. GHG: 0.0 TPY (not regulated)

Flares

The project involving the flares involves only existing emission units; therefore, the emissions increase is calculated as the sum of the difference between the projected actual emissions and the baseline actual emissions, for each affected flare according to 20.2.74.200.D(3) NMAC. The baseline period selected for all pollutants October 2016 through September 2018. For all pollutants other than CO, pursuant to 20.2.74.7.AR(4) NMAC, Navajo has elected to use potential to emit in lieu of making a projection of PAE. As summarized in the table below, the project is a major modification for VOC.

Pollutant	BAE (tpy)	PAE (tpy)	Project Related Increase (tpy)
NOx	24.66	63.83	39.17
CO	94.94	188.43	93.49
VOC	27.35	235.05	207.70
SO2	32.56	52.18	19.62
GHG	102,601	72,824	-29,777
TOTAL	**324.47**	**364.80**	**16.45**

Accordingly, emissions increase for all regulated pollutants are:

a. NOx: 39.17 TPY (< 40 TPY)
b. CO: 93.49 TPY (< 100 TPY)
c. VOC: 207.70 TPY (> 40 TPY)
d. SOx: 19.62 TPY (< 40 TPY)
e. PM: 0.0 TPY (< 25 TPY)
f. PM10: 0.0 TPY (< 15 TPY)
g. PM2.5: 0.0 TPY (< 10 TPY)
h. Fluorides: 0.0 TPY (< 3 TPY)
i. Lead: 0.0 TPY (< 0.6 TPY)
j. H2S: 0.0 TPY (< 10 TPY)
k. GHG: -29,777 TPY (< 75,000 TPY)

Hydrogen Reformer Furnaces (H-8801/8802 and H-9851)

The proposed changes to the hydrogen reformer furnaces (H-8801/8802 and H-9851) to accommodate combustion of amine-treated RFG will result in the following increases in emissions for regulated NSR pollutants, all of which are less than the PSD significant levels. The SO_2 increase is calculated as the difference between (i) the sum of the current allowable emissions from these furnaces in Permit No. PSD-NM-0195-M39R4 (3.00 tpy) and (ii) the sum of the requested allowable emissions from these units (15.96 tpy).

a. NOx: 0.0 TPY (< 40 TPY)
b. CO: 0.0 TPY (< 100 TPY)
c. VOC: 0.0 TPY (< 40 TPY)
d. SOx: 12.96 TPY (< 40 TPY)
e. PM: 0.0 TPY (< 25 TPY)
f. PM10: 0.0 TPY (< 15 TPY)
g. PM2.5: 0.0 TPY (< 10 TPY)
h. Fluorides: 0.0 TPY (< 3 TPY)
i. Lead: 0.0 TPY (< 0.6 TPY)
j. H2S: 0.0 TPY (< 10 TPY)
k. GHG: 0.0 TPY (not regulated)

Dissolved Air Flotation Units

The requested revisions to the VOC emission limits for the dissolved air flotation units will result in the following increases in emissions for regulated NSR pollutants, all of which are less than the PSD significant levels. The VOC increase is calculated as the difference between (i) the sum of the current allowable emissions from T-0806 and T-0896 in Permit No. PSD-NM-0195-M39R4 (1.4 tpy) and (ii) the sum of the requested allowable emissions from these units (7.18 tpy).

a. NOx: 0.0 TPY (< 40 TPY)
b. CO: 0.0 TPY (< 100 TPY)
c. VOC: 5.78 TPY (< 40 TPY)
d. SOx: 0.0 TPY (< 40 TPY)
e. PM: 0.0 TPY (< 25 TPY)
f. PM10: 0.0 TPY (< 15 TPY)
g. PM2.5: 0.0 TPY (< 10 TPY)
h. Fluorides: 0.0 TPY (< 3 TPY)
i. Lead: 0.0 TPY (< 0.6 TPY)
j. H2S: 0.0 TPY (< 10 TPY)
k. GHG: 0.0 TPY (not regulated)

Netting is not required for any of the projects for which authorization is sought in this permit application. The project at the flares will cause a significant increase in emissions of VOC. Navajo is electing not to perform a netting analysis for VOC but rather to undergo PSD review as a major modification with a significant net emissions increase for VOC. The project at the flares will not cause a significant increase in emissions of any other regulated NSR pollutant. Other changes for which authorization is sought herein (i.e., the loading racks and storage tanks, the hydrogen reformer furnaces, and the dissolved air flotation unit) will not cause a significant increase in emissions of any regulated NSR pollutant.

C. **BACT is** required for emissions of VOC from the refinery's five flares. Each flare is an emissions unit at which a net increase in emissions of VOC will occur as a result of the physical or operational change in the emissions unit performed as part of the major modification described above. BACT for VOC emissions from the flares is evaluated in Section 12.B below. BACT is not required for other projects and other emissions units because the changes to these units are stand-alone projects that are not by themselves major modifications and are separate and independent from the major modification involving the flares.

D. 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. With this permit application, as described in detail in Section 3, Navajo is requesting authorization for four projects. Each of these projects involves changes to a distinct set of emissions units: 1) loading racks and fixed-roof and floating-roof storage tanks; 2) flares; 3) hydrogen reformer furnaces; and 4) dissolved air flotation units. Each of these actions represents stand-alone projects, separate and independent from and wholly unrelated to one another. As described in B-D above, the flares project is a major modification subject to PSD review for VOC emissions. Other changes to permit terms requested in this permit application are not a major modification subject to PSD review because they are reconciliations involving no physical changes in or changes in method of operation of the stationary source.

If this is **NOT** a PSD application, delete this sentence and the entire Section 12.B below.

Section 12.B
Special Requirements for a PSD Application

(Submitting under 20.2.74 NMAC)

Prior *to Submitting a PSD application*, the permittee shall:

- ■ Submit the BACT analysis for review prior to submittal of the application. No application will be ruled complete until the final determination regarding BACT is made, as this determination can ultimately affect information to be provided in the application. A pre-application meeting is recommended to discuss the requirements of the BACT analysis.
- ■ Submit a modeling protocol prior to submitting the permit application. **[Except for GHG]**
- ☐ Submit the monitoring exemption analysis protocol prior to submitting the application. **[Except for GHG]**

For PSD applications, the permittee shall also include the following:

- ■ Documentation containing an analysis on the impact on visibility. **[Except for GHG]**
- ■ Documentation containing an analysis on the impact on soil. **[Except for GHG]**
- ■ Documentation containing an analysis on the impact on vegetation, including state and federal threatened and endangered species. **[Except for GHG]**
- ■ Documentation containing an analysis on the impact on water consumption and quality. **[Except for GHG]**
- ■ Documentation that the federal land manager of a Class I area within 100 km of the site has been notified and provided a copy of the application, including the BACT and modeling results. The name of any Class I Federal area located within one hundred (100) kilometers of the facility.

Only PSD analyses for the major modification proposed in this permit application—requested revisions of permit terms for the flares, which is a major modification with respect to emissions of VOC—are addressed in this Section 12.B. Section 20 of this permit application includes analyses of other requested permit revisions, including reconciliations.

BACT for VOC emissions from the five affected flares at the Navajo Artesia Refinery flares requires no additional controls beyond the work practices already required as demonstrated by the following analysis.

Step 1: Identify All Control Options

Identified control technologies and techniques for VOC emissions from refinery flares include use of flare gas recovery systems, which reduce the quantity of VOC-containing gas routed to the flares by capturing and compressing these gases into the refinery's fuel gas system for use in boilers and process heaters, and equipment design standards and work practices to ensure a high VOC destruction efficiency is achieved at the flare tip. These equipment design standards and work practices are maintaining a pilot flame at all times; maintaining adequate flare capacity to ensure the flare tip exit velocity does not exceed the level at which flame lift-off would occur; and maintaining the net heating value of the flare combustion zone gas (NHV_{CZ}) above the level required for flammability.

Step 2 – Eliminate Technically Infeasible Control Options

All of the identified control options are technically feasible for all five flares at the Artesia Refinery.

Step 3 – Characterize Control Effectiveness of Technically Feasible Control Options

All identified equipment design standards and work practices are already in place and enforceable for the five flares at the Artesia Refinery pursuant to 40 CFR § 63.670. These equipment design standards and work practices are sufficient to achieve 98 percent VOC destruction efficiency on a continuous basis.[5] Potential VOC emissions with these equipment design standards and work practices are 225 tpy (total for five flares, including routine and MSS emissions).

The only other identified control strategy for the five flares at the Artesia Refinery is to install and operate flare gas recovery systems (FGRS) in addition to the required equipment design standards and work practices. It is conservatively assumed for purposes of this BACT evaluation for the flares at the Artesia Refinery that this control strategy would achieve a further reduction in VOC emissions of 100 percent of the routine (non-MSS) emissions, assuming a two-compressor configuration. Actual VOC reduction efficiency would be somewhat less because achievable compressor reliability (i.e., uptime) is less than 100 percent and because flaring is avoided only when fuel demands at the refinery's fuel gas-fired boilers and process heaters exceed the supply of available fuel gas, including recovered gas from the flare headers.

Step 4 – Evaluate More Effective Control Options

The most cost-effective possible FGRS at the Artesia Refinery is a two-compressor system with a design capacity of approximately 100,000 standard cubic feet per hour, sized to accommodate the combined flow to the FL-0400 North Plant Flare and the FL-0404 GOHT Flare. This design provides for re-routing the flow of excess hydrogen product from the refinery's hydrogen production (pressure swing adsorption) units to bypass the FGRS. As shown in the table below, this control strategy is not economically reasonable and should not be required as BACT. FGRS in any other configuration, or for any of the other flares at the Artesia Refinery, would be less cost effective.

Table 12.B-1 Cost Effectiveness of FGRS for FL-400 and FL-404

Parameter	Value	Notes
Installed cost	$ 45,000,000	Site-specific engineering study
Capital recovery factor	9.44%	20 years, 7% interest
Annualized capital recovery cost	$ 4,250,000	
Annual O&M cost	$ -	Conservatively assumed to be zero
VOC emissions reduction (tpy)	100	Conservatively assumed to be 100% of routine (non-MSS) flow
Cost effectiveness of VOC emissions reduction ($/ton)	$ 42,500	

Step 5 – Establish BACT

Navajo proposes that the emission limits representing BACT for VOC emissions from the affected flares are the emission rates in Table 2-E of this permit application.

An analysis of the impacts on air quality due to the requested increases in allowable VOC emissions from flares is presented in the air dispersion modeling report in Section 16 of this permit application.

The requested increases in allowable VOC emissions from flares will have no adverse impact on visibility. See, for example, *Workbook for Plume Visual Impact Screening and Analysis (Revised)*, EPA-454/R-92-023, U.S. EPA, Oct. 1992, identifying that only particulate matter, NO_X, and sulfates are expected to impair near-field visibility. These increases also will have no adverse impacts on soil or vegetation. See, for example, *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals*, EPA-450/2-81-078, U.S. EPA, Dec. 1980, indicating that ethylene is the only hydrocarbon causing adverse effects on vegetation at ambient concentrations of 1 part per million by volume ("ppmv") or less. See, also, U.S. EPA's final rule revoking the National Ambient Air

[5] See, generally, *Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards*, 80 *Fed. Reg.* 75178 (Dec. 1, 2015); see, also, *National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries—Background Information for Final Rule—Summary of Public Comments and Responses*, U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC (Sept. 2015)(available at www.epa.gov/sites/production/files/2018-07/documents/epa-hq-oar-2010-0682-0802.pdf).

Quality Standard ("NAAQS") for hydrocarbons, 48 *Fed. Reg.* 628, indicating "hydrocarbons, as a class, do not appear to cause adverse health or welfare effects at the present ambient air levels." The requested increases in allowable VOC emissions from the flares also will have no impact on water consumption or quality.

Section 13

Determination of State & Federal Air Quality Regulations

<u>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.</u>

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 13-1 - State Regulations

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply Construction permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	The Artesia Refinery is subject to 20.2.3 NMAC State Implementation Plan ("SIP") approved regulation that limits the maximum allowable concentration of, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide.
20.2.7 NMAC	Excess Emissions	Yes	Facility	The Artesia Refinery is subject to permit emissions limits, and federal or state regulation's numerical emissions standards. Thus, it is subject to 20.2.7 NMAC requirements.
20.2.23 NMAC	Fugitive Dust Control	No	Facility	The Artesia Refinery is not a fugitive dust source listed at 20.2.23.108.A NMAC, and is not located in an area subject to a mitigation plan pursuant to 40 CFR 51.930. As of January 2019, the only areas of the State subject to a mitigation plan per 40 CFR 51.930 are in Doña Ana and Luna Counties.
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	Yes	See Table 13-3	The Artesia Refinery has new (equipment which commenced construction or modification after February 17, 1972) and existing gas burning equipment (i.e., gas fired boilers and heaters) with a heat input of greater than 1,000,000 million British Thermal Units per year per unit. Table 13-3 at the end of this section, summarizes the applicable regulations to the Artesia Refinery boilers and heaters.
20.2.34 NMAC	Oil Burning Equipment: NO_2	No	N/A	The Artesia Refinery does not have oil burning equipment (i.e., external combustion emission sources, such as oil-fired boilers and heaters) having a heat input of greater than 1,000,000 million British Thermal Units per year per unit.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	No	N/A	The Artesia Refinery is not a natural gas processing plant as the term is defined in 20.2.35.7.A and B.
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	N/A	N/A	The Artesia Refinery had equipment subject to 20.2.36 and 20.2.37 NMAC before the repeal of these rules. Therefore, the affected combustion emission sources are now subject to 20.2.61 NMAC.
20.2.38 NMAC	Hydrocarbon Storage Facility	Yes	See Table 13-12	Section 111 of this rule does not apply because the Artesia Refinery is not located within five miles of the corporate limits of a municipality that has a population of 20,000 or greater. Section 112 of this rule does not apply because the Artesia Refinery is not a petroleum production facility. Table 13-12, included at the end of this section, summarizes the Artesia Refinery petroleum storage tanks subject to certain other 20.2.38 NMAC requirements.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	The Artesia Refinery SRUs are part of a petroleum processing facility, therefore, per 20.2.39.6 NMAC this regulation is not applicable.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	See Tables 13-3, 13-4, 13-6, and 13-7	The Artesia Refinery boilers, heaters, SRU tail gas incinerators, flares, and engines are subject to the 20% opacity limit for Stationary Combustion Equipment in 20.2.61.109 NMAC as summarized in Tables 13-3 through 13-6 included at the end of this section.

STATE REGU-LATIONS CITATION	**Title**	**Applies? Enter Yes or No**	**Unit(s) or Facility**	**JUSTIFICATION:**
20.2.70 NMAC	Operating Permits	Yes	Facility	The Artesia Refinery is a major source with a potential to emit ("PTE") of 100 tpy or more for NO_X, CO, VOC, SO_2 and $PM/PM_{10}/PM_{2.5}$, and a HAPs PTE of 10 tpy or more for a single HAP or 25 or more tpy for combined HAPs. The Artesia Refinery operates under Operating Permit P051-R3.
20.2.71 NMAC	Operating Permit Fees	Yes	Facility	The Artesia Refinery is subject to 20.2.70 NMAC. The Artesia Refinery Operating Permit P051-R3 includes numerical ton per year emission limits. Therefore, it is subject to 20.2.71 NMAC
20.2.72 NMAC	Construction Permits	Yes	Facility	The Artesia Refinery is subject to 20.2.72 NMAC and NSR Permit number: PSD-NM-0195-M39R4.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	Notice of Intent ("NOI"): N/A. All facilities that are a Title V Major Source as defined at 20.2.70.7.R NMAC, are subject to Emissions Inventory Reporting.
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	Yes	Units	Per 20.2.74.7.AG(1) NMAC, the Artesia Refinery is a major stationary source as it is a stationary source listed in Table 1 (20.2.74.501 NMAC) which emits, or has the potential to emit, emissions equal to or greater than one hundred (100) tons per year of any regulated NSR air pollutant. Certain units at the Artesia Refinery are subject to PSD requirements in NSR Permit No. PSD-NM-0195-M39R4.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	The Artesia Refinery is not subject to the 20.2.75.11.E annual fees because it is subject to 20.2.71 NMAC.
20.2.77 NMAC	New Source Performance	Yes	See Tables 13-3 thru 13-12	Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 60 applicability for the Artesia Refinery NSPS affected facilities.
20.2.78 NMAC	Emission Standards for HAPS	Yes	Facility	The Artesia Refinery is subject to 40 CFR 61, Subpart FF but is exempt from control requirements (40 CFR §§ 61.340(a) and 61.342(a))
20.2.79 NMAC	Permits – Nonattainment Areas	No	Facility	The Artesia Refinery is located in Eddy County, an area that is designated as unclassifiable or attainment with respect to all National Ambient Air Quality Standards.
20.2.80 NMAC	Stack Heights	No	Facility	Rule restricts NMED, not stationary sources.
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	See Tables 13-3 thru 13-12	Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 63 applicability for the Artesia Refinery affected HAPs emission sources.

Table 13-2 - Federal Regulations

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	NAAQS	Yes	Facility	The Artesia Refinery is subject to 20.2.70, 20.2.72, and 20.2.74 NMAC. Per 20.2.70.7.E.11
40 CFR 60 Subpart A	General Provisions	Yes	See Tables 13-3 thru 13-12	Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 60 applicability for the Artesia Refinery NSPS affected facilities.
40 CFR 60 Subpart D	Standards of Performance for Fossil-Fuel-Fired Steam Generators	No	N/A	The Artesia Refinery boilers design capacities are less than Subpart D applicability threshold of 250 MMBtu/hr, and the process heaters are not fossil-fuel-fired steam generating units, as the term is defined in 40 CFR § 60.41.
40 CFR 60 Subpart Da	Standards of Performance for Electric Utility Steam Generating Units	No	N/A	The Artesia Refinery does not own or operate an electric utility steam generating unit, as the term is defined in 40 CFR §60.41Da.
40 CFR 60 Subpart Db	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	Yes	See Table 13-3	The Artesia Refinery boilers B-0007, B-0008, and B-0009 and hot oil heater H-2501 commenced construction after June 19, 1984, have design heat input capacities great than 100 MMBtu/hr (HHV), fire solely fuel gas, and are "*steam generating units*" as this term is defined in 40 CFR §60.41b. Subpart Db standards for PM and SO_2 are not applicable to refinery fuel gas firing units.
40 CFR 60 Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	Yes	See Table 13-3	The SRU Hot Oil Heaters H-0464 and H-3101 each commenced construction after June 9, 1989, has design heat input capacity greater than 10 MMBtu/hr (HHV) and less than 100 MMBtu/hr (HHV), fires solely fuel gas, and is a "*steam generating unit*" as this term is defined in 40 CFR §60.41c. Subpart Dc standards for SO_2 and PM are not applicable to refinery fuel gas firing units.
40 CFR 60 Subpart J	Standards of Performance for Petroleum Refineries	Yes	See Tables 13-3 and 13-5	Tables 13-3 and 13-5, included at the end of this section. summarize 40 CFR Part 60, Subpart J applicability for potentially affected Artesia Refinery boilers, heaters, FCCU, and SRU2.
40 CFR 60 Subpart Ja	Standards of Performance for Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After May 14, 2007	Yes	See Tables 13-3, 13-4, 13-6	Tables 13-3, 13-4, and 13-6, included at the end of this section. summarize 40 CFR Part 60, Subpart Ja applicability for potentially affected Artesia Refinery boilers, heaters, SRU3, and flares.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 60 Subpart K	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978	Yes	See Table 13-12	Table 13-12, included at the end of this section, summarizes 40 CFR Part 60, Subpart K applicability for potentially affected Artesia Refinery storage tanks.
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	Yes	See Table 13-12	Table 13-12 included at the end of this section, summarizes 40 CFR Part 60, Subpart Ka applicability for potentially affected Artesia Refinery storage tanks.
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	See Table 13-12	Table 13-12, included at the end of this section, summarizes 40 CFR Part 60, Subpart Kb applicability for potentially affected Artesia Refinery storage tanks.
40 CFR 60 Subpart GG	Standards of Performance for Stationary Gas Turbines	No	N/A	The Artesia Refinery does not include stationary gas turbines.
40 CFR 60 Subpart XX	Standards of Performance for Bulk Gasoline Terminals	No	See Table 13-10	Table 13-10, included at the end of this section, summarizes 40 CFR Part 60, Subpart XX applicability for potentially affected Artesia Refinery loading racks.
40 CFR 60 Subpart GGG	Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced after January 4, 1983, and on or before November 7, 2006	No	N/A	The Artesia Refinery affected facilities were constructed, reconstructed, or modified after November 7, 2006, and are therefore subject to 40 CFR 60, Subpart GGGa, rather than Subpart GGG.

FEDERAL REGU-LATIONS CITATION	**Title**	**Applies? Enter Yes or No**	**Unit(s) or Facility**	**JUSTIFICATION:**
40 CFR 60 Subpart GGGa	Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced after November 7, 2006	Yes	See Table 13-11	Table 13-11, included at the end of this section, summarizes 40 CFR Part 60, Subpart GGGa applicability for the affected facilities in the Artesia Refinery.
40 CFR 60 Subpart KKK	Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011	No	N/A	The Artesia Refinery is not a natural gas processing plant as this term is defined in 40 CFR § 60.631.
40 CFR 60 Subpart LLL	Standards of Performance for SO_2 Emissions from Onshore Natural Gas Processing for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011	No	N/A	The Artesia Refinery does not include any sweetening units as this term is defined in 40 CFR § 60.641.
40 CFR 60 Subpart NNN	Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations	Yes	W-623,	The depropanizer column in the Alkylation Unit is subject to this rule because it produces, among other things, propane as a product. (See, 40 CFR §§ 60.660(b) and 60.667.)
40 CFR 60 Subpart QQQ	Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems	Yes	See Tables 13-9 and 13-11	Tables 13-9 and 13-11, included at the end of this section, summarize 40 CFR Part 60, Subpart QQQ applicability for the affected facilities in the Artesia Refinery.
40 CFR 60 Subpart RRR	Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes	Yes	Alky Reactor	The reactor in the Alkylation Unit is subject to this rule because it produces, among other things, propane as a product. (See, 40 CFR §§ 60.700(b) and 60.707.)

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	Yes	See Table 13-7	Table 13-7 included at the end of this section, summarizes 40 CFR Part 60, Subpart IIII applicability for the Artesia Refinery stationary compression ignition ("CI") internal combustion engines ("ICE.")
40 CFR 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	No	N/A	The Artesia Refinery does not own or operate any stationary spark ignition internal combustion engines.
40 CFR 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 Artesia Refinery is not in the Crude Oil and Natural Gas Production source category, as defined in §60.5430.
40 CFR 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	The Artesia Refinery is not in the Crude Oil and Natural Gas Production source category, as defined in §60.5430a.
40 CFR 60 Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units	No	N/A	The Artesia Refinery does not own or operate any steam generating unit, IGCC, or stationary combustion turbine as these terms are defined in 40 CFR § 60.5580 that commenced construction after January 8, 2014 and have a base load rating greater than 250 MMBtu/hr of fossil fuel.
40 CFR 60 Subpart UUUUa	Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units	No	N/A	Rule applies to NMED, not stationary sources.
40 CFR 60 Subparts WWW, XXX, Cc, and Cf	Standards of performance for Municipal Solid Waste (MSW) Landfills	No	N/A	The Artesia Refinery is not a municipal solid waste landfill.
40 CFR 61 Subpart A	General Provisions	Yes	Units Subject to 40 CFR 61	Applies if any other Subpart in 40 CFR 61 applies.
40 CFR 61 Subparts J & V	National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene	No	N/A	The Artesia Refinery does not operate any piece of equipment in benzene service (i.e., fluid that is at least 10 percent benzene by weight) as this term is defined in 40 CFR § 61.111.
40 CFR 61 Subpart M	National Emission Standard for Asbestos	Yes	Facility	The Artesia Refinery complies with the requirements of 40 CFR §61.145 as applicable.

FEDERAL REGU-LATIONS CITATION	**Title**	**Applies? Enter Yes or No**	**Unit(s) or Facility**	**JUSTIFICATION:**
40 CFR 61 Subpart FF	National Emission Standard for Benzene Waste Operations	Yes	See Tables 13-9 and 13-12	Tables 13-9 and 13-12, included at the end of this section. summarize 40 CFR Part 61, Subpart FF applicability for the Artesia Refinery storage tanks and wastewater emission sources.
MACT 40 CFR 63.1, Subpart A	General Provisions	Yes	Units Subject to 40 CFR 63	Applies if any other Subpart in 40 CFR 63 applies.
NESHAP 40 CFR 63.400, Subpart Q	National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers	No	See Table 13-8	The Artesia Refinery no longer owns or operates any industrial process cooling tower operated with chromium-based water treatment chemicals.
NESHAP 40 CFR 63.640, Subpart R	National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)	No	See Table 13-10	Table 13-10, included at the end of this section, summarizes 40 CFR Part 63, Subpart R applicability for potentially affected Artesia Refinery loading rack.
NESHAP 40 CFR 63.640, Subpart CC	National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries	Yes	See Tables 13-3 through 13-12	Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 63, Subpart CC applicability for the Artesia Refinery NESHAP affected sources.
MACT 40 CFR 63.760 Subpart HH	**Oil and Natural Gas Production Facilities**	No	N/A	The Artesia Refinery is not an oil and natural gas production facility.
MACT 40 CFR 63.1270 Subpart HHH	National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities	No	N/A	The Artesia Refinery is not a natural gas transmission and storage facility.
MACT 40 CFR 63.1561 Subpart UUU	National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units	Yes	See Tables 13-4 and 13-5	Tables 13-4 and 13-5, included at the end of this section. summarize 40 CFR Part 63, Subpart UUU applicability for the Artesia Refinery FCC regenerator, Continuous Catalyst Regenerator ("CCR"), and SRUs.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
MACT 40 CFR 63.6580 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	Yes	See Table 13-7	Table 13-7, included at the end of this section, summarizes 40 CFR Part 60, Subpart ZZZZ applicability for the Artesia Refinery stationary reciprocating internal combustion engines ("RICE.")
MACT 40 CFR 63.7485 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters	Yes	See Table 13-3	Table 13-3, included at the end of this section, summarizes 40 CFR Part 60, Subpart DDDDD applicability for the Artesia Refinery boilers and process heaters as defined in §63.7575.
40 CFR 63 Subpart UUUUU	National Emission Standards for Hazardous Air Pollutants Coal & Oil Fire Electric Utility Steam Generating Unit	No	N/A	The Artesia Refinery does not own or operate a coal-fired electric generating unit ("EGU") or an oil-fired EGU as defined in §63.10042.
40 CFR 63 Subpart BBBBBB	National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities	No	N/A	The Artesia Refinery is not an area source of HAPs.
40 CFR 63 Subpart CCCCCC	National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities	No	N/A	The Artesia Refinery is not an area source of HAPs.
40 CFR 64	**Compliance Assurance Monitoring**	No	N/A	The Artesia Refinery FCC Regenerator and SRUs are subject to 40 CFR 63, Subpart UUU emission standards proposed after November 15, 1990, and are therefore exempt from the requirements of 40 CFR Part 64 per §64.2(b)(1)(i). The Artesia Refinery fuels truck loading rack, TL-4, is subject to 40 CFR 63, Subpart CC emission standards proposed after November 15, 1990, and are therefore exempt from the requirements of 40 CFR Part 64 per §64.2(b)(1)(i).
40 CFR 68	**Chemical Accident Prevention**	Yes	Facility	The Artesia Refinery is a stationary source that processes more than the threshold quantity of a regulated substance, as determined under 40 CFR §68.115.
Title IV – Acid Rain 40 CFR 72.6	**Acid Rain**	No	N/A	The Artesia Refinery does not generate commercial electric power or electric power for sale.
Title IV – Acid Rain 40 CFR 73.2	**Sulfur Dioxide** Allowance Emissions	No	N/A	The Artesia Refinery does not generate commercial electric power or electric power for sale.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
Title IV-Acid Rain 40 CFR 75.2	**Continuous Emissions Monitoring**	No	N/A	The Artesia Refinery does not generate commercial electric power or electric power for sale.
Title IV – Acid Rain 40 CFR 76.1	**Acid Rain** Nitrogen Oxides **Emission Reduction Program**	No	N/A	The Artesia Refinery does not generate commercial electric power or electric power for sale.
Title VI – 40 CFR 82	Protection of **Stratospheric Ozone**	Yes	N/A	The Artesia Refinery maintains and services building air conditioning units that may contain affected refrigerants. Therefore, the Artesia Refinery is subject to Subpart F to Part 82, which regulates activities to maintaining, servicing, or repairing appliances containing class I, class II or non-exempt substitute refrigerants.

Table 13-3 Boilers and Heaters Summary of Applicable Regulations

Unit ID	Description	NSPS D	NSPS Db	NSPS Dc	NSPS J [a]	NSPS Ja [b]	MACT DDDDD	20.2.33.108 NMAC	20.2.61 NMAC	CAM
B-0007	Boiler 7	NO	YES	NO	YES	NO	YES	YES	YES	NO
B-0008	Boiler 8	NO	YES	NO	YES	NO	YES	YES	YES	NO
B-0009	Boiler 9	NO	YES	NO	NO	YES [c]	YES	YES	YES	NO
H-0009	Unit 13 Naphtha Splitter Reboiler	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0011	Unit 21 Vacuum Unit Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0018	Unit 06 HDS Reboiler	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0019	South Crude Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0020	South Crude Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0028	Unit 21 Heater H-28	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0030	Unit 06 Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0040	Unit 13 Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0303	Unit 05 Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0312	Unit 10 FCC Feed Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0352	Unit 70 CCR Reformer Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0353	Unit 70 CCR Reformer Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0354	Unit 70 CCR Reformer Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0355	Unit 70 Stabilizer Reboiler Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0362	Unit 70 CCR Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0363	Unit 70 CCR Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0364	Unit 70 CCR Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0421	Unit 44 Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0464	SRU Hot Oil Heater	NO	NO	YES	YES	NO	YES	NO	YES	NO
H-0473	SRU2 Tail Gas Incinerator	NO	NO	NO	YES	NO	NO	NO	YES	NO
H-0600	Unit 09 Depropanizer Reboiler Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-0601	Unit 33 Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-2421	Unit 45 Charge Heater	NO	NO	NO	YES	NO	YES	NO	YES	NO
H-8801/ H-8802	Unit 63 Hydrogen Plant Reformer	NO	NO	NO	YES	NO	YES	YES	YES	NO
H-3402	Unit 34 Hydrocracker Reboiler 1	NO	NO	NO	NO	YES	YES	NO	YES	NO
H-3403	Hydrocracker Reactor Charge Heater	NO	NO	NO	NO	YES	YES	NO	YES	NO
H-5401	Unit 54 HDS Reactor Heater	NO	NO	NO	NO	YES	YES	NO	YES	NO
H-9851	Unit 64 Hydrogen Plant Reformer	NO	NO	NO	NO	YES	YES	YES	YES	NO

Unit ID	Description	NSPS D	NSPS Db	NSPS Dc	NSPS J [a]	NSPS Ja [b]	MACT DDDDD	20.2.33.108 NMAC	20.2.61 NMAC	CAM
H-2501	Unit 25 ROSE® Unit No.2 Hot Oil Heater	NO	YES	NO	NO	YES [c]	YES	YES	YES	NO
H-3101	SRU3 Hot Oil Heater	NO	NO	YES	NO	YES [d]	YES	NO	YES	NO
H-3103	SRU3 Tail Gas Incinerator	NO	NO	NO	NO	YES	NO	NO	YES	NO

a. For all fuel gas combustion devices that are affected facilities under NSPS subpart J, Navajo has elected to comply with the fuel gas H_2S concentration standard under 40 CFR § 60.102a(g)(1)(ii) and associated monitoring, recordkeeping, and reporting requirements in NSPS subpart Ja, as provided by 40 CFR §§ 60.100(e) and 60.100a(b).

b. Except as noted, affected facilities under NSPS subpart Ja are process heaters subject to both the fuel gas H_2S concentration standard under 40 CFR § 60.102a(g)(1)(ii) and, if applicable based on heat input capacity, emission standards for NO_X under § 60.102a(g)(2).

c. Steam generating unit, not subject to NO_X emission standards under NSPS subpart Ja pursuant to 40 CFR § 60.40b(c).

d. Steam generating unit, not subject to NO_X emission standards under NSPS subpart Ja pursuant to 40 CFR § 60.40c(h).

Table 13-4 SRU Summary of Applicable Regulations

Source ID	Emission Point ID	Description	NSPS J	NSPS Ja	MACT UUU	20.2.61 NMAC	20.2.39 NMAC	CAM
SRU2	H-0473	SRU2 Tail Gas Incinerator	YES	NO	YES	YES	NO	YES Satisfied by MACT UUU
SRU3	H-3103	SRU3 Tail Gas Incinerator	NO	YES	YES	YES	NO	YES Satisfied by MACT UUU

Table 13-5 FCCU and CCR Summary of Applicable Regulations

Unit ID	NSPS J	NSPS Ja	MACT UUU	CAM
FCCREGEN	YES	NO	YES	YES Satisfied by MACT UUU
CCR	N/A	N/A	YES	NO

Table 13-6 Flares Summary of Applicable Regulations

Unit ID	Description[a]	NSPS J	NSPS Ja	MACT CC	20.2.61 NMAC
FL-400	North Plant Flare	NO	YES	YES	YES
FL-401	South Plant Flare	NO	YES	YES	YES
FL-402	FCCU Flare	NO	YES	YES	YES
FL-403	Alky Flare	NO	YES	YES	YES
FL-404	GOHT Flare	NO	YES	YES	YES
FL-HEP-PORT	Portable Flare for Holly Energy Partners (HEP) Pipeline Pigging Operations	NO[b]	NO[b]	NO[c]	NO[d]

a. FL-400 through FL-404 flares are steam assisted.

b. Flare is not in a petroleum refinery.

c. Flare is not used as a control device for any emission points listed in 40 CFR § 63.640(c).

d. Flare is portable, not stationary.

Table 13-7 Engines Summary of Applicable Regulations

Source ID	Description	NSPS IIII	NSPS JJJJ	MACT ZZZZ	20.2.61.109 NMAC	CAM
MG-0001	Portable Air Compressor	YES	NO	YES	YES	NO
MG-0002	Portable Air Compressor	YES	NO	YES	YES	NO
MG-0003	Portable Air Compressor	YES	NO	YES	YES	NO
MG-0004	Portable Fire Water Pump Engine	YES	NO	YES	YES	NO
SG-0100	UPS backup generator	NO	NO	YES	YES	NO
SG-0101	UPS backup generator	NO	NO	YES	YES	NO
SG-0102	Server Backup Generator	YES	NO	YES	YES	NO
FWG-0600	Fire Water Pump Engine	YES	NO	YES	YES	NO
FWG-0601	Fire Water Pump Engine	YES	NO	YES	YES	NO
FWG-0602	Fire Water Pump Engine	YES	NO	YES	YES	NO
FWG-0603	Fire Water Pump Engine	YES	NO	YES	YES	NO

Table 13-8 Cooling Towers Summary of Applicable Regulations

Cooling Tower	Description	MACT Q	MACT CC[a]	CAM
Y-0001	TCC Cooling Tower	NO	YES	NO
Y-0002	S. Alky Cooling Tower (Marley Cooling Tower)	NO	YES	NO
Y-0008	North Alky Cooling Tower	NO	YES	NO
Y-0011	FCC & NP Cooling Tower	NO	YES	NO
Y-0012	Hydrogen Plants Cooling Tower	NO	YES	NO
CT TT-0006	Unit 07 Amine W-0745 Cooling Tower	NO	NO	NO

a For MACT CC, the "heat exchange system" is included in the existing affected source. "YES" indicates the listed cooling tower is part of a heat exchange systems that is part of the affected source.

Table 13-9 Wastewater Units Summary of Applicable Regulations

Equipment ID	Emission Point ID	NESHAP FF	NSPS QQQ	MACT CC	CAM
Collector Sump T-0845 Weir Box T-0844 Stilling Well T-0846 Stormwater Lift Station (SWLS)	D-8000/D-8001	YES	YES	YES	NO
T-0830 Stormwater Surge Tank	T-0830	YES	YES	YES	NO
S-1/T-1 Barscreen and Junction Box API-894 API-895	D-0829/0830	YES	YES	YES	NO
Equalization T-801	T-801	YES	NO	YES	NO
Equalization T-836	T-836	YES	NO	YES	NO
Flocculator T-0805	T-805	YES	NO	YES	NO
DAF-896 DAF-806	DAF-896/ 806	YES	NO	YES	NO
Open Sump T-897	T-0897	YES	NO	YES	NO
Walnut Hull Filters D-810/811 and Mechanical Filter D-808/809	D-810/811 D-808/809	YES	NO	YES	NO
DAF Surge Tank T-809	T-0809	YES	NO	YES	NO

Table 13-10 Truck and Rail Loading Racks Summary of Applicable Regulations

Unit ID	Description	NSPS XX	MACT R	MACT CC	CAM
TLO-1	Asphalt Truck Loading and Off-Loading Rack #1	NO	NO	NO	NO
TL-2	Asphalt Truck Loading Rack #2	NO	NO	NO	NO
TL-4	Fuels Truck Loading Rack	NO*	NO**	YES	NO
TL-7	CBO/LCO Truck Loading Rack	NO	NO	NO	NO
RLO-8	Railcar Loading & Off-Loading	NO	NO	NO	NO
RLO-19	Railcar Loading & Off-Loading	NO	NO	NO	NO
TLO-20	Asphalt/Pitch Truck Loading	NO	NO	NO	NO
TRLO-9	Molten Sulfur Truck/Railcar Loading	NO	NO	NO	NO

*Compliance is not required pursuant to 40 CFR § 63.640(r).
**Compliance is not required pursuant to 40 CFR § 63.420(i).

Table 13-11 Fugitives Summary of Applicable Regulations

Title V Permit Unit ID	Description	MACT CC	NSPS GGGa	NSPS QQQ[a]	NESHAP J[b]	NESHAP V[c]
FUG-02-SP CRUDE	South Division Crude Unit	NO[d]	YES	YES	NO	NO
FUG-06-NHDU	Naphtha HDS Unit 06	NO[d]	YES	YES	NO	NO
FUG-07-N AMINE	Amine Unit-Treating/Regen.	NO[d]	YES	YES	NO	NO
FUG-07-SWS1	Sour Water Stripper	NO[d]	YES	YES	NO	NO
FUG-08-TRUCK RK	Loading Racks	NO[d]	YES	YES	NO	NO
FUG-09-N ALKY	North Alkylation Unit (New-Inside battery limits)	NO[d]	YES	YES	NO	NO
FUG-10-FCC	FCC w/CVS	NO[d]	YES	YES	NO	NO
FUG-13-NHDU	Naphtha HDS Unit 13	NO[d]	YES	YES	NO	NO
FUG-18-LSR MEROX TRT	Merox/Merichem Treating Units	NO[d]	NO	YES	NO	NO
FUG-19-NAPH	Naphtha Merox	NO[d]	NO	YES	NO	NO
FUG-20-ISOM	BenFree Unit	NO[d]	YES	YES	NO	NO
FUG-21-SP VACUUM	Flasher/Vacuum Unit	NO[d]	YES	YES	NO	NO
FUG-25-ROSE-2	ROSE Unit	NO[d]	YES	YES	NO	NO

Title V Permit Unit ID	Description	MACT CC	NSPS GGGa	NSPS QQQ[a]	NESHAP J[b]	NESHAP V[c]
FUG-29-BLENDER/TK FARM	Light Oil Tankage	NO[d]	YES	YES	NO	NO
FUG-30-SRU2/TGTU	SRU2/SWS w/CVS	NO[d]	YES	YES	NO	NO
FUG-31- SRU3/TGTU3/TGI3	SRU3 Unit	NO[d]	YES	YES	NO	NO
FUG-33-DIST HDU	Relocated Diesel HDS Unit w/CVS	NO[d]	YES	YES	NO	NO
FUG-34- HYDROCRACKER	WX Hydrocracker	NO[d]	YES	YES	NO	NO
FUG-35-SAT GAS	Saturates Gas Plant	NO[d]	YES	YES	NO	NO
FUG-36-RO	Reverse Osmosis	NO	NO	YES	NO	NO
FUG-37-NP-UT	North Plant Utilities	NO	NO	YES	NO	NO
FUG-41-PBC	PBC Unit	NO[d]	YES	YES	NO	NO
FUG-43-S ALKY	South Alky Unit (W-76)	NO[d]	NO	YES	NO	NO
FUG-44-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	NO[d]	YES	YES	NO	NO
FUG-45-DIST-HDU	Gas Oil Hydrotreater (incl. CVS)	NO[d]	YES	YES	NO	NO
FUG-54-PRIMEG	Prime G Unit	NO[d]	YES	YES	NO	NO
FUG-63-H2 PLANT-1	Hydrogen Plant	NO	YES	YES	NO	NO
FUG-64-H2 PLANT-2	Hydrogen Plant	NO	YES	YES	NO	NO
FUG-70-CCR	CCR Reformer (w/in battery limits)	NO[d]	YES	YES	NO	NO
FUG-73-SP UTIL	Utilities	NO	NO	YES	NO	NO
FUG-80-WWTP CVS	Oil/Water Separator	NO[d]	YES	YES	NO	NO
FUG-LPG	LPG Storage System	NO[d]	YES	YES	NO	NO

a. All wastewater sources are subject to NSPS QQQ (0195-M17(5)(J), December 15, 2004).
b. No refinery streams contain benzene at concentration of 10% wt or greater.
c. NESHAP V is only applicable if subject to NESHAP J.
d. Exempt from MACT CC pursuant to 40 CFR §63.640(p)(2)

Table 13-12 Storage Tanks Summary of Applicable Regulations

Tank No.	NSPS K	NSPS Ka	NSPS Kb	MACT CC Storage	MACT CC Wastewater	NESHAP FF	NSPS QQQ	20.2.38.109 NMAC	20.2.38.110 NMAC	20.2.38.113 NMAC	CAM
T-0001	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
T-0002	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
T-0003	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
T-0004	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
T-0011	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0012	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0020	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0021	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0022	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0023	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0026	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0028	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0031	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0040	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0041	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0042	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0045	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0046	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0049	NO	NO	NO	YES	N/A	YES	YES	YES	YES	NO	NO
T-0055	NO	YES	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0056	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0059	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0061	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0063	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0064	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0065	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0071	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0072	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0073	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0074	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0075	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO

Tank No.	NSPS K	NSPS Ka	NSPS Kb	MACT CC Storage	MACT CC Wastewater	NESHAP FF	NSPS QQQ	20.2.38.109 NMAC	20.2.38.110 NMAC	20.2.38.113 NMAC	CAM
T-0076	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0079	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0081	NO	NO	NO	YES	N/A	N/A	N/A	YES	NO	NO	NO
T-0082	NO	NO	NO	YES	N/A	N/A	N/A	YES	NO	NO	NO
T-0106	NO	NO	NO	YES	N/A	N/A	N/A	YES	YES	NO	NO
T-0107	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0108	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0109	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0110	NO	NO	NO	YES	N/A	N/A	N/A	YES	YES	NO	NO
T-0111	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0112	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0114	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0115	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0116	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0117	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0119	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0124	NO	YES	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0400	NO	YES	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0401	NO	YES	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0402	NO	YES	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0410	NO	NO	NO	YES	N/A	N/A	N/A	YES	YES	NO	NO
T-0411	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0412	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0413	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0415	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0417	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0418	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0419	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0420	NO	NO	NO	YES	N/A	N/A	N/A	YES	YES	NO	NO
T-0422	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0423	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0431	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0432	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO

Tank No.	NSPS K	NSPS Ka	NSPS Kb	MACT CC Storage	MACT CC Wastewater	NESHAP FF	NSPS QQQ	20.2.38.109 NMAC	20.2.38.110 NMAC	20.2.38.113 NMAC	CAM
T-0433	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0434	NO	YES	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0435	NO	NO	YES	YES	N/A	N/A	N/A	YES	YES	YES	NO
T-0437	YES	NO	NO	YES	N/A	N/A	N/A	YES	NO	NO	NO
T-0438	NO	YES	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0439	NO	YES	NO	YES	N/A	N/A	N/A	YES	YES	YES	NO
T-0446	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0447	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0448	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0449	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0450	NO	NO	YES	YES	N/A	N/A	N/A	YES	NO	NO	NO
T-0451	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0452	NO	NO	YES	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0453	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0460	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0465	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0466	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0467	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0468	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0600	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0737	NO	NO	YES	YES	N/A	N/A	N/A	YES	YES	YES	NO
T-0802	NO	NO	YES	YES	N/A	N/A	N/A	YES	YES	YES	NO
T-0803	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
T-0804	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
T-0807	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0809	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
T-0814	NO	NO	NO	YES	N/A	N/A	N/A	YES	YES	YES	NO
T-0815	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0816	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0821	NO	NO	YES	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0829	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
T-0834	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0835	NO	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO

Tank No.	NSPS K	NSPS Ka	NSPS Kb	MACT CC Storage	MACT CC Wastewater	NESHAP FF	NSPS QQQ	20.2.38.109 NMAC	20.2.38.110 NMAC	20.2.38.113 NMAC	CAM
T-0838	YES	NO	NO	YES	N/A	N/A	N/A	NO	NO	NO	NO
T-0839	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0840	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0841	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0891	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-0892	NO	NO	NO	NO	N/A	N/A	N/A	NO	NO	NO	NO
T-1224	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
T-1225	NO	NO	YES	YES	N/A	N/A	N/A	YES	NO	NO	NO
T-1227	NO	NO	YES	YES	N/A	N/A	N/A	YES	YES	YES	NO

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.

Artesia Refinery's Standard Operating Procedures describe measures used to mitigate source excess emissions during startup, shutdown, or malfunction. The Artesia Refinery will comply with the startup, shutdown, and malfunction requirements in 40 CFR 63, Subparts CC and UUU and maintain records to demonstrate compliance. Changes proposed in this application will not affect the current procedures.

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 Artesia Refinery operates as described in Section 10 of this application. No alternative operating scenarios are proposed.

Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) 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.	**X**
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.	
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

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

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Unit No.	Test Description	Test Date
FL-0404 TS CMS	Annual CMS RATA and 3-year linearity	02/23/2021
FL-0402 TS CMS	Annual CMS RATA and 3-year linearity	02/25/2021
FL-0401 TS CMS	Annual CMS RATA and 3-year linearity	02/22/2021
FL-0400 TS CMS	Annual CMS RATA and 3-year linearity	02/24/2021
FL-0404 H2S CMS	Annual CMS RATA and 3-year linearity	02/23/2021
FL-0402 H2S CMS	Annual CMS RATA and 3-year linearity	02/25/2021
FL-0401 H2S CMS	Annual CMS RATA and 3-year linearity	02/22/2021
FL-0400 H2S CMS	Annual CMS RATA and 3-year linearity	02/24/2021
FL-0404 H2S CMS	Annual CMS RATA	03/03/2020
FL-0402 H2S CMS	Annual CMS RATA	02/27/2020
FL-0401 H2S CMS	Annual CMS RATA	02/26/2020
FL-0400 H2S CMS	Annual CMS RATA	03/02/2020
FL-0404 H2S CMS	Annual CMS RATA	03/27/2019
FL-0402 H2S CMS	Annual CMS RATA	02/19/2019
FL-0401 H2S CMS	Annual CMS RATA	02/21/2019
FL-0400 H2S CMS	Annual CMS RATA	02/20/2019
FL-0404 H2S CMS	Annual CMS RATA	02/14/2018
FL-0402 H2S CMS	Annual CMS RATA	01/23/2018
FL-0401 H2S CMS	Annual CMS RATA	01/26/2018
FL-0400 H2S CMS	Annual CMS RATA	01/24/2018
FL-0404 H2S CMS	Annual CMS RATA	01/19/2017
FL-0402 H2S CMS	Annual CMS RATA	01/20/2017
FL-0401 H2S CMS	Annual CMS RATA	01/17/2017
FL-0400 H2S CMS	Annual CMS RATA	01/24/2017
FL-0404 H2S CMS	Initial CMS RATA	02/03/2016
FL-0402 H2S CMS	Initial CMS RATA	01/31/2016
FL-0401 H2S CMS	Initial CMS RATA	01/26/2016
FL-0400 H2S CMS	Initial CMS RATA	01/23/2016
FCC REGEN DynaWave Scrubber CEMS	Annual CEMS RATA	03/05/2021
FCC REGEN DynaWave Scrubber CEMS	Annual CEMS RATA	02/05/2020
FCC REGEN DynaWave Scrubber CEMS	Annual CEMS RATA	02/13/2019
FCC REGEN DynaWave Scrubber CEMS	Annual CEMS RATA	01/09/2018
FCC REGEN DynaWave Scrubber CEMS	Annual CEMS RATA	01/04/2017
FCC REGEN DynaWave Scrubber	Annual Performance Test for CD Alternative Monitoring Plan	01/042017
SRU3-TGI	Annual CEMS RATA	03/04/2021
SRU3-TGI	Annual CEMS RATA	03/18/2020
SRU3-TGI	Annual CEMS RATA	04/18/2019

Unit No.	Test Description	Test Date
SRU3-TGI	Annual CEMS RATA	03/21/2018
SRU3-TGI	Annual CEMS RATA	07/26/2017
SRU2-TGI	Annual CEMS RATA	03/03/2021
SRU2-TGI	Annual CEMS RATA	03/19/2020
SRU2-TGI	Annual CEMS RATA	04/10/2019
SRU2-TGI	Annual CEMS RATA	03/22/2018
SRU2-TGI	Annual CEMS RATA	04/27/2017
SRU2-TGI	Annual CEMS RATA	05/05/2016
B-9	Annual CEMS RATA	03/01/2021
B-9	Annual CEMS RATA	03/11/2020
B-9	Annual CEMS RATA	03/20/2019
B-9	Annual CEMS RATA	03/07/2018
B-9	Annual CEMS RATA	07/24/2017
B-8	Annual CEMS RATA	03/02/2021
B-8	Annual CEMS RATA	03/11/2020
B-8	Annual CEMS RATA	03/19/2019
B-8	Annual CEMS RATA	03/07/2018
B-8	Annual CEMS RATA	06/22/2017
B-8	Annual CEMS RATA	07/14/2016
B-7	Annual CEMS RATA	03/11/2021
B-7	Annual CEMS RATA	03/10/2020
B-7	Annual CEMS RATA	03/19/2019
B-7	Annual CEMS RATA	03/06/2018
B-7	Annual CEMS RATA	06/21/2017
B-7	Annual CEMS RATA	07/13/2016
H-362,363,364 Unit 70	Annual Performance Test	02/03/2021
H-362,363,364 Unit 70	Annual Performance Test	02/07/2020
H-362,363,364 Unit 70	Annual Performance Test	02/14/2019
H-362,363,364 Unit 70	Annual Performance Test	01/31/2018
H-362,363,364 Unit 70	Annual Performance Test	01/10/2017
H-362,363,364 Unit 70	Annual Performance Test	07/11/2016
H-9851	Annual CEMS RATA	03/08/2021
H-9851	Annual CEMS RATA	02/07/2020
H-9851	Annual CEMS RATA	03/21/2019
H-9851	Annual CEMS RATA	03/20/2018
H-9851	Annual CEMS RATA	06/20/2017
H-9851	Annual CEMS RATA	07/14/2016
H-8801, H-8802	Annual CEMS RATA	02/12/2020
H-8801, H-8802	Annual CEMS RATA	02/18/2019
H-8801, H-8802	Annual CEMS RATA	01/30/2018
H-8801, H-8802	Annual CEMS RATA	01/08/2017
H-5401 (Prime G)	Annual Performance Test	02/05/2021
H-5401 (Prime G)	Annual Performance Test	03/16/2020
H-5401 (Prime G)	Annual Performance Test	04/08/2019
H-5401 (Prime G)	Annual Performance Test	03/08/2018
H-5401 (Prime G)	Initial Performance Test	10/25/2017
H-3402 (HCKR-BOIL1)	Annual Performance Test for NO_X, CO and O_2 CMS RATA (AMP Req is bi-annual)	03/09/2021
H-3402 (HCKR-BOIL1)	Annual Performance Test for NO_X, CO and O_2 CMS RATA (AMP Req is bi-annual)	02/11/2020
H-3402 (HCKR-BOIL1)	Annual Performance Test for NO_X, CO and O_2 CMS RATA (AMP Req is bi-annual)	02/15/2019
H-3402 (HCKR-BOIL1)	Annual Performance Test for NO_X, CO and O_2 CMS RATA (AMP Req is bi-annual)	02/22/2018
H-3402 (HCKR-BOIL1)	Annual Performance Test for NO_X, CO and O_2 CMS RATA (AMP Req is bi-annual)	01/11/2017

Unit No.	Test Description	Test Date
H-3402 (HCKR-BOIL1)	Annual Performance Test for NO_X, CO and O_2 CMS RATA (AMP Req is bi-annual)	07/11/2016
H-3403 (HCKR) Unit 34	Annual Performance Test	03/09/2021
H-3403 (HCKR) Unit 34	Annual Performance Test	02/10/2020
H-3403 (HCKR) Unit 34	Annual Performance Test	02/14/2019
H-3403 (HCKR) Unit 34	Annual Performance Test	02/01/2018
H-3403 (HCKR) Unit 34	Annual Performance Test	01/23/2017
H-3403 (HCKR) Unit 34	Annual Performance Test	07/12/2016
H-2501 (ROSE2-HOH) Unit 25	Annual CEMS RATA	03/10/2021
H-2501 (ROSE2-HOH) Unit 25	Annual CEMS RATA	02/13/2020
H-2501 (ROSE2-HOH) Unit 25	Annual CEMS RATA	02/10/2019
H-2501 (ROSE2-HOH) Unit 25	Annual CEMS RATA	01/10/2018
H-2501 (ROSE2-HOH) Unit 25	Annual CEMS RATA	01/09/2017
H-2501 (ROSE2-HOH) Unit 25	Annual CEMS RATA	01/09/2017
H-2501 (ROSE2-HOH) Unit 25	Annual CEMS RATA	05/05/2016
H-2421	Annual Performance Test	02/02/2021
H-2421	Annual Performance Test	03/13/2020
H-2421	Annual Performance Test	04/18/2019
H-2421	Annual Performance Test	03/20/2018
H-2421	Annual Performance Test	01/05/2017
H-2421	Annual Performance Test	07/25/2017
H-0020	Annual Performance Test	02/01/2021
H-0020	Annual Performance Test	02/07/2020
H-0020	Annual Performance Test	02/20/2019
H-0020	Annual Performance Test	01/11/2018
H-0020	Annual Performance Test	01/05/2017
H-0019	Annual Performance Test	02/01/2021
H-0019	Annual Performance Test	02/06/2020
H-0019	Annual Performance Test	02/20/2019
H-0019	Annual Performance Test	01/11/2018
H-0019	Annual Performance Test	01/05/2017
LP (D-19) Fuel Gas H2S	Annual CMS RATA	03/03/2021
LP (D-19) Fuel Gas H2S	Annual CMS RATA	03/17/2020
LP (D-19) Fuel Gas H2S	Annual CMS RATA	03/07/2019
LP (D-19) Fuel Gas H2S	Annual CMS RATA	02/15/2018
LP (D-19) Fuel Gas H2S	Annual CMS RATA	01/03/2017
HP (D-770) Fuel Gas H2S (Permanent)	Annual CMS RATA	03/02/2021

Unit No.	Test Description	Test Date
HP (D-770) Fuel Gas H2S (Permanent)	Annual CMS RATA	03/17/2020
HP (D-770) Fuel Gas H2S (Permanent)	Annual CMS RATA	04/04/2019
HP (D-770) Fuel Gas H2S (Permanent)	Annual CMS RATA	02/27/2018
HP (D-770) Fuel Gas H2S (Permanent)	Annual CMS RATA	06/22/2017
HP (D-770) Fuel Gas H2S (Permanent)	Annual CMS RATA	07/14/2016
2 Backup Analyzers (Horiba brand with data logger)	Annual CEMS RATA	12/19/2019-sent to factory for rebuild and recertification.
2 Backup Analyzers (Horiba brand with data logger)	Annual CEMS RATA	03/07/2019
2 Backup Analyzers (Horiba brand with data logger)	Annual CEMS RATA	03/06/2018
2 Backup Analyzers (Horiba brand with data logger)	Annual CEMS RATA	06/20/2017
2 Backup Analyzers (Horiba brand with data logger)	Annual CEMS RATA	08/16/2016
TL-4	CEMS RATA	11/06/2019
TL-4	CEMS RATA	09/28/2018
TL-4	CEMS RATA	09/12/2017
TL-4	CEMS RATA	04/07/2016
Fuel Gas H_2S (Portable Back-up Analyzer)	Annual CMS RATA	07/13/2016

Section 20

Other Relevant Information

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

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

<u>Historical PSD Review</u>

As discussed in Sections 3 and 12 herein, with this permit application Navajo is seeking authorization for four separate and independent projects—one involving revisions to permit terms for certain loading racks and storage tanks; another involving changes to the flares; a third involving changes in fuel composition for three process heaters; and a fourth involving increases in the VOC concentration in the wastewater entering the dissolved air flotation units—as well as numerous permit revisions that are reconciliations involving no physical changes in or changes in method of operation of the stationary source. In this Section 20, Navajo is providing a summary of its review and evaluation of these revisions on historical PSD analyses for the Artesia Refinery.

<u>FCCU Catalyst Regenerator</u>. For the FCCU catalyst regenerator, Navajo is representing emissions of VOC for the first time and is representing higher PM_{10} and $PM_{2.5}$ emission rates.

The VOC emissions represented in the present application reflect new data gathered by U.S. EPA in the context of the Refinery Sector Rule. See April 2015 Emissions Estimation Protocol for Petroleum Refineries, Version 3, and ICR reported FCCU data and NPRA capacities. This is a reconciliation, not an emissions increase, and it has no implications for historical PSD applicability as discussed below.

The FCCU was constructed in 1979 as a replacement of a then-existing Thermofor Catalytic Cracking Unit (“TCCU”). Construction was authorized pursuant to a determination issued by NMED in May 1979, identified as Permit No. 236, that no permit was required because there was no increase in allowable emissions. Construction also was authorized by Permit No. PSD-NM-208 issued by U.S. EPA in July 1979. The PSD permit was rescinded in December 1981 because Navajo met the non-applicability and rescission criteria at 40 CFR §§ 52.21(i)(v) and 52.21(w)(3). *See,* 45 *Fed. Reg.* 52676 (Aug. 7, 1980) and 49 *Fed. Reg.* 11708 (Mar. 27, 1984). Specifically, under these provisions, and pursuant to the administrative stay of the PSD rules issued following the decision of the U.S. Court of Appeals in *Ala. Power Co. v. Costle*, 636 F.2d 323 (D.C. Cir. 1979), the applicability criteria in the proposed 1979 PSD rule revisions were applicable. *See,* 45 *Fed. Reg.* 7800 (Feb. 5, 1980). The emissions increase test for a major modification under the proposed 1979 PSD rule was a “significant net increase in that source’s potential to emit,” where significant for VOC emissions was defined as an increase of 10 tons per year. *See*, 44 *Fed. Reg.* 51924 (Sept. 5, 1979). Because the replacement of the TCCU with an FCCU did not increase the refinery’s potential to emit of any pollutant, including VOC, PSD was not applicable.

The increase in the represented PM_{10} and $PM_{2.5}$ emission rates is a reconciliation, to account for condensable particulate matter for the first time. This is not an emissions increase and it has no implications for historical PSD applicability, as discussed below.

The GOHT project in 2001 involved changes to the FCCU and the permit record for that project (Permit 0195-M15) includes a PM_{10} emissions increase analysis. The pre-project actual filterable PM_{10} emissions were estimated to be 164.2 tpy, based on a 44.1 lb/hr filterable PM emission rate measured in a 1998 stack test and a 1999 stack test showing filterable PM_{10} = 85% of filterable PM. The unit was subject to a filterable PM/PM_{10} limit of 113.4 tpy in the M14 permit (and prior permits), which was less than the calculated actual emissions, so that allowable emissions rate is the pre-project actual filterable PM_{10} emission rate for the M15 PSD applicability analysis. The post-project allowable filterable PM_{10} emission rate was set to remain constant (i.e., no increase or decrease) at 113.4 tpy. The current representation is 90.9 tpy filterable PM_{10} plus 4.7 tpy condensable PM_{10}. This is not a relaxation of any limit relied upon in the M15 permitting and has no implications for that PSD analysis.

Beginning with the application for Permit No. PSD-NM-0195-M25 submitted in 2006, Navajo represented a filterable PM_{10}/$PM_{2.5}$ emission rate of 109.5 tpy. This value, which represents a slight decrease from the prior 113.4 tpy limit, is based on the Consent Decree filterable PM limit of 2.0 lb per ton of coke burned. The current representation is 90.9 tpy filterable PM_{10} plus 4.7 tpy condensable PM_{10}. This is not a relaxation of any limit relied upon in the M25 permitting—the FCCU catalyst regenerator was not among the emissions units affected by that project—and it has no implications for that PSD analysis.

Sulfur Recovery Unit #2 Tail Gas Incinerator (H-0473). Navajo is representing higher PM_{10} and $PM_{2.5}$ emission rates than previously represented. This is a reconciliation, to account for condensable particulate matter for the first time. This is not an emissions increase and it has no implications for historical PSD applicability, as discussed below.

H-0473 was installed in 2001 pursuant to Permit No. 0195-M12 and the PM_{10} emissions increase from that project included only the emissions from H-0473. The original permitted filterable PM emissions from H-0473 were 1.1 tpy. The filterable PM emission limit and the represented filterable PM_{10} emission rate increased to 2.2 tpy upon issuance of Permit No. 0195-M20 in 2006. No changes to represented emission rates from H-0473 have occurred since 2006.

The current representation is 2.1 tpy filterable PM_{10}/$PM_{2.5}$ plus 6.3 tpy condensable PM_{10}/$PM_{2.5}$. This is not a relaxation of any limit relied upon in the M12 or M20 permitting and it has no implications for those PSD applicability analyses.

Sulfur Recovery Unit #3 Tail Gas Incinerator (H-3103). Navajo is representing higher PM_{10} and $PM_{2.5}$ emission rates than previously represented. This is a reconciliation, to account for condensable particulate matter for the first time. This is not an emissions increase and it has no implications for historical PSD applicability, as discussed below.

H-3103 was initially constructed in 2009 as part of the 2007 refinery expansion project authorized pursuant to Permit No. PSD-NM-0195-M25. The requested reconciliation has no implications for the PSD applicability analysis performed in conjunction with Permit No. PSD-NM-0195-M25. The requested reconciliation also has no implications for the BACT determination made by NMED in conjunction with Permit No. PSD-NM-0195-M25. As indicated at pages 29-31 of the permit issued by NMED on Dec. 14, 2007, BACT for this unit is a set of work practices; these practices remain in place, unaffected by the consideration of condensable particulate matter. The original permitted filterable PM emissions from H-3103 were 2.2 tpy. No changes to represented emission rates from H-3103 have occurred since 2007.

The lower PM_{10}/$PM_{2.5}$ emission rates from H-3103 were considered in the PSD impact analyses performed in conjunction with issuance of Permit No. PSD-NM-0195-M25. Updated impact analyses for the 2007 refinery expansion project are discussed separately below.

Unit 63 hydrogen reformer furnaces (H-8801 and H-8802). Navajo is requesting an increase in allowable emissions of SO_2 from these furnaces from the current limit of 0.8 tpy to a new limit of 4.96 tpy. These furnaces were initially constructed in 2006 pursuant to Permit No. 0195-M22. These were the only SO_2-emitting units affected by this project. The allowable SO_2 emissions from these furnaces in Permit 0195-M22 were 5.0 tpy. The requested relaxation has no implications for the PSD applicability analysis performed in conjunction with issuance of Permit No. 0195-M22.

The allowable SO_2 emissions from the H-8801 and H-8802 furnaces decreased to the current limit of 0.8 tpy at the time of issuance of Permit No. PSD-NM-0195-M25 in 2007. This was not a BACT limit, as these furnaces were not modified as part of the 2007 refinery expansion project.

The lower emission rate was considered in the PSD impact analyses performed in conjunction with issuance of Permit No. PSD-NM-0195-M25. Updated impact analyses for the 2007 refinery expansion project are discussed separately below.

Unit 64 hydrogen reformer furnace (H-9851). Navajo is requesting an increase in allowable emissions of SO_2 from this furnace from the current limit of 2.2 tpy to a new limit of 11.0 tpy. This furnace was initially constructed as part of the 2007 refinery expansion project authorized pursuant to, and the current SO_2 emission limits were established in, Permit No. PSD-NM-0195-M25. The requested relaxation has no implications for the PSD applicability analysis performed in conjunction with Permit No. PSD-NM-0195-M25 as the project was a major modification for SO_2. The requested relaxation also has no implications for the BACT determination made by NMED in conjunction with Permit No. PSD-NM-0195-M25. As indicated at pages 29-30 of the permit issued by NMED on Dec. 14, 2007, and at page 2 of the Statement of Basis document issued by NMED on the same date, BACT for refinery fuel gas-fired combustion units is a fuel sulfur limit of 60 ppmv as H_2S on a 365-day rolling average basis. The revised limits proposed in this permit application are more stringent than the 2007 BACT determination.

The lower SO_2 emission rate was considered in the PSD impact analyses performed in conjunction with issuance of Permit No. PSD-NM-0195-M25. Updated impact analyses for the 2007 refinery expansion project are discussed separately below.

Boiler 9 (B-0009). Navajo is requesting increases in allowable emissions of all pollutants from this boiler because the actual heat input capacity of the installed boiler (244.4 MMBtu/hr HHV basis) is greater than the nominal capacity used at the time of its initial permitting (220 MMBtu/hr HHV). This boiler was initially constructed in 2012 pursuant to Permit No. PSD-NM-0195-M33. This was the only emissions unit affected by this project. The requested relaxation has no implications for the PSD applicability analysis performed in conjunction with issuance of Permit No. PSD-NM-0195-M33 because the allowable emissions requested in this permit application are less than the PSD significant levels for all pollutants.

Dissolved Air Flotation (DAF) Units (T-0806 and T-0896). Navajo is requesting an increase in allowable emissions of VOC from these two units by 5.8 tpy, from the current level of 1.4 tpy to a new limit of 7.2 tpy. This relaxation has no implications for historical PSD applicability as discussed below.

T-0806 was initially permitted in 2007 as part of the 2007 refinery expansion project authorized pursuant to Permit No. PSD-NM-0195-M25, although it existed before that time. Initial construction of T-0896 was authorized under the same permit. The requested relaxation has no implications for the PSD applicability analysis performed in conjunction with Permit No. PSD-NM-0195-M25 as the project was a major modification for VOC.

The original permitted allowable VOC emissions from T-0806 and T-0896 were 5.3 tpy in total (2.65 tpy for each DAF). Total allowable emissions increased to 6.8 tpy in Permit No. PSD-NM-0195-M26 issued in 2009, decreased to 0.2 tpy in Permit No. PSD-NM-0195-M28 issued in 2011, and increased to the current 1.4 tpy level in Permit No. PSD-NM-0195-M36 issued in 2016. No changes to allowable emissions from T-0806 and T-0896 have occurred since 2016.

The requested relaxation has no implications for the BACT determination made by NMED in conjunction with Permit No. PSD-NM-0195-M25. As indicated at pages 29-31 of the permit issued by NMED on Dec. 14, 2007, BACT for the wastewater treatment facility included control requirements only for the new oil-water separator.

The requested relaxation has no implications for the PSD applicability analysis performed for the Prime G project in conjunction with Permit No. PSD-NM-0195-M36. The total project VOC increase calculated for that project was 25.9 tpy. Even if the present increase of 5.8 tpy is conservatively assumed to be entirely attributable to the Prime G project, and even if no consideration is given to the decrease in allowable emissions from fugitive emissions in the Prime G unit requested in this permit application, the increase from the Prime G project would remain well below the PSD significant level of 40 tpy.

Alky Flare (FL-0403). For the Alky Flare, Navajo is requesting increases in allowable emissions of NO_X, CO, and VOC emission rates relative to Permit No. PSD-NM-0195M39R4.

The initial installation of this flare occurred in 1991 as part of the North Alkylation Unit project authorized under Permit No. 0195-M3, with changes to allowable emissions in Permit No. 0195-M4, both issued in 1991. The SO_2, NO_X, and CO emission rates represented in the present permit application for routine operation are less than the rates authorized in 1991 (0.8 tpy vs. 10.3 tpy for SO_2, 2.5 tpy vs. 15.8 tpy for NO_X, and 10.4 tpy vs. 59.0 tpy for CO), so the proposed increases have no implications with respect to the 1991 PSD applicability analyses for these pollutants. No VOC emissions were listed in the permits issued in 1991, and Navajo has not been able to locate a copy of the PSD applicability analyses performed with respect to VOC emissions in conjunction with issuance of the 1991 permits, but the allowable fugitive VOC emissions from equipment leaks in the North Alkylation Unit (FUG-09-N ALKY) in the 1991 permit (44.9 tpy) were greater than the sum of the represented VOC emissions from both equipment leaks (27.8 tpy) and FL-0403 (13.6 tpy) in the present permit application. The requested permit changes therefore have no implications for PSD applicability for the North Alkylation Unit project in 1991.

Allowable emissions from FL-0403 decreased from the initially permitted levels at the time of issuance of Administrative Permit Revision No. PSD-NM-0195-M26R1 in 2009. There were no physical changes or changes in method of operation and there can be no PSD implications associated with this permitting action.

GOHT Flare (FL-0404). For the GOHT Flare, Navajo is requesting increases in allowable emissions of SO_2, NO_X, CO, and VOC emission rates relative to Permit No. PSD-NM-0195M39R4.

These revisions to the permitted emission rates for the GOHT Flare will affect the PSD applicability analysis performed in conjunction with issuance of Permit No. 0195-M15 in 2001 authorizing the GOHT project and PSD impact analyses performed in conjunction with issuance of Permit No. PSD-NM-0195-M25 for the refinery expansion project in 2007. Updated analyses for the 2001 GOHT project and the 2007 refinery expansion project are discussed separately below.

North Plant Flare (FL-0400), South Plant Flare (FL-0401), and FCCU Flare (FL-0402). For these flares, Navajo is requesting increases in allowable emissions of several pollutants.

FL-0400 and FL-0401 were in existence prior to enactment of the PSD permitting program, so the requested changes to permitted emission rates for these flares have no implications on historical PSD applicability for any project. Similarly, FL-0402 was constructed as part of the FCCU project authorized pursuant to a determination issued by NMED in May 1979, identified as Permit No. 236, that no permit was required because there was no increase in allowable emissions. Even if FL-0402 is conservatively assumed not to have been considered in that determination, the emission rates represented in the present permit application are less than the applicability thresholds in the then-effective PSD rule (5.6 tpy SO_2 vs. 10 tpy threshold, 2.2 tpy NO_X vs. 10 tpy threshold, 9.1 tpy CO vs. 100 tpy threshold, and 7.7 tpy VOC vs. 10 tpy threshold).

Refinery Expansion Project authorized by Permit No. PSD-NM-0195-M25. As noted above, several of the requested relaxations and reconciliations of emission rates requested in this permit application result in emission rates in excess of those used in the impact analyses performed in conjunction with issuance of this PSD permit in 2007. The air dispersion modeling report provided in Section 16 of this permit application includes updated impact analyses demonstrating that, even with the higher emission rates represented herein, the 2007 refinery expansion project does not cause or contribute to violations of any PSD increment; does not cause or contribute to exceedances of any NAAQS; does not adversely impact air quality related values in any Class I area; and does not cause adverse impacts on soils, vegetation, or visibility.

GOHT Project authorized by Permit No. 0195-M15. The GOHT Flare (FL-404) was initially installed pursuant to this construction permit issued in 2001 and the permitted potential emissions from FL-404 were considered in determining that this project was not a major modification under PSD. As previously reported to NMED in the permit application for Permit No. PSD-NM-0195-M39, increases in the emission limits for FL-404 results in the conclusion that the 2001 GOHT Project may have triggered PSD review for CO and NO_X emissions. The technical analysis submitted by Navajo in 2018, in conjunction with the permit application for Permit No. PSD-NM-0195-M39, demonstrated, among other things, that the GOHT Project does not trigger PSD review for any other pollutant; that the work practices in place at FL-404 represent BACT for CO and NO_X emissions; and that the 2001 GOHT Project does not cause or contribute to any PSD increment violation or NAAQS exceedance. The further increase in permitted emissions from FL-404 requested herein does not adversely affect any of these conclusions as discussed below.

The SO_2 and VOC net emissions changes from the 2001 GOHT Project as recalculated in Navajo's 2018 technical analysis were net decreases of 261 tpy and 320 tpy, respectively. The further increases associated with the present application are 1 tpy and 41 tpy, respectively. The prior conclusion that the 2001 GOHT Project did not cause significant net increases in emissions of these pollutants remains valid.

The work practices currently in place at FL-404 continue to represent BACT for CO and NO_X emissions. Table 20-1 presents additional analysis demonstrating that a flare gas recovery system is not required as BACT for FL-404:

Table 20-1 Cost Effectiveness of Flare Gas Recovery for FL-404

Parameter	Value	Notes
Installed cost	$ 22,500,000	Conservative estimate, assumed to be 50% of total cost of 2-flare system
Capital recovery factor	9.44%	20 years, 7% interest
Annualized capital recovery cost	$ 2,120,000	
Annual O&M cost	$ -	Conservatively assumed to be zero
CO emissions reduction (tpy)	114.7	Conservatively assumed to be 100%
NO_X emissions reduction (tpy)	21.1	Conservatively assumed to be 100%
Cost effectiveness of CO emissions reduction ($/ton)	$ 18,500	
Cost effectiveness of NO_X emissions reduction ($/ton)	$ 101,000	

The air dispersion modeling report provided in Section 16 of this permit application includes updated impact analyses demonstrating that, even with the higher emission rates represented herein, the 2001 GOHT Project, conservatively considered in combination with the separate increases from the 2007 Refinery Expansion Project, does not cause or contribute to violations of the PSD increment for NO_X or exceedances of any NAAQS for CO or NO_X.

Units ID Updates

Through this permit application, Navajo requests the following updates to unit's IDs. These changes are requested to reconcile plant IDs with permit IDs, and involve no physical change in or changes in the method of operation of the stationary source.

Former Unit Number	Updated Unit Number	Source Description
H-0473 (SRU1/SRU2 TGI)	H-0473 (SRU2 TGI)	SRU2 Tail Gas Incinerator
SRU3-TGI	H-3103 (SRU3 TGI)	SRU3 Tail Gas Incinerator
V0543	MG-0001	Portable Air Compressor
V0545	MG-0002	Portable Air Compressor
V0546	MG-0003	Portable Air Compressor
V0511	MG-0004	Portable Fire Water Pump Engine
G0100	SG-0100	UPS Backup Generator
G0101	SG-0101	UPS Backup Generator
G0102	SG-0102	Sever Backup Generator
E0600W	FWG-0600	Fire Water Pump Engine
E0601M	FWG-0601	Fire Water Pump Engine
E0602E	FWG-0602	Fire Water Pump Engine
E0603	FWG-0603	Fire Water Pump Engine

Section 22: Certification

Company Name: HollyFrotier Navajo Refining, LLC

I, Parrish Miller, 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 2 day of September, 2021, upon my oath or affirmation, before a notary of the State of

New Mexico.

*Signature

Date 9/2/21

Parrish Miller
Printed Name

VP+Refinery Manager
Title

Scribed and sworn before me on this 2 day of September, 2021.

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

27 day of April, 2024.

Notary's Signature

09/02/2021
Date

Suzanne Garcia
Notary's Printed Name

OFFICIAL SEAL
SUZANNE GARCIA
NOTARY PUBLIC
STATE OF NEW MEXICO
My Comm. Expires April 27, 2024

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

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility:	Artesia Refinery
2	Name of company:	HollyFrontier Navajo Refining LLC
3	Current Permit number:	PSD-NM-0195-M39R4; TV Operating Permit No. P-051R3
4	Name of applicant's modeler:	David Keen, RTP Environmental Associates, Inc.
5	Phone number of modeler:	919-845-1422 x41
6	E-mail of modeler:	keen@rtpenv.com

16-B: Brief

1	Was a modeling protocol submitted and approved?	Yes☒	No☐
2	Why is the modeling being done? PSD permit application and NAAQS/NMAAQS demonstration.	Other (describe below)	
3	Describe the permit changes relevant to the modeling.		
	Application to correct historical permitting errors and to permit unpermitted equipment.		
4	What geodetic datum was used in the modeling?	NAD83	
5	How long will the facility be at this location?	>25 yrs	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☒	No☐
7	Identify the Air Quality Control Region (AQCR) in which the facility is located	155	

8	List the PSD baseline dates for this region (minor or major, as appropriate).			
	NO_2	3/16/1988		
	SO_2	7/28/1978		
	PM_{10}	2/20/1979		
	$PM_{2.5}$	11/13/2013		
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).			
	Bosque del Apache (245km), Carlsbad Caverns (74km), Guadalupe Mountains (101km), Salt Creek Wilderness (79km), White Mountains (134km)			
10	Is the facility located in a non-attainment area? If so describe below		Yes☐	No☒
11	Describe any special modeling requirements, such as streamline permit requirements.			

16-C: Modeling History of Facility

1 Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
CO	n/a		
NO_2	PSD-NM-0195-M33	Jan. 18, 2013	Cumulative analysis performed for 1-hr NAAQS, others below SILs
SO_2	PSD-NM-0195-M33	Jan. 18, 2013	Cumulative analysis performed for 1-hr NAAQS, others below SILs
H_2S	n/a		
PM2.5	PSD-NM-0195-M33	Jan. 18, 2013	Cumulative analysis performed for 24-hr NAAQS and increment, others below SILs
PM10	PSD-NM-195-M25	Dec. 14, 2007	
Lead	n/a		
Ozone (PSD only)	n/a		
NM Toxic Air Pollutants (20.2.72.402 NMAC)	n/a		

16-D: Modeling performed for this application

1 For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
CO	☒	☐	☐	☐	☐
NO_2	☐	☒	☐	☐	☐
SO_2	☐	☒	☐	☐	☐
H_2S	☐	☒	☐	☐	☐

	PM2.5	☐	☒	☐	☐	☐
	PM10	☒	☐	☐	☐	☐
	Lead	☐	☐	☐	☐	☒
	Ozone	☒	☐	☐	☐	☐
	State air toxic(s) (20.2.72.402 NMAC)	☒	☐	☐	☐	☐

16-E: New Mexico toxic air pollutants modeling

1	List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application. Ammonia and sulfuric acid mist					
2	List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.					
	Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor

16-F: Modeling options

1	Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	April 29, 2021
2	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.	
	AQB Source ID	Description of Corrections
	359@1 (Southeast Readi-Mix)	172.14 lb/hr PM10 and PM2.5 provided in inventory. Reduced to 16.27 lb/hr (71.25 TPY) for PM10 and 4.08 lb/hr (17.875 TPY) for PM2.5 based on NMED Modeling Guidance (p. 60) since this is a GCP5 permit limited to 95 TPY.

16-H: Building and structure downwash

1	How many buildings are present at the facility?	63	
2	How many above ground storage tanks are present at the facility?	98	
3	Was building downwash modeled for all buildings and tanks? If not explain why below.	Yes☒	No☐
	All significant structures (height above 10ft) were included.		
4	Building comments		

16-I: Receptors and modeled property boundary

1	"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 a 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. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.					
	Perimeter fencing.					
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?				Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?				Yes☒	No☐
4	Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.					
	Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
	Cartesian	Fence following	100m	Starting at fence	2,500m from fence	
	Cartesian	Fence following	250m	2,500m from fence	7,500m from fence	
	Cartesian	Fence following	500m	7,500m from fence	10,000m from fence	
5	Describe receptor spacing along the fence line.					
	25m spacing along fence.					
6	Describe the PSD Class I area receptors.					
	Receptor locations and elevations were obtained from the National Park Service.					

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? If so describe below. This information is optional (and purposely undefined) but may help determine issues related to public notice.	Yes☐	No☒
3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	Yes☒	No☐

16-K: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).
	Only one, worst-case scenario was modeled which included startup and shutdown emissions.
2	Which scenario produces the highest concentrations? Why?
	Not applicable. Only a single, worst-case scenario was modeled.

3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☐	No☒
4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources:		

	Hour of Day	Factor	Hour of Day	Factor								
5	1		13									
	2		14									
	3		15									
	4		16									
	5		17									
	6		18									
	7		19									
	8		20									
	9		21									
	10		22									
	11		23									
	12		24									
	If hourly, variable emission rates were used that were not described above, describe them below.											

6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☒	No☐
	Short-term potential emissions were modeled for comparison to the hourly, 3-hr, 8-hr and 24-hr standards. Annual potential emissions were used to assess compliance with annual standards.		

16-L: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.			
	☒	ARM2		
	☐	100% NO_X to NO_2 conversion		
	☐	PVMRM		
	☐	OLM		
	☐	Other:		
2	Describe the NO_2 modeling.			
	NO_2 modeling incorporated ARM2 with minimum and maximum NO_2/NOx ambient ratios of 0.5 and 0.9, respectively.			
3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.		Yes☒	No☐
4	Describe the design value used for each averaging period modeled.			
	1-hour: 98th percentile as calculated by AERMOD Annual: Highest Annual Average of Three Years			

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.			
	☐	PM2.5		
	☐	PM10		
	☒	None		
2	Describe the particle size distributions used. Include the source of information.			
	Not applicable.			
3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.		Yes☒	No☐
4	Was secondary PM modeled for PM2.5?		Yes☒	No☐
5	If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.			
	NO_X (ton/yr)	SO_2 (ton/yr)	$[PM2.5]_{annual}$	$[PM2.5]_{24\text{-hour}}$
	239.8	446.2	0.114 ug/m3	2.59 ug/m3

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	Not applicable.
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.
	Not applicable.

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.		Yes☐	No☒
	Unit Number in UA-2	Unit Number in Modeling Files		
	Please see the attached Cross Reference Table.			
2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.		Yes☒	No☐
3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?		Yes☐	No☒

4	Which units consume increment for which pollutants? All sources at the refinery were conservatively assumed to consume increment at their potential to emit rates.				
	Unit ID	NO_2	SO_2	PM10	PM2.5

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	The project does not trigger increment consumption for PM2.5 since it is an application to correct historical permitting errors which were committed prior to the PM2.5 trigger date. Increment compliance has been evaluated for all other pollutants.

6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	FL0400		5.91E+08	16.11
	FL0401		2.10E+08	9.60
	FL0402		1.96E+08	9.28
	FL0403		8.61E+08	19.45
	FL0404		1.54E+09	26.01
	TL4VCU		3.50E+07	3.92
	FLHEP		1.19E+07	2.29
	TVCU		8.82E+04	0.20

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☐	No☒
2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.		
	Sigma Y values calculated as the square root of the area, or average length of side, divided by 4.3 (Table 3-1 of AERMOD Manual for Single Volume Source). Area for tanks calculated from diameter. Sigma Z values for elevated sources on or adjacent to a building calculated as the building height divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source on or Adjacent to Building). Release height equal to center of volume except for storage tanks where the emissions occur at the top of the tank. In this case, the tank height was modeled as the release height.		

3	Describe how the volume sources are related to unit numbers. Or say they are the same.
	They are the same (as specified in the attached cross reference table).
4	Describe any open pits.
	Not applicable.
5	Describe emission units included in each open pit.
	Not applicable.

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☒	No☐
	CO: N/A		
	NO_2: Outside Carlsbad (350151005)		
	PM2.5: Hobbs-Jefferson (350450019)		
	PM10: N/A		
	SO_2: Bloomfield(350450009)		
	Other:		
	Comments:		
2	Were background concentrations refined to monthly or hourly values? If so describe below.	Yes☒	No☐
	98% hourly NO_2 values by season and hour of day from Carlsbad were employed.		

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used.	Yes☐	No☒
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
	The 2016-2020, 5-year sequential hourly surface meteorological data collected at the National Weather Service (“NWS”) station in Artesia, NM (WBAN No. 03035) and upper air data from Midland, TX (WBAN No. 23023) were used. These data were processed into a “model-ready” format using the latest version of AERMET (version 21112). See the attached modeling report for a more complete description of the MET processing.		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☒	No☐
2	What was the source of the terrain data?		
	National Elevation Data (NED).		

16-U: Modeling Files

1	Describe the modeling files:		
	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
	Artesia SIL_(MET Year)_(Pollutant)	PM25, PM10, H2S, SO2, NO2, CO	ROI and SIL
	Artesia NAAQS_(MET Year)_(Pollutant)	PM25, H2S, SO2, NO2	Cumulative NAAQS
	Artesia Increment_(MET Year)_(Pollutant)	NO2, SO2	Cumulative increment
	Artesia TAP_(MET Year)_(Pollutant)	H2SO4, NH3	State toxics

16-V: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☒
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☒	No☐
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
	Pursuant to 20.2.74.306.A NMAC and 40 CFR § 52.21(m)(1), HollyFrontier proposed to use the AQB's recommended background values in lieu of site-specific preconstruction data (see protocol page 5-2). The AQB approved the protocol, with the exception of the treatment of intermittent sources, on August 2, 2021.		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
	An analysis was conducted to assess the project's impacts to local soils, vegetation and visibility. Please see the attached application for more details.		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☒	No☐
	Ozone and secondary PM2.5 impacts were calculated using the MERPs approach as discussed 16-M above.		

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☐	No☒
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
H2S, 1-hr, NMAAQS	27.85	28.68	NA	NA	28.68	41.8	69	556415.70	3634620.21	3363.51
NO2, annual, NMAAQS	17.3	17.3	NA	5.0	22.3	94.02	24	556460.99	3635129.21	3365.12
NO2, 1-hr, NAAQS	174.0	174.0	NA	Varies	174.0	188.03	93	556460.99	3635129.21	3365.12
PM25, annual, NAAQS	4.4	5.6	0.11	5.9	11.6	12	96	556505.52	3635129.20	3364.43
PM25, 24-hr, NAAQS	17.9	18.4	2.59	13.4	34.4	35	98	556505.52	3635129.20	3364.43
SO2, 1-hr, NAAQS	157.0	157.0	NA	5.3	162.3	196.4	83	556300.00	3634300.00	3367.84
NO2, Annual, Increment	17.2	24.7	NA	NA	24.7	25	99	556505.52	3635129.20	3364.43
SO2, 24-hr, Increment	63.5	67.1	NA	NA	67.1	91	74	556375.48	3635087.04	3366.43
NH3, 8-hr, Toxics	32.3	32.3	NA	NA	32.3	180	18	556380.79	3635023.79	3365.84
H2SO4, 8-hr, Toxics	4.9	4.9	NA	NA	4.9	10	49	556300	3634900	3366.62

16-X: Summary/conclusions

	A statement that modeling requirements have been satisfied and that the permit can be issued.
1	A dispersion modeling analysis was conducted for the HollyFrontier Navajo Artesia refinery. The model was conducted according to NMED and EPA policies and practices using the latest EPA-approved models. The models demonstrate compliance with all applicable ambient air quality standards.

AIR DISPERSION MODELING
FOR HOLLYFRONTIER NAVAJO REFINING LLC
IN ARTESIA, NEW MEXICO

HOLLYFRONTIER

Prepared for:
HollyFrontier Navajo Refining LLC
501 E. Main St, Artesia, NM 88210

Prepared by:
RTP Environmental Associates, Inc.
304A West Millbrook Road
Raleigh, North Carolina 27609

Original Submittal September 2021
Updated January 2022

HollyFrontier

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for HollyFrontier Navajo Refining LLC ("HollyFrontier") for its petroleum refinery in Artesia, New Mexico. This analysis was conducted in support of an air quality constructon permit application submitted to correct several permit conditions and to authorize changes to several emissions units. This analysis has been conducted by RTP Environmental Associates, Inc. ("RTP") on behalf of HollyFrontier.

The analysis evaluated emissions of the criteria and toxic air pollutants regulated under the applicable provisions of the New Mexico Administrative Code ("NMAC"). The New Mexico Air Quality Bureau ("AQB") requires an analysis of air quality standards with any construction permit application. The ambient standards that evaluated include the National Ambient Air Quality Standards ("NAAQS"), New Mexico Ambient Air Quality Standards ("NMAAQS"), Prevention of Significant Deterioration ("PSD") increments, and toxic air pollutants subject to 20.2.72.403.A(2).

This analysis conforms with the modeling procedures outlined in the Environmental Protection Agency's Guideline on Air Quality Models[1] ("Guideline" or "Appendix W"), the AQB's Air Dispersion Modeling Guidelines[2], and associated EPA modeling policy and guidance. The analysis also conforms with the modeling protocol submitted to the AQB and Federal Land Managers ("FLMs") on May 26, 2021 and approved, with a requested revision to the proposed treatment of intermittent emissions, by the AQB on August 2, 2021. No comments on the protocol were received from the FLMs.

RTP had proposed to exclude emergency engines and firewater pumps that emit intermittently from the demonstration of compliance with the 1-hr standards. The AQB stated that these sources should be included unless they were exempt from permitting. HollyFrontier has therefore elected to request an exemption from permitting for the emergency engines. The firewater pumps have been included in the 1-hr modeling demonstrations.

2.0 PROJECT DESCRIPTION

The Artesia Refinery occupies approximately 466 acres and has a crude oil capacity of 100,000 barrels per day. The Refinery has been in operation since the mid-1920s when oil wells were first drilled in southeastern New Mexico. The Refinery can process heavy, sour and light, sweet crude oils and runs a predominant slate of Permian Basin crudes that are gathered in West Texas and Southeast New Mexico. The refinery can also source a variety of crude oils from Cushing, Oklahoma including Canadian crudes.

With the permit application, HollyFrontier is requesting revisions to existing emission limits and other permit terms for several permitted emissions units; to add existing, unpermitted emissions units to the permit; to add permitted emission rates to the permit for certain emissions units from which not all emitted pollutants have previously been permitted; to authorize changes to the refinery's flares, including increases in emission limits; and to authorize changes in changes in fuel composition for three process heaters. The flare project is a major modification for VOC. None of the requested changes are major modifications under the PSD program for any pollutant other than VOC. However, several of the emission limits for which HollyFrontier is requesting revisions were considered in the impact analyses for two historical major modifications at the Artesia Refinery: The GOHT Project authorized by Permit No. 0195-M15, which was a major modification for emissions of CO and NO_X, and the Refinery Expansion Project authorized by Permit No. PSD-NM-0195-M25, which was a major modification for emissions of CO, VOC, NO_X, SO_2, PM10, and PM. The air dispersion modeling analysis discussed herein therefore includes updates to the impact analyses for those two major modifications.

3.0 SITE DESCRIPTION

The Artesia Refinery is located in Eddy County, in southeastern NM, approximately 62km south of Roswell and 225km northeast of El Paso. The approximate Universal Transverse Mercator ("UTM") coordinates of the refinery are 556,690 meters east and 3,634,600 meters north (NAD 83, UTM Zone 13) at an elevation of 3400 feet above sea level. Figure 1 shows the general location of the refinery. Figure 2 shows the specific refinery location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

Eddy County is classified as attainment or unclassified for all regulated pollutants.

The refinery is classified under the regulations governing PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC) as a major stationary source.

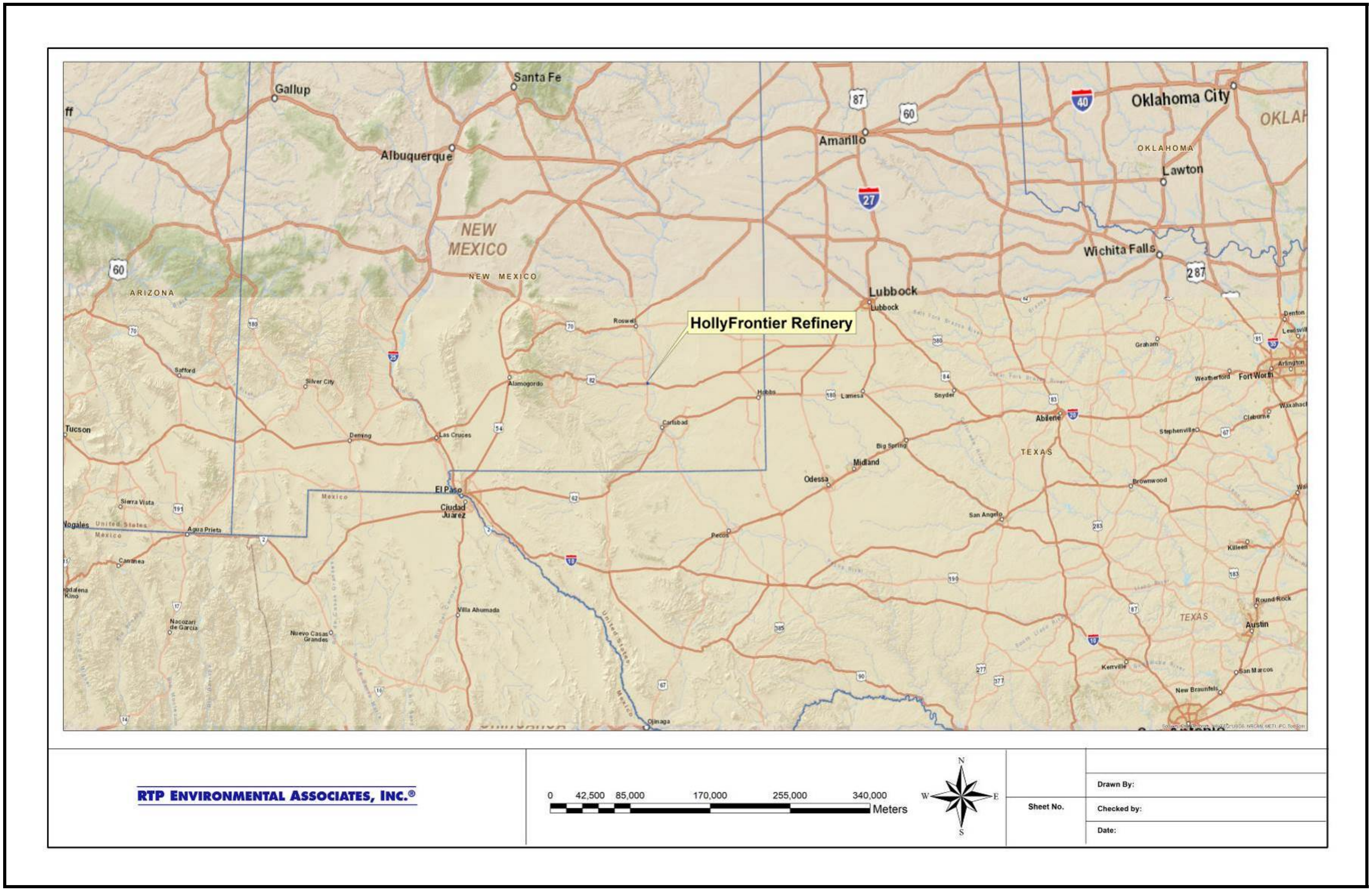

Figure 1. General Location of the Artesia Refinery

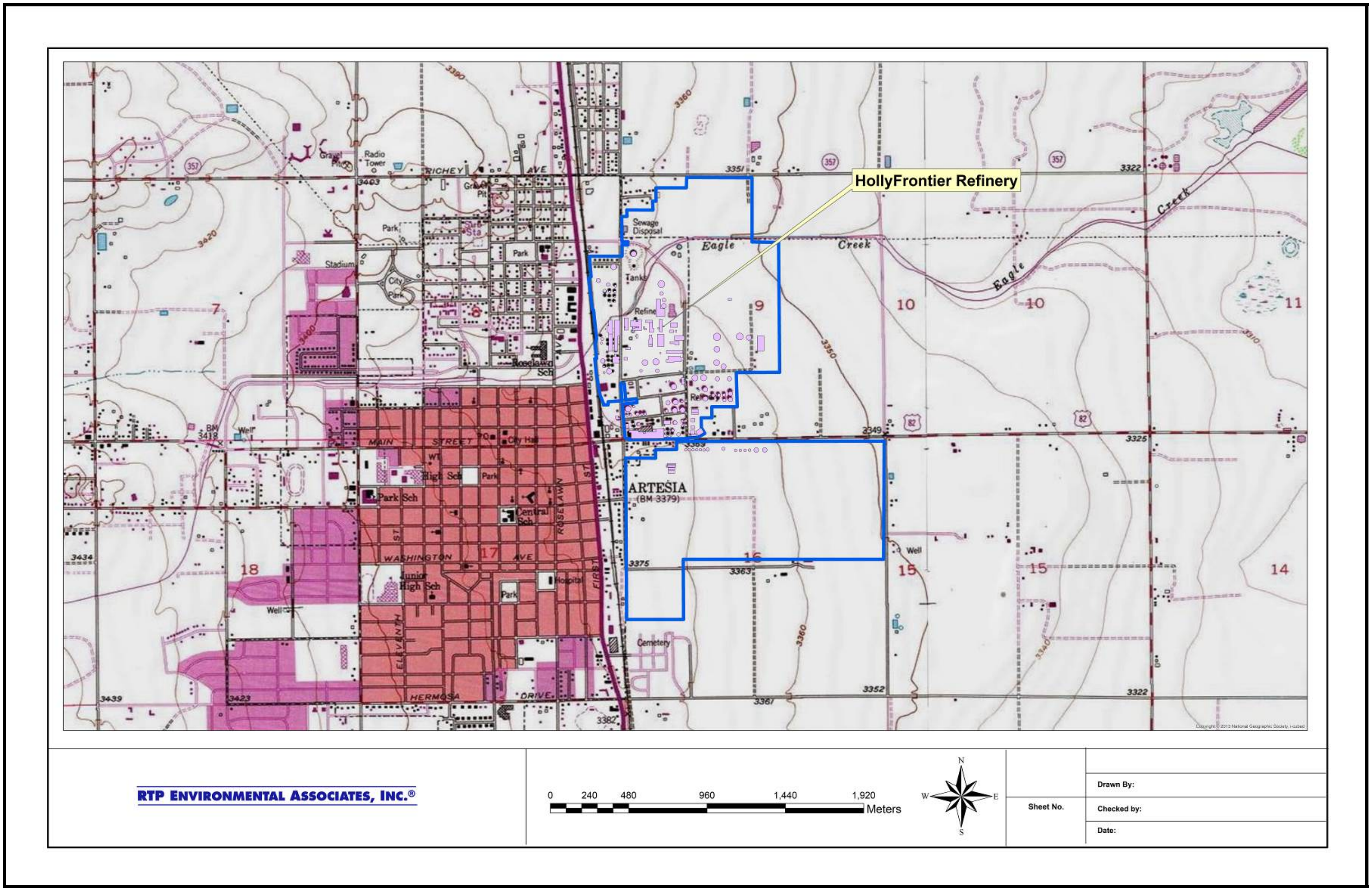

Figure 2. Specific Location of the Artesia Refinery

4.0 CLASS II AREA MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 21112) was used to conduct the near-field dispersion modeling analysis. The modeling protocol stated that AERMOD Version 19191 would be used. However, EPA released an updated version of the model after the protocol was submitted. RTP has elected to use the most recent version of AERMOD in the analysis.

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is an appropriate model for calculating ambient concentrations near the Artesia Refinery based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the EPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface (“GUI”) was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of Appendix W was not warranted.

The VISCREEN model is designed to assist in the evaluation of plume visual impacts as required under PSD. The model implements the visibility calculation procedures as outlined in the EPA's Workbook for Visual Impact Screening and Analysis.[3] VISCREEN was used to assess the potential for the 2001 and 2007 major modifications to cause a visual plume within 50km of the proposed facility.

For more distant locations (i.e., areas located in excess of 50km from the proposed site), the AERMOD and VISCREEN models are not appropriate as the steady state assumptions in the models tend to degrade. Therefore, the EPA-approved version of the CALPUFF model (Version 5.8.5) was used to assess pollutant concentrations, deposition rates, and the potential for visibility impacts at these distant locations, namely PSD Class I areas. The CALPUFF modeling methodology is discussed in Section 6 of this report.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. The use of rural dispersion coefficients is supported by the Land Use Procedure consistent with subsection 7.2.1.1.b.i of the Guideline and Section 5.1 of the AERMOD Implementation Guide. The USGS 2016 National Land Cover Data ("NLCD") within 3km of the site were converted to Auer 1978 land use types and evaluated.[4] It was determined that the land use in the vicinity of the refinery is predominantly rural as defined by Auer (less than 50% of the area is classified as urban - Figure 3). Only the red and dark red regions in Figure 3 (NLCD categories 23 and 24) are considered urban.

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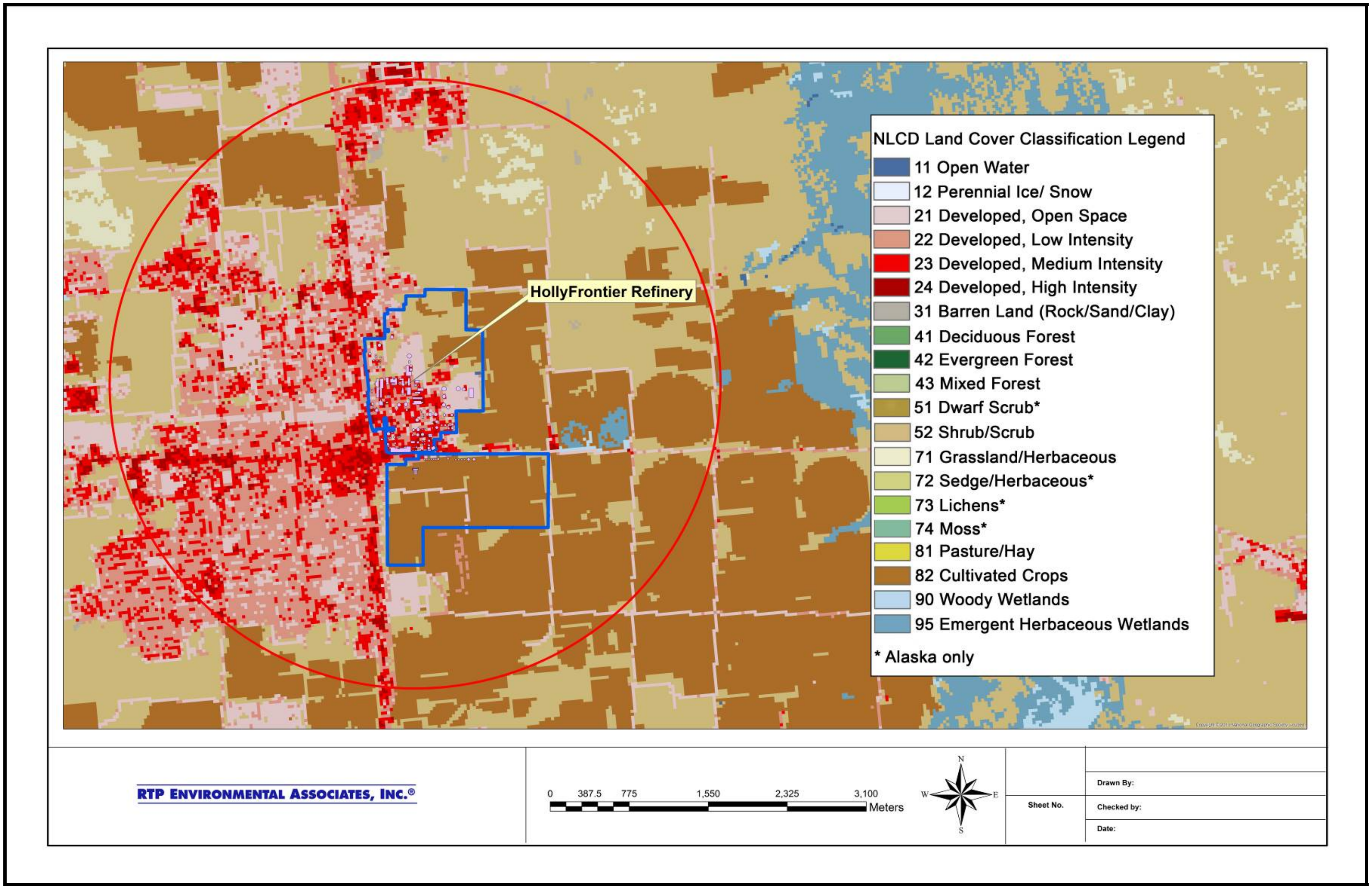


Figure 3. Land Use within Three Kilometers (Three Kilometer Radius Shown as Red Circle)

4.3 Source Data

Source Characterization

Point Sources

Most emission sources at the refinery vent to stacks with well-defined openings. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions from storage tanks and equipment leaks also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well-defined opening. These were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

All source locations were based upon a NAD83, UTM Zone 13 projection.

Flares

There are eight flares at the refinery for which emissions during periods of malfunction may exceed those during routine operation, including startup and shutdown periods. Malfunction emissions are not required to be modeled per 40 CFR Part 51 Appendix W. Emissions during startup or shutdown (i.e., non-emergency flaring) and other foreseeable operations were modeled using the proceedures outlined in the EPA's AERSCREEN manual[5]. These proceedures are slightly different than those contained in the AQB's Modeling Guidelines; however, the AQB approved of the AERSCREEN method on May 20, 2021. The effective stack height (H, in meters) was calculated as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$H_{equivalent} = H_{actual} + 4.56 \text{ x } 10^{-3} \text{ X } (Q)^{0.478}$$

The effective flare diameter (d, in meters) was calculated as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88 \times 10^{-4} \times ((Q \times (1-0.55))^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec was assumed.

All modeling input data, including the volume source and flare parameter calculations can be found in Attachment A to this report.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model. Procedures used were in accordance with those described in the EPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[6]. GEP formula stack height, as defined in 20.2.72.300 NMAC and in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from refinery construction drawings and prior modeling submissions. The structure locations and heights were input to the EPA's Building Profile Input Program ("BPIP-PRIME") computer program to calculate the direction-specific building dimensions needed for AERMOD. The Artesia Refinery plot plan and the ambient air boundaries are shown in Figure 4. A three dimensional rendering of the refinery is shown in Figure 5. All stacks and significant structures were included in the BPIP runs.

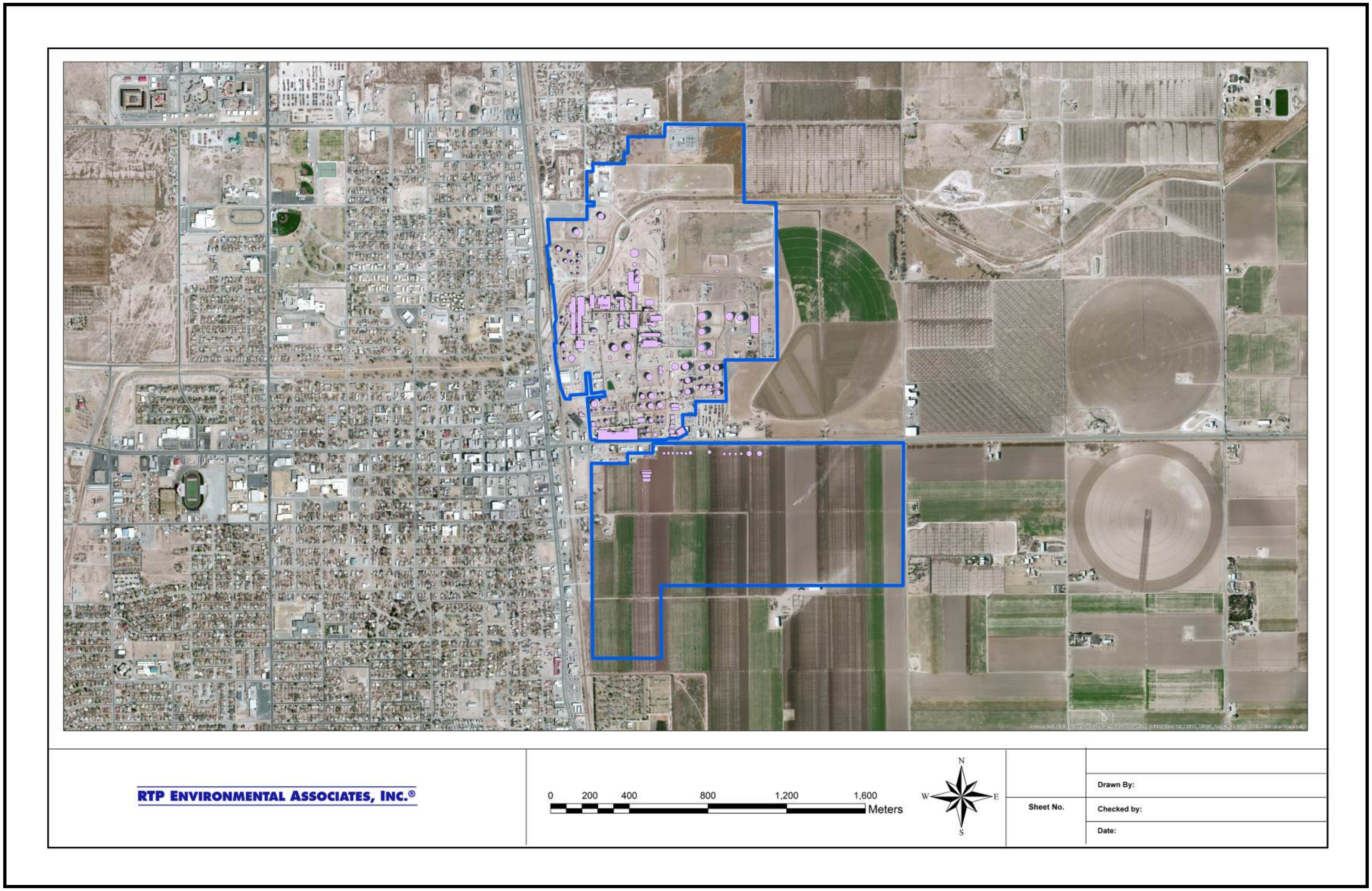


Figure 4. HollyFrontier Plot Plan and Ambient Air Boundary

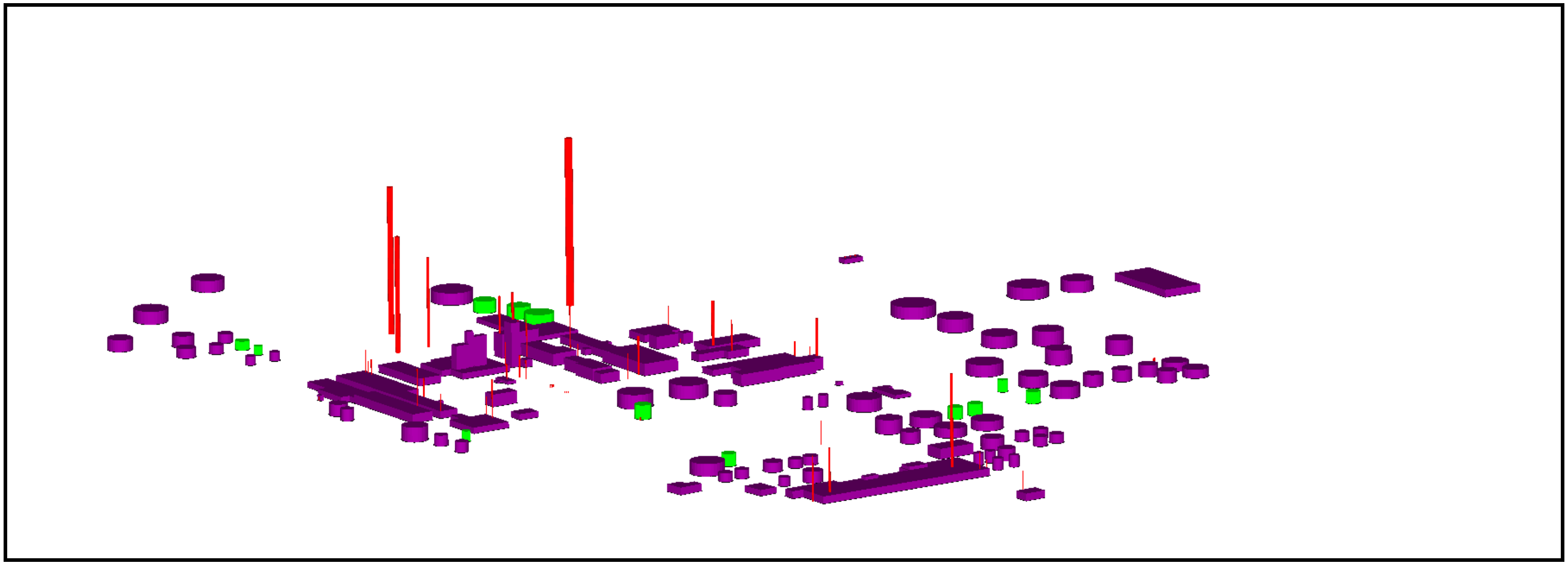


Figure 5. Artesia Refinery Three-Dimensional Plot Plan (View from SW)

4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 20.2.74.303.B NMAC and 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 20.2.74.306.A NMAC and 40 CFR § 52.21(m), as discussed in Section 5.3 herein.

The AQB has recommended background concentrations established for New Mexico. These values are provided in the Air Dispersion Modeling Guidelines and were used in this analysis. These data satisfy the criteria provided in EPA's Ambient Monitoring Guidelines[7] as being representative of the HollyFrontier site.

The background data employed are presented in Table 1.

Table 1. Background Concentrations

Pollutant	Averaging Time	Value (µg/m^3)	Monitor Location
CO	8-hr	1524	Del Norte High School
	1-hr	2203	
NO_2	Annual	5.0	Outside Carlsbad
	1-hr	See Table 2	
PM_{10}	24-hour	100.7	Eastern NM, Hobbs
PM_{25}	24-hour	13.4	
	Annual	5.9	
O_3	1-hour	150.5	

A range of monitored background NO_2 values that consider seasonal and diurnal variation was used to assess compliance with the 1-hr NO_2 NAAQS. These seasonal values reflect the three year average of the 98th percentile value by hour of day and by season. Data from the Carlsbad monitor (AQS No. 35-015-1005) were used. Since the 2020 monitor values were not available, the lastest three years (2017-2019) were used. These seasonal NO_2 values (Table 2) were added to the modeled value within AERMOD.

Table 2. Carlsbad 98% Hourly NO_2 (ppb) By Season and Hour of Day

Model Ending Hour	Winter	Spring	Summer	Fall
01	24.67	13.67	10.67	19.00
02	23.00	15.33	13.33	17.33
03	21.67	15.67	14.33	20.67
04	25.33	16.33	14.67	22.67
05	23.33	19.00	15.33	22.00
06	24.67	20.67	16.67	21.67
07	24.67	21.33	17.67	19.67
08	21.33	18.33	14.33	19.00
09	20.00	14.67	14.33	18.67
10	20.00	12.00	10.67	16.00
11	18.00	10.33	7.67	14.00
12	16.33	8.00	5.33	12.00
13	15.67	7.33	5.00	11.00
14	12.00	5.67	4.33	10.33
15	12.33	5.33	4.00	9.33
16	14.67	5.00	3.33	8.67
17	18.00	4.67	3.33	11.00
18	20.00	6.33	4.00	12.33
19	18.33	10.33	6.67	12.00
20	16.00	11.67	9.67	12.00
21	15.67	10.33	10.67	12.67
22	19.00	10.00	11.00	14.33
23	21.33	10.00	10.00	14.67
24	23.33	10.33	10.33	19.00

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR § 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 8,200 receptors were employed. The receptor grid consisted of three cartesian grids and receptors spaced at 25m intervals along the ambient boundary. The first cartesian grid extended to approximately 2.5km from the boundary in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region was 250m. The third grid extended to 10km with a spacing of 500m. The receptor grid was designed such that maximum impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 3.

Table 3. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Fence (m)
100	2,500
250	7,500
500	10,000

The Artesia Refinery is located in southeastern New Mexico. The terrain in the area is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from one arc-second National Elevation Data ("NED") obtained from the USGS. Locations were based upon a NAD83, UTM Zone 13 projection. The near-field receptor grid is presented in Figure 6.

4.6 Meteorological Data

Data Selection and Processing

The 2016-2020, 5-year sequential hourly surface meteorological data collected at the National Weather Service ("NWS") station in Artesia, NM (WBAN No. 03035) and upper air data from Midland, TX (WBAN No. 23023) were used in the near-field modeling analysis performed using AERMOD. These data were processed into a "model-ready" format using the latest version of AERMET (version 21112).

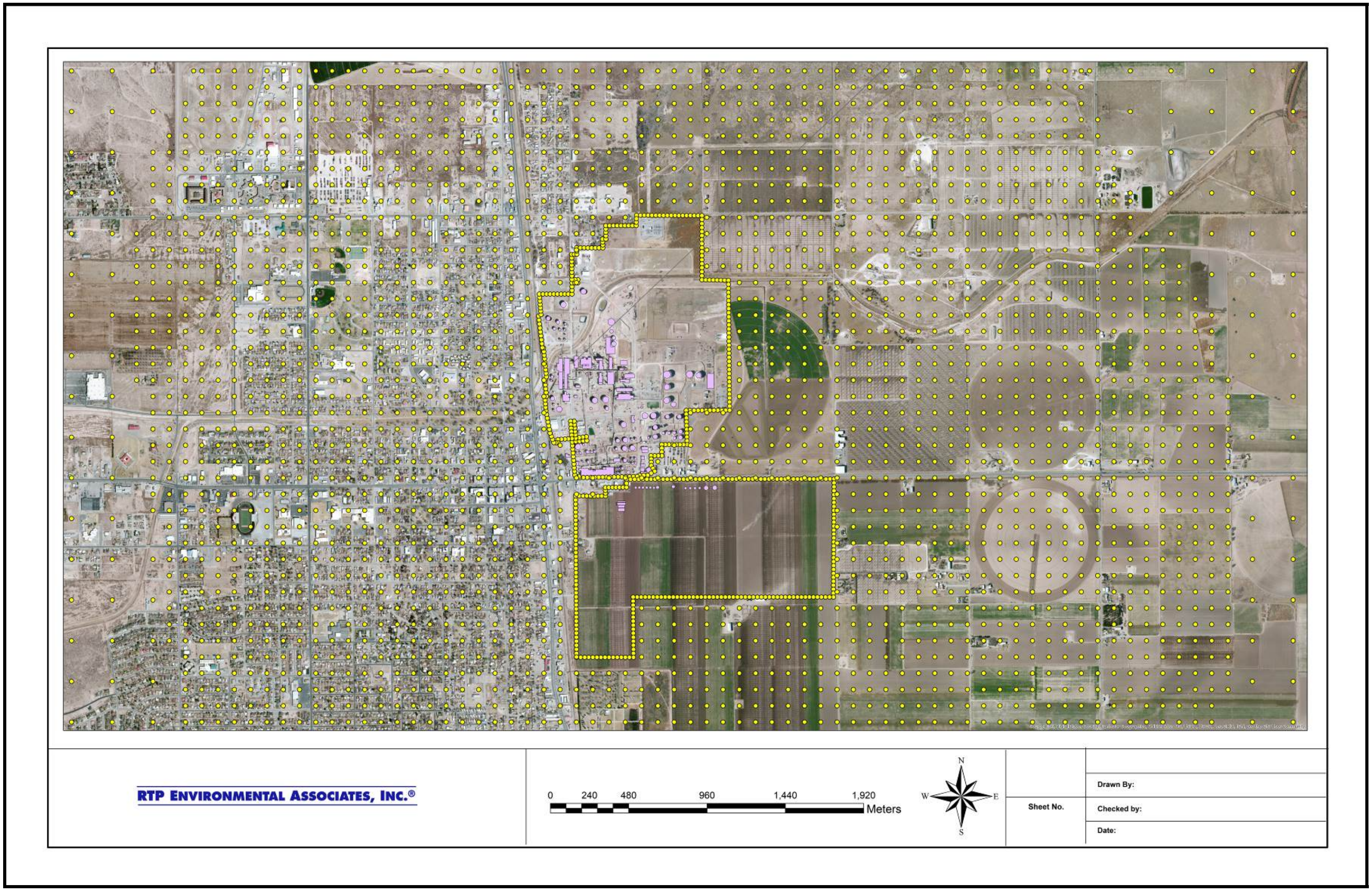


Figure 6. HollyFrontier Near-field Receptor Grid

In AERMET Stage 1, the Artesia surface meteorological data in the Integrated Surface Data ("ISD") format were extracted. Midland upper air meteorological data in the Forecast Systems Laboratory ("FSL") format were also extracted.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption. The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. RTP developed estimates of the surface characteristics using EPA's AERSURFACE program (Version 20060). A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. The default season definitions were used with no continuous snow cover for one or more months during the winter and dry moisture. The "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed. The 2016-2020 wind rose is shown in Figure 7.

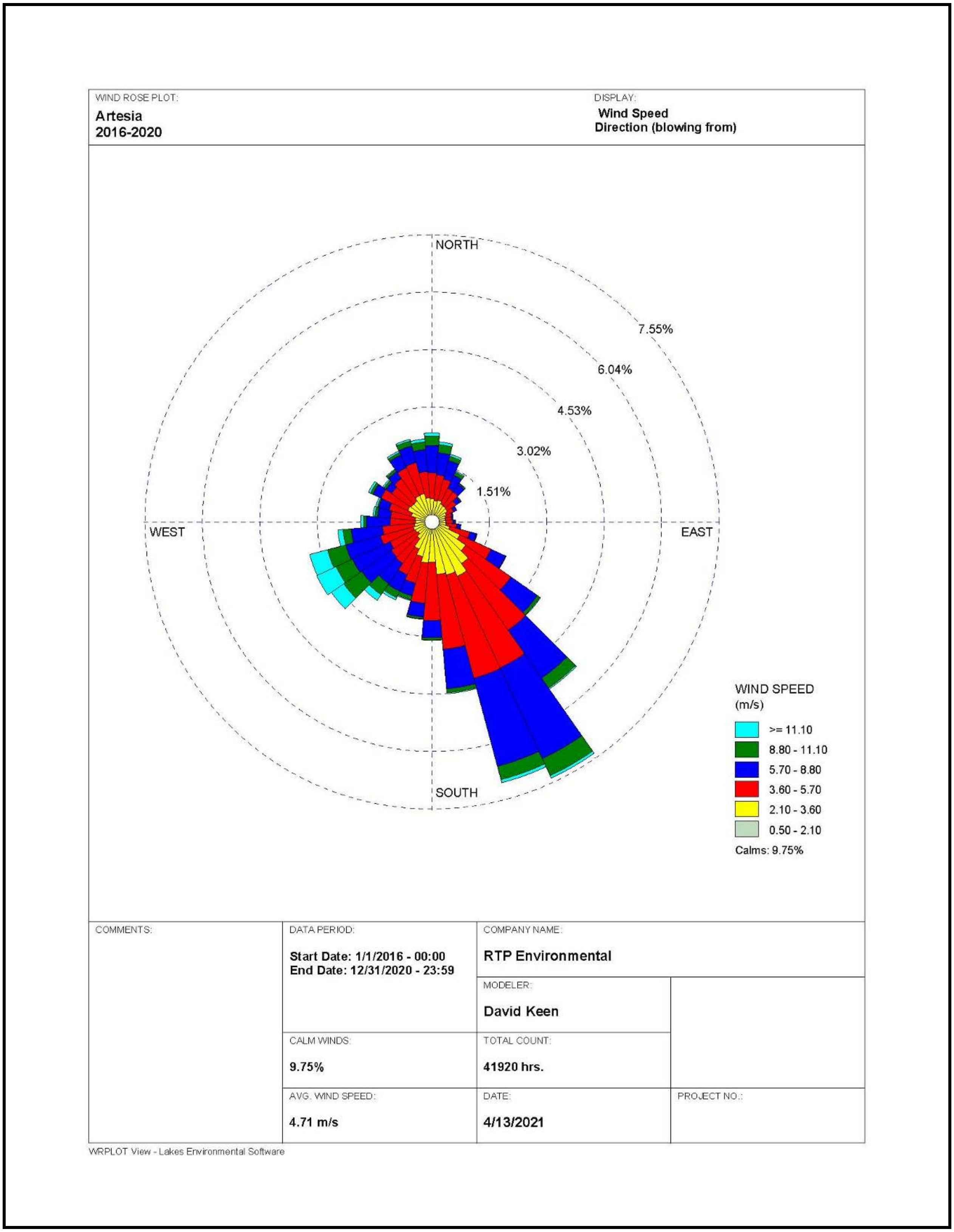


Figure 7. 2016-2020 Artesia Windrose

5.0 CLASS II AREA MODELING METHODOLOGY

5.1 Pollutants Subject to Review

The proposed permitting action will potentially allow for an increase in emissions of all criteria pollutants, with the exception of lead, as well as H_2S and two air toxics: ammonia and sulfuric acid mist. HollyFrontier has therefore elected to conduct a facility wide model for all pollutants using the requested permit to emit rates. Since precursor VOC emissions will also increase, ozone impacts were addressed.

5.2 Significant Impact Analysis

The criteria pollutant air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase including an increment analysis and a NAAQS/NMAAQS analysis. In the significant impacts analysis, the calculated maximum impacts associated with the project were determined for each pollutant. These impacts determined the net change in air quality resulting from the proposed modification. Five years of meteorological data were used in the significant impact analysis. Maximum modeled concentrations were compared to the pollutant-specific significance levels for all pollutants and averaging times except for the 1-hour NO_2, SO_2 and 24-hr PM2.5 impacts. For these pollutants and averaging times, the five-year average of the maximum impact at each receptor were used to assess significance. The PSD Class II and AQB Significant Impact Levels are listed in Table 4.

Table 4. PSD Class II and AQB Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels (μg/m^3)
CO	1-hour	2,000
	8-hour	500
H_2S	1-hour	5.0
PM10	24-hour	5.0
	Annual	1.0
PM2.5[a]	24-hour	1.2
	Annual	0.3
NO_2	1-hour	7.52[b]
	Annual	1.0
SO_2	1-hour	7.8[b]
	3-hour	25.0
	24-hour	5.0
	Annual	1.0
O_3	8-hour	1.96

[a]Please note that on January 22, 2013, the US Court of Appeals for the District of Columbia Circuit Court granted a request from the EPA to vacate and remand the $PM_{2.5}$ SILs codified in the federal PSD rule. EPA modeling guidance (August 1, 2016), issued subsequent to the remand, continues to recommend use of the SILs listed above to justify permitting decisions for PM2.5 NAAQS and increment evaluations.
[b]There are no 1-hr NO_2 or SO_2 SILs promulgated at 40 CFR 51.165. The EPA proposed interim SILs for NO_2 of 4ppb and SO_2 of 3ppb will be used.

Pollutants with impacts that exceeded the ambient air significance levels, as defined in 40 CFR 51.165, were included in both the NAAQS/NMAAQS and increment analyses. In these latter analyses, impacts from the Artesia Refinery were added to concentrations calculated from other nearby PM10, PM2.5, SO_2 and H_2S sources, plus a regional background concentration (for the NAAQS/NMAAQS analysis only). The resultant total concentration was compared to the NAAQS/NMAAQS and increments to determine compliance.

5.3 Preconstruction Monitoring

In order to satisfy the requirement for an air quality analysis pursuant to 20.2.74.306.A NMAC and 40 CFR § 52.21(m)(1), HollyFrontier used the AQB's recommended background values discussed in Section 4.4 herein. HollyFrontier requested that the existing ambient monitoring data be allowed for use in lieu of site-specific preconstruction data.

5.4 Nearby Source Inventories

Off-site sources were included in the H_2S, SO_2, PM2.5, PM10 NAAQS/NMAAQS analyses as well as the increment analyses. Modeled impacts from the nearby sources were added to impacts from HollyFrontier in assessing compliance. Prior to the most recent 2017 Appendix W (40 CFR Part 51) revisions, the maximum distance to a significant impact plus 50km was historically used as a radius to define the screening area. The most recent Appendix W modeling guideline now states that professional judgment must be exercised in assessing sources to be included in the modeling analysis. Appendix W as well as the NM Modeling Guidelines further state that the number of nearby sources explicitly modeled in the air quality analysis is expected to be few, except in unusual situations, and that these sources will typically be located within the first 10-20 kilometers from the proposed source (see January 17, 2017, 82 Federal Register 5182 at page 5221).

The AQB provided RTP Environmental with the offsite source inventories required to conduct the analyses. HollyFrontier modeled all SO_2, PM10, and PM2.5 sources located within 10km of the refinery. Background concentrations adequately represent any PM10/PM2.5 sources beyond 10km. No nearby sources were modeled in the NAAQS/NMAAQS for the remaining pollutants as the background values also adequately represent impacts. For the H_2S and increment analysis where backgound concentrations are not considered, all sources located within 25km of the refinery as well as any large sources (1,000 lb/hr) located within 50km of the refinery were modeled.

5.5 NAAQS/NMAAQS Analysis

A refined air quality analysis to determine compliance with the NAAQS/NMAAQS was conducted. As stated, this analysis was conducted to determine compliance with the

NAAQS/NMAAQS for all regulated pollutants with impacts that exceeded the significant impact levels. Lead emissions were not evaluated because the facility does not have appreciable lead emissions. Each new or modified source's potential emission rate was used. Average emissions were used for the existing FCC regenerator, which is not part of the project, in assessing NAAQS compliance. Average emissions are allowed to be modeled for non-modified units pursuant to Table 8-2 of the EPA's Modeling Guideline (Appendix W).

Only those receptors showing a significant impact were modeled for NAAQS/NMAAQS compliance. In assessing NAAQS/NMAAQS compliance for most pollutants, the AQB allows for applicants either to model nearby sources or to use a background concentration to represent impacts from the nearby sources. The AQB, however, recommends inclusion of both nearby sources located within 10km of the refinery and background in assessing PM2.5 and PM10 compliance. The form of the modeled values and whether nearby sources or background were included to assess NAAQS/NMAAQS compliance are shown in Table 5. The more stringent of either the NAAQS or NMAAQS are shown in Table 6. These are the standards HollyFrontier used to assess compliance. Modeling was not conducted for the SO_2 24-hour NAAQS eventhough significant impacts were calculated because the AQB considers a compliance demonstration using the 1-hr standard as a surrogate for compliance with the 24-hr standard.

Table 5. Form of Modeled Values Used to Assess NAAQS/NMAAQS Compliance

Pollutant	Averaging Time	Add Background Concentration or Include Nearby Sources	Modeled Value
CO	8-hour	Background	Maximum
	1-hour	Background	Maximum
H_2S	1-hour	Nearby Sources	Maximum
NO_2	Annual	Background	Average
	1-hour	Background	98th percentile max daily 1-hour
PM2.5	Annual	Both	Average
	24-hour	Both	98th percentile
PM10	24-hour	Both	High 6th high
SO_2	1-hour	Background	99th percentile max daily 1-hour

Table 6. National and New Mexico Ambient Air Quality Standards

Pollutant	Averaging Time	Ambient Air Quality Standards ($\mu g/m^3$)
CO	8-hour	9,960.1
	1-hour	14,997.5
H_2S	1-hour	41.8
NO_2	Annual	94.02
	1-hour	188.03
O_3	8-hour	137.3
PM2.5	Annual	12
	24-hour	35
PM10	24-hour	150
SO_2[a]	1-hour	196.4

[a]Modeling not required for the other SO2 averaging periods if compliance can be demonstrated with the 1-hour standard.

5.6 PSD Increment Analysis

The Artesia Refinery is located in Air Quality Control Region No. 155. The PSD Minor Source Baseline dates have been triggered in this baseline area for all pollutants. NO_2 was triggered 3/16/1988, SO_2 was triggered 7/28/1978, PM10 was triggered 8/4/1978, and PM2.5 was triggered 11/13/2013. The Artesia Refinery was constructed in the mid-1920's and modifications have been made since the increment trigger dates for all pollutants except PM2.5. Increment compliance was therefore evaluated for all pollutants except PM2.5. As a conservative means of assessing increment compliance, HollyFrontier modeled potential emissions from all sources at the refinery. Only those receptors showing a significant impact were modeled for increment compliance.

Compliance with the PSD increments was based on the cumulative impacts of the Artesia Refinery and other increment consuming sources identified in the nearby source emissions inventory. All nearby sources located within 25km of the refinery and any large (>1000 lb/hr) sources within 50km of the refinery were included in the Class II increment demonstration. The resultant cumulative impacts were compared to the PSD Class II increment levels. The highest modeled annual averages was used for evaluating compliance with the annual increments and the high-second-high values was used for the evaluation of compliance with the short-term increments.

The PSD Class I and Class II increments are shown in Table 7.

Table 7. PSD Class I and II Increments

Pollutant	Averaging Time	PSD Class I Increment ($\mu g/m^3$)	PSD Class II Increment ($\mu g/m^3$)
NO_2	Annual	2.5	25
PM2.5	Annual	1	4
	24-hour	2	9
PM10	Annual	4	17
	24-hour	8	30
SO_2	Annual	2	20
	24-hour	5	91
	3-hour	25	512

5.7 Secondary PM2.5 Analyses

On February 10, 2020, the USEPA issued draft guidance for assessing ozone and fine particulate matter modeling.[8] The guidance addresses both primary and secondary PM2.5 impacts. Primary PM2.5 impacts refer to the impacts due to direct emissions of PM2.5. Secondary impacts refer to the PM2.5 impacts attributable to nitrates and sulfates formed due to precursor NO_2 and SO_2 emissions. The AQB's Guidelines, which follow EPA's, were followed in assessing secondary PM2.5 impacts. Specifically, the following Modeled Emission Rates for Precursors ("MERPs") values and equations was used:

PM2.5 Annual ($\mu g/m^3$) = ((NOx (tpy)/3184) + (SO_2 (tpy)/2289)) x 0.2
PM2.5 24-hr ($\mu g/m^3$) = ((NOx (tpy)/1155) + (SO_2 (tpy)/225)) x 1.2

The calculated secondary PM2.5 impacts were added to the modeled concentrations to assess significant impacts as well as compliance with the NAAQS/NMAAQS and increments.

5.8 O_3 Analyses

Ozone impacts were calculated using the AQB's Guidelines, which follow the EPA's MERPS guidance. Specifically, the following values and equations was used:

Ozone 8-hour (µg/m3) = ((NOx (tpy)/184) + (VOC (tpy)/1049)) x 1.96

The calculated secondary O_3 impacts were compared to the O3 significant impact level of 1.96 μg/m^3 or 1 ppb.

5.9 NO_2 Analyses

Following USEPA and AQB guidance, the NO_2 modeling analyses employed the recommended three tier screening approach. Initially, Tier 1 was employed with the conservative assumption that 100% of the available NOx converts to NO_2. Based on these results, HollyFrontier employed Tier 2 (the Ambient Ratio Method, ARM2) with the EPA default minimum and maximum ambient ratios of 0.5 and 0.9, respectively. Tier 3 was not employed. Tier 3 accounts for the chemical reactions that convert NOx to NO_2 in the presence of ozone.

5.10 Air Toxics Analysis

HollyFrontier conducted modeling for two toxic air pollutants, ammonia and sulfuric acid mist, which are emitted in excess of the levels specified in 20.2.72.502 NMAC – Permits for Toxic Air Pollutants. Maximum 8-hour impacts were compared to one-one hundredth of the Occupational Exposure Level ("OEL") listed in 20.2.72.502 NMAC.

5.11 Class II Visibility Analysis

In addition, a Class II visibility analysis was conducted using the VISCREEN model. The Living Desert State Park, which is located a minimum of 42km and a maximum of 49km south of the Artesia Refinery was used as an indicator of potential Class II visibility impacts. First level screening values of 1.00 for the color parameter ("delta E") and 0.02 for the contrast parameter ("C") were used. A background visible range of 110km was also used. This background visual range is recommended as the default value according to EPA's Workbook for Plume Visual Impact Screening and Analysis.[9]

6.0 CLASS I AREA ANALYSIS

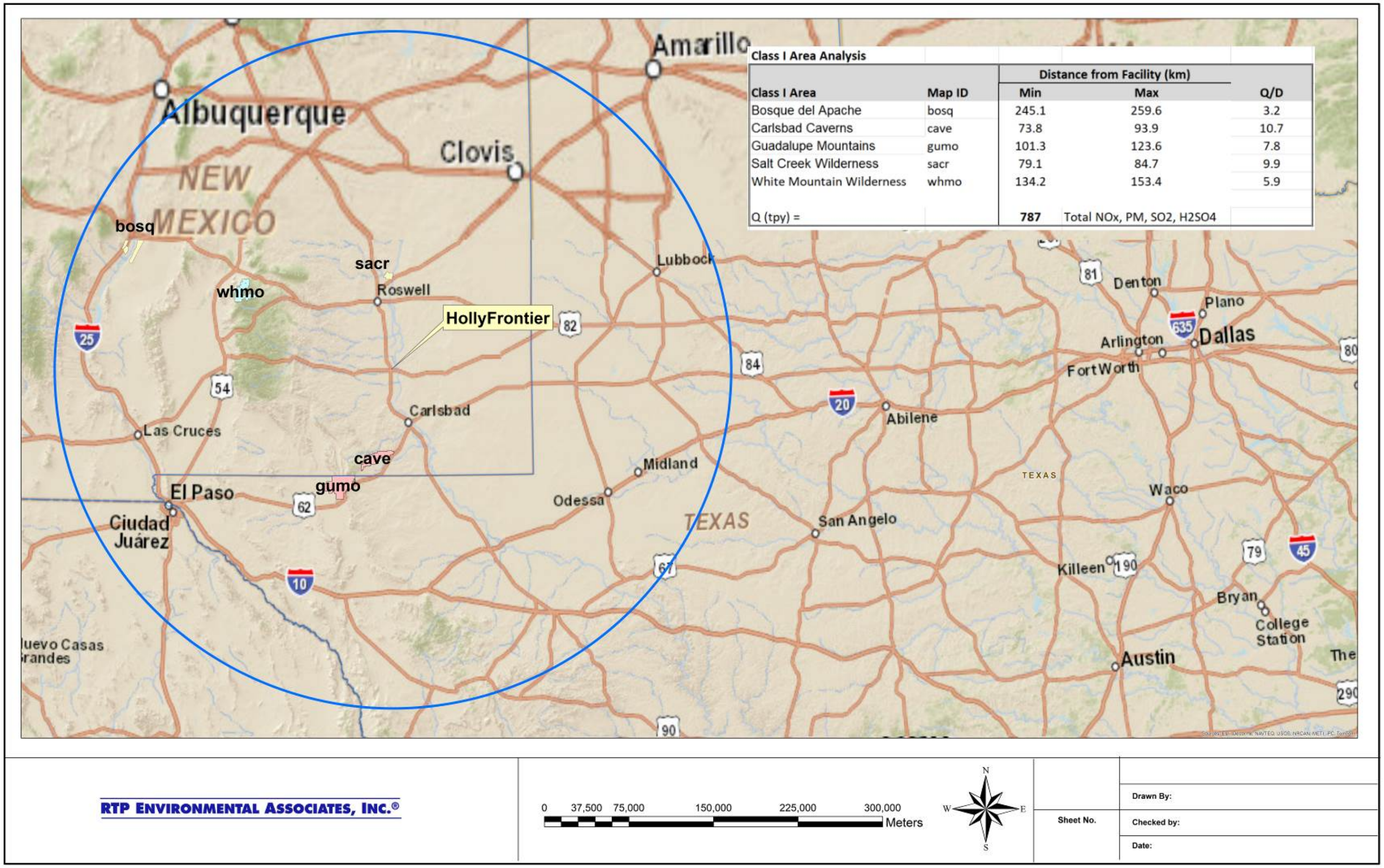
6.1 Class I AQRV Analysis

There are five Class I areas located within 300km of the Artesia Refinery: Carlsbad Caverns, Guadalupe Mountains, White Mountains Wilderness, Salt Creek Wilderness, and Bosque del Apache (Figure 8).[1] The closest Class I area is the Carlsbad Caverns National Park which is located 73km to the south. The Federal Land Manager's ("FLM") Q/D (maximum daily emissions in tons per year over distance in kilometers) method has been used to determine the potential for adverse Class I impacts for each Class I area (Table 8). We have presumed that no Class I Air Quality Related Values ("AQRV") evaluation was required for the Class I areas with calculated Q/D values below 10. Project emission estimates reveal a maximum annual, total SO_2, H_2SO_4, NOx and PM_{10} emission rate of 787 tons per year which results in the Q/D values shown in Table 5. Annual emissions were calculated as the maximum daily emissions and 365 day/yr operation.

Table 8. Calculated Q/D Values for Each Class I Area

Class I	Map ID	Minimum Distance from the SRP Facility (km)	Maximum Distance from the SRP Facility (km)	Q/D
Bosque del Apache	bosq	245.1	259.6	3.2
Carlsbad Caverns	cave	73.8	93.9	10.7
Guadalupe Mountains	gumo	101.3	123.6	7.8
Salt Creek	sacr	79.1	84.7	9.9
White Mountain	whmo	134.2	153.4	5.9

[1] Class I areas are pristine areas (e.g., National Parks and Wilderness Areas) that have been designated by Congress and are afforded a greater degree of air quality protection. All other areas are designated as Class II areas.



Class I Area Analysis

Class I Area	Map ID	Distance from Facility (km) Min	Max	Q/D
Bosque del Apache	bosq	245.1	259.6	3.2
Carlsbad Caverns	cave	73.8	93.9	10.7
Guadalupe Mountains	gumo	101.3	123.6	7.8
Salt Creek Wilderness	sacr	79.1	84.7	9.9
White Mountain Wilderness	whmo	134.2	153.4	5.9
Q (tpy) =		787	Total NOx, PM, SO2, H2SO4	

Figure 8. Class I Areas Located within 300km of the Artesia Refinery

For the Class I area, Carlsbad Caverns, with the Q/D values in excess of 10, AQRVs were calculated. Visibility and sulfur and nitrogen deposition were calculated using techniques prescribed by the Guideline for Air Quality Models (40 CFR 51, Appendix W), the EPA's Interagency Workgroup on Air Quality Modeling (IWAQM)[10], and the FLM's Air Quality Related Values Work Group (FLAG) document.[11]

6.2 Class I Increment Analysis

6.3 CALPUFF

The EPA-approved version of CALPUFF (Version 5.8) was used to assess Class I air quality impacts. The EPA-approved version of CALPUFF includes the CALMET meteorological model (Version 5.8.4, Level 130731), the non-steady-state puff model (CALPUFF, Version 5.8.5, Level 151214) with chemical transformation and deposition, and the post processors (POSTUTIL Version 1.5.6, Level 070627 and CALPOST, Version 6.221, Level 082724) for combining, converting, averaging, and ranking the concentrations, visibility impacts, and deposition.

CALMET

RTP used the Mesoscale Model Interface Program ("MMIF") Version 3.4 and the EPA's 2013-2015, 12km Weather Research and Forcasting Model ("WRF") for the Continental United States (CONUS) to develop a CALMET dataset.[b] The extraction domain extended 50km beyond the Class I areas. The lower left and upper right coordinates of the extraction domain was -967.383, -923.424 and -631.767, -579.363 km, respectively (LCC, with the RPO projection). The origin was set to -972.0, -924.0km with 29 cells in each direction. The default vertical layers (ZFACE) of 0.0, 20.0, 40.0, 80.0, 160.0, 320.0, 640.0, 1200.0, 2000.0, 3000.0, 4000.0m were employed. MMIF was run in pass-through mode using the "CALSCI_MIXH WRF" option.

[b] Please note that the most current version of MMIF is Ver. 3.4.1. This version will not read WRF files larger than 2 gigabytes. The WRF data files in RTP's possession are 12gb. The only difference between versions 3.4 and 3.4.1 is 3.4.1's ability to estimate cloud cover. Lack of such estimates should not appreciably affect CALPUFF results.

Modeled Emissions

The Artesia Refinery's primary emission sources are refinery fuel gas-fired heaters. There are also several flares and a fluid catalytic cracking unit. The National Park Service ("NPS") PM speciation calculation for combustion turbines ("CTs") was employed for the gas fired units. This calculation assumes that all of the estimated PM emissions have an aerodynamic diameter of less than 1 micron and that 25% of the PM is filterable and 75% is condensable. All of the filterable PM is assumed to be elemental carbon. All of the condensable PM was assumed to be soluble organic carbon (SOA), while one third of the SO_2 emissions were assumed to be sulfate (SO_4).

CALPUFF Technical Settings

CALPUFF was run using the FLM-approved default parameters where available. These options generally follow EPA's Guideline on Air Quality Models (40 CFR 51, Appendix W) and the IWAQM Phase 2 guidance. The regulatory default switch was used (MREG = 1).

The Class I area receptors modeled were obtained from the NPS. Lambert-Conformal Conic (LCC) Coordinates were used with an origin of 49.0N and 97.0W and Standard Parallels of 33.0N and 45.0N (the RPO projection).

The modeling domain and Class I receptors are shown in Figure 9.

Ozone and Ammonia

Hourly background ozone concentrations were input to CALPUFF. The ozone observations were collected at the Carlsbad monitor (AQS No. 35-015-1005) concurrent with the three years of WRF data. Missing values from Carlsbad were filled with data from the Hobbs monitor (AQS No. 35-025-008) located approximately 100km east of the refinery.

Ammonia is not simulated by CALPUFF, but rather a background value is specified. Ammonia is important because the level of particulate nitrate (NO_3) can depend on the amount of ammonia present. The partitioning of total nitrate between gaseous HNO_3 and particulate NO_3 depends on the amount of ammonia present and other parameters (e.g., SO_4, temperature, and RH).

In the CALPUFF simulation, one value of background is assumed across the region and each puff uses the full background value in its equilibrium calculation. The IWAQM Phase II report contains the following recommendations for background ammonia: "typical (within a factor of 2) background values of ammonia are: 10 ppb for grasslands, 0.5 ppb for forest, and 1 ppb for arid lands at 20 C" (IWAQM, 1998). Based on the fact that all of the reviewed Class I areas lie in an arid region, a background ammonia value of 1 part per billion (ppb) was used.

Natural Conditions and Monthly Relative Humidity Factors f(RH)

Natural background conditions must be established to determine a change in natural conditions related to a source's emissions. The EPA lists three types of natural background conditions in their guidance document: Annual Average, Best 20% Days, and Worst 20% Days.[12] Based on the FLAG 2010 guidance, Annual Average Natural Visibility Conditions were used for this analysis. The EPA, in its BART Guidelines (2005), concluded that by using monthly average Relative Humidity Adjustment Factors f(RH), the likelihood that the highest modeled visibility impacts that were caused by short-term and geographically different meteorological phenomena (e.g., weather events) would be minimized. The FLAG (2010) report agreed with the EPA; therefore, the visibility analysis was conducted using monthly average f(RH) values for large hygroscopic particles, small hygroscopic particles and sea salt, rather than hourly values.

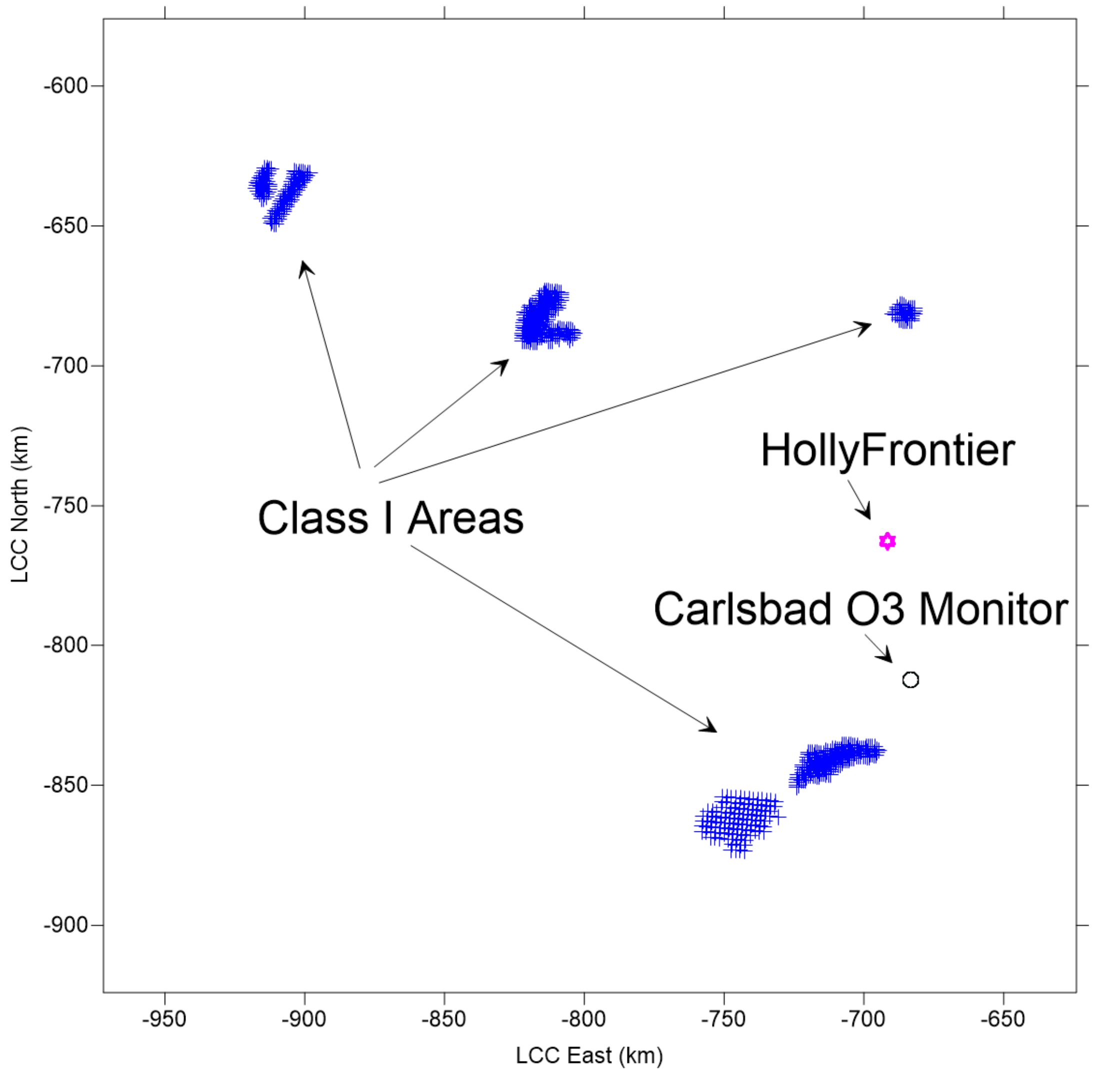


Figure 9. Modeling Domain and Class I Area Receptors

Light Extinction and Haze Impact Calculations

CALPOST was used to calculate light extinction. The EPA/IMPROVE formula will be used to calculate the change in light extinction due to increases in the particulate matter concentrations according to the following:

B_{ext} = 2.2 x f_S(RH) x [Small Sulfates] + 4.8 x f_L(RH) x [Large Sulfate]
+ 2.4 x f_S(RH) x [Small Nitrates] + 5.1 x fL(RH) x [Large Nitrates]
+ 2.8 x [Small Organic Mass] + 6.1 x [Large Organic Mass]
+ 10 x [Elemental Carbon]
+ 1 x [Fine Soil]
+ 0.6 x [Coarse Mass]
+ 1.7 x f_{SS}(RH) x [Sea Salt]
+ [Rayleigh Scattering]
+ 0.33 x [NO_2 (ppb)]

The concentrations, in square brackets, are in micrograms per cubic meter $\mu g/m^3$ and b_{ext} is in units of inverse mega-meters Mm^{-1}.

The values for f_s(RH), f_L(RH), f_{ss}(RH), and the Rayleigh scattering term were obtained from the 2010 FLAG Report in Tables 6, 7, 8 and 9. The assessment of visibility impacts employed CALPOST Method 8, sub-mode 5. CALPUFF assumes that all of the background ammonia is available for the formation of ammonium nitrate from each puff. However, where these puffs overlap in the model, puffs are actually in competition for the available ammonia. To prevent the overestimation of nitrate, the Ammonia Limiting Method option in the POSTUTIL processor (MNITRATE = 1) was used to compute the HNO_3/NO_3 concentration partition prior to executing the visibility calculations in CALPOST. In addition, the relative humidity in CALPOST was capped at 95% consistent with current FLM recommendations.

CALPOST calculates the change in light extinction for each 24-hour day. These results were reviewed to determine the number of days where the change in light extinction is at or above 5% change and 10% change at each Class I area.

Deposition Calculations

In addition to visibility, modeled deposition rates for total sulfur (S) and nitrogen (N) were calculated. POSTUTIL was used to summarize the total dry and wet deposition fluxes for the S and N species. Specifically, the N and S deposition was assumed to consist of the following composition of modeled species:

Total Nitrogen Flux (CSPECCMP) =

SO_4 x 0.291667
NOx x 0.304348
HNO_3 x 0.222222
NO_3 x 0.451613

Total Sulfur Flux (CSPECCMP)=

SO_2 x 0.500000
SO_4 x 0.333333

After the total N and S deposition rates were calculated in POSTUTIL, CALPOST was used to determine the average annual N and S deposition for each receptor in each Class I area. Two pollutant names were modeled in CALPUFF and passed to POSTUTIL and CALPOST. SO2 represented the maximum short term emissions from the refinery project. SO2LT represented the annual emissions increase. The SO2LT pollutant was used in the deposition analysis. SO2 was used in all other analyses. A scaling factor (A) of 316.224 was employed in CALPOST to convert the default deposition rates in units of μg/m^2/sec to the units of kg/ha/yr needed for comparison to the Deposition Analysis Thresholds (DATs) of 0.005.

6.4 Class I Increment Analysis

Pollutant concentrations were also calculated for comparision to the proposed Class I significance levels. CALPUFF was used to calculate concentrations at all Class I receptors located in excess of 50km from the source, regardless of Q/D. The model results were compared to the proposed Class I significant impact levels (Table 9).

Table 9. Proposed PSD Class I Significant Impact Levels

Pollutant	Averaging Time	PSD Class I Significant Impact Levels (µg/m^3)
PM2.5	24-hour	0.27
	Annual	0.05
PM10	24-hour	0.30
	Annual	0.20
NO_2	Annual	0.10
SO_2	3-hour	1.00
	24-hour	0.20
	Annual	0.10

7.0 CLASS II ANALYSIS RESULTS

Attachment B provides the model summary output. Model input and output files, including the BPIP-PRIME and meteorological data files, are provided electronically.

7.1 Significant Impact Analysis Results

The project is expected to result in significant impacts for PM2.5, SO_2, NO_2 and H_2S (Table 10). Insignificant impacts were calculated for PM10 and O_3. Based upon the results of the significant impacts analysis, a cumulative analysis was conducted to assess compliance with the NAAQS/NMAAQS and increments.

Table 10. Class II Significant Impact Analysis Results

Pollutant	Avg Period	Maximum Modeled Impact (Including Secondary PM2.5) ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
PM2.5	Annual	0.42	0.2	NA	0.76
	24-hr	4.51	1.2	4.0	1.48
PM10	Annual	0.66	1.0	NA	NA
	24-hr	2.13	5.0	10	NA
SO_2	1-hr	26.06	7.8	NA	10.7
	24-hr	7.93	5.0	13	1.73
	3-hr	22.3	25.0	NA	NA
	Annual	0.74	1.0	NA	NA
NO_2	1-hr	35.1	7.5	14	1.82
	Annual	2.63	1.0	NA	1.07
CO	1-hr	41.2	2000	NA	NA
	8-hr	25.4	500	575	NA
H_2S	1-hr	24.5	5.0	NA	0.76
O_3	8-hr	1.69	1.96	NA	NA

NA- not applicable.

7.2 NAAQS/NMAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the NAAQS and NMAAQS for pollutants showing a significant impact. The offsite source inventories discuss in Section 5.4 were employed. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the 24-hr PM2.5 NAAQS was based on the 98th percentile of the annual distribution of daily maximum 24-hour concentrations. Compliance with the 1-hr NO_2 and SO_2 NAAQS was based on the 98th and 99th percentiles, respectively, of the annual distributions of daily maximum 1-hour concentrations. Compliance with the PM10 24-hr standard was based upon the sixth highest value. Annual NAAQS compliance was evaluated based upon the maximum modeled value. Only receptors showing significant project-related impacts were modeled in assessing compliance.

The results of the NAAQS analysis are presented in Table 11 . As can be seen, the model demonstrates compliance.

Table 11. NAAQS/NMAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration (μg/m^3)	Background Concentration (μg/m^3)	Total Concentration (μg/m^3)	Standard (μg/m^3)
H_2S	1-hr	28.9	NA	28.7	41.8
NO_2	Annual	17.3	5.0	22.3	94.02
	1-hr	174	NA	174.0	188.0
PM2.5	Annual	5.71	5.9	11.6	12.0
	24-hour	20.99	13.4	34.4	35.0
SO_2	1-hour	157.0	5.3	162.3	196.4

NA – not applicable. Background monitored values added within model.
PM2.5 modeled values includes secondary PM2.5 contribution.

7.3 Increment Analysis Results

Evaluation of compliance with the short-term increments was based upon the highest-second-high modeled value. The maximum annual concentrations were used to assess compliance with the annual increments. All sources at the refinery were conservatively

assumed to consume increment at their potential to emit rates. Only receptors showing significant project-related impacts were modeled in assessing compliance.
The results of the increment analysis are presented in Table 12. As shown, the model demonstrates compliance.

Table 12. PSD Increment Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)[a]	Standard ($\mu g/m^3$)
NO_2	Annual	24.7	25
SO_2	24-hr	67.1	91

7.4 Secondary PM2.5 Analysis

Following the the AQB's Guidelines, the MERPs calculations resulted in the following values for secondary PM2.5. These values were added to the modeled PM2.5 concentrations:

PM2.5 Annual ($\mu g/m^3$) = ((NOx 240 tpy)/3184) + (SO_2 446 tpy)/2289)) x 0.2 = **0.11**
PM2.5 24-hr ($\mu g/m^3$) = ((NOx (240 tpy)/1155) + (SO_2 446 tpy)/225)) x 1.2 = **2.6**

The calculated secondary PM2.5 impacts were added to the modeled concentrations to assess significant impacts as well as compliance with the NAAQS/NMAAQS and increments.

7.5 Ozone Analysis

Following the the AQB's Guidelines, the MERPs calculations resulted in the following estimate of ozone:

Ozone 8-hour (µg/m3) = ((NOx 240 tpy)/184) + (VOC 208 tpy)/1049)) x 1.96 = **1.69**

The calculated secondary O_3 impact was compared to the O3 significant impact level of 1.96 $\mu g/m^3$ and determined to be insignificant.

7.6 Air Toxics

The results of the air toxics analysis for NH_3 and H_2SO_4 are presented in Table 13. Maximum 8-hour modeled impacts were compared to one-one hundredth of the Occupational Exposure Level ("OEL") listed in 20.2.72.502 NMAC. As shown, the maximum modeled impacts are less than standards.

Table 13. Air Toxics Analysis Results

Pollutant	Avgeraging Period	Maximum Modeled Impact - ($\mu g/m^3$)	1/100 of OEL ($\mu g/m^3$)
NH_3	8-hr	32.3	180
H_2SO_4	8-hr	4.9	10

7.7 Class II Visibility Analysis

The CAA Amendments of 1977 require evaluation of new and modified emission sources to determine potential impacts on visibility. The total hourly particulate matter and NO_X emissions from the project were used as input parameters in the visibility analysis. Emissions were evaluated as described in the EPA Workbook for Plume Visual Impact Screening and Analysis[13] to determine potential contribution to atmospheric discoloration and visual range reduction.

Generally, atmospheric discoloration occurs when NO emissions from combustion sources react in the presence of atmospheric oxygen to form NO_2, a reddish-brown gas. Another form of atmospheric discoloration may be caused by particulate emissions and secondary aerosols formed by gaseous precursor emissions. The visual range reduction (increased haze) is caused primarily by particulate emissions and secondary aerosols such as sulfates and nitrates.[14] Both secondary sulfate and primary particulate emissions are accounted for in the analysis. Emission of other pollutants do not materially affect visibility.

U.S. EPA visibility impairment analysis guidelines were followed in conducting the analysis. The analysis was performed for the Living Desert State Park, located a minimum of 42 km and a maximum of 49 km south of the refinery.

This analysis requires inputs of emission rates (PM and NO_X), regional visual range, distance between the source and the object of study, and worst-case dispersion parameters (i.e., wind speed and stability). Outputs from the model include:

- Plume contrast against the sky and terrain; and,
- Perceptibility of the plume (Delta E criteria).

Emission rates for PM and NOx for the analyses were set to 84.3 and 182 tons per year, respectively. The background visual range was set to 110km, which was determined from Figure 9 of the VISCREEN manual. The VISCREEN default screening values for Delta E (2.0) and contrast (0.05) were assumed.

As shown in Table 14, no exceedances of the default delta E parameter or green contrast paramters were calculated using the conservative meteorological conditions (F stability and 1 m/sec wind speed) and Level-1 procedures.

The VISCREEN input and output model files are also provided electronically..

Table 14. Level-1 Class II Visibility Analysis Results for the Living Desert State Park

Viewing Background	Theta (degrees)	Azimuth (degrees)	Distance (km)	Alpha (degrees)	Delta E		Green Contrast	
					Criterion	Plume	Criterion	Plume
SKY	10	122	49	46	2.000	0.956	0.050	0.011
SKY	140	122	49	46.000	2.000	0.435	0.05	-0.01
TERRAIN	10	84	42	84.000	2.000	1.631	0.05	0.015
TERRAIN	140	84	42	84.000	2.000	0.180	0.05	0.004

8.0 CLASS I AREA ANALYSIS RESULTS

8.1 Class I Significant Impact Analysis

A Class I significant impacts analysis was conducted for all Class I areas located within 300km of the refinery, regardless of the Q/D screening result. The model results are shown in Table 15. As shown, all impacts are calculated to be insignificant. The SRU3 Tail Gas Incinerator (Model ID H3103) was modeled with a 24-hr average SO_2 emission rate of 28 lb/hr. SO_2 emissions of 50 lb/hr were modeled for SRU3 for the other SO_2 averaging periods.

Table 15. Class I Significant Impact Analysis Results

Pollutant	Average	Modeled Year	Modeled Conc. (μg/m3)	Class I SIL[a] (μg/m³)
NO_2	Annual	2013	1.88×10^{-2}	0.10
		2014	1.89×10^{-2}	
		2015	2.00×10^{-2}	
PM10	24-hour	2013	6.66×10^{-2}	0.30
		2014	6.11×10^{-2}	
		2015	5.78×10^{-2}	
	Annual	2013	7.76×10^{-3}	0.20
		2014	7.59×10^{-3}	
		2015	8.27×10^{-3}	
SO_2	Annual	2013	3.52×10^{-2}	0.10
		2014	3.52×10^{-2}	
		2015	3.79×10^{-2}	
	24-hr	2013	1.93×10^{-1}	0.20
		2014	1.78×10^{-1}	
		2015	1.56×10^{-1}	
	3-hr	2013	9.45×10^{-1}	1.0
		2014	9.82×10^{-1}	
		2015	8.76×10^{-1}	

[a]See 61 FR 38249 (July 23, 1996) for the proposed Class I SILs.

8.2 Class I Visibility Analysis Results

HollyFrontier used the CALPUFF model and associated programs to evaluate the potential visibility impacts associated with the proposed project at the Carlsbad Caverns, the only Class I Area with a Q/D value that exceeded the FLM's screening criterion. The 98% (8th high) concentrations over all receptors, not by receptor, were conservatively used in the assessment.

Results are presented in Table 16. As shown, there are no exceedances of the 5% extinction criterion at Carlsbad Caverns.

Table 16. Class I 24-hr Visibility Analysis Results

Parameter	Meteorological Model Year	Modeled Value, Extinction (% change)	Change in Light Extinction (% change)	%Standard
Visibility	2013	2.78	5	56%
	2014	1.90	5	38%
	2015	2.24	5	45%

8.3 Class I Deposition Analysis Results

In addition to visibility, modeled deposition rates of total sulfur (S) and nitrogen (N) were calculated. These results were reviewed or comparison to the Deposition Analysis Thresholds (DATs) of 0.005 at each Class I area. Annual emission rates were used. In addition, all Class I areas were conservatively included eventhough only Carlsbad Caverns had a Q/D in excess of the FLM's screening criterion.

Results for nitrogen and sulfur deposition are presented in Table 17. No exceedances of the DATs were identified.

Table 17. Class I Annual Deposition Analysis Results

Parameter	Meteorological Model Year	Modeled Value, Deposition (ka/ha/yr)	Deposition Analysis Threshold (ka/ha/yr)	%Standard
Nitrogen	2013	2.56×10^{-3}	0.005	51%
	2014	2.67×10^{-3}		53%
	2015	2.87×10^{-3}		57%
Sulfur	2013	3.14×10^{-3}		63%
	2014	3.32×10^{-3}		66%
	2015	3.77×10^{-3}		75%

HOLLYFRONTIER

ATTACHMENT A

- HollyFrontier Model Input Data
- Off-Site Source Model Input Data
- Volume Source Calculations
- Flare Parameter Calculations
- CALPUFF Model Input Data
- CALPUFF CT PM Speciation

Last Update 1-6-21
Holly Frontier - Artesia Model Input
NAD83, Zone 13
Point Sources

											Project Related Emissions Increase (lb/hr)								
Model Source No.	**Source ID**		**Source Description**	**Easting (X) (m)**	**Northing (Y) (m)**	**Base Elevation (ft)**	**Stack Height (ft)**	**Temp. (°F)**	**Exit Velocity (ft/sec)**	**Stack Diameter (ft)**	**PM10**	**PM25_ST**	**PM25_LT**	**NO2_ST**	**NO2_LT**	**SO2_ST**	**SO2_LT**	**CO**	**H2S**
1	B0007	DEFAULT	Boiler 7	556685.00	3634643.00	3363.5	74.8	275	47.90	5.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	B0008	DEFAULT	Boiler 8	556686.00	3634633.00	3363.5	65.0	250	62.80	4.50	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	B0009	DEFAULT	Boiler 9	556665.00	3634636.00	3363.3	60.0	300	47.70	5.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	H0009	DEFAULT	Unit 13 Naphtha Splitter Reboiler	556553.00	3634619.00	3363.4	77.5	530	17.90	4.50	8.42E-02	8.42E-02	8.42E-02	5.40E-01	5.40E-01	1.83E-01	0.00E+00	8.76E-01	0.00E+00
5	H0011	DEFAULT	Unit 21 Vacuum Unit Heater	556821.00	3634014.00	3370.9	80.0	850	26.00	4.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	H0018	DEFAULT	Unit 06 HDS Reboiler	556556.00	3634718.00	3362.3	75.0	700	19.50	4.00	1.15E-01	1.15E-01	1.15E-01	1.52E+00	1.52E+00	4.25E-01	0.00E+00	1.27E+00	0.00E+00
7	H0019	DEFAULT	South Crude Charge Heater	556625.00	3634023.00	3370.3	155.7	450	21.40	4.38	6.70E-02	6.70E-02	6.70E-02	6.20E-01	5.66E-01	0.00E+00	0.00E+00	7.71E-01	0.00E+00
8	H0020	DEFAULT	South Crude Charge Heater	556644.00	3634021.00	3370.5	175.0	330	12.20	6.50	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	H0028	DEFAULT	Unit 21 Heater	556829.00	3634014.00	3370.9	50.3	850	18.80	2.67	3.13E-02	3.13E-02	3.13E-02	1.72E+00	1.72E+00	9.99E-02	0.00E+00	3.51E-01	0.00E+00
10	H0030	DEFAULT	Unit 06 Charge Heater	556556.00	3634724.00	3362.2	67.0	575	22.50	4.00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	1.00E+00	1.88E-01	0.00E+00	2.75E+00	0.00E+00
11	H0040	DEFAULT	Unit 13 Charge Heater	556557.00	3634730.00	3362.1	101.0	590	22.80	4.00	0.00E+00	0.00E+00	0.00E+00	7.20E-01	7.20E-01	0.00E+00	0.00E+00	7.73E-01	0.00E+00
12	H0312	DEFAULT	Unit 10 FCC Feed Heater	556690.00	3634676.00	3363.8	96.5	675	20.40	4.00	2.30E-01	2.30E-01	2.30E-01	3.35E+00	3.35E+00	9.69E-01	1.78E-01	2.95E+00	0.00E+00
13	H0352_54	DEFAULT	Unit 70 CCR Heaters	556734.00	3634728.00	3364.0	210.9	300	16.50	8.75	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E+00	0.00E+00
14	H0355	DEFAULT	Unit 70 Stabilizer Reboiler Heater	556734.12	3634703.54	3364.0	135.2	442	28.70	2.50	1.18E-02	1.18E-02	1.18E-02	9.70E-01	9.70E-01	0.00E+00	0.00E+00	1.01E+00	0.00E+00
15	H0362_64	DEFAULT	Unit 70 CCR Heaters	556718.00	3634728.00	3364.1	205.5	338	16.90	7.00	3.10E-01	3.10E-01	3.10E-01	2.51E+00	2.51E+00	1.34E+00	0.00E+00	3.45E+00	0.00E+00
16	H0421	DEFAULT	Unit 44 Charge Heater	556755.00	3634642.00	3364.0	81.7	650	23.70	3.25	7.35E-02	7.35E-02	7.35E-02	6.30E-01	6.30E-01	2.38E-01	0.00E+00	8.10E-01	0.00E+00
17	H0464	DEFAULT	SRU Hot Oil Heater	556526.00	3634548.00	3364.3	79.8	450	9.60	2.75	9.47E-03	9.47E-03	9.47E-03	5.28E-02	5.28E-02	0.00E+00	0.00E+00	8.83E-02	0.00E+00
18	H0600	DEFAULT	Unit 09 Depropanizer Reboiler Heater	556795.00	3634716.00	3364.0	177.0	500	33.00	4.60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.55E+00	0.00E+00
19	H0601	DEFAULT	Unit 33 Charge Heater	556788.00	3634582.00	3364.3	131.0	300	11.60	6.50	2.35E-01	2.35E-01	2.35E-01	1.30E+00	1.30E+00	7.98E-01	0.00E+00	2.57E+00	0.00E+00
20	H2421	DEFAULT	Unit 45 Charge Heater	556769.00	3634573.00	3364.3	87.0	890	24.80	3.50	2.35E-02	2.35E-02	2.35E-02	2.30E-02	2.30E-02	0.00E+00	0.00E+00	2.98E-01	0.00E+00
21	H2501	DEFAULT	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	556949.00	3634500.00	3364.5	168.0	710	19.00	7.83	9.93E-01	9.93E-01	9.93E-01	3.60E+00	3.60E+00	4.35E+00	1.64E+00	7.20E+00	0.00E+00
22	H3101	DEFAULT	SRU3 Hot Oil Heater	556557.00	3634512.00	3364.5	80.0	450	9.62	2.75	9.21E-02	9.21E-02	9.21E-02	3.30E-01	3.30E-01	4.11E-01	1.62E-01	9.87E-01	0.00E+00
23	H3402	DEFAULT	Unit 34 Hydrocracker Reboiler 1	556947.00	3634510.00	3364.4	67.0	575	27.90	4.00	4.30E-01	4.30E-01	4.30E-01	1.56E+00	1.56E+00	1.89E+00	7.11E-01	4.68E+00	0.00E+00
24	H3403	DEFAULT	Unit 34 Hydrocracker Reactor Charge Heater	556933.00	3634516.00	3364.4	86.1	705	19.40	4.00	2.65E-01	2.65E-01	2.65E-01	9.60E-01	9.60E-01	1.16E+00	4.38E-01	2.92E+00	0.00E+00
25	H8801_02	DEFAULT	Unit 63 Hydrogen Plant Reformer Furnaces	556903.00	3634585.00	3364.0	130.0	600	75.40	3.83	3.64E-01	3.64E-01	3.64E-01	4.46E+00	4.46E+00	0.00E+00	0.00E+00	4.02E+00	0.00E+00
26	H9851	DEFAULT	Unit 64 Hydrogen Plant Reformer	556901.00	3634616.00	3364.0	176.0	350	23.80	10.00	2.59E+00	2.59E+00	2.59E+00	1.12E+01	4.51E+00	0.00E+00	0.00E+00	1.81E+01	0.00E+00
27	H0473	DEFAULT	SRU2 Tail Gas Incinerator	556518.00	3634578.00	3364.1	150.0	1150	44.20	4.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
28	H3103	DEFAULT	SRU3 Tail Gas Incinerator	556553.00	3634495.00	3364.7	150.0	1200	49.90	4.00	1.33E+01	1.33E+01	1.91E+00	6.50E+00	6.51E+00	5.00E+01	1.87E+01	1.50E+01	2.32E-01
29	FCCREGEN	DEFAULT	FCC Regenerator	556712.00	3634686.00	3363.7	153.0	125	28.30	6.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
30	FL0400	DEFAULT	FL-0400, North Plant Flare	556647.00	3634806.00	3361.9	395.1	1832	65.60	16.11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-02
31	FL0401	DEFAULT	FL-0401, South Plant Flare	556802.00	3634036.00	3370.6	342.2	1832	65.60	9.60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.09E-01
32	FL0402	DEFAULT	FL-0402, FCC Flare	556684.00	3634806.00	3363.8	304.6	1832	65.60	9.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E+01
33	FL0403	DEFAULT	FL-0403, Alky Flare	556685.00	3634875.00	3363.3	499.1	1832	65.60	19.45	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-02
34	FL0404	DEFAULT	FL-0404, GOHT Flare	556898.00	3634870.00	3361.8	568.5	1832	65.60	26.01	0.00E+00	0.00E+00	0.00E+00	1.12E+01	4.82E+00	3.98E+01	2.46E+00	4.78E+01	4.24E-01
35	TL4VCU	DEFAULT	TL-4 VCU	556768.00	3634222.00	3367.9	81.8	1832	65.60	3.92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
36	H5401	DEFAULT	Unit 54 HDS Reactor Heater	556917.00	3634721.00	3363.0	83.0	643	8.81	3.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
37	Y0001	DEFAULT	TCC Cooling Tower	556711.00	3634046.00	3370.5	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
38	Y0002	DEFAULT	S. Alky Cooling Tower (Marley Cooling Tower)	556770.00	3634059.00	3370.2	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	Y0008	DEFAULT	North Alky Cooling Tower	556872.00	3634669.00	3363.8	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	Y0011	DEFAULT	FCC & NP Cooling Tower	556601.00	3634564.00	3363.9	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	Y0012	DEFAULT	Hydrogen Plants Cooling Tower	556898.00	3634670.00	3363.7	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42	CTTT0006	DEFAULT	Unit 07 Amine W-0745 Cooling Tower	556469.00	3634681.00	3363.4	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
43	FLHEP	DEFAULT	HEP Portable Flare	556740.00	3634216.00	3367.8	51.1	1832	65.60	2.29	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.88E-02
44	TVCU	DEFAULT	Tank VCU	556458.00	3634605.00	3364.3	18.5	1832	65.60	0.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	H_2601	DEFAULT	RDU Reactor Heater	556954.24	3634430.58	3365.0	138.5	600	25.50	3.87	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
46	Y_0026A	DEFAULT	RDU Cooling Tower	556999.64	3634453.06	3364.6	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
47	Y_0026B	DEFAULT	RDU Cooling Tower	556999.55	3634447.97	3364.7	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	Y_0093A	DEFAULT	PTU Cooling Tower	556855.96	3633752.89	3373.2	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	Y_0093B	DEFAULT	PTU Cooling Tower	556855.87	3633747.81	3373.3	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	H_9301	DEFAULT	Vapor Combustor Unit	556871.00	3633812.00	3372.9	87.0	1600	2.60	4.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51	082B6	DEFAULT	Filter Aid Tank Vent	556883.66	3633823.60	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	26_2B25A	DEFAULT	26_2B25AP01 - Adsorption Train 1 Vent B	556854.36	3633819.49	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	26_1B25B	DEFAULT	26_1B25BP01 - Adsorption Train 2 Vent A	556859.14	3633819.49	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54	26_2B25B	DEFAULT	26_2B25BP01 - Adsorption Train 2 Vent B	556864.00	3633819.49	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	26_2B26	DEFAULT	26_2B26P01 - Adsorption Vent B	556872.17	3633819.84	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	26_1B26	DEFAULT	26_1B26P01 - Adsorption Vent A	556880.87	3633819.69	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57	26_1B25A	DEFAULT	26_1B25AP01 - Adsorption Train 1 Vent A	556890.55	3633819.76	3372.8	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	56B25C	DEFAULT	Silo 3 Vent	556846.62	3633816.62	3373.1	80.0	100	161.10	0.67	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59	*V0543*	DEFAULT	*Portable Air Compressor*	556618.90	3634620.37	3363.4	6.0	1000	244.82	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60	*V0545*	DEFAULT	*Portable Air Compressor*	556695.95	3634556.00	3364.0	6.0	1000	244.82	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	*V0546*	DEFAULT	*Portable Air Compressor*	556765.80	3634115.08	3369.5	6.0	1000	225.99	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62	*G0100*	DEFAULT	*UPS backup generator*	556695.06	3634566.59	3364.0	10.0	1000	229.84	0.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
63	*G0101*	DEFAULT	*UPS backup generator*	556780.25	3634102.48	3369.7	12.0	1000	238.68	0.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	*G0102*	DEFAULT	*Server Backup Generator*	557026.11	3634058.67	3369.2	10.0	1000	354.00	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	*E0600W*	DEFAULT	*Fire Water Pump Engine*	557227.00	3634864.00	3357.7	4.0	1000	354.04	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
66	*E0601M*	DEFAULT	*Fire Water Pump Engine*	557233.04	3634863.96	3357.6	4.0	1000	354.04	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	*E0602E*	DEFAULT	*Fire Water Pump Engine*	557238.59	3634863.84	3357.5	4.0	1000	354.04	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	*E0603*	DEFAULT	*Fire Water Pump Engine*	556907.01	3634446.37	3365.1	4.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
69	*V0511*	DEFAULT	*Portable Fire Water Pump Engine*	557058.55	3634424.95	3364.0	8.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70	*G2601*	DEFAULT	*Emergency Generator*	556682.00	3634588.54	3363.7	10.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71	*G2602*	DEFAULT	*Emergency Generator*	556698.90	3634587.41	3363.8	10.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	TRLO_9	DEFAULT	Molten Sulfur Railcar Loading Controlled	556463.00	3634577.00	3364.5	15.0	130	97.48	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-03
										Total (lb/hr)	**19.25**	**19.25**	**7.84**	**54.74**	**41.65**	**101.88**	**24.33**	**124.26**	**13.35**
										Total (tpy)	84.31	84.31	34.35	239.75	182.42	446.23	106.56	544.24	58.48

Sources identified by the red font are not part of the HollyFrontier refinery. They are an adjacent, separate stationary source.
Per Table 8-2 of Appendix W, actual PM emissions were modeled in lieu of PTE for the FCC regenerator. This unit is not modified.
Pollutant names: pollutant names with a "ST" extension were used to assess compliance with short-term standards (i.e., 1-hr, 3-hr and 24-hr).
Pollutant names: pollutant names with a "LT" extension were used to assess compliance with annual standards.

Last Update 1-6-21
Holly Frontier - Artesia Model Input
NAD83, Zone 13
Point Sources

				Potential to Emit (lb/hr)										
Model Source No.	**Source ID**		**Source Description**	**PM10**	**PM25_ST**	**PM25_LT**	**NO2_ST**	**NO2_LT**	**SO2_ST**	**SO2_24hr**	**CO**	**H2S**	**H2SO4**	**NH3**
1	B0007	DEFAULT	Boiler 7	1.78E+00	1.78E+00	1.78E+00	1.29E+01	1.29E+01	8.04E+00	8.04E+00	1.97E+01	0.00E+00	0.00E+00	0.00E+00
2	B0008	DEFAULT	Boiler 8	1.78E+00	1.78E+00	1.78E+00	1.29E+01	1.29E+01	8.04E+00	8.04E+00	1.97E+01	0.00E+00	0.00E+00	0.00E+00
3	B0009	DEFAULT	Boiler 9	1.82E+00	1.82E+00	1.82E+00	4.89E+00	4.89E+00	2.89E+00	2.89E+00	9.04E+00	0.00E+00	0.00E+00	0.00E+00
4	H0009	DEFAULT	Unit 13 Naphtha Splitter Reboiler	3.64E-01	3.64E-01	3.64E-01	3.96E+00	3.96E+00	1.64E+00	1.64E+00	4.03E+00	0.00E+00	0.00E+00	0.00E+00
5	H0011	DEFAULT	Unit 21 Vacuum Unit Heater	3.15E-01	3.15E-01	3.15E-01	9.52E+00	7.24E+00	1.42E+00	1.42E+00	3.48E+00	0.00E+00	0.00E+00	0.00E+00
6	H0018	DEFAULT	Unit 06 HDS Reboiler	2.65E-01	2.65E-01	2.65E-01	3.49E+00	3.49E+00	1.19E+00	1.19E+00	2.93E+00	0.00E+00	0.00E+00	0.00E+00
7	H0019	DEFAULT	South Crude Charge Heater	4.47E-01	4.47E-01	4.57E-01	2.90E+00	2.85E+00	2.02E+00	2.02E+00	4.94E+00	0.00E+00	0.00E+00	0.00E+00
8	H0020	DEFAULT	South Crude Charge Heater	7.45E-01	7.45E-01	7.45E-01	4.82E+00	4.82E+00	3.37E+00	3.37E+00	8.23E+00	0.00E+00	0.00E+00	0.00E+00
9	H0028	DEFAULT	Unit 21 Heater	1.02E-01	1.02E-01	1.02E-01	2.17E+00	2.17E+00	4.60E-01	4.60E-01	1.13E+00	0.00E+00	0.00E+00	0.00E+00
10	H0030	DEFAULT	Unit 06 Charge Heater	4.00E-01	4.00E-01	3.48E-01	3.19E+00	3.19E+00	1.57E+00	1.57E+00	3.84E+00	0.00E+00	0.00E+00	0.00E+00
11	H0040	DEFAULT	Unit 13 Charge Heater	4.00E-01	4.00E-01	3.48E-01	3.78E+00	3.78E+00	1.57E+00	1.57E+00	3.84E+00	0.00E+00	0.00E+00	0.00E+00
12	H0312	DEFAULT	Unit 10 FCC Feed Heater	2.90E-01	2.90E-01	2.90E-01	4.62E+00	4.62E+00	1.31E+00	1.31E+00	3.20E+00	0.00E+00	0.00E+00	0.00E+00
13	H0352_54	DEFAULT	Unit 70 CCR Heaters	1.70E+00	1.70E+00	1.66E+00	9.00E+00	9.00E+00	8.07E+00	8.07E+00	1.83E+01	0.00E+00	0.00E+00	0.00E+00
14	H0355	DEFAULT	Unit 70 Stabilizer Reboiler Heater	2.32E-01	2.32E-01	2.32E-01	2.52E+00	2.52E+00	1.13E+00	1.13E+00	2.56E+00	0.00E+00	0.00E+00	0.00E+00
15	H0362_64	DEFAULT	Unit 70 CCR Heaters	1.03E+00	1.03E+00	1.03E+00	6.88E+00	6.88E+00	5.04E+00	5.04E+00	1.14E+01	0.00E+00	0.00E+00	0.00E+00
16	H0421	DEFAULT	Unit 44 Charge Heater	2.24E-01	2.24E-01	2.24E-01	2.43E+00	2.43E+00	1.01E+00	1.01E+00	2.47E+00	0.00E+00	0.00E+00	0.00E+00
17	H0464	DEFAULT	SRU Hot Oil Heater	7.95E-02	7.95E-02	9.13E-02	5.23E-01	5.23E-01	3.58E-01	3.58E-01	8.78E-01	0.00E+00	0.00E+00	0.00E+00
18	H0600	DEFAULT	Unit 09 Depropanizer Reboiler Heater	6.95E-01	6.95E-01	6.95E-01	4.70E+00	4.67E+00	3.14E+00	3.14E+00	7.69E+00	0.00E+00	0.00E+00	0.00E+00
19	H0601	DEFAULT	Unit 33 Charge Heater	6.46E-01	6.46E-01	6.46E-01	3.51E+00	3.51E+00	2.91E+00	2.91E+00	7.14E+00	0.00E+00	0.00E+00	0.00E+00
20	H2421	DEFAULT	Unit 45 Charge Heater	2.24E-01	2.24E-01	2.24E-01	1.22E+00	1.22E+00	9.77E-01	9.77E-01	2.47E+00	0.00E+00	0.00E+00	0.00E+00
21	H2501	DEFAULT	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	9.93E-01	9.93E-01	9.93E-01	3.60E+00	3.60E+00	4.35E+00	4.35E+00	7.20E+00	0.00E+00	0.00E+00	0.00E+00
22	H3101	DEFAULT	SRU3 Hot Oil Heater	9.11E-02	9.11E-02	9.13E-02	3.30E-01	3.30E-01	4.11E-01	4.11E-01	9.90E-01	0.00E+00	0.00E+00	0.00E+00
23	H3402	DEFAULT	Unit 34 Hydrocracker Reboiler 1	4.30E-01	4.30E-01	4.30E-01	1.56E+00	1.56E+00	1.89E+00	1.89E+00	4.68E+00	0.00E+00	0.00E+00	0.00E+00
24	H3403	DEFAULT	Unit 34 Hydrocracker Reactor Charge Heater	2.65E-01	2.65E-01	2.65E-01	9.60E-01	9.60E-01	1.16E+00	1.16E+00	2.93E+00	0.00E+00	0.00E+00	0.00E+00
25	H8801_02	DEFAULT	Unit 63 Hydrogen Plant Reformer Furnaces	1.26E+00	1.26E+00	1.26E+00	8.66E+00	8.66E+00	2.85E+00	2.85E+00	1.39E+01	0.00E+00	0.00E+00	0.00E+00
26	H9851	DEFAULT	Unit 64 Hydrogen Plant Reformer	2.79E+00	2.79E+00	2.81E+00	1.12E+01	4.52E+00	6.32E+00	6.32E+00	2.02E+01	0.00E+00	0.00E+00	1.38E+00
27	H0473	DEFAULT	SRU2 Tail Gas Incinerator	1.15E+01	1.15E+01	1.92E+00	6.50E+00	6.51E+00	1.35E+02	1.35E+02	2.77E+01	1.44E+00	1.03E+01	0.00E+00
28	H3103	DEFAULT	SRU3 Tail Gas Incinerator	4.93E+00	4.93E+00	1.91E+00	6.50E+00	6.51E+00	5.00E+01	5.00E+01	1.50E+01	5.32E-01	3.83E+00	0.00E+00
29	FCCREGEN	DEFAULT	FCC Regenerator	2.29E+01	1.90E+01	1.57E+01	3.49E+01	2.32E+01	2.79E+01	2.79E+01	1.22E+02	0.00E+00	2.13E+00	1.63E+01
30	FL0400	DEFAULT	FL-0400, North Plant Flare	0.00E+00	0.00E+00	0.00E+00	3.47E+00	1.24E+00	4.48E+00	4.48E+00	1.42E+01	4.75E-02	0.00E+00	0.00E+00
31	FL0401	DEFAULT	FL-0401, South Plant Flare	0.00E+00	0.00E+00	0.00E+00	1.66E+00	4.22E-01	5.73E+01	5.73E+01	6.82E+00	6.09E-01	0.00E+00	0.00E+00
32	FL0402	DEFAULT	FL-0402, FCC Flare	0.00E+00	0.00E+00	0.00E+00	1.63E+02	4.68E+00	1.13E+03	1.13E+03	1.24E+03	1.20E+01	0.00E+00	0.00E+00
33	FL0403	DEFAULT	FL-0403, Alky Flare	0.00E+00	0.00E+00	0.00E+00	2.74E+00	5.78E-01	1.10E+00	1.10E+00	1.13E+01	1.17E-02	0.00E+00	0.00E+00
34	FL0404	DEFAULT	FL-0404, GOHT Flare	0.00E+00	0.00E+00	0.00E+00	1.17E+01	5.36E+00	3.99E+01	3.99E+01	4.80E+01	4.24E-01	0.00E+00	0.00E+00
35	TL4VCU	DEFAULT	TL-4 VCU	1.05E-01	1.05E-01	1.50E-02	1.97E+00	2.80E-01	5.14E-01	5.14E-01	1.97E+00	0.00E+00	0.00E+00	0.00E+00
36	H5401	DEFAULT	Unit 54 HDS Reactor Heater	1.60E-01	1.60E-01	1.60E-01	7.73E-01	7.73E-01	7.22E-01	7.22E-01	6.44E-01	0.00E+00	0.00E+00	0.00E+00
37	Y0001	DEFAULT	TCC Cooling Tower	1.58E-01	5.94E-04	5.94E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
38	Y0002	DEFAULT	S. Alky Cooling Tower (Marley Cooling Tower)	1.58E-01	5.94E-04	5.94E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	Y0008	DEFAULT	North Alky Cooling Tower	3.69E-01	1.39E-03	1.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	Y0011	DEFAULT	FCC & NP Cooling Tower	3.16E-01	1.19E-03	1.19E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	Y0012	DEFAULT	Hydrogen Plants Cooling Tower	1.05E-01	3.96E-04	3.96E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42	CTTT0006	DEFAULT	Unit 07 Amine W-0745 Cooling Tower	9.48E-02	3.56E-04	3.56E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
43	FLHEP	DEFAULT	HEP Portable Flare	0.00E+00	0.00E+00	0.00E+00	1.16E+01	1.98E-02	1.10E-01	1.10E-01	5.01E+01	1.19E-03	0.00E+00	0.00E+00
44	TVCU	DEFAULT	Tank VCU	9.39E-03	9.39E-03	5.71E-04	1.74E-01	8.42E-03	4.96E-02	4.96E-02	1.73E-01	1.24E-03	0.00E+00	0.00E+00
45	H_2601	DEFAULT	RDU Reactor Heater	3.21E-01	3.21E-01	3.21E-01	1.29E+00	1.29E+00	5.78E-01	5.78E-01	2.59E+00	0.00E+00	0.00E+00	0.00E+00
46	Y_0026A	DEFAULT	RDU Cooling Tower	1.32E-02	4.95E-05	4.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
47	Y_0026B	DEFAULT	RDU Cooling Tower	1.32E-02	4.95E-05	4.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	Y_0093A	DEFAULT	PTU Cooling Tower	1.30E-02	5.00E-05	5.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	Y_0093B	DEFAULT	PTU Cooling Tower	1.30E-02	5.00E-05	5.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	H_9301	DEFAULT	Vapor Combustor Unit	1.40E-02	1.40E-02	1.40E-02	4.27E-01	4.27E-01	1.10E-02	1.10E-02	1.56E-01	0.00E+00	0.00E+00	0.00E+00
51	082B6	DEFAULT	Filter Aid Tank Vent	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	26_2B25A	DEFAULT	26_2B25AP01 - Adsorption Train 1 Vent B	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	26_1B25B	DEFAULT	26_1B25BP01 - Adsorption Train 2 Vent A	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54	26_2B25B	DEFAULT	26_2B25BP01 - Adsorption Train 2 Vent B	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	26_2B26	DEFAULT	26_2B26P01 - Adsorption Vent B	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	26_1B26	DEFAULT	26_1B26P01 - Adsorption Vent A	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57	26_1B25A	DEFAULT	26_1B25AP01 - Adsorption Train 1 Vent A	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	56B25C	DEFAULT	Silo 3 Vent	5.80E-02	5.80E-02	5.80E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59	*V0543*	DEFAULT	*Portable Air Compressor*	9.21E-02	9.21E-02	9.21E-02	1.84E+00	1.84E+00	3.48E-03	3.48E-03	1.61E+00	0.00E+00	0.00E+00	0.00E+00
60	*V0545*	DEFAULT	*Portable Air Compressor*	9.21E-02	9.21E-02	9.21E-02	1.84E+00	1.84E+00	3.48E-03	3.48E-03	1.61E+00	0.00E+00	0.00E+00	0.00E+00
61	*V0546*	DEFAULT	*Portable Air Compressor*	4.54E-03	4.54E-03	4.54E-03	9.07E-02	9.07E-02	1.72E-03	1.72E-03	1.13E+00	0.00E+00	0.00E+00	0.00E+00
62	*G0100*	DEFAULT	*UPS backup generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
63	*G0101*	DEFAULT	*UPS backup generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	*G0102*	DEFAULT	*Server Backup Generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	*E0600W*	DEFAULT	*Fire Water Pump Engine*	1.24E-01	1.24E-01	1.42E-03	2.49E+00	2.84E-02	4.68E-03	4.68E-03	2.16E+00	0.00E+00	0.00E+00	0.00E+00
66	*E0601M*	DEFAULT	*Fire Water Pump Engine*	1.24E-01	1.24E-01	1.42E-03	2.49E+00	2.84E-02	4.68E-03	4.68E-03	2.16E+00	0.00E+00	0.00E+00	0.00E+00
67	*E0602E*	DEFAULT	*Fire Water Pump Engine*	1.24E-01	1.24E-01	1.42E-03	2.49E+00	2.84E-02	4.68E-03	4.68E-03	2.16E+00	0.00E+00	0.00E+00	0.00E+00
68	*E0603*	DEFAULT	*Fire Water Pump Engine*	1.01E-01	1.01E-01	1.15E-03	2.02E+00	2.30E-02	3.79E-03	3.79E-03	1.75E+00	0.00E+00	0.00E+00	0.00E+00
69	*V0511*	DEFAULT	*Portable Fire Water Pump Engine*	2.30E-01	2.30E-01	2.63E-03	4.60E+00	5.25E-02	8.70E-03	8.70E-03	4.03E+00	0.00E+00	0.00E+00	0.00E+00
70	*G2601*	DEFAULT	*Emergency Generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71	*G2602*	DEFAULT	*Emergency Generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	TRLO_9	DEFAULT	Molten Sulfur Railcar Loading Controlled	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-03	0.00E+00	0.00E+00
Sources identified by the red font are not part of the HollyFrontier refinery. They are an adja				**61.57**	**56.44**	**39.62**	**390.70**	**172.47**	**1524.25**	**1524.25**	**1746.92**	**15.11**	**16.29**	**17.63**
Per Table 8-2 of Appendix W, actual PM emissions were modeled in lieu of PTE for the FCC				269.68	247.21	173.52	1711.27	755.40	6676.20	6676.20	7651.51	66.18	71.37	77.23
Pollutant names: pollutant names with a "ST" extension were used to assess compliance wit														
Pollutant names: pollutant names with a "LT" extension were used to assess compliance wit						**173.52**								

HollyFrontier - Volume Sources (H2S and Toxics Only)

Model Source No.	Source ID	Source Description	Easting (X)	Northing (Y)	Base Elevation (ft)	Release Height (ft)	Horizontal Dimension - Sigma Y (ft)	Vertical Dimension - Sigma Z (ft)
73	TLO_1	TLO-1 Asphalt Truck Loading Rack	556951.00	3634033.00	3370.5	15.0	2.3	7.0
74	TL_2	TL-2 Asphalt Truck Loading Rack #2	556913.00	3634267.00	3366.9	15.0	2.3	7.0
75	TL_4	TL-4 Fuels Truck Loading Rack e, f	556740.00	3634364.00	3365.9	15.0	2.3	7.0
76	TL_7	TL-7 CBO/LCO Truck Loading Rack	556410.00	3634889.00	3365.3	15.0	2.3	7.0
77	RLO_8	RLO-8 Railcar Loading Rack	556379.00	3634966.00	3366.5	15.0	2.3	7.0
78	RLO_19	RLO-19 Railcar Loading Rack	556513.00	3634124.00	3369.6	15.0	2.3	7.0
79	TLO_20	TLO-20 Asphalt/Pitch Truck Loading Rack	557316.00	3634568.00	3360.1	15.0	2.3	7.0
80	TRLO_9F	Molten Sulfur Railcar Loading	556463.00	3634577.00	3364.5	15.0	2.3	7.0
81	T_0049	Slop Oil Tank	556806.00	3634183.00	3368.3	36.0	2.3	16.7
82	T_0059	T-0059, Light Cycle Oil (LCO) tank	556498.59	3634850.62	3363.5	30.0	7.2	14.0
83	T_0061	Light Cycle Oil (LCO) fixed roof tank	556497.48	3634911.00	3364.1	30.0	10.3	14.0
84	T_0063	Heavy Cycle Oil (HCO) fixed roof tank	556531.58	3634945.66	3363.7	30.0	10.5	14.0
85	T_0065	Heavy Cycle Oil (HCO) fixed roof tank	556528.22	3634909.88	3363.7	30.0	10.3	14.0
86	T_0075	Heavy Cycle Oil (HCO)fixed roof tank	556464.49	3634916.03	3364.6	32.0	13.4	14.9
87	T_0081	Asphalt/Pitch Tank	557350.20	3634629.35	3358.7	40.0	22.4	18.6
88	T_0082	Asphalt/Pitch Tank	557294.90	3634635.86	3359.7	40.0	28.8	18.6
89	T_0110	Asphalt/Pitch Tank	556900.88	3634231.86	3367.6	35.0	22.3	16.3
90	T_0400	Gas Oil fixed roof tank	556712.93	3634475.65	3364.7	48.0	24.7	22.3
91	T_0402	T-0402 Light Cat Naphtha tank	557231.49	3634376.15	3362.9	50.0	18.5	23.3
92	T_0410	Asphalt/Pitch Tank	556898.32	3634106.89	3369.3	40.0	16.3	18.6
93	T_0411	T-0411 Gasolines & Gasoline Blendstocks	557083.75	3634253.22	3365.3	40.0	20.6	18.6
94	T_0419	No. 2 Fuel Oil (Diesel) fixed roof tank	556713.81	3634160.70	3368.9	28.0	10.9	13.0
95	T_0420	Asphalt/Pitch Tank	556940.51	3634116.91	3369.1	30.0	10.3	14.0
96	T_0422	Light Cycle Oil (LCO) fixed roof tank	556963.72	3634117.96	3369.0	30.0	10.3	14.0
97	T_0423	Light Cycle Oil (LCO) fixed roof tank	556964.77	3634090.54	3369.4	30.0	10.3	14.0
98	T_0431	Fuel Oil fixed roof tank	556896.67	3634180.59	3368.3	32.0	22.5	14.9
99	T_0432	Fuel Oil fixed roof tank	556943.73	3634184.42	3368.0	32.0	22.5	14.9
100	T_0433	Straight Run Gas Oil fixed roof tank	556890.24	3634326.64	3366.2	42.0	24.1	19.5
101	T_0434	Straight Run Diesel fixed roof tank	556609.74	3634191.31	3368.4	42.0	24.1	19.5
102	T_0914	Slop Oil Tank	556918.87	3634034.06	3370.5	40.0	15.5	18.6
103	T_1227	Asphalt/Pitch Tank	556788.69	3634425.75	3365.3	40.0	15.9	18.6
104	T_0106	T-0106 Sour Water Tank	556846.55	3634177.91	3368.4	40.0	13.8	18.6
105	T_0435	T-0435 Sour Water Tank	556807.39	3634533.97	3364.5	40.0	6.2	18.6
106	T_0437	T-0437 Crude Oil Tank	557154.64	3634557.61	3362.4	40.0	24.7	18.6
107	T_0438	Straight Run Gas Oil fixed roof tank	556854.20	3634228.42	3367.7	48.0	18.5	22.3
108	T_0439	T-0439 Sour Naphtha Tank	556780.49	3634480.62	3364.7	46.0	26.8	21.4
109	T_0450	T-0450 Sour Naphtha Tank	557152.77	3634475.54	3363.0	40.0	24.7	18.6
110	T_0451	T-0451 Straight Run Diesel tank	556842.85	3634358.19	3365.8	40.0	7.2	18.6
111	T_0737	T-0737 Sour Water Tank	556450.62	3634620.57	3364.1	40.0	13.0	18.6
112	T_0802	T-0802 Sour Water Tank	556445.16	3634595.97	3364.4	40.0	9.3	18.6
113	T_0814	Asphalt/Pitch Tank	556943.68	3634088.43	3369.6	32.0	10.3	14.9
114	T_0815	No. 2 Fuel Oil (Diesel) tank	556520.39	3635063.61	3364.6	43.0	23.9	20.0
115	T_0821	Light Cat Naphtha tank	557195.90	3634451.64	3362.7	50.0	21.8	23.3
116	T_0830	T-0830 Slop Oil Tank	556813.69	3634957.68	3362.5	40.0	28.8	18.6
117	T_0834	Straight Run Diesel tank	556427.01	3634979.64	3365.6	40.0	17.5	18.6
118	T_0835	Straight Run Diesel tank	556643.07	3635144.08	3363.0	40.0	22.9	18.6
119	T_0838	No. 2 Fuel Oil (Diesel) tank	556486.78	3634955.24	3364.5	40.0	15.2	18.6
120	T_1225	T-1225 Crude Oil Tank	557155.26	3634634.07	3362.1	40.0	30.9	18.6

HollyFrontier - Volume Sources (H2S and Toxics Only)

Model Source No.	Source ID	Source Description	Project Related Emissions Increase (lb/hr)								
			PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT	CO	H2S
73	TLO_1	TLO-1 Asphalt Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.28E-03
74	TL_2	TL-2 Asphalt Truck Loading Rack #2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03
75	TL_4	TL-4 Fuels Truck Loading Rack e, f	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-02
76	TL_7	TL-7 CBO/LCO Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-05
77	RLO_8	RLO-8 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03
78	RLO_19	RLO-19 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-02
79	TLO_20	TLO-20 Asphalt/Pitch Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-02
80	TRLO_9F	Molten Sulfur Railcar Loading	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-02
81	T_0049	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.88E-01
82	T_0059	T-0059, Light Cycle Oil (LCO) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-05
83	T_0061	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E-05
84	T_0063	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.61E-04
85	T_0065	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02
86	T_0075	Heavy Cycle Oil (HCO)fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02
87	T_0081	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-02
88	T_0082	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-02
89	T_0110	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03
90	T_0400	Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-02
91	T_0402	T-0402 Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.52E-04
92	T_0410	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-02
93	T_0411	T-0411 Gasolines & Gasoline Blendstocks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-05
94	T_0419	No. 2 Fuel Oil (Diesel) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03
95	T_0420	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-03
96	T_0422	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04
97	T_0423	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-04
98	T_0431	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-02
99	T_0432	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.04E-03
100	T_0433	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-04
101	T_0434	Straight Run Diesel fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02
102	T_0914	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
103	T_1227	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-02
104	T_0106	T-0106 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.36E-01
105	T_0435	T-0435 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.28E-01
106	T_0437	T-0437 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.21E-01
107	T_0438	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-03
108	T_0439	T-0439 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-03
109	T_0450	T-0450 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-03
110	T_0451	T-0451 Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-04
111	T_0737	T-0737 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.18E-02
112	T_0802	T-0802 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.79E-02
113	T_0814	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-02
114	T_0815	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02
115	T_0821	Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.87E-04
116	T_0830	T-0830 Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	T_0834	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-03
118	T_0835	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03
119	T_0838	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.40E-03
120	T_1225	T-1225 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.32E-01

HollyFrontier - Volume Sources (H2S and Toxics Only)

Model Source No.	Source ID	Source Description	Potential to Emit (lb/hr) PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_24hr	CO	H2S	H2SO4	NH3
73	TLO_1	TLO-1 Asphalt Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.28E-03	0.00E+00	0.00E+00
74	TL_2	TL-2 Asphalt Truck Loading Rack #2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03	0.00E+00	0.00E+00
75	TL_4	TL-4 Fuels Truck Loading Rack e, f	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-02	0.00E+00	0.00E+00
76	TL_7	TL-7 CBO/LCO Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-05	0.00E+00	0.00E+00
77	RLO_8	RLO-8 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03	0.00E+00	0.00E+00
78	RLO_19	RLO-19 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-02	0.00E+00	0.00E+00
79	TLO_20	TLO-20 Asphalt/Pitch Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-02	0.00E+00	0.00E+00
80	TRLO_9F	Molten Sulfur Railcar Loading	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-02	0.00E+00	0.00E+00
81	T_0049	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.88E-01	0.00E+00	0.00E+00
82	T_0059	T-0059, Light Cycle Oil (LCO) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-05	0.00E+00	0.00E+00
83	T_0061	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E-05	0.00E+00	0.00E+00
84	T_0063	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.61E-04	0.00E+00	0.00E+00
85	T_0065	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02	0.00E+00	0.00E+00
86	T_0075	Heavy Cycle Oil (HCO)fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02	0.00E+00	0.00E+00
87	T_0081	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-02	0.00E+00	0.00E+00
88	T_0082	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-02	0.00E+00	0.00E+00
89	T_0110	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03	0.00E+00	0.00E+00
90	T_0400	Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-02	0.00E+00	0.00E+00
91	T_0402	T-0402 Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.52E-04	0.00E+00	0.00E+00
92	T_0410	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-02	0.00E+00	0.00E+00
93	T_0411	T-0411 Gasolines & Gasoline Blendstocks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-05	0.00E+00	0.00E+00
94	T_0419	No. 2 Fuel Oil (Diesel) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03	0.00E+00	0.00E+00
95	T_0420	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-03	0.00E+00	0.00E+00
96	T_0422	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04	0.00E+00	0.00E+00
97	T_0423	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-04	0.00E+00	0.00E+00
98	T_0431	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-02	0.00E+00	0.00E+00
99	T_0432	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.04E-03	0.00E+00	0.00E+00
100	T_0433	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-04	0.00E+00	0.00E+00
101	T_0434	Straight Run Diesel fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02	0.00E+00	0.00E+00
102	T_0914	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
103	T_1227	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-02	0.00E+00	0.00E+00
104	T_0106	T-0106 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-02	0.00E+00	0.00E+00
105	T_0435	T-0435 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.63E-03	0.00E+00	0.00E+00
106	T_0437	T-0437 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-03	0.00E+00	0.00E+00
107	T_0438	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-03	0.00E+00	0.00E+00
108	T_0439	T-0439 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-03	0.00E+00	0.00E+00
109	T_0450	T-0450 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-03	0.00E+00	0.00E+00
110	T_0451	T-0451 Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-04	0.00E+00	0.00E+00
111	T_0737	T-0737 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-02	0.00E+00	0.00E+00
112	T_0802	T-0802 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-02	0.00E+00	0.00E+00
113	T_0814	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-02	0.00E+00	0.00E+00
114	T_0815	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02	0.00E+00	0.00E+00
115	T_0821	Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.87E-04	0.00E+00	0.00E+00
116	T_0830	T-0830 Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	T_0834	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-03	0.00E+00	0.00E+00
118	T_0835	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03	0.00E+00	0.00E+00
119	T_0838	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.40E-03	0.00E+00	0.00E+00
120	T_1225	T-1225 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03	0.00E+00	0.00E+00

HollyFrontier Off-Site Point Source NAAQS/NMAAQS Input Data (Updated 7-12-21)

										Potential to Emit (lb/hr)								
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT	CO	H2S
352E1	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.63	3637097.65	3373.8	80.0	400	50.98	1.12	0.798	0.798	0.798					1.395	
352E2	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556300.17	3637104.67	3373.6	35.0	110	45.21	1.51	1.587	1.587	1.587						
352E4	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556285.79	3637106.13	3373.9	35.0	110	45.21	1.51	1.587	1.587	1.587						
402E3	DEFAULT	Holly Frontier Asphalt Company	556992.61	3637197.56	3359.9	15.0	500	29.89	1.51	6.508	6.508	6.508					7.937	
402E6	DEFAULT	Holly Frontier Asphalt Company	557000.15	3637204.58	3359.9	25.0	285	7.19	1.51	0.906	0.906	0.906					9.524	
402E8	DEFAULT	Holly Frontier Asphalt Company	557000.15	3637204.58	3359.9	25.0	500	29.89	1.51								3.080	
402E7	DEFAULT	Holly Frontier Asphalt Company	556981.53	3637199.14	3360.1	25.0	285	7.19	1.51								7.143	
402E9	DEFAULT	Holly Frontier Asphalt Company	556983.18	3637190.99	3360.0	25.0	500	29.89	1.51								3.080	
203R2	DEFAULT	DCP - Shadow Booster Station	557393.94	3622548.16	3367.7	23.0	854	91.86	0.98									0.363
191E64	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569332.26	3626710.82	3554.0	54.5	1150	19.88	3.51									3.987
191R15	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569339.80	3626717.84	3555.0	115.0	1832	65.58	28.44									3.443
191R16	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569333.01	3626721.39	3554.8	115.0	1832	65.58	28.44									8.154
191R17	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569325.42	3626719.30	3554.1	115.0	1832	65.58	28.44									8.154
191R18	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569321.18	3626712.40	3553.4	115.0	1832	65.58	28.44									0.725
191R19	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569322.83	3626704.25	3553.2	115.0	1832	65.58	28.44									0.363
191R20	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569329.78	3626699.28	3553.3	115.0	1832	65.58	28.44									16.308
211E25	DEFAULT	Lucid Artesia - Dagger Draw Gas Plant	551931.36	3619797.52	3472.0	200.0	1832	65.62	9.81									223.020
39270R3	DEFAULT	Lucid Artesia - North Pen Compressor Station	551454.28	3619910.64	3477.6	23.0	854	91.86	0.98									2.537
199E38	DEFAULT	Artesia Gas Plant	574000.18	3624399.74	3609.0	70.6	1832	65.62	68.26									26.455
31815E15	DEFAULT	Frontier - Coyote Compressor Station	578708.30	3628257.94	3668.9	23.0	854	91.86	0.98									1.825
39714E8	DEFAULT	Spur - Shelby 23 Tank Battery	551738.94	3611091.61	3409.5	35.0	1832	65.62	8.64									6.197
39714E9	DEFAULT	Spur - Shelby 23 Tank Battery	551746.48	3611098.63	3409.0	30.0	1832	65.62	8.64									6.197
39003E5	DEFAULT	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	35.0	1832	65.62	29.75									13.391

Rest of sources provided by NMAQB are located in excess of 10km from refinery. Not included in NAAQS/NMAAQS model.

All sources within 25km and large (1,000lb/hr) emitters within 50km were evaluated for inclusion in the H2S NMAAQS analysis.

PM10, PM2.5 and SO2 sources located beyond 10km were excluded. There are no SO2 sources located within 10km of the refinery.

No cummulative NAAQS/NMAAQS modeling conducted for pollutants other than PM10, PM25, H2S and SO2 as the nearby source contribution is reflected in the background concentration.

HollyFrontier Off-Site Source NAAQS/NMAAQS Volume Source Input Data (Updated 5-5-21)

								Potential to Emit (lb/hr)								
Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT	CO	H2S
3403E2	Schlumberger - Artesia District Bulk Facility	556719.31	3635718.50	3362.8	3.3	1.54	3.05	2.38	2.381	2.381						
3403R1	Schlumberger - Artesia District Bulk Facility	556726.85	3635725.52	3362.7	3.3	1.54	3.05	0.72	0.725	0.725						
359@1	Southeast Readi-Mix - Artesia Plant	557117.00	3635667.03	3356.9	32.8	721.78	30.51	16.27	4.08	4.081						
352E3	Land O' Lakes Purina Feed - Artesia Feed Mill	556293.38	3637108.22	3373.8	20.0	1.54	3.05	0.79	0.794	0.794						
402R2	Holly Frontier Asphalt Company	556993.36	3637208.13	3360.0	32.8	32.81	30.51	6.51	6.508	6.508						
402R3	Holly Frontier Asphalt Company	556985.77	3637206.04	3360.1	32.8	32.81	30.51	6.50	6.505	6.505						
402R6	Holly Frontier Asphalt Company	556981.53	3637199.14	3360.1	32.8	32.81	30.51	6.35	6.349	6.349						
30254@1	Par Five Energy LLC - Par Five Energy	564319.69	3632835.00	3342.9	3.3	1.54	3.05	2.38	2.381	2.381						
30254R1	Par Five Energy LLC - Par Five Energy	564327.22	3632842.02	3343.0	32.8	32.81	30.51	5.56	5.556	5.556						
28959E1	Lime Rock - Condor 7 Battery	563709.45	3625436.95	3287.2	17.0	1.54	3.05									0.544
26441E1	Lime Rock - Atoka San Andreas Unit Battery	561619.20	3623917.88	3302.5	3.3	1.54	3.05									0.363
26441E2	Lime Rock - Atoka San Andreas Unit Battery	561626.73	3623924.91	3302.4	3.3	1.54	3.05									0.363
26441E3	Lime Rock - Atoka San Andreas Unit Battery	561619.95	3623928.46	3302.4	3.3	1.54	3.05									0.363
203R1	DCP - Shadow Booster Station	557400.73	3622544.60	3367.6	3.3	1.54	3.05									0.317
29063R1	Chesapeake Operating Inc - Hondo Federal Gas	568814.07	3629620.53	3468.8	3.3	1.54	3.05									4.762
39270E3	Lucid Artesia - North Pen Compressor Station	551465.37	3619909.06	3477.3	3.3	1.54	3.05									7.143
39270E4	Lucid Artesia - North Pen Compressor Station	551472.91	3619916.08	3477.1	3.3	1.54	3.05									7.143
39270R1	Lucid Artesia - North Pen Compressor Station	551466.12	3619919.63	3477.1	3.3	1.54	3.05									0.238
39270R2	Lucid Artesia - North Pen Compressor Station	551458.53	3619917.54	3477.3	3.3	1.54	3.05									1.825
199R2	Artesia Gas Plant	574007.71	3624406.77	3608.9	3.3	1.54	3.05									0.000
199R3	Artesia Gas Plant	574000.93	3624410.32	3609.0	3.3	1.54	3.05									0.000
31815R1	Frontier - Coyote Compressor Station	578715.83	3628264.96	3668.9	3.3	1.54	3.05									3.571
31815R3	Frontier - Coyote Compressor Station	578709.05	3628268.51	3668.9	3.3	1.54	3.05									18.120
39714R1	Spur - Shelby 23 Tank Battery	551739.69	3611102.18	3408.9	3.3	1.54	3.05									0.159

Note: The volume sources at the Artesia Gas Plant (Source IDs. 199R2 and 199R3 represent emissions from the acid gas flare. These emissions were therefore modeles as a flare (Source ID 199E38).

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC1	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.63	3637097.65	3373.8	80.0	400	51.0	1.1	0.798						
INC2	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556300.170	3637104.670	3373.6	35.0	110	45.2	1.5	1.587						
INC3	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556285.790	3637106.130	3373.9	35.0	110	45.2	1.5	1.587						
INC4	DEFAULT	Holly Frontier Asphalt Company	556992.610	3637197.560	3359.9	15.0	500	29.9	1.5	6.508						
INC5	DEFAULT	Holly Frontier Asphalt Company	557000.150	3637204.580	3359.9	25.0	285	7.2	1.5	0.906						
INC6	DEFAULT	DCP - Shadow Booster Station	557393.190	3622537.580	3367.9	15.0	1125	118.2	0.1	1.746						
INC7	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	42.5	780	136.0	0.1	1.508						
INC8	DEFAULT	Chesapeake Operating Inc - Hondo Federal Gas	568814.070	3629620.530	3468.8	6.0	860	53.3	0.8	0.794						
INC9	DEFAULT	DCP - Pecos Diamond Gas Plant	568071.310	3625977.910	3541.9	50.0	600	105.0	1.0	1.587						
INC10	DEFAULT	DCP - Pecos Diamond Gas Plant	568061.290	3625977.950	3540.7	40.0	600	105.1	1.0	1.587						
INC11	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569341.200	3626597.800	3548.5	27.0	670	200.0	1.3	-2.356						
INC12	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	27.0	670	200.0	1.3	-3.080						
INC13	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	40.0	670	200.0	1.3	-11.905						
INC14	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	31.1	730	181.0	1.5	-2.537						
INC15	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.0	955	200.0	1.6	-3.443						
INC16	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	36.0	759	170.0	1.4	-3.262						
INC17	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	40.0	759	160.0	1.5	-3.806						
INC18	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	21.0	600	34.0	2.0	-0.127						
INC19	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	33.0	925	200.0	1.6	-1.449						
INC20	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569336.770	3626723.010	3555.2	54.5	1150	19.9	3.5	0.159						
INC21	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	54.5	1150	27.7	3.5	0.037						
INC22	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.870	3626716.420	3553.4	120.0	600	17.2	6.2	4.762						
INC23	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.090	3626706.380	3553.0	120.0	600	17.2	6.2	4.762						
INC24	DEFAULT	DCP - Carbon Valley Booster	571606.690	3638669.910	3469.5	15.0	1125	118.2	1.2	1.812						
INC25	DEFAULT	DCP - Carbon Valley Booster	571614.220	3638676.940	3468.6	15.0	1125	118.2	1.2	1.812						
INC26	DEFAULT	DCP - Carbon Valley Booster	571599.840	3638678.400	3468.7	15.0	1125	118.2	1.2	1.812						
INC27	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	21.0	869	152.3	1.0	0.556						
INC28	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	21.0	869	152.3	1.0	0.556						
INC29	DEFAULT	EOG - Rumble State No4	547037.570	3620834.180	3568.8	15.0	600	3.8	1.0	0.018						
INC30	DEFAULT	EOG - Rumble State No5	547018.950	3620828.740	3569.5	15.0	832	171.6	1.0	0.794						
INC31	DEFAULT	EOG - Rumble State No6	547020.600	3620820.590	3569.5	15.0	832	171.6	1.0	0.794						
INC32	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	15.0	1131	30.0	0.7	0.159						
INC33	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	15.0	931	192.9	0.7	0.397						
INC34	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	15.0	832	349.9	0.7	0.794						
INC35	DEFAULT	EOG - Lacama 20 State Com 602H	545061.180	3621964.500	3614.7	15.0	1255	161.9	0.7	0.952						
INC36	DEFAULT	Yates Petroleum - Pierre State No1 Facility	570982.950	3620931.670	3522.0	23.0	854	91.9	1.0	0.037						
INC37	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.3	1340	89.2	1.0	1.957						
INC38	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.3	1340	89.2	1.0	0.979						
INC39	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	44.7	750	21.2	3.0	2.175						
INC40	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	-0.544						
INC41	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC42	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC43	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC44	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	0.979						
INC45	DEFAULT	Artesia Gas Plant	574011.520	3624405.460	3608.9	62.3	-460	91.9	15.1	3.175						
INC46	DEFAULT	Artesia Gas Plant	574004.680	3624411.940	3609.1	62.3	-460	91.9	15.1	2.857						
INC47	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.3	1340	89.2	1.0	0.979						
INC48	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1125	147.9	1.0	1.268						
INC49	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	0.979						
INC50	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	0.979						
INC51	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC52	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC53	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.0	1500	0.1	2.8	0.018						
INC54	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.0	990	142.0	1.1	0.794						
INC55	DEFAULT	Frontier - Coyote Compressor Station	578709.050	3628268.510	3668.9	22.0	600	18.0	0.8	0.317						
INC56	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	20.0	990	142.0	1.1	0.794						
INC57	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	23.0	873	128.0	0.9	0.794						
INC58	DEFAULT	Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	25.0	250	21.6	0.7	0.079						
INC59	DEFAULT	Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	25.0	250	21.6	0.7	0.079						
INC60	DEFAULT	Shelby 23 Tank Battery	551739.690	3611102.180	3408.9	25.0	250	21.6	0.7	0.079						
INC61	DEFAULT	Shelby 23 Tank Battery	551732.090	3611100.090	3409.2	25.0	250	21.6	0.7	0.079						
INC62	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.630	3637097.650	3373.8	79.987	399.992	50.984	1.115		0.798	0.798				
INC63	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556300.170	3637104.670	3373.6	35.007	109.994	45.210	1.509		1.587	1.587				

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential to Emit (lb/hr) PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC64	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556285.790	3637106.130	3373.9	35.007	109.994	45.210	1.509		1.587	1.587				
INC65	DEFAULT	Holly Frontier Asphalt Company	556992.610	3637197.560	3359.9	14.993	500.000	29.888	1.509		6.508	6.508				
INC66	DEFAULT	Holly Frontier Asphalt Company	557000.150	3637204.580	3359.9	25.000	285.008	7.185	1.509		0.906	0.906				
INC67	DEFAULT	DCP - Shadow Booster Station	557393.190	3622537.580	3367.9	14.993	1124.996	118.209	0.098		1.746	1.746				
INC68	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	42.487	780.008	135.991	0.131		1.508	1.508				
INC69	DEFAULT	DCP - Pecos Diamond Gas Plant	568071.310	3625977.910	3541.9	50.000	600.008	104.987	0.984		1.587	1.587				
INC70	DEFAULT	DCP - Pecos Diamond Gas Plant	568061.290	3625977.950	3540.7	39.993	600.008	105.085	0.984		1.587	1.587				
INC71	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569341.200	3626597.800	3548.5	27.001	669.992	200.000	1.280		-2.356	-2.356				
INC72	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	27.001	669.992	200.000	1.280		-3.080	-3.080				
INC73	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	669.992	200.000	1.280		-11.905	-11.905				
INC74	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	37.992	719.996	185.007	1.280		-2.718	-2.718				
INC75	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	31.102	730.004	181.004	1.476		-2.537	-2.537				
INC76	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.991	759.002	170.013	1.444		-3.262	-3.262				
INC77	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	759.002	160.007	1.509		-3.806	-3.806				
INC78	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	20.997	600.008	33.990	1.969		-0.127	-0.127				
INC79	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	33.005	924.998	200.000	1.608		-1.449	-1.449				
INC80	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569336.770	3626723.010	3555.2	54.495	1149.998	19.882	3.510		0.159	0.159				
INC81	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	54.495	1149.998	27.690	3.510		0.037	0.037				
INC82	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.870	3626716.420	3553.4	120.013	600.008	17.192	6.168		4.762	4.762				
INC83	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.090	3626706.380	3553.0	120.013	600.008	17.192	6.168		4.762	4.762				
INC84	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984		0.556	0.556				
INC85	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984		0.556	0.556				
INC86	DEFAULT	EOG - Rumble State No4	547037.570	3620834.180	3568.8	14.993	600.008	3.806	0.984		0.018	0.018				
INC87	DEFAULT	EOG - Rumble State No5	547018.950	3620828.740	3569.5	14.993	831.992	171.588	0.984		0.794	0.794				
INC88	DEFAULT	EOG - Rumble State No6	547020.600	3620820.590	3569.5	14.993	831.992	171.588	0.984		0.794	0.794				
INC89	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	14.993	1131.008	30.020	0.689		0.159	0.159				
INC90	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	14.993	930.992	192.946	0.689		0.397	0.397				
INC91	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	14.993	831.992	349.934	0.689		0.794	0.794				
INC92	DEFAULT	EOG - Lacama 20 State Com 602H	545061.180	3621964.500	3614.7	14.993	1254.992	161.877	0.689		0.952	0.952				
INC93	DEFAULT	Artesia Gas Plant	574011.520	3624405.460	3608.9	62.336	-459.670	91.864	15.092		3.175	3.175				
INC94	DEFAULT	Artesia Gas Plant	574004.680	3624411.940	3609.1	62.336	-459.670	91.864	15.092		2.857	2.857				
INC95	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1124.996	147.900	0.984		2.537	2.537				
INC96	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.010	1500.008	0.098	2.756		0.018	0.018				
INC97	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.013	989.996	141.995	1.148		0.794	0.794				
INC98	DEFAULT	Frontier - Coyote Compressor Station	578709.050	3628268.510	3668.9	22.014	600.008	18.012	0.820		0.317	0.317				
INC99	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	20.013	989.996	141.995	1.148		0.794	0.794				
INC100	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	22.999	872.996	127.986	0.919		0.794	0.794				
INC101	DEFAULT	Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	25.000	249.998	21.621	0.656		0.079	0.079				
INC102	DEFAULT	Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	25.000	249.998	21.621	0.656		0.079	0.079				
INC103	DEFAULT	Shelby 23 Tank Battery	551739.690	3611102.180	3408.9	25.000	249.998	21.621	0.656		0.079	0.079				
INC104	DEFAULT	Shelby 23 Tank Battery	551732.090	3611100.090	3409.2	25.000	249.998	21.621	0.656		0.079	0.079				
INC105	DEFAULT	Lime Rock - Malco B Battery	563966.960	3627073.850	3441.4	25.000	1831.730	65.617	68.261						5.556	5.556
INC106	DEFAULT	Lime Rock - Kaiser B Battery	563767.890	3625655.950	3319.3	25.000	1831.730	65.617	68.261						3.968	3.968
INC107	DEFAULT	Lime Rock - Kaiser B Battery	563775.430	3625662.970	3320.9	22.014	100.004	18.012	0.492						34.128	34.128
INC108	DEFAULT	Lime Rock - West Red Lake Battery	564130.550	3625904.740	3422.4	22.014	100.004	18.012	0.492						11.053	11.053
INC109	DEFAULT	Lime Rock - West Red Lake Battery	564138.090	3625911.760	3422.6	22.014	100.004	18.012	0.492						11.053	11.053
INC110	DEFAULT	Lime Rock - West Red Lake Battery	564131.300	3625915.310	3421.9	22.014	100.004	18.012	0.492						11.053	11.053
INC111	DEFAULT	Lime Rock - Atoka San Andreas Unit Battery	561626.730	3623924.910	3302.4	22.014	100.004	18.012	0.492						15.873	15.873
INC112	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	14.993	1124.996	118.209	0.098						2.302	2.302
INC113	DEFAULT	DCP - Shadow Booster Station	557393.940	3622548.160	3367.7	42.487	780.008	135.991	0.131						2.302	2.302
INC114	DEFAULT	Lime Rock - Hawk 8 Battery	565542.390	3624866.860	3444.5	22.014	1831.730	65.617	68.261						3.968	3.968
INC115	DEFAULT	Lime Rock - Hondo Federal Battery	567428.660	3626819.640	3582.9	22.014	1831.730	65.617	68.261						2.718	2.718
INC116	DEFAULT	EOG - War Dog State No1H	569708.850	3637607.080	3427.3	60.007	1831.730	65.617	1.673						14.445	14.445
INC117	DEFAULT	Lime Rock - Hawk 9 Battery	566922.460	3624722.080	3519.9	22.014	100.004	18.012	0.492						11.053	11.053
INC118	DEFAULT	Lime Rock - Hawk 9 Battery	566930.000	3624729.100	3520.3	22.014	100.004	18.012	0.492						11.053	11.053
INC119	DEFAULT	Lime Rock - Falcon 3 Battery	568831.750	3627075.620	3578.3	22.014	100.004	18.012	0.492						10.318	10.318
INC120	DEFAULT	Lime Rock - Falcon 3 Battery	568839.280	3627082.650	3578.6	22.014	100.004	18.012	0.492						10.318	10.318
INC121	DEFAULT	Lime Rock - Eagle 35 Sat Battery	569992.810	3628438.870	3589.9	25.000	1831.730	65.617	68.261						2.356	2.356
INC122	DEFAULT	Lime Rock - Eagle 35 Sat Battery	570000.350	3628445.890	3589.6	22.014	100.004	18.012	0.492						11.905	11.905
INC123	DEFAULT	Lime Rock - Eagle 35 Sat Battery	569993.560	3628449.440	3589.0	22.014	100.004	18.012	0.492						11.905	11.905
INC124	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261						0.079	0.079
INC125	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261						0.079	0.079
INC126	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569333.010	3626721.390	3554.8	54.495	1149.998	19.882	3.510						378.578	378.578
INC127	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569325.420	3626719.300	3554.1	54.495	1149.998	27.690	3.510						0.079	0.079
INC128	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569321.180	3626712.400	3553.4	120.013	600.008	17.192	6.168						8.730	8.730

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC129	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569322.830	3626704.250	3553.2	120.013	600.008	17.192	6.168						8.730	8.730
INC130	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569329.780	3626699.280	3553.3	29.987	600.008	25.098	2.493						2.381	2.381
INC131	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569338.460	3626700.430	3553.8	114.993	1832.000	65.584	28.445						118.143	118.143
INC132	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569344.170	3626707.350	3554.6	114.993	1832.000	65.584	28.445						9.060	9.060
INC133	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569343.610	3626716.530	3555.2	114.993	1832.000	65.584	28.445						9.060	9.060
INC134	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569336.770	3626723.010	3555.2	114.993	1832.000	65.584	28.445						68.857	68.857
INC135	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	114.993	1832.000	65.584	28.445						26.093	26.093
INC136	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.870	3626716.420	3553.4	114.993	1832.000	65.584	28.445						18.120	18.120
INC137	DEFAULT	Lucid Artesia - Dagger Draw Gas Plant	551931.360	3619797.520	3472.0	200.000	1831.730	65.617	9.810						22333.709	22333.709
INC138	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984						0.079	0.079
INC139	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984						0.079	0.079
INC140	DEFAULT	Lucid Artesia - North Pen Compressor Station	551466.120	3619919.630	3477.1	22.966	854.330	91.864	0.984						94.225	94.225
INC141	DEFAULT	EOG - Rumble State No5	547030.030	3620827.160	3569.2	25.000	1831.730	65.617	68.261						0.476	0.476
INC142	DEFAULT	EOG - Rumble State No5	547030.780	3620837.730	3569.0	14.993	831.992	171.588	0.984						0.397	0.397
INC143	DEFAULT	EOG - Rumble State No6	547023.190	3620835.640	3569.4	14.993	831.992	171.588	0.984						0.397	0.397
INC144	DEFAULT	EOG - Lacama 20 State Com 602H	545072.270	3621962.920	3614.3	14.993	1131.008	30.020	0.689						0.079	0.079
INC145	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	14.993	930.992	192.946	0.689						0.238	0.238
INC146	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	14.993	831.992	349.934	0.689						3.968	3.968
INC147	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	14.993	1254.992	161.877	0.689						0.238	0.238
INC148	DEFAULT	Chalk Compressor Station	569361.150	3621748.040	3460.6	22.014	465.008	49.803	1.115						34.048	34.048
INC149	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	44.685	750.002	21.194	2.986						0.326	0.326
INC150	DEFAULT	Artesia Gas Plant	574007.710	3624406.770	3608.9	70.604	1831.730	65.617	68.261						0.159	0.159
INC151	DEFAULT	Artesia Gas Plant	574000.930	3624410.320	3609.0	70.604	1831.730	65.617	68.261						0.079	0.079
INC152	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1124.996	147.900	0.984						1.812	1.812
INC153	DEFAULT	EOG - Badboy CTB	549646.080	3613604.540	3454.8	60.007	1831.730	65.617	1.673						2.381	2.381
INC154	DEFAULT	EOG - Badboy CTB	549653.620	3613611.560	3454.6	60.007	1831.730	65.617	1.673						2.381	2.381
INC155	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.010	1500.008	0.098	2.756						1.508	1.508
INC156	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.013	989.996	141.995	1.148						0.079	0.079
INC157	DEFAULT	Frontier - Coyote Compressor Station	578709.050	3628268.510	3668.9	22.014	600.008	18.012	0.820						0.159	0.159
INC158	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	20.013	989.996	141.995	1.148						0.079	0.079
INC159	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	22.999	872.996	127.986	0.919						0.079	0.079
INC160	DEFAULT	Spur - Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	35.007	1831.730	65.617	8.635						8.390	8.390
INC161	DEFAULT	Spur - Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	29.987	1831.730	65.617	8.635						8.390	8.390
INC162	DEFAULT	EOG- Falcata Battery	540689.170	3616360.840	3695.3	14.993	1131.008	29.987	0.689						0.079	0.079
INC163	DEFAULT	EOG- Falcata Battery	586879.330	3576089.170	3002.3	14.993	930.992	192.946	0.689						0.238	0.238
INC164	DEFAULT	EOG- Falcata Battery	540689.920	3616371.420	3696.4	14.993	831.992	349.934	0.689						0.397	0.397
INC165	DEFAULT	EOG- Falcata Battery	540682.320	3616369.320	3695.0	14.993	600.008	161.877	0.689						0.238	0.238
INC166	DEFAULT	EOG- Falcata Battery	540678.080	3616362.420	3693.9	14.993	600.008	17.848	0.689						0.079	0.079
INC167	DEFAULT	Spur Energy - Ross Ranch Battery	548838.120	3611188.930	3472.3	35.007	1831.730	65.617	29.754						25.873	25.873
INC168	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.630	3637097.650	3373.8	79.987	399.992	50.984	1.115				6.667	6.667		
INC169	DEFAULT	Holly Frontier Asphalt Company	556992.610	3637197.560	3359.9	14.993	500.000	29.888	1.509				9.524	9.524		
INC170	DEFAULT	Holly Frontier Asphalt Company	556993.360	3637208.130	3360.0	25.000	285.008	7.185	1.509				11.111	11.111		
INC171	DEFAULT	Holly Frontier Asphalt Company	556985.770	3637206.040	3360.1	25.000	285.008	7.185	1.509				7.937	7.937		
INC172	DEFAULT	Holly Frontier Asphalt Company	556981.530	3637199.140	3360.1	25.000	500.000	29.888	1.509				3.624	3.624		
INC173	DEFAULT	Holly Frontier Asphalt Company	556983.180	3637190.990	3360.0	25.000	500.000	29.888	1.509				3.624	3.624		
INC174	DEFAULT	Lady Luck No1 Facility	567323.770	3638398.310	3413.2	14.993	489.992	22.014	0.984				22.223	22.223		
INC175	DEFAULT	Lady Luck No1 Facility	567331.310	3638405.330	3413.5	22.966	854.330	91.864	0.984				0.794	0.794		
INC176	DEFAULT	Atoka Dehydration Facility	560915.280	3624129.050	3309.6	22.966	854.330	91.864	0.984				1.812	1.812		
INC177	DEFAULT	Lime Rock - Atoka San Andreas Unit Battery	561619.200	3623917.880	3302.5	22.014	100.004	18.012	0.492				0.363	0.363		
INC178	DEFAULT	Lucky Lobo ASX #2 Facility	567399.310	3639898.520	3484.5	14.993	469.994	21.490	0.984				44.445	44.445		
INC179	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	14.993	1124.996	118.209	0.098				32.302	32.302		
INC180	DEFAULT	DCP - Shadow Booster Station	557393.940	3622548.160	3367.7	42.487	780.008	135.991	0.131				86.906	86.906		
INC181	DEFAULT	Chesapeake Operating Inc - Hondo Federal Gas	568814.070	3629620.530	3468.8	6.004	860.000	53.314	0.787				18.254	18.254		
INC182	DEFAULT	EOG - War Dog State No1H	569708.850	3637607.080	3427.3	60.007	1831.730	65.617	1.673				1.429	1.429		
INC183	DEFAULT	DCP - Pecos Booster Station	565591.520	3623798.120	3405.4	14.009	1000.004	47.014	0.656				53.969	53.969		
INC184	DEFAULT	DCP - Pecos Booster Station	565591.520	3623798.120	3405.4	14.009	1000.004	47.014	0.656				53.969	53.969		
INC185	DEFAULT	DCP - Pecos Booster Station	565591.520	3623798.120	3405.4	14.009	1000.004	47.014	0.656				53.969	53.969		
INC186	DEFAULT	DCP - Pecos Diamond Gas Plant	568071.310	3625977.910	3541.9	50.000	600.008	104.987	0.984				118.256	118.256		
INC187	DEFAULT	DCP - Pecos Diamond Gas Plant	568061.290	3625977.950	3540.7	39.993	600.008	105.085	0.984				116.669	116.669		
INC188	DEFAULT	DCP - Pecos Diamond Gas Plant	568111.330	3625987.940	3546.4	20.013	800.006	6.988	1.509				2.381	2.381		
INC189	DEFAULT	DCP - Pecos Diamond Gas Plant	568393.230	3626095.860	3539.0	20.013	600.008	8.990	0.492				1.631	1.631		
INC190	DEFAULT	Lucid Artesia - Southern Union Compressor Station	571186.750	3631625.290	3507.3	22.966	854.330	91.864	0.984				0.794	0.794		
INC191	DEFAULT	Lucid Artesia - Southern Union Compressor Station	571193.700	3631620.330	3507.0	23.589	1011.992	135.007	1.247				15.080	15.080		
INC192	DEFAULT	Lucid Artesia - Southern Union Compressor Station	571202.390	3631621.470	3506.1	23.589	1011.992	135.007	1.247				15.080	15.080		
INC193	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	27.001	669.992	200.000	1.280				-117.419	-117.419		

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential to Emit (lb/hr) PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC194	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	669.992	200.000	1.280				-103.466	-103.466		
INC195	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	37.992	719.996	185.007	1.280				-331.056	-331.056		
INC196	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	31.102	730.004	181.004	1.476				-357.512	-357.512		
INC197	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	22.966	854.330	91.864	0.984				-105.478	-105.478		
INC198	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	955.004	200.000	1.575				-444.850	-444.850		
INC199	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.991	759.002	170.013	1.444				-215.630	-215.630		
INC200	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	759.002	160.007	1.509				-329.244	-329.244		
INC201	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	29.987	1085.000	100.000	0.656				-8.879	-8.879		
INC202	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	31.004	899.996	12.992	1.969				-0.725	-0.725		
INC203	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	20.997	600.008	33.990	1.969				-1.812	-1.812		
INC204	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	33.005	924.998	200.000	1.608				-143.512	-143.512		
INC205	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	24.016	687.992	100.000	0.656				-5.436	-5.436		
INC206	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	26.411	861.998	187.106	0.853				-39.286	-39.286		
INC207	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	26.411	861.998	187.106	0.853				-59.525	-59.525		
INC208	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261				0.714	0.714		
INC209	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261				0.714	0.714		
INC210	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				34.818	34.818		
INC211	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				30.223	30.223		
INC212	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				32.744	32.744		
INC213	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569320.600	3626699.000	3552.8	54.495	1149.998	19.882	3.510				1.587	1.587		
INC214	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569331.780	3626693.930	3553.1	35.007	854.006	162.008	0.984				33.351	33.351		
INC215	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				34.921	34.921		
INC216	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569349.680	3626709.080	3555.0	54.495	1149.998	27.690	3.510				0.397	0.397		
INC217	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				34.921	34.921		
INC218	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	989.996	184.908	0.984				23.810	23.810		
INC219	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	989.996	184.908	0.984				23.810	23.810		
INC220	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569314.110	3626715.280	3552.9	120.013	600.008	17.192	6.168				61.112	61.112		
INC221	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569315.670	3626701.560	3552.6	120.013	600.008	17.192	6.168				61.112	61.112		
INC222	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569326.340	3626692.450	3552.8	120.013	600.008	13.911	2.493				7.937	7.937		
INC223	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569340.580	3626693.070	3553.5	29.987	600.008	25.098	2.493				14.286	14.286		
INC224	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569350.720	3626703.390	3554.8	114.993	1832.000	65.584	28.445				37.509	37.509		
INC225	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.120	3626718.070	3555.6	114.993	1832.000	65.584	28.445				9.060	9.060		
INC226	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569341.250	3626729.250	3556.0	114.993	1832.000	65.584	28.445				9.060	9.060		
INC227	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569326.190	3626730.710	3554.9	114.993	1832.000	65.584	28.445				2.537	2.537		
INC228	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569314.000	3626721.380	3553.1	114.993	1832.000	65.584	28.445				1.812	1.812		
INC229	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569311.410	3626706.030	3552.3	114.993	1832.000	65.584	28.445				18.120	18.120		
INC230	DEFAULT	Lucid Artesia - Four Dinkus Compressor Station GCP4	544776.370	3625305.660	3622.6	20.013	860.000	60.499	0.984				20.635	20.635		
INC231	DEFAULT	Lucid Artesia - Four Dinkus Compressor Station GCP5	544776.370	3625305.660	3622.6	20.013	860.000	60.499	0.984				20.635	20.635		
INC232	DEFAULT	DCP - Carbon Valley Booster	571606.690	3638669.910	3469.5	50.000	1831.730	65.617	68.261				521.437	521.437		
INC233	DEFAULT	DCP - Carbon Valley Booster	571614.220	3638676.940	3468.6	14.993	1124.996	118.209	1.247				18.254	18.254		
INC234	DEFAULT	DCP - Carbon Valley Booster	571607.440	3638680.490	3468.3	14.993	1124.996	118.209	1.247				18.254	18.254		
INC235	DEFAULT	DCP - Carbon Valley Booster	571595.600	3638671.500	3469.6	14.993	1124.996	118.209	1.247				18.254	18.254		
INC236	DEFAULT	DCP - Carbon Valley Booster	551931.360	3619797.520	3472.0	14.993	1831.730	65.617	68.261				0.000	0.000		
INC237	DEFAULT	DCP - Carbon Valley Booster	551933.140	3619458.070	3476.6	18.406	350.006	4.298	0.984				-118.126	-118.126		
INC238	DEFAULT	DCP - Carbon Valley Booster	552003.120	3620198.100	3465.0	60.007	600.008	20.013	2.001				11.905	11.905		
INC239	DEFAULT	DCP - Carbon Valley Booster	551924.510	3619806.000	3471.9	10.007	219.992	100.000	0.492				2.381	2.381		
INC240	DEFAULT	Lucid Artesia - North Pen Compressor Station	551465.370	3619909.060	3477.3	20.013	1831.730	65.617	68.261				0.079	0.079		
INC241	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984				44.445	44.445		
INC242	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984				44.445	44.445		
INC243	DEFAULT	Lucid Artesia - North Pen Compressor Station	551458.530	3619917.540	3477.3	22.966	854.330	91.864	0.984				2.356	2.356		
INC244	DEFAULT	Carbon Valley 14 Fed Com No2	570014.390	3643077.800	3585.2	10.499	1045.004	1.706	2.395				26.191	26.191		
INC245	DEFAULT	EOG - Rumble State No5	547030.030	3620827.160	3569.2	25.000	1831.730	65.617	68.261				0.079	0.079		
INC246	DEFAULT	EOG - Rumble State No5	547037.570	3620834.180	3568.8	25.000	1831.730	65.617	68.261				1.746	1.746		
INC247	DEFAULT	EOG - Rumble State No4	547030.780	3620837.730	3569.0	14.993	600.008	3.806	0.984				0.238	0.238		
INC248	DEFAULT	EOG - Rumble State No5	547020.600	3620820.590	3569.5	14.993	831.992	171.588	0.984				12.064	12.064		
INC249	DEFAULT	EOG - Rumble State No6	547027.550	3620815.620	3569.2	14.993	831.992	171.588	0.984				12.064	12.064		
INC250	DEFAULT	EOG - Lacama 20 State Com 602H	545072.270	3621962.920	3614.3	25.000	1831.730	65.617	68.261				0.079	0.079		
INC251	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	25.000	1831.730	65.617	68.261				3.016	3.016		
INC252	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	14.993	1131.008	30.020	0.689				1.270	1.270		
INC253	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	14.993	930.992	192.946	0.689				6.032	6.032		
INC254	DEFAULT	EOG - Lacama 20 State Com 602H	545061.180	3621964.500	3614.7	14.993	831.992	349.934	0.689				12.064	12.064		
INC255	DEFAULT	EOG - Lacama 20 State Com 602H	545062.830	3621956.350	3615.7	14.993	1254.992	161.877	0.689				13.334	13.334		
INC256	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	16.601	1099.994	131.004	0.656				21.429	21.429		
INC257	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	50.000	1200.002	102.986	0.656				17.461	17.461		
INC258	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	50.000	1200.002	102.986	0.656				17.461	17.461		

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC259	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	60.007	1025.006	81.004	0.984				38.096	38.096		
INC260	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	50.000	1200.002	102.986	0.656				17.461	17.461		
INC261	DEFAULT	Illinois Camp Booster Station	574661.630	3627054.860	3659.2	35.007	1340.006	57.415	0.656				39.683	39.683		
INC262	DEFAULT	Illinois Camp Booster Station	574634.650	3627054.880	3659.7	35.007	1340.006	57.415	0.656				39.683	39.683		
INC263	DEFAULT	Illinois Camp Booster Station	574643.640	3627054.830	3659.5	35.007	1340.006	57.415	0.656				39.683	39.683		
INC264	DEFAULT	Illinois Camp Booster Station	574652.630	3627054.900	3659.3	35.007	1340.006	57.415	0.656				39.683	39.683		
INC265	DEFAULT	Chalk Compressor Station	569361.150	3621748.040	3460.6	22.014	465.008	49.803	1.115				12.540	12.540		
INC266	DEFAULT	Cimarex Enegy - Montana 1 Fee 3	551935.760	3616514.870	3422.9	10.007	887.000	358.301	0.492				11.349	11.349		
INC267	DEFAULT	Kristina Booster Station	572690.330	3624526.200	3615.5	20.013	780.008	366.010	0.820				69.842	69.842		
INC268	DEFAULT	Mack - Mark Twain Federal Com Battery	575824.070	3636427.600	3593.7	6.988	224.996	381.988	6.988				3.968	3.968		
INC269	DEFAULT	Dickens 29 Federal Battery	575704.960	3639831.920	3596.4	6.988	224.996	381.988	6.988				3.968	3.968		
INC270	DEFAULT	Oxy USA Inc.-Spurck 16 State Com No2	576460.460	3633013.760	3554.8	22.966	854.330	91.864	0.984				7.143	7.143		
INC271	DEFAULT	Yates Petroleum - Pierre State No1 Facility	570982.950	3620931.670	3522.0	22.966	854.330	91.864	0.984				4.457	4.457		
INC272	DEFAULT	Shakespeare 20 Federal No1	575701.430	3640657.870	3607.2	10.991	564.998	32.251	0.492				3.262	3.262		
INC273	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.289	1340.006	89.206	0.984				41.584	41.584		
INC274	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.289	1340.006	89.206	0.984				42.064	42.064		
INC275	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	44.685	750.002	21.194	2.986				57.144	57.144		
INC276	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.005	800.006	60.991	0.984				-324.532	-324.532		
INC277	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.005	800.006	60.991	0.984				-302.788	-302.788		
INC278	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.005	800.006	60.991	0.984				-241.179	-241.179		
INC279	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.990	800.006	54.987	0.984				-311.304	-311.304		
INC280	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.010	1000.004	49.016	0.984				-132.821	-132.821		
INC281	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	43.996	986.000	58.005	0.984				-140.613	-140.613		
INC282	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.010	986.000	58.005	0.984				-164.658	-164.658		
INC283	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				-36.240	-36.240		
INC284	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				28.196	28.196		
INC285	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC286	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC287	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	75.000	1832.000	65.584	1.673				-17.690	-17.690		
INC288	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	42.290	750.002	21.194	3.609				57.144	57.144		
INC289	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	899.996	60.007	0.820				-5.056	-5.056		
INC290	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				37.076	37.076		
INC291	DEFAULT	Artesia Gas Plant	573999.690	3624382.850	3608.5	70.604	1831.730	65.617	68.261				1.667	1.667		
INC292	DEFAULT	Artesia Gas Plant	574011.530	3624386.830	3608.5	70.604	1831.730	65.617	68.261				0.714	0.714		
INC293	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	33.104	629.996	20.801	3.609				2.381	2.381		
INC294	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				42.064	42.064		
INC295	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				35.772	35.772		
INC296	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				32.394	32.394		
INC297	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				39.637	39.637		
INC298	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.289	1340.006	89.206	0.984				41.584	41.584		
INC299	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				34.604	34.604		
INC300	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1124.996	147.900	0.984				68.255	68.255		
INC301	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				42.064	42.064		
INC302	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				42.064	42.064		
INC303	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC304	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC305	DEFAULT	Yates - Eastern Shores QW No1 Facility	565479.650	3615436.960	3277.3	9.843	571.010	49.213	0.328				33.096	33.096		
INC306	DEFAULT	EOG - Secretariat 3 Fed Com No501H	569284.850	3617086.880	3457.6	60.007	1831.730	65.617	1.673				9.048	9.048		
INC307	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.010	1500.008	0.098	2.756				0.238	0.238		
INC308	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.013	989.996	141.995	1.148				17.866	17.866		
INC309	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	22.014	600.008	18.012	0.820				0.079	0.079		
INC310	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	20.013	989.996	141.995	1.148				24.127	24.127		
INC311	DEFAULT	Frontier - Coyote Compressor Station	578698.860	3628251.370	3668.9	22.999	872.996	127.986	0.919				46.906	46.906		
INC312	DEFAULT	Parallel - Hagerman Plant GCP4-3380	562777.140	3657403.570	3443.0	22.966	854.330	91.864	0.984				0.556	0.556		
INC313	DEFAULT	Parallel - Hagerman Plant GCP4-3381	562784.680	3657410.590	3443.0	22.966	854.330	91.864	0.984				1.429	1.429		
INC314	DEFAULT	Parallel - Hagerman Plant GCP4-3382	562777.890	3657414.140	3443.0	22.999	854.006	162.008	0.984				35.153	35.153		
INC315	DEFAULT	Parallel - Hagerman Plant GCP4-3383	562770.300	3657412.050	3443.0	22.999	854.006	162.008	0.984				35.153	35.153		
INC316	DEFAULT	COG - Man State 2H Battery	574496.980	3618616.590	3549.2	16.010	1831.730	65.617	2.592				9.524	9.524		
INC317	DEFAULT	COG - Man State 2H Battery	574504.510	3618623.610	3549.5	12.008	1043.006	189.993	0.328				3.968	3.968		
INC318	DEFAULT	Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	25.000	249.998	21.621	0.656				0.714	0.714		
INC319	DEFAULT	Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	25.000	249.998	21.621	0.656				0.714	0.714		
INC320	DEFAULT	Shelby 23 Tank Battery	551739.690	3611102.180	3408.9	25.000	249.998	21.621	0.656				0.714	0.714		
INC321	DEFAULT	Shelby 23 Tank Battery	551732.090	3611100.090	3409.2	25.000	249.998	21.621	0.656				0.714	0.714		
INC322	DEFAULT	Spur - Shelby 23 Tank Battery	551729.500	3611085.030	3410.1	35.007	1831.730	65.617	8.635				4.048	4.048		
INC323	DEFAULT	Spur - Shelby 23 Tank Battery	551736.450	3611080.070	3410.2	29.987	1831.730	65.617	8.635				4.048	4.048		

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC324	DEFAULT	EOG- Falcata Battery	540689.170	3616360.840	3695.3	14.993	1131.008	29.987	0.689				1.270	1.270		
INC325	DEFAULT	EOG- Falcata Battery	586879.330	3576089.170	3002.3	14.993	930.992	192.946	0.689				6.032	6.032		
INC326	DEFAULT	EOG- Falcata Battery	540689.920	3616371.420	3696.4	14.993	831.992	349.934	0.689				12.064	12.064		
INC327	DEFAULT	EOG- Falcata Battery	540682.320	3616369.320	3695.0	14.993	600.008	161.877	0.689				13.334	13.334		
INC328	DEFAULT	EOG- Falcata Battery	540678.080	3616362.420	3693.9	39.993	1831.730	65.617	8.635				5.079	5.079		
INC329	DEFAULT	EOG- Falcata Battery	540679.740	3616354.270	3693.4	39.993	1831.730	65.617	68.261				0.794	0.794		
INC330	DEFAULT	EOG- Falcata Battery	540686.680	3616349.310	3694.0	14.993	600.008	17.848	0.689				0.873	0.873		
INC331	DEFAULT	Winchester Compressor Station	567991.310	3612198.320	3519.7	39.993	960.998	41.010	1.214				33.334	33.334		
INC332	DEFAULT	Winchester Compressor Station	567991.310	3612198.320	3519.7	39.993	960.998	41.010	1.214				33.334	33.334		
INC333	DEFAULT	Winchester Compressor Station	567991.310	3612198.320	3519.7	39.993	960.998	41.010	1.214				33.334	33.334		
INC334	DEFAULT	Spur Energy - Ross Ranch Battery	548845.660	3611195.950	3472.1	35.007	1831.730	65.617	29.754				89.208	89.208		

All sources within 25km and large (1,000lb/hr) emitters within 50km were included in the increment analysis.

HollyFrontier Off-Site Volume Source Increment Input Data (Updated 5-5-21)

								Potential to Emit (lb/hr)						
Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC335	Schlumberger - Artesia District Bulk Facility	556719.31	3635718.50	3362.8	3.28	1.54	3.05	2.38						
INC336	Schlumberger - Artesia District Bulk Facility	556726.85	3635725.52	3362.7	3.28	1.54	3.05	0.72						
INC337	Land O' Lakes Purina Feed - Artesia Feed Mill	556293.38	3637108.22	3373.8	20.01	1.54	3.05	0.79						
INC338	Holly Frontier Asphalt Company	556993.36	3637208.13	3360.0	32.81	32.81	30.51	6.51						
INC339	Holly Frontier Asphalt Company	556985.77	3637206.04	3360.1	32.81	32.81	30.51	6.50						
INC340	Holly Frontier Asphalt Company	556981.53	3637199.14	3360.1	32.81	32.81	30.51	6.35						
INC341	Par Five Energy LLC - Par Five Energy	564319.69	3632835.00	3342.9	3.28	1.54	3.05	2.38						
INC342	Par Five Energy LLC - Par Five Energy	564327.22	3632842.02	3343.0	32.81	32.81	30.51	5.56						
INC343	Helena Chemical Co - Artesia New Mexico	557950.20	3646037.75	3342.1	3.28	1.54	3.05	0.24						
INC344	Helena Chemical Co - Artesia New Mexico	557957.74	3646044.77	3341.9	3.28	1.54	3.05	0.56						
INC345	Helena Chemical Co - Artesia New Mexico	557950.95	3646048.32	3341.9	3.28	1.54	3.05	2.38						
INC346	Helena Chemical Co - Artesia New Mexico	557943.36	3646046.23	3342.0	3.28	1.54	3.05	0.24						
INC347	Helena Chemical Co - Artesia New Mexico	557939.12	3646039.33	3342.2	3.28	1.54	3.05	0.16						
INC348	Helena Chemical Co - Artesia New Mexico	557940.77	3646031.17	3342.2	3.28	1.54	3.05	0.48						
INC349	EOG - Rumble State No4	547030.03	3620827.16	3569.2	32.81	32.81	30.51	4.52						
INC350	EOG - Rumble State No5	547030.78	3620837.73	3569.0	14.99	1.54	3.05	0.08						
INC351	EOG - Rumble State No6	547023.19	3620835.64	3569.4	14.99	1.54	3.05	0.04						
INC352	EOG - Lacama 20 State Com 602H	545072.27	3621962.92	3614.3	32.81	32.81	30.51	4.92						
INC353	EOG - Lacama 20 State Com 602H	545062.83	3621956.35	3615.7	14.99	1.54	3.05	0.08						
INC354	Shelby 23 Tank Battery	551727.85	3611093.19	3409.7	25.00	1.54	3.05	0.08						
INC355	EOG- Falcata Battery	540689.17	3616360.84	3695.3	3.28	1.54	3.05	3.65						
INC356	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	25.00	1.54	3.05	0.04						
INC357	Spur Energy - Ross Ranch Battery	548845.66	3611195.95	3472.1	25.00	1.54	3.05	0.04						
INC358	Spur Energy - Ross Ranch Battery	548838.87	3611199.51	3472.7	25.00	1.54	3.05	0.04						
INC359	Spur Energy - Ross Ranch Battery	548831.28	3611197.41	3473.0	25.00	1.54	3.05	0.04						
INC360	Schlumberger - Artesia District Bulk Facility	556719.31	3635718.50	3362.8	3.28	1.54	3.05		2.381	2.381				
INC361	Schlumberger - Artesia District Bulk Facility	556726.85	3635725.52	3362.7	3.28	1.54	3.05		0.725	0.725				
INC362	EOG - Rumble State No4	547030.03	3620827.16	3569.2	32.81	32.81	30.51		0.476	0.476				
INC363	EOG - Rumble State No5	547030.78	3620837.73	3569.0	14.99	1.54	3.05		0.079	0.079				
INC364	EOG - Rumble State No6	547023.19	3620835.64	3569.4	14.99	1.54	3.05		0.037	0.037				
INC365	EOG - Lacama 20 State Com 602H	545072.27	3621962.92	3614.3	32.81	32.81	30.51		0.476	0.476				
INC366	EOG - Lacama 20 State Com 602H	545062.83	3621956.35	3615.7	14.99	1.54	3.05		0.079	0.079				
INC367	COG - Man State 2H Battery	574496.98	3618616.59	3549.2	3.28	1.54	3.05		1.812	1.812				
INC368	Shelby 23 Tank Battery	551727.85	3611093.19	3409.7	25.00	1.54	3.05		0.079	0.079				
INC369	EOG- Falcata Battery	540689.17	3616360.84	3695.3	3.28	1.54	3.05		0.317	0.317				
INC370	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	25.00	1.54	3.05		0.037	0.037				
INC371	Spur Energy - Ross Ranch Battery	548845.66	3611195.95	3472.1	25.00	1.54	3.05		0.037	0.037				
INC372	Spur Energy - Ross Ranch Battery	548838.87	3611199.51	3472.7	25.00	1.54	3.05		0.037	0.037				
INC373	Spur Energy - Ross Ranch Battery	548831.28	3611197.41	3473.0	25.00	1.54	3.05		0.037	0.037				
INC374	Lime Rock - Malco B Battery	563974.50	3627080.87	3442.5	22.01	1.54	3.05						26.191	26.191
INC375	Lime Rock - Condor 7 Battery	563709.45	3625436.95	3287.2	22.01	1.54	3.05						3.968	3.968
INC376	Lime Rock - Condor 7 Battery	563716.98	3625443.97	3287.6	22.01	1.54	3.05						3.968	3.968
INC377	Ramirez & Sons Inc - Crusher No2	552788.48	3623752.45	3448.6	32.81	1410.76	30.51						181.202	181.202
INC378	Lime Rock - Condor Stirling Battery	563708.44	3625403.35	3286.5	22.01	1.54	3.05						6.349	6.349
INC379	Lime Rock - Condor Stirling Battery	563715.98	3625410.37	3286.7	22.01	1.54	3.05						6.349	6.349
INC380	Lime Rock - Condor Stirling Battery	563709.19	3625413.92	3286.7	22.01	1.54	3.05						10.318	10.318
INC381	Lime Rock - Hawk 8 Battery	565549.93	3624873.88	3444.8	22.01	1.54	3.05						18.254	18.254
INC382	Lime Rock - Hawk 8 Battery	565543.14	3624877.43	3444.7	20.01	1.54	3.05						18.254	18.254
INC383	Lime Rock - Hondo Federal Battery	567436.20	3626826.66	3582.7	22.01	1.54	3.05						13.492	13.492
INC384	Lime Rock - Hondo Federal Battery	567429.41	3626830.21	3582.7	22.01	1.54	3.05						13.492	13.492
INC385	EOG - Rumble State No4	547037.57	3620834.18	3568.8	14.99	1.54	3.05						0.079	0.079
INC386	Cimarex Enegy - Montana 1	551943.30	3616521.89	3422.5	3.28	1.54	3.05						10.000	10.000
INC387	Total Malfunction Construction	573989.09	3624401.33	3608.9	3.28	1.54	3.05						685.124	685.124
INC388	Total Malfunction Construction	573990.74	3624393.17	3608.6	3.28	1.54	3.05						18.120	18.120
INC389	Frontier - Coyote Compressor Station	578698.86	3628251.37	3668.9	3.28	1.54	3.05						18.120	18.120
INC390	Southeast Readi-Mix - Artesia Plant	557117.00	3635667.03	3356.9	32.81	721.78	30.51				172.142	172.142		
INC391	Ramirez & Sons Inc - Crusher No2	552788.48	3623752.45	3448.6	32.81	1410.76	30.51				344.284	344.284		
INC392	EOG - Rumble State No4	547023.19	3620835.64	3569.4	14.99	1.54	3.05				0.873	0.873		

HollyFrontier Off-Site Volume Source Increment Input Data (Updated 5-5-21)

Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential to Emit (lb/hr)						
								PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC393	EOG - Rumble State No5	547018.95	3620828.74	3569.5	14.99	1.54	3.05				0.476	0.476		
INC394	EOG - Lacama 20 State Com 602H	545069.78	3621951.39	3615.9	14.99	1.54	3.05				0.873	0.873		
INC395	Artesia Gas Plant	573981.91	3624410.31	3609.4	3.28	1.54	3.05				17.939	17.939		
INC396	Artesia Gas Plant	573979.32	3624394.96	3608.8	3.28	1.54	3.05				18.120	18.120		
INC397	Frontier - Coyote Compressor Station	578705.81	3628246.40	3669.1	3.28	1.54	3.05				18.120	18.120		
INC398	Spur - Shelby 23 Tank Battery	551727.85	3611093.19	3409.7	25.00	1.54	3.05				0.476	0.476		
INC399	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	25.00	1.54	3.05				0.476	0.476		
INC400	Spur Energy - Ross Ranch Battery	548838.87	3611199.51	3472.7	25.00	1.54	3.05				0.476	0.476		
INC401	Spur Energy - Ross Ranch Battery	548831.28	3611197.41	3473.0	25.00	1.54	3.05				0.476	0.476		
INC402	Spur Energy - Ross Ranch Battery	548827.04	3611190.51	3472.9	25.00	1.54	3.05				0.476	0.476		
INC403	WPX - DD and EE Federal Leases	543610.96	3613500.45	3619.1	3.28	1.54	3.05				0.397	0.397		

HollyFrontier Navajo Volume Source Parameter Calculation

Source ID	Source Description	Source Dimensions: Length (ft)	Width (ft)	Area (ft2)	Square Root of Area (ft)	Structure Height/Vertical Dimension (ft)	Release Height (ft)	Tank Diameter (ft)	Initial Dispersion Coefficients: Initial Horizontal Dimension s_Y (ft)	Initial Vertical Dimension s_Z (ft)	Note
TRLO_9	Molten Sulfur Railcar Loading	10.0	10.0	100.00	10.00	15.00	15.00	NA	2.33	6.98	Elevated source on or adjacent to building
T_0049	Slop Oil Tank	NA	NA	94.99	9.75	36.00	36.00	11.00	2.27	16.74	Elevated source on or adjacent to building
T_0081	Asphalt/Pitch Tank	NA	NA	9241.22	96.13	40.00	40.00	108.50	22.36	18.60	Elevated source on or adjacent to building
T_0082	Asphalt/Pitch Tank	NA	NA	15386.00	124.04	40.00	40.00	140.00	28.85	18.60	Elevated source on or adjacent to building
T_0110	Asphalt/Pitch Tank	NA	NA	9156.24	95.69	35.00	35.00	108.00	22.25	16.28	Elevated source on or adjacent to building
T_0410	Asphalt/Pitch Tank	NA	NA	4899.19	69.99	40.00	40.00	79.00	16.28	18.60	Elevated source on or adjacent to building
T_0420	Asphalt/Pitch Tank	NA	NA	1962.50	44.30	30.00	30.00	50.00	10.30	13.95	Elevated source on or adjacent to building
T_0814	Asphalt/Pitch Tank	NA	NA	1962.50	44.30	32.00	32.00	50.00	10.30	14.88	Elevated source on or adjacent to building
T_0914	Slop Oil Tank	NA	NA	4415.63	66.45	40.00	40.00	75.00	15.45	18.60	Elevated source on or adjacent to building
T_1227	Asphalt/Pitch Tank	NA	NA	4654.27	68.22	40.00	40.00	77.00	15.87	18.60	Elevated source on or adjacent to building
T_0106	T-0106 Sour Water Tank	NA	NA	3523.87	59.36	40.00	40.00	67.00	13.81	18.60	Elevated source on or adjacent to building
T_0435	T-0435 Sour Water Tank	NA	NA	706.50	26.58	40.00	40.00	30.00	6.18	18.60	Elevated source on or adjacent to building
T_0437	T-0437 Crude Oil Tank	NA	NA	11304.00	106.32	40.00	40.00	120.00	24.73	18.60	Elevated source on or adjacent to building
T_0439	T-0439 Sour Naphtha Tank	NA	NA	13266.50	115.18	46.00	46.00	130.00	26.79	21.40	Elevated source on or adjacent to building
T_0450	T-0450 Sour Naphtha Tank	NA	NA	11304.00	106.32	40.00	40.00	120.00	24.73	18.60	Elevated source on or adjacent to building
T_0737	T-0737 Sour Water Tank	NA	NA	3115.67	55.82	40.00	40.00	63.00	12.98	18.60	Elevated source on or adjacent to building
T_0802	T-0802 Sour Water Tank	NA	NA	1589.63	39.87	40.00	40.00	45.00	9.27	18.60	Elevated source on or adjacent to building
T_0830	T-0830 Slop Oil Tank	NA	NA	15386.00	124.04	40.00	40.00	140.00	28.85	18.60	Elevated source on or adjacent to building
T_1225	T-1225 Crude Oil Tank	NA	NA	17662.50	132.90	40.00	40.00	150.00	30.91	18.60	Elevated source on or adjacent to building

NA - Not applicable.

Sigma Y values calculated as the square root of the area, or average length of side, divided by 4.3 (Table 3-1 of AERMOD Manual for Single Volume Source). Area for tanks calculated from diameter.

Sigma Z values for surface based sources calculated as the initial vertical dimension of source divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Sigma Z values for elevated sources on or adjacent to a building calculated as the building height divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source on or Adjacent to Building).

Sigma Z values for elevated sources not on or adjacent to a building calculated as the initial vertical dimension of source divided by 4.3 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Release height for tanks and railcar loading equal to top of tank/railcar as this is where emissions occur.

HollyFrontier Flare Stack Parameter Calculation

Source ID	Source Description	Effective Stack Height (ft)	Temp. (°F)	Exit Velocity (ft/sec)	Effective Stack Diameter (ft)	MMBtu/hr	cal/sec	Actual Stack Height (ft)
FL0400	FL-0400, North Plant Flare	395.1	1832	65.6	16.11	8440	5.91E+08	162.0
FL0401	FL-0401, South Plant Flare	342.2	1832	65.6	9.60	3000	2.10E+08	200.0
FL0402	FL-0402, FCC Flare	304.6	1832	65.6	9.28	2800	1.96E+08	167.0
FL0403	FL-0403, Alky Flare	499.1	1832	65.6	19.45	12300	8.61E+08	220.0
FL0404	FL-0404, GOHT Flare	568.5	1832	65.6	26.01	22000	1.54E+09	200.0
TL4VCU	TL-4 VCU	81.8	1832	65.6	3.92	500	3.50E+07	21.4
FLHEP	HEP Portable Flare	51.1	1832	65.6	2.29	170	1.19E+07	15.0
TVCU	Tank VCU	18.5	1832	65.6	0.20	1.26	8.82E+04	15.0

Per AERSCREEN Manual

2.1.2 Flares

Flare sources are denoted by the term "** FLARE DATA" in the input file in the line above the source parameters. Flare source inputs are, with English and metric units:

- emission rate (lb/hr or g/s)
- stack height (feet or meters)
- total heat release rate (cal/sec)
- radiative heat loss fraction

The heat loss fraction can be user selected or the SCREEN3 default value of 0.55. For information about heat loss fractions, see Leahey and Davies (1984). AERSCREEN will process the flare in AERMOD as a POINT source type. For the exit velocity and exit temperature, AERSCREEN defaults these values to 20 m/s and 1,273 K, respectively as done in SCREEN3 (U.S. EPA, 1995). The stack diameter and effective stack height used in AERMOD are calculated from the inputs as:

$$D = 9.88 \times 10^{-4} \times \sqrt{HR \times (1 - HL)} \qquad (1)$$

$$h_{eff} = H_s + 4.56 \times 10^{-3} \times HR^{0.478} \qquad (2)$$

Where D is effective stack diameter, HR is the heat release rate, HL is the heat loss fraction, H_{eff} is effective stack height and H_s is the stack height entered by the user.

1 MMBtu (IT)/hour [MMBtu/h] = 69998.8225308643 calorie (IT)/second [cal/s]

HL is assumed to be 0.55 per AERSCREEN Manual

Holly Frontier - Artesia CALPUFF Input

Model Source Description	Model Source ID	LCC East (km)	LCC North (km)	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Velocity (m/sec)	Temp. (K)	Sigma Y (m)	Sigma Z (m)	Momentum Flux	SO_2 (lb/hr)	SO2LT (lb/hr)	SO_4 (lb/hr)	SO_4LT (lb/hr)	NOx (lb/hr)	PMC (lb/hr)	EC (lb/hr)	SOA (lb/hr)
Unit 13 Naphtha Splitter Reboiler	H0009	-691.753	-762.453	23.63	1025.42	1.37	5.46	549.82	0	0	1	0.183	0.000	0.091	0.000	0.540	0.084	0.021	0.000
Unit 06 HDS Reboiler	H0018	-691.742	-762.355	22.87	1025.08	1.22	5.95	644.26	0	0	1	0.425	0.000	0.212	0.000	1.515	0.115	0.029	0.000
South Crude Charge Heater	H0019	-691.733	-763.054	47.46	1027.53	1.33	6.52	505.37	0	0	1	0.000	0.000	0.000	0.000	0.620	0.067	0.017	0.050
Unit 21 Heater	H0028	-691.531	-763.081	15.34	1027.71	0.81	5.73	727.59	0	0	1	0.100	0.000	0.050	0.000	1.718	0.031	0.008	0.000
Unit 06 Charge Heater	H0030	-691.741	-762.349	20.43	1025.05	1.22	6.86	574.82	0	0	1	0.188	0.000	0.094	0.000	1.002	0.000	0.000	0.000
Unit 13 Charge Heater	H0040	-691.740	-762.343	30.79	1025.02	1.22	6.95	583.15	0	0	1	0.000	0.000	0.000	0.000	0.720	0.000	0.000	0.000
Unit 10 FCC Feed Heater	H0312	-691.612	-762.409	29.41	1025.54	1.22	6.22	630.37	0	0	1	0.969	0.178	0.484	0.089	3.350	0.230	0.057	0.000
Unit 70 Stabilizer Reboiler Heater	H0355	-691.566	-762.385	41.21	1025.62	0.76	8.75	500.93	0	0	1	0.000	0.000	0.000	0.000	0.970	0.012	0.003	0.009
Unit 70 CCR Heaters	H0362_64	-691.579	-762.359	62.65	1025.63	2.13	5.15	443.15	0	0	1	1.338	0.000	0.669	0.000	2.506	0.310	0.077	0.000
Unit 44 Charge Heater	H0421	-691.550	-762.448	24.90	1025.61	0.99	7.23	616.48	0	0	1	0.238	0.000	0.119	0.000	0.630	0.074	0.018	0.000
SRU Hot Oil Heater	H0464	-691.786	-762.522	24.33	1025.71	0.84	2.93	505.37	0	0	1	0.000	0.000	0.000	0.000	0.053	0.009	0.002	0.007
Unit 33 Charge Heater	H0601	-691.522	-762.511	39.94	1025.71	1.98	3.54	422.04	0	0	1	0.798	0.000	0.399	0.000	1.304	0.235	0.059	0.000
Unit 45 Charge Heater	H2421	-691.542	-762.518	26.52	1025.69	1.07	7.56	749.82	0	0	1	0.000	0.000	0.000	0.000	0.023	0.024	0.006	0.018
Unit 25 ROSE® Unit No. 2 Hot Oil Heater	H2501	-691.369	-762.607	51.22	1025.76	2.39	5.79	649.82	0	0	1	4.352	1.641	2.176	0.821	3.600	0.993	0.248	0.000
SRU3 Hot Oil Heater	H3101	-691.759	-762.560	24.39	1025.75	0.84	2.93	505.37	0	0	1	0.411	0.162	0.205	0.081	0.330	0.092	0.023	0.000
Unit 34 Hydrocracker Reboiler 1	H3402	-691.370	-762.596	20.43	1025.72	1.22	8.51	574.82	0	0	1	1.886	0.711	0.943	0.356	1.560	0.430	0.108	0.000
Unit 34 Hydrocracker Reactor Charge Hea	H3403	-691.383	-762.589	26.24	1025.73	1.22	5.91	647.04	0	0	1	1.160	0.438	0.580	0.219	0.960	0.265	0.066	0.000
Unit 63 Hydrogen Plant Reformer Furnace:	H8801_02	-691.407	-762.518	39.63	1025.62	1.17	22.99	588.71	0	0	1	0.000	0.000	0.000	0.000	4.458	0.364	0.091	0.273
Unit 64 Hydrogen Plant Reformer	H9851	-691.407	-762.487	53.66	1025.62	3.05	7.26	449.82	0	0	1	0.000	0.000	0.000	0.000	11.222	2.594	0.648	1.945
SRU2 Tail Gas Incinerator	H0473	-691.792	-762.491	45.73	1025.63	1.22	13.48	894.26	0	0	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SRU3 Tail Gas Incinerator	H3103	-691.764	-762.577	45.73	1025.82	1.22	15.21	922.04	0	0	1	50.000	18.740	25.000	9.370	6.500	13.320	3.330	0.000
FL-0404, GOHT Flare	FL0404	-691.387	-762.233	173.33	1024.95	7.93	20.00	1273.15	0	0	1	39.833	2.458	19.917	1.229	11.156	0.000	0.000	0.000
Notes:												**101.88**	**24.33**	**50.94**	**12.16**	**54.74**	**19.25**	**4.81**	**2.30**

LCC Origin: 40.0N, 97.0W, Standard (Matching) Parallels: 33.0N, 45.0N. Datum: NWS-84.

PMCoarse (PMC) = PM between 2.5 and 10 um in diameter.

EC = elemental carbon

SOA = secondary organic aerosols

PM speciation based upon NPS guidance for NG Combustion Turbines.

Consensus Gas-fired Turbine

Example of Consensus Approach where H2SO4 emissions are not provided by applicant
Applicant's estimates are in **BOLD**.

	Heat Input	Filterable PM (25% Estimate)		Condensible PM (75% Estimate)		Total PM (Applicant)		SO2 (Applicant)		
Turbine	(mmBtu/hr)	(lb/mmBtu)	(lb/hr)	(lb/mmBtu)	(lb/hr)	(lb/mmBtu)	(lb/hr)	(gr/100scf)		(lb/hr)
			0.00		0.00		**0.00**	2.0		**0.00**

SO4
(lb/hr)
0.00

SO2 (Applicant-33%)
(lb/hr)
0.00

Organic Carbon
(lb/hr)
0.00

Impact of Consensus Combined Cycle Turbine Example on Extinction

Type		Name	Extinction Coef.	f(RH)*	Efficiency	Emissions (lb/hr)	Total Relative bext 1/Mm	
Filterable		EC	10		10	0.00	0.00	
Inorganic CPM		SOIL	1		1		0.00	
Inorganic CPM		SO4	3	2	6	0.00	0.00	* f(RH) will vary
Organic CPM		SOA	4		4	0.00	0.00	
						0.00	0.00	

HOLLYFRONTIER

ATTACHMENT B

Model Summary Results

8-25-21 HollyFrontier Artesia SIL Model, Full Grid (Includes 1-22 H2S Remodel)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time
AERMOD 21112	Artesia SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	41.21148	556397.63	3634797.91	1025.65	1025.65	0	20012818
AERMOD 21112	Artesia SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	41.05966	556390.61	3634800.06	1025.67	1025.67	0	19011518
AERMOD 21112	Artesia SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	40.16028	556379.06	3634896.87	1025.9	1025.9	0	17012302
AERMOD 21112	Artesia SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	40.14757	556381.95	3634872.66	1025.85	1025.85	0	18111006
AERMOD 21112	Artesia SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	39.89154	556381.95	3634872.66	1025.85	1025.85	0	16101103
AERMOD 21112	Artesia SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	25.414	556381.95	3634872.66	1025.85	1025.85	0	16051516
AERMOD 21112	Artesia SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	24.41507	556384.84	3634848.46	1025.81	1025.81	0	20031516
AERMOD 21112	Artesia SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	23.04333	556384.84	3634848.46	1025.81	1025.81	0	17092816
AERMOD 21112	Artesia SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	22.1883	556384.84	3634848.46	1025.81	1025.81	0	18070524
AERMOD 21112	Artesia SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	22.05946	556384.84	3634848.46	1025.81	1025.81	0	19021816
AERMOD 21112	Artesia SIL_2016_H2S.SUM	H2S	1-HR	ALL	1ST	24.44764	556500	3634100	1027.15	1027.15	0	16121303
AERMOD 21112	Artesia SIL_2018_H2S.SUM	H2S	1-HR	ALL	1ST	23.62346	556854.85	3634006.44	1027.45	1027.45	0	18090722
AERMOD 21112	Artesia SIL_2019_H2S.SUM	H2S	1-HR	ALL	1ST	22.44775	556854.85	3634006.44	1027.45	1027.45	0	19111903
AERMOD 21112	Artesia SIL_2017_H2S.SUM	H2S	1-HR	ALL	1ST	21.22834	556902.06	3634007.39	1027.52	1027.52	0	17113021
AERMOD 21112	Artesia SIL_2020_H2S.SUM	H2S	1-HR	ALL	1ST	21.15178	556854.85	3634006.44	1027.45	1027.45	0	20122506
AERMOD 21112	Artesia SIL_2016-2020_NO2_ST.SUM	NO2	1ST-HIGHEST MAX D.	ALL	1ST	35.14309	556588.18	3634040.29	1027.2	1027.2	0	5 YEARS
AERMOD 21112	Artesia SIL_2018_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.62696	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS
AERMOD 21112	Artesia SIL_2019_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.40098	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS
AERMOD 21112	Artesia SIL_2017_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.33655	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS
AERMOD 21112	Artesia SIL_2020_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.25856	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS
AERMOD 21112	Artesia SIL_2016_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.09455	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS
AERMOD 21112	Artesia SIL_2020_PM10.SUM	PM10	24-HR	ALL	1ST	2.12842	556300	3635000	1026.57	1026.57	0	20060624
AERMOD 21112	Artesia SIL_2018_PM10.SUM	PM10	24-HR	ALL	1ST	2.09536	556379.06	3634896.87	1025.9	1025.9	0	18073124
AERMOD 21112	Artesia SIL_2016_PM10.SUM	PM10	24-HR	ALL	1ST	1.98536	556370.4	3634969.47	1026.16	1026.16	0	16082224
AERMOD 21112	Artesia SIL_2017_PM10.SUM	PM10	24-HR	ALL	1ST	1.91596	556300	3635000	1026.57	1026.57	0	17050724
AERMOD 21112	Artesia SIL_2019_PM10.SUM	PM10	24-HR	ALL	1ST	1.91181	556300	3634900	1026.41	1026.41	0	19033124
AERMOD 21112	Artesia SIL_2018_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.6628	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS
AERMOD 21112	Artesia SIL_2019_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.65634	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS
AERMOD 21112	Artesia SIL_2020_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.6208	556376.17	3634921.07	1026.01	1026.01	0	1 YEARS
AERMOD 21112	Artesia SIL_2017_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.60552	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS
AERMOD 21112	Artesia SIL_2016_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.57825	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS
AERMOD 21112	Artesia SIL_2016-2020_PM25_ST.SUM	PM25	1ST-HIGHEST 24-HR	ALL	1ST	1.92291	556376.17	3634921.07	1026.01	1026.01	0	5 YEARS
AERMOD 21112	Artesia SIL_2016-2020_PM25_LT.SUM	PM25	ANNUAL	ALL	1ST	0.30301	556505.52	3635129.2	1025.74	1025.74	0	5 YEARS
AERMOD 21112	Artesia SIL_2019_SO2_ST.SUM	SO2	1-HR	ALL	1ST	26.06468	556300	3634500	1026.17	1026.17	0	19041611
AERMOD 21112	Artesia SIL_2020_SO2_ST.SUM	SO2	1-HR	ALL	1ST	25.45004	556300	3634400	1026.36	1026.36	0	20103111
AERMOD 21112	Artesia SIL_2017_SO2_ST.SUM	SO2	1-HR	ALL	1ST	25.26063	556300	3634400	1026.36	1026.36	0	17031812
AERMOD 21112	Artesia SIL_2016_SO2_ST.SUM	SO2	1-HR	ALL	1ST	25.05872	556445.7	3634255.43	1026.77	1026.77	0	16061309
AERMOD 21112	Artesia SIL_2018_SO2_ST.SUM	SO2	1-HR	ALL	1ST	24.60504	556300	3634300	1026.78	1026.78	0	18103010
AERMOD 21112	Artesia SIL_2020_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.93385	556300	3635000	1026.57	1026.57	0	20060624
AERMOD 21112	Artesia SIL_2018_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.77685	556379.06	3634896.87	1025.9	1025.9	0	18073124
AERMOD 21112	Artesia SIL_2016_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.28096	556376.17	3634921.07	1026.01	1026.01	0	16092224
AERMOD 21112	Artesia SIL_2019_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.0093	556382.56	3635002.7	1026.13	1026.13	0	19072624
AERMOD 21112	Artesia SIL_2017_SO2_ST.SUM	SO2	24-HR	ALL	1ST	6.91898	556300	3635000	1026.57	1026.57	0	17050724
AERMOD 21112	Artesia SIL_2019_SO2_ST.SUM	SO2	3-HR	ALL	1ST	22.27776	556390.61	3634800.06	1025.67	1025.67	0	19111312
AERMOD 21112	Artesia SIL_2017_SO2_ST.SUM	SO2	3-HR	ALL	1ST	22.24497	556300	3634700	1026.14	1026.14	0	17040712
AERMOD 21112	Artesia SIL_2020_SO2_ST.SUM	SO2	3-HR	ALL	1ST	22.17742	556400	3634200	1027.1	1027.1	0	20032012
AERMOD 21112	Artesia SIL_2018_SO2_ST.SUM	SO2	3-HR	ALL	1ST	21.39588	556300	3634300	1026.78	1026.78	0	18040512
AERMOD 21112	Artesia SIL_2016_SO2_ST.SUM	SO2	3-HR	ALL	1ST	21.31755	556400	3634200	1027.1	1027.1	0	16021412
AERMOD 21112	Artesia SIL_2019_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.74039	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS
AERMOD 21112	Artesia SIL_2018_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.73197	556300	3634900	1026.41	1026.41	0	1 YEARS
AERMOD 21112	Artesia SIL_2020_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.70143	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS
AERMOD 21112	Artesia SIL_2017_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.66959	556300	3634900	1026.41	1026.41	0	1 YEARS
AERMOD 21112	Artesia SIL_2016_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.6453	556381.95	3634872.66	1025.85	1025.85	0	1 YEARS

8-25-21 HollyFrontier Artesia SIL Model, Full Grid (Includes 1-22 H2S Remodel)

Pollutant	Average	Group	Rank	Conc. (ug/m3)	Secondary PM2.5 Conc. (ug/m3)	Total Conc. (ug/m3)	SIL (ug/m3)	%SIL	Max Distance to SIL (km)
PM25	ANNUAL	ALL	1ST	0.30	0.11	0.42	0.2	209%	0.76
PM25	1ST-HIGHEST 24-HR	ALL	1ST	1.92	2.59	4.51	1.2	376%	1.48
PM10	ANNUAL	ALL	1ST	0.66	NA	0.66	1.0	66%	NA
PM10	24-HR	ALL	1ST	2.13	NA	2.13	5.0	43%	NA
SO2	1-HR	ALL	1ST	26.06	NA	26.06	7.8	334%	10.7
SO2	24-HR	ALL	1ST	7.93	NA	7.93	5.0	159%	1.73
SO2	3-HR	ALL	1ST	22.28	NA	22.28	25.0	89%	NA
SO2	ANNUAL	ALL	1ST	0.74	NA	0.74	1.0	74%	NA
NO2	1ST-HIGHEST MAX D.	ALL	1ST	35.14	NA	35.14	7.5	467%	1.82
NO2	ANNUAL	ALL	1ST	2.63	NA	2.63	1.0	263%	1.07
CO	1-HR	ALL	1ST	41.21	NA	41.21	2000.0	2%	NA
CO	8-HR	ALL	1ST	25.41	NA	25.41	500.0	5%	NA
H2S	1-HR	ALL	1ST	24.45	NA	24.45	5.0	489%	1.01

NA - not applicable

Maximum 5-yr 1-hr SO2 impact conservatively used in lieu of 5-yr average of maxima.

NO2 modeling included the ARM2 method to account for NOx to NO2 conversion. The default minimum and maximum NO2/NOx ratios of 0.5 and 0.9 were employed.

8-25-21 HollyFrontier Artesia NAAQS Model, Significance Grid (Includes 1-22 H2S Remodel)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File
AERMOD 21112	Artesia NAAQS_2019_H2S.SUM	H2S	1-HR	ALL	1ST	28.94206	556415.7	3634620.21	1025.46	1025.46		0	19123017	Artes
AERMOD 21112	Artesia NAAQS_2018_H2S.SUM	H2S	1-HR	ALL	1ST	27.66808	556854.85	3634006.44	1027.45	1027.45		0	18090722	Artes
AERMOD 21112	Artesia NAAQS_2016_H2S.SUM	H2S	1-HR	ALL	1ST	27.65655	556664.07	3634229.22	1026.56	1026.56		0	16101007	Artes
AERMOD 21112	Artesia NAAQS_2017_H2S.SUM	H2S	1-HR	ALL	1ST	27.34274	556413.44	3634642.42	1025.43	1025.43		0	17020308	Artes
AERMOD 21112	Artesia NAAQS_2020_H2S.SUM	H2S	1-HR	ALL	1ST	26.3362	556664.07	3634229.22	1026.56	1026.56		0	20071106	Artes
AERMOD 21112	Artesia NAAQS_2019_H2S.SUM	H2S	1-HR	HOLLY	1ST	28.87117	556415.7	3634620.21	1025.46	1025.46		0	19123017	Artes
AERMOD 21112	Artesia NAAQS_2018_H2S.SUM	H2S	1-HR	HOLLY	1ST	27.59325	556854.85	3634006.44	1027.45	1027.45		0	18090722	Artes
AERMOD 21112	Artesia NAAQS_2016_H2S.SUM	H2S	1-HR	HOLLY	1ST	27.28641	556878.45	3634006.92	1027.46	1027.46		0	16011205	Artes
AERMOD 21112	Artesia NAAQS_2017_H2S.SUM	H2S	1-HR	HOLLY	1ST	26.89261	556413.44	3634642.42	1025.43	1025.43		0	17020308	Artes
AERMOD 21112	Artesia NAAQS_2020_H2S.SUM	H2S	1-HR	HOLLY	1ST	26.03605	556972.87	3634008.83	1027.38	1027.38		0	20011207	Artes
AERMOD 21112	Artesia NAAQS_2020_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.58068	556300	3633900	1028.29	1028.29		0	20121320	Artes
AERMOD 21112	Artesia NAAQS_2016_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.38897	556300	3633900	1028.29	1028.29		0	16011724	Artes
AERMOD 21112	Artesia NAAQS_2019_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.28026	555800	3634200	1028.6	1028.6		0	19010421	Artes
AERMOD 21112	Artesia NAAQS_2018_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.00066	557157.31	3633991.57	1026.38	1026.38		0	18013002	Artes
AERMOD 21112	Artesia NAAQS_2017_H2S.SUM	H2S	1-HR	NEARBY	1ST	13.52761	557731.89	3633992.58	1023.46	1023.46		0	17022105	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_NO2_ST.SUM	NO2	8TH-HIGHEST MAX D	ALL	1ST	173.99957	556460.99	3635129.21	1025.95	1025.95		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_NO2_ST.SUM	NO2	8TH-HIGHEST MAX D	HOLLY	1ST	138.43808	556382.56	3635002.7	1026.13	1026.13		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2018_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	17.29712	556460.99	3635129.21	1025.95	1025.95		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2019_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	16.43736	556460.99	3635129.21	1025.95	1025.95		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2020_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	16.04415	556483.26	3635129.2	1025.85	1025.85		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2017_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	15.11576	556460.99	3635129.21	1025.95	1025.95		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	13.56671	556483.26	3635129.2	1025.85	1025.85		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2018_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	17.29712	556460.99	3635129.21	1025.95	1025.95		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2019_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	16.43736	556460.99	3635129.21	1025.95	1025.95		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2020_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	16.04415	556483.26	3635129.2	1025.85	1025.85		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2017_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	15.11576	556460.99	3635129.21	1025.95	1025.95		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	13.56671	556483.26	3635129.2	1025.85	1025.85		0	1 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_ST.SUM	PM25	8TH-HIGHEST 24-HR	ALL	1ST	18.42716	556505.52	3635129.2	1025.74	1025.74		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_ST.SUM	PM25	8TH-HIGHEST 24-HR	HOLLY	1ST	17.88599	556505.52	3635129.2	1025.74	1025.74		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_ST.SUM	PM25	8TH-HIGHEST 24-HR	NEARBY	1ST	8.71237	556571.66	3635263.01	1025.55	1025.55		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_LT.SUM	PM25	ANNUAL	ALL	1ST	5.56499	556505.52	3635129.2	1025.74	1025.74		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_LT.SUM	PM25	ANNUAL	HOLLY	1ST	4.37949	556505.52	3635129.2	1025.74	1025.74		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_LT.SUM	PM25	ANNUAL	NEARBY	1ST	1.86594	556570.94	3635328.83	1025.74	1025.74		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_SO2_ST.SUM	SO2	4TH-HIGHEST MAX D	ALL	1ST	156.97927	556300	3634300	1026.78	1026.78		0	5 YEARS	Artes
AERMOD 21112	Artesia NAAQS_2016-2020_SO2_ST.SUM	SO2	4TH-HIGHEST MAX D	HOLLY	1ST	156.97927	556300	3634300	1026.78	1026.78		0	5 YEARS	Artes

8-25-21 HollyFrontier Artesia NAAQS Model, Significance Grid (Includes 1-22 H2S Remodel)

Pollutant	Average	Group	Rank	Modeled Conc. (ug/m3)	Background Conc. (ug/m3)	Secondary PM2.5 Conc. (ug/m3)	Total Conc. (ug/m3)	NMAAQS/ NAAQS (ug/m3)	% NMAAQS/NAAQS	Comments
H2S	1-HR	ALL	1ST	28.94	NA	NA	28.9	41.8	69%	Includes off-site source inventory.
H2S	1-HR	HOLLY	1ST	28.87	NA	NA	28.9	41.8	69%	
H2S	1-HR	NEARBY	1ST	14.6	NA	NA	14.6	41.8	35%	
NO2	ANNUAL	ALL	1ST	17.3	5.0	NA	22.3	94.02	24%	Oustide Carlsbad monitor
NO2	8TH-HIGHEST MAX D	ALL	1ST	174.0	NA	NA	174.0	188.03	93%	No offsite source inventory required.
PM25	ANNUAL	ALL	1ST	5.6	5.9	0.11	11.6	12.0	96%	Eastern NM monitor.
PM25	ANNUAL	HOLLY	1ST	4.4	5.9	0.11	10	12.0	87%	Includes off-site source inventory
PM25	ANNUAL	NEARBY	1ST	1.9	5.9	0.11	8	12.0	66%	
PM25	8TH-HIGHEST 24-HR	ALL	1ST	18.4	13.4	2.59	34.4	35.0	98%	
PM25	8TH-HIGHEST 24-HR	HOLLY	1ST	17.9	13.4	2.59	33.9	35.0	97%	
PM25	8TH-HIGHEST 24-HR	NEARBY	1ST	8.7	13.4	2.59	24.7	35.0	71%	
SO2	4TH-HIGHEST MAX D	ALL	1ST	157.0	5.3	NA	162.3	196.4	83%	Bloomfield monitor. There are no offsite SO2 sources within 10km.

NA - Not applicable.
Background concentrations as recommended by the NMAQB.
1-hr NO2 background concentrations from the Carlsbad monitor added within model.
"HOLLY" source group includes only the Artesia refinery sources.
NO2 modeling included the ARM2 method to account for NOx to NO2 conversion. The default minimum and maximum NO2/NOx ratios of 0.5 and 0.9 were employed.
SO2 24-hr NMAAQS modeling was not conducted as compliance is demonstrated using the 1-hr NAAQS (per NMED policy).

8-25-21 HollyFrontier Artesia Increment Model, PTE Assumed for Holly, Significance Gri

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Artesia Increment_2018_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	24.67837	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2019_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	24.16853	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2020_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	23.67046	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2017_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	23.2157	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2016_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	22.19136	556527.78	3635129.2	1025.58	1025.58	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2018_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	17.21266	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2019_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	16.35653	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2020_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	15.97009	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2017_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	15.04591	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2016_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	13.51191	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2017_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	17.79712	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2016_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	16.83571	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2018_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	16.60564	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2019_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	16.57839	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2020_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	15.69278	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artes	228	3	132
AERMOD 21112	Artesia Increment_2017_SO2_ST.SUM	SO2	24-HR	ALL	2ND	67.11136	556375.48	3635087.04	1026.35	1026.35	0	17040624	Artes	127	3	245
AERMOD 21112	Artesia Increment_2019_SO2_ST.SUM	SO2	24-HR	ALL	2ND	65.72592	556527.78	3635129.2	1025.58	1025.58	0	19082024	Artes	127	3	245
AERMOD 21112	Artesia Increment_2016_SO2_ST.SUM	SO2	24-HR	ALL	2ND	63.32752	556505.52	3635129.2	1025.74	1025.74	0	16100824	Artes	127	3	245
AERMOD 21112	Artesia Increment_2018_SO2_ST.SUM	SO2	24-HR	ALL	2ND	60.36211	556416.47	3635129.21	1026.2	1026.2	0	18100124	Artes	127	3	245
AERMOD 21112	Artesia Increment_2020_SO2_ST.SUM	SO2	24-HR	ALL	2ND	60.19588	556483.26	3635129.2	1025.85	1025.85	0	20061624	Artes	127	3	245
AERMOD 21112	Artesia Increment_2019_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	63.5348	556527.78	3635129.2	1025.58	1025.58	0	19082024	Artes	127	3	245
AERMOD 21112	Artesia Increment_2018_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	58.85538	556416.47	3635129.21	1026.2	1026.2	0	18091724	Artes	127	3	245
AERMOD 21112	Artesia Increment_2017_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	57.47117	556375.48	3635087.04	1026.35	1026.35	0	17091024	Artes	127	3	245
AERMOD 21112	Artesia Increment_2016_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	57.27247	556416.47	3635129.21	1026.2	1026.2	0	16072024	Artes	127	3	245
AERMOD 21112	Artesia Increment_2020_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	54.91992	556483.26	3635129.2	1025.85	1025.85	0	20022124	Artes	127	3	245
AERMOD 21112	Artesia Increment_2020_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	38.16688	557200	3634100	1025.78	1025.78	0	20022224	Artes	127	3	245
AERMOD 21112	Artesia Increment_2019_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	31.71447	555900	3633100	1032.5	1032.5	0	19112524	Artes	127	3	245
AERMOD 21112	Artesia Increment_2016_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	31.52081	555900	3635300	1031.49	1031.49	0	16122324	Artes	127	3	245
AERMOD 21112	Artesia Increment_2017_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	29.08133	557537.74	3634690.06	1022.56	1022.56	0	17122024	Artes	127	3	245
AERMOD 21112	Artesia Increment_2018_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	25.97896	555800	3635200	1030.06	1030.06	0	18032624	Artes	127	3	245

8-25-21 HollyFrontier Artesia Increment Model, PTE Assumed for Holly, Significance Gri

Pollutant	Average	Group	Rank	Modeled Conc. (ug/m3)	Secondary PM2.5 Conc. (ug/m3)	Total Conc. (ug/m3)	Increment (ug/m3)	% Increment	Comments
NO2	ANNUAL	ALL	1ST	24.7	NA	24.7	25	99%	
NO2	ANNUAL	HOLLY	1ST	17.2	NA	17.2	25	69%	
NO2	ANNUAL	NEARBY	1ST	17.8	NA	17.8	25	71%	
SO2	24-HR	ALL	2ND	67.1	NA	67.1	91	74%	
SO2	24-HR	HOLLY	2ND	63.5	NA	63.5	91	70%	
SO2	24-HR	NEARBY	2ND	38.2	NA	38.2	91	42%	

NA - Not applicable.

PM2.5 increment not triggered due to project.

8-25-21 HollyFrontier Artesia TAP Mode

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Artesia TAP_2017_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.86031	556300	3634900	1026.41	1026.41	0	17020416	Artes	3	1	8195
AERMOD 21112	Artesia TAP_2020_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.59695	556575.62	3634197.94	1026.68	1026.68	0	20040316	Artes	3	1	8195
AERMOD 21112	Artesia TAP_2016_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.26709	556500	3634200	1026.85	1026.85	0	16011116	Artes	3	1	8195
AERMOD 21112	Artesia TAP_2018_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.25832	556300	3634900	1026.41	1026.41	0	18010616	Artes	3	1	8195
AERMOD 21112	Artesia TAP_2019_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.11581	556370.4	3634969.47	1026.16	1026.16	0	19110216	Artes	3	1	8195
AERMOD 21112	Artesia TAP_2020_NH3.SUM	NH3	8-HR	ALL	1ST	32.28275	556380.79	3635023.79	1026.17	1026.17	0	20112308	Artes	2	1	8195
AERMOD 21112	Artesia TAP_2018_NH3.SUM	NH3	8-HR	ALL	1ST	32.01996	556587.86	3634326.98	1026.22	1026.22	0	18110908	Artes	2	1	8195
AERMOD 21112	Artesia TAP_2017_NH3.SUM	NH3	8-HR	ALL	1ST	29.49	556400	3634500	1025.86	1025.86	0	17082824	Artes	2	1	8195
AERMOD 21112	Artesia TAP_2019_NH3.SUM	NH3	8-HR	ALL	1ST	28.23331	556416.92	3634389.47	1026.21	1026.21	0	19111124	Artes	2	1	8195
AERMOD 21112	Artesia TAP_2016_NH3.SUM	NH3	8-HR	ALL	1ST	26.04177	556572.31	3635129.2	1025.36	1025.36	0	16080108	Artes	2	1	8195

8-25-21 HollyFrontier Artesia TAP Mode

Pollutant	Average	Group	Rank	Modeled Conc. (ug/m3)	1/100 OEL(ug/m3)	% Standard
NH3	8-HR	ALL	1ST	32.3	180	18%
H2SO4	8-HR	ALL	1ST	4.9	10	49%

CALPUFF Results (9/6/21)

Parameter	Averaging Time	Meteorological Year Modeled	Modeled Value	Modeled Value Units	Standard	% Standard	Comments
AQRV - Visibility	24-hour	2013	2.78	Extinction (%)	5.0	56%	Only Carlsbad Caverns has Q/d > 10.
		2014	1.90	98% (8th high)	5.0	38%	8th high over all receptors, not by receptor, conservatively used.
		2015	2.24		5.0	45%	
SIL - PM10 (PMC)	24-hour	2013	6.66E-02	Concentration (ug/m3)	0.30	22%	Class I SIL
		2014	6.11E-02		0.30	20%	All Class I areas modeled.
		2015	5.78E-02		0.30	19%	
	Annual	2013	7.76E-03		0.20	4%	
		2014	7.59E-03		0.20	4%	
		2015	8.27E-03		0.20	4%	
SIL - SO2	Annual	2013	3.52E-02	Concentration (ug/m3)	0.10	35%	Class I SIL
		2014	3.52E-02		0.10	35%	All Class I areas modeled.
		2015	3.79E-02		0.10	38%	
	24-hour	2013	3.01E-01		0.20	150%	SRU3 at 50 lb/hr.
		2013	1.93E-01		0.20	97%	SRU3 at 28 lb/hr.
		2014	2.70E-01		0.20	135%	SRU3 at 50 lb/hr.
		2014	1.78E-01		0.20	89%	SRU3 at 28 lb/hr.
		2015	2.41E-01		0.20	120%	SRU3 at 50 lb/hr.
		2015	1.56E-01		0.20	78%	SRU3 at 28 lb/hr.
	3-hour	2013	9.45E-01		1.00	95%	
		2014	9.82E-01		1.00	98%	
		2015	8.76E-01		1.00	88%	
SIL - NOx	Annual	2013	1.88E-02	Concentration (ug/m3)	0.10	19%	Class I SIL
		2014	1.89E-02		0.10	19%	All Class I areas modeled.
		2015	2.00E-02		0.10	20%	
AQRV	Annual	2013	2.56E-03	Deposition (kg/ha/yr)	0.005	51%	All Class I areas conservatively modeled.
Nitrogen Deposition		2014	2.67E-03		0.005	53%	
		2015	2.87E-03		0.005	57%	
Sulfur Deposition	Annual	2013	3.14E-03		0.005	63%	Used annual SO2 and SO4 emissions.
		2014	3.32E-03		0.005	66%	
		2015	3.77E-03		0.005	75%	

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AIR DISPERSION MODELING
FOR HOLLYFRONTIER NAVAJO REFINING LLC
IN ARTESIA, NEW MEXICO

HOLLYFRONTIER

Prepared for:
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Original Submittal September 2021
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Second Update July 2022

HollyFrontier

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for HollyFrontier Navajo Refining LLC ("HollyFrontier") for its petroleum refinery in Artesia, New Mexico. This analysis was conducted in support of an air quality constructon permit application submitted to correct several permit conditions and to authorize changes to several emissions units. This analysis has been conducted by RTP Environmental Associates, Inc. ("RTP") on behalf of HollyFrontier.

The analysis evaluated emissions of the criteria and toxic air pollutants regulated under the applicable provisions of the New Mexico Administrative Code ("NMAC"). The New Mexico Air Quality Bureau ("AQB") requires an analysis of air quality standards with any construction permit application. The ambient standards that evaluated include the National Ambient Air Quality Standards ("NAAQS"), New Mexico Ambient Air Quality Standards ("NMAAQS"), Prevention of Significant Deterioration ("PSD") increments, and toxic air pollutants subject to 20.2.72.403.A(2).

This analysis conforms with the modeling procedures outlined in the Environmental Protection Agency's Guideline on Air Quality Models[1] ("Guideline" or "Appendix W"), the AQB's Air Dispersion Modeling Guidelines[2], and associated EPA modeling policy and guidance. The analysis also conforms with the modeling protocol submitted to the AQB and Federal Land Managers ("FLMs") on May 26, 2021 and approved, with a requested revision to the proposed treatment of intermittent emissions, by the AQB on August 2, 2021. No comments on the protocol were received from the FLMs.

RTP had proposed to exclude emergency engines and firewater pumps that emit intermittently from the demonstration of compliance with the 1-hr standards. The AQB stated that these sources should be included unless they were exempt from permitting. HollyFrontier has therefore elected to request an exemption from permitting for the emergency engines. The firewater pumps have been included in the 1-hr modeling demonstrations.

This second revision to the analysis includes a change to the fence line along the southern portion of the refinery as well as a change to the Modeled Emission Rates for Percursors (“MERPS”) values used in calculating the potential for secondary particulate matter and ozone formation due to the project.

2.0 PROJECT DESCRIPTION

The Artesia Refinery occupies approximately 466 acres and has a crude oil capacity of 100,000 barrels per day. The Refinery has been in operation since the mid-1920s when oil wells were first drilled in southeastern New Mexico. The Refinery can process heavy, sour and light, sweet crude oils and runs a predominant slate of Permian Basin crudes that are gathered in West Texas and Southeast New Mexico. The refinery can also source a variety of crude oils from Cushing, Oklahoma including Canadian crudes.

With the permit application, HollyFrontier is requesting revisions to existing emission limits and other permit terms for several permitted emissions units; to add existing, unpermitted emissions units to the permit; to add permitted emission rates to the permit for certain emissions units from which not all emitted pollutants have previously been permitted; to authorize changes to the refinery's flares, including increases in emission limits; and to authorize changes in changes in fuel composition for three process heaters. The flare project is a major modification for VOC. None of the requested changes are major modifications under the PSD program for any pollutant other than VOC. However, several of the emission limits for which HollyFrontier is requesting revisions were considered in the impact analyses for two historical major modifications at the Artesia Refinery: The GOHT Project authorized by Permit No. 0195-M15, which was a major modification for emissions of CO and NO_X, and the Refinery Expansion Project authorized by Permit No. PSD-NM-0195-M25, which was a major modification for emissions of CO, VOC, NO_X, SO_2, PM10, and PM. The air dispersion modeling analysis discussed herein therefore includes updates to the impact analyses for those two major modifications.

3.0 SITE DESCRIPTION

The Artesia Refinery is located in Eddy County, in southeastern NM, approximately 62km south of Roswell and 225km northeast of El Paso. The approximate Universal Transverse Mercator ("UTM") coordinates of the refinery are 556,690 meters east and 3,634,600 meters north (NAD 83, UTM Zone 13) at an elevation of 3400 feet above sea level. Figure 1 shows the general location of the refinery. Figure 2 shows the specific refinery location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

Eddy County is classified as attainment or unclassified for all regulated pollutants.

The refinery is classified under the regulations governing PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC) as a major stationary source.

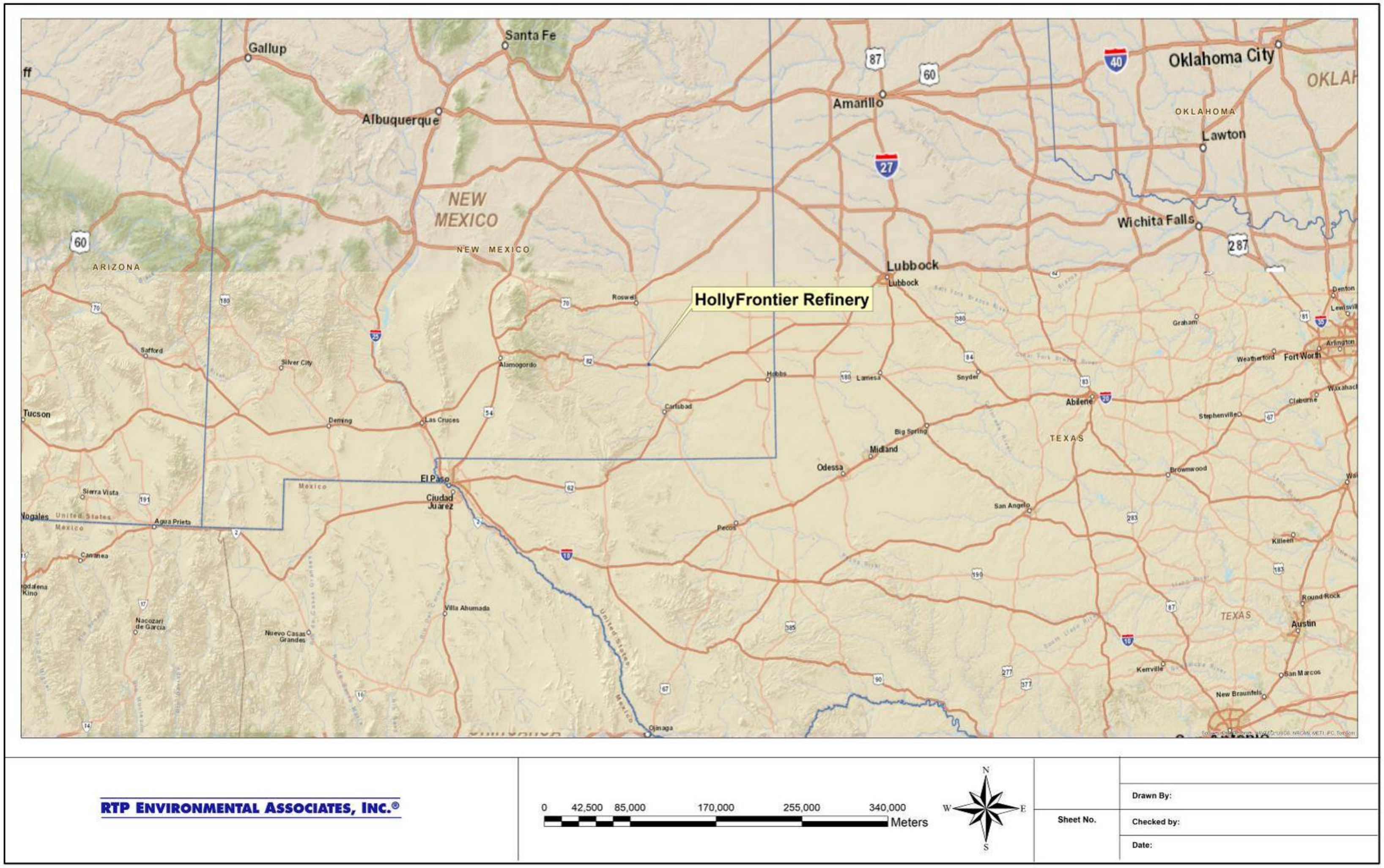


Figure 1. General Location of the Artesia Refinery

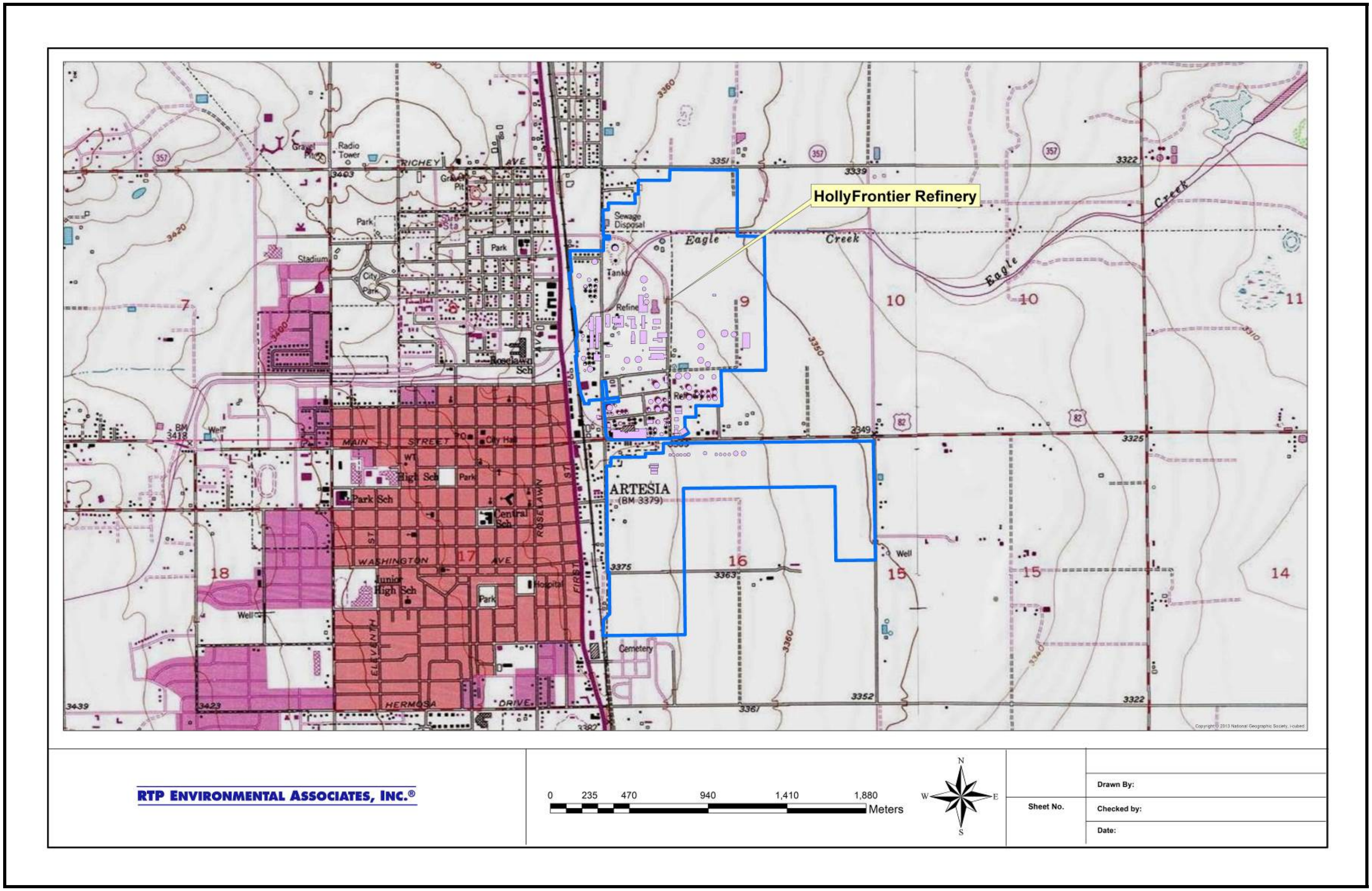


Figure 2. Specific Location of the Artesia Refinery

4.0 CLASS II AREA MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 21112) was used to conduct the near-field dispersion modeling analysis. The modeling protocol stated that AERMOD Version 19191 would be used. However, EPA released an updated version of the model after the protocol was submitted. RTP has elected to use the most recent version of AERMOD in the analysis.

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is an appropriate model for calculating ambient concentrations near the Artesia Refinery based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the EPA <u>Guideline on Air Quality Models</u>.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of Appendix W was not warranted.

The VISCREEN model is designed to assist in the evaluation of plume visual impacts as required under PSD. The model implements the visibility calculation procedures as outlined in the EPA's Workbook for Visual Impact Screening and Analysis.[3] VISCREEN was used to assess the potential for the 2001 and 2007 major modifications to cause a visual plume within 50km of the proposed facility.

For more distant locations (i.e., areas located in excess of 50km from the proposed site), the AERMOD and VISCREEN models are not appropriate as the steady state assumptions in the models tend to degrade. Therefore, the EPA-approved version of the CALPUFF model (Version 5.8.5) was used to assess pollutant concentrations, deposition rates, and the potential for visibility impacts at these distant locations, namely PSD Class I areas. The CALPUFF modeling methodology is discussed in Section 6 of this report.

4.2 <u>Model Control Options and Land Use</u>

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. The use of rural dispersion coefficients is supported by the Land Use Procedure consistent with subsection 7.2.1.1.b.i of the Guideline and Section 5.1 of the AERMOD Implementation Guide. The USGS 2016 National Land Cover Data (“NLCD”) within 3km of the site were converted to Auer 1978 land use types and evaluated.[4] It was determined that the land use in the vicinity of the refinery is predominantly rural as defined by Auer (less than 50% of the area is classified as urban - Figure 3). Only the red and dark red regions in Figure 3 (NLCD categories 23 and 24) are considered urban.

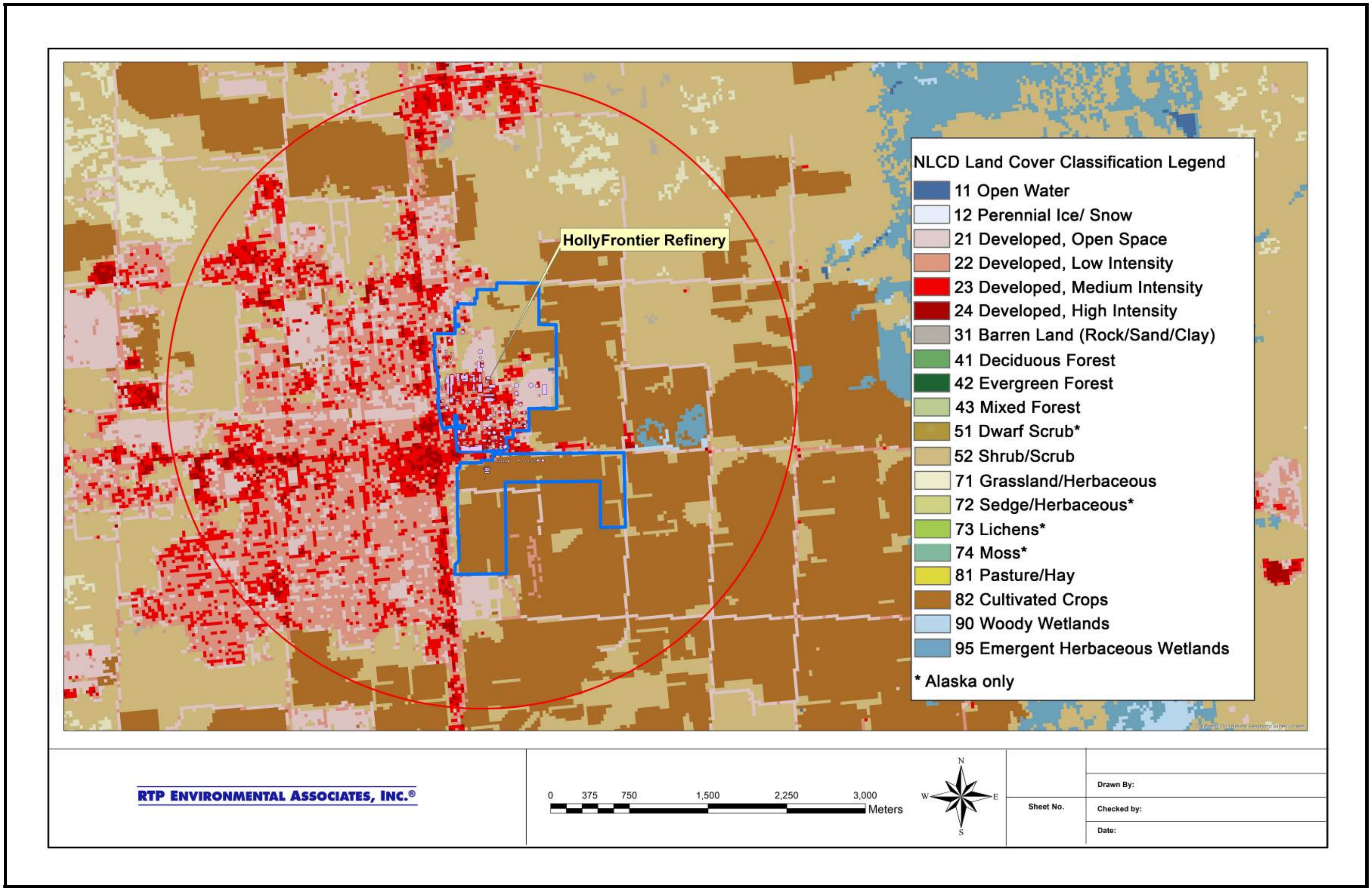


Figure 3. Land Use within Three Kilometers (Three Kilometer Radius Shown as Red Circle)

4.3 Source Data

Source Characterization

Point Sources

Most emission sources at the refinery vent to stacks with well-defined openings. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions from storage tanks and equipment leaks also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well-defined opening. These were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

All source locations were based upon a NAD83, UTM Zone 13 projection.

Flares

There are eight flares at the refinery for which emissions during periods of malfunction may exceed those during routine operation, including startup and shutdown periods. Malfunction emissions are not required to be modeled per 40 CFR Part 51 Appendix W. Emissions during startup or shutdown (i.e., non-emergency flaring) and other foreseeable operations were modeled using the proceedures outlined in the EPA's AERSCREEN manual[5]. These proceedures are slightly different than those contained in the AQB's Modeling Guidelines; however, the AQB approved of the AERSCREEN method on May 20, 2021. The effective stack height (H, in meters) was calculated as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$H_{equivalent} = H_{actual} + 4.56 \times 10^{-3} X (Q)^{0.478}$$

The effective flare diameter (d, in meters) was calculated as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88 \times 10^{-4} \times ((Q \times (1-0.55))^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec was assumed.

All modeling input data, including the volume source and flare parameter calculations can be found in Attachment A to this report.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model. Procedures used were in accordance with those described in the EPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[6]. GEP formula stack height, as defined in 20.2.72.300 NMAC and in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from refinery construction drawings and prior modeling submissions. The structure locations and heights were input to the EPA's Building Profile Input Program ("BPIP-PRIME") computer program to calculate the direction-specific building dimensions needed for AERMOD. The Artesia Refinery plot plan and the ambient air boundaries are shown in Figure 4. A three dimensional rendering of the refinery is shown in Figure 5. All stacks and significant structures were included in the BPIP runs.

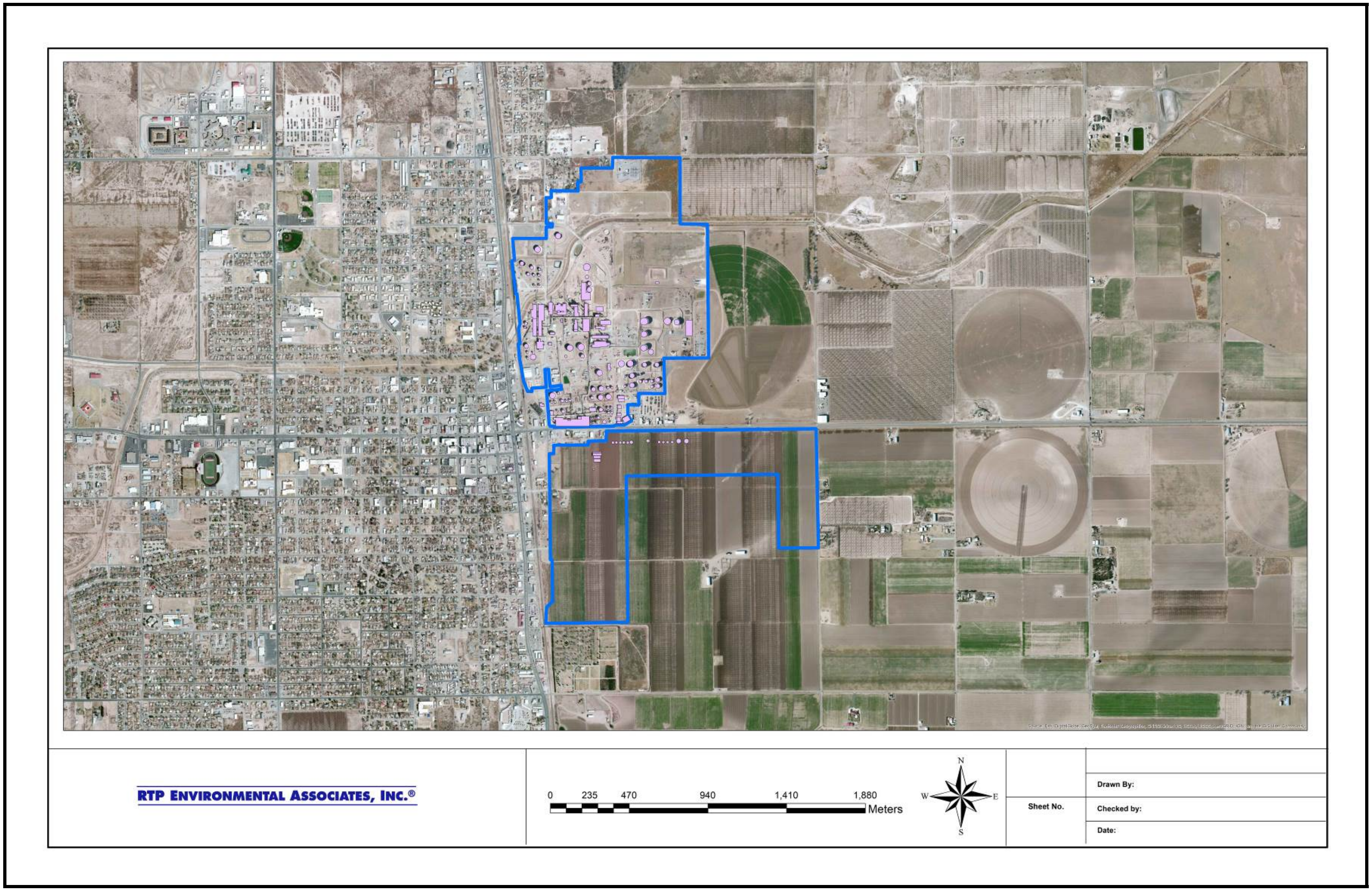


Figure 4. HollyFrontier Plot Plan and Ambient Air Boundary

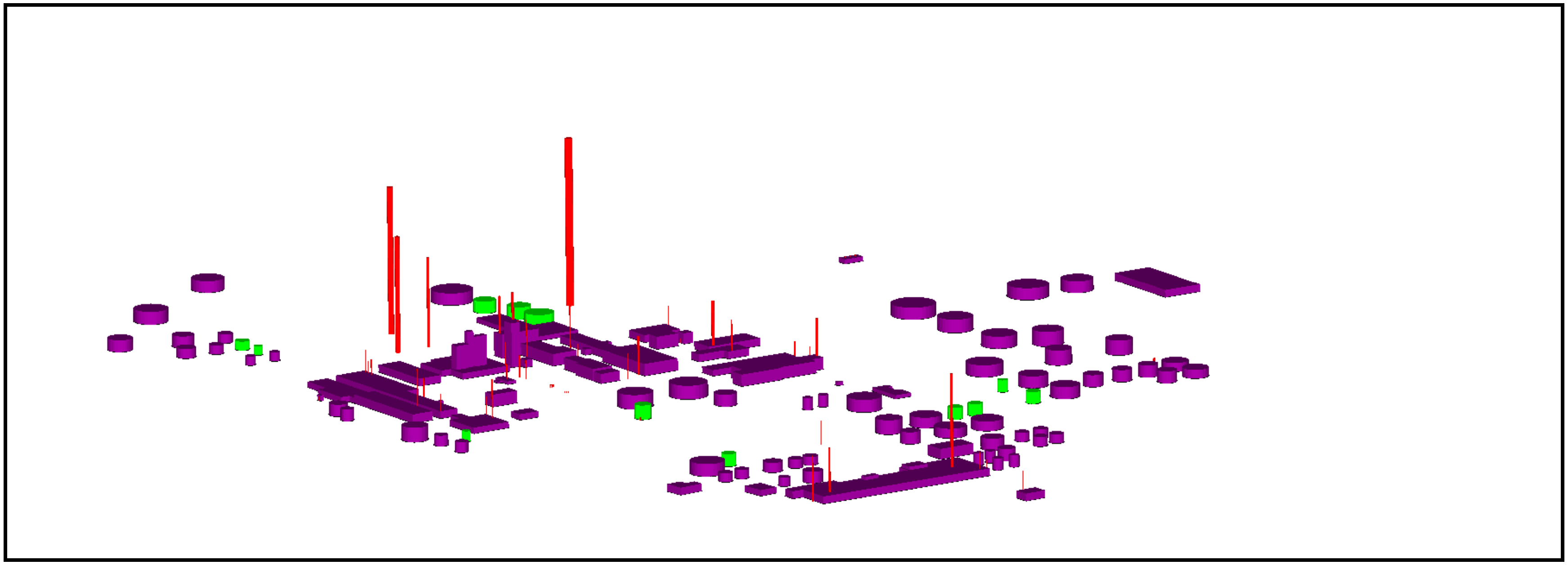


Figure 5. Artesia Refinery Three-Dimensional Plot Plan (View from SW)

4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 20.2.74.303.B NMAC and 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 20.2.74.306.A NMAC and 40 CFR § 52.21(m), as discussed in Section 5.3 herein.

The AQB has recommended background concentrations established for New Mexico. These values are provided in the Air Dispersion Modeling Guidelines and were used in this analysis. These data satisfy the criteria provided in EPA's Ambient Monitoring Guidelines[7] as being representative of the HollyFrontier site.

The background data employed are presented in Table 1.

Table 1. Background Concentrations

Pollutant	Averaging Time	Value (µg/m³)	Monitor Location
CO	8-hr	1524	Del Norte High School
	1-hr	2203	
NO_2	Annual	5.0	Outside Carlsbad
	1-hr	See Table 2	
PM_{10}	24-hour	100.7	Eastern NM, Hobbs
PM_{25}	24-hour	13.4	
	Annual	5.9	
O_3	1-hour	150.5	

A range of monitored background NO_2 values that consider seasonal and diurnal variation was used to assess compliance with the 1-hr NO_2 NAAQS. These seasonal values reflect the three year average of the 98th percentile value by hour of day and by season. Data from the Carlsbad monitor (AQS No. 35-015-1005) were used. Since the 2020 monitor values were not available, the lastest three years (2017-2019) were used. These seasonal NO_2 values (Table 2) were added to the modeled value within AERMOD.

Table 2. Carlsbad 98% Hourly NO_2 (ppb) By Season and Hour of Day

Model Ending Hour	Winter	Spring	Summer	Fall
01	24.67	13.67	10.67	19.00
02	23.00	15.33	13.33	17.33
03	21.67	15.67	14.33	20.67
04	25.33	16.33	14.67	22.67
05	23.33	19.00	15.33	22.00
06	24.67	20.67	16.67	21.67
07	24.67	21.33	17.67	19.67
08	21.33	18.33	14.33	19.00
09	20.00	14.67	14.33	18.67
10	20.00	12.00	10.67	16.00
11	18.00	10.33	7.67	14.00
12	16.33	8.00	5.33	12.00
13	15.67	7.33	5.00	11.00
14	12.00	5.67	4.33	10.33
15	12.33	5.33	4.00	9.33
16	14.67	5.00	3.33	8.67
17	18.00	4.67	3.33	11.00
18	20.00	6.33	4.00	12.33
19	18.33	10.33	6.67	12.00
20	16.00	11.67	9.67	12.00
21	15.67	10.33	10.67	12.67
22	19.00	10.00	11.00	14.33
23	21.33	10.00	10.00	14.67
24	23.33	10.33	10.33	19.00

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR § 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 8,200 receptors were employed. The receptor grid consisted of three cartesian grids and receptors spaced at 25m intervals along the ambient boundary. The first cartesian grid extended to approximately 2.5km from the boundary in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region was 250m. The third grid extended to 10km with a spacing of 500m. The receptor grid was designed such that maximum impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 3.

Table 3. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Fence (m)
100	2,500
250	7,500
500	10,000

The Artesia Refinery is located in southeastern New Mexico. The terrain in the area is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from one arc-second National Elevation Data ("NED") obtained from the USGS. Locations were based upon a NAD83, UTM Zone 13 projection. The near-field receptor grid is presented in Figure 6.

4.6 <u>Meteorological Data</u>

Data Selection and Processing

The 2016-2020, 5-year sequential hourly surface meteorological data collected at the National Weather Service ("NWS") station in Artesia, NM (WBAN No. 03035) and upper air data from Midland, TX (WBAN No. 23023) were used in the near-field modeling analysis performed using AERMOD. These data were processed into a "model-ready" format using the latest version of AERMET (version 21112).

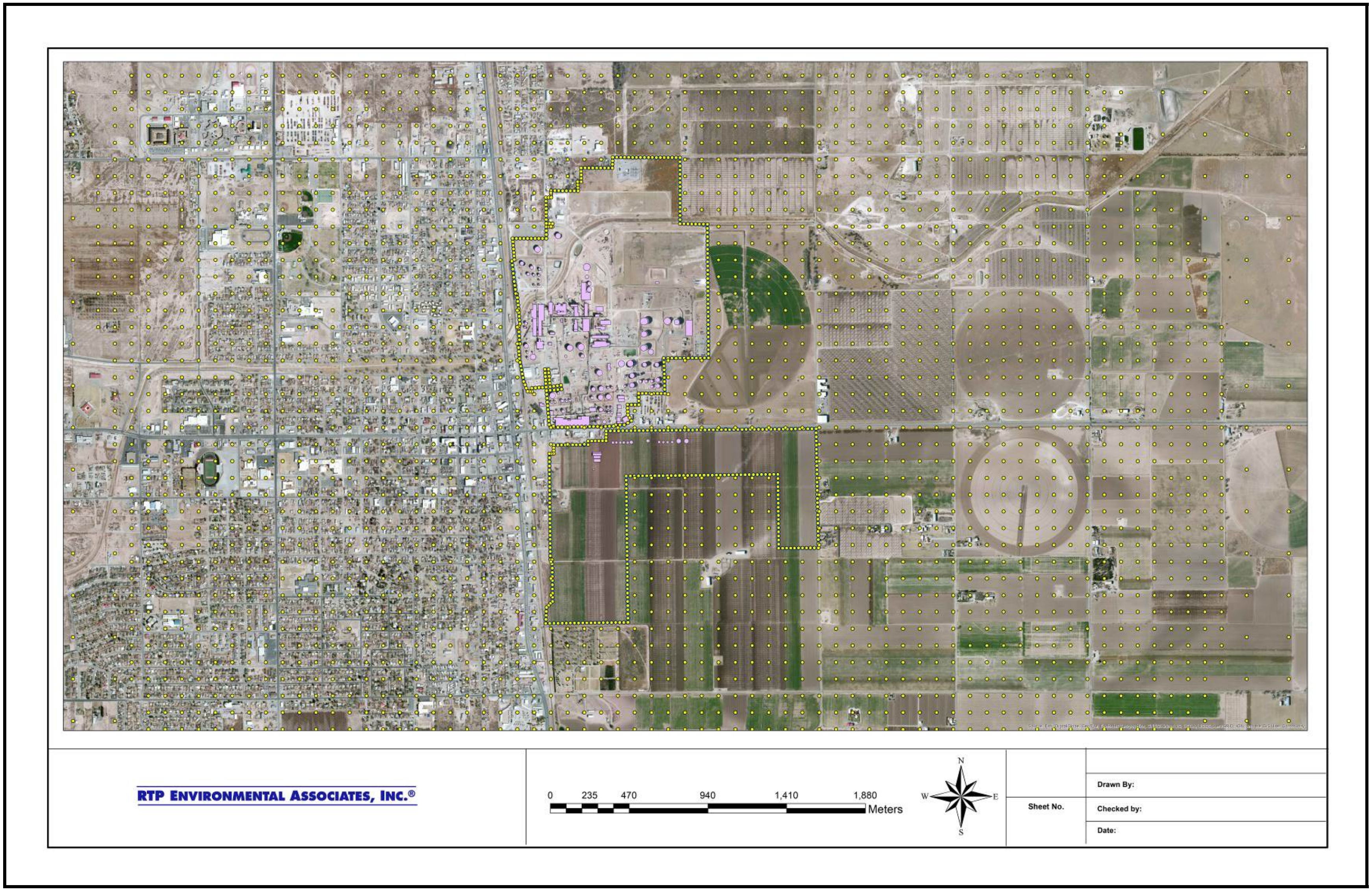


Figure 6. HollyFrontier Near-field Receptor Grid

In AERMET Stage 1, the Artesia surface meteorological data in the Integrated Surface Data ("ISD") format were extracted. Midland upper air meteorological data in the Forecast Systems Laboratory ("FSL") format were also extracted.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption. The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. RTP developed estimates of the surface characteristics using EPA's AERSURFACE program (Version 20060). A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. The default season definitions were used with no continuous snow cover for one or more months during the winter and dry moisture. The "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed. The 2016-2020 wind rose is shown in Figure 7.

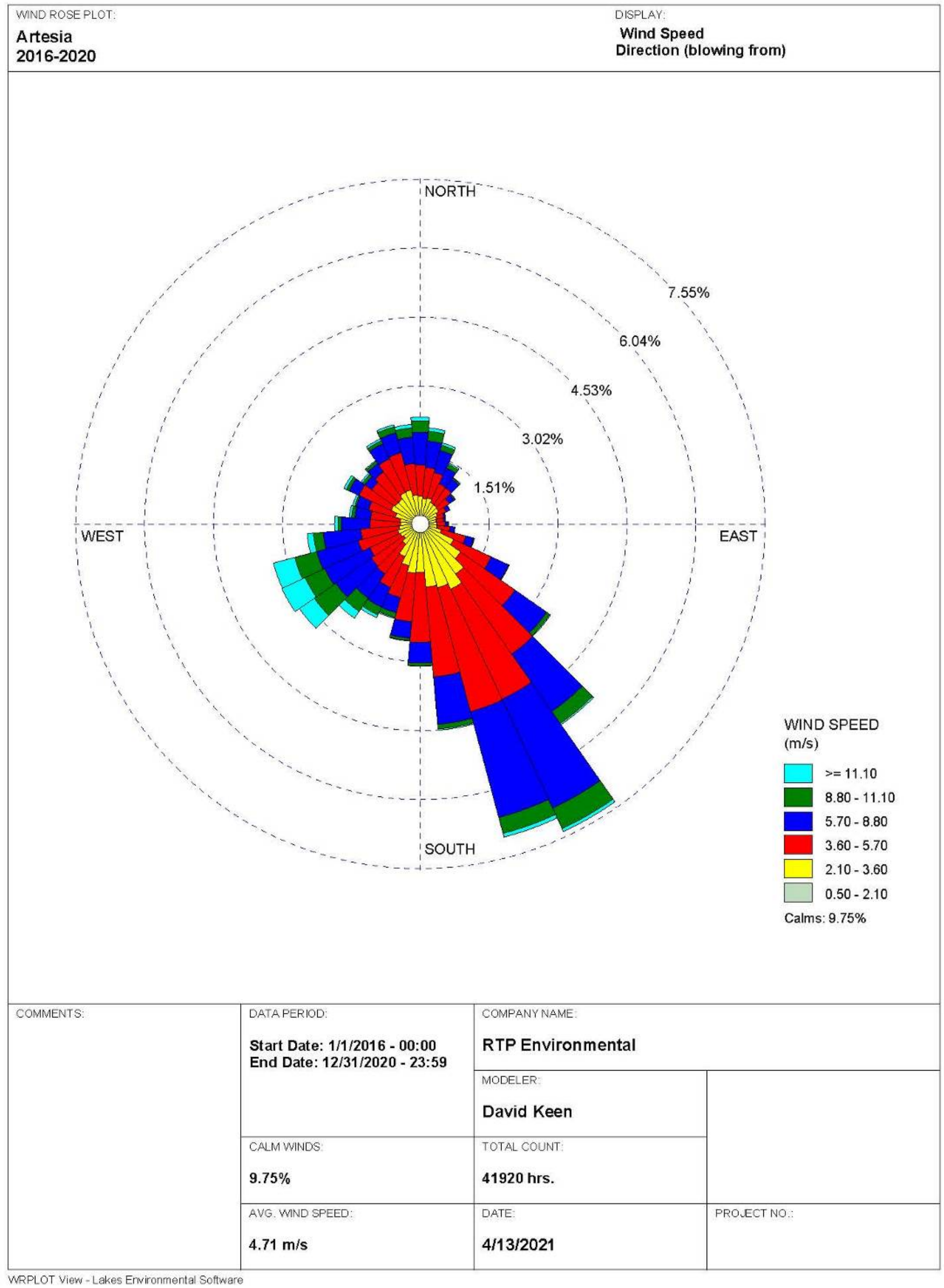


Figure 7. 2016-2020 Artesia Windrose

5.0 CLASS II AREA MODELING METHODOLOGY

5.1 Pollutants Subject to Review

The proposed permitting action will potentially allow for an increase in emissions of all criteria pollutants, with the exception of lead, as well as H_2S and two air toxics: ammonia and sulfuric acid mist. HollyFrontier has therefore elected to conduct a facility wide model for all pollutants using the requested permit to emit rates. Since precursor VOC emissions will also increase, ozone impacts were addressed.

5.2 Significant Impact Analysis

The criteria pollutant air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase including an increment analysis and a NAAQS/NMAAQS analysis. In the significant impacts analysis, the calculated maximum impacts associated with the project were determined for each pollutant. These impacts determined the net change in air quality resulting from the proposed modification. Five years of meteorological data were used in the significant impact analysis. Maximum modeled concentrations were compared to the pollutant-specific significance levels for all pollutants and averaging times except for the 1-hour NO_2, SO_2 and 24-hr PM2.5 impacts. For these pollutants and averaging times, the five-year average of the maximum impact at each receptor were used to assess significance. The PSD Class II and AQB Significant Impact Levels are listed in Table 4.

Table 4. PSD Class II and AQB Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels (µg/m³)
CO	1-hour	2,000
	8-hour	500
H_2S	1-hour	5.0
PM10	24-hour	5.0
	Annual	1.0
PM2.5[a]	24-hour	1.2
	Annual	0.3
NO_2	1-hour	7.52[b]
	Annual	1.0
SO_2	1-hour	7.8[b]
	3-hour	25.0
	24-hour	5.0
	Annual	1.0
O_3	8-hour	1.96

[a]Please note that on January 22, 2013, the US Court of Appeals for the District of Columbia Circuit Court granted a request from the EPA to vacate and remand the $PM_{2.5}$ SILs codified in the federal PSD rule. EPA modeling guidance (August 1, 2016), issued subsequent to the remand, continues to recommend use of the SILs listed above to justify permitting decisions for PM2.5 NAAQS and increment evaluations.
[b]There are no 1-hr NO_2 or SO_2 SILs promulgated at 40 CFR 51.165. The EPA proposed interim SILs for NO_2 of 4ppb and SO_2 of 3ppb will be used.

Pollutants with impacts that exceeded the ambient air significance levels, as defined in 40 CFR 51.165, were included in both the NAAQS/NMAAQS and increment analyses. In these latter analyses, impacts from the Artesia Refinery were added to concentrations calculated from other nearby PM10, PM2.5, SO_2 and H_2S sources, plus a regional background concentration (for the NAAQS/NMAAQS analysis only). The resultant total concentration was compared to the NAAQS/NMAAQS and increments to determine compliance.

5.3 Preconstruction Monitoring

In order to satisfy the requirement for an air quality analysis pursuant to 20.2.74.306.A NMAC and 40 CFR § 52.21(m)(1), HollyFrontier used the AQB's recommended background values discussed in Section 4.4 herein. HollyFrontier requested that the existing ambient monitoring data be allowed for use in lieu of site-specific preconstruction data.

5.4 Nearby Source Inventories

Off-site sources were included in the H_2S, SO_2, PM2.5, PM10 NAAQS/NMAAQS analyses as well as the increment analyses. Modeled impacts from the nearby sources were added to impacts from HollyFrontier in assessing compliance. Prior to the most recent 2017 Appendix W (40 CFR Part 51) revisions, the maximum distance to a significant impact plus 50km was historically used as a radius to define the screening area. The most recent Appendix W modeling guideline now states that professional judgment must be exercised in assessing sources to be included in the modeling analysis. Appendix W as well as the NM Modeling Guidelines further state that the number of nearby sources explicitly modeled in the air quality analysis is expected to be few, except in unusual situations, and that these sources will typically be located within the first 10-20 kilometers from the proposed source (see January 17, 2017, 82 Federal Register 5182 at page 5221).

The AQB provided RTP Environmental with the offsite source inventories required to conduct the analyses. HollyFrontier modeled all SO_2, PM10, and PM2.5 sources located within 10km of the refinery. Background concentrations adequately represent any PM10/PM2.5 sources beyond 10km. No nearby sources were modeled in the NAAQS/NMAAQS for the remaining pollutants as the background values also adequately represent impacts. For the H_2S and increment analysis where backgound concentrations are not considered, all sources located within 25km of the refinery as well as any large sources (1,000 lb/hr) located within 50km of the refinery were modeled.

5.5 NAAQS/NMAAQS Analysis

A refined air quality analysis to determine compliance with the NAAQS/NMAAQS was conducted. As stated, this analysis was conducted to determine compliance with the

NAAQS/NMAAQS for all regulated pollutants with impacts that exceeded the significant impact levels. Lead emissions were not evaluated because the facility does not have appreciable lead emissions. Each new or modified source's potential emission rate was used. Average emissions were used for the existing FCC regenerator, which is not part of the project, in assessing NAAQS compliance. Average emissions are allowed to be modeled for non-modified units pursuant to Table 8-2 of the EPA's Modeling Guideline (Appendix W).

Only those receptors showing a significant impact were modeled for NAAQS/NMAAQS compliance. In assessing NAAQS/NMAAQS compliance for most pollutants, the AQB allows for applicants either to model nearby sources or to use a background concentration to represent impacts from the nearby sources. The AQB, however, recommends inclusion of both nearby sources located within 10km of the refinery and background in assessing PM2.5 and PM10 compliance. The form of the modeled values and whether nearby sources or background were included to assess NAAQS/NMAAQS compliance are shown in Table 5. The more stringent of either the NAAQS or NMAAQS are shown in Table 6. These are the standards HollyFrontier used to assess compliance. Modeling was not conducted for the SO_2 24-hour NAAQS eventhough significant impacts were calculated because the AQB considers a compliance demonstration using the 1-hr standard as a surrogate for compliance with the 24-hr standard.

Table 5. Form of Modeled Values Used to Assess NAAQS/NMAAQS Compliance

Pollutant	Averaging Time	Add Background Concentration or Include Nearby Sources	Modeled Value
CO	8-hour	Background	Maximum
	1-hour	Background	Maximum
H_2S	1-hour	Nearby Sources	Maximum
NO_2	Annual	Background	Average
	1-hour	Background	98th percentile max daily 1-hour
PM2.5	Annual	Both	Average
	24-hour	Both	98th percentile
PM10	24-hour	Both	High 6th high
SO_2	1-hour	Background	99th percentile max daily 1-hour

Table 6. National and New Mexico Ambient Air Quality Standards

Pollutant	Averaging Time	Ambient Air Quality Standards (µg/m^3)
CO	8-hour	9,960.1
	1-hour	14,997.5
H_2S	1-hour	41.8
NO_2	Annual	94.02
	1-hour	188.03
O_3	8-hour	137.3
PM2.5	Annual	12
	24-hour	35
PM10	24-hour	150
SO_2[a]	1-hour	196.4

[a]Modeling not required for the other SO2 averaging periods if compliance can be demonstrated with the 1-hour standard.

5.6 PSD Increment Analysis

The Artesia Refinery is located in Air Quality Control Region No. 155. The PSD Minor Source Baseline dates have been triggered in this baseline area for all pollutants. NO_2 was triggered 3/16/1988, SO_2 was triggered 7/28/1978, PM10 was triggered 8/4/1978, and PM2.5 was triggered 11/13/2013. The Artesia Refinery was constructed in the mid-1920's and modifications have been made since the increment trigger dates for all pollutants except PM2.5. Increment compliance was therefore evaluated for all pollutants except PM2.5. As a conservative means of assessing increment compliance, HollyFrontier modeled potential emissions from all sources at the refinery. Only those receptors showing a significant impact were modeled for increment compliance.

Compliance with the PSD increments was based on the cumulative impacts of the Artesia Refinery and other increment consuming sources identified in the nearby source emissions inventory. All nearby sources located within 25km of the refinery and any large (>1000 lb/hr) sources within 50km of the refinery were included in the Class II increment demonstration. The resultant cumulative impacts were compared to the PSD Class II increment levels. The highest modeled annual averages was used for evaluating compliance with the annual increments and the high-second-high values was used for the evaluation of compliance with the short-term increments.

The PSD Class I and Class II increments are shown in Table 7.

Table 7. PSD Class I and II Increments

Pollutant	Averaging Time	PSD Class I Increment ($\mu g/m^3$)	PSD Class II Increment ($\mu g/m^3$)
NO_2	Annual	2.5	25
PM2.5	Annual	1	4
	24-hour	2	9
PM10	Annual	4	17
	24-hour	8	30
SO_2	Annual	2	20
	24-hour	5	91
	3-hour	25	512

5.7 Secondary PM2.5 Analyses

On February 10, 2020, the USEPA issued draft guidance for assessing ozone and fine particulate matter modeling.[8] The guidance addresses both primary and secondary PM2.5 impacts. Primary PM2.5 impacts refer to the impacts due to direct emissions of PM2.5. Secondary impacts refer to the PM2.5 impacts attributable to nitrates and sulfates formed due to precursor NO_2 and SO_2 emissions. The AQB's Guidelines, which follow EPA's, were followed in assessing secondary PM2.5 impacts. Specifically, the following Modeled Emission Rates for Precursors ("MERPs") values and equations was used:

PM2.5 Annual ($\mu g/m^3$) = ((NOx (tpy)/26,780) + (SO_2 (tpy)/14,978)) x 0.2
PM2.5 24-hr ($\mu g/m^3$) = ((NOx (tpy)/7,331) + (SO_2 (tpy)/1,981)) x 1.2

The AQB in consultation with EPA Region 6 requested use of the most conservative MERPs value for each category from hypothetical single source modeling reported on the EPA website https://www.epa.gov/scram/merps-view-qlik. Selected values were from either Terry, Texas or Roosevelt County, NM. The calculated secondary PM2.5 impacts were added to the modeled concentrations to assess significant impacts as well as compliance with the NAAQS/NMAAQS and increments.

5.8 O_3 Analyses

Ozone impacts were calculated using the AQB's Guidelines, which follow the EPA's MERPS guidance. Specifically, the following values and equations was used:

Ozone 8-hour (µg/m3) = ((NOx (tpy)/340) + (VOC (tpy)/9,578)) x 1.96

The AQB in consultation with EPA Region 6 requested use of the most conservative MERPs value for each category from hypothetical single source modeling reported on the EPA website https://www.epa.gov/scram/merps-view-qlik. Selected values were from either Terry, Texas or Roosevelt County, NM. The calculated secondary O_3 impacts were compared to the O3 significant impact level of 1.96 µg/m^3 or 1 ppb.

5.9 NO_2 Analyses

Following USEPA and AQB guidance, the NO_2 modeling analyses employed the recommended three tier screening approach. Initially, Tier 1 was employed with the conservative assumption that 100% of the available NOx converts to NO_2. Based on these results, HollyFrontier employed Tier 2 (the Ambient Ratio Method, ARM2) with the EPA default minimum and maximum ambient ratios of 0.5 and 0.9, respectively. Tier 3 was not employed. Tier 3 accounts for the chemical reactions that convert NOx to NO_2 in the presence of ozone.

5.10 Air Toxics Analysis

HollyFrontier conducted modeling for two toxic air pollutants, ammonia and sulfuric acid mist, which are emitted in excess of the levels specified in 20.2.72.502 NMAC – Permits for Toxic Air Pollutants. Maximum 8-hour impacts were compared to one-one hundredth of the Occupational Exposure Level ("OEL") listed in 20.2.72.502 NMAC.

5.11 Class II Visibility Analysis

In addition, a Class II visibility analysis was conducted using the VISCREEN model. The Living Desert State Park, which is located a minimum of 42km and a maximum of 49km south of the Artesia Refinery was used as an indicator of potential Class II visibility impacts. First level screening values of 1.00 for the color parameter ("delta E") and 0.02 for the contrast parameter ("C") were used. A background visible range of 110km was also used. This background visual range is recommended as the default value according to EPA's Workbook for Plume Visual Impact Screening and Analysis.[9]

6.0 CLASS I AREA ANALYSIS

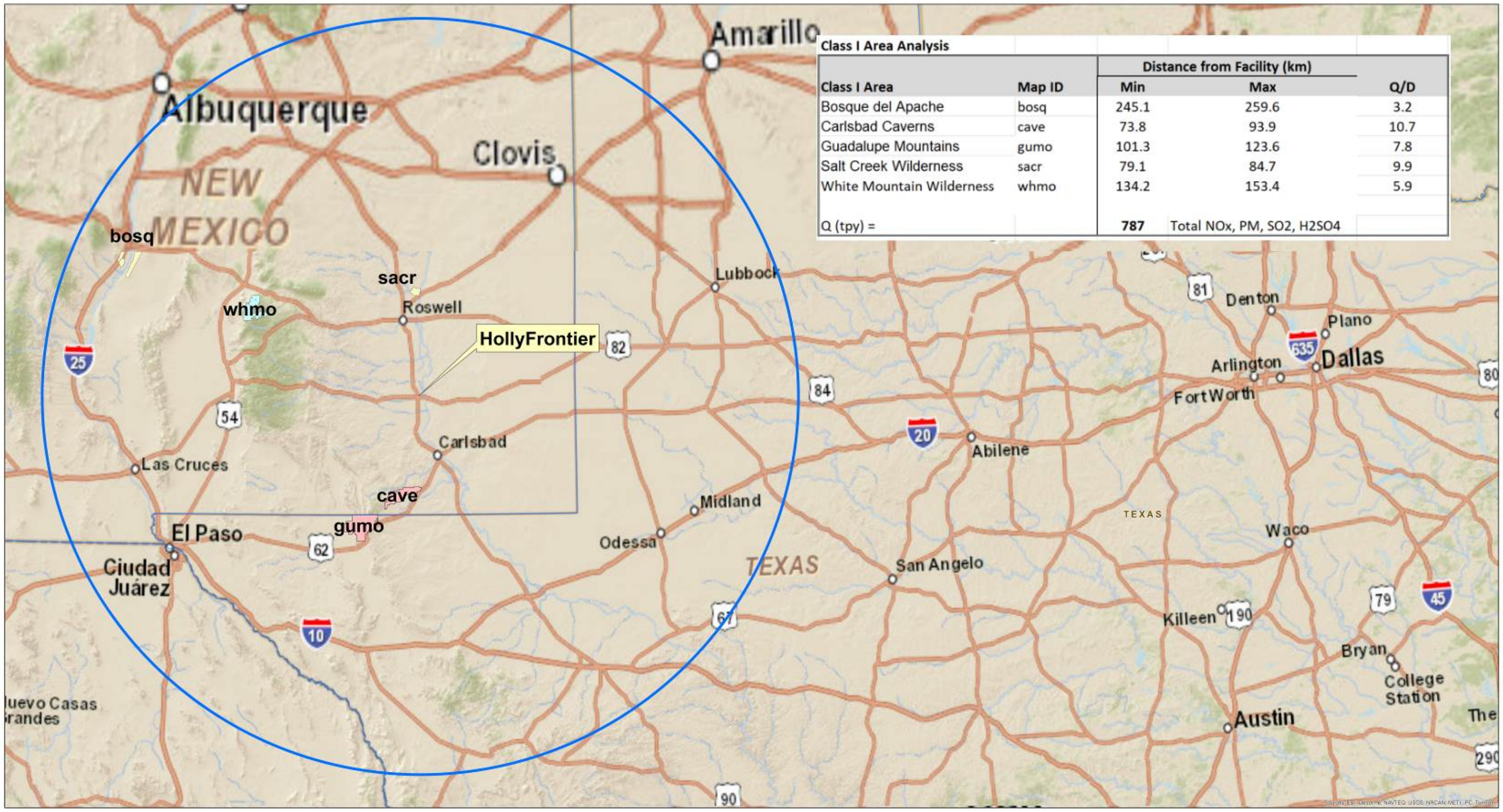
6.1 Class I AQRV Analysis

There are five Class I areas located within 300km of the Artesia Refinery: Carlsbad Caverns, Guadalupe Mountains, White Mountains Wilderness, Salt Creek Wilderness, and Bosque del Apache (Figure 8). [1] The closest Class I area is the Carlsbad Caverns National Park which is located 73km to the south. The Federal Land Manager's ("FLM") Q/D (maximum daily emissions in tons per year over distance in kilometers) method has been used to determine the potential for adverse Class I impacts for each Class I area (Table 8). We have presumed that no Class I Air Quality Related Values ("AQRV") evaluation was required for the Class I areas with calculated Q/D values below 10. Project emission estimates reveal a maximum annual, total SO_2, H_2SO_4, NOx and PM_{10} emission rate of 787 tons per year which results in the Q/D values shown in Table 5. Annual emissions were calculated as the maximum daily emissions and 365 day/yr operation.

Table 8. Calculated Q/D Values for Each Class I Area

Class I	Map ID	Minimum Distance from the SRP Facility (km)	Maximum Distance from the SRP Facility (km)	Q/D
Bosque del Apache	bosq	245.1	259.6	3.2
Carlsbad Caverns	cave	73.8	93.9	10.7
Guadalupe Mountains	gumo	101.3	123.6	7.8
Salt Creek	sacr	79.1	84.7	9.9
White Mountain	whmo	134.2	153.4	5.9

[1] Class I areas are pristine areas (e.g., National Parks and Wilderness Areas) that have been designated by Congress and are afforded a greater degree of air quality protection. All other areas are designated as Class II areas.



Class I Area Analysis

Class I Area	Map ID	Distance from Facility (km) Min	Max	Q/D
Bosque del Apache	bosq	245.1	259.6	3.2
Carlsbad Caverns	cave	73.8	93.9	10.7
Guadalupe Mountains	gumo	101.3	123.6	7.8
Salt Creek Wilderness	sacr	79.1	84.7	9.9
White Mountain Wilderness	whmo	134.2	153.4	5.9
Q (tpy) =		787	Total NOx, PM, SO2, H2SO4	

RTP ENVIRONMENTAL ASSOCIATES, INC.®

0 37,500 75,000 150,000 225,000 300,000 Meters

N E S W

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Checked by:

Date:

Figure 8. Class I Areas Located within 300km of the Artesia Refinery

For the Class I area, Carlsbad Caverns, with the Q/D values in excess of 10, AQRVs were calculated. Visibility and sulfur and nitrogen deposition were calculated using techniques prescribed by the Guideline for Air Quality Models (40 CFR 51, Appendix W), the EPA's Interagency Workgroup on Air Quality Modeling (IWAQM)[10], and the FLM's Air Quality Related Values Work Group (FLAG) document.[11]

6.2 Class I Increment Analysis

6.3 CALPUFF

The EPA-approved version of CALPUFF (Version 5.8) was used to assess Class I air quality impacts. The EPA-approved version of CALPUFF includes the CALMET meteorological model (Version 5.8.4, Level 130731), the non-steady-state puff model (CALPUFF, Version 5.8.5, Level 151214) with chemical transformation and deposition, and the post processors (POSTUTIL Version 1.5.6, Level 070627 and CALPOST, Version 6.221, Level 082724) for combining, converting, averaging, and ranking the concentrations, visibility impacts, and deposition.

CALMET

RTP used the Mesoscale Model Interface Program ("MMIF") Version 3.4 and the EPA's 2013-2015, 12km Weather Research and Forcasting Model ("WRF") for the Continental United States (CONUS) to develop a CALMET dataset.[b] The extraction domain extended 50km beyond the Class I areas. The lower left and upper right coordinates of the extraction domain was -967.383, -923.424 and -631.767, -579.363 km, respectively (LCC, with the RPO projection). The origin was set to -972.0, -924.0km with 29 cells in each direction. The default vertical layers (ZFACE) of 0.0, 20.0, 40.0, 80.0, 160.0, 320.0, 640.0, 1200.0, 2000.0, 3000.0, 4000.0m were employed. MMIF was run in pass-through mode using the "CALSCI_MIXH WRF" option.

[b] Please note that the most current version of MMIF is Ver. 3.4.1. This version will not read WRF files larger than 2 gigabytes. The WRF data files in RTP's possession are 12gb. The only difference between versions 3.4 and 3.4.1 is 3.4.1's ability to estimate cloud cover. Lack of such estimates should not appreciably affect CALPUFF results.

Modeled Emissions

The Artesia Refinery's primary emission sources are refinery fuel gas-fired heaters. There are also several flares and a fluid catalytic cracking unit. The National Park Service ("NPS") PM speciation calculation for combustion turbines ("CTs") was employed for the gas fired units. This calculation assumes that all of the estimated PM emissions have an aerodynamic diameter of less than 1 micron and that 25% of the PM is filterable and 75% is condensable. All of the filterable PM is assumed to be elemental carbon. All of the condensable PM was assumed to be soluble organic carbon (SOA), while one third of the SO_2 emissions were assumed to be sulfate (SO_4).

CALPUFF Technical Settings

CALPUFF was run using the FLM-approved default parameters where available. These options generally follow EPA's Guideline on Air Quality Models (40 CFR 51, Appendix W) and the IWAQM Phase 2 guidance. The regulatory default switch was used (MREG = 1).

The Class I area receptors modeled were obtained from the NPS. Lambert-Conformal Conic (LCC) Coordinates were used with an origin of 49.0N and 97.0W and Standard Parallels of 33.0N and 45.0N (the RPO projection).

The modeling domain and Class I receptors are shown in Figure 9.

Ozone and Ammonia

Hourly background ozone concentrations were input to CALPUFF. The ozone observations were collected at the Carlsbad monitor (AQS No. 35-015-1005) concurrent with the three years of WRF data. Missing values from Carlsbad were filled with data from the Hobbs monitor (AQS No. 35-025-008) located approximately 100km east of the refinery.

Ammonia is not simulated by CALPUFF, but rather a background value is specified. Ammonia is important because the level of particulate nitrate (NO_3) can depend on the amount of ammonia present. The partitioning of total nitrate between gaseous HNO_3 and particulate NO_3 depends on the amount of ammonia present and other parameters (e.g., SO_4, temperature, and RH).

In the CALPUFF simulation, one value of background is assumed across the region and each puff uses the full background value in its equilibrium calculation. The IWAQM Phase II report contains the following recommendations for background ammonia: "typical (within a factor of 2) background values of ammonia are: 10 ppb for grasslands, 0.5 ppb for forest, and 1 ppb for arid lands at 20 C" (IWAQM, 1998). Based on the fact that all of the reviewed Class I areas lie in an arid region, a background ammonia value of 1 part per billion (ppb) was used.

Natural Conditions and Monthly Relative Humidity Factors f(RH)

Natural background conditions must be established to determine a change in natural conditions related to a source's emissions. The EPA lists three types of natural background conditions in their guidance document: Annual Average, Best 20% Days, and Worst 20% Days.[12] Based on the FLAG 2010 guidance, Annual Average Natural Visibility Conditions were used for this analysis. The EPA, in its BART Guidelines (2005), concluded that by using monthly average Relative Humidity Adjustment Factors f(RH), the likelihood that the highest modeled visibility impacts that were caused by short-term and geographically different meteorological phenomena (e.g., weather events) would be minimized. The FLAG (2010) report agreed with the EPA; therefore, the visibility analysis was conducted using monthly average f(RH) values for large hygroscopic particles, small hygroscopic particles and sea salt, rather than hourly values.

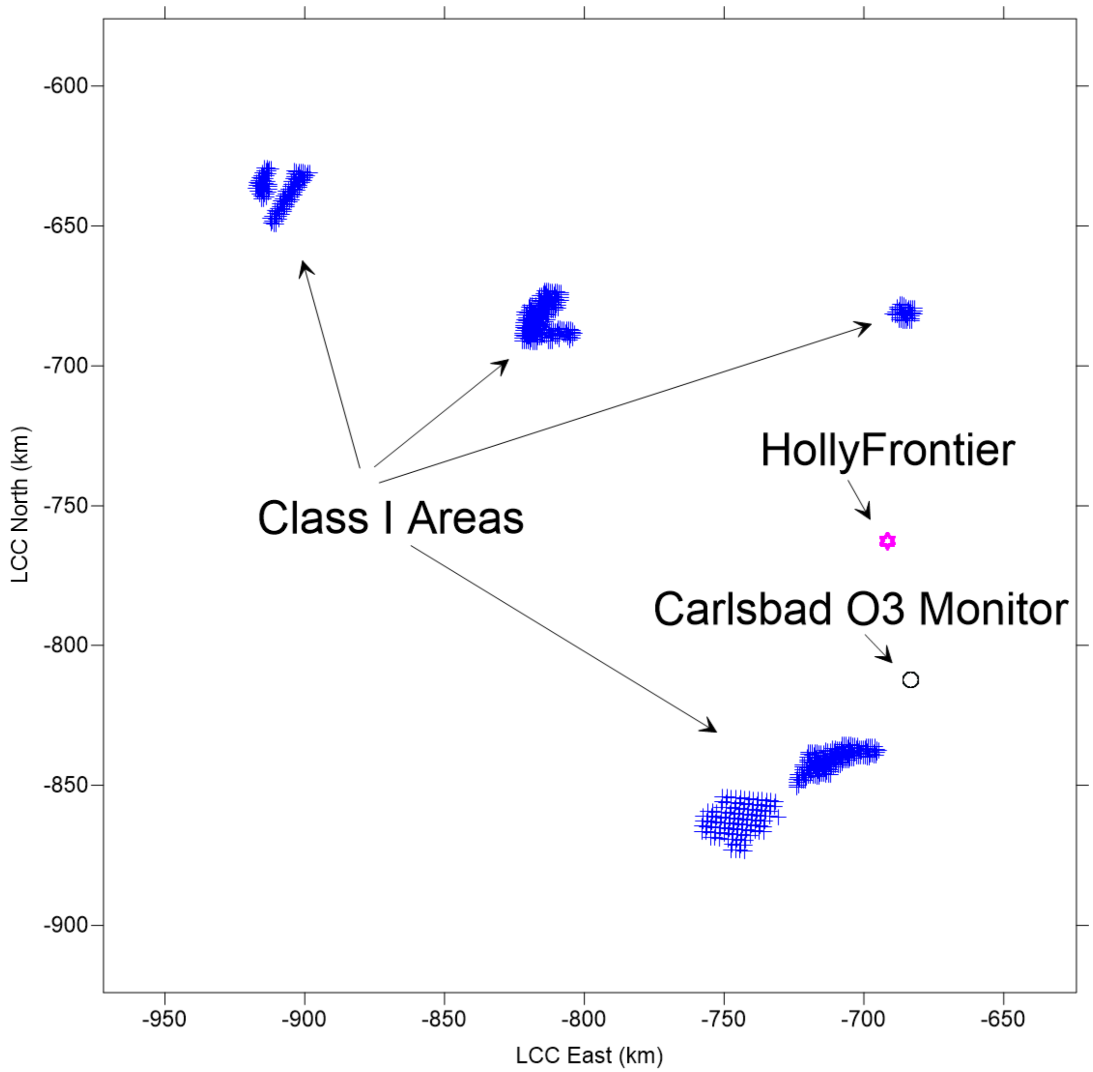

Figure 9. Modeling Domain and Class I Area Receptors

Light Extinction and Haze Impact Calculations

CALPOST was used to calculate light extinction. The EPA/IMPROVE formula will be used to calculate the change in light extinction due to increases in the particulate matter concentrations according to the following:

B_{ext} = 2.2 x f_S(RH) x [Small Sulfates] + 4.8 x f_L(RH) x [Large Sulfate]
+ 2.4 x f_S(RH) x [Small Nitrates] + 5.1 x fL(RH) x [Large Nitrates]
+ 2.8 x [Small Organic Mass] + 6.1 x [Large Organic Mass]
+ 10 x [Elemental Carbon]
+ 1 x [Fine Soil]
+ 0.6 x [Coarse Mass]
+ 1.7 x f_{SS}(RH) x [Sea Salt]
+ [Rayleigh Scattering]
+ 0.33 x [NO_2 (ppb)]

The concentrations, in square brackets, are in micrograms per cubic meter μg/m^3 and b_{ext} is in units of inverse mega-meters Mm^{-1}.

The values for f_s(RH), f_L(RH), f_{ss}(RH), and the Rayleigh scattering term were obtained from the 2010 FLAG Report in Tables 6, 7, 8 and 9. The assessment of visibility impacts employed CALPOST Method 8, sub-mode 5. CALPUFF assumes that all of the background ammonia is available for the formation of ammonium nitrate from each puff. However, where these puffs overlap in the model, puffs are actually in competition for the available ammonia. To prevent the overestimation of nitrate, the Ammonia Limiting Method option in the POSTUTIL processor (MNITRATE = 1) was used to compute the HNO_3/NO_3 concentration partition prior to executing the visibility calculations in CALPOST. In addition, the relative humidity in CALPOST was capped at 95% consistent with current FLM recommendations.

CALPOST calculates the change in light extinction for each 24-hour day. These results were reviewed to determine the number of days where the change in light extinction is at or above 5% change and 10% change at each Class I area.

Deposition Calculations

In addition to visibility, modeled deposition rates for total sulfur (S) and nitrogen (N) were calculated. POSTUTIL was used to summarize the total dry and wet deposition fluxes for the S and N species. Specifically, the N and S deposition was assumed to consist of the following composition of modeled species:

Total Nitrogen Flux (CSPECCMP) =

SO_4 x 0.291667
NOx x 0.304348
HNO_3 x 0.222222
NO_3 x 0.451613

Total Sulfur Flux (CSPECCMP)=

SO_2 x 0.500000
SO_4 x 0.333333

After the total N and S deposition rates were calculated in POSTUTIL, CALPOST was used to determine the average annual N and S deposition for each receptor in each Class I area. Two pollutant names were modeled in CALPUFF and passed to POSTUTIL and CALPOST. SO2 represented the maximum short term emissions from the refinery project. SO2LT represented the annual emissions increase. The SO2LT pollutant was used in the deposition analysis. SO2 was used in all other analyses. A scaling factor (A) of 316.224 was employed in CALPOST to convert the default deposition rates in units of $\mu g/m^2/sec$ to the units of kg/ha/yr needed for comparison to the Deposition Analysis Thresholds (DATs) of 0.005.

6.4 Class I Increment Analysis

Pollutant concentrations were also calculated for comparision to the proposed Class I significance levels. CALPUFF was used to calculate concentrations at all Class I receptors located in excess of 50km from the source, regardless of Q/D. The model results were compared to the proposed Class I significant impact levels (Table 9).

Table 9. Proposed PSD Class I Significant Impact Levels

Pollutant	Averaging Time	PSD Class I Significant Impact Levels (μg/m^3)
PM2.5	24-hour	0.27
	Annual	0.05
PM10	24-hour	0.30
	Annual	0.20
NO_2	Annual	0.10
SO_2	3-hour	1.00
	24-hour	0.20
	Annual	0.10

7.0 CLASS II ANALYSIS RESULTS

Attachment B provides the model summary output. Model input and output files, including the BPIP-PRIME and meteorological data files, are provided electronically.

7.1 Significant Impact Analysis Results

The project is expected to result in significant impacts for PM2.5, SO_2, NO_2 and H_2S (Table 10). Insignificant impacts were calculated for PM10 and O_3. Based upon the results of the significant impacts analysis, a cumulative analysis was conducted to assess compliance with the NAAQS/NMAAQS and increments.

Table 10. Class II Significant Impact Analysis Results

Pollutant	Avg Period	Maximum Modeled Impact (Including Secondary PM2.5) (μg/m³)	PSD Significant Class II Impact Level (μg/m³)	Significant Monitoring Concentration (μg/m³)	Maximum Distance to a Significant Impact (km)
PM2.5	Annual	0.31	0.2	NA	0.76
	24-hr	2.23	1.2	4.0	1.48
PM10	Annual	0.66	1.0	NA	NA
	24-hr	2.13	5.0	10	NA
SO_2	1-hr	26.06	7.8	NA	10.7
	24-hr	7.93	5.0	13	1.73
	3-hr	22.3	25.0	NA	NA
	Annual	0.74	1.0	NA	NA
NO_2	1-hr	35.1	7.5	14	1.82
	Annual	2.63	1.0	NA	1.07
CO	1-hr	41.2	2000	NA	NA
	8-hr	25.4	500	575	NA
H_2S	1-hr	24.5	5.0	NA	1.44
O_3	8-hr	1.43	1.96	NA	NA

NA- not applicable.

7.2 NAAQS/NMAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the NAAQS and NMAAQS for pollutants showing a significant impact. The offsite source inventories discuss in Section 5.4 were employed. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the 24-hr PM2.5 NAAQS was based on the 98th percentile of the annual distribution of daily maximum 24-hour concentrations. Compliance with the 1-hr NO_2 and SO_2 NAAQS was based on the 98th and 99th percentiles, respectively, of the annual distributions of daily maximum 1-hour concentrations. Compliance with the PM10 24-hr standard was based upon the sixth highest value. Annual NAAQS compliance was evaluated based upon the maximum modeled value. Only receptors showing significant project-related impacts were modeled in assessing compliance.

The results of the NAAQS analysis are presented in Table 11 . As can be seen, the model demonstrates compliance.

Table 11. NAAQS/NMAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)
H_2S	1-hr	28.9	NA	28.9	41.8
NO_2	Annual	17.3	5.0	22.3	94.02
	1-hr	174	NA	174.0	188.0
PM2.5	Annual	5.56	5.9	11.5	12.0
	24-hour	18.4	13.4	32.1	35.0
SO_2	1-hour	157.0	5.3	162.1	196.4

NA – not applicable. Background monitored values added within model.
PM2.5 modeled values includes secondary PM2.5 contribution.

7.3 Increment Analysis Results

Evaluation of compliance with the short-term increments was based upon the highest-second-high modeled value. The maximum annual concentrations were used to assess compliance with the annual increments. All sources at the refinery were conservatively

assumed to consume increment at their potential to emit rates. Only receptors showing significant project-related impacts were modeled in assessing compliance.
The results of the increment analysis are presented in Table 12. As shown, the model demonstrates compliance.

Table 12. PSD Increment Analysis Results

Pollutant	Averaging Period	Modeled Concentration (μg/m^3)[a]	Standard (μg/m^3)
NO_2	Annual	24.7	25
SO_2	24-hr	67.1	91

7.4 Secondary PM2.5 Analysis

Following the the AQB's recommendations, the MERPs calculations resulted in the following values for secondary PM2.5. These values were added to the modeled PM2.5 concentrations:

PM2.5 MERP Calculation

Facility NOx (tpy) =	239.75
Facility SO2 (tpy) =	446.23
$MERP_{NOxannual}$ =	26780
$MERP_{SO2annual}$ =	14978
$MERP_{NOx24hr}$ =	7331
$MERP_{SO2\_24hrl}$ =	1981

PM2.5 Annual (ug/m3) = ((NOx (tpy)/$MERP_{NOxannual}$) + (SO2 (tpy)/$MERP_{SO2annual}$)) x 0.2

PM2.5 Annual (ug/m3) = **0.008**

PM2.5 24-hr (ug/m3) = ((NOx (tpy)/$MERP_{NOx24hr}$) + (SO2 (tpy)/$MERP_{SO2\_24hr}$)) x 1.2

PM2.5 24-hr (ug/m3) = **0.310**

MERPs values were determined using the most conservative value for each category from hypothetical single source modeling reported on the EPA website https://www.epa.gov/scram/merps-view-qlik. Selected values were from either Terry, Texas or Roosevelt County, NM.

The calculated secondary PM2.5 impacts were added to the modeled concentrations to assess significant impacts as well as compliance with the NAAQS/NMAAQS (refer to Tables 10 and 11 on pages 7-1 and 7-2, respectively).

7.5 Ozone Analysis

Following the the AQB's Guidelines, the MERPs calculations resulted in the following estimate of ozone:

O3 MERP Calculation	
Facility NOx (tpy) =	239.75
Facility VOC (tpy) =	208.00
$MERP_{NOx}$ =	340
$MERP_{VOC}$ =	9578
O3 8-hr (ug/m3) = ((NOx (tpy)/$MERP_{NOx}$) + (VOC (tpy)/$MERP_{VOC}$)) x 1.96	
O3 8-hr (ug/m3) =	**1.425**

MERPs values were determined using the most conservative value for each category from hypothetical single source modeling reported on the EPA website https://www.epa.gov/scram/merps-view-qlik. Selected values were from either Terry, Texas or Roosevelt County, NM.

The calculated secondary O_3 impact was compared to the O3 significant impact level of 1.96 μg/m^3 and determined to be insignificant.

7.6 Air Toxics

The results of the air toxics analysis for NH_3 and H_2SO_4 are presented in Table 13. Maximum 8-hour modeled impacts were compared to one-one hundredth of the Occupational Exposure Level ("OEL") listed in 20.2.72.502 NMAC. As shown, the maximum modeled impacts are less than standards.

Table 13. Air Toxics Analysis Results

Pollutant	Avgeraging Period	Maximum Modeled Impact - ($\mu g/m^3$)	1/100 of OEL ($\mu g/m^3$)
NH_3	8-hr	32.3	180
H_2SO_4	8-hr	4.9	10

7.7 Class II Visibility Analysis

The CAA Amendments of 1977 require evaluation of new and modified emission sources to determine potential impacts on visibility. The total hourly particulate matter and NO_X emissions from the project were used as input parameters in the visibility analysis. Emissions were evaluated as described in the EPA Workbook for Plume Visual Impact Screening and Analysis[13] to determine potential contribution to atmospheric discoloration and visual range reduction.

Generally, atmospheric discoloration occurs when NO emissions from combustion sources react in the presence of atmospheric oxygen to form NO_2, a reddish-brown gas. Another form of atmospheric discoloration may be caused by particulate emissions and secondary aerosols formed by gaseous precursor emissions. The visual range reduction (increased haze) is caused primarily by particulate emissions and secondary aerosols such as sulfates and nitrates.[14] Both secondary sulfate and primary particulate emissions are accounted for in the analysis. Emission of other pollutants do not materially affect visibility.

U.S. EPA visibility impairment analysis guidelines were followed in conducting the analysis. The analysis was performed for the Living Desert State Park, located a minimum of 42 km and a maximum of 49 km south of the refinery.

This analysis requires inputs of emission rates (PM and NO_X), regional visual range, distance between the source and the object of study, and worst-case dispersion parameters (i.e., wind speed and stability). Outputs from the model include:

- Plume contrast against the sky and terrain; and,
- Perceptibility of the plume (Delta E criteria).

Emission rates for PM and NOx for the analyses were set to 84.3 and 182 tons per year, respectively. The background visual range was set to 110km, which was determined from Figure 9 of the VISCREEN manual. The VISCREEN default screening values for Delta E (2.0) and contrast (0.05) were assumed.

As shown in Table 14, no exceedances of the default delta E parameter or green contrast paramters were calculated using the conservative meteorological conditions (F stability and 1 m/sec wind speed) and Level-1 procedures.

The VISCREEN input and output model files are also provided electronically..

Table 14. Level-1 Class II Visibility Analysis Results for the Living Desert State Park

Viewing Background	Theta (degrees)	Azimuth (degrees)	Distance (km)	Alpha (degrees)	Delta E		Green Contrast	
					Criterion	Plume	Criterion	Plume
SKY	10	122	49	46	2.000	0.956	0.050	0.011
SKY	140	122	49	46.000	2.000	0.435	0.05	-0.01
TERRAIN	10	84	42	84.000	2.000	1.631	0.05	0.015
TERRAIN	140	84	42	84.000	2.000	0.180	0.05	0.004

8.0 CLASS I AREA ANALYSIS RESULTS

8.1 Class I Significant Impact Analysis

A Class I significant impacts analysis was conducted for all Class I areas located within 300km of the refinery, regardless of the Q/D screening result. The model results are shown in Table 15. As shown, all impacts are calculated to be insignificant. The SRU3 Tail Gas Incinerator (Model ID H3103) was modeled with a 24-hr average SO_2 emission rate of 28 lb/hr. SO_2 emissions of 50 lb/hr were modeled for SRU3 for the other SO_2 averaging periods.

Table 15. Class I Significant Impact Analysis Results

Pollutant	Average	Modeled Year	Modeled Conc. (μg/m3)	Class I SIL[a] (μg/m^3)
NO_2	Annual	2013	1.88×10^{-2}	0.10
		2014	1.89×10^{-2}	
		2015	2.00×10^{-2}	
PM10	24-hour	2013	6.66×10^{-2}	0.30
		2014	6.11×10^{-2}	
		2015	5.78×10^{-2}	
	Annual	2013	7.76×10^{-3}	0.20
		2014	7.59×10^{-3}	
		2015	8.27×10^{-3}	
SO_2	Annual	2013	3.52×10^{-2}	0.10
		2014	3.52×10^{-2}	
		2015	3.79×10^{-2}	
	24-hr	2013	1.93×10^{-1}	0.20
		2014	1.78×10^{-1}	
		2015	1.56×10^{-1}	
	3-hr	2013	9.45×10^{-1}	1.0
		2014	9.82×10^{-1}	
		2015	8.76×10^{-1}	

[a]See 61 FR 38249 (July 23, 1996) for the proposed Class I SILs.

8.2 Class I Visibility Analysis Results

HollyFrontier used the CALPUFF model and associated programs to evaluate the potential visibility impacts associated with the proposed project at the Carlsbad Caverns, the only Class I Area with a Q/D value that exceeded the FLM's screening criterion. The 98% (8th high) concentrations over all receptors, not by receptor, were conservatively used in the assessment.

Results are presented in Table 16. As shown, there are no exceedances of the 5% extinction criterion at Carlsbad Caverns.

Table 16. Class I 24-hr Visibility Analysis Results

Parameter	Meteorological Model Year	Modeled Value, Extinction (% change)	Change in Light Extinction (% change)	%Standard
Visibility	2013	2.78	5	56%
	2014	1.90	5	38%
	2015	2.24	5	45%

8.3 Class I Deposition Analysis Results

In addition to visibility, modeled deposition rates of total sulfur (S) and nitrogen (N) were calculated. These results were reviewed or comparison to the Deposition Analysis Thresholds (DATs) of 0.005 at each Class I area. Annual emission rates were used. In addition, all Class I areas were conservatively included eventhough only Carlsbad Caverns had a Q/D in excess of the FLM's screening criterion.

Results for nitrogen and sulfur deposition are presented in Table 17. No exceedances of the DATs were identified.

Table 17. Class I Annual Deposition Analysis Results

Parameter	Meteorological Model Year	Modeled Value, Deposition (ka/ha/yr)	Deposition Analysis Threshold (ka/ha/yr)	%Standard
Nitrogen	2013	2.56×10^{-3}	0.005	51%
	2014	2.67×10^{-3}		53%
	2015	2.87×10^{-3}		57%
Sulfur	2013	3.14×10^{-3}		63%
	2014	3.32×10^{-3}		66%
	2015	3.77×10^{-3}		75%

ATTACHMENT A

- HollyFrontier Model Input Data
- Off-Site Source Model Input Data
- Volume Source Calculations
- Flare Parameter Calculations
- CALPUFF Model Input Data
- CALPUFF CT PM Speciation

Last Update 7-7-22
Holly Frontier - Artesia Model Input
NAD83, Zone 13
Point Sources

Model Source No.	Source ID		Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (°F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Project Related Emissions Increase (lb/hr) PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT	CO	H2S
1	B0007	DEFAULT	Boiler 7	556685.00	3634643.00	3363.5	74.8	275	47.90	5.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	B0008	DEFAULT	Boiler 8	556686.00	3634633.00	3363.5	65.0	250	62.80	4.50	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	B0009	DEFAULT	Boiler 9	556665.00	3634636.00	3363.3	60.0	300	47.70	5.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	H0009	DEFAULT	Unit 13 Naphtha Splitter Reboiler	556553.00	3634619.00	3363.4	77.5	530	17.90	4.50	8.42E-02	8.42E-02	8.42E-02	5.40E-01	5.40E-01	1.83E-01	0.00E+00	8.76E-01	0.00E+00
5	H0011	DEFAULT	Unit 21 Vacuum Unit Heater	556821.00	3634014.00	3370.9	80.0	850	26.00	4.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	H0018	DEFAULT	Unit 06 HDS Reboiler	556556.00	3634718.00	3362.3	75.0	700	19.50	4.00	1.15E-01	1.15E-01	1.15E-01	1.52E+00	1.52E+00	4.25E-01	0.00E+00	1.27E+00	0.00E+00
7	H0019	DEFAULT	South Crude Charge Heater	556625.00	3634023.00	3370.3	155.7	450	21.40	4.38	6.70E-02	6.70E-02	6.70E-02	6.20E-01	5.66E-01	0.00E+00	0.00E+00	7.71E-01	0.00E+00
8	H0020	DEFAULT	South Crude Charge Heater	556644.00	3634021.00	3370.5	175.0	330	12.20	6.50	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	H0028	DEFAULT	Unit 21 Heater	556829.00	3634014.00	3370.9	50.3	850	18.80	2.67	3.13E-02	3.13E-02	3.13E-02	1.72E+00	1.72E+00	9.99E-02	0.00E+00	3.51E-01	0.00E+00
10	H0030	DEFAULT	Unit 06 Charge Heater	556556.00	3634724.00	3362.2	67.0	575	22.50	4.00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	1.00E+00	1.88E-01	0.00E+00	2.75E+00	0.00E+00
11	H0040	DEFAULT	Unit 13 Charge Heater	556557.00	3634730.00	3362.1	101.0	590	22.80	4.00	0.00E+00	0.00E+00	0.00E+00	7.20E-01	7.20E-01	0.00E+00	0.00E+00	7.73E-01	0.00E+00
12	H0312	DEFAULT	Unit 10 FCC Feed Heater	556690.00	3634676.00	3363.8	96.5	675	20.40	4.00	2.30E-01	2.30E-01	2.30E-01	3.35E+00	3.35E+00	9.69E-01	1.78E-01	2.95E+00	0.00E+00
13	H0352_54	DEFAULT	Unit 70 CCR Heaters	556734.00	3634728.00	3364.0	210.9	300	16.50	8.75	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E+00	0.00E+00
14	H0355	DEFAULT	Unit 70 Stabilizer Reboiler Heater	556734.12	3634703.54	3364.0	135.2	442	28.70	2.50	1.18E-02	1.18E-02	1.18E-02	9.70E-01	9.70E-01	0.00E+00	0.00E+00	1.01E+00	0.00E+00
15	H0362_64	DEFAULT	Unit 70 CCR Heaters	556718.00	3634728.00	3364.1	205.5	338	16.90	7.00	3.10E-01	3.10E-01	3.10E-01	2.51E+00	2.51E+00	1.34E+00	0.00E+00	3.45E+00	0.00E+00
16	H0421	DEFAULT	Unit 44 Charge Heater	556755.00	3634642.00	3364.0	81.7	650	23.70	3.25	7.35E-02	7.35E-02	7.35E-02	6.30E-01	6.30E-01	2.38E-01	0.00E+00	8.10E-01	0.00E+00
17	H0464	DEFAULT	SRU Hot Oil Heater	556526.00	3634548.00	3364.3	79.8	450	9.60	2.75	9.47E-03	9.47E-03	9.47E-03	5.28E-02	5.28E-02	0.00E+00	0.00E+00	8.83E-02	0.00E+00
18	H0600	DEFAULT	Unit 09 Depropanizer Reboiler Heater	556795.00	3634716.00	3364.0	177.0	500	33.00	4.60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.55E+00	0.00E+00
19	H0601	DEFAULT	Unit 33 Charge Heater	556788.00	3634582.00	3364.3	131.0	300	11.60	6.50	2.35E-01	2.35E-01	2.35E-01	1.30E+00	1.30E+00	7.98E-01	0.00E+00	2.57E+00	0.00E+00
20	H2421	DEFAULT	Unit 45 Charge Heater	556769.00	3634573.00	3364.3	87.0	890	24.80	3.50	2.35E-02	2.35E-02	2.35E-02	2.30E-02	2.30E-02	0.00E+00	0.00E+00	2.98E-01	0.00E+00
21	H2501	DEFAULT	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	556949.00	3634500.00	3364.5	168.0	710	19.00	7.83	9.93E-01	9.93E-01	9.93E-01	3.60E+00	3.60E+00	4.35E+00	1.64E+00	7.20E+00	0.00E+00
22	H3101	DEFAULT	SRU3 Hot Oil Heater	556557.00	3634512.00	3364.5	80.0	450	9.62	2.75	9.21E-02	9.21E-02	9.21E-02	3.30E-01	3.30E-01	4.11E-01	1.62E-01	9.87E-01	0.00E+00
23	H3402	DEFAULT	Unit 34 Hydrocracker Reboiler 1	556947.00	3634510.00	3364.4	67.0	575	27.90	4.00	4.30E-01	4.30E-01	4.30E-01	1.56E+00	1.56E+00	1.89E+00	7.11E-01	4.68E+00	0.00E+00
24	H3403	DEFAULT	Unit 34 Hydrocracker Reactor Charge Heate	556933.00	3634516.00	3364.4	86.1	705	19.40	4.00	2.65E-01	2.65E-01	2.65E-01	9.60E-01	9.60E-01	1.16E+00	4.38E-01	2.92E+00	0.00E+00
25	H8801_02	DEFAULT	Unit 63 Hydrogen Plant Reformer Furnaces	556903.00	3634585.00	3364.0	130.0	600	75.40	3.83	3.64E-01	3.64E-01	3.64E-01	4.46E+00	4.46E+00	0.00E+00	0.00E+00	4.02E+00	0.00E+00
26	H9851	DEFAULT	Unit 64 Hydrogen Plant Reformer	556901.00	3634616.00	3364.0	176.0	350	23.80	10.00	2.59E+00	2.59E+00	2.59E+00	1.12E+01	4.51E+00	0.00E+00	0.00E+00	1.81E+01	0.00E+00
27	H0473	DEFAULT	SRU2 Tail Gas Incinerator	556518.00	3634578.00	3364.1	150.0	1150	44.20	4.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
28	H3103	DEFAULT	SRU3 Tail Gas Incinerator	556553.00	3634495.00	3364.7	150.0	1200	49.90	4.00	1.33E+01	1.33E+01	1.91E+00	6.50E+00	6.51E+00	5.00E+01	1.87E+01	1.50E+01	2.32E-01
29	FCCREGEN	DEFAULT	FCC Regenerator	556712.00	3634686.00	3363.7	153.0	125	28.30	6.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
30	FL0400	DEFAULT	FL-0400, North Plant Flare	556647.00	3634806.00	3361.9	395.1	1832	65.60	16.11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-02
31	FL0401	DEFAULT	FL-0401, South Plant Flare	556802.00	3634036.00	3370.6	342.2	1832	65.60	9.60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.09E-01
32	FL0402	DEFAULT	FL-0402, FCC Flare	556684.00	3634806.00	3363.8	304.6	1832	65.60	9.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E+01
33	FL0403	DEFAULT	FL-0403, Alky Flare	556685.00	3634875.00	3363.3	499.1	1832	65.60	19.45	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-02
34	FL0404	DEFAULT	FL-0404, GOHT Flare	556898.00	3634870.00	3361.8	568.5	1832	65.60	26.01	0.00E+00	0.00E+00	0.00E+00	1.12E+01	4.82E+00	3.98E+01	2.46E+00	4.78E+01	4.24E-01
35	TL4VCU	DEFAULT	TL-4 VCU	556768.00	3634222.00	3367.9	81.8	1832	65.60	3.92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
36	H5401	DEFAULT	Unit 54 HDS Reactor Heater	556917.00	3634721.00	3363.0	83.0	643	8.81	3.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
37	Y0001	DEFAULT	TCC Cooling Tower	556711.00	3634046.00	3370.5	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
38	Y0002	DEFAULT	S. Alky Cooling Tower (Marley Cooling Towe	556770.00	3634059.00	3370.2	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	Y0008	DEFAULT	North Alky Cooling Tower	556872.00	3634669.00	3363.8	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	Y0011	DEFAULT	FCC & NP Cooling Tower	556601.00	3634564.00	3363.9	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	Y0012	DEFAULT	Hydrogen Plants Cooling Tower	556898.00	3634670.00	3363.7	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42	CTTT0006	DEFAULT	Unit 07 Amine W-0745 Cooling Tower	556469.00	3634681.00	3363.4	14.0	100	25.00	8.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
43	FLHEP	DEFAULT	HEP Portable Flare	556740.00	3634216.00	3367.8	51.1	1832	65.60	2.29	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.88E-02
44	TVCU	DEFAULT	Tank VCU	556458.00	3634605.00	3364.3	18.5	1832	65.60	0.20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
45	H_2601	DEFAULT	RDU Reactor Heater	556954.24	3634430.58	3365.0	138.5	600	25.50	3.87	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
46	Y_0026A	DEFAULT	RDU Cooling Tower	556999.64	3634453.06	3364.6	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
47	Y_0026B	DEFAULT	RDU Cooling Tower	556999.55	3634447.97	3364.7	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	Y_0093A	DEFAULT	PTU Cooling Tower	556855.96	3633752.89	3373.2	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	Y_0093B	DEFAULT	PTU Cooling Tower	556855.87	3633747.81	3373.3	21.0	90	25.80	12.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	H_9301	DEFAULT	Vapor Combustor Unit	556871.00	3633812.00	3372.9	87.0	1600	2.60	4.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51	082B6	DEFAULT	Filter Aid Tank Vent	556883.66	3633823.60	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	26_2B25A	DEFAULT	26_2B25AP01 - Adsorption Train 1 Vent B	556854.36	3633819.49	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	26_1B25B	DEFAULT	26_1B25BP01 - Adsorption Train 2 Vent A	556859.14	3633819.49	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54	26_2B25B	DEFAULT	26_2B25BP01 - Adsorption Train 2 Vent B	556864.00	3633819.49	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	26_2B26	DEFAULT	26_2B26P01 - Adsorption Vent B	556872.17	3633819.84	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	26_1B26	DEFAULT	26_1B26P01 - Adsorption Vent A	556880.87	3633819.69	3372.9	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57	26_1B25A	DEFAULT	26_1B25AP01 - Adsorption Train 1 Vent A	556890.55	3633819.76	3372.8	80.0	100	127.30	0.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	56B25C	DEFAULT	Silo 3 Vent	556846.62	3633816.62	3373.1	80.0	100	161.10	0.67	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59	*V0543*	DEFAULT	*Portable Air Compressor*	556618.90	3634620.37	3363.4	6.0	1000	244.82	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60	*V0545*	DEFAULT	*Portable Air Compressor*	556695.95	3634556.00	3364.0	6.0	1000	244.82	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61	*V0546*	DEFAULT	*Portable Air Compressor*	556765.80	3634115.08	3369.5	6.0	1000	225.99	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62	*G0100*	DEFAULT	*UPS backup generator*	556695.06	3634566.59	3364.0	10.0	1000	229.84	0.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
63	*G0101*	DEFAULT	*UPS backup generator*	556780.25	3634102.48	3369.7	12.0	1000	238.68	0.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	*G0102*	DEFAULT	*Server Backup Generator*	557026.11	3634058.67	3369.2	10.0	1000	354.00	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	*E0600W*	DEFAULT	*Fire Water Pump Engine*	557227.00	3634864.00	3357.7	4.0	1000	354.04	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
66	*E0601M*	DEFAULT	*Fire Water Pump Engine*	557233.04	3634863.96	3357.6	4.0	1000	354.04	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67	*E0602E*	DEFAULT	*Fire Water Pump Engine*	557238.59	3634863.84	3357.5	4.0	1000	354.04	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68	*E0603*	DEFAULT	*Fire Water Pump Engine*	556907.01	3634446.37	3365.1	4.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
69	*V0511*	DEFAULT	*Portable Fire Water Pump Engine*	557058.55	3634424.95	3364.0	8.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70	*G2601*	DEFAULT	*Emergency Generator*	556682.00	3634588.54	3363.7	10.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71	*G2602*	DEFAULT	*Emergency Generator*	556698.90	3634587.41	3363.8	10.0	1000	287.19	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	TRLO_9	DEFAULT	Molten Sulfur Railcar Loading Controllec	556463.00	3634577.00	3364.5	15.0	130	97.48	0.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-03
										Total (lb/hr)	**19.25**	**19.25**	**7.84**	**54.74**	**41.65**	**101.88**	**24.33**	**124.26**	**13.35**
										Total (tpy)	84.31	84.31	34.35	239.75	182.42	446.23	106.56	544.24	58.48

Sources identified by the red font are not part of the HollyFrontier refinery. They are an adjacent, separate stationary source.
Per Table 8-2 of Appendix W, actual PM emissions were modeled in lieu of PTE for the FCC regenerator. This unit is not modified.
Pollutant names: pollutant names with a "ST" extension were used to assess compliance with short-term standards (i.e., 1-hr, 3-hr and 24-hı
Pollutant names: pollutant names with a "LT" extension were used to assess compliance with annual standard:

Last Update 7-7-22
Holly Frontier - Artesia Model Input
NAD83, Zone 13
Point Sources

Model Source No.	Source ID		Source Description	Potential to Emit (lb/hr)										
				PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_24hr	CO	H2S	H2SO4	NH3
1	B0007	DEFAULT	Boiler 7	1.78E+00	1.78E+00	1.78E+00	1.29E+01	1.29E+01	8.04E+00	8.04E+00	1.97E+01	0.00E+00	0.00E+00	0.00E+00
2	B0008	DEFAULT	Boiler 8	1.78E+00	1.78E+00	1.78E+00	1.29E+01	1.29E+01	8.04E+00	8.04E+00	1.97E+01	0.00E+00	0.00E+00	0.00E+00
3	B0009	DEFAULT	Boiler 9	1.82E+00	1.82E+00	1.82E+00	4.89E+00	4.89E+00	2.89E+00	2.89E+00	9.04E+00	0.00E+00	0.00E+00	0.00E+00
4	H0009	DEFAULT	Unit 13 Naphtha Splitter Reboiler	3.64E-01	3.64E-01	3.64E-01	3.96E+00	3.96E+00	1.64E+00	1.64E+00	4.03E+00	0.00E+00	0.00E+00	0.00E+00
5	H0011	DEFAULT	Unit 21 Vacuum Unit Heater	3.15E-01	3.15E-01	3.15E-01	9.52E+00	7.24E+00	1.42E+00	1.42E+00	3.48E+00	0.00E+00	0.00E+00	0.00E+00
6	H0018	DEFAULT	Unit 06 HDS Reboiler	2.65E-01	2.65E-01	2.65E-01	3.49E+00	3.49E+00	1.19E+00	1.19E+00	2.93E+00	0.00E+00	0.00E+00	0.00E+00
7	H0019	DEFAULT	South Crude Charge Heater	4.47E-01	4.47E-01	4.57E-01	2.90E+00	2.85E+00	2.02E+00	2.02E+00	4.94E+00	0.00E+00	0.00E+00	0.00E+00
8	H0020	DEFAULT	South Crude Charge Heater	7.45E-01	7.45E-01	7.45E-01	4.82E+00	4.82E+00	3.37E+00	3.37E+00	8.23E+00	0.00E+00	0.00E+00	0.00E+00
9	H0028	DEFAULT	Unit 21 Heater	1.02E-01	1.02E-01	1.02E-01	2.17E+00	2.17E+00	4.60E-01	4.60E-01	1.13E+00	0.00E+00	0.00E+00	0.00E+00
10	H0030	DEFAULT	Unit 06 Charge Heater	4.00E-01	4.00E-01	3.48E-01	3.19E+00	3.19E+00	1.57E+00	1.57E+00	3.84E+00	0.00E+00	0.00E+00	0.00E+00
11	H0040	DEFAULT	Unit 13 Charge Heater	4.00E-01	4.00E-01	3.48E-01	3.78E+00	3.78E+00	1.57E+00	1.57E+00	3.84E+00	0.00E+00	0.00E+00	0.00E+00
12	H0312	DEFAULT	Unit 10 FCC Feed Heater	2.90E-01	2.90E-01	2.90E-01	4.62E+00	4.62E+00	1.31E+00	1.31E+00	3.20E+00	0.00E+00	0.00E+00	0.00E+00
13	H0352_54	DEFAULT	Unit 70 CCR Heaters	1.70E+00	1.70E+00	1.66E+00	9.00E+00	9.00E+00	8.07E+00	8.07E+00	1.83E+01	0.00E+00	0.00E+00	0.00E+00
14	H0355	DEFAULT	Unit 70 Stabilizer Reboiler Heater	2.32E-01	2.32E-01	2.32E-01	2.52E+00	2.52E+00	1.13E+00	1.13E+00	2.56E+00	0.00E+00	0.00E+00	0.00E+00
15	H0362_64	DEFAULT	Unit 70 CCR Heaters	1.03E+00	1.03E+00	1.03E+00	6.88E+00	6.88E+00	5.04E+00	5.04E+00	1.14E+01	0.00E+00	0.00E+00	0.00E+00
16	H0421	DEFAULT	Unit 44 Charge Heater	2.24E-01	2.24E-01	2.24E-01	2.43E+00	2.43E+00	1.01E+00	1.01E+00	2.47E+00	0.00E+00	0.00E+00	0.00E+00
17	H0464	DEFAULT	SRU Hot Oil Heater	7.95E-02	7.95E-02	9.13E-02	5.23E-01	5.23E-01	3.58E-01	3.58E-01	8.78E-01	0.00E+00	0.00E+00	0.00E+00
18	H0600	DEFAULT	Unit 09 Depropanizer Reboiler Heater	6.95E-01	6.95E-01	6.95E-01	4.70E+00	4.67E+00	3.14E+00	3.14E+00	7.69E+00	0.00E+00	0.00E+00	0.00E+00
19	H0601	DEFAULT	Unit 33 Charge Heater	6.46E-01	6.46E-01	6.46E-01	3.51E+00	3.51E+00	2.91E+00	2.91E+00	7.14E+00	0.00E+00	0.00E+00	0.00E+00
20	H2421	DEFAULT	Unit 45 Charge Heater	2.24E-01	2.24E-01	2.24E-01	1.22E+00	1.22E+00	9.77E-01	9.77E-01	2.47E+00	0.00E+00	0.00E+00	0.00E+00
21	H2501	DEFAULT	Unit 25 ROSE® Unit No. 2 Hot Oil Heater	9.93E-01	9.93E-01	9.93E-01	3.60E+00	3.60E+00	4.35E+00	4.35E+00	7.20E+00	0.00E+00	0.00E+00	0.00E+00
22	H3101	DEFAULT	SRU3 Hot Oil Heater	9.11E-02	9.11E-02	9.13E-02	3.30E-01	3.30E-01	4.11E-01	4.11E-01	9.90E-01	0.00E+00	0.00E+00	0.00E+00
23	H3402	DEFAULT	Unit 34 Hydrocracker Reboiler 1	4.30E-01	4.30E-01	4.30E-01	1.56E+00	1.56E+00	1.89E+00	1.89E+00	4.68E+00	0.00E+00	0.00E+00	0.00E+00
24	H3403	DEFAULT	Unit 34 Hydrocracker Reactor Charge Heate	2.65E-01	2.65E-01	2.65E-01	9.60E-01	9.60E-01	1.16E+00	1.16E+00	2.93E+00	0.00E+00	0.00E+00	0.00E+00
25	H8801_02	DEFAULT	Unit 63 Hydrogen Plant Reformer Furnaces	1.26E+00	1.26E+00	1.26E+00	8.66E+00	8.66E+00	2.85E+00	2.85E+00	1.39E+01	0.00E+00	0.00E+00	0.00E+00
26	H9851	DEFAULT	Unit 64 Hydrogen Plant Reformer	2.79E+00	2.79E+00	2.81E+00	1.12E+01	4.52E+00	6.32E+00	6.32E+00	2.02E+01	0.00E+00	0.00E+00	1.38E+00
27	H0473	DEFAULT	SRU2 Tail Gas Incinerator	1.15E+01	1.15E+01	1.92E+00	6.50E+00	6.51E+00	1.35E+02	1.35E+02	2.77E+01	1.44E+00	1.03E+01	0.00E+00
28	H3103	DEFAULT	SRU3 Tail Gas Incinerator	4.93E+00	4.93E+00	1.91E+00	6.50E+00	6.51E+00	5.00E+01	5.00E+01	1.50E+01	5.32E-01	3.83E+00	0.00E+00
29	FCCREGEN	DEFAULT	FCC Regenerator	2.29E+01	1.90E+01	1.57E+01	3.49E+01	2.32E+01	2.79E+01	2.79E+01	1.22E+02	0.00E+00	2.13E+00	1.63E+01
30	FL0400	DEFAULT	FL-0400, North Plant Flare	0.00E+00	0.00E+00	0.00E+00	3.47E+00	1.24E+00	4.48E+00	4.48E+00	1.42E+01	4.75E-02	0.00E+00	0.00E+00
31	FL0401	DEFAULT	FL-0401, South Plant Flare	0.00E+00	0.00E+00	0.00E+00	1.66E+00	4.22E-01	5.73E+01	5.73E+01	6.82E+00	6.09E-01	0.00E+00	0.00E+00
32	FL0402	DEFAULT	FL-0402, FCC Flare	0.00E+00	0.00E+00	0.00E+00	1.63E+02	4.68E+00	1.13E+03	1.13E+03	1.24E+03	1.20E+01	0.00E+00	0.00E+00
33	FL0403	DEFAULT	FL-0403, Alky Flare	0.00E+00	0.00E+00	0.00E+00	2.74E+00	5.78E-01	1.10E+00	1.10E+00	1.13E+01	1.17E-02	0.00E+00	0.00E+00
34	FL0404	DEFAULT	FL-0404, GOHT Flare	0.00E+00	0.00E+00	0.00E+00	1.17E+01	5.36E+00	3.99E+01	3.99E+01	4.80E+01	4.24E-01	0.00E+00	0.00E+00
35	TL4VCU	DEFAULT	TL-4 VCU	1.05E-01	1.05E-01	1.50E-02	1.97E+00	2.80E-01	5.14E-01	5.14E-01	1.97E+00	0.00E+00	0.00E+00	0.00E+00
36	H5401	DEFAULT	Unit 54 HDS Reactor Heater	1.60E-01	1.60E-01	1.60E-01	7.73E-01	7.73E-01	7.22E-01	7.22E-01	6.44E-01	0.00E+00	0.00E+00	0.00E+00
37	Y0001	DEFAULT	TCC Cooling Tower	1.58E-01	5.94E-04	5.94E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
38	Y0002	DEFAULT	S. Alky Cooling Tower (Marley Cooling Towe	1.58E-01	5.94E-04	5.94E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39	Y0008	DEFAULT	North Alky Cooling Tower	3.69E-01	1.39E-03	1.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	Y0011	DEFAULT	FCC & NP Cooling Tower	3.16E-01	1.19E-03	1.19E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	Y0012	DEFAULT	Hydrogen Plants Cooling Tower	1.05E-01	3.96E-04	3.96E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42	CTTT0006	DEFAULT	Unit 07 Amine W-0745 Cooling Tower	9.48E-02	3.56E-04	3.56E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
43	FLHEP	DEFAULT	HEP Portable Flare	0.00E+00	0.00E+00	0.00E+00	1.16E+01	1.98E-02	1.10E-01	1.10E-01	5.01E+01	1.19E-03	0.00E+00	0.00E+00
44	TVCU	DEFAULT	Tank VCU	9.39E-03	9.39E-03	5.71E-04	1.74E-01	8.42E-03	4.96E-02	4.96E-02	1.73E-01	1.24E-03	0.00E+00	0.00E+00
45	H_2601	DEFAULT	RDU Reactor Heater	3.21E-01	3.21E-01	3.21E-01	1.29E+00	1.29E+00	5.78E-01	5.78E-01	2.59E+00	0.00E+00	0.00E+00	0.00E+00
46	Y_0026A	DEFAULT	RDU Cooling Tower	1.32E-02	4.95E-05	4.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
47	Y_0026B	DEFAULT	RDU Cooling Tower	1.32E-02	4.95E-05	4.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	Y_0093A	DEFAULT	PTU Cooling Tower	1.30E-02	5.00E-05	5.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	Y_0093B	DEFAULT	PTU Cooling Tower	1.30E-02	5.00E-05	5.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50	H_9301	DEFAULT	Vapor Combustor Unit	1.40E-02	1.40E-02	1.40E-02	4.27E-01	4.27E-01	1.10E-02	1.10E-02	1.56E-01	0.00E+00	0.00E+00	0.00E+00
51	082B6	DEFAULT	Filter Aid Tank Vent	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	26_2B25A	DEFAULT	26_2B25AP01 - Adsorption Train 1 Vent B	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53	26_1B25B	DEFAULT	26_1B25BP01 - Adsorption Train 2 Vent A	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54	26_2B25B	DEFAULT	26_2B25BP01 - Adsorption Train 2 Vent B	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55	26_2B26	DEFAULT	26_2B26P01 - Adsorption Vent B	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	26_1B26	DEFAULT	26_1B26P01 - Adsorption Vent A	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57	26_1B25A	DEFAULT	26_1B25AP01 - Adsorption Train 1 Vent A	6.40E-03	6.40E-03	6.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58	56B25C	DEFAULT	Silo 3 Vent	5.80E-02	5.80E-02	5.80E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59	*V0543*	DEFAULT	*Portable Air Compressor*	9.21E-02	9.21E-02	9.21E-02	1.84E+00	1.84E+00	3.48E-03	3.48E-03	1.61E+00	0.00E+00	0.00E+00	0.00E+00
60	*V0545*	DEFAULT	*Portable Air Compressor*	9.21E-02	9.21E-02	9.21E-02	1.84E+00	1.84E+00	3.48E-03	3.48E-03	1.61E+00	0.00E+00	0.00E+00	0.00E+00
61	*V0546*	DEFAULT	*Portable Air Compressor*	4.54E-03	4.54E-03	4.54E-03	9.07E-02	9.07E-02	1.72E-03	1.72E-03	1.13E+00	0.00E+00	0.00E+00	0.00E+00
62	*G0100*	DEFAULT	*UPS backup generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
63	*G0101*	DEFAULT	*UPS backup generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	*G0102*	DEFAULT	*Server Backup Generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	*E0600W*	DEFAULT	*Fire Water Pump Engine*	1.24E-01	1.24E-01	1.42E-03	2.49E+00	2.84E-02	4.68E-03	4.68E-03	2.16E+00	0.00E+00	0.00E+00	0.00E+00
66	*E0601M*	DEFAULT	*Fire Water Pump Engine*	1.24E-01	1.24E-01	1.42E-03	2.49E+00	2.84E-02	4.68E-03	4.68E-03	2.16E+00	0.00E+00	0.00E+00	0.00E+00
67	*E0602E*	DEFAULT	*Fire Water Pump Engine*	1.24E-01	1.24E-01	1.42E-03	2.49E+00	2.84E-02	4.68E-03	4.68E-03	2.16E+00	0.00E+00	0.00E+00	0.00E+00
68	*E0603*	DEFAULT	*Fire Water Pump Engine*	1.01E-01	1.01E-01	1.15E-03	2.02E+00	2.30E-02	3.79E-03	3.79E-03	1.75E+00	0.00E+00	0.00E+00	0.00E+00
69	*V0511*	DEFAULT	*Portable Fire Water Pump Engine*	2.30E-01	2.30E-01	2.63E-03	4.60E+00	5.25E-02	8.70E-03	8.70E-03	4.03E+00	0.00E+00	0.00E+00	0.00E+00
70	*G2601*	DEFAULT	*Emergency Generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71	*G2602*	DEFAULT	*Emergency Generator*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	TRLO_9	DEFAULT	Molten Sulfur Railcar Loading Controllec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-03	0.00E+00	0.00E+00
Sources identified by the red font are not part of the HollyFrontier refinery. They are an				**61.57**	**56.44**	**39.62**	**390.70**	**172.47**	**1524.25**	**1524.25**	**1746.92**	**15.11**	**16.29**	**17.63**
Per Table 8-2 of Appendix W, actual PM emissions were modeled in lieu of PTE for the				269.68	247.21	173.52	1711.27	755.40	6676.20	6676.20	7651.51	66.18	71.37	77.23
Pollutant names: pollutant names with a "ST" extension were used to assess complianc														
Pollutant names: pollutant names with a "LT" extension were used to assess complianc						**173.52**								

HollyFrontier - Volume Sources (H2S and Toxics Only)

Model Source No.	Source ID	Source Description	Easting (X)	Northing (Y)	Base Elevation (ft)	Release Height (ft)	Horizontal Dimension - Sigma Y (ft)	Vertical Dimension - Sigma Z (ft)
73	TLO_1	TLO-1 Asphalt Truck Loading Rack	556951.00	3634033.00	3370.5	15.0	2.3	7.0
74	TL_2	TL-2 Asphalt Truck Loading Rack #2	556913.00	3634267.00	3366.9	15.0	2.3	7.0
75	TL_4	TL-4 Fuels Truck Loading Rack e, f	556740.00	3634364.00	3365.9	15.0	2.3	7.0
76	TL_7	TL-7 CBO/LCO Truck Loading Rack	556410.00	3634889.00	3365.3	15.0	2.3	7.0
77	RLO_8	RLO-8 Railcar Loading Rack	556379.00	3634966.00	3366.5	15.0	2.3	7.0
78	RLO_19	RLO-19 Railcar Loading Rack	556513.00	3634124.00	3369.6	15.0	2.3	7.0
79	TLO_20	TLO-20 Asphalt/Pitch Truck Loading Rack	557316.00	3634568.00	3360.1	15.0	2.3	7.0
80	TRLO_9F	Molten Sulfur Railcar Loading	556463.00	3634577.00	3364.5	15.0	2.3	7.0
81	T_0049	Slop Oil Tank	556806.00	3634183.00	3368.3	36.0	2.3	16.7
82	T_0059	T-0059, Light Cycle Oil (LCO) tank	556498.59	3634850.62	3363.5	30.0	7.2	14.0
83	T_0061	Light Cycle Oil (LCO) fixed roof tank	556497.48	3634911.00	3364.1	30.0	10.3	14.0
84	T_0063	Heavy Cycle Oil (HCO) fixed roof tank	556531.58	3634945.66	3363.7	30.0	10.5	14.0
85	T_0065	Heavy Cycle Oil (HCO) fixed roof tank	556528.22	3634909.88	3363.7	30.0	10.3	14.0
86	T_0075	Heavy Cycle Oil (HCO)fixed roof tank	556464.49	3634916.03	3364.6	32.0	13.4	14.9
87	T_0081	Asphalt/Pitch Tank	557350.20	3634629.35	3358.7	40.0	22.4	18.6
88	T_0082	Asphalt/Pitch Tank	557294.90	3634635.86	3359.7	40.0	28.8	18.6
89	T_0110	Asphalt/Pitch Tank	556900.88	3634231.86	3367.6	35.0	22.3	16.3
90	T_0400	Gas Oil fixed roof tank	556712.93	3634475.65	3364.7	48.0	24.7	22.3
91	T_0402	T-0402 Light Cat Naphtha tank	557231.49	3634376.15	3362.9	50.0	18.5	23.3
92	T_0410	Asphalt/Pitch Tank	556898.32	3634106.89	3369.3	40.0	16.3	18.6
93	T_0411	T-0411 Gasolines & Gasoline Blendstocks	557083.75	3634253.22	3365.3	40.0	20.6	18.6
94	T_0419	No. 2 Fuel Oil (Diesel) fixed roof tank	556713.81	3634160.70	3368.9	28.0	10.9	13.0
95	T_0420	Asphalt/Pitch Tank	556940.51	3634116.91	3369.1	30.0	10.3	14.0
96	T_0422	Light Cycle Oil (LCO) fixed roof tank	556963.72	3634117.96	3369.0	30.0	10.3	14.0
97	T_0423	Light Cycle Oil (LCO) fixed roof tank	556964.77	3634090.54	3369.4	30.0	10.3	14.0
98	T_0431	Fuel Oil fixed roof tank	556896.67	3634180.59	3368.3	32.0	22.5	14.9
99	T_0432	Fuel Oil fixed roof tank	556943.73	3634184.42	3368.0	32.0	22.5	14.9
100	T_0433	Straight Run Gas Oil fixed roof tank	556890.24	3634326.64	3366.2	42.0	24.1	19.5
101	T_0434	Straight Run Diesel fixed roof tank	556609.74	3634191.31	3368.4	42.0	24.1	19.5
102	T_0914	Slop Oil Tank	556918.87	3634034.06	3370.5	40.0	15.5	18.6
103	T_1227	Asphalt/Pitch Tank	556788.69	3634425.75	3365.3	40.0	15.9	18.6
104	T_0106	T-0106 Sour Water Tank	556846.55	3634177.91	3368.4	40.0	13.8	18.6
105	T_0435	T-0435 Sour Water Tank	556807.39	3634533.97	3364.5	40.0	6.2	18.6
106	T_0437	T-0437 Crude Oil Tank	557154.64	3634557.61	3362.4	40.0	24.7	18.6
107	T_0438	Straight Run Gas Oil fixed roof tank	556854.20	3634228.42	3367.7	48.0	18.5	22.3
108	T_0439	T-0439 Sour Naphtha Tank	556780.49	3634480.62	3364.7	46.0	26.8	21.4
109	T_0450	T-0450 Sour Naphtha Tank	557152.77	3634475.54	3363.0	40.0	24.7	18.6
110	T_0451	T-0451 Straight Run Diesel tank	556842.85	3634358.19	3365.8	40.0	7.2	18.6
111	T_0737	T-0737 Sour Water Tank	556450.62	3634620.57	3364.1	40.0	13.0	18.6
112	T_0802	T-0802 Sour Water Tank	556445.16	3634595.97	3364.4	40.0	9.3	18.6
113	T_0814	Asphalt/Pitch Tank	556943.68	3634088.43	3369.6	32.0	10.3	14.9
114	T_0815	No. 2 Fuel Oil (Diesel) tank	556520.39	3635063.61	3364.6	43.0	23.9	20.0
115	T_0821	Light Cat Naphtha tank	557195.90	3634451.64	3362.7	50.0	21.8	23.3
116	T_0830	T-0830 Slop Oil Tank	556813.69	3634957.68	3362.5	40.0	28.8	18.6
117	T_0834	Straight Run Diesel tank	556427.01	3634979.64	3365.6	40.0	17.5	18.6
118	T_0835	Straight Run Diesel tank	556643.07	3635144.08	3363.0	40.0	22.9	18.6
119	T_0838	No. 2 Fuel Oil (Diesel) tank	556486.78	3634955.24	3364.5	40.0	15.2	18.6
120	T_1225	T-1225 Crude Oil Tank	557155.26	3634634.07	3362.1	40.0	30.9	18.6

HollyFrontier - Volume Sources (H2S and Toxics Only)

Model Source No.	Source ID	Source Description	Project Related Emissions Increase (lb/hr) PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT	CO	H2S
73	TLO_1	TLO-1 Asphalt Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.28E-03
74	TL_2	TL-2 Asphalt Truck Loading Rack #2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03
75	TL_4	TL-4 Fuels Truck Loading Rack e, f	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-02
76	TL_7	TL-7 CBO/LCO Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-05
77	RLO_8	RLO-8 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03
78	RLO_19	RLO-19 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-02
79	TLO_20	TLO-20 Asphalt/Pitch Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-02
80	TRLO_9F	Molten Sulfur Railcar Loading	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-02
81	T_0049	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.88E-01
82	T_0059	T-0059, Light Cycle Oil (LCO) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-05
83	T_0061	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E-05
84	T_0063	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.61E-04
85	T_0065	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02
86	T_0075	Heavy Cycle Oil (HCO)fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02
87	T_0081	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-02
88	T_0082	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-02
89	T_0110	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03
90	T_0400	Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-02
91	T_0402	T-0402 Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.52E-04
92	T_0410	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-02
93	T_0411	T-0411 Gasolines & Gasoline Blendstocks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-05
94	T_0419	No. 2 Fuel Oil (Diesel) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03
95	T_0420	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-03
96	T_0422	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04
97	T_0423	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-04
98	T_0431	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-02
99	T_0432	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.04E-03
100	T_0433	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-04
101	T_0434	Straight Run Diesel fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02
102	T_0914	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
103	T_1227	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-02
104	T_0106	T-0106 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.36E-01
105	T_0435	T-0435 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.28E-01
106	T_0437	T-0437 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.21E-01
107	T_0438	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-03
108	T_0439	T-0439 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-03
109	T_0450	T-0450 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-03
110	T_0451	T-0451 Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-04
111	T_0737	T-0737 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.18E-02
112	T_0802	T-0802 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.79E-02
113	T_0814	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-02
114	T_0815	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02
115	T_0821	Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.87E-04
116	T_0830	T-0830 Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	T_0834	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-03
118	T_0835	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03
119	T_0838	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.40E-03
120	T_1225	T-1225 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.32E-01

HollyFrontier - Volume Sources (H2S and Toxics Only)

Model Source No.	Source ID	Source Description	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_24hr	CO	H2S
			Potential to Emit (lb/hr)								
73	TLO_1	TLO-1 Asphalt Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.28E-03
74	TL_2	TL-2 Asphalt Truck Loading Rack #2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03
75	TL_4	TL-4 Fuels Truck Loading Rack e, f	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-02
76	TL_7	TL-7 CBO/LCO Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-05
77	RLO_8	RLO-8 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-03
78	RLO_19	RLO-19 Railcar Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-02
79	TLO_20	TLO-20 Asphalt/Pitch Truck Loading Rack	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-02
80	TRLO_9F	Molten Sulfur Railcar Loading	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-02
81	T_0049	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.88E-01
82	T_0059	T-0059, Light Cycle Oil (LCO) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-05
83	T_0061	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E-05
84	T_0063	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.61E-04
85	T_0065	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02
86	T_0075	Heavy Cycle Oil (HCO)fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-02
87	T_0081	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-02
88	T_0082	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-02
89	T_0110	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03
90	T_0400	Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-02
91	T_0402	T-0402 Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.52E-04
92	T_0410	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-02
93	T_0411	T-0411 Gasolines & Gasoline Blendstocks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-05
94	T_0419	No. 2 Fuel Oil (Diesel) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03
95	T_0420	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-03
96	T_0422	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04
97	T_0423	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-04
98	T_0431	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-02
99	T_0432	Fuel Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.04E-03
100	T_0433	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-04
101	T_0434	Straight Run Diesel fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02
102	T_0914	Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
103	T_1227	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-02
104	T_0106	T-0106 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-02
105	T_0435	T-0435 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.63E-03
106	T_0437	T-0437 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-03
107	T_0438	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-03
108	T_0439	T-0439 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-03
109	T_0450	T-0450 Sour Naphtha Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-03
110	T_0451	T-0451 Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-04
111	T_0737	T-0737 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E-02
112	T_0802	T-0802 Sour Water Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-02
113	T_0814	Asphalt/Pitch Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-02
114	T_0815	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-02
115	T_0821	Light Cat Naphtha tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.87E-04
116	T_0830	T-0830 Slop Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117	T_0834	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-03
118	T_0835	Straight Run Diesel tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03
119	T_0838	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.40E-03
120	T_1225	T-1225 Crude Oil Tank	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03

HollyFrontier - Volume Sources (H2S and Toxics Only)

Model Source No.	Source ID	Source Description	H2SO4	NH3
73	TLO_1	TLO-1 Asphalt Truck Loading Rack	0.00E+00	0.00E+00
74	TL_2	TL-2 Asphalt Truck Loading Rack #2	0.00E+00	0.00E+00
75	TL_4	TL-4 Fuels Truck Loading Rack e, f	0.00E+00	0.00E+00
76	TL_7	TL-7 CBO/LCO Truck Loading Rack	0.00E+00	0.00E+00
77	RLO_8	RLO-8 Railcar Loading Rack	0.00E+00	0.00E+00
78	RLO_19	RLO-19 Railcar Loading Rack	0.00E+00	0.00E+00
79	TLO_20	TLO-20 Asphalt/Pitch Truck Loading Rack	0.00E+00	0.00E+00
80	TRLO_9F	Molten Sulfur Railcar Loading	0.00E+00	0.00E+00
81	T_0049	Slop Oil Tank	0.00E+00	0.00E+00
82	T_0059	T-0059, Light Cycle Oil (LCO) tank	0.00E+00	0.00E+00
83	T_0061	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00
84	T_0063	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00
85	T_0065	Heavy Cycle Oil (HCO) fixed roof tank	0.00E+00	0.00E+00
86	T_0075	Heavy Cycle Oil (HCO)fixed roof tank	0.00E+00	0.00E+00
87	T_0081	Asphalt/Pitch Tank	0.00E+00	0.00E+00
88	T_0082	Asphalt/Pitch Tank	0.00E+00	0.00E+00
89	T_0110	Asphalt/Pitch Tank	0.00E+00	0.00E+00
90	T_0400	Gas Oil fixed roof tank	0.00E+00	0.00E+00
91	T_0402	T-0402 Light Cat Naphtha tank	0.00E+00	0.00E+00
92	T_0410	Asphalt/Pitch Tank	0.00E+00	0.00E+00
93	T_0411	T-0411 Gasolines & Gasoline Blendstocks	0.00E+00	0.00E+00
94	T_0419	No. 2 Fuel Oil (Diesel) fixed roof tank	0.00E+00	0.00E+00
95	T_0420	Asphalt/Pitch Tank	0.00E+00	0.00E+00
96	T_0422	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00
97	T_0423	Light Cycle Oil (LCO) fixed roof tank	0.00E+00	0.00E+00
98	T_0431	Fuel Oil fixed roof tank	0.00E+00	0.00E+00
99	T_0432	Fuel Oil fixed roof tank	0.00E+00	0.00E+00
100	T_0433	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00
101	T_0434	Straight Run Diesel fixed roof tank	0.00E+00	0.00E+00
102	T_0914	Slop Oil Tank	0.00E+00	0.00E+00
103	T_1227	Asphalt/Pitch Tank	0.00E+00	0.00E+00
104	T_0106	T-0106 Sour Water Tank	0.00E+00	0.00E+00
105	T_0435	T-0435 Sour Water Tank	0.00E+00	0.00E+00
106	T_0437	T-0437 Crude Oil Tank	0.00E+00	0.00E+00
107	T_0438	Straight Run Gas Oil fixed roof tank	0.00E+00	0.00E+00
108	T_0439	T-0439 Sour Naphtha Tank	0.00E+00	0.00E+00
109	T_0450	T-0450 Sour Naphtha Tank	0.00E+00	0.00E+00
110	T_0451	T-0451 Straight Run Diesel tank	0.00E+00	0.00E+00
111	T_0737	T-0737 Sour Water Tank	0.00E+00	0.00E+00
112	T_0802	T-0802 Sour Water Tank	0.00E+00	0.00E+00
113	T_0814	Asphalt/Pitch Tank	0.00E+00	0.00E+00
114	T_0815	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00
115	T_0821	Light Cat Naphtha tank	0.00E+00	0.00E+00
116	T_0830	T-0830 Slop Oil Tank	0.00E+00	0.00E+00
117	T_0834	Straight Run Diesel tank	0.00E+00	0.00E+00
118	T_0835	Straight Run Diesel tank	0.00E+00	0.00E+00
119	T_0838	No. 2 Fuel Oil (Diesel) tank	0.00E+00	0.00E+00
120	T_1225	T-1225 Crude Oil Tank	0.00E+00	0.00E+00

HollyFrontier Off-Site Point Source NAAQS/NMAAQS Input Data (Updated 7-12-21)

										Potential to Emit (lb/hr)								
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT	CO	H2S
352E1	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.63	3637097.65	3373.8	80.0	400	50.98	1.12	0.798	0.798	0.798					1.395	
352E2	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556300.17	3637104.67	3373.6	35.0	110	45.21	1.51	1.587	1.587	1.587						
352E4	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556285.79	3637106.13	3373.9	35.0	110	45.21	1.51	1.587	1.587	1.587						
402E3	DEFAULT	Holly Frontier Asphalt Company	556992.61	3637197.56	3359.9	15.0	500	29.89	1.51	6.508	6.508	6.508					7.937	
402E6	DEFAULT	Holly Frontier Asphalt Company	557000.15	3637204.58	3359.9	25.0	285	7.19	1.51	0.906	0.906	0.906					9.524	
402E8	DEFAULT	Holly Frontier Asphalt Company	557000.15	3637204.58	3359.9	25.0	500	29.89	1.51								3.080	
402E7	DEFAULT	Holly Frontier Asphalt Company	556981.53	3637199.14	3360.1	25.0	285	7.19	1.51								7.143	
402E9	DEFAULT	Holly Frontier Asphalt Company	556983.18	3637190.99	3360.0	25.0	500	29.89	1.51								3.080	
203R2	DEFAULT	DCP - Shadow Booster Station	557393.94	3622548.16	3367.7	23.0	854	91.86	0.98									0.363
191E64	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569332.26	3626710.82	3554.0	54.5	1150	19.88	3.51									3.987
191R15	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569339.80	3626717.84	3555.0	115.0	1832	65.58	28.44									3.443
191R16	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569333.01	3626721.39	3554.8	115.0	1832	65.58	28.44									8.154
191R17	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569325.42	3626719.30	3554.1	115.0	1832	65.58	28.44									8.154
191R18	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569321.18	3626712.40	3553.4	115.0	1832	65.58	28.44									0.725
191R19	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569322.83	3626704.25	3553.2	115.0	1832	65.58	28.44									0.363
191R20	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569329.78	3626699.28	3553.3	115.0	1832	65.58	28.44									16.308
211E25	DEFAULT	Lucid Artesia - Dagger Draw Gas Plant	551931.36	3619797.52	3472.0	200.0	1832	65.62	9.81									223.020
39270R3	DEFAULT	Lucid Artesia - North Pen Compressor Station	551454.28	3619910.64	3477.6	23.0	854	91.86	0.98									2.537
199E38	DEFAULT	Artesia Gas Plant	574000.18	3624399.74	3609.0	70.6	1832	65.62	68.26									26.455
31815E15	DEFAULT	Frontier - Coyote Compressor Station	578708.30	3628257.94	3668.9	23.0	854	91.86	0.98									1.825
39714E8	DEFAULT	Spur - Shelby 23 Tank Battery	551738.94	3611091.61	3409.5	35.0	1832	65.62	8.64									6.197
39714E9	DEFAULT	Spur - Shelby 23 Tank Battery	551746.48	3611098.63	3409.0	30.0	1832	65.62	8.64									6.197
39003E5	DEFAULT	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	35.0	1832	65.62	29.75									13.391

Rest of sources provided by NMAQB are located in excess of 10km from refinery. Not included in NAAQS/NMAAQS model.

All sources within 25km and large (1,000lb/hr) emitters within 50km were evaluated for inclusion in the H2S NMAAQS analysis.

PM10, PM2.5 and SO2 sources located beyond 10km were excluded. There are no SO2 sources located within 10km of the refinery.

No cummulative NAAQS/NMAAQS modeling conducted for pollutants other than PM10, PM25, H2S and SO2 as the nearby source contribution is reflected in the background concentration.

HollyFrontier Off-Site Source NAAQS/NMAAQS Volume Source Input Data (Updated 5-5-21)

								Potential to Emit (lb/hr)								
Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT	CO	H2S
3403E2	Schlumberger - Artesia District Bulk Facility	556719.31	3635718.50	3362.8	3.3	1.54	3.05	2.38	2.381	2.381						
3403R1	Schlumberger - Artesia District Bulk Facility	556726.85	3635725.52	3362.7	3.3	1.54	3.05	0.72	0.725	0.725						
359@1	Southeast Readi-Mix - Artesia Plant	557117.00	3635667.03	3356.9	32.8	721.78	30.51	16.27	4.08	4.081						
352E3	Land O' Lakes Purina Feed - Artesia Feed Mill	556293.38	3637108.22	3373.8	20.0	1.54	3.05	0.79	0.794	0.794						
402R2	Holly Frontier Asphalt Company	556993.36	3637208.13	3360.0	32.8	32.81	30.51	6.51	6.508	6.508						
402R3	Holly Frontier Asphalt Company	556985.77	3637206.04	3360.1	32.8	32.81	30.51	6.50	6.505	6.505						
402R6	Holly Frontier Asphalt Company	556981.53	3637199.14	3360.1	32.8	32.81	30.51	6.35	6.349	6.349						
30254@1	Par Five Energy LLC - Par Five Energy	564319.69	3632835.00	3342.9	3.3	1.54	3.05	2.38	2.381	2.381						
30254R1	Par Five Energy LLC - Par Five Energy	564327.22	3632842.02	3343.0	32.8	32.81	30.51	5.56	5.556	5.556						
28959E1	Lime Rock - Condor 7 Battery	563709.45	3625436.95	3287.2	17.0	1.54	3.05									0.544
26441E1	Lime Rock - Atoka San Andreas Unit Battery	561619.20	3623917.88	3302.5	3.3	1.54	3.05									0.363
26441E2	Lime Rock - Atoka San Andreas Unit Battery	561626.73	3623924.91	3302.4	3.3	1.54	3.05									0.363
26441E3	Lime Rock - Atoka San Andreas Unit Battery	561619.95	3623928.46	3302.4	3.3	1.54	3.05									0.363
203R1	DCP - Shadow Booster Station	557400.73	3622544.60	3367.6	3.3	1.54	3.05									0.317
29063R1	Chesapeake Operating Inc - Hondo Federal Gas	568814.07	3629620.53	3468.8	3.3	1.54	3.05									4.762
39270E3	Lucid Artesia - North Pen Compressor Station	551465.37	3619909.06	3477.3	3.3	1.54	3.05									7.143
39270E4	Lucid Artesia - North Pen Compressor Station	551472.91	3619916.08	3477.1	3.3	1.54	3.05									7.143
39270R1	Lucid Artesia - North Pen Compressor Station	551466.12	3619919.63	3477.1	3.3	1.54	3.05									0.238
39270R2	Lucid Artesia - North Pen Compressor Station	551458.53	3619917.54	3477.3	3.3	1.54	3.05									1.825
199R2	Artesia Gas Plant	574007.71	3624406.77	3608.9	3.3	1.54	3.05									0.000
199R3	Artesia Gas Plant	574000.93	3624410.32	3609.0	3.3	1.54	3.05									0.000
31815R1	Frontier - Coyote Compressor Station	578715.83	3628264.96	3668.9	3.3	1.54	3.05									3.571
31815R3	Frontier - Coyote Compressor Station	578709.05	3628268.51	3668.9	3.3	1.54	3.05									18.120
39714R1	Spur - Shelby 23 Tank Battery	551739.69	3611102.18	3408.9	3.3	1.54	3.05									0.159

Note: The volume sources at the Artesia Gas Plant (Source IDs. 199R2 and 199R3 represent emissions from the acid gas flare. These emissions were therefore modeles as a flare (Source ID 199E38).

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC1	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.63	3637097.65	3373.8	80.0	400	51.0	1.1	0.798						
INC2	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556300.170	3637104.670	3373.6	35.0	110	45.2	1.5	1.587						
INC3	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556285.790	3637106.130	3373.9	35.0	110	45.2	1.5	1.587						
INC4	DEFAULT	Holly Frontier Asphalt Company	556992.610	3637197.560	3359.9	15.0	500	29.9	1.5	6.508						
INC5	DEFAULT	Holly Frontier Asphalt Company	557000.150	3637204.580	3359.9	25.0	285	7.2	1.5	0.906						
INC6	DEFAULT	DCP - Shadow Booster Station	557393.190	3622537.580	3367.9	15.0	1125	118.2	0.1	1.746						
INC7	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	42.5	780	136.0	0.1	1.508						
INC8	DEFAULT	Chesapeake Operating Inc - Hondo Federal Gas	568814.070	3629620.530	3468.8	6.0	860	53.3	0.8	0.794						
INC9	DEFAULT	DCP - Pecos Diamond Gas Plant	568071.310	3625977.910	3541.9	50.0	600	105.0	1.0	1.587						
INC10	DEFAULT	DCP - Pecos Diamond Gas Plant	568061.290	3625977.950	3540.7	40.0	600	105.1	1.0	1.587						
INC11	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569341.200	3626597.800	3548.5	27.0	670	200.0	1.3	-2.356						
INC12	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	27.0	670	200.0	1.3	-3.080						
INC13	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	40.0	670	200.0	1.3	-11.905						
INC14	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	31.1	730	181.0	1.5	-2.537						
INC15	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.0	955	200.0	1.6	-3.443						
INC16	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	36.0	759	170.0	1.4	-3.262						
INC17	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	40.0	759	160.0	1.5	-3.806						
INC18	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	21.0	600	34.0	2.0	-0.127						
INC19	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	33.0	925	200.0	1.6	-1.449						
INC20	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569336.770	3626723.010	3555.2	54.5	1150	19.9	3.5	0.159						
INC21	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	54.5	1150	27.7	3.5	0.037						
INC22	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.870	3626716.420	3553.4	120.0	600	17.2	6.2	4.762						
INC23	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.090	3626706.380	3553.0	120.0	600	17.2	6.2	4.762						
INC24	DEFAULT	DCP - Carbon Valley Booster	571606.690	3638669.910	3469.5	15.0	1125	118.2	1.2	1.812						
INC25	DEFAULT	DCP - Carbon Valley Booster	571614.220	3638676.940	3468.6	15.0	1125	118.2	1.2	1.812						
INC26	DEFAULT	DCP - Carbon Valley Booster	571599.840	3638678.400	3468.7	15.0	1125	118.2	1.2	1.812						
INC27	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	21.0	869	152.3	1.0	0.556						
INC28	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	21.0	869	152.3	1.0	0.556						
INC29	DEFAULT	EOG - Rumble State No4	547037.570	3620834.180	3568.8	15.0	600	3.8	1.0	0.018						
INC30	DEFAULT	EOG - Rumble State No5	547018.950	3620828.740	3569.5	15.0	832	171.6	1.0	0.794						
INC31	DEFAULT	EOG - Rumble State No6	547020.600	3620820.590	3569.5	15.0	832	171.6	1.0	0.794						
INC32	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	15.0	1131	30.0	0.7	0.159						
INC33	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	15.0	931	192.9	0.7	0.397						
INC34	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	15.0	832	349.9	0.7	0.794						
INC35	DEFAULT	EOG - Lacama 20 State Com 602H	545061.180	3621964.500	3614.7	15.0	1255	161.9	0.7	0.952						
INC36	DEFAULT	Yates Petroleum - Pierre State No1 Facility	570982.950	3620931.670	3522.0	23.0	854	91.9	1.0	0.037						
INC37	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.3	1340	89.2	1.0	1.957						
INC38	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.3	1340	89.2	1.0	0.979						
INC39	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	44.7	750	21.2	3.0	2.175						
INC40	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	-0.544						
INC41	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC42	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC43	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC44	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	0.979						
INC45	DEFAULT	Artesia Gas Plant	574011.520	3624405.460	3608.9	62.3	-460	91.9	15.1	3.175						
INC46	DEFAULT	Artesia Gas Plant	574004.680	3624411.940	3609.1	62.3	-460	91.9	15.1	2.857						
INC47	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.3	1340	89.2	1.0	0.979						
INC48	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1125	147.9	1.0	1.268						
INC49	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	0.979						
INC50	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	0.979						
INC51	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC52	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	46.0	1340	89.2	1.0	1.957						
INC53	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.0	1500	0.1	2.8	0.018						
INC54	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.0	990	142.0	1.1	0.794						
INC55	DEFAULT	Frontier - Coyote Compressor Station	578709.050	3628268.510	3668.9	22.0	600	18.0	0.8	0.317						
INC56	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	20.0	990	142.0	1.1	0.794						
INC57	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	23.0	873	128.0	0.9	0.794						
INC58	DEFAULT	Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	25.0	250	21.6	0.7	0.079						
INC59	DEFAULT	Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	25.0	250	21.6	0.7	0.079						
INC60	DEFAULT	Shelby 23 Tank Battery	551739.690	3611102.180	3408.9	25.0	250	21.6	0.7	0.079						
INC61	DEFAULT	Shelby 23 Tank Battery	551732.090	3611100.090	3409.2	25.0	250	21.6	0.7	0.079						
INC62	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.630	3637097.650	3373.8	79.987	399.992	50.984	1.115		0.798	0.798				
INC63	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556300.170	3637104.670	3373.6	35.007	109.994	45.210	1.509		1.587	1.587				

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC64	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556285.790	3637106.130	3373.9	35.007	109.994	45.210	1.509		1.587	1.587				
INC65	DEFAULT	Holly Frontier Asphalt Company	556992.610	3637197.560	3359.9	14.993	500.000	29.888	1.509		6.508	6.508				
INC66	DEFAULT	Holly Frontier Asphalt Company	557000.150	3637204.580	3359.9	25.000	285.008	7.185	1.509		0.906	0.906				
INC67	DEFAULT	DCP - Shadow Booster Station	557393.190	3622537.580	3367.9	14.993	1124.996	118.209	0.098		1.746	1.746				
INC68	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	42.487	780.008	135.991	0.131		1.508	1.508				
INC69	DEFAULT	DCP - Pecos Diamond Gas Plant	568071.310	3625977.910	3541.9	50.000	600.008	104.987	0.984		1.587	1.587				
INC70	DEFAULT	DCP - Pecos Diamond Gas Plant	568061.290	3625977.950	3540.7	39.993	600.008	105.085	0.984		1.587	1.587				
INC71	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569341.200	3626597.800	3548.5	27.001	669.992	200.000	1.280		-2.356	-2.356				
INC72	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	27.001	669.992	200.000	1.280		-3.080	-3.080				
INC73	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	669.992	200.000	1.280		-11.905	-11.905				
INC74	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	37.992	719.996	185.007	1.280		-2.718	-2.718				
INC75	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	31.102	730.004	181.004	1.476		-2.537	-2.537				
INC76	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.991	759.002	170.013	1.444		-3.262	-3.262				
INC77	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	759.002	160.007	1.509		-3.806	-3.806				
INC78	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	20.997	600.008	33.990	1.969		-0.127	-0.127				
INC79	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	33.005	924.998	200.000	1.608		-1.449	-1.449				
INC80	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569336.770	3626723.010	3555.2	54.495	1149.998	19.882	3.510		0.159	0.159				
INC81	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	54.495	1149.998	27.690	3.510		0.037	0.037				
INC82	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.870	3626716.420	3553.4	120.013	600.008	17.192	6.168		4.762	4.762				
INC83	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.090	3626706.380	3553.0	120.013	600.008	17.192	6.168		4.762	4.762				
INC84	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984		0.556	0.556				
INC85	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984		0.556	0.556				
INC86	DEFAULT	EOG - Rumble State No4	547037.570	3620834.180	3568.8	14.993	600.008	3.806	0.984		0.018	0.018				
INC87	DEFAULT	EOG - Rumble State No5	547018.950	3620828.740	3569.5	14.993	831.992	171.588	0.984		0.794	0.794				
INC88	DEFAULT	EOG - Rumble State No6	547020.600	3620820.590	3569.5	14.993	831.992	171.588	0.984		0.794	0.794				
INC89	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	14.993	1131.008	30.020	0.689		0.159	0.159				
INC90	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	14.993	930.992	192.946	0.689		0.397	0.397				
INC91	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	14.993	831.992	349.934	0.689		0.794	0.794				
INC92	DEFAULT	EOG - Lacama 20 State Com 602H	545061.180	3621964.500	3614.7	14.993	1254.992	161.877	0.689		0.952	0.952				
INC93	DEFAULT	Artesia Gas Plant	574011.520	3624405.460	3608.9	62.336	-459.670	91.864	15.092		3.175	3.175				
INC94	DEFAULT	Artesia Gas Plant	574004.680	3624411.940	3609.1	62.336	-459.670	91.864	15.092		2.857	2.857				
INC95	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1124.996	147.900	0.984		2.537	2.537				
INC96	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.010	1500.008	0.098	2.756		0.018	0.018				
INC97	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.013	989.996	141.995	1.148		0.794	0.794				
INC98	DEFAULT	Frontier - Coyote Compressor Station	578709.050	3628268.510	3668.9	22.014	600.008	18.012	0.820		0.317	0.317				
INC99	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	20.013	989.996	141.995	1.148		0.794	0.794				
INC100	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	22.999	872.996	127.986	0.919		0.794	0.794				
INC101	DEFAULT	Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	25.000	249.998	21.621	0.656		0.079	0.079				
INC102	DEFAULT	Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	25.000	249.998	21.621	0.656		0.079	0.079				
INC103	DEFAULT	Shelby 23 Tank Battery	551739.690	3611102.180	3408.9	25.000	249.998	21.621	0.656		0.079	0.079				
INC104	DEFAULT	Shelby 23 Tank Battery	551732.090	3611100.090	3409.2	25.000	249.998	21.621	0.656		0.079	0.079				
INC105	DEFAULT	Lime Rock - Malco B Battery	563966.960	3627073.850	3441.4	25.000	1831.730	65.617	68.261						5.556	5.556
INC106	DEFAULT	Lime Rock - Kaiser B Battery	563767.890	3625655.950	3319.3	25.000	1831.730	65.617	68.261						3.968	3.968
INC107	DEFAULT	Lime Rock - Kaiser B Battery	563775.430	3625662.970	3320.9	22.014	100.004	18.012	0.492						34.128	34.128
INC108	DEFAULT	Lime Rock - West Red Lake Battery	564130.550	3625904.740	3422.4	22.014	100.004	18.012	0.492						11.053	11.053
INC109	DEFAULT	Lime Rock - West Red Lake Battery	564138.090	3625911.760	3422.6	22.014	100.004	18.012	0.492						11.053	11.053
INC110	DEFAULT	Lime Rock - West Red Lake Battery	564131.300	3625915.310	3421.9	22.014	100.004	18.012	0.492						11.053	11.053
INC111	DEFAULT	Lime Rock - Atoka San Andreas Unit Battery	561626.730	3623924.910	3302.4	22.014	100.004	18.012	0.492						15.873	15.873
INC112	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	14.993	1124.996	118.209	0.098						2.302	2.302
INC113	DEFAULT	DCP - Shadow Booster Station	557393.940	3622548.160	3367.7	42.487	780.008	135.991	0.131						2.302	2.302
INC114	DEFAULT	Lime Rock - Hawk 8 Battery	565542.390	3624866.860	3444.5	22.014	1831.730	65.617	68.261						3.968	3.968
INC115	DEFAULT	Lime Rock - Hondo Federal Battery	567428.660	3626819.640	3582.9	22.014	1831.730	65.617	68.261						2.718	2.718
INC116	DEFAULT	EOG - War Dog State No1H	569708.850	3637607.080	3427.3	60.007	1831.730	65.617	1.673						14.445	14.445
INC117	DEFAULT	Lime Rock - Hawk 9 Battery	566922.460	3624722.080	3519.9	22.014	100.004	18.012	0.492						11.053	11.053
INC118	DEFAULT	Lime Rock - Hawk 9 Battery	566930.000	3624729.100	3520.3	22.014	100.004	18.012	0.492						11.053	11.053
INC119	DEFAULT	Lime Rock - Falcon 3 Battery	568831.750	3627075.620	3578.3	22.014	100.004	18.012	0.492						10.318	10.318
INC120	DEFAULT	Lime Rock - Falcon 3 Battery	568839.280	3627082.650	3578.6	22.014	100.004	18.012	0.492						10.318	10.318
INC121	DEFAULT	Lime Rock - Eagle 35 Sat Battery	569992.810	3628438.870	3589.9	25.000	1831.730	65.617	68.261						2.356	2.356
INC122	DEFAULT	Lime Rock - Eagle 35 Sat Battery	570000.350	3628445.890	3589.6	22.014	100.004	18.012	0.492						11.905	11.905
INC123	DEFAULT	Lime Rock - Eagle 35 Sat Battery	569993.560	3628449.440	3589.0	22.014	100.004	18.012	0.492						11.905	11.905
INC124	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261						0.079	0.079
INC125	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261						0.079	0.079
INC126	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569333.010	3626721.390	3554.8	54.495	1149.998	19.882	3.510						378.578	378.578
INC127	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569325.420	3626719.300	3554.1	54.495	1149.998	27.690	3.510						0.079	0.079
INC128	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569321.180	3626712.400	3553.4	120.013	600.008	17.192	6.168						8.730	8.730

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC129	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569322.830	3626704.250	3553.2	120.013	600.008	17.192	6.168						8.730	8.730
INC130	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569329.780	3626699.280	3553.3	29.987	600.008	25.098	2.493						2.381	2.381
INC131	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569338.460	3626700.430	3553.8	114.993	1832.000	65.584	28.445						118.143	118.143
INC132	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569344.170	3626707.350	3554.6	114.993	1832.000	65.584	28.445						9.060	9.060
INC133	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569343.610	3626716.530	3555.2	114.993	1832.000	65.584	28.445						9.060	9.060
INC134	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569336.770	3626723.010	3555.2	114.993	1832.000	65.584	28.445						68.857	68.857
INC135	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	114.993	1832.000	65.584	28.445						26.093	26.093
INC136	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569319.870	3626716.420	3553.4	114.993	1832.000	65.584	28.445						18.120	18.120
INC137	DEFAULT	Lucid Artesia - Dagger Draw Gas Plant	551931.360	3619797.520	3472.0	200.000	1831.730	65.617	9.810						22333.709	22333.709
INC138	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984						0.079	0.079
INC139	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984						0.079	0.079
INC140	DEFAULT	Lucid Artesia - North Pen Compressor Station	551466.120	3619919.630	3477.1	22.966	854.330	91.864	0.984						94.225	94.225
INC141	DEFAULT	EOG - Rumble State No5	547030.030	3620827.160	3569.2	25.000	1831.730	65.617	68.261						0.476	0.476
INC142	DEFAULT	EOG - Rumble State No5	547030.780	3620837.730	3569.0	14.993	831.992	171.588	0.984						0.397	0.397
INC143	DEFAULT	EOG - Rumble State No6	547023.190	3620835.640	3569.4	14.993	831.992	171.588	0.984						0.397	0.397
INC144	DEFAULT	EOG - Lacama 20 State Com 602H	545072.270	3621962.920	3614.3	14.993	1131.008	30.020	0.689						0.079	0.079
INC145	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	14.993	930.992	192.946	0.689						0.238	0.238
INC146	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	14.993	831.992	349.934	0.689						3.968	3.968
INC147	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	14.993	1254.992	161.877	0.689						0.238	0.238
INC148	DEFAULT	Chalk Compressor Station	569361.150	3621748.040	3460.6	22.014	465.008	49.803	1.115						34.048	34.048
INC149	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	44.685	750.002	21.194	2.986						0.326	0.326
INC150	DEFAULT	Artesia Gas Plant	574007.710	3624406.770	3608.9	70.604	1831.730	65.617	68.261						0.159	0.159
INC151	DEFAULT	Artesia Gas Plant	574000.930	3624410.320	3609.0	70.604	1831.730	65.617	68.261						0.079	0.079
INC152	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1124.996	147.900	0.984						1.812	1.812
INC153	DEFAULT	EOG - Badboy CTB	549646.080	3613604.540	3454.8	60.007	1831.730	65.617	1.673						2.381	2.381
INC154	DEFAULT	EOG - Badboy CTB	549653.620	3613611.560	3454.6	60.007	1831.730	65.617	1.673						2.381	2.381
INC155	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.010	1500.008	0.098	2.756						1.508	1.508
INC156	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.013	989.996	141.995	1.148						0.079	0.079
INC157	DEFAULT	Frontier - Coyote Compressor Station	578709.050	3628268.510	3668.9	22.014	600.008	18.012	0.820						0.159	0.159
INC158	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	20.013	989.996	141.995	1.148						0.079	0.079
INC159	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	22.999	872.996	127.986	0.919						0.079	0.079
INC160	DEFAULT	Spur - Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	35.007	1831.730	65.617	8.635						8.390	8.390
INC161	DEFAULT	Spur - Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	29.987	1831.730	65.617	8.635						8.390	8.390
INC162	DEFAULT	EOG- Falcata Battery	540689.170	3616360.840	3695.3	14.993	1131.008	29.987	0.689						0.079	0.079
INC163	DEFAULT	EOG- Falcata Battery	586879.330	3576089.170	3002.3	14.993	930.992	192.946	0.689						0.238	0.238
INC164	DEFAULT	EOG- Falcata Battery	540689.920	3616371.420	3696.4	14.993	831.992	349.934	0.689						0.397	0.397
INC165	DEFAULT	EOG- Falcata Battery	540682.320	3616369.320	3695.0	14.993	600.008	161.877	0.689						0.238	0.238
INC166	DEFAULT	EOG- Falcata Battery	540678.080	3616362.420	3693.9	14.993	600.008	17.848	0.689						0.079	0.079
INC167	DEFAULT	Spur Energy - Ross Ranch Battery	548838.120	3611188.930	3472.3	35.007	1831.730	65.617	29.754						25.873	25.873
INC168	DEFAULT	Land O' Lakes Purina Feed - Artesia Feed Mill	556292.630	3637097.650	3373.8	79.987	399.992	50.984	1.115				6.667	6.667		
INC169	DEFAULT	Holly Frontier Asphalt Company	556992.610	3637197.560	3359.9	14.993	500.000	29.888	1.509				9.524	9.524		
INC170	DEFAULT	Holly Frontier Asphalt Company	556993.360	3637208.130	3360.0	25.000	285.008	7.185	1.509				11.111	11.111		
INC171	DEFAULT	Holly Frontier Asphalt Company	556985.770	3637206.040	3360.1	25.000	285.008	7.185	1.509				7.937	7.937		
INC172	DEFAULT	Holly Frontier Asphalt Company	556981.530	3637199.140	3360.1	25.000	500.000	29.888	1.509				3.624	3.624		
INC173	DEFAULT	Holly Frontier Asphalt Company	556983.180	3637190.990	3360.0	25.000	500.000	29.888	1.509				3.624	3.624		
INC174	DEFAULT	Lady Luck No1 Facility	567323.770	3638398.310	3413.2	14.993	489.992	22.014	0.984				22.223	22.223		
INC175	DEFAULT	Lady Luck No1 Facility	567331.310	3638405.330	3413.5	22.966	854.330	91.864	0.984				0.794	0.794		
INC176	DEFAULT	Atoka Dehydration Facility	560915.280	3624129.050	3309.6	22.966	854.330	91.864	0.984				1.812	1.812		
INC177	DEFAULT	Lime Rock - Atoka San Andreas Unit Battery	561619.200	3623917.880	3302.5	22.014	100.004	18.012	0.492				0.363	0.363		
INC178	DEFAULT	Lucky Lobo ASX #2 Facility	567399.310	3639898.520	3484.5	14.993	469.994	21.490	0.984				44.445	44.445		
INC179	DEFAULT	DCP - Shadow Booster Station	557400.730	3622544.600	3367.6	14.993	1124.996	118.209	0.098				32.302	32.302		
INC180	DEFAULT	DCP - Shadow Booster Station	557393.940	3622548.160	3367.7	42.487	780.008	135.991	0.131				86.906	86.906		
INC181	DEFAULT	Chesapeake Operating Inc - Hondo Federal Gas	568814.070	3629620.530	3468.8	6.004	860.000	53.314	0.787				18.254	18.254		
INC182	DEFAULT	EOG - War Dog State No1H	569708.850	3637607.080	3427.3	60.007	1831.730	65.617	1.673				1.429	1.429		
INC183	DEFAULT	DCP - Pecos Booster Station	565591.520	3623798.120	3405.4	14.009	1000.004	47.014	0.656				53.969	53.969		
INC184	DEFAULT	DCP - Pecos Booster Station	565591.520	3623798.120	3405.4	14.009	1000.004	47.014	0.656				53.969	53.969		
INC185	DEFAULT	DCP - Pecos Booster Station	565591.520	3623798.120	3405.4	14.009	1000.004	47.014	0.656				53.969	53.969		
INC186	DEFAULT	DCP - Pecos Diamond Gas Plant	568071.310	3625977.910	3541.9	50.000	600.008	104.987	0.984				118.256	118.256		
INC187	DEFAULT	DCP - Pecos Diamond Gas Plant	568061.290	3625977.950	3540.7	39.993	600.008	105.085	0.984				116.669	116.669		
INC188	DEFAULT	DCP - Pecos Diamond Gas Plant	568111.330	3625987.940	3546.4	20.013	800.006	6.988	1.509				2.381	2.381		
INC189	DEFAULT	DCP - Pecos Diamond Gas Plant	568393.230	3626095.860	3539.0	20.013	600.008	8.990	0.492				1.631	1.631		
INC190	DEFAULT	Lucid Artesia - Southern Union Compressor Station	571186.750	3631625.290	3507.3	22.966	854.330	91.864	0.984				0.794	0.794		
INC191	DEFAULT	Lucid Artesia - Southern Union Compressor Station	571193.700	3631620.330	3507.0	23.589	1011.992	135.007	1.247				15.080	15.080		
INC192	DEFAULT	Lucid Artesia - Southern Union Compressor Station	571202.390	3631621.470	3506.1	23.589	1011.992	135.007	1.247				15.080	15.080		
INC193	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	27.001	669.992	200.000	1.280				-117.419	-117.419		

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential to Emit (lb/hr)						
										PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC194	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	669.992	200.000	1.280				-103.466	-103.466		
INC195	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	37.992	719.996	185.007	1.280				-331.056	-331.056		
INC196	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	31.102	730.004	181.004	1.476				-357.512	-357.512		
INC197	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	22.966	854.330	91.864	0.984				-105.478	-105.478		
INC198	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	955.004	200.000	1.575				-444.850	-444.850		
INC199	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.991	759.002	170.013	1.444				-215.630	-215.630		
INC200	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	39.993	759.002	160.007	1.509				-329.244	-329.244		
INC201	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	29.987	1085.000	100.000	0.656				-8.879	-8.879		
INC202	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569327.130	3626723.090	3554.4	31.004	899.996	12.992	1.969				-0.725	-0.725		
INC203	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	20.997	600.008	33.990	1.969				-1.812	-1.812		
INC204	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	33.005	924.998	200.000	1.608				-143.512	-143.512		
INC205	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	24.016	687.992	100.000	0.656				-5.436	-5.436		
INC206	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	26.411	861.998	187.106	0.853				-39.286	-39.286		
INC207	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	26.411	861.998	187.106	0.853				-59.525	-59.525		
INC208	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261				0.714	0.714		
INC209	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	114.993	1831.730	65.617	68.261				0.714	0.714		
INC210	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				34.818	34.818		
INC211	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				30.223	30.223		
INC212	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				32.744	32.744		
INC213	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569320.600	3626699.000	3552.8	54.495	1149.998	19.882	3.510				1.587	1.587		
INC214	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569331.780	3626693.930	3553.1	35.007	854.006	162.008	0.984				33.351	33.351		
INC215	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				34.921	34.921		
INC216	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569349.680	3626709.080	3555.0	54.495	1149.998	27.690	3.510				0.397	0.397		
INC217	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	854.006	162.008	0.984				34.921	34.921		
INC218	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	989.996	184.908	0.984				23.810	23.810		
INC219	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.590	3626398.760	3534.7	35.007	989.996	184.908	0.984				23.810	23.810		
INC220	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569314.110	3626715.280	3552.9	120.013	600.008	17.192	6.168				61.112	61.112		
INC221	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569315.670	3626701.560	3552.6	120.013	600.008	17.192	6.168				61.112	61.112		
INC222	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569326.340	3626692.450	3552.8	120.013	600.008	13.911	2.493				7.937	7.937		
INC223	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569340.580	3626693.070	3553.5	29.987	600.008	25.098	2.493				14.286	14.286		
INC224	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569350.720	3626703.390	3554.8	114.993	1832.000	65.584	28.445				37.509	37.509		
INC225	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569351.120	3626718.070	3555.6	114.993	1832.000	65.584	28.445				9.060	9.060		
INC226	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569341.250	3626729.250	3556.0	114.993	1832.000	65.584	28.445				9.060	9.060		
INC227	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569326.190	3626730.710	3554.9	114.993	1832.000	65.584	28.445				2.537	2.537		
INC228	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569314.000	3626721.380	3553.1	114.993	1832.000	65.584	28.445				1.812	1.812		
INC229	DEFAULT	Durango Midstream - Empire Abo Gas Plant	569311.410	3626706.030	3552.3	114.993	1832.000	65.584	28.445				18.120	18.120		
INC230	DEFAULT	Lucid Artesia - Four Dinkus Compressor Station GCP4	544776.370	3625305.660	3622.6	20.013	860.000	60.499	0.984				20.635	20.635		
INC231	DEFAULT	Lucid Artesia - Four Dinkus Compressor Station GCP5	544776.370	3625305.660	3622.6	20.013	860.000	60.499	0.984				20.635	20.635		
INC232	DEFAULT	DCP - Carbon Valley Booster	571606.690	3638669.910	3469.5	50.000	1831.730	65.617	68.261				521.437	521.437		
INC233	DEFAULT	DCP - Carbon Valley Booster	571614.220	3638676.940	3468.6	14.993	1124.996	118.209	1.247				18.254	18.254		
INC234	DEFAULT	DCP - Carbon Valley Booster	571607.440	3638680.490	3468.3	14.993	1124.996	118.209	1.247				18.254	18.254		
INC235	DEFAULT	DCP - Carbon Valley Booster	571595.600	3638671.500	3469.6	14.993	1124.996	118.209	1.247				18.254	18.254		
INC236	DEFAULT	DCP - Carbon Valley Booster	551931.360	3619797.520	3472.0	14.993	1831.730	65.617	68.261				0.000	0.000		
INC237	DEFAULT	DCP - Carbon Valley Booster	551933.140	3619458.070	3476.6	18.406	350.006	4.298	0.984				-118.126	-118.126		
INC238	DEFAULT	DCP - Carbon Valley Booster	552003.120	3620198.100	3465.0	60.007	600.008	20.013	2.001				11.905	11.905		
INC239	DEFAULT	DCP - Carbon Valley Booster	551924.510	3619806.000	3471.9	10.007	219.992	100.000	0.492				2.381	2.381		
INC240	DEFAULT	Lucid Artesia - North Pen Compressor Station	551465.370	3619909.060	3477.3	20.013	1831.730	65.617	68.261				0.079	0.079		
INC241	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984				44.445	44.445		
INC242	DEFAULT	Lucid Artesia - North Pen Compressor Station	552193.100	3619498.130	3473.5	20.997	869.000	152.297	0.984				44.445	44.445		
INC243	DEFAULT	Lucid Artesia - North Pen Compressor Station	551458.530	3619917.540	3477.3	22.966	854.330	91.864	0.984				2.356	2.356		
INC244	DEFAULT	Carbon Valley 14 Fed Com No2	570014.390	3643077.800	3585.2	10.499	1045.004	1.706	2.395				26.191	26.191		
INC245	DEFAULT	EOG - Rumble State No5	547030.030	3620827.160	3569.2	25.000	1831.730	65.617	68.261				0.079	0.079		
INC246	DEFAULT	EOG - Rumble State No5	547037.570	3620834.180	3568.8	25.000	1831.730	65.617	68.261				1.746	1.746		
INC247	DEFAULT	EOG - Rumble State No4	547030.780	3620837.730	3569.0	14.993	600.008	3.806	0.984				0.238	0.238		
INC248	DEFAULT	EOG - Rumble State No5	547020.600	3620820.590	3569.5	14.993	831.992	171.588	0.984				12.064	12.064		
INC249	DEFAULT	EOG - Rumble State No6	547027.550	3620815.620	3569.2	14.993	831.992	171.588	0.984				12.064	12.064		
INC250	DEFAULT	EOG - Lacama 20 State Com 602H	545072.270	3621962.920	3614.3	25.000	1831.730	65.617	68.261				0.079	0.079		
INC251	DEFAULT	EOG - Lacama 20 State Com 602H	545079.800	3621969.940	3613.0	25.000	1831.730	65.617	68.261				3.016	3.016		
INC252	DEFAULT	EOG - Lacama 20 State Com 602H	545073.020	3621973.500	3613.1	14.993	1131.008	30.020	0.689				1.270	1.270		
INC253	DEFAULT	EOG - Lacama 20 State Com 602H	545065.420	3621971.400	3613.7	14.993	930.992	192.946	0.689				6.032	6.032		
INC254	DEFAULT	EOG - Lacama 20 State Com 602H	545061.180	3621964.500	3614.7	14.993	831.992	349.934	0.689				12.064	12.064		
INC255	DEFAULT	EOG - Lacama 20 State Com 602H	545062.830	3621956.350	3615.7	14.993	1254.992	161.877	0.689				13.334	13.334		
INC256	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	16.601	1099.994	131.004	0.656				21.429	21.429		
INC257	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	50.000	1200.002	102.986	0.656				17.461	17.461		
INC258	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	50.000	1200.002	102.986	0.656				17.461	17.461		

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential to Emit (lb/hr)						
										PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC259	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	60.007	1025.006	81.004	0.984				38.096	38.096		
INC260	DEFAULT	Atoka No1 Compressor Station	572460.800	3627167.900	3665.9	50.000	1200.002	102.986	0.656				17.461	17.461		
INC261	DEFAULT	Illinois Camp Booster Station	574661.630	3627054.860	3659.2	35.007	1340.006	57.415	0.656				39.683	39.683		
INC262	DEFAULT	Illinois Camp Booster Station	574634.650	3627054.880	3659.7	35.007	1340.006	57.415	0.656				39.683	39.683		
INC263	DEFAULT	Illinois Camp Booster Station	574643.640	3627054.830	3659.5	35.007	1340.006	57.415	0.656				39.683	39.683		
INC264	DEFAULT	Illinois Camp Booster Station	574652.630	3627054.900	3659.3	35.007	1340.006	57.415	0.656				39.683	39.683		
INC265	DEFAULT	Chalk Compressor Station	569361.150	3621748.040	3460.6	22.014	465.008	49.803	1.115				12.540	12.540		
INC266	DEFAULT	Cimarex Enegy - Montana 1 Fee 3	551935.760	3616514.870	3422.9	10.007	887.000	358.301	0.492				11.349	11.349		
INC267	DEFAULT	Kristina Booster Station	572690.330	3624526.200	3615.5	20.013	780.008	366.010	0.820				69.842	69.842		
INC268	DEFAULT	Mack - Mark Twain Federal Com Battery	575824.070	3636427.600	3593.7	6.988	224.996	381.988	6.988				3.968	3.968		
INC269	DEFAULT	Dickens 29 Federal Battery	575704.960	3639831.920	3596.4	6.988	224.996	381.988	6.988				3.968	3.968		
INC270	DEFAULT	Oxy USA Inc.-Spurck 16 State Com No2	576460.460	3633013.760	3554.8	22.966	854.330	91.864	0.984				7.143	7.143		
INC271	DEFAULT	Yates Petroleum - Pierre State No1 Facility	570982.950	3620931.670	3522.0	22.966	854.330	91.864	0.984				4.457	4.457		
INC272	DEFAULT	Shakespeare 20 Federal No1	575701.430	3640657.870	3607.2	10.991	564.998	32.251	0.492				3.262	3.262		
INC273	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.289	1340.006	89.206	0.984				41.584	41.584		
INC274	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.289	1340.006	89.206	0.984				42.064	42.064		
INC275	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	44.685	750.002	21.194	2.986				57.144	57.144		
INC276	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.005	800.006	60.991	0.984				-324.532	-324.532		
INC277	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.005	800.006	60.991	0.984				-302.788	-302.788		
INC278	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.005	800.006	60.991	0.984				-241.179	-241.179		
INC279	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	58.990	800.006	54.987	0.984				-311.304	-311.304		
INC280	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.010	1000.004	49.016	0.984				-132.821	-132.821		
INC281	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	43.996	986.000	58.005	0.984				-140.613	-140.613		
INC282	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.010	986.000	58.005	0.984				-164.658	-164.658		
INC283	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				-36.240	-36.240		
INC284	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				28.196	28.196		
INC285	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC286	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC287	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	75.000	1832.000	65.584	1.673				-17.690	-17.690		
INC288	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	42.290	750.002	21.194	3.609				57.144	57.144		
INC289	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	899.996	60.007	0.820				-5.056	-5.056		
INC290	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				37.076	37.076		
INC291	DEFAULT	Artesia Gas Plant	573999.690	3624382.850	3608.5	70.604	1831.730	65.617	68.261				1.667	1.667		
INC292	DEFAULT	Artesia Gas Plant	574011.530	3624386.830	3608.5	70.604	1831.730	65.617	68.261				0.714	0.714		
INC293	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	33.104	629.996	20.801	3.609				2.381	2.381		
INC294	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				42.064	42.064		
INC295	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				35.772	35.772		
INC296	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				32.394	32.394		
INC297	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				39.637	39.637		
INC298	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	40.289	1340.006	89.206	0.984				41.584	41.584		
INC299	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	41.995	854.996	162.992	0.984				34.604	34.604		
INC300	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1124.996	147.900	0.984				68.255	68.255		
INC301	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				42.064	42.064		
INC302	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				42.064	42.064		
INC303	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC304	DEFAULT	Artesia Gas Plant	573990.740	3624597.900	3613.9	45.997	1340.006	89.206	0.984				84.128	84.128		
INC305	DEFAULT	Yates - Eastern Shores QW No1 Facility	565479.650	3615436.960	3277.3	9.843	571.010	49.213	0.328				33.096	33.096		
INC306	DEFAULT	EOG - Secretariat 3 Fed Com No501H	569284.850	3617086.880	3457.6	60.007	1831.730	65.617	1.673				9.048	9.048		
INC307	DEFAULT	Frontier - Coyote Compressor Station	578708.300	3628257.940	3668.9	16.010	1500.008	0.098	2.756				0.238	0.238		
INC308	DEFAULT	Frontier - Coyote Compressor Station	578715.830	3628264.960	3668.9	20.013	989.996	141.995	1.148				17.866	17.866		
INC309	DEFAULT	Frontier - Coyote Compressor Station	578701.450	3628266.420	3668.9	22.014	600.008	18.012	0.820				0.079	0.079		
INC310	DEFAULT	Frontier - Coyote Compressor Station	578697.210	3628259.520	3668.9	20.013	989.996	141.995	1.148				24.127	24.127		
INC311	DEFAULT	Frontier - Coyote Compressor Station	578698.860	3628251.370	3668.9	22.999	872.996	127.986	0.919				46.906	46.906		
INC312	DEFAULT	Parallel - Hagerman Plant GCP4-3380	562777.140	3657403.570	3443.0	22.966	854.330	91.864	0.984				0.556	0.556		
INC313	DEFAULT	Parallel - Hagerman Plant GCP4-3381	562784.680	3657410.590	3443.0	22.966	854.330	91.864	0.984				1.429	1.429		
INC314	DEFAULT	Parallel - Hagerman Plant GCP4-3382	562777.890	3657414.140	3443.0	22.999	854.006	162.008	0.984				35.153	35.153		
INC315	DEFAULT	Parallel - Hagerman Plant GCP4-3383	562770.300	3657412.050	3443.0	22.999	854.006	162.008	0.984				35.153	35.153		
INC316	DEFAULT	COG - Man State 2H Battery	574496.980	3618616.590	3549.2	16.010	1831.730	65.617	2.592				9.524	9.524		
INC317	DEFAULT	COG - Man State 2H Battery	574504.510	3618623.610	3549.5	12.008	1043.006	189.993	0.328				3.968	3.968		
INC318	DEFAULT	Shelby 23 Tank Battery	551738.940	3611091.610	3409.5	25.000	249.998	21.621	0.656				0.714	0.714		
INC319	DEFAULT	Shelby 23 Tank Battery	551746.480	3611098.630	3409.0	25.000	249.998	21.621	0.656				0.714	0.714		
INC320	DEFAULT	Shelby 23 Tank Battery	551739.690	3611102.180	3408.9	25.000	249.998	21.621	0.656				0.714	0.714		
INC321	DEFAULT	Shelby 23 Tank Battery	551732.090	3611100.090	3409.2	25.000	249.998	21.621	0.656				0.714	0.714		
INC322	DEFAULT	Spur - Shelby 23 Tank Battery	551729.500	3611085.030	3410.1	35.007	1831.730	65.617	8.635				4.048	4.048		
INC323	DEFAULT	Spur - Shelby 23 Tank Battery	551736.450	3611080.070	3410.2	29.987	1831.730	65.617	8.635				4.048	4.048		

HollyFrontier Off-Site Point Source Increment Input Data (Updated 5-5-21)

										Potential to Emit (lb/hr)						
Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC324	DEFAULT	EOG- Falcata Battery	540689.170	3616360.840	3695.3	14.993	1131.008	29.987	0.689				1.270	1.270		
INC325	DEFAULT	EOG- Falcata Battery	586879.330	3576089.170	3002.3	14.993	930.992	192.946	0.689				6.032	6.032		
INC326	DEFAULT	EOG- Falcata Battery	540689.920	3616371.420	3696.4	14.993	831.992	349.934	0.689				12.064	12.064		
INC327	DEFAULT	EOG- Falcata Battery	540682.320	3616369.320	3695.0	14.993	600.008	161.877	0.689				13.334	13.334		
INC328	DEFAULT	EOG- Falcata Battery	540678.080	3616362.420	3693.9	39.993	1831.730	65.617	8.635				5.079	5.079		
INC329	DEFAULT	EOG- Falcata Battery	540679.740	3616354.270	3693.4	39.993	1831.730	65.617	68.261				0.794	0.794		
INC330	DEFAULT	EOG- Falcata Battery	540686.680	3616349.310	3694.0	14.993	600.008	17.848	0.689				0.873	0.873		
INC331	DEFAULT	Winchester Compressor Station	567991.310	3612198.320	3519.7	39.993	960.998	41.010	1.214				33.334	33.334		
INC332	DEFAULT	Winchester Compressor Station	567991.310	3612198.320	3519.7	39.993	960.998	41.010	1.214				33.334	33.334		
INC333	DEFAULT	Winchester Compressor Station	567991.310	3612198.320	3519.7	39.993	960.998	41.010	1.214				33.334	33.334		
INC334	DEFAULT	Spur Energy - Ross Ranch Battery	548845.660	3611195.950	3472.1	35.007	1831.730	65.617	29.754				89.208	89.208		

All sources within 25km and large (1,000lb/hr) emitters within 50km were included in the increment analysis.

HollyFrontier Off-Site Volume Source Increment Input Data (Updated 5-5-21)

								Potential to Emit (lb/hr)						
Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC335	Schlumberger - Artesia District Bulk Facility	556719.31	3635718.50	3362.8	3.28	1.54	3.05	2.38						
INC336	Schlumberger - Artesia District Bulk Facility	556726.85	3635725.52	3362.7	3.28	1.54	3.05	0.72						
INC337	Land O' Lakes Purina Feed - Artesia Feed Mill	556293.38	3637108.22	3373.8	20.01	1.54	3.05	0.79						
INC338	Holly Frontier Asphalt Company	556993.36	3637208.13	3360.0	32.81	32.81	30.51	6.51						
INC339	Holly Frontier Asphalt Company	556985.77	3637206.04	3360.1	32.81	32.81	30.51	6.50						
INC340	Holly Frontier Asphalt Company	556981.53	3637199.14	3360.1	32.81	32.81	30.51	6.35						
INC341	Par Five Energy LLC - Par Five Energy	564319.69	3632835.00	3342.9	3.28	1.54	3.05	2.38						
INC342	Par Five Energy LLC - Par Five Energy	564327.22	3632842.02	3343.0	32.81	32.81	30.51	5.56						
INC343	Helena Chemical Co - Artesia New Mexico	557950.20	3646037.75	3342.1	3.28	1.54	3.05	0.24						
INC344	Helena Chemical Co - Artesia New Mexico	557957.74	3646044.77	3341.9	3.28	1.54	3.05	0.56						
INC345	Helena Chemical Co - Artesia New Mexico	557950.95	3646048.32	3341.9	3.28	1.54	3.05	2.38						
INC346	Helena Chemical Co - Artesia New Mexico	557943.36	3646046.23	3342.0	3.28	1.54	3.05	0.24						
INC347	Helena Chemical Co - Artesia New Mexico	557939.12	3646039.33	3342.2	3.28	1.54	3.05	0.16						
INC348	Helena Chemical Co - Artesia New Mexico	557940.77	3646031.17	3342.2	3.28	1.54	3.05	0.48						
INC349	EOG - Rumble State No4	547030.03	3620827.16	3569.2	32.81	32.81	30.51	4.52						
INC350	EOG - Rumble State No5	547030.78	3620837.73	3569.0	14.99	1.54	3.05	0.08						
INC351	EOG - Rumble State No6	547023.19	3620835.64	3569.4	14.99	1.54	3.05	0.04						
INC352	EOG - Lacama 20 State Com 602H	545072.27	3621962.92	3614.3	32.81	32.81	30.51	4.92						
INC353	EOG - Lacama 20 State Com 602H	545062.83	3621956.35	3615.7	14.99	1.54	3.05	0.08						
INC354	Shelby 23 Tank Battery	551727.85	3611093.19	3409.7	25.00	1.54	3.05	0.08						
INC355	EOG- Falcata Battery	540689.17	3616360.84	3695.3	3.28	1.54	3.05	3.65						
INC356	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	25.00	1.54	3.05	0.04						
INC357	Spur Energy - Ross Ranch Battery	548845.66	3611195.95	3472.1	25.00	1.54	3.05	0.04						
INC358	Spur Energy - Ross Ranch Battery	548838.87	3611199.51	3472.7	25.00	1.54	3.05	0.04						
INC359	Spur Energy - Ross Ranch Battery	548831.28	3611197.41	3473.0	25.00	1.54	3.05	0.04						
INC360	Schlumberger - Artesia District Bulk Facility	556719.31	3635718.50	3362.8	3.28	1.54	3.05		2.381	2.381				
INC361	Schlumberger - Artesia District Bulk Facility	556726.85	3635725.52	3362.7	3.28	1.54	3.05		0.725	0.725				
INC362	EOG - Rumble State No4	547030.03	3620827.16	3569.2	32.81	32.81	30.51		0.476	0.476				
INC363	EOG - Rumble State No5	547030.78	3620837.73	3569.0	14.99	1.54	3.05		0.079	0.079				
INC364	EOG - Rumble State No6	547023.19	3620835.64	3569.4	14.99	1.54	3.05		0.037	0.037				
INC365	EOG - Lacama 20 State Com 602H	545072.27	3621962.92	3614.3	32.81	32.81	30.51		0.476	0.476				
INC366	EOG - Lacama 20 State Com 602H	545062.83	3621956.35	3615.7	14.99	1.54	3.05		0.079	0.079				
INC367	COG - Man State 2H Battery	574496.98	3618616.59	3549.2	3.28	1.54	3.05		1.812	1.812				
INC368	Shelby 23 Tank Battery	551727.85	3611093.19	3409.7	25.00	1.54	3.05		0.079	0.079				
INC369	EOG- Falcata Battery	540689.17	3616360.84	3695.3	3.28	1.54	3.05		0.317	0.317				
INC370	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	25.00	1.54	3.05		0.037	0.037				
INC371	Spur Energy - Ross Ranch Battery	548845.66	3611195.95	3472.1	25.00	1.54	3.05		0.037	0.037				
INC372	Spur Energy - Ross Ranch Battery	548838.87	3611199.51	3472.7	25.00	1.54	3.05		0.037	0.037				
INC373	Spur Energy - Ross Ranch Battery	548831.28	3611197.41	3473.0	25.00	1.54	3.05		0.037	0.037				
INC374	Lime Rock - Malco B Battery	563974.50	3627080.87	3442.5	22.01	1.54	3.05						26.191	26.191
INC375	Lime Rock - Condor 7 Battery	563709.45	3625436.95	3287.2	22.01	1.54	3.05						3.968	3.968
INC376	Lime Rock - Condor 7 Battery	563716.98	3625443.97	3287.6	22.01	1.54	3.05						3.968	3.968
INC377	Ramirez & Sons Inc - Crusher No2	552788.48	3623752.45	3448.6	32.81	1410.76	30.51						181.202	181.202
INC378	Lime Rock - Condor Stirling Battery	563708.44	3625403.35	3286.5	22.01	1.54	3.05						6.349	6.349
INC379	Lime Rock - Condor Stirling Battery	563715.98	3625410.37	3286.7	22.01	1.54	3.05						6.349	6.349
INC380	Lime Rock - Condor Stirling Battery	563709.19	3625413.92	3286.7	22.01	1.54	3.05						10.318	10.318
INC381	Lime Rock - Hawk 8 Battery	565549.93	3624873.88	3444.8	22.01	1.54	3.05						18.254	18.254
INC382	Lime Rock - Hawk 8 Battery	565543.14	3624877.43	3444.7	20.01	1.54	3.05						18.254	18.254
INC383	Lime Rock - Hondo Federal Battery	567436.20	3626826.66	3582.7	22.01	1.54	3.05						13.492	13.492
INC384	Lime Rock - Hondo Federal Battery	567429.41	3626830.21	3582.7	22.01	1.54	3.05						13.492	13.492
INC385	EOG - Rumble State No4	547037.57	3620834.18	3568.8	14.99	1.54	3.05						0.079	0.079
INC386	Cimarex Enegy - Montana 1	551943.30	3616521.89	3422.5	3.28	1.54	3.05						10.000	10.000
INC387	Total Malfunction Construction	573989.09	3624401.33	3608.9	3.28	1.54	3.05						685.124	685.124
INC388	Total Malfunction Construction	573990.74	3624393.17	3608.6	3.28	1.54	3.05						18.120	18.120
INC389	Frontier - Coyote Compressor Station	578698.86	3628251.37	3668.9	3.28	1.54	3.05						18.120	18.120
INC390	Southeast Readi-Mix - Artesia Plant	557117.00	3635667.03	3356.9	32.81	721.78	30.51				172.142	172.142		
INC391	Ramirez & Sons Inc - Crusher No2	552788.48	3623752.45	3448.6	32.81	1410.76	30.51				344.284	344.284		
INC392	EOG - Rumble State No4	547023.19	3620835.64	3569.4	14.99	1.54	3.05				0.873	0.873		

HollyFrontier Off-Site Volume Source Increment Input Data (Updated 5-5-21)

Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential to Emit (lb/hr)						
								PM10	PM25_ST	PM25_LT	NO2_ST	NO2_LT	SO2_ST	SO2_LT
INC393	EOG - Rumble State No5	547018.95	3620828.74	3569.5	14.99	1.54	3.05				0.476	0.476		
INC394	EOG - Lacama 20 State Com 602H	545069.78	3621951.39	3615.9	14.99	1.54	3.05				0.873	0.873		
INC395	Artesia Gas Plant	573981.91	3624410.31	3609.4	3.28	1.54	3.05				17.939	17.939		
INC396	Artesia Gas Plant	573979.32	3624394.96	3608.8	3.28	1.54	3.05				18.120	18.120		
INC397	Frontier - Coyote Compressor Station	578705.81	3628246.40	3669.1	3.28	1.54	3.05				18.120	18.120		
INC398	Spur - Shelby 23 Tank Battery	551727.85	3611093.19	3409.7	25.00	1.54	3.05				0.476	0.476		
INC399	Spur Energy - Ross Ranch Battery	548838.12	3611188.93	3472.3	25.00	1.54	3.05				0.476	0.476		
INC400	Spur Energy - Ross Ranch Battery	548838.87	3611199.51	3472.7	25.00	1.54	3.05				0.476	0.476		
INC401	Spur Energy - Ross Ranch Battery	548831.28	3611197.41	3473.0	25.00	1.54	3.05				0.476	0.476		
INC402	Spur Energy - Ross Ranch Battery	548827.04	3611190.51	3472.9	25.00	1.54	3.05				0.476	0.476		
INC403	WPX - DD and EE Federal Leases	543610.96	3613500.45	3619.1	3.28	1.54	3.05				0.397	0.397		

HollyFrontier Navajo Volume Source Parameter Calculation

Source ID	Source Description	Source Dimensions: Length (ft)	Width (ft)	Area (ft2)	Square Root of Area (ft)	Structure Height/Vertical Dimension (ft)	Release Height (ft)	Tank Diameter (ft)	Initial Dispersion Coefficients: Initial Horizontal Dimension s_Y (ft)	Initial Vertical Dimension s_Z (ft)	Note
TRLO_9	Molten Sulfur Railcar Loading	10.0	10.0	100.00	10.00	15.00	15.00	NA	2.33	6.98	Elevated source on or adjacent to building
T_0049	Slop Oil Tank	NA	NA	94.99	9.75	36.00	36.00	11.00	2.27	16.74	Elevated source on or adjacent to building
T_0081	Asphalt/Pitch Tank	NA	NA	9241.22	96.13	40.00	40.00	108.50	22.36	18.60	Elevated source on or adjacent to building
T_0082	Asphalt/Pitch Tank	NA	NA	15386.00	124.04	40.00	40.00	140.00	28.85	18.60	Elevated source on or adjacent to building
T_0110	Asphalt/Pitch Tank	NA	NA	9156.24	95.69	35.00	35.00	108.00	22.25	16.28	Elevated source on or adjacent to building
T_0410	Asphalt/Pitch Tank	NA	NA	4899.19	69.99	40.00	40.00	79.00	16.28	18.60	Elevated source on or adjacent to building
T_0420	Asphalt/Pitch Tank	NA	NA	1962.50	44.30	30.00	30.00	50.00	10.30	13.95	Elevated source on or adjacent to building
T_0814	Asphalt/Pitch Tank	NA	NA	1962.50	44.30	32.00	32.00	50.00	10.30	14.88	Elevated source on or adjacent to building
T_0914	Slop Oil Tank	NA	NA	4415.63	66.45	40.00	40.00	75.00	15.45	18.60	Elevated source on or adjacent to building
T_1227	Asphalt/Pitch Tank	NA	NA	4654.27	68.22	40.00	40.00	77.00	15.87	18.60	Elevated source on or adjacent to building
T_0106	T-0106 Sour Water Tank	NA	NA	3523.87	59.36	40.00	40.00	67.00	13.81	18.60	Elevated source on or adjacent to building
T_0435	T-0435 Sour Water Tank	NA	NA	706.50	26.58	40.00	40.00	30.00	6.18	18.60	Elevated source on or adjacent to building
T_0437	T-0437 Crude Oil Tank	NA	NA	11304.00	106.32	40.00	40.00	120.00	24.73	18.60	Elevated source on or adjacent to building
T_0439	T-0439 Sour Naphtha Tank	NA	NA	13266.50	115.18	46.00	46.00	130.00	26.79	21.40	Elevated source on or adjacent to building
T_0450	T-0450 Sour Naphtha Tank	NA	NA	11304.00	106.32	40.00	40.00	120.00	24.73	18.60	Elevated source on or adjacent to building
T_0737	T-0737 Sour Water Tank	NA	NA	3115.67	55.82	40.00	40.00	63.00	12.98	18.60	Elevated source on or adjacent to building
T_0802	T-0802 Sour Water Tank	NA	NA	1589.63	39.87	40.00	40.00	45.00	9.27	18.60	Elevated source on or adjacent to building
T_0830	T-0830 Slop Oil Tank	NA	NA	15386.00	124.04	40.00	40.00	140.00	28.85	18.60	Elevated source on or adjacent to building
T_1225	T-1225 Crude Oil Tank	NA	NA	17662.50	132.90	40.00	40.00	150.00	30.91	18.60	Elevated source on or adjacent to building

NA - Not applicable.

Sigma Y values calculated as the square root of the area, or average length of side, divided by 4.3 (Table 3-1 of AERMOD Manual for Single Volume Source). Area for tanks calculated from diameter.

Sigma Z values for surface based sources calculated as the initial vertical dimension of source divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Sigma Z values for elevated sources on or adjacent to a building calculated as the building height divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source on or Adjacent to Building).

Sigma Z values for elevated sources not on or adjacent to a building calculated as the initial vertical dimension of source divided by 4.3 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Release height for tanks and railcar loading equal to top of tank/railcar as this is where emissions occur.

HollyFrontier Flare Stack Parameter Calculation

Source ID	Source Description	Effective Stack Height (ft)	Temp. (°F)	Exit Velocity (ft/sec)	Effective Stack Diameter (ft)	MMBtu/hr	cal/sec	Actual Stack Height (ft)
FL0400	FL-0400, North Plant Flare	395.1	1832	65.6	16.11	8440	5.91E+08	162.0
FL0401	FL-0401, South Plant Flare	342.2	1832	65.6	9.60	3000	2.10E+08	200.0
FL0402	FL-0402, FCC Flare	304.6	1832	65.6	9.28	2800	1.96E+08	167.0
FL0403	FL-0403, Alky Flare	499.1	1832	65.6	19.45	12300	8.61E+08	220.0
FL0404	FL-0404, GOHT Flare	568.5	1832	65.6	26.01	22000	1.54E+09	200.0
TL4VCU	TL-4 VCU	81.8	1832	65.6	3.92	500	3.50E+07	21.4
FLHEP	HEP Portable Flare	51.1	1832	65.6	2.29	170	1.19E+07	15.0
TVCU	Tank VCU	18.5	1832	65.6	0.20	1.26	8.82E+04	15.0

Per AERSCREEN Manual

2.1.2 Flares

Flare sources are denoted by the term "** FLARE DATA" in the input file in the line above the source parameters. Flare source inputs are, with English and metric units:

- emission rate (lb/hr or g/s)
- stack height (feet or meters)
- total heat release rate (cal/sec)
- radiative heat loss fraction

The heat loss fraction can be user selected or the SCREEN3 default value of 0.55. For information about heat loss fractions, see Leahey and Davies (1984). AERSCREEN will process the flare in AERMOD as a POINT source type. For the exit velocity and exit temperature, AERSCREEN defaults these values to 20 m/s and 1,273 K, respectively as done in SCREEN3 (U.S. EPA, 1995). The stack diameter and effective stack height used in AERMOD are calculated from the inputs as:

$$D = 9.88 \times 10^{-4} \times \sqrt{HR \times (1 - HL)} \quad (1)$$

$$h_{eff} = H_s + 4.56 \times 10^{-3} \times HR^{0.478} \quad (2)$$

Where D is effective stack diameter, HR is the heat release rate, HL is the heat loss fraction, H_{eff} is effective stack height and H_s is the stack height entered by the user.

1 MMBtu (IT)/hour [MMBtu/h] = 69998.8225308643 calorie (IT)/second [cal/s]

HL is assumed to be 0.55 per AERSCREEN Manual

Holly Frontier - Artesia CALPUFF Input

Model Source Description	Model Source ID	LCC East (km)	LCC North (km)	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Velocity (m/sec)	Temp. (K)	Sigma Y (m)	Sigma Z (m)	Momentum Flux	SO_2 (lb/hr)	SO2LT (lb/hr)	SO_4 (lb/hr)	SO_4LT (lb/hr)	NOx (lb/hr)	PMC (lb/hr)	EC (lb/hr)	SOA (lb/hr)
Unit 13 Naphtha Splitter Reboiler	H0009	-691.753	-762.453	23.63	1025.42	1.37	5.46	549.82	0	0	1	0.183	0.000	0.091	0.000	0.540	0.084	0.021	0.000
Unit 06 HDS Reboiler	H0018	-691.742	-762.355	22.87	1025.08	1.22	5.95	644.26	0	0	1	0.425	0.000	0.212	0.000	1.515	0.115	0.029	0.000
South Crude Charge Heater	H0019	-691.733	-763.054	47.46	1027.53	1.33	6.52	505.37	0	0	1	0.000	0.000	0.000	0.000	0.620	0.067	0.017	0.050
Unit 21 Heater	H0028	-691.531	-763.081	15.34	1027.71	0.81	5.73	727.59	0	0	1	0.100	0.000	0.050	0.000	1.718	0.031	0.008	0.000
Unit 06 Charge Heater	H0030	-691.741	-762.349	20.43	1025.05	1.22	6.86	574.82	0	0	1	0.188	0.000	0.094	0.000	1.002	0.000	0.000	0.000
Unit 13 Charge Heater	H0040	-691.740	-762.343	30.79	1025.02	1.22	6.95	583.15	0	0	1	0.000	0.000	0.000	0.000	0.720	0.000	0.000	0.000
Unit 10 FCC Feed Heater	H0312	-691.612	-762.409	29.41	1025.54	1.22	6.22	630.37	0	0	1	0.969	0.178	0.484	0.089	3.350	0.230	0.057	0.000
Unit 70 Stabilizer Reboiler Heater	H0355	-691.566	-762.385	41.21	1025.62	0.76	8.75	500.93	0	0	1	0.000	0.000	0.000	0.000	0.970	0.012	0.003	0.009
Unit 70 CCR Heaters	H0362_64	-691.579	-762.359	62.65	1025.63	2.13	5.15	443.15	0	0	1	1.338	0.000	0.669	0.000	2.506	0.310	0.077	0.000
Unit 44 Charge Heater	H0421	-691.550	-762.448	24.90	1025.61	0.99	7.23	616.48	0	0	1	0.238	0.000	0.119	0.000	0.630	0.074	0.018	0.000
SRU Hot Oil Heater	H0464	-691.786	-762.522	24.33	1025.71	0.84	2.93	505.37	0	0	1	0.000	0.000	0.000	0.000	0.053	0.009	0.002	0.007
Unit 33 Charge Heater	H0601	-691.522	-762.511	39.94	1025.71	1.98	3.54	422.04	0	0	1	0.798	0.000	0.399	0.000	1.304	0.235	0.059	0.000
Unit 45 Charge Heater	H2421	-691.542	-762.518	26.52	1025.69	1.07	7.56	749.82	0	0	1	0.000	0.000	0.000	0.000	0.023	0.024	0.006	0.018
Unit 25 ROSE® Unit No. 2 Hot Oil Heater	H2501	-691.369	-762.607	51.22	1025.76	2.39	5.79	649.82	0	0	1	4.352	1.641	2.176	0.821	3.600	0.993	0.248	0.000
SRU3 Hot Oil Heater	H3101	-691.759	-762.560	24.39	1025.75	0.84	2.93	505.37	0	0	1	0.411	0.162	0.205	0.081	0.330	0.092	0.023	0.000
Unit 34 Hydrocracker Reboiler 1	H3402	-691.370	-762.596	20.43	1025.72	1.22	8.51	574.82	0	0	1	1.886	0.711	0.943	0.356	1.560	0.430	0.108	0.000
Unit 34 Hydrocracker Reactor Charge Hea	H3403	-691.383	-762.589	26.24	1025.73	1.22	5.91	647.04	0	0	1	1.160	0.438	0.580	0.219	0.960	0.265	0.066	0.000
Unit 63 Hydrogen Plant Reformer Furnaces	H8801_02	-691.407	-762.518	39.63	1025.62	1.17	22.99	588.71	0	0	1	0.000	0.000	0.000	0.000	4.458	0.364	0.091	0.273
Unit 64 Hydrogen Plant Reformer	H9851	-691.407	-762.487	53.66	1025.62	3.05	7.26	449.82	0	0	1	0.000	0.000	0.000	0.000	11.222	2.594	0.648	1.945
SRU2 Tail Gas Incinerator	H0473	-691.792	-762.491	45.73	1025.63	1.22	13.48	894.26	0	0	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SRU3 Tail Gas Incinerator	H3103	-691.764	-762.577	45.73	1025.82	1.22	15.21	922.04	0	0	1	50.000	18.740	25.000	9.370	6.500	13.320	3.330	0.000
FL-0404, GOHT Flare	FL0404	-691.387	-762.233	173.33	1024.95	7.93	20.00	1273.15	0	0	1	39.833	2.458	19.917	1.229	11.156	0.000	0.000	0.000
Notes:												**101.88**	**24.33**	**50.94**	**12.16**	**54.74**	**19.25**	**4.81**	**2.30**

LCC Origin: 40.0N, 97.0W, Standard (Matching) Parallels: 33.0N, 45.0N. Datum: NWS-84.
PMCoarse (PMC) = PM between 2.5 and 10 um in diameter.
EC = elemental carbon
SOA = secondary organic aerosols
PM speciation based upon NPS guidance for NG Combustion Turbines.

Consensus Gas-fired Turbine

Example of Consensus Approach where H_2SO_4 emissions are not provided by applicant
Applicant's estimates are in **BOLD**.

Turbine	Heat Input (mmBtu/hr)	Filterable PM (25% Estimate) (lb/mmBtu)	Filterable PM (25% Estimate) (lb/hr)	Condensible PM (75% Estimate) (lb/mmBtu)	Condensible PM (75% Estimate) (lb/hr)	Total PM (Applicant) (lb/mmBtu)	Total PM (Applicant) (lb/hr)	SO2 (Applicant) (gr/100scf)	SO2 (Applicant)	SO2 (Applicant) (lb/hr)
			0.00		0.00		**0.00**	2.0		**0.00**

SO4
(lb/hr)
0.00

SO2 (Applicant-33%)
(lb/hr)
0.00

Organic Carbon
(lb/hr)
0.00

Impact of Consensus Combined Cycle Turbine Example on Extinction

Type		Name	Extinction Coef.	f(RH)*	Efficiency	Emissions (lb/hr)	Total Relative bext 1/Mm
Filterable		EC	10		10	0.00	0.00
Inorganic CPM		SOIL	1		1		0.00
Inorganic CPM		SO4	3	2	6	0.00	0.00
Organic CPM		SOA	4		4	0.00	0.00
						0.00	0.00

* f(RH) will vary

ATTACHMENT B

Model Summary Results

7-7-22 HollyFrontier Artesia SIL Model, Full Gri

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Artesia SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	41.21148	556397.63	3634797.91	1025.65	1025.65	0	20012818	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	41.05966	556390.61	3634800.06	1025.67	1025.67	0	19011518	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	40.16028	556379.06	3634896.87	1025.9	1025.9	0	17012302	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	40.14757	556381.95	3634872.66	1025.85	1025.85	0	18111006	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	39.89154	556381.95	3634872.66	1025.85	1025.85	0	16101103	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	25.414	556381.95	3634872.66	1025.85	1025.85	0	16051516	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	24.41507	556384.84	3634848.46	1025.81	1025.81	0	20031516	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	23.04333	556384.84	3634848.46	1025.81	1025.81	0	17092816	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	22.1883	556384.84	3634848.46	1025.81	1025.81	0	18070524	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	22.05946	556384.84	3634848.46	1025.81	1025.81	0	19021816	Artesia 2016-2020 (RTP P	23	1	8341
AERMOD 21112	Artesia SIL_2016_H2S.SUM	H2S	1-HR	ALL	1ST	24.44764	556500	3634100	1027.15	1027.15	0	16121303	Artes	54	1	8341
AERMOD 21112	Artesia SIL_2018_H2S.SUM	H2S	1-HR	ALL	1ST	23.62346	556854.85	3634006.44	1027.45	1027.45	0	18090722	Artes	54	1	8341
AERMOD 21112	Artesia SIL_2019_H2S.SUM	H2S	1-HR	ALL	1ST	22.44775	556854.85	3634006.44	1027.45	1027.45	0	19111903	Artes	54	1	8341
AERMOD 21112	Artesia SIL_2017_H2S.SUM	H2S	1-HR	ALL	1ST	21.22834	556902.06	3634007.39	1027.52	1027.52	0	17113021	Artes	54	1	8341
AERMOD 21112	Artesia SIL_2020_H2S.SUM	H2S	1-HR	ALL	1ST	21.15178	556854.85	3634006.44	1027.45	1027.45	0	20122506	Artes	54	1	8341
AERMOD 21112	Artesia SIL_2016-2020_NO2_ST.SUM	NO2	1ST-HIGHEST MAX DAILY 1-I	ALL	1ST	35.14309	556588.18	3634040.29	1027.2	1027.2	0	5 YEARS	Artesia 2016-2020 (RTP P	21	1	8341
AERMOD 21112	Artesia SIL_2018_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.62696	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS	Artesia 2016-2020 (RTP P	21	1	8341
AERMOD 21112	Artesia SIL_2019_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.40098	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS	Artesia 2016-2020 (RTP P	21	1	8341
AERMOD 21112	Artesia SIL_2017_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.33655	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS	Artesia 2016-2020 (RTP P	21	1	8341
AERMOD 21112	Artesia SIL_2020_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.25856	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS	Artesia 2016-2020 (RTP P	21	1	8341
AERMOD 21112	Artesia SIL_2016_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	2.09455	556382.56	3635002.7	1026.13	1026.13	0	1 YEARS	Artesia 2016-2020 (RTP P	21	1	8341
AERMOD 21112	Artesia SIL_2020_PM10.SUM	PM10	24-HR	ALL	1ST	2.12842	556300	3635000	1026.57	1026.57	0	20060624	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2018_PM10.SUM	PM10	24-HR	ALL	1ST	2.09536	556379.06	3634896.87	1025.9	1025.9	0	18073124	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2016_PM10.SUM	PM10	24-HR	ALL	1ST	1.98536	556370.4	3634969.47	1026.16	1026.16	0	16082224	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2017_PM10.SUM	PM10	24-HR	ALL	1ST	1.91596	556300	3635000	1026.57	1026.57	0	17050724	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2019_PM10.SUM	PM10	24-HR	ALL	1ST	1.91181	556300	3634900	1026.41	1026.41	0	19033124	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2018_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.6628	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2019_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.65634	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2020_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.6208	556376.17	3634921.07	1026.01	1026.01	0	1 YEARS	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2017_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.60552	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2016_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.57825	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2016-2020_PM25_ST.SUM	PM25	1ST-HIGHEST 24-HR	ALL	1ST	1.92291	556376.17	3634921.07	1026.01	1026.01	0	5 YEARS	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2016-2020_PM25_LT.SUM	PM25	ANNUAL	ALL	1ST	0.30288	556505.52	3635129.2	1025.74	1025.74	0	5 YEARS	Artesia 2016-2020 (RTP P	18	1	8341
AERMOD 21112	Artesia SIL_2019_SO2_ST.SUM	SO2	1-HR	ALL	1ST	26.06468	556300	3634500	1026.17	1026.17	0	19041611	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2020_SO2_ST.SUM	SO2	1-HR	ALL	1ST	25.45004	556300	3634400	1026.36	1026.36	0	20103111	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2017_SO2_ST.SUM	SO2	1-HR	ALL	1ST	25.26063	556300	3634400	1026.36	1026.36	0	17031812	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2016_SO2_ST.SUM	SO2	1-HR	ALL	1ST	25.05872	556445.7	3634255.43	1026.77	1026.77	0	16061309	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2018_SO2_ST.SUM	SO2	1-HR	ALL	1ST	24.60504	556300	3634300	1026.78	1026.78	0	18103010	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2020_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.93385	556300	3635000	1026.57	1026.57	0	20060624	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2018_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.77685	556379.06	3634896.87	1025.9	1025.9	0	18073124	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2016_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.28096	556376.17	3634921.07	1026.01	1026.01	0	16092224	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2019_SO2_ST.SUM	SO2	24-HR	ALL	1ST	7.0093	556382.56	3635002.7	1026.13	1026.13	0	19072624	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2017_SO2_ST.SUM	SO2	24-HR	ALL	1ST	6.91898	556300	3635000	1026.57	1026.57	0	17050724	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2019_SO2_ST.SUM	SO2	3-HR	ALL	1ST	22.27776	556390.61	3634800.06	1025.67	1025.67	0	19111312	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2017_SO2_ST.SUM	SO2	3-HR	ALL	1ST	22.24497	556300	3634700	1026.14	1026.14	0	17040712	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2020_SO2_ST.SUM	SO2	3-HR	ALL	1ST	22.17742	556400	3634200	1027.1	1027.1	0	20032012	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2018_SO2_ST.SUM	SO2	3-HR	ALL	1ST	21.39588	556300	3634300	1026.78	1026.78	0	18040512	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2016_SO2_ST.SUM	SO2	3-HR	ALL	1ST	21.31755	556400	3634200	1027.1	1027.1	0	16021412	Artesia 2016-2020 (RTP P	14	1	8341
AERMOD 21112	Artesia SIL_2019_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.74039	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS	Artesia 2016-2020 (RTP P	7	1	8341
AERMOD 21112	Artesia SIL_2018_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.73197	556300	3634900	1026.41	1026.41	0	1 YEARS	Artesia 2016-2020 (RTP P	7	1	8341
AERMOD 21112	Artesia SIL_2020_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.70143	556379.06	3634896.87	1025.9	1025.9	0	1 YEARS	Artesia 2016-2020 (RTP P	7	1	8341
AERMOD 21112	Artesia SIL_2017_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.66959	556300	3634900	1026.41	1026.41	0	1 YEARS	Artesia 2016-2020 (RTP P	7	1	8341
AERMOD 21112	Artesia SIL_2016_SO2_LT.SUM	SO2	ANNUAL	ALL	1ST	0.6453	556381.95	3634872.66	1025.85	1025.85	0	1 YEARS	Artesia 2016-2020 (RTP P	7	1	8341

7-7-22 HollyFrontier Artesia SIL Model, Full Gri

Pollutant	Average	Group	Rank	Conc. (ug/m3)	Secondary PM2.5 Conc. (ug/m3)	Total Conc. (ug/m3)	SIL (ug/m3)	%SIL	Max Distance to SIL (km)
PM25	ANNUAL	ALL	1ST	0.30	0.008	0.31	0.2	155%	0.76
PM25	1ST-HIGHEST 24-HR	ALL	1ST	1.92	0.310	2.23	1.2	186%	1.48
PM10	ANNUAL	ALL	1ST	0.66	NA	0.66	1.0	66%	NA
PM10	24-HR	ALL	1ST	2.13	NA	2.13	5.0	43%	NA
SO2	1-HR	ALL	1ST	26.06	NA	26.06	7.8	334%	10.7
SO2	24-HR	ALL	1ST	7.93	NA	7.93	5.0	159%	1.73
SO2	3-HR	ALL	1ST	22.28	NA	22.28	25.0	89%	NA
SO2	ANNUAL	ALL	1ST	0.74	NA	0.74	1.0	74%	NA
NO2	1ST-HIGHEST MAX DAILY 1-I	ALL	1ST	35.14	NA	35.14	7.5	467%	1.82
NO2	ANNUAL	ALL	1ST	2.63	NA	2.63	1.0	263%	1.07
CO	1-HR	ALL	1ST	41.21	NA	41.21	2000.0	2%	NA
CO	8-HR	ALL	1ST	25.41	NA	25.41	500.0	5%	NA
H2S	1-HR	ALL	1ST	24.45	NA	24.45	5.0	489%	1.44

NA - not applicable

Maximum 5-yr 1-hr SO2 impact conservatively used in lieu of 5-yr average of maxima.

NO2 modeling included the ARM2 method to account for NOx to NO2 conversion. The default minimum and maximum NO2/NOx ratios of 0.5 and 0.9 were employed.

7-7-22 HollyFrontier Artesia NAAQS Model, Significance Gri

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Artesia NAAQS_2019_H2S.SUM	H2S	1-HR	ALL	1ST	28.94206	556415.7	3634620.21	1025.46	1025.46	0	19123017	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2018_H2S.SUM	H2S	1-HR	ALL	1ST	27.66808	556854.85	3634006.44	1027.45	1027.45	0	18090722	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2016_H2S.SUM	H2S	1-HR	ALL	1ST	27.65655	556664.07	3634229.22	1026.56	1026.56	0	16101007	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2017_H2S.SUM	H2S	1-HR	ALL	1ST	27.34274	556413.44	3634642.42	1025.43	1025.43	0	17020308	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2020_H2S.SUM	H2S	1-HR	ALL	1ST	26.3362	556664.07	3634229.22	1026.56	1026.56	0	20071106	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2019_H2S.SUM	H2S	1-HR	HOLLY	1ST	28.87117	556415.7	3634620.21	1025.46	1025.46	0	19123017	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2018_H2S.SUM	H2S	1-HR	HOLLY	1ST	27.59325	556854.85	3634006.44	1027.45	1027.45	0	18090722	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2016_H2S.SUM	H2S	1-HR	HOLLY	1ST	27.28641	556878.45	3634006.92	1027.46	1027.46	0	16011205	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2017_H2S.SUM	H2S	1-HR	HOLLY	1ST	26.89261	556413.44	3634642.42	1025.43	1025.43	0	17020308	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2020_H2S.SUM	H2S	1-HR	HOLLY	1ST	26.03605	556972.87	3634008.83	1027.38	1027.38	0	20011207	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2018_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.78474	557200	3633300	1026.67	1026.67	0	18011705	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2020_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.58068	556300	3633900	1028.29	1028.29	0	20121320	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2016_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.38897	556300	3633900	1028.29	1028.29	0	16011724	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2019_H2S.SUM	H2S	1-HR	NEARBY	1ST	14.28026	555800	3634200	1028.6	1028.6	0	19010421	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2017_H2S.SUM	H2S	1-HR	NEARBY	1ST	13.97282	557600	3633700	1024.37	1024.37	0	17022105	Artes	84	3	397
AERMOD 21112	Artesia NAAQS_2016-2020_NO2_ST.SUM	NO2	8TH-HIGHEST MAX DAILY 1-I	ALL	1ST	173.99957	556460.99	3635129.21	1025.95	1025.95	0	5 YEARS	Artesia 2016-2020 (RTP P	48	2	618
AERMOD 21112	Artesia NAAQS_2016-2020_NO2_ST.SUM	NO2	8TH-HIGHEST MAX DAILY 1-I	HOLLY	1ST	138.43808	556382.56	3635002.7	1026.13	1026.13	0	5 YEARS	Artesia 2016-2020 (RTP P	48	2	618
AERMOD 21112	Artesia NAAQS_2018_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	17.29727	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2019_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	16.43751	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2020_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	16.04429	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2017_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	15.11588	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2016_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	13.56682	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2018_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	17.29727	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2019_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	16.43751	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2020_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	16.04429	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2017_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	15.11588	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2016_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	13.56682	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artesia 2016-2020 (RTP P	48	2	134
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_ST.SUM	PM25	8TH-HIGHEST 24-HR	ALL	1ST	18.42737	556505.52	3635129.2	1025.74	1025.74	0	5 YEARS	Artesia 2016-2020 (RTP P	74	3	218
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_ST.SUM	PM25	8TH-HIGHEST 24-HR	HOLLY	1ST	17.88615	556505.52	3635129.2	1025.74	1025.74	0	5 YEARS	Artesia 2016-2020 (RTP P	74	3	218
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_ST.SUM	PM25	8TH-HIGHEST 24-HR	NEARBY	1ST	8.71237	556571.66	3635263.01	1025.55	1025.55	0	5 YEARS	Artesia 2016-2020 (RTP P	74	3	218
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_LT.SUM	PM25	ANNUAL	ALL	1ST	5.56499	556505.52	3635129.2	1025.74	1025.74	0	5 YEARS	Artesia 2016-2020 (RTP P	74	3	52
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_LT.SUM	PM25	ANNUAL	HOLLY	1ST	4.3795	556505.52	3635129.2	1025.74	1025.74	0	5 YEARS	Artesia 2016-2020 (RTP P	74	3	52
AERMOD 21112	Artesia NAAQS_2016-2020_PM25_LT.SUM	PM25	ANNUAL	NEARBY	1ST	1.86594	556570.94	3635328.83	1025.74	1025.74	0	5 YEARS	Artesia 2016-2020 (RTP P	74	3	52
AERMOD 21112	Artesia NAAQS_2016-2020_SO2_ST.SUM	SO2	4TH-HIGHEST MAX DAILY 1-I	ALL	1ST	156.79626	556300	3634300	1026.78	1026.78	0	5 YEARS	Artesia 2016-2020 (RTP P	48	2	4364
AERMOD 21112	Artesia NAAQS_2016-2020_SO2_ST.SUM	SO2	4TH-HIGHEST MAX DAILY 1-I	HOLLY	1ST	156.79626	556300	3634300	1026.78	1026.78	0	5 YEARS	Artesia 2016-2020 (RTP P	48	2	4364

7-7-22 HollyFrontier Artesia NAAQS Model, Significance Gri

Pollutant	Average	Group	Rank	Modeled Conc. (ug/m3)	Background Conc. (ug/m3)	Secondary PM2.5 Conc. (ug/m3)	Total Conc. (ug/m3)	NMAAQS/ NAAQS (ug/m3)	% NMAAQS/NAAQS	Comments
H2S	1-HR	ALL	1ST	28.94	NA	NA	28.9	41.8	69%	Includes off-site source inventory
H2S	1-HR	HOLLY	1ST	28.87	NA	NA	28.9	41.8	69%	
H2S	1-HR	NEARBY	1ST	14.8	NA	NA	14.8	41.8	35%	
NO2	ANNUAL	ALL	1ST	17.3	5.0	NA	22.3	94.02	24%	Oustide Carlsbad monito
NO2	8TH-HIGHEST MAX DAILY 1-I	ALL	1ST	174.0	NA	NA	174.0	188.03	93%	No offsite source inventory required.
PM25	ANNUAL	ALL	1ST	5.56	5.9	0.008	11.5	12.0	96%	Eastern NM monitor.
PM25	ANNUAL	HOLLY	1ST	4.38	5.9	0.008	10	12.0	86%	Includes off-site source inventory
PM25	ANNUAL	NEARBY	1ST	1.87	5.9	0.008	8	12.0	65%	
PM25	8TH-HIGHEST 24-HR	ALL	1ST	18.43	13.4	0.31	32.1	35.0	92%	
PM25	8TH-HIGHEST 24-HR	HOLLY	1ST	17.89	13.4	0.31	31.6	35.0	90%	
PM25	8TH-HIGHEST 24-HR	NEARBY	1ST	8.71	13.4	0.31	22.4	35.0	64%	
SO2	4TH-HIGHEST MAX DAILY 1-I	ALL	1ST	156.8	5.3	NA	162.1	196.4	83%	Bloomfield monitor. There are no offsite SO2 sources within 10km.

NA - Not applicable.
Background concentrations as recommended by the NMAQB.
1-hr NO2 background concentrations from the Carlsbad monitor added within model.
"HOLLY" source group includes only the Artesia refinery sources.
NO2 modeling included the ARM2 method to account for NOx to NO2 conversion. The default minimum and maximum NO2/NOx ratios of 0.5 and 0.9 were employed.
SO2 24-hr NMAAQS modeling was not conducted as compliance is demonstrated using the 1-hr NAAQS (per NMED policy).

4-22-22 HollyFrontier Artesia Increment Model, PTE Assumed for Holly, Significance Gri

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Artesia Increment_2018_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	24.67837	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2019_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	24.16853	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2020_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	23.67046	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2017_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	23.2157	556505.52	3635129.2	1025.74	1025.74	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2016_NO2_LT.SUM	NO2	ANNUAL	ALL	1ST	22.19136	556527.78	3635129.2	1025.58	1025.58	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2018_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	17.21266	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2019_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	16.35653	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2020_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	15.97009	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2017_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	15.04591	556460.99	3635129.21	1025.95	1025.95	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2016_NO2_LT.SUM	NO2	ANNUAL	HOLLY	1ST	13.51191	556483.26	3635129.2	1025.85	1025.85	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2017_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	17.79712	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2016_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	16.83571	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2018_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	16.60564	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2019_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	16.57839	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2020_NO2_LT.SUM	NO2	ANNUAL	NEARBY	1ST	15.69278	556600.99	3635413.42	1025.64	1025.64	0	1 YEARS	Artesia 2016-2020 (RTP P	228	3	134
AERMOD 21112	Artesia Increment_2017_SO2_ST.SUM	SO2	24-HR	ALL	2ND	67.11136	556375.48	3635087.04	1026.35	1026.35	0	17040624	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2019_SO2_ST.SUM	SO2	24-HR	ALL	2ND	65.72592	556527.78	3635129.2	1025.58	1025.58	0	19082024	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2016_SO2_ST.SUM	SO2	24-HR	ALL	2ND	63.32752	556505.52	3635129.2	1025.74	1025.74	0	16100824	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2018_SO2_ST.SUM	SO2	24-HR	ALL	2ND	60.36211	556416.47	3635129.21	1026.2	1026.2	0	18100124	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2020_SO2_ST.SUM	SO2	24-HR	ALL	2ND	60.19588	556483.26	3635129.2	1025.85	1025.85	0	20061624	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2019_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	63.5348	556527.78	3635129.2	1025.58	1025.58	0	19082024	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2018_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	58.85538	556416.47	3635129.21	1026.2	1026.2	0	18091724	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2017_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	57.47117	556375.48	3635087.04	1026.35	1026.35	0	17091024	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2016_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	57.27247	556416.47	3635129.21	1026.2	1026.2	0	16072024	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2020_SO2_ST.SUM	SO2	24-HR	HOLLY	2ND	54.91992	556483.26	3635129.2	1025.85	1025.85	0	20022124	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2020_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	38.16688	557200	3634100	1025.78	1025.78	0	20022224	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2019_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	31.71447	555900	3633100	1032.5	1032.5	0	19112524	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2016_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	31.52081	555900	3635300	1031.49	1031.49	0	16122324	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2017_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	29.08133	557537.74	3634690.06	1022.56	1022.56	0	17122024	Artesia 2016-2020 (RTP P	127	3	248
AERMOD 21112	Artesia Increment_2018_SO2_ST.SUM	SO2	24-HR	NEARBY	2ND	25.97896	555800	3635200	1030.06	1030.06	0	18032624	Artesia 2016-2020 (RTP P	127	3	248

4-22-22 HollyFrontier Artesia Increment Model, PTE Assumed for Holly, Significance Gri

Pollutant	Average	Group	Rank	Modeled Conc. (ug/m3)	Secondary PM2.5 Conc. (ug/m3)	Total Conc. (ug/m3)	Increment (ug/m3)	% Increment	Comments
NO2	ANNUAL	ALL	1ST	24.7	NA	24.7	25	99%	
NO2	ANNUAL	HOLLY	1ST	17.2	NA	17.2	25	69%	
NO2	ANNUAL	NEARBY	1ST	17.8	NA	17.8	25	71%	
SO2	24-HR	ALL	2ND	67.1	NA	67.1	91	74%	
SO2	24-HR	HOLLY	2ND	63.5	NA	63.5	91	70%	
SO2	24-HR	NEARBY	2ND	38.2	NA	38.2	91	42%	

NA - Not applicable.

PM2.5 increment not triggered due to project.

4-22-22 HollyFrontier Artesia TAP Mode

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Artesia TAP_2017_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.86031	556300	3634900	1026.41	1026.41	0	17020416	Artesia 2016-2020 (RTP P	3	1	8341
AERMOD 21112	Artesia TAP_2020_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.59695	556575.62	3634197.94	1026.68	1026.68	0	20040316	Artesia 2016-2020 (RTP P	3	1	8341
AERMOD 21112	Artesia TAP_2016_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.26709	556500	3634200	1026.85	1026.85	0	16011116	Artesia 2016-2020 (RTP P	3	1	8341
AERMOD 21112	Artesia TAP_2018_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.25832	556300	3634900	1026.41	1026.41	0	18010616	Artesia 2016-2020 (RTP P	3	1	8341
AERMOD 21112	Artesia TAP_2019_H2SO4.SUM	H2SO4	8-HR	ALL	1ST	4.11581	556370.4	3634969.47	1026.16	1026.16	0	19110216	Artesia 2016-2020 (RTP P	3	1	8341
AERMOD 21112	Artesia TAP_2020_NH3.SUM	NH3	8-HR	ALL	1ST	32.28275	556380.79	3635023.79	1026.17	1026.17	0	20112308	Artesia 2016-2020 (RTP P	2	1	8341
AERMOD 21112	Artesia TAP_2018_NH3.SUM	NH3	8-HR	ALL	1ST	32.01996	556587.86	3634326.98	1026.22	1026.22	0	18110908	Artesia 2016-2020 (RTP P	2	1	8341
AERMOD 21112	Artesia TAP_2017_NH3.SUM	NH3	8-HR	ALL	1ST	29.49	556400	3634500	1025.86	1025.86	0	17082824	Artesia 2016-2020 (RTP P	2	1	8341
AERMOD 21112	Artesia TAP_2019_NH3.SUM	NH3	8-HR	ALL	1ST	28.23331	556416.92	3634389.47	1026.21	1026.21	0	19111124	Artesia 2016-2020 (RTP P	2	1	8341
AERMOD 21112	Artesia TAP_2016_NH3.SUM	NH3	8-HR	ALL	1ST	26.04177	556572.31	3635129.2	1025.36	1025.36	0	16080108	Artesia 2016-2020 (RTP P	2	1	8341

4-22-22 HollyFrontier Artesia TAP Mode

Pollutant	Average	Group	Rank	Modeled Conc. (ug/m3)	1/100 OEL(ug/m3)	% Standard
NH3	8-HR	ALL	1ST	32.3	180	18%
H2SO4	8-HR	ALL	1ST	4.9	10	49%

CALPUFF Results (9/6/21)

Parameter	Averaging Time	Meteorological Year Modeled	Modeled Value	Modeled Value Units	Standard	% Standard	Comments
AQRV - Visibility	24-hour	2013	2.78	Extinction (%)	5.0	56%	Only Carlsbad Caverns has Q/d > 10.
		2014	1.90	98% (8th high)	5.0	38%	8th high over all receptors, not by receptor, conservatively used.
		2015	2.24		5.0	45%	
SIL - PM10 (PMC)	24-hour	2013	6.66E-02	Concentration (ug/m3)	0.30	22%	Class I SIL
		2014	6.11E-02		0.30	20%	All Class I areas modeled.
		2015	5.78E-02		0.30	19%	
	Annual	2013	7.76E-03		0.20	4%	
		2014	7.59E-03		0.20	4%	
		2015	8.27E-03		0.20	4%	
SIL - SO2	Annual	2013	3.52E-02	Concentration (ug/m3)	0.10	35%	Class I SIL
		2014	3.52E-02		0.10	35%	All Class I areas modeled.
		2015	3.79E-02		0.10	38%	
	24-hour	2013	3.01E-01		0.20	150%	SRU3 at 50 lb/hr.
		2013	1.93E-01		0.20	97%	SRU3 at 28 lb/hr.
		2014	2.70E-01		0.20	135%	SRU3 at 50 lb/hr.
		2014	1.78E-01		0.20	89%	SRU3 at 28 lb/hr.
		2015	2.41E-01		0.20	120%	SRU3 at 50 lb/hr.
		2015	1.56E-01		0.20	78%	SRU3 at 28 lb/hr.
	3-hour	2013	9.45E-01		1.00	95%	
		2014	9.82E-01		1.00	98%	
		2015	8.76E-01		1.00	88%	
SIL - NOx	Annual	2013	1.88E-02	Concentration (ug/m3)	0.10	19%	Class I SIL
		2014	1.89E-02		0.10	19%	All Class I areas modeled.
		2015	2.00E-02		0.10	20%	
AQRV Nitrogen Deposition	Annual	2013	2.56E-03	Deposition (kg/ha/yr)	0.005	51%	All Class I areas conservatively modeled.
		2014	2.67E-03		0.005	53%	
		2015	2.87E-03		0.005	57%	
Sulfur Deposition	Annual	2013	3.14E-03		0.005	63%	Used annual SO2 and SO4 emissions.
		2014	3.32E-03		0.005	66%	
		2015	3.77E-03		0.005	75%	

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ATTACHMENT B

Model Summary Results

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