Appendix Q- BACT/RACT Analyses

Appendix Q, Table Q-1. Top-Down BACT Analysis for Sulfur Treatment Unit (STU) $PM_{10}/PM_{2.5}$

Process	Pollutant
U237 Sulfur Treatment Unit (STU) equipped with thermal oxidizers	$PM_{10}/PM_{2.5}$

		Control Technology	Baghouse / Fabric Filter	Dry Electrostatic Precipitator - Pipe Type (ESP)	Wet Electrostatic Precipitator - Wire Type (ESP)	Wet Scrubber	High-Efficiency Cyclones
Step 1.	IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES	Control Technology Description	A fabric filter unit (or baghouse) consists of one or more compartments containing rows of fabric bags. Particle-laden gases pass along the surface of the bags then through the fabric. Particles are retained on the upstream face of the bags and the cleaned gas stream is vented to the atmosphere. Fabric filters collect particles with sizes ranging from submicron to several hundred microns in diameter. Fabric filters are used for medium and low gas flow streams with high particulate concentrations.	A dry electrostatic precipitator (ESP) is a particle control device that uses electrical forces to move the particles out of the gas stream onto collector plates. This process is accomplished by the charging of particles in the gas stream using positively or negatively charged electrodes. The particles are then collected as they are attracted to oppositely opposed electrodes. Once the particles are collected on the plates, they are removed by knocking them loose from the plates, allowing the collected layer of particles to fall down into a hopper.	A wet electrostatic precipitator (ESP) is a particle control device that uses electrical forces to move the particles out of the gas stream onto collector tubes. This process is accomplished by the charging of particles in the gas stream using positively or negatively charged electrodes. The particles are then collected as they are attracted to oppositely opposed electrodes. Once the particles are collected on the conductive tubes, they are removed by being washed intermittently or continuously by a spray of liquid, usually water, allowing the wet effluent to be collected with a drainage system. [3]	A wet gas scrubber is an air pollution control device that removes $PM_{2.5}$ from stationary point sources waste streams. PM_{10} and $PM_{2.5}$ are primarily removed through the impaction, diffusion, interception, and/or absorption of the pollutant onto droplets of liquid. Wet scrubbers have some advantages over ESPs and baghouses in that they are particularly useful in removing PM with the following characteristics: (1) Sticky and/or hygroscopic materials; (2) Combustible, corrosive or explosive materials; (3) Particles that are difficult to remove in dry form; (4) PM in the presence of soluble gases; and (5) PM in gas stream with high moisture content.	A cyclone separator (cyclone) operates on the principle of centrifugal separation. The exhaust enters the inlet and spirals around towards the outlet. As the particles proceed through the cyclone, the heavier material hits the outside wall and drops out where it is collected. The cleaned gas escapes through an inner tube. Cyclones are generally used to reduce dust loading and collect large particles.
		Typical Operating Temperature	Up to 550 °F [1]	Up to 1,300 °F [2]	Lower than 170 - 190 °F [3]	40 - 700 °F [4]	Up to 1,000 °F [5]
		Typical Inlet Flow Rate	Varies	100,000 - 200,000 scfm [2]	1,000 - 100,000 scfm [3]	500 - 75,000 scfm [4]	1,060 - 25,400 scfm [5]
		Typical Inlet Pollutant Concentration	0.5 - 10 grains/dscf [1]	0.5 - 5 grains/dscf [2]	0.5 - 5 grains/dscf [3]	0.20 grains/scf [4]	1.0 - 100 grains /scf [5]
		Other Considerations	Moisture and corrosives content are the major gas stream characteristics requiring design consideration. Standard fabric filters can be used in pressure or vacuum service, but only within the range of about ± 640 millimeters of water column (25 inches of water column).	Dry ESPs are used to capture coarse particles at high concentrations. Small particles at low concentrations are not effectively collected by an ESP.	Wet ESPs not suitable for use in processes which are highly variable because they are sensitive to fluctuation in gas stream conditions.	PM and acid gases are primarily removed through the impaction, diffusion, interception and/or absorption of the pollutant onto droplets of liquid. Considering the low concentration of small size of particulate, the wet scrubber efficiency would be reduced.	Cyclones perform more efficiently with higher pollutant loadings, provided that the devices does not become choked. Higher pollutant loading are generally associated with higher flow designs. [5]
Step 2.	ELIMINATE TECHNICALLY INFEASIBLE OPTIONS	RBLC Database Information	Not included in the RBLC for control of PM emissions from thermal oxidizers at petroleum refineries.	Not included in the RBLC for control of PM emissiona from thermal oxidizers at petroleum refineries.	Not included in the RBLC for control of PM emissions from thermal oxidizers at petroleum refineries.	Not included in the RBLC for control of PM emissions from thermal oxidizers at petroleum refineries.	Not included in the RBLC for control of PM emissions from thermal oxidizers at petroleum refineries.
		Feasibility Discussion	Temperatures much in excess of 550°F require special refractory mineral or metallic fabrics which can be expensive. Fabric filters cannot be operated in a moist enviroment.[1] Due to the high moisture content the baghouse is not a technically feasible option.	The STU thermal oxidizers exhaust flowrates will approximately be 585 scfm which is much lower than the typical gas flowrates for dry ESPs. In addition, dry ESPs are not recommended for removing sticky or moist particles.[2] Therefore, the dry ESP is not a technically feasible control option.	Wet ESPs are limited to operating at stream temperatures under approximately 170 °F to 190 °F. The exhaust temperature for the STU thermal oxidizers will be above approximately 500 °F. Therefore, the exhaust temperature of the gas will be outside the acceptable temperature range for wet ESPs and will require cooling equipment. In addition, the STU thermal oxidizers exhaust flowrates will approximately be 585 scfm which is much lower than the typical gas flowrates for wet ESPs. Therefore, the dry ESP is not a technically feasible control option.	Technically feasible control option.	The control efficiency is not high enough to meet BACT. In addition, the STU thermal oxidizers exhaust flowrates will approximately be 585 scfm which is much lower than the typical gas flowrates for a cyclone. Therefore, a cyclone is technically infeasible.
Step 3.	RANK REMAINING CONTROL TECHNOLOGIES	Overall Control Efficiency	99 - 99.9% [1]	90 - 99.9% [2]	90 - 99.9% [3]	98% [5]	20-70% [6]
Step 4.	EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS	Cost Effectiveness ($/ton)	N/A - Technically infeasible control technology	N/A - Technically infeasible control technology	N/A - Technically infeasible control technology	The scrubber is proposed as BACT.	N/A - Technically infeasible control technology
Step 5.	SELECT BACT					**BACT: Wet scrubber**	

1. U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Baghouse)," EPA-452/F-03-025.
2. U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Dry Electrostatic Precipitator - Wire Plate Type)," EPA-452/F-03-027.
3. U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Wet Electrostatic Precipitator - Wire-Pipe Type)," EPA-452/F-03-029.
4. U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Packed-Bed/Packed-Tower Wet Scrubber)," EPA-452/F-03-015.
5. The manufacturer has guaranteed a 98% PM control efficiency for the wet scrubber.
6. U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Cyclones)," EPA-452/F-03-005.

Appendix Q, Table Q-2. Top-Down BACT Analysis for Sulfur Treatment Unit (STU) SO_2

Process	Pollutant
U237 Sulfur Treatment Unit (STU) equipped with thermal oxidizers	SO_2

			Wet Scrubber	Dry Scrubber
		Control Technology		
Step 1.	**IDENTIFY AIR POLLUTION CONTROL TECHNOLOGIES**	**Control Technology Description**	A wet scrubber is a control technology that is capable of removing inorganic fumes, vapors and gases such as SO_2. Caustic solution is the most common scrubbing liquid used for acid-gas control (e.g., SO_2, HCl). When the acid gases are absorbed into the scrubbing solution, they react with the alkaline compounds to produce neutral salts. The rate of absorption of the acid gases is dependent upon the solubility of the acid gases in the scrubbing liquid.	A dry scrubber is a control technology used to remove water soluble contaminants such as SO_2. Dry scrubbers inject either dry, powdered sorbent or an aqueous slurry that contains a high concentration of the sorbent. Wet scrubbers achieve higher SO_2 removal efficiencies than dry scrubbers. [2]
		Typical Operating Temperature	40 - 700 °F [1]	Spray dry systems: 20 - 30 °F [3] Dry sorbent injection system: 300 - 350 °F [3]
		Typical Inlet Flow Rate	500 - 75,000 scfm[1]	--
		Typical Inlet Pollutant Concentration	250 to 10,000 ppmv[1]	Approximately 2,000 ppm [3]
		Other Considerations	For gas absorption the solvent must be treated to remove the captured pollutant from the solution. The effluent from the column can be recycled and re-used.	Dry scrubber will require emission stream pretreatment. The flue gas must be cooled to a lower temperature range. This will also prevent deposition on downstream equipment. The gas can be cooled via heat recovery boiler, an evaporative cooler or a heat exchanger. [3]
Step 2.	**ELIMINATE TECHNICALLY INFEASIBLE OPTIONS**	**RBLC Database Information**	Not included in the RBLC for control of SO2 emissions from thermal oxidizers at petroleum refineries.	Not included in the RBLC for control of SO2 emissions from thermal oxidizers at petroleum refineries.
		Feasibility Discussion	Technically feasible	SO_2 removal efficiency is lower than wet scrubbers at 85-95%.[2] In addition, cooling equipment will be required to lower the temperature of the exhaust gas to an optimal temperature range. Therefore, a dry scrubber is not a technically feasible control technology.
Step 3.	**RANK REMAINING CONTROL TECHNOLOGIES**	**Overall Control Efficiency**	99.9% [4]	85-95% [2]
Step 4.	**EVALUATE AND DOCUMENT MOST EFFECTIVE CONTROLS**	**Cost Effectiveness ($/ton)**	The scrubber is proposed as RACT.	N/A - Technically infeasible control technology Less efficient that wet scrubber
Step 5.	**SELECT BACT**		**BACT: Wet scrubber**	

1. U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Packed-Bed/Packed-Tower wet Scrubber)," EPA-452/F-03-015.
2. U.S. EPA SO2 and Acid Gas Controls, "Chapter 1 Wet and Dry Scrubbers for Acid Gas Control".
3. U.S. EPA, Office of Air Quality Planning and Standards, "Air Pollution Control Technology Fact Sheet (Flue Gas Desulfurization (FGD) - Wet, Spray Dry, and Dry Scrubbers", EPA-452/F-03-034.
4. The manufacturer has guaranteed a 99.9% control efficiency for the wet scrubber. This grain loading rate meets and exceeds NSPS requirements. This is believed to be the best that can be offered for impeller mill baghouse systems based on a review of multiple vendor

Appendix Q, Table Q-3: Cost-Effectiveness for SCR Projects **Confidential Business Information**

Year	Company	Location	A Flue Gas Capacity	B SCR Only ($MM)	C Total Installed Cost ($MM)	D Total Installed Cost per thou lb/hr flue gas D = C ÷ A	E Adjusted Installed Cost ($MM) E = D x 30.944 thou lb/hr
2019		Carson/Wilmington, CA	62,491 lb/hr	$0.86	$14.60	$233,633.64	$7.23
2019		Carson/Wilmington, CA	68,121 lb/hr	$0.92	$20.15	$295,797.18	$9.15
2019		El Segundo, CA	210 MMSCFD (730,000 lb/hr)	$1.98	$64.05	$87,739.73	$2.72
2019		Wilmington, CA	585,000 lb/hr		$23.00	$39,316.24	$1.22
2019		Carson/Wilmington, CA	178,935 lb/hr (design), 131,288 Norm	$0.30	$16.90	$94,447.70	$2.92
2019		Martinez, CA	1,322,000 lb/hr		$122.26	$92,481.09	$2.86
2022		Rodeo, CA	30,944 lb/hr (total for 2 units)	$1.50	$15.60		$15.60

Appendix Q, Table Q-3 above provides cost estimates for several projects for other types of processes in which SCR units were installed. Also shown in the last entry in Table Q-3 is a cost estimate from the equipment vendor for an add-on SCR (two SCR units) immediately downstream of the proposed U237 STU. This SCR is guaranteed by the vendor to achieve an outlet concentration of 32 ppmv @ 3% O2. In Table Q-3, four of these projects are for Phillips 66's Carson/Wilmington refinery (in SCAQMD's jurisdiction) in 2019, one is for another refinery in SCAQMD's jurisdiction in 2019, and two are in BAAQMD's jurisdiction (including the aforementioned estimate from the equipment vendor). Cost effectiveness is calculated using:

-The US EPA Air Pollution Control Cost Manual, 7th Edition (EPA-452-02-001, 2002, SCR Chapter updated in 2019), control equipment parameters shown in Table Q-4
-The estimated annual NOx emissions (of 10.1 tons) removed by the add-on SCR provided in Tables Q-5 and Q-6
-The installed capital costs that have been proportionally adjusted based on the flue gas capacity of the aforementioned add-on SCR provided by the equipment vendor.

Based on the lowest adjusted installed cost estimate of $1.22 million (as shown in Table Q-3), the cost-effectiveness calculated based on the methodology above was $21,531/ton of NOx reduced (see Appendix Q, Table Q-5) , which exceeds the current BACT threshold of $17,500/ton of NOx reduced. Since the use of an SCR has been demonstrated above to exceed the cost-effectiveness thresholds for BACT, it follows that an SCR will also exceed the cost-effectiveness threshold for RACT, which is expected to be lower than that for BACT.

Furthermore, based on the quote provided by the equipment vendor, installing an SCR would require redesign of the STU and installation of an additional burner. These changes would result far higher cost-effectiveness calculation of $236,382/ton of NOx reduced (as shown in Appendix Q, Table Q-6). Thus, while the addition of an SCR may be technologically feasible, the Air District has determined it does not constitute RACT when considering cost-effectiveness and the extent of necessary modifications to the source.

Appendix Q, Table Q-4
Design Analysis for SCR RACT Analysis
For 2 SCRs (one for each thermal oxidizer at U237)
Phillips 66 Company - San Francisco Refinery
Rodeo, CA

Parameter	Description	Value	Units	Notes
Q_B	Heat input rate	14.8	MMBtu/hr	
CF	Capacity factor	1.0	--	Year-round operation
h_{NOx}	NO_x removal efficiency	78%	--	
$q_{fluegas}$	Flue gas flow rate	5,291	cu ft/min	Vendor data
$Vol_{catalyst}$	Volume of catalyst	44.2	cu ft	
h_{adj}	NO_x efficiency adjustment factor	1.11	--	
$Slip_{adj}$	Ammonia slip adjustment factor	1.0	--	assume 5 ppm slip
NOx_{adj}	Inlet NO_x adjustment factor	0.96	--	
NOx_{in}	Uncontrolled NO_x in flue gas	0.33	lb/MMBtu	
S_{adj}	Sulfur in coal adjustment factor	1.0	--	Only relevant for units fired on coal
T_{adj}	Temperature adjustment factor	1.0	--	assume reactor inlet temp of 700 deg F
$A_{catalyst}$	Catalyst cross-sectional area	6	sq ft	
n_{layer}	Number of catalyst layers	3	--	
n_{total}	Total catalyst layers (including empty layers)	3	--	
h_{layer}	Height of one catalyst layer	4.1	ft	
h_{SCR}	Height of SCR reactor	42.3	ft	
DP_{duct}	Pressure drop (duct)	2	in H_2O	
$DP_{catalyst}$	Pressure drop (catalyst)	0.75	in H_2O	
$m_{reagent}$	Mass flow of reagent	5.2	lb/hr	Assume urea as reagent
m_{sol}	Mass flow of aqueous reagent solution	10	lb/hr	
C_{sol}	Urea concentration by weight	50%	--	
q_{sol}	Solution volume flow rate	0.15	gal/hr	
TV	Tank volume for reagent storage	1,000	gallons	

Reference:

USEPA, "EPA Air Pollution Control Cost Manual, 7th Edition," EPA-452-02-001, 2002.
SCR Chapter Updated 2019

Appendix Q, Table Q-5

Cost Analysis for SCR RACT Analysis for SCR with Lowest Cost Estimate from Prior SCR Projects (see Table Q-3)

For 2 SCRs (one for each thermal oxidizer at U237)

Phillips 66 Company - San Francisco Refinery

Rodeo, CA

Installed Capital Costs			
SCR duct, catalyst, ammonia vaporization skid, and aqueous ammonia storage	$ 1,216,602	Vendor quote	No utilities, no installation, no maintenance
Direct Annual Costs			
Operating and Supervisory Labor	$0		
Maintenance Labor (0.015 installed capital cost)	$18,249		
Annual Reagent Consumption Cost	$33,922		
Ammonia volume flow rate	13	lb/hr	
Ammonia reagent cost	$0.30	$/lb	
Capacity factor	1.0	--	
Annual Electricity Cost	$3,295		
Heat input rate	14.8	MMBtu/hr	
Input NO_x concentration	0.38	lb/MMBtu	
Pressure drop (duct)	2	in H_2O	
Number of catalyst layers	3	--	
Pressure drop (catalyst)	0.75	in H_2O	
Capacity factor	1.0	--	
Electricity cost	$0.10	$/kWh	
Annual Catalyst Replacement Cost	$0.01		
Catalyst volume	44.2	cu ft	
Catalyst cost	$240	$/cu ft	
Catalyst replacement factor (R_{layer})	1		
Catalyst operating life	8,760	hours	
Term of FWF	175.2	years	
Future Worth Factor (FWF)	0.00	--	
Subtotal (DAC)	$52,171		
Indirect Annual Costs (TCI x CRF)	$165,297		
Capital Recovery Factor (6% over 10 years)	0.136		
Total Annual Costs (TAC)	**$217,468**		
Uncontrolled NO_x emissions	13	tons/yr	
Removal efficiency	78%		
Controlled NO_x emissions[1]	2.9	tons/yr	
Annual NO_x removed	10.1	tons/yr	
Cost Effectiveness	**$21,531**	**$/ton NOx**	
BAAQMD NOx cost effectiveness threshold	**$17,500**	**$/ton NOx**	

[1] Vendor Guarantee

Reference:

USEPA, "EPA Air Pollution Control Cost Manual, 7th Edition," EPA-452-02-001, 2002.

SCR Chapter Updated 2019

Appendix Q, Table Q-6

Cost Analysis for SCR RACT Analysis for SCRs from Equipment Vendor

For 2 SCRs (one for each thermal oxidizer at U237)

Phillips 66 Company - San Francisco Refinery

Rodeo, CA

Installed Capital Costs			
SCR duct, catalyst, ammonia vaporization skid, and aqueous ammonia storage	$15,600,000	Vendor quote	No utilities, no installation, no maintenance
Direct Annual Costs			
Operating and Supervisory Labor	$0		
Maintenance Labor (0.015 installed capital cost)	$234,000		
Annual Reagent Consumption Cost	$33,922		
Ammonia volume flow rate	13	lb/hr	
Ammonia reagent cost	$0.30	$/lb	
Capacity factor	1.0	--	
Annual Electricity Cost	$3,295		
Heat input rate	14.8	MMBtu/hr	
Input NO_x concentration	0.38	lb/MMBtu	
Pressure drop (duct)	2	in H_2O	
Number of catalyst layers	3	--	
Pressure drop (catalyst)	0.75	in H_2O	
Capacity factor	1.0	--	
Electricity cost	$0.10	$/kWh	
Annual Catalyst Replacement Cost	$0.01		
Catalyst volume	44.2	cu ft	
Catalyst cost	$240	$/cu ft	
Catalyst replacement factor (R_{layer})	1		
Catalyst operating life	8,760	hours	
Term of FWF	175.2	years	
Future Worth Factor (FWF)	0.00	--	
Subtotal (DAC)	$267,922		
Indirect Annual Costs (TCI x CRF)	$2,119,540		
Capital Recovery Factor (6% over 10 years)	0.136		
Total Annual Costs (TAC)	**$2,387,462**		
Uncontrolled NO_x emissions	13	tons/yr	
Removal efficiency	78%		
Controlled NO_x emissions[1]	2.9	tons/yr	
Annual NO_x removed	10.1	tons/yr	
Cost Effectiveness	**$236,382**	**$/ton NOx**	
BAAQMD NOx cost effectiveness threshold	**$17,500**	**$/ton NOx**	

[1] Vendor Guarantee

Reference:

USEPA, "EPA Air Pollution Control Cost Manual, 7th Edition," EPA-452-02-001, 2002.

SCR Chapter Updated 2019

Appendix Q, Table Q-7: BACT Comparison Tables

BACT Guidelines at Other Air Districts

Air District	VOC	Date of Update
Texas Commission on Environmental Quality (TCEQ)	Specify which is applicable: 1. Uncontrolled VOC emissions < 10 tpy: none 2. 10 tpy < uncontrolled VOC emissions < 25 tpy: 28M leak detection and repair program. 75% credit for 28M. 3. Uncontrolled VOC emissions > 25 tpy: 28VHP leak detection and repair program. 97% credit for valves, 85% for pumps and compressors. 4. VOC vp < 0.002 psia: no inspection required, no fugitive emissions expected. 5. For emissions of approved odorous compounds (chlorine, ammonia, hydrogen sulfide, hydrogen cyanide and mercaptans only): AVO inspection twice per shift. Appropriate credit for AVO program.	2011
South Coast Air Quality Management District (SCAQMD)	All components in VOC service except for pumps, compressors and drains: 200 < leak < 1,000 ppm measured as methane shall be repaired within 14 days. Leak > 1,000 ppm shall be repaired according to Rule 1173. All pumps, compressor and drains: 500 < leak < 1,000 ppm measured as methane shall be repaired within 14 days. Leak > 1,000 ppm shall be repaired according to Rule 1173.	12/5/2003
San Joaquin Valley AQMD	Valves & Connectors: 100 ppm Pump & Compressor Seals: 500 ppm	7/22/2020
Santa Barbara AQMD	BACT Technologies. Valves, flanges, pump seals, compressor seals, pressure relief valves/devices, other components: 100 ppm	11/20/2017
Sacramento Metropolitan AQMD	None	n/a

EPA RACT/BACT/LAER Clearinghouse: Keyword "Equipment Leak"

RBLCID	FACILITY NAME	DATE DETERMINATION LAST UPDATED	PROCESS NAME	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	EMISSION LIMIT 1 AVG TIME CONDITION	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	EMISSION LIMIT 2 AVGERAGE TIME CONDITION	POLLUTANT COMPLIANCE NOTES
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPLEX	5/4/2016	VOC Emissions from Equipment Leaks	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR) Monitoring System	1.1	TONS/YR	ROLLING TWELVE (12) MONTH TOTAL	0			
IA-0111	DES MOINES SOYBEAN PROCESSING PLANT	7/6/2016	Equipment Leaks	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR) Monitoring System	788	TONS/YR	ROLLING 12-MONTH TOTAL	0			Work practice requirements so no short term limit.
IL-0115	WOOD RIVER REFINERY	7/6/2016	EQUIPMENT LEAKS/FUGITIVE EMISSIONS	Volatile Organic Compounds (VOC)	LDAR BUT LOWER LEAK DEFINITION FOR VALVES IN G/LL SERVICE (500 PPM) AND PUMP SEALS IN LL (2000 PPM); LOW EMISSION VALVES WHERE APPROPRIATE.	0			0			
IL-0119	PHILLIPS 66 PIPELINE LLC	9/14/2016	Equipment Leaks / Fugitive Emissions	Volatile Organic Compounds (VOC)	LDAR	0			0			40 CFR 63 Subpart H plus the following: b.The Permittee shall monitor affected components to detect leaks by the method specified in 40 CFR 63.180(b), except that a more stringent definition of a leak shall apply, i.e., an instrument reading of 500 parts per million or greater from valves in gas and light liquid service and an instrument reading of 2,000 ppm or greater from pumps in light liquid service shall be considered a leak. c.The Permittee shall install the following low emission components associated with the affected product tank (Tank 2003): i.Dual mechanical seals for all pumps in gas/vapor or light liquid service as defined by 40 CFR 63.161. ii.Low emission valves for all valves in gas/vapor or light liquid service as defined by 40 CFR 63.161.
IN-0173	MIDWEST FERTILIZER CORPORATION	5/4/2016	FUGITIVE EMISSIONS FROM EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	LEAK DETECTION AND REPAIR (LDAR) PROGRAM USING 40 CFR 60, SUBPART VVA PROCEDURES	0			0			
IN-0180	MIDWEST FERTILIZER CORPORATION	5/5/2016	FUGITIVE EMISSIONS FROM EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	LEAK DETECTION AND REPAIR (LDAR) PROGRAM USING 40 CFR 60, SUBPART VVA PROCEDURES	0			0			

*IN-0324	MIDWEST FERTILIZER COMPANY LLC	5/12/2022	Fugitive emissions from equipment leaks F-1	Volatile Organic Compounds (VOC)		0			0			Fugitive VOC emissions shall be controlled by a Leak Detection and Repair (LDAR) program. The leak detection and repair program specified in 40 CFR 60, Subpart VVa shall serve as BACT for VOC fugitive emissions.
*IN-0345	EVONIK CORPORATION TIPPECANOE LABORATORIES	3/23/2022	Bulk Chemical Manuf. Equipment Leaks/Fugitive	Volatile Organic Compounds (VOC)		0		MONTHLY SENSORY BASED MONITORING	0			(1)When equipment is operating as affected facilities under 40 CFR 63, Subpart GGG, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63.1255. (2)When equipment is operating as affected facilities under 40 CFR 63, Subpart DD, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63.691. (3)When equipment is operating as affected facilities under 40 CFR 63, Subpart FFFF, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63.2480. (4)When equipment is operating as affected facilities under 40 CFR 63 Subparts F, G, or H, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63, Subpart H. (5)The VOC BACT for equipment leaks
KY-0112	WESTLAKE VINYLS, INC.- PVC PLANT	4/6/2021	Fugitive Equipment Leaks [EU20]	Volatile Organic Compounds (VOC)	includes: proper labeling and following the requirements in 40 CFR 63, Subpart UU and following good work practices including: 1.Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes based on the material. 2. New and reworked buried connectors shall be welded. 3. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be reasonably accessible for leak checking during plant operation. 4. Damaged, leaking, or severely rusted valves, connectors, compressor seals, agitator seals, and pump seals found by visual inspection to be leaking (e.g., process fluids) shall be tagged and replaced or repaired. All leaking components that cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging.	0			0			For pumps subject to 401 KAR 51:017, the permittee shall install leakless pumps with dual mechanical seals or with a barrier fluid to reduce leaks. If a leakless pump is not feasible, the permittee shall submit justification as to its technical infeasibility. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors in gas\vapor and light liquid service shall be monitored annually with an approved gas analyzer.
LA-0331	CALCASIEU PASS LNG PROJECT	6/19/2019	Fugitive Equipment Leaks	Volatile Organic Compounds (VOC)	Proper piping design and compliance with LAC 33:III.2111.	5	T/YR	ANNUAL TOTAL	0			

MD-0045	MATTAWOMAN ENERGY CENTER	5/13/2016	EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)		0			0			VOC LAER FOR THE NATURAL GAS PIPELINE COMPONENTS ASSOCIATED WITH THE PIPELINE SHALL BE THE IMPLEMENTATION OF AN AUDIBLE, VISUAL, AND OLFACTORY (AVO) PROGRAM PLAN ON SITE FOR THE REVIEW UPON REQUEST BY MDE-ARMA. IN ACCORDANCE WITH THE AVO PROGRAM PLAN, THE INSPECTIONS SHALL BE DOCUMENTED, LEAKS IDENTIFIED FROM THE AVO ASSESMENT SHALL BE REPAIRED WITHIN FIVE DAYS OF DISCOVERY, REPAIRS DOCUMENTED, AND ASSOCIATED REPAIR RECORDS MAINTAINED.
OH-0368	PALLAS NITROGEN LLC	6/19/2019	Urea Process Equipment Leaks (F004)	Volatile Organic Compounds (VOC)	Leak detection and repair (LDAR) and comply with work practice standards in 40 CFR 60.482-1a â€“ 60.482-11a as applicable for all equipment in VOC service.	4.1	LB/H		17.9	T/YR	PER ROLLING 12 MONTH PERIOD	
OK-0148	BUFFALO CREEK PROCESSING PLANT	5/11/2018	Fugitive Equipment Leaks (Natural Gas Plant)	Volatile Organic Compounds (VOC)	LDAR.	0			0			Comply with baseline NSPS, Subpart OOOO.
OK-0156	NORTHSTAR AGRI IND ENID	5/11/2018	Equipment Leaks	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR)	0			0			NFPA 36/Monitoring
OK-0176	BPV GATHERING AND MARKETING CUSHING STATION	5/11/2018	FUGITIVE EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	Conduct and record AVO observations.	217.24	TONS/YEAR/FACILITY		0			40 CFR Part 112
OK-0180	CUSHING TERMINAL	9/10/2021	FUGITIVE EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	Conduct and record AVO observations. Prepare, implement, and maintain SPCC plan. Records of inspections, identified leaks, and corrective actions.	0			0			Addresses increase from additional (added) components.
*TN-0163	HOLSTON ARMY AMMUNITION PLANT	3/21/2019	Fugitive Equipment Leaks	Volatile Organic Compounds (VOC)	Comply with NSPS VVa work practices	0			0			
TX-0731	CORPUS CHRISTI TERMINAL CONDENSATE SPLITTER	5/16/2016	, Petroleum Refining Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	Quarterly instrumental monitoring using a method 21 gas analyzer for all valves, pump seals, compressor seals, and agitator seals with a leak definition of 500 parts per million volume (ppmv) for valves and 2,000 ppmv for pump, compressor and agitator seals. Leaking components must be repaired within 15 days of detection of the leak.	36.6	TPY		0			
TX-0765	SUNOCO MARINE VESSEL LOADING OPERATIONS	7/6/2016	Petroleum Refining Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	Quarterly instrumental monitoring using a method 21 gas analyzer for all valves, pump seals, compressor seals, and agitator seals with a leak definition of 500 ppmv for valves and 2,000 ppmv for pump, compressor and agitator seals. Leaking components must be repaired within 15 days of detection of the leak.	10.13	TPY		0			28VHP
TX-0797	CORPUS CHRISTI TERMINAL	7/29/2016	Petroleum Refining Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	Fugitive Leak Detection and Repair (LDAR) per the 28 MID Monitoring program that requires quarterly monitoring of all components with a leak definition of 500 ppmv and directed maintenance.	500	PPM		33.1	T/YR		SIP Subchapter D â€“ Petroleum Refining, Natural Gas Processing, and Petrochemical Processes.
TX-0811	LINEAR ALPHA OLEFINS PLANT	11/16/2017	SOCMI Equipment Leaks	Volatile Organic Compounds (VOC)	Quarterly instrumental monitoring of all accessible piping components (pumps, compressors, valves, flanges) in vapor and light liquid service with a leak definition of 500 ppmv VOC. Weekly audio-visual-olfactory monitoring for all components in heavy liquid service. Upon detection of a leak, a first attempt must be made to repair within 5 days, and repairs must be	6.87	T/YR		0			MACT FFFF, 30 TAC 115, SUBCHAPTER H

TX-0812	CRUDE OIL PROCESSING FACILITY	11/16/2017	Equipment Leaks	Volatile Organic Compounds (VOC)	Quarterly instrumental monitoring of accessible pumps, compressors and valves in vapor or light liquid service, with leak definitions of 500 ppmv (valves) and 2,000 ppmv (pump and compressor seals). Upon detection of a leak, a first attempt to repair must be made within 5 days, and repairs must be completed within 15 days.	8.72	T/YR		0			NSPS GGG, GGGa, 30 TAC 115, SUBCHAPTER D
TX-0847	VALERO PORT ARTHUR REFINERY	4/4/2019	Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	28 VHP	0			0			
TX-0903	SWEENY REFINERY	9/14/2021	Equipment Leaks/Fugitive Emission	Volatile Organic Compounds (VOC)	Fugitive Leak Detection and Repair (LDAR) per the 28MID, 28PI, 28CNTQ, and 28CNTA monitoring programs.	0			0			

EPA RACT/BACT/LAER Clearinghouse: Keyword "Fugitive"

RBLCID	FACILITY NAME	DATE DETERMINATION LAST UPDATED	PROCESS NAME	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	EMISSION LIMIT 1 AVG TIME CONDITION	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT	EMISSION LIMIT 2 AVGERAGE TIME CONDITION	POLLUTANT COMPLIANCE NOTES
FL-0368	NUCOR STEEL FLORIDA FACILITY	3/4/2022	Meltshop Baghouse & Fugitives	Volatile Organic Compounds (VOC)	Good combustion practice and process control along with a scrap management plan	0.3	LB/TON OF STEEL	3-HOUR AVG	18	LB/HOUR	3-HOUR AVG	
*IA-0117	SHELL ROCK SOY PROCESSING	4/20/2021	Fugitive VOC Sources	Volatile Organic Compounds (VOC)		0.14	GAL/TON	VOC	0			
IL-0115	WOOD RIVER REFINERY	7/6/2016	EQUIPMENT LEAKS/FUGITIVE EMISSIONS	Volatile Organic Compounds (VOC)	LDAR BUT LOWER LEAK DEFINITION FOR VALVES IN G/LL SERVICE (500 PPM) AND PUMP SEALS IN LL (2000 PPM); LOW EMISSION VALVES WHERE APPROPRIATE.	0			0			
IL-0119	PHILLIPS 66 PIPELINE LLC	9/14/2016	Equipment Leaks / Fugitive Emissions	Volatile Organic Compounds (VOC)	LDAR	0			0			40 CFR 63 Subpart H plus the following: b. The Permittee shall monitor affected components to detect leaks by the method specified in 40 CFR 63.180(b), except that a more stringent definition of a leak shall apply, i.e., an instrument reading of 500 parts per million or greater from valves in gas and light liquid service and an instrument reading of 2,000 ppm or greater from pumps in light liquid service shall be considered a leak. c. The Permittee shall install the following low emission components associated with the affected product tank (Tank 2003): i.Dual mechanical seals for all pumps in gas/vapor or light liquid service as defined by 40 CFR 63.161. ii.Low emission valves for all valves in gas/vapor or light liquid service as defined by 40 CFR 63.161.
IN-0173	MIDWEST FERTILIZER CORPORATION	5/4/2016	FUGITIVE EMISSIONS FROM EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	LEAK DETECTION AND REPAIR (LDAR) PROGRAM USING 40 CFR 60, SUBPART VVA PROCEDURES	0			0			
IN-0179	OHIO VALLEY RESOURCES, LLC	5/4/2016	FUGITIVE VOC EMISSIONS	Volatile Organic Compounds (VOC)	USE OF A LEAK DETECTION AND REPAIR (LDAR) PROGRAM USING 40 CFR 60, SUBPART VVA PROCEDURES.	0			0			
IN-0180	MIDWEST FERTILIZER CORPORATION	5/5/2016	FUGITIVE EMISSIONS FROM EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	LEAK DETECTION AND REPAIR (LDAR) PROGRAM USING 40 CFR 60, SUBPART VVA PROCEDURES	0			0			
IN-0200	ELI LILLY AND COMPANY-CLINTON LABORATORIES	6/8/2016	FUGITIVES VOC	Volatile Organic Compounds (VOC)		0			0			THE FUGITIVES VOC EMISSIONS SHALL BE MINIMIZED BY USE OF A LEAK DETECTION AND REPAIR PROGRAM WHICH REQUIRES TIMELY REPAIRS OF PIPING AND EQUIPMENT COMPONENTS FOUND LEAKING.
IN-0317	RIVERVIEW ENERGY CORPORATION	5/26/2021	Block 2000 fugitive emissions	Volatile Organic Compounds (VOC)	leak detection and repair (LDAR) program	151.18	TONS	12 CONSECUTIVE MONTHS	0			40 CFR 60, subpart GGGa
IN-0317	RIVERVIEW ENERGY CORPORATION	5/26/2021	Block 4000 fugitive emissions	Volatile Organic Compounds (VOC)	Leak detection and repair (LDAR) program	25.04	TONS	12 CONSECUTIVE MONTHS	0			40 CFR 60, subpart GGGa
*IN-0324	MIDWEST FERTILIZER COMPANY LLC	5/12/2022	Fugitive emissions from equipment leaks F-1	Volatile Organic Compounds (VOC)		0			0			Fugitive VOC emissions shall be controlled by a Leak Detection and Repair (LDAR) program. The leak detection and repair program specified in 40 CFR 60, Subpart VVa shall serve as BACT for VOC fugitive emissions.

*IN-0345	EVONIK CORPORATION TIPPECANOE LABORATORIES	3/23/2022	Bulk Chemical Manuf. Equipment Leaks/Fugitive	Volatile Organic Compounds (VOC)		0		MONTHLY SENSORY BASED MONITORING	0			When equipment is operating as affected facilities under 40 CFR 63, Subpart GGG, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63.1255. (2)When equipment is operating as affected facilities under 40 CFR 63, Subpart DD, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63.691. (3)When equipment is operating as affected facilities under 40 CFR 63, Subpart FFFF, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63.2480. (4)When equipment is operating as affected facilities under 40 CFR 63 Subparts F, G, or H, VOC BACT for equipment leaks is an LDAR program as specified in 40 CFR 63, Subpart H. (5)The VOC BACT for equipment leaks for connectors in on-site waste service is an LDAR program as specified in 40 CFR 63, Subpart H, except connector
KY-0112	WESTLAKE VINYLS, INC.- PVC PLANT	4/6/2021	Fugitive Equipment Leaks [EU20]	Volatile Organic Compounds (VOC)	includes: proper labeling and following the requirements in 40 CFR 63, Subpart UU and following good work practices including: 1.Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes based on the material. 2. New and reworked buried connectors shall be welded. 3. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be reasonably accessible for leak checking during plant operation. 4. Damaged, leaking, or severely rusted valves, connectors, compressor seals, agitator seals, and pump seals found by visual inspection to be leaking (e.g., process fluids) shall be tagged and replaced or repaired. All leaking components that cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging.	0			0			For pumps subject to 401 KAR 51:017, the permittee shall install leakless pumps with dual mechanical seals or with a barrier fluid to reduce leaks. If a leakless pump is not feasible, the permittee shall submit justification as to its technical infeasibility. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors in gas\vapor and light liquid service shall be monitored annually with an approved gas analyzer.
KY-0113	WESTLAKE CHEMICAL OPCO, LP	4/6/2021	EU# 025A (EPN FUG-ETH-VVa) Ethylene Plant Fugitives	Volatile Organic Compounds (VOC)	includes: proper labeling and following the requirements in 40 CFR 60, Subpart VVa and following good work practices including: 1.Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes based on the material. 2. New and reworked buried connectors shall be welded. 3. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be reasonably accessible for leak checking during plant operation. 4. Damaged, leaking, or severely rusted valves, connectors, compressor seals, agitator seals, and pump seals found by visual inspection to be leaking (e.g., process fluids) shall be tagged and replaced or repaired. All leaking components that cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging.	0			0			For pumps subject to 401 KAR 51:017, the permittee shall install leakless pumps with dual mechanical seals or with a barrier fluid to reduce leaks. If a leakless pump is not feasible, the permittee shall submit justification as to its technical infeasibility. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors in gas\vapor and light liquid service shall be monitored annually with an approved gas analyzer.

KY-0113	WESTLAKE CHEMICAL OPCO, LP	4/6/2021	EU# 025B (EPN FUG-ETH) Ethylene Plant Fugitives	Volatile Organic Compounds (VOC)	includes: proper labeling and following the requirements in 40 CFR 60, Subpart VVa and following good work practices including: 1.Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes based on the material. 2. New and reworked buried connectors shall be welded. 3. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be reasonably accessible for leak checking during plant operation. 4. Damaged, leaking, or severely rusted valves, connectors, compressor seals, agitator seals, and pump seals found by visual inspection to be leaking (e.g., process fluids) shall be tagged and replaced or repaired. All leaking components that cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging.	0			0			For pumps subject to 401 KAR 51:017, the permittee shall install leakless pumps with dual mechanical seals or with a barrier fluid to reduce leaks. If a leakless pump is not feasible, the permittee shall submit justification as to its technical infeasibility. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors in gas\vapor and light liquid service shall be monitored annually with an approved gas analyzer.
KY-0113	WESTLAKE CHEMICAL OPCO, LP	4/6/2021	EU# 025 (EPN FUG-ETH-YY) Ethylene Plant Fugitives	Volatile Organic Compounds (VOC)	includes: proper labeling and following the requirements in 40 CFR 63, Subpart YY and Subpart UU and following good work practices including: 1.Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes based on the material. 2. New and reworked buried connectors shall be welded. 3. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be reasonably accessible for leak checking during plant operation. 4. Damaged, leaking, or severely rusted valves, connectors, compressor seals, agitator seals, and pump seals found by visual inspection to be leaking (e.g., process fluids) shall be tagged and replaced or repaired. All leaking components that cannot be repaired until a scheduled shutdown	0			0			For pumps subject to 401 KAR 51:017, the permittee shall install leakless pumps with dual mechanical seals or with a barrier fluid to reduce leaks. If a leakless pump is not feasible, the permittee shall submit justification as to its technical infeasibility. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors in gas\vapor and light liquid service shall be monitored annually with an approved gas analyzer.
KY-0114	WESTLAKE VINYLS, INC.- VINYLS PLANT	4/6/2021	FUG-MON-H Monomer Plant Fugitives	Volatile Organic Compounds (VOC)	MACT H LDAR program as required by the regulations, and promptly repairing any leaking components in accordance with the LDAR plan. 2.Leak is defined as a reading of 500 ppmv. 3.The permittee will install leakless pumps with dual mechanical seals or with a barrier fluid to reduce leaks, as possible. If a leakless pump is not feasible, the permittee shall submit justification as to its technical infeasibility. 4.The permittee will monitor new non-leakless pumps to a leak detection threshold of 500 ppm. 5.The permittee will utilize Good Work Practices. Good work practices include: 1.Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes based on the material. 2.New and reworked buried connectors	0			0			

KY-0114	WESTLAKE VINYLS, INC.- VINYLS PLANT	4/6/2021	FUG-MON-NG Monomer Plant Fugitives In Natural Gas service	Volatile Organic Compounds (VOC)	consistent with 40 CFR 63, Subpart H requirements. 2.Leak is defined as a reading of 500 ppmv. 3.Good work practices. (4) The permittee shall install leak-less pumps with dual mechanical seals or with a barrier fluid to reduce leaks. If a leak-less pump is not feasible, the permittee shall submit justification as to its technical infeasibility. Good work practices including: Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes based on the material. 2. New and reworked buried connectors shall be welded. 3. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be reasonably accessible for leak checking during plant operation.	0			0			the permittee shall install leakless pumps with dual mechanical seals or with a barrier fluid to reduce leaks. If a leakless pump is not feasible, the permittee shall submit justification as to its technical infeasibility. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. In addition, all connectors in gas\vapor and light liquid service shall be monitored annually with an approved gas analyzer.
LA-0272	AMMONIA PRODUCTION FACILITY	5/4/2016	FUGITIVE EMISSIONS (FUG)	Volatile Organic Compounds (VOC)		0			0			THE PSD PERMIT DOES NOT ESTABLISH MASS EMISSION LIMITS FOR FUGITIVE EMISSIONS. NO LDAR PROGRAM PRESCRIBED.
LA-0277	COMONIMER-1 UNIT	4/28/2017	Fugitive Emissions	Volatile Organic Compounds (VOC)	Comply with requirements of 40 CFR 63 Subpart UU and LAC 33:III.2111	0			0			
LA-0282	ALLIANCE REFINERY	9/14/2016	Unit Fugitives for the Low Sulfur Gasoline Unit (294-FF, FUG 0004)	Volatile Organic Compounds (VOC)	Louisiana MACT Determination for Refinery Equipment Leaks (Fugitive Emission Sources) dated July 26, 1994	15.43	LB/HR	HOURLY AVERAGE	67.59	TPY	ANNUAL MAXIMUM	
LA-0283	ALLIANCE REFINERY	9/14/2016	UNIT FUGITIVES FOR LOW SULFUR GASOLINE UNIT (294-FF, FUG 0004)	Volatile Organic Compounds (VOC)	LDAR: Louisiana MACT Determination for Refinery Equipment Leaks (Fugitive Emission Sources) dated July 26, 1994	15.43	LB/HR	HOURLY AVERAGE	67.59	TPY	ANNUAL MAXIMUM	
LA-0284	ALLIANCE REFINERY	12/20/2016	Unit Fugitives for Loading Docks (406-FF, FUG 11)	Volatile Organic Compounds (VOC)	LDAR: 40 CFR 63 Subpart H	0			0			
LA-0288	LAKE CHARLES CHEMICAL COMPLEX	9/14/2016	Power Area Fugitives (FUG 12)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR) Program: 40 CFR 63 Subpart FFFF	0.01	TPY	ANNUAL MAXIMUM	0			The LDAR program applies only to components conveying MON-regulated fuel gas to the boilers
LA-0290	LAKE CHARLES CHEMICAL COMPLEX GTL LAB-2 UNIT	4/28/2017	LAB-2 Unit Fugitive Emissions (FUG 11)	Volatile Organic Compounds (VOC)	Leak detection and repair (LDAR) program: 40 CFR 63 Subpart H	16.77	TPY	ANNUAL MAXIMUM	0			
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	9/19/2016	GTL Unit Fugitive Emissions (FUG 15)	Volatile Organic Compounds (VOC)	Leak detection and repair (LDAR) program: 40 CFR 63 Subpart FFFF	89.13	TPY	ANNUAL MAXIMUM	0			
LA-0294	DODSON DIVISION	12/20/2016	Fugitive Ink Emissions (039, FUG 4)	Volatile Organic Compounds (VOC)	Good housekeeping practices and the use of low VOC materials when possible. Good housekeeping practices include keeping containers closed and minimizing spills and leaks to the maximum extent practical.	0.34	LB/H	HOURLY MAXIMUM	1.21	T/YR	ANNUAL MAXIMUM	
LA-0295	WESTLAKE FACILITY	9/19/2016	Facility Fugitive Emissions (FUG 4)	Volatile Organic Compounds (VOC)	Leak detection and repair (LDAR): LAC 33:III.2122	0			0			40 CFR 60 Subpart DDD (referencing Subpart VV) is also applicable, but LAC 33:III.2122 is the overall most stringent program.
LA-0296	LAKE CHARLES CHEMICAL COMPLEX LDPE UNIT	4/28/2017	LDPE Fugitives (FUG 13)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): 40 CFR 60 Subpart VVa	17.44	TPY	ANNUAL MAXIMUM	0			
LA-0297	LAKE CHARLES CHEMICAL COMPLEX LLDPE UNIT	4/28/2017	LLDPE Fugitive Emissions (FUG 10)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): 40 CFR 63 Subpart FFFF	17.44	TPY	ANNUAL MAXIMUM	0			
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	4/28/2017	Guerbet Fugitive Emissions (FUG 14)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): LAC 33:III.2122	25.54	TPY	ANNUAL MAXIMUM	0			
LA-0299	LAKE CHARLES CHEMICAL COMPLEX ETHOXYLATION UNIT	4/28/2017	Fugitives (FUG 21)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): 40 CFR 63 Subpart FFFF	10.92	TPY	ANNUAL MAXIMUM	0			
LA-0300	LAKE CHARLES CHEMICAL COMPLEX ALUMINA UNIT	4/28/2017	Alumina Unit Fugitives (FUG 7)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): LAC 33:III.2122	21.38	TPY	ANNUAL MAXIMUM	0			
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	4/28/2017	Steam Fugitive Emissions (FUG 17)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): LAC 33:III.2122	88.14	TPY	ANNUAL MAXIMUM	0			
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	4/28/2017	Fugitive Emissions (FUG 19)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): 40 CFR 63 Subpart UU	90.31	TPY	ANNUAL MAXIMUM	0			
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	4/28/2017	Fugitive Emissions (FUG 20)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): 40 CFR 63 Subpart H	26.51	TPY	ANNUAL MAXIMUM	0			
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	4/28/2017	Fugitive Emissions (FUG 22)	Volatile Organic Compounds (VOC)	Leak Detection and Repair (LDAR): 40 CFR 63 Subpart FFFF	308.48	TPY	ANNUAL MAXIMUM	0			
LA-0307	MAGNOLIA LNG FACILITY	4/28/2017	fugitives	Volatile Organic Compounds (VOC)	Comply with LAC 33:III.2111	0			0			

*LA-0312	ST. JAMES METHANOL PLANT	5/1/2020	WWTF-13 - Wastewater Treatment Fugitives (FUG0001)	Volatile Organic Compounds (VOC)	Compliance with NESHAP Subpart F and NESHAP Subpart G. LDAR Monitoring.	0.29	LB/HR		0				
*LA-0312	ST. JAMES METHANOL PLANT	5/1/2020	PF-13 - Process Fugitives (FUG0002)	Volatile Organic Compounds (VOC)	Compliance with NESHAP Subpart H. LDAR Monitoring.	0			0				
LA-0314	INDORAMA LAKE CHARLES FACILITY	4/28/2017	Fugitive Emissions	Volatile Organic Compounds (VOC)	proper piping design, complying with LAC 33:III.2111, and conduct an LDAR meeting requirements of 40 CFR 63 Subpart UU	0			0				
*LA-0315	G2G PLANT	4/5/2021	Process Methanol Fugitives	Volatile Organic Compounds (VOC)	Compliance with 40 CFR 63 Subpart H LDAR program	0.08	LB/H	HOURLY MAXIMUM	0.36	T/YR	ANNUAL MAXIMUM		
*LA-0315	G2G PLANT	4/5/2021	Process Gasoline Fugitives	Volatile Organic Compounds (VOC)	Compliance with 40 CFR 63 Subpart H LDAR program	0.18	LB/H	HOURLY MAXIMUM	0.79	T/YR	ANNUAL MAXIMUM		
*LA-0315	G2G PLANT	4/5/2021	Wastewater System Fugitives	Volatile Organic Compounds (VOC)	Compliance with 40 CFR 63 Subpart H LDAR program	0.01	LB/H	HOURLY MAXIMUM	0.05	T/YR	ANNUAL MAXIMUM		
LA-0316	CAMERON LNG FACILITY	4/28/2017	fugitive emissions	Volatile Organic Compounds (VOC)	Complying with LAC 33:III.2111	0			0				
LA-0319	LAKE CHARLES CHEMICAL COMPLEX - COMONOMER-1 UNIT	4/28/2017	Fugitive Emissions FE-1	Volatile Organic Compounds (VOC)	Complying with 40 CFR 63 Subpart UU	0			0				
LA-0328	PLAQUEMINES PLANT 1	2/19/2019	Fugitive Emissions (Bio)	Volatile Organic Compounds (VOC)	Comply with 40 CFR 63 Subpart H	0.35	LB/H		0				
LA-0328	PLAQUEMINES PLANT 1	2/19/2019	PVC Unit Fugitives	Volatile Organic Compounds (VOC)	Comply with 40 CFR 63 Subpart H	0.263	LB/H		0				
LA-0331	CALCASIEU PASS LNG PROJECT	6/19/2019	Fugitive Equipment Leaks	Volatile Organic Compounds (VOC)	Proper piping design and compliance with LAC 33:III.2111.	5	T/YR	ANNUAL TOTAL	0				
LA-0346	GULF COAST METHANOL COMPLEX	8/6/2021	fugitives	Volatile Organic Compounds (VOC)	LDAR meets requirements of 40 CFR 63 Subpart H	0			0				
LA-0349	DRIFTWOOD LNG FACILITY	8/6/2021	Fugitives	Volatile Organic Compounds (VOC)	Good Work Practices, Comply with LAC 33:III.2111, 40 CFR 63 Subpart H, TT, or UU, as applicable	0			0				
LA-0355	GARYVILLE REFINERY	8/6/2021	Fugitives from Crude Unit, Coker Unit and FCCU	Volatile Organic Compounds (VOC)	Comply with 40 CFR 60 Subpart GGGa	0			0				
LA-0356	GARYVILLE REFINERY	8/6/2021	Fugitive Emissions (Unit 305, Unit 333, Refinery, GRL)	Volatile Organic Compounds (VOC)	Comply with 40 CFR 60 Subpart GGGa	0			0				
LA-0362	LAKE CHARLES REFINERY, AREA D	8/9/2021	Area D Process D Fugitives	Volatile Organic Compounds (VOC)	Compliance with the most stringent applicable Leak Detection and Repair (LDAR) program, which is Louisiana MACT Determination for Refineries with Consent Decree Enhancements	24.44	LB/H		0				
LA-0364	FG LA COMPLEX	8/9/2021	Fugitive Emissions	Volatile Organic Compounds (VOC)	Compliance with applicable provisions 40 CFR 63 Subpart UU.	0			0				
LA-0364	FG LA COMPLEX	8/9/2021	Fugitive Emissions HON	Volatile Organic Compounds (VOC)	Compliance with applicable provisions 40 CFR 63 Subpart H.	0			0				
LA-0366	HOLDEN WOOD PRODUCTS MILL	4/30/2021	Shavings Bin and Truck Load-out Fugitives	Volatile Organic Compounds (VOC)		13.9	T/HR		0				
LA-0373	LAKE CHARLES CHEMICAL COMPLEX	8/9/2021	UO&I Fugitives - FUG0024	Volatile Organic Compounds (VOC)	Comply with 40 CFR 63 Subpart UU	0			0				
LA-0379	SHINTECH PLAQUEMINES PLANT 1	3/4/2022	PVC Unit Fugitive Emissions 2	Volatile Organic Compounds (VOC)	Comply with 40 CFR 63 Subpart H.	0.243	LB/HR		1.06	T/YR			
LA-0382	BIG LAKE FUELS METHANOL PLANT	3/4/2022	Fugitives (FUG0001)	Volatile Organic Compounds (VOC)	Comply with 40 CFR 63 Subpart H	0			0				
LA-0383	LAKE CHARLES LNG EXPORT TERMINAL	3/4/2022	Fugitives (FUG0001)	Volatile Organic Compounds (VOC)	Proper piping design and LDAR	0			0				
LA-0385	GARYVILLE REFINERY	3/4/2022	Refinery Fugitives	Volatile Organic Compounds (VOC)	Comply with 40 CFR 60 Subpart GGGa (for components servicing streams with 10% or more VOC)	0			0				
*LA-0388	LACC LLC US - ETHYLENE PLANT	5/12/2022	Ethylene Plant Fugitive Emissions	Volatile Organic Compounds (VOC)	Compliance with 40 CFR 63 Subpart UU	93.93	T/YR		0				
MS-0092	EMBERCLEAR GTL MS	11/7/2016	Process fugitives	Volatile Organic Compounds (VOC)	LDAR for all equipment in VOC service, equivalent to NSPS VVa	0			0				
OH-0358	RUMPKE SANITARY LANDFILL	5/4/2016	Fugitive emissions from 4 Gas Recovery Plants	Volatile Organic Compounds (VOC)		745.7	T/YR		0				Limits for non-methane organic compounds (NMOC). Subject to Part 60 Subpart WWW and Part 63 Subpart AAAA for landfills; 98% control efficiency or reduce NMOC at outlet to less than 20 ppm.

OH-0378	PTTGCA PETROCHEMICAL COMPLEX	6/19/2019	Fugitive Emissions (P807)	Volatile Organic Compounds (VOC)	requirements to the most stringent leak detection and repair (LDAR) regulation applicable to affected equipment/process units. The following identifies LDAR requirements for affected equipment/process units which have been determined to representative of BACT: i.40 CFR Part 63 Subpart UU as applicable to the ethylene manufacturing process with enhanced connector monitoring; ii.40 CFR Part 60 Subpart VVa as applicable to the polyethylene manufacturing process with enhanced connector monitoring; The LDAR programs indicated above which are representative of BACT shall implement the following enhanced connector monitoring requirements: i.connector monitoring subsequent to the initial monitoring required shall be performed on a quarterly basis; ii.If following the initial four (4) consecutive quarters, the percent leaking connectors in a process unit is less than 0.5 percent during the most recent quarterly monitoring event, then the frequency of connector monitoring can be reduced to semi-annual; iii.If following two (2) consecutive semi-	99.38	T/YR	PER ROLLING 12 MONTH PERIOD. SEE NOTES.	0			requirements to the most stringent leak detection and repair (LDAR) regulation applicable to affected equipment/process units. The following identifies LDAR requirements for affected equipment/process units which have been determined to representative of BACT: i.40 CFR Part 63 Subpart UU as applicable to the ethylene manufacturing process with enhanced connector monitoring; ii.40 CFR Part 60 Subpart VVa as applicable to the polyethylene manufacturing process with enhanced connector monitoring; The LDAR programs indicated above which are representative of BACT shall implement the following enhanced connector monitoring requirements: i.connector monitoring subsequent to the initial monitoring required shall be performed on a quarterly basis; ii.If following the initial four (4) consecutive quarters, the percent leaking connectors in a process unit is less than 0.5 percent during the most
OK-0153	ROSE VALLEY PLANT	7/29/2016	FUGITIVE EQUIPMENT	Volatile Organic Compounds (VOC)	LDAR IN COMPLIANCE WITH NSPS 000.	0			0			ALL FUGITIVE SOURCES WILL BE SUBJECT TO THE LDAR PROGRAM.
OK-0175	WILDHORSE TERMINAL	5/11/2018	Fugitive Emission Sources	Volatile Organic Compounds (VOC)		0			0			40 CFR Part 112 Prepare, implement, and maintain SPCC Plan. Records of quarterly inspections, identified leaks, and corrective actions shall be maintained.
OK-0176	BPV GATHERING AND MARKETING CUSHING STATION	5/11/2018	FUGITIVE EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	Conduct and record AVO observations.	217.24	TONS/YEAR/FACILITY		0			40 CFR Part 112
OK-0177	CUSHING SOUTH TANK FARM	3/4/2022	Fugitive emission source	Volatile Organic Compounds (VOC)	Prepare, implement, and maintain SPCC plan. Records of quarterly inspections, identified leaks, and corrective actions shall be maintained.	0			0			40 CFR Part 112.
OK-0180	CUSHING TERMINAL	9/10/2021	FUGITIVE EQUIPMENT LEAKS	Volatile Organic Compounds (VOC)	Conduct and record AVO observations. Prepare, implement, and maintain SPCC plan. Records of inspections, identified leaks, and corrective actions.	0			0			Addresses increase from additional (added) components.
*PA-0324	MARCUS HOOK	6/16/2021	Fugitive leaks	Volatile Organic Compounds (VOC)		500	PPM		0			LDAR program, leak definition of 500 ppm, 0.5% leak percetage rate for reduction in monitoring frequency
*PA-0330	SUPERIOR TUBE	9/24/2021	GENERAL SOURCE FUGITIVE EMISSIONS	Volatile Organic Compounds (VOC)	The permittee shall record the amount of VOC-containing solvent used by this spray booth on a weekly basis when in use, and perform monthly calculations to demonstrate compliance with the VOC emission limit for each 12 consecutive month period.	13.8	TONS	YEAR	0			
SC-0170	BP AMOCO CHEMICAL COMPANY - COOPER RIVER PLANT	6/6/2019	#1 OXIDATION UNIT FUGITIVES	Volatile Organic Compounds (VOC)	HON LDAR	0			0			FACILITY IS USING HON LDAR PROGRAM AS BACT LIMIT
SC-0170	BP AMOCO CHEMICAL COMPANY - COOPER RIVER PLANT	6/6/2019	#2 OXIDATION UNIT FUGITIVES	Volatile Organic Compounds (VOC)	HON LDAR	0			0			BACT LIMIT IS HON LDAR
SC-0182	FIBER INDUSTRIES LLC	4/12/2019	Fugitives	Volatile Organic Compounds (VOC)	Use of leakless types of components to replace individual chronically leaking components where possible and the use an LDAR program which includes the applicable provisions of 40 CFR 63, Subpart JJJ.	0			0			
SC-0183	NUCOR STEEL - BERKELEY	4/2/2019	Pickle Line Equipment (pickle line no. 3 fugitives)	Volatile Organic Compounds (VOC)	Proper Operation and Maintenance	0			0			VOC Minimization Plan
*TN-0163	HOLSTON ARMY AMMUNITION PLANT	3/21/2019	Fugitive Equipment Leaks	Volatile Organic Compounds (VOC)	Comply with NSPS VVa work practices	0			0			
TX-0656	GAS TO GASOLINE PLANT	5/12/2016	Fugitive Components	Volatile Organic Compounds (VOC)	LDAR 28 VHP	500	PPM		0			
TX-0657	BEAUMONT GAS TO GASOLINE PLANT	11/12/2020	Fugitive emissions in Gas to Gasoline Plant	Volatile Organic Compounds (VOC)	28 VHP Fugitive Monitoring Program	25.58	TPY		0			
TX-0661	OILTANKING APPELT TERMINAL	11/12/2020	Fugitive Sources	Volatile Organic Compounds (VOC)	LDAR	0.03	POUND	HOUR	0.13	TON	YEAR	
TX-0682	GALENA PARK TERMINAL	5/9/2016	Fugitives	Volatile Organic Compounds (VOC)	28 LAER monitoring program with a leak definition of 500 ppmv will be used for control of fugitives. A weekly visual inspection will also be performed on components in heavy liquid service	500	PPMV	LEAK DEFINITION	0			
TX-0711	CELANESE CLEAR LAKE PLANT	5/16/2016	Fugitives	Volatile Organic Compounds (VOC)	28 LAER leak detection and repair program	0			0			
TX-0721	PROPANE DEHYDROGENATION UNIT	1/31/2020	Fugitives	Volatile Organic Compounds (VOC)	VOC fugitives will be controlled by 28 MID LDAR programs.	0			0			

TX-0722	ORGANIC CHEMICAL MANUFACTURING	1/31/2020	Fugitives	Volatile Organic Compounds (VOC)	Chevron Phillipâ€™s proposes to utilize the 28 LAER leak detection and repair program with that addition of quarterly connector monitoring for fugitive components associated with the project.	0			0			
TX-0723	NATURAL GAS LIQUIDS PROCESSING PLANT	1/31/2020	Fugitives	Volatile Organic Compounds (VOC)	Piping, valves, pumps, compressors, and other fittings will be subject to a leak detection and repair program with some directed to flare control as minor vents. 28 LAER will be implemented	0			0			
TX-0731	CORPUS CHRISTI TERMINAL CONDENSATE SPLITTER	5/16/2016	, Petroleum Refining Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	Quarterly instrumental monitoring using a method 21 gas analyzer for all valves, pump seals, compressor seals, and agitator seals with a leak definition of 500 parts per million volume (ppmv) for valves and 2,000 ppmv for pump, compressor and agitator seals. Leaking components must be repaired within 15 days of detection of the leak.	36.6	TPY		0			
TX-0752	INGLESIDE TERMINAL	12/3/2015	Fugitives	Volatile Organic Compounds (VOC)	28 VHP: Quarterly instrumental monitoring using a method 21 gas analyzer for all valves, pump seals, compressor seals, and agitator seals with a leak definition of 500 ppmv for valves and 2,000 ppmv for pump, compressor and agitator seals. Leaking components must be repaired within 15 days of detection of the leak.	5.4	T/YR		0			NSPS Kb and OOOO MACT EEEE
TX-0755	RAMSEY GAS PLANT	7/6/2016	Fugitive Components	Volatile Organic Compounds (VOC)	40 CFR Part 60, Subpart OOOO requirements and TCEQâ€™s 28 M Fugitive Monitoring requirements will be used to control fugitive emissions from each Ramsey Gas Plant.	500	PPMV	VALVES	10000	PPMV	PUMP AND COMPRESSER SEALS	40 CFR Part 60, Subpart OOOO
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	7/6/2016	Fugitive Components	Volatile Organic Compounds (VOC)	Fugitive Leak Detection and Repair (LDAR) program that requires quarterly monitoring of valves with a leak definition of 500 ppmv. Quarterly monitoring of pump and compressor seals with a leak definition of 2,000 ppmv.	500	PPMV	VALVES	2000	PPMV	PUMP AND COMPRESSER SEALS	40CFR60 Subparts A and GGGa
TX-0759	PORT ARTHUR REFINERY	7/6/2016	Hydrocracking and Hydro-treating Fugitive Components	Volatile Organic Compounds (VOC)	(LDAR) program that requires quarterly monitoring of valves, pumps, and compressor seals with a leak definition of 500 ppmv. Enhancements to the LDAR program include: 1) Monitoring to be done with data loggers capable of assigning time stamps to individual monitoring events; 2) Repair of leaking components found during weekly physical inspections within 15 days; 3) First attempt of repair of any valve found with a VOC reading greater than 100 ppmv; 4) Conduct of annual training for all of all LDAR technicians in the application of Method 21 consistent with the requirements of the permit; 5) Performance of a third party audit by no later than December 31, 2015 and then at least once every two years thereafter to verify whether EPA Method 21 is being properly applied; 6) and Initiation of an optical gas imaging (OGI) enhanced monitoring program for equipment leaks at those process units subject to EPA Method 21. In addition to the enhanced program, Motiva has agreed to perform quarterly instrument	500	PPM	VALVES, PUMPS, SEALS	147.66	T/YR		
TX-0760	CORPUS CHRISTI TERMINAL	7/6/2016	Fugitives	Volatile Organic Compounds (VOC)	Fugitive Leak Detection and Repair (LDAR) per the 28 MID Monitoring program that requires quarterly monitoring of all components with a leak definition of 500 ppmv and directed maintenance.	500	PPMV		0			
TX-0765	SUNOCO MARINE VESSEL LOADING OPERATIONS	7/6/2016	Petroleum Refining Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	Quarterly instrumental monitoring using a method 21 gas analyzer for all valves, pump seals, compressor seals, and agitator seals with a leak definition of 500 ppmv for valves and 2,000 ppmv for pump, compressor and agitator seals. Leaking components must be repaired within 15 days of detection of the leak.	10.13	TPY		0			28VHP
TX-0774	BISHOP FACILITY	7/6/2016	Fugitives	Volatile Organic Compounds (VOC)	28VHP fugitive monitoring program	4.61	TPY		0			NSPS VVa, MACT H
TX-0783	LBC HOUSTON BAYPORT TERMINAL	7/6/2016	Fugitives	Volatile Organic Compounds (VOC)	An enhanced leak detection and repair program (28LAER) that requires quarterly instrumental monitoring of all fugitive components (pumps, compressors, valves, connectors, seals, etc.) with directed maintenance.	500	PPMV		0			40 CFR Part 61, Subparts A, J, V
TX-0790	PORT ARTHUR LNG EXPORT TERMINAL	7/29/2016	LNG Export Facility - Natural Gas Fugitive Emissions	Volatile Organic Compounds (VOC)	Work practice - leak detection and repair program (TCEQâ€™s 28 VHP LDAR program)	21.65	T/YR		0			

TX-0797	CORPUS CHRISTI TERMINAL	7/29/2016	Petroleum Refining Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	Fugitive Leak Detection and Repair (LDAR) per the 28 MID Monitoring program that requires quarterly monitoring of all components with a leak definition of 500 ppmv and directed maintenance.	500	PPM		33.1	T/YR		SIP Subchapter D â€" Petroleum Refining, Natural Gas Processing, and Petrochemical Processes.
TX-0799	BEAUMONT TERMINAL	7/7/2016	Fugitives	Volatile Organic Compounds (VOC)	Uncontrolled VOC fugitive emissions are estimated to be greater than 25 tpy. Component fugitive emissions are calculated using component counts and the SOCMI without ethylene emission factors. Phillips 66 employs the 28VHP inspection and 28CNTQ monitoring program	33.18	T/YR		0			40 CFR Part 63, Subparts A, R, & EEEE
TX-0800	CORPUS CRUDE OIL TERMINAL	11/16/2017	Fugitives	Volatile Organic Compounds (VOC)	Uncontrolled VOC fugitive emissions are estimated to be less than 10 TPY. Fugitive components are monitored and minimized via an audio, olfactory, and visual (AVO) inspection once every four hours.	0.41	T/YR		0			
TX-0803	PL PROPYLENE HOUSTON OLEFINS PLANT	11/16/2017	Equipment Leak Fugitives	Volatile Organic Compounds (VOC)	LDAR (TCEQ 28LAER)	11.58	LB/H		0			
TX-0804	ADN UNIT	11/16/2017	Equipment Leak Fugitives	Volatile Organic Compounds (VOC)	LDAR program (TCEQ 28VHP)	5.41	LB/H		0			30 TAC Chapter 115 Subchapter B
TX-0808	HOUSTON FUEL OIL TERMINAL	11/16/2017	Fugitives at Marine Loading	Volatile Organic Compounds (VOC)	Monitoring under 28LAER (Lowest Available Emission Rate) Leak Detection and Repair program.	0.04	T/YR		0			
TX-0813	ODESSA PETROCHEMICAL PLANT	11/16/2017	FUGITIVES	Volatile Organic Compounds (VOC)	Quarterly instrumental monitoring of accessible pumps, compressors and valves in vapor or light liquid service, with leak definitions of 500 ppmv (valves) and 2,000 ppmv (pump and compressor seals). Upon detection of a leak, a first attempt to repair must be made within 5 days, and repairs must be completed within 15 days.	88.52	T/YR		0			NSPS DDD
TX-0815	PORT ARTHUR ETHANE SIDE CRACKER	11/16/2017	FUGITIVES	Volatile Organic Compounds (VOC)	28VHP LDAR Program	17.2	T/YR		0			NSPS VVa, NESHAP J,V,FF, MACT UU, YY, SIP(115 Subchapter D
TX-0818	FUEL OIL TERMINAL	6/28/2017	FUGITIVES MARINE LOADING	Volatile Organic Compounds (VOC)	Monitoring under 28LAER (Lowest Available Emission Rate) Leak Detection and Repair program.	0.16	T/YR		0			
TX-0823	LYONDELL CHEMICAL BAYPORT CHOATE PLANT	11/16/2017	FUGITIVES	Volatile Organic Compounds (VOC)	28 LAER	4.36	T/YR		0			NSPS VVa NESHAP H 30 TAC 115 SUBCHAPTER D
TX-0825	PASADENA TERMINAL	11/16/2017	Uncaptured Marine Loading Fugitives From Ships	Volatile Organic Compounds (VOC)	A minimum of three vessels per year for five years will undergo VOC collection efficiency testing to ensure compliance with 99.89% loading vapor collection efficiency of inerted ocean-going marine vessels	23.66	T/YR		0			MACT Y
TX-0836	CHOCOLATE BAYOU	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28LAER LDAR	1.4	TON/YR		0			MACT FFFF
TX-0837	INVISTA S.A.R.L. VICTORIA PLANT	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28VHP LDAR	202.3	TON/YR		0			
TX-0840	CORPUS CHRISTI TERMINAL	2/20/2019	FUGITIVES	Volatile Organic Compounds (VOC)	Fugitive Leak Detection and Repair (LDAR) per the 28 MID Monitoring program that requires quarterly monitoring of all components with a leak definition of 500 ppmv and directed maintenance.	0			0			NSPS Kb, MACT Y,R,EEEE, 30 TAC 115
TX-0843	VICTORIA PLANT	4/4/2019	FUGITIVES	Volatile Organic Compounds (VOC)	28VHP	203	T/YR		0			NSPS VVa MACT F, H 30 TAC 115
TX-0847	VALERO PORT ARTHUR REFINERY	4/4/2019	Equipment Leaks/Fugitive Emissions	Volatile Organic Compounds (VOC)	28 VHP	0			0			
TX-0849	MONT BELVIEU	2/19/2019	FUGITIVES	Volatile Organic Compounds (VOC)	28 VHP LAER	0			0			
TX-0850	CORPUS CHRISTI TERMINAL	2/19/2019	FUGITIVES	Volatile Organic Compounds (VOC)	28 MID	0			0			
TX-0851	RIO BRAVO PIPELINE FACILITY	2/19/2019	FUGITIVES	Volatile Organic Compounds (VOC)	28VHP	0			0			
TX-0852	CORPUS CHRISTI WATERFRONT TERMINAL	4/4/2019	Fugitive Components	Volatile Organic Compounds (VOC)	28LAER	0			0			
TX-0855	BUCKEYE SOUTH TEXAS GATEWAY TERMINAL	11/12/2020	Fugitives	Volatile Organic Compounds (VOC)	28 VHP, 28PI LDAR	0			0			
TX-0858	GULF COAST GROWTH VENTURES PROJECT	11/12/2020	Fugitive Components	Volatile Organic Compounds (VOC)	TCEQ 28VHP and 28CNTQ leak detection and repair (LDAR) programs for piping components in VOC service	0			0			
TX-0859	GULF COAST GROWTH VENTURES PROJECT RAILYARD	11/12/2020	Fugitive Components & Piping	Volatile Organic Compounds (VOC)	monitored quarterly using an approved portable hydrocarbon analyzer. Leaks are defined at 500 ppmv VOC for valves and flanges, and 2,000 ppmv VOC for pump seals. Components in heavy liquid service, which are exempt from instrumental monitoring, must be inspected weekly via audio, visual and olfactory (AVO)	0			0			

TX-0861	BUCKEYE TEXAS PROCESSING CORPUS CHRISTI FACILITY	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28VHP LDAR	0			0			
TX-0862	BUCKEYE TEXAS HUB	11/12/2020	Fugitives	Volatile Organic Compounds (VOC)	28 VHP & 28CNTA LDAR	0			0			
TX-0863	POLYETHYLENE 7 FACILITY	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28 MID	0			0			
TX-0864	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	11/12/2020	Fugitive Components	Volatile Organic Compounds (VOC)	28LAER & 28PI	500	PPMV		0			
TX-0865	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28LAER, 28PI LDAR	0			0			
TX-0871	PORT ARTHUR REFINERY	11/12/2020	Fugitives	Volatile Organic Compounds (VOC)	28VHP leak detection and repair (LDAR)	0			0			
TX-0872	CONDENSATE SPLITTER FACILITY	11/12/2020	Fugitives (Routine)	Volatile Organic Compounds (VOC)	28VHP. Leak-less connectors.	15.63	LB/H		0			NSPS GGGa
TX-0873	PORT ARTHUR REFINERY	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28 MID, 28 AVO and OGI fugitive programs. Authorized for infrared camera (28MID+).	0			0			
TX-0874	PORT ARTHUR REFINERY	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28MID LDAR and 28CNTQ.	0			0			
TX-0876	PORT ARTHUR ETHANE CRACKER UNIT	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	TCEQ 28VHP and 28CNTQ leak detection and repair (LDAR) programs	500	PPMV		0			
TX-0877	SWEENY REFINERY	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28 MID, 28CNTQ, and 28 PI programs. 28 MID: 97% control efficiencies for valves in gas/vapor and light liquid, 93% control efficiency for pumps light liquids and 30% for heavy liquid, 95% for compressors, 97% for relief valves. 28CNTQ: 97% control efficiencies for flanges/connectors in gas/vapor and light liquid and 30% for heavy liquid. 28PI: 30% control efficiencies for valves all phases, pumps all phases, flanges/connectors all phases, compressors, and relieve valves.	0			0			MACT CC, 30 TAC 115
TX-0879	MOTIVA PORT ARTHUR TERMINAL	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28PET leak detection and repair program. Monthly Audio/Visual/Olfactory (AVO) inspection requirements	0			0			
TX-0879	MOTIVA PORT ARTHUR TERMINAL	11/12/2020	PROCESS FUGITIVES	Volatile Organic Compounds (VOC)	28VHP leak detection and repair program. 97% credit for valves, 85% for pumps and compressors.	0			0			
TX-0884	PROPANE DEHYDROGENATION (PDH) UNIT	11/12/2020	FUGITIVES	Volatile Organic Compounds (VOC)	28 LAER	0			0			NSPS Subpart VVa, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006 MACT 40 CFR 63 Subpart FFFF, National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.
TX-0886	MONT BELVIEU NGL FRACTIONATION UNIT	11/12/2020	EQUIPMENT LEAK FUGITIVES	Volatile Organic Compounds (VOC)	28 LAER leak detection and repair (LDAR) program	0			0			NSPS OOOOa Ch. 115 Subchapter D Division 3
TX-0887	MIDLAND PLAINS MARKETING TERMINAL	11/12/2020	Fugitives	Volatile Organic Compounds (VOC)	The site-wide fugitive emissions are less than 10 tpy uncontrolled VOC emissions. LADR program and emission reduction credit is not applied.	0			0			
TX-0888	ORANGE POLYETHYLENE PLANT	11/12/2020	FUGITIVE COMPONENTS	Volatile Organic Compounds (VOC)	28 VHP, 28CNTA, 28PI leak detection and repair (LDAR) programs	0			0			NSPS VVa NESHAP J & V
TX-0890	ENTERPRISE PRODUCTS OPERATING MOUNT BELVIEU COMPLEX	11/12/2020	Fugitive components	Volatile Organic Compounds (VOC)	28 LAER LDAR	0			0			NSPS VVa NESHAP J, V
TX-0892	NEDERLAND TERMINAL	11/12/2020	fugitives	Volatile Organic Compounds (VOC)	28-VHP LDAR fugitive	0			0			
TX-0894	CHEVRON PHILLIPS CHEMICAL SWEENY COMPLEX	11/12/2020	Unit 81 Fugitives (EPN FUG-02)	Volatile Organic Compounds (VOC)	Piping components at the Sweeny site are currently monitored under the stringent 28LAER LDAR program. The proposed piping components in this amendment will be monitored using the 28LAER program. Valves in heavy liquid service will use the language in the 28LAER LDAR program that requires AVO inspection.	0			0			
TX-0899	LBC HOUSTON BAYPORT TERMINAL	12/1/2021	FUGITIVES	Volatile Organic Compounds (VOC)	Fugitive components will be monitored under the 28LAER program. This control meets LAER	0			0			
TX-0903	SWEENY REFINERY	9/14/2021	Equipment Leaks/Fugitive Emission	Volatile Organic Compounds (VOC)	Fugitive Leak Detection and Repair (LDAR) per the 28MID, 28PI, 28CNTQ, and 28CNTA monitoring programs.	0			0			
TX-0904	MOTIVA POLYETHYLENE MANUFACTURING COMPLEX	12/1/2021	FUGITIVES	Volatile Organic Compounds (VOC)	TCEQ 28VHP and 28CNTQ leak detection and repair (LDAR) programs	0			0			

TX-0906	PORT ARTHUR REFINERY	3/8/2022	FUGITIVES	Volatile Organic Compounds (VOC)	TCEQ 28VHP (LDAR) program	0			0			
TX-0908	NEWMAN POWER STATION	3/8/2022	Fugitives	Volatile Organic Compounds (VOC)	weekly AVO	0			0			
TX-0909	POLYETHYLENE UNIT 1792	5/10/2021	Fugitives	Volatile Organic Compounds (VOC)	28VHP	0			0			
TX-0910	POLYETHYLENE UNIT 1796	5/10/2021	FUGITIVES	Volatile Organic Compounds (VOC)	28 VHP	0			0			
TX-0912	MONT BELVIEU FRACTIONATOR	5/10/2021	FUGITIVES	Volatile Organic Compounds (VOC)	Implement a 28LAER Leak Detection and Repair program including monitoring for leaks using Method 21.	0			0			
TX-0914	BORGER REFINERY	3/8/2022	FUGITIVE COMPONENTS	Volatile Organic Compounds (VOC)	28VHP	0			0			
TX-0916	CEDAR BAYOU	3/8/2022	FUGITIVE COMPONENTS	Volatile Organic Compounds (VOC)	28 VHP	0			0			
TX-0918	CEDAR BAYOU PLANT	3/8/2022	FUGITIVE COMPONENTS	Volatile Organic Compounds (VOC)	28LAER	0			0			
*TX-0921	HOUSTON PLANT - 22052	6/14/2022	FUGITIVES	Volatile Organic Compounds (VOC)	28LAER	0			0			NSPA VV, MACT H
*TX-0922	HOUSTON PLANT - 46307	6/14/2022	FUGITIVES	Volatile Organic Compounds (VOC)	28 LAER	0			0			NSPS VV, MACT H
*TX-0924	HOUSTON PLANT - 19806	6/14/2022	FUGITIVES	Volatile Organic Compounds (VOC)	28 LAER	0			0			
TX-0929	FORMOSA POINT COMFORT PLANT	3/8/2022	FUGITIVES	Volatile Organic Compounds (VOC)	modified 28VHP LDAR program in VOC service. A more stringent 500ppmv leak definition of 28MID is used. Annual 28CNTA monitoring is voluntarily used.	0			0			
TX-0930	CENTURION BROWNSVILLE	3/8/2022	Fugitive Components	Volatile Organic Compounds (VOC)	Leak detection and repair (LDAR) monitoring and directed maintenance in accordance with the 28VHP program. Quarterly instrumental monitoring using a Method 21 gas analyzer.	0			0			
TX-0931	ROEHM AMERICA BAY CITY SITE	3/8/2022	Fugitives	Volatile Organic Compounds (VOC)	TCEQ 28VHP/28CNTQ (LDAR) Program	0			0			
TX-0933	NACERO PENWELL FACILITY	3/8/2022	Electrical Equipment Fugitive Leaks	Volatile Organic Compounds (VOC)	The manufacturerâ€™s recommendations for maintenance, repair, and recycling of SF6 recovered during maintenance will be followed. Pressure in breakers and switches will be monitored, and repair when pressure drops 10% below initial pressure will be initiated.	0			0			
*TX-0936	BILL GREEHEY REFINERY EAST PLANT	4/11/2022	REFINERY FUGITIVES	Volatile Organic Compounds (VOC)	28VHP, 28AVO	0			0			
*WI-0261	ENBRIDGE ENERGY - SUPERIOR TERMINAL	5/31/2022	Piping components / pumping fugitive	Volatile Organic Compounds (VOC)	Routine Leak Detection and Repair (LDAR) Quarterly or semiannual if leak rate is less than 0.5%. 500 ppm detection threshold. LDAR combining routine M21 as well as sound, sight and smell observations. May screen using Smart LDAR (IR cam) w/ M21 confirmation. Use of certified low leaking valves or valves fitted with certified low leaking valve packing technology except where demonstrated as not commercially available for a particular application. Pigging equipment shall be constructed to drain to a sump tank and depressurize prior to opening. Normally limited to routine maint. / inspection operation except for Line 61 where needed for batch segregation. See 13-DCF-129, 12-DCF-205.	0			0			
WI-0266	GREEN BAY PACKAGING, INC. - SHIPPING CONTAINER DIVISION	2/19/2019	Corrugator No. 4 (Fugitive F61)	Volatile Organic Compounds (VOC)	Use of Low VOC coating and additives: Average VOC content of all VOC-containing materials may not exceed 0.15% by weight, as applied on a monthly basis.	2.57	TON/MONTH		0			

WI-0279	CORPORATE/COMPANY NAMEENBRIDGE ENERGY LIMITED PARTNERSHIP -	3/8/2022	Process NameF01 â€" Piping Component/Pumping Fugitive	Volatile Organic Compounds (VOC)	Complying with Leak Detection and Repair (LDAR) Program	0			0			BACT is LDAR Program established on 17-DCF-091 Final Permit pg. 62-66 (I.G.1.a.3) including quarterly inspections and reporting. And The use of Certified Low-Leaking Valves technology except when commercially unavailable. â€œCertified Low-Leaking Valvesâ€ shall mean valves for which a manufacturer has issued either a written guarantee that the valve will not leak above 100 parts per million (ppm) for five years or a written guarantee, certification or equivalent documentation that the valve has been tested pursuant to generally-accepted good engineering practices and has been found to be leaking at no greater than 100 ppm. 17-DCF-091 Final Permit pg. 66-67 (I.G.1.a.3)
WI-0283	AFE, INC. â€"LCM PLANT	3/8/2022	F10 â€" Fugitive Wipe Cleaning Operations	Volatile Organic Compounds (VOC)	Concentration Control	0			0			The as applied VOC content of the solvent or solvent solution for industrial cleaning operations shall not exceed 0.25 pounds per gallon (0.03 kilograms per liter).

Appendix S – Federal Modification Test

Appendix S, Table S-1: Federal Major Modification Analysis

Existing or New	Source Number[1]	Description	2018/2019 Two yr avg Baseline Emissions (tons/year)[1]								Post-Project Emissions (tons/year)[2]								Change in Emissions (tons/yr)							
			NO_x	SO_2	CO	POC	PM_{10}	$PM_{2.5}$	H_2SO_4	GHGs (MT)	NO_x	SO_2	CO	POC	PM_{10}	$PM_{2.5}$	H_2SO_4	GHGs (MT)	NO_x	SO_2	CO	POC	PM_{10}	$PM_{2.5}$	H_2SO_4	GHGs (MT)
Existing	11	U240_B-201 Heater	13.4	15.5	0.4	1.3	1.8	1.8	1.0	33,443	6.8	8.0	0.23	0.7	1.0	1.0	0.6	17,492	-6.5	-7.5	-0.2	-0.6	-0.8	-0.8	-0.4	-15,951
Existing	12	U240 B-202 Heater	1.9	4.0	0.3	0.3	0.5	0.5	0.3	8,761	2.8	5.8	0.64	0.5	0.7	0.7	0.43	12,607	0.9	1.8	0.4	0.2	0.2	0.2	0.2	3,846
Existing	13	U240_B-301 Heater	7.6	31.8	0.9	2.8	3.8	3.8	2.0	69,653	5.2	22	0.65	2.0	2.7	2.7	1.7	49,541	-2.5	-9.4	-0.3	-0.8	-1.1	-1.1	-0.3	-20,112
Existing	22	U248_B-606 HEATER	1.4	3.2	2.5	0.3	0.4	0.4	0.2	6,905	1.4	3.2	2.48	0.3	0.4	0.4	0.20	6,905	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	29	U200 B-5 Heater	11.2	17.4	0.4	1.5	2.1	2.1	1.1	38,101	--	--	--	--	--	--	--	--	-11.2	-17.4	-0.4	-1.5	-2.1	-2.1	-1.1	-38,101
Existing	30	U200 B-101 Heater	6.4	7.6	0.2	0.7	0.9	0.9	0.5	16,652	--	--	--	--	--	--	--	--	-6.4	-7.6	-0.2	-0.7	-0.9	-0.9	-0.5	-16,652
Existing	36	U200 B-102 HEATER	1.5	1.6	0.6	0.9	1.2	1.2	0.1	25,743	--	--	--	--	--	--	--	--	-1.5	-1.6	-0.6	-0.9	-1.2	-1.2	-0.1	-25,743
Existing	45	U246 B-801 A/B Heater	1.4	0.1	0.8	0.3	0.9	0.9	0.0	31,773	0.52	0.046	0.32	0.1	0.3	0.3	0.003	10,922	-0.8	-0.1	-0.5	-0.2	-0.6	-0.6	0.0	-20,851
Existing	70	Rail Renewable Feedstock Unloading Rack	--	--	--	--	--	--	--	--	--	--	--	0.3	--	--	--	--	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0
Existing	97	TANK NO. 100	--	--	--	1.4	--	--	--	--	--	--	--	0.3	--	--	--	--	0.0	0.0	0.0	-1.1	0.0	0.0	0.0	0
Existing	99	TANK NO. 102	--	--	--	0.2	--	--	--	--	--	--	--	0.2	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	101	Tank 104 Storm Water Equalization	--	--	--	0.09	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0
Existing	102	Tank 105 Storm Water Equalization	--	--	--	0.10	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0
Existing	103	TANK NO. 106	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	105	TANK NO. 129	--	--	--	0.0	--	--	--	--	--	--	--	0.04	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	106	Tank 130 Stormwater Equalization	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	108	TANK NO. 153	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	109	TANK NO.154	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	110	TANK NO. 155	--	--	--	0.5	--	--	--	--	--	--	--	0.5	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	111	TANK NO. 156	--	--	--	0.3	--	--	--	--	--	--	--	0.3	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	112	TANK NO. 157	--	--	--	1.6	--	--	--	--	--	--	--	1.6	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	113	TANK NO. 158	--	--	--	1.3	--	--	--	--	--	--	--	1.3	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	114	TANK NO. 159	--	--	--	1.7	--	--	--	--	--	--	--	1.7	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	122	TANK 167	--	--	--	1.7	--	--	--	--	--	--	--	1.7	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	125	TANK 170	--	--	--	0.9	--	--	--	--	--	--	--	0.9	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	126	Tank No. 172	--	--	--	0.1	--	--	--	--	--	--	--	0.14	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	127	TANK NO. 173	--	--	--	0.0	--	--	--	--	--	--	--	0.02	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	135	Tank #200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	137	TANK NO. 202	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	138	TANK NO. 203	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	139	TANK NO. 204	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	140	TANK #205	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	150	TANK NO. 241	--	--	--	1.8	--	--	--	--	--	--	--	1.8	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	173	TANK #280	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	174	TANK #281	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	175	TANK #284	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	188	TANK NO. 300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	189	TANK NO. 301	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	190	TANK NO. 302	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	204	TANK NO. 528	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	205	TANK NO. 529	--	--	--	0.0	--	--	--	--	--	--	--	0.04	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	253	TANK NO. 833	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	254	TANK NO. 1001	--	--	--	0.2	--	--	--	--	--	--	--	0.2	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	256	Tank No. 1003	--	--	--	0.0	--	--	--	--	--	--	--	0.03	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	257	Tank No. 1004	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	261	TANK NO. 1010	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	262	TANK NO. 1011	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	263	TANK NO. 1012	--	--	--	0.2	--	--	--	--	--	--	--	0.2	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	296	C-1 FLARE	5.8	6.2	7.3	2.8	0.6	0.6	--	17,482	5.8	6.2	7.3	2.8	0.63	0.63	0.00	17,482	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	307	U240 UNICRACKING UNIT 240	--	--	--	4.2	--	--	--	--	--	--	--	5.1	--	--	--	--	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0
Existing	309	U248_UNISAR UNIT 248	--	--	--	0.7	--	--	--	--	--	--	--	0.7	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	322	U40_RAW MATERIALS RECEIVING	--	--	--	0.9	--	--	--	--	--	--	--	1.1	--	--	--	--	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0
Existing	324	Unit 100 API	2.9	0.0	2.4	0.2	0.2	0.2	0.0	0.0	2.8	0.4	7.4	0.2	0.2	0.2	0.0	0.0	-0.1	0.3	4.9	0.0	0.0	0.0	0.0	0
Existing	334	Tank #107	--	--	--	0.8	--	--	--	--	--	--	--	0.8	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	338	U233 FUEL GAS CENTER	--	--	--	0.4	--	--	--	--	--	--	--	0.4	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	339	U80_REFINED OIL SHIPPING UNIT	--	--	--	2.0	--	--	--	--	--	--	--	2.0	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	340	TANK #108	--	--	--	0.9	--	--	--	--	--	--	--	0.9	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	341	TANK #208	--	--	--	0.5	--	--	--	--	--	--	--	0.5	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	342	TANK #209	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	350	U267_Crude Distillation Unit 267	--	--	--	3.5	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	-3.5	0.0	0.0	0.0	0
Existing	351	U267_B-601/602 Tower Preheaters	3.6	17.1	3.7	1.5	2.0	2.0	1.1	37,157	--	--	--	--	--	--	--	--	-3.6	-17.1	-3.7	-1.5	-2.0	-2.0	-1.1	-37,157
Existing	352	Combustion Turbine (16.6 MW)	17.2	24.7	0.7	0.4	6.2	6.2	3.7	109,189	17	25	0.72	0.36	6.2	6.2	3.7	109,189	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	353	Combustion Turbine (16.6 MW)	17.4	24.9	0.8	0.3	6.2	6.2	3.8	106,320	17	25	0.83	0.31	6.2	6.2	3.8	106,320	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	354	Combustion Turbine (16.6 MW)	15.3	25.1	0.7	0.3	6.3	6.3	3.8	108,789	15	25	0.69	0.34	6.3	6.3	3.8	108,789	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	355	Supplemental Firing Duct Burners	4.1	2.9	0.2	0.1	1.4	1.4	0.4	23,785	4.1	2.9	0.16	0.07	1.4	1.4	0.4	23,785	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	356	Supplemental Firing Duct Burners	3.5	2.5	0.2	0.1	1.2	1.2	0.4	23,124	3.5	2.5	0.18	0.06	1.2	1.2	0.4	23,124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	357	Supplemental Firing Duct Burners	3.6	2.7	0.2	0.1	1.4	1.4	0.4	23,665	3.6	2.7	0.15	0.07	1.4	1.4	0.4	23,665	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	381	Aeration Tank, Pact (F-201)	--	--	--	0.0	--	--	--	--	--	--	--	0.04	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	382	Aeration Tank, Pact (F-202)	--	--	--	0.0	--	--	--	--	--	--	--	0.04	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	383	Clarifier, F-203	--	--	--	0.0	--	--	--	--	--	--	--	0.01	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	384	Clarifier (F-204)	--	--	--	0.0	--	--	--	--	--	--	--	0.01	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	385	Media Filter (F-271 to F-278)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	386	PAC Regeneration Sludge Thickener (F-211)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	387	Wet Air Regeneration (F-201)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	390	F-248 Thickened Sludge Storage	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	398	MP-30 Flare	1.4	0.1	1.8	0.5	0.1	0.1	--	2,956	1.4	0.1	1.8	0.5	0.1	0.1		2,956	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	400	Wet Weather Wastewater Sump	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Existing	401	Dry Weather Wastewater Sump	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Existing	425	Marine Terminal Berth M1	--	--	--	1.4	--	--	--	--	--	--	--	1.5	--	--	--	--	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0
Existing	426	Marine Terminal Berth M2	--	--	--	1.0	--	--	--	--	--	--	--	1.5	--	--	--	--	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0
Existing	427	Marine Terminal Berth B2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	428	Marine Terminal Berth B3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	429	Marine Terminal Berth B4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	434	U246 High Pressure Reactor Train	--	--	--	1.0	--	--	--	--	--	--	--	1.5	--	--	--	--	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0
Existing	437	Unit 110 Hydrogen Manufacturing Unit	--	--	--	0.3	--	--	--	127,633	--	--	--	0.3	--	--	--	137,269	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9,636
Existing	438	U110_H-1 Furnace (H2 Unit Reforming)	3.9	4.4	1.3	0.2	5.6	5.6	0.3	16,680	5.0	5.7	1.8	0.2	6.3	6.3	0.5	22,239	1.1	1.3	0.4	0.0	0.7	0.7	0.2	5,559
Existing	439	Tank 109	--	--	--	0.9	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	-0.9	0.0	0.0	0.0	0
Existing	440	Tank 110	--	--	--	0.7	--	--	--	--	--	--	--	2.3	--	--	--	--	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0
Existing	442	TK 112	--	--	--	0.7	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	-0.7	0.0	0.0	0.0	0
Existing	444	Tank 243	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	445	Tank 271	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	448	Tank 1007	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	449	TANK #285	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	453	U236 Cooling Tower	--	--	--	0.3	0.3	0.3	--	--	--	--	--	0.3	0.3	0.3	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	455	U240 Cooling Tower	--	--	--	0.9	1.0	1.0	--	--	--	--	--	0.9	1.0	1.0	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	456	U110 Cooling Tower	--	--	--	0.0	0.2	0.2	--	--	--	--	--	0.0	0.2	0.2	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	465	Unit 235 Sulfur Pit-Tank	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	503	Sulfur Storage Tank	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	504	Sulfur Degassing Unit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	505	Sulfur Truck Loading Rack	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	506	Tank 257	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	1002	Sulfur Plant - Unit 236	1.6	4.9	11.1	0.0	1.5	1.5	0.5	7,163	--	--	--	--	--	--	--	--	-1.6	-4.9	-11.1	0.0	-1.5	-1.5	-0.5	-7,163
Existing	1002	Sulfur Plant - Unit 236 Eq Leaks	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0
Existing	1003	Sulfur Plant Unit 238	4.1	5.5	37.4	0.0	1.4	1.4	0.6	11,633	--	--	--	--	--	--	--	--	-4.1	-5.5	-37.4	0.0	-1.4	-1.4	-0.6	-11,633
Existing	1003	Sulfur Plant Unit 238 Eq Leaks	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0
Existing	1007	Unit 100 Dissolved Air Flotation Unit	0.26	0.00	0.22	0.11	0.02	0.02	--	--	0.26	0.00	0.22	0.11	0.02	0.02	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	1008	Unit 100 Primary Stormwater Basin	--	--	--	0.03	--	--	--	--	--	--	--	0.03	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	1009	Unit 100 Main Basin	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	1010	U235 Sulfur Recovery Unit	7.5	3.0	3.2	0.2	0.9	0.9	0.6	26,270	7.5	3.0	3.2	0.2	0.9	0.9	0.6	26,270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	1010	U235 Sulfur Recovery Unit - Eq Leaks	--	--	--	0.1	--	--	--	--	--	--	--	0.1	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	50007	Tank 224	--	--	--	3.4	--	--	--	--	--	--	--	3.4	--	--	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Existing	Carbon Plant	Carbon Plant, All Sources	190.4	1050.0	54.3	0.9	59.2	59.2	10.2	195,001	--	--	--	--	--	--	--	--	-190	-1,050	-54	-0.9	-59	-59	-10	-195,001
New	Unit 237	Unit 237 Sulfur Treatment Unit	--	--	--	--	--	--	--	--	10	4.6	3.6	0.9	4.2	4.2	4.2	27,184	10.0	4.6	3.6	0.9	4.2	4.2	4.2	27,184
New	Filter Aid	Silos/Day Hoppers Material Handling	--	--	--	--	--	--	--	--	--	--	--	--	1.2	1.2	--	--	--	--	--	--	1.2	1.2	--	--
New	PTU	Equipment Components	--	--	--	--	--	--	--	--	--	--	--	8.6	--	--	--	--	--	--	--	8.6	--	--	--	--
New	PTU	Vapor Recovery	--	--	--	--	--	--	--	--	--	--	--	0.5	--	--	--	--	--	--	--	0.5	--	--	--	--
		Total	**327**	**1,255**	**132**	**56**	**107**	**107**	**832**	**1,067,879**	**110**	**142**	**32**	**56**	**43**	**43**	**822**	**725,741**	**-216.6**	**-1112.9**	**-99.3**	**0.1**	**-64.5**	**-64.6**	**-10.2**	**-342,139**

Notes:

[1] Baseline emissions for existing sources are from the facility's 2018 and 2019 BAAQMD Regulation 12-15 Emissions Inventory. Source IDs may repeat to account for different categories of emissions occurring at a single source.
[2] Post-Project emissions are based on projected actuals for existing sources and PTE for new sources.

Appendix S, Table S-2: Post-Project Emissions Estimates for Combustion Devices

Source ID	Description	Post-Project Status	Emission Type	2019 Throughput		Post-Project Throughput		2019 Emissions[1] (tons/year)							Post-Project Emissions[2] (tons/year)						
				Rate	Units	Rate	Units	NOx	SO_2	CO	POC	PM_{10}	$PM_{2.5}$	GHGs (MT)	NOx	SO_2	CO	POC	PM_{10}	$PM_{2.5}$	GHGs (MT)
11	U240 B-201 Heater	Operational	Combustion	56	MMBtu/hr	33	MMBtu/hr	11	13	0.39	1.2	1.6	1.6	29,233	6.8	8.0	0.23	0.71	1.0	1.0	17,492
12	U240 B-202 Heater	Operational	Combustion	16	MMBtu/hr	24	MMBtu/hr	1.8	3.8	0.42	0.34	0.46	0.46	8,271	2.8	5.8	0.64	0.51	0.71	0.71	12,607
13	U240 B-301 Heater	Operational	Combustion	125	MMBtu/hr	93	MMBtu/hr	6.9	30	0.87	2.7	3.7	3.7	66,359	5.2	22	0.65	2.0	2.7	2.7	49,541
45	U246 B-801 A/B Heater	Operational	Combustion	62	MMBtu/hr	24	MMBtu/hr	1.4	0.12	0.82	0.26	0.81	0.81	28,384	0.52	0.046	0.32	0.10	0.31	0.31	10,922
437	Unit 110 Hydrogen Manufacturing Unit	Operational	Hydrogen Plant	12	MMScf/day	17	MMScf/day	--	--	--	--	--	--	100,368	--	--	--	--	--	--	137,269
438	U110 H-1 Furnace (H2 Plant Reforming)	Operational	Combustion	140	MMBtu/hr	191	MMBtu/hr	3.6	4.1	1.3	0.15	4.6	4.6	16,261	5.0	5.7	1.8	0.20	6.3	6.3	22,239

Notes:

1. Obtained directly from the facility's 2019 BAAQMD Rule 12-15 Emissions Inventory.
2. Post-project emissions were estimated using 2019 throughput and emissions and post-project projected rates.

Abbreviations:

CO - carbon monoxide
GHG - greenhouse gas
hr - hour
Mbbl - thousand barrels
Mgal - thousand gallons
MMBtu - million British thermal units
MT - metric ton
NOx - nitrogen oxides
PM_{10} - particulate matter less than 10 microns in diameter
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
POC - precursor organic compounds
SO_2 - sulfur dioxide
yr - year