

Emission Sources - Maximum Allowable Emission Rates

Permit Number 9708 and PSDTX861M3

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

Air Contaminants Data

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
MAINTENANCE EMISSIONS CAPS: (7)		VOC	4517.54	33.06
		NO _x	116.53	14.83
		CO	677.03	18.89
		SO ₂	1768.80	6.13
		H ₂ S	19.31	0.05
		HCl	4.00	< 0.01
		PM	2.02	0.44
		PM ₁₀	2.02	0.44
		PM _{2.5}	2.02	0.44
B-10	No. 18 Boiler	NO _x	8.73	38.22
		CO	28.08	57.67
		VOC	1.21	5.28
		SO ₂	5.18	10.15
		PM	1.67	7.30
		PM ₁₀	1.67	7.30
		PM _{2.5}	1.67	7.30
B-11	No. 19 Boiler	NO _x	8.73	38.22
		CO	15.86	69.47
		VOC	1.21	5.28
		SO ₂	5.18	10.15
		PM	1.67	7.30
		PM ₁₀	1.67	7.30
		PM _{2.5}	1.67	7.30

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B-12	600# Boiler	NO _x	49.28	155.43
		CO	17.47	61.21
		VOC	1.33	4.66
		SO ₂	5.70	8.94
		PM	1.84	6.43
		PM ₁₀	1.84	6.43
		PM _{2.5}	1.84	6.43
B-4	No. 11 Boiler	NO _x	17.01	59.59
		CO	6.35	18.32
		VOC	0.48	1.69
		SO ₂	2.07	3.25
		PM	0.67	2.34
		PM ₁₀	0.67	2.34
		PM _{2.5}	0.67	2.34
B-6	No. 13 Boiler	NO _x	15.60	54.66
		CO	5.82	17.59
		VOC	0.44	1.55
		SO ₂	1.90	2.98
		PM	0.61	2.14
		PM ₁₀	0.61	2.14
		PM _{2.5}	0.61	2.14
B-8	No. 15 Boiler	NO _x	9.40	32.94
		CO	11.10	38.92
		VOC	0.84	2.96
		SO ₂	3.62	5.69
		PM	1.17	4.09
		PM ₁₀	1.17	4.09
		PM _{2.5}	1.17	4.09

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B-9	No. 16 Boiler	NO _x	13.16	32.94
		CO	11.11	38.92
		VOC	0.84	2.96
		SO ₂	3.62	5.69
		PM	1.17	4.09
		PM ₁₀	1.17	4.09
		PM _{2.5}	1.17	4.09
H-1	No. 1 Crude Charge Heater	NO _x	18.59	46.46
		CO	21.96	82.34
		VOC	1.67	6.26
		SO ₂	7.16	12.03
		PM	2.31	8.66
		PM ₁₀	2.31	8.66
		PM _{2.5}	2.31	8.66
H-11	No. 2 Crude Charge Heater (Anderson)	NO _x	3.87	14.23
		CO	6.54	24.01
		VOC	0.50	1.83
		SO ₂	2.13	3.51
		PM	0.69	2.52
		PM ₁₀	0.69	2.52
		PM _{2.5}	0.69	2.52

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H-13	Gas Oil Frac. Heater	NO _x	4.00	17.52
		CO	2.84	12.42
		VOC	0.22	0.94
		SO ₂	0.93	1.81
		PM	0.30	1.31
		PM ₁₀	0.30	1.31
		PM _{2.5}	0.30	1.31
H-14	Unifiner Charge Heater	NO _x	2.60	11.38
		CO	1.88	8.23
		VOC	0.14	0.63
		SO ₂	0.61	1.20
		PM	0.20	0.87
		PM ₁₀	0.20	0.87
		PM _{2.5}	0.20	0.87
H-15	No. 1 Naphtha Hydrotreater Desulfurizer Boiler	NO _x	1.63	7.12
		CO	2.56	11.22
		VOC	0.19	0.85
		SO ₂	0.84	1.64
		PM	0.27	1.18
		PM ₁₀	0.27	1.18
		PM _{2.5}	0.27	1.18
H-18	No. 1 Reformer Charge Heater	NO _x	17.96	52.81
		CO	25.45	33.37
		VOC	1.94	6.47
		SO ₂	8.31	12.43
		PM	2.68	8.94
		PM ₁₀	2.68	8.94
		PM _{2.5}	2.68	8.94

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H-2	No. 1 Vacuum Charge Heater	NO _x	3.08	11.52
		CO	6.24	11.66
		VOC	0.47	1.77
		SO ₂	2.04	3.41
		PM	0.66	2.45
		PM ₁₀	0.66	2.45
		PM _{2.5}	0.66	2.45
H-26	No. 2 Vacuum Charge Heater	NO _x	4.06	15.76
		CO	6.55	25.39
		VOC	0.50	1.93
		SO ₂	2.14	3.71
		PM	0.69	2.67
		PM ₁₀	0.69	2.67
		PM _{2.5}	0.69	2.67
H-27	P/P Mole Sieve Regeneration Heater	NO _x	1.35	0.76
		CO	0.68	0.38
		VOC	0.05	0.03
		SO ₂	0.22	0.06
		PM	0.07	0.04
		PM ₁₀	0.07	0.04
		PM _{2.5}	0.07	0.04
H-28	Active Butane Oxygenate Heater	NO _x	1.16	5.07
		CO	0.84	3.67
		VOC	0.06	0.28
		SO ₂	0.27	0.54
		PM	0.09	0.39
		PM ₁₀	0.09	0.39
		PM _{2.5}	0.09	0.39

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H-34	No. 1 Reformer Stabilizer Reboiler	NO _x	3.08	13.48
		CO	1.82	7.96
		VOC	0.14	0.61
		SO ₂	0.59	1.16
		PM	0.19	0.84
		PM ₁₀	0.19	0.84
		PM _{2.5}	0.19	0.84
H-36	No. 2 Naphtha Hydrotreater Charge Heater	NO _x	1.78	7.80
		CO	4.07	8.92
		VOC	0.31	1.36
		SO ₂	1.33	2.61
		PM	0.43	1.88
		PM ₁₀	0.43	1.88
		PM _{2.5}	0.43	1.88
H-37	No. 2 Naphtha Hydrotreater Desulfurizer Reboiler	NO _x	6.40	15.97
		CO	4.54	11.32
		VOC	0.34	0.86
		SO ₂	1.48	1.65
		PM	0.48	1.19
		PM ₁₀	0.48	1.19
		PM _{2.5}	0.48	1.19
H-38	#2 Reformer Charge Heater	NO _x	13.58	42.07
		CO	24.67	66.53
		VOC	1.88	5.82
		SO ₂	8.05	11.17
		PM	2.59	8.04
		PM ₁₀	2.59	8.04
		PM _{2.5}	2.59	8.04

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H-39	#2 Reformer Stabilizer Reboiler Heater	NO _x	3.47	12.78
		CO	2.05	7.55
		VOC	0.16	0.57
		SO ₂	0.67	1.10
		PM	0.22	0.79
		PM ₁₀	0.22	0.79
		PM _{2.5}	0.22	0.79
H-40	No. 1 PDA Asphalt Heater (Asphalt-South)	NO _x	10.21	37.17
		CO	5.66	10.29
		VOC	0.43	1.57
		SO ₂	1.85	3.01
		PM	0.59	2.16
		PM ₁₀	0.59	2.16
		PM _{2.5}	0.59	2.16
H-41	No. 2 Crude Charge-Born Heater	NO _x	16.40	71.83
		CO	21.93	36.49
		VOC	1.67	7.31
		SO ₂	7.16	14.03
		PM	2.31	10.10
		PM ₁₀	2.31	10.10
		PM _{2.5}	2.31	10.10
H-42	Hydrocracker Recycle Heater	NO _x	4.06	15.28
		CO	7.02	13.21
		VOC	0.53	2.01
		SO ₂	2.29	3.86
		PM	0.74	2.78
		PM ₁₀	0.74	2.78
		PM _{2.5}	0.74	2.78

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H-43	HCU Debutanizer Reboiler Heater	NO _x	3.31	14.49
		CO	6.17	13.52
		VOC	0.47	2.06
		SO ₂	2.01	3.95
		PM	0.65	2.84
		PM ₁₀	0.65	2.84
		PM _{2.5}	0.65	2.84
H-45	No. 1 Naphtha Hydrotreater Charge Heater	NO _x	2.66	11.67
		CO	4.97	10.88
		VOC	0.38	1.66
		SO ₂	1.62	3.18
		PM	0.52	2.29
		PM ₁₀	0.52	2.29
		PM _{2.5}	0.52	2.29
H-46	No. 1 Reformer No. 1 Interheater	NO _x	9.53	32.77
		CO	14.68	50.50
		VOC	1.12	3.84
		SO ₂	4.79	7.38
		PM	1.54	5.31
		PM ₁₀	1.54	5.31
		PM _{2.5}	1.54	5.31
H-48	Diesel Hydrotreater Charge Heater	NO _x	3.42	14.98
		CO	6.73	14.74
		VOC	0.51	2.24
		SO ₂	2.20	4.31
		PM	0.71	3.10
		PM ₁₀	0.71	3.10
		PM _{2.5}	0.71	3.10

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H-6	Dago Heater	NO _x	3.39	14.87
		CO	2.01	8.78
		VOC	0.15	0.67
		SO ₂	0.65	1.28
		PM	0.21	0.92
		PM ₁₀	0.21	0.92
		PM _{2.5}	0.21	0.92
H-64	No. 4 Hydrotreater Charge Heater	NO _x	1.27	5.54
		CO	2.36	5.17
		VOC	0.18	0.79
		SO ₂	0.77	1.51
		PM	0.25	1.09
		PM ₁₀	0.25	1.09
		PM _{2.5}	0.25	1.09
H-8	HCU Charge Heater (Petrochem North)	NO _x	4.69	20.52
		CO	6.27	27.45
		VOC	0.48	2.09
		SO ₂	2.04	4.01
		PM	0.66	2.88
		PM ₁₀	0.66	2.88
		PM _{2.5}	0.66	2.88
H-80	FCC Gas HDS Charge Heater	NO _x	3.05	13.36
		CO	6.98	30.55
		VOC	0.53	2.32
		SO ₂	2.28	4.46
		PM	0.73	3.21
		PM ₁₀	0.73	3.21
		PM _{2.5}	0.73	3.21
H-88	Acid Plant Startup Heater (Intermittent)	NO _x	0.79	3.46
		CO	0.40	1.75
		VOC	0.03	0.13
		SO ₂	0.13	0.26
		PM	0.04	0.18
		PM ₁₀	0.04	0.18
		PM _{2.5}	0.04	0.18
H-89	H2 Unit Reformer	NO _x	5.33	15.58

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		CO	27.17	59.50
		VOC	1.92	8.40
		SO ₂	5.41	11.86
		PM	2.65	11.61
		PM ₁₀	2.65	11.61
		PM _{2.5}	2.13	9.35
		HAPs	0.66	2.88
		NH ₃	1.65	7.24
H-9	No. 2 Crude Heater (Petrochem South)	NO _x	3.02	13.25
		CO	3.40	7.45
		VOC	0.26	1.13
		SO ₂	1.11	2.18
		PM	0.36	1.57
		PM ₁₀	0.36	1.57
		PM _{2.5}	0.36	1.57
F-20	No. 1 Refinery Cooling Tower	VOC (5) (6)	3.52	15.40
		Benzene	0.21	0.92
		PM	3.06	13.41
		PM ₁₀	0.51	2.24
		PM _{2.5}	0.01	0.02
F-21	Gasoline Plant Cooling Tower	VOC (5) (6)	2.90	12.69
		Benzene	0.17	0.76
		PM	2.54	11.13
		PM ₁₀	0.42	1.83
		PM _{2.5}	< 0.01	0.02
F-47	No. 2 Refinery Cooling Tower	VOC (5) (6)	2.28	9.97
		Benzene	0.14	0.59
		PM	2.16	9.48
		PM ₁₀	0.30	1.29
		PM _{2.5}	< 0.01	0.01

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E-7	Unifiner Engine (Clark)	NO _x	4.56	19.98
		CO	0.08	0.36
		VOC	0.17	0.76
		SO ₂	0.01	0.01
		PM	0.07	0.29
		PM ₁₀	0.07	0.29
		PM _{2.5}	0.07	0.29
FL-9	Brine Degas Drum	NO _x	8.21	0.99
		CO	16.38	1.98
		VOC	30.15	5.52
FL-6	Wastewater Flare	NO _x	2.09	4.59
		CO	10.66	23.38
		VOC	5.00	10.94
		SO ₂	2.03	1.33
		H ₂ S	0.02	0.01
		NH ₃	< 0.01	< 0.01
Combined Compliance Short Term and Annual Caps for Flares FL-1, FL-3, FL-4, and FL-8 (8)		NO _x	40.46	34.31
		CO	210.06	190.66
		VOC	352.09	179.46
		SO ₂	19.05	15.69
		H ₂ S	6.07	0.27
FGR-SUMP	FGR Oily Water Sump	VOC	0.03	0.07
FL-7	Loading Rack Vapor Combustor	NO _x	6.39	8.83
		CO	15.73	21.89
		VOC (6)	19.23	9.71
		Benzene	6.87	1.38
		SO ₂	0.09	0.02
		PM	0.26	0.17
		PM ₁₀	0.26	0.17
		PM _{2.5}	0.26	0.17
L-2	Asphalt Truck Loading Rack	VOC	10.60	5.85
L-11	Railcar/ Truck Loading Rack	VOC (6)	10.48	10.20
		Benzene	0.32	0.32
L-7	Asphalt Railcar Rack	VOC	6.97	12.82

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V-29	Sulfuric Acid Plant Vent	SO ₂	21.67	7.36
		H ₂ SO ₄	0.63	2.74
V-20	F.C.C.U. (Fluidized Catalytic Cracking Unit)	NO _x	220.11	163.36
		CO	37.80	93.07
		VOC	10.55	38.19
		SO ₂	459.69	138.69
		PM	80.00	294.02
		PM ₁₀	80.00	294.02
		PM _{2.5}	80.00	294.02
		NH ₃	40.74	146.00
		H ₂ SO ₄	12.40	41.98
		Hydrogen Cyanide	25.20	108.54
V-18	No. 1 Reformer Cat Regenerator Vent	CO	3.27	14.31
		VOC	0.61	2.68
		HCl	0.15	0.67
		Cl ₂	0.04	0.19
V-21	No. 2 Reformer Cat Regenerator Vent	CO	70.00	3.36
		VOC	0.03	< 0.01
		HCl	1.06	0.05
		Cl ₂	0.31	0.01
V-13	Soda Ash Silo	PM	0.09	0.02
		PM ₁₀	0.09	0.02
		PM _{2.5}	0.09	0.02
V-14	Lime Silo Vent	PM	0.09	0.02
		PM ₁₀	0.09	0.02
		PM _{2.5}	0.09	0.02
V-17	FCC Catalyst Silo Vent	PM	0.01	0.01
		PM ₁₀	0.01	0.01
		PM _{2.5}	0.01	0.01

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V-5	SRU No. 1 Incinerator	NO _x	0.40	1.75
		CO	1.87	8.20
		VOC	0.19	0.82
		SO ₂	10.69	46.84
		H ₂ S	0.11	0.50
		PM	0.38	1.67
		PM ₁₀	0.38	1.67
		PM _{2.5}	0.38	1.67
V-16	SRU No. 2 Incinerator	NO _x	0.56	2.45
		CO	13.66	59.82
		VOC	0.20	0.87
		SO ₂	10.96	48.01
		H ₂ S	0.12	0.51
		PM	0.84	3.68
		PM ₁₀	0.84	3.68
		PM _{2.5}	0.84	3.68
V-30	FCCU Spent Catalyst Roll Off Boxes	PM	< 0.01	< 0.01
		PM ₁₀	< 0.01	< 0.01
		PM _{2.5}	< 0.01	< 0.01
S-044	Tank 144	Caustic	0.01	0.01
S-142	Tank 232	Caustic	0.01	0.01
CARBON CAN	Carbon Canister System Fugitives (CAS1 – CAS9)	VOC	3.24	5.68
F-1CRUDE, F-1REF_HT, F-2CRUDE, F-2REF_HT, F-4HT, F-HCU, F-ALKY_PDA, F-ALKY, F-ASPHALT, F-CAVERN, F-FGR, F-DESALT, F-DHDSU, F-ETNKFRM, F-FCCU, F-GASBLD, F-GASPLT, F-GHDS, F-HDS_GOF, F-LPG, F-IOCTENE, F-NBULKLD, F-NTNKFRM, F-ORU, F-PENEX, F-PUMPSTA, F-RAILLOAD, F-RLE, F-SBULKLD, F-SRU1, F-SRU2, F-SWS, F-UNIFINER, F-WTNKFRM, F-MSAT, F-WWTP, F-AMINE2, F-MSATLOAD, F-SUMP	Cap for Fugitives	VOC (5) (6)	151.27	662.17
		Benzene (5)	0.99	4.31
		H ₂ S (5)	0.24	1.02
		NH ₃ (5)	0.03	0.14

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S-168, S-173, S-174, S-175, S-184, S-195, S-196, S-197, S-199, S-227, S-228,	Cap for Storage Tanks	VOC (6)	3.08	6.57
		Benzene	0.01	0.02
OX-001	Wastewater Sludge Centrifuge Catalytic Oxidizer	NO _x	< 0.01	< 0.01
		CO	0.34	1.48
		VOC	0.03	0.11
		SO ₂	1.25	5.49
		PM	< 0.01	< 0.01
		PM ₁₀	< 0.01	< 0.01
		PM _{2.5}	< 0.01	< 0.01
ADDITIVETK	Biodiesel Additive Tank	VOC	5.03	1.68
F-85	Painting	VOC	4.25	1.26
F-BRINE	Brine Pond Fugitives	VOC (5)	23.74	2.80
MSS_ABRBLS	Abrasive Blasting Operation	PM	0.54	0.37
		PM ₁₀	0.07	0.05
		PM _{2.5}	< 0.01	< 0.01
F-HYDROGEN	H2 Unit Fugitives (5)	VOC	0.37	1.47
		CO	2.34	10.26
		SO ₂	0.01	0.01
		NH ₃	0.01	0.05
FL-4	H2 Unit MSS Emissions from Flares (9)	NO _x	20.58	3.59
		CO	104.86	17.73
		VOC	0.16	0.01
		SO ₂	1.70	0.03
		NH ₃	18.25	0.44
H2-MSS	H2 Unit MSS (10)	CO	15.34	10.99
		VOC	0.72	0.03
		H ₂ S	0.01	0.01
		PM	0.09	0.01
		PM ₁₀	0.09	0.01

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		PM _{2.5}	0.01	0.01
		NH ₃	0.08	0.01

- (1) Emission point identification - either specific equipment designation or emission point number from plot plan.
- (2) Specific point source name. For fugitive sources, use area name or fugitive source name.
- (3) VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
- NO_x - total oxides of nitrogen
- SO₂ - sulfur dioxide
- PM - total particulate matter, suspended in the atmosphere, including PM₁₀ and PM_{2.5}, as represented
- PM₁₀ - total particulate matter equal to or less than 10 microns in diameter, including PM_{2.5}, as represented
- PM_{2.5} - particulate matter equal to or less than 2.5 microns in diameter
- CO - carbon monoxide
- H₂S - hydrogen sulfide
- H₂SO₄ - sulfuric acid
- HCl - hydrogen chloride
- HAPs - hazardous air pollutant as listed in § 112(b) of the Federal Clean Air Act or Title 40 Code of Federal Regulations Part 63, Subpart C
- NH₃ - ammonia
- Cl₂ - chlorine
- (4) Compliance with annual emission limits (tons per year) is based on a 12 month rolling period.
- (5) Emission rate is an estimate and is enforceable through compliance with the applicable special condition(s) and permit application representations.
- (6) VOC rate includes Benzene emissions.
- (7) See Attachment D for a list of sources included in the Maintenance Emissions Cap.
- (8) The caps for flares include emissions associated with the flare gas recovery maintenance.
- (9) Includes only maintenance, startup, and shutdown (MSS) emissions from the activities authorized in the special conditions controlled by the No. 3 Hydrocracking Unit (HCU) Flare authorized in Permit Number 9708.
- (10) Includes only MSS emissions from the activities authorized in the special conditions.

Date: April 25, 2023