

# Emission Sources - Maximum Allowable Emission Rates

Permit Numbers 172324 and PSDTX1620

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)
AUXBLR	Auxiliary Boiler	VOC	1.37	4.61
		NOx (Routine)	3.81	8.94
		NOx (MSS)	15.24	
		CO	18.78	31.58
		PM	0.86	0.83
		PM <sub>10</sub>	0.86	0.83
		PM <sub>2.5</sub>	0.86	0.83
		SO <sub>2</sub>	1.14	3.84
		HCN (HAP)	0.03	0.04
		NH <sub>3</sub>	1.14	3.84
H2HTR1	Hydrogen Production Train 1 Heater	VOC	1.52	-
		NOx (Routine)	4.22	-
		NOx (MSS)	16.86	-
		CO	20.78	-
		PM	2.11	-
		PM <sub>10</sub>	2.11	-
		PM <sub>2.5</sub>	1.05	-
		SO <sub>2</sub>	1.26	-
		HCN (HAP)	0.04	-
		NH <sub>3</sub>	1.26	-
H2HTR2	Hydrogen Production Train 2 Heater	VOC	1.52	-
		NOx (Routine)	4.22	-
		NOx (MSS)	16.86	-
		CO	20.78	-
		PM	2.11	-
		PM <sub>10</sub>	2.11	-
		PM <sub>2.5</sub>	1.05	-
		SO <sub>2</sub>	1.26	-
		HCN (HAP)	0.04	-

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		NH <sub>3</sub>	1.26	-
H2HTR CAP	Hydrogen Production Train 1 & Train 2 Heaters Annual Emissions CAP	VOC	-	13.22
		NOx (Routine and MSS)	-	25.33
		CO	-	90.53
		PM	-	18.36
		PM <sub>10</sub>	-	18.36
		PM <sub>2.5</sub>	-	8.10
		SO <sub>2</sub>	-	11.02
		HCN (HAP)	-	0.10
		NH <sub>3</sub>	-	11.01
ASUHTR1A	ASU Regeneration Heater A	VOC	0.12	-
		NOx	0.27	-
		CO	0.82	-
		PM	0.17	-
		PM <sub>10</sub>	0.17	-
		PM <sub>2.5</sub>	0.17	-
		SO <sub>2</sub>	0.03	-
ASUHTR1B	ASU Regeneration Heater B	VOC	0.12	-
		NOx	0.27	-
		CO	0.82	-
		PM	0.17	-
		PM <sub>10</sub>	0.17	-
		PM <sub>2.5</sub>	0.17	-
		SO <sub>2</sub>	0.03	-
ASUHTR1 CAP	ASU Regeneration Heaters A and B Annual Emissions CAP	VOC	-	0.22
		NOx	-	0.49
		CO	-	1.52
		PM	-	0.31
		PM <sub>10</sub>	-	0.31
		PM <sub>2.5</sub>	-	0.31
		SO <sub>2</sub>	-	0.06
ASUHTR2A	ASU Vaporizer Heater A	VOC	0.44	-
		NOx	0.98	-
		CO	3.02	-
		PM	0.61	-
		PM <sub>10</sub>	0.61	-

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ASUHTR2B	ASU Vaporizer Heater B	PM <sub>2.5</sub>	0.61	-
		SO <sub>2</sub>	0.11	-
		VOC	0.44	-
		NOx	0.98	-
		CO	3.02	-
		PM	0.61	-
		PM <sub>10</sub>	0.61	-
		PM <sub>2.5</sub>	0.61	-
		SO <sub>2</sub>	0.11	-
ASUHTR2 CAP	ASU Vaporizer Heaters A and B Annual Emissions CAP	VOC	-	0.39
		NOx	-	0.86
		CO	-	2.64
		PM	-	0.54
		PM <sub>10</sub>	-	0.54
		PM <sub>2.5</sub>	-	0.54
		SO <sub>2</sub>	-	0.10
ASUCT	ASU Cooling Tower	PM	0.42	1.84
		PM <sub>10</sub>	0.29	1.26
		PM <sub>2.5</sub>	<0.01	<0.01
H2CT	H2 Production Cooling Tower	VOC	0.54	2.34
		PM	1.34	5.86
		PM <sub>10</sub>	0.85	3.72
		PM <sub>2.5</sub>	<0.01	0.01
		HCN (HAP)	0.01	0.02
FUGS	Equipment Fugitives (5)	VOC	0.62	2.72
		CO	4.86	21.31
		HCN (HAP)	<0.01	<0.01
		NH <sub>3</sub>	0.05	0.22
WWT	Wastewater Treatment System	VOC	3.58	2.74
		HCN (HAP)	0.10	0.19
		NH <sub>3</sub>	0.04	0.03
FLR1	Flare (Normal Operations)	VOC	0.16	0.69
		NOx	0.87	3.82
		CO	7.47	32.70
		SO <sub>2</sub>	0.01	0.04
		HCN (HAP)	0.01	0.01

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FLR1MSS	Flare (MSS)	VOC	21.79	0.24
		NOx	150.89	26.61
		CO	2,847.62	118.23
		SO <sub>2</sub>	1.38	0.24
		HCN (HAP)	<0.01	<0.01
CO2VENT1	CO2 Process Vent Hydrogen Train 1	VOC	0.17	-
		CO	2.58	-
		HCN (HAP)	0.56	-
CO2VENT2	CO2 Process Vent Hydrogen Train 2	VOC	0.17	-
		CO	2.58	-
		HCN (HAP)	0.56	-
CO2VENT CAP	CO2 Process Vent Hydrogen Trains 1 and 2 Annual Emissions CAP	VOC	-	0.49
		CO	-	7.43
		HCN (HAP)	-	1.61
VENTMSS1A	Condensate Blowdown Vent Train 1	VOC	3.41	-
		CO	0.16	-
		HCN (HAP)	0.02	-
		NH <sub>3</sub>	1.60	-
VENTMSS2A	Condensate Blowdown Vent Train 2	VOC	3.41	-
		CO	0.16	-
		HCN (HAP)	0.02	-
		NH <sub>3</sub>	1.60	-
BLDWNV CAP	Condensate Blowdown Vent Trains 1 and 2 Annual Emissions Cap	VOC	-	0.08
		CO	-	<0.01
		HCN (HAP)	-	<0.01
		NH <sub>3</sub>	-	0.04
VENTMSS1B	Steam Vent Train 1	VOC	57.95	-
		HCN (HAP)	0.11	-
		NH <sub>3</sub>	14.31	-
VENTMSS2B	Steam Vent Train 2	VOC	57.95	-
		HCN (HAP)	0.11	-
		NH <sub>3</sub>	14.31	-
STEAMV CAP	Steam Vent Trains 1 and 2 Annual Emissions Cap	VOC	-	1.39
		HCN (HAP)	-	<0.01
		NH <sub>3</sub>	-	0.34
MSSILE	MSS Inherently Low Emitting (ILE)	VOC	3.00	0.15

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		CO	<0.01	<0.01
		HCN (HAP)	0.02	<0.01
		NH <sub>3</sub>	<0.01	<0.01
MSSCAT	MSS Catalyst Handling	PM	0.02	<0.01
		PM <sub>10</sub>	0.01	<0.01
		PM <sub>2.5</sub>	<0.01	<0.01
MSSEQOPN	MSS Equipment Opening	VOC	33.18	0.37
		CO	0.16	<0.01
		HCN (HAP)	0.25	<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<sub>x</sub>
  - total oxides of nitrogen
- SO<sub>2</sub>
  - sulfur dioxide
- PM
  - total particulate matter, suspended in the atmosphere, including PM<sub>10</sub> and PM<sub>2.5</sub>, as represented
- PM<sub>10</sub>
  - total particulate matter equal to or less than 10 microns in diameter, including PM<sub>2.5</sub>, as represented
- PM<sub>2.5</sub>
  - particulate matter equal to or less than 2.5 microns in diameter
- CO
  - carbon monoxide
- HAP
  - 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
- HCN
  - hydrogen cyanide
- NH<sub>3</sub>
  - ammonia
- (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.

Date: TBD

# Emission Sources - Maximum Allowable Emission Rates

Permit Number GHGPSDTX231

This table lists the maximum allowable emission rates of greenhouse gas (GHG) emissions, as defined in Title 30 Texas Administrative Code § 101.1, for all sources of GHG air contaminants on the applicant's property that are authorized 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 authorized by this permit.

## Air Contaminants Data

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates
			TPY (4)
AUXBLR	Auxiliary Boiler	CO <sub>2</sub> e	97,249.57
		CO <sub>2</sub>	96,771.81
		CH <sub>4</sub>	5.65
		N <sub>2</sub> O	1.13
H2HTR CAP	H2 Production Train 1 & Train 2 Heaters Annual Emissions CAP	CO <sub>2</sub> e	278,782.10
		CO <sub>2</sub>	277,412.51
		CH <sub>4</sub>	16.19
		N <sub>2</sub> O	3.24
ASUHTR1 CAP	ASU Regeneration Heaters A and B Annual Emissions CAP	CO <sub>2</sub> e	4,819.80
		CO <sub>2</sub>	4,814.83
		CH <sub>4</sub>	0.09
		N <sub>2</sub> O	0.01
ASUHTR2 CAP	ASU Vaporizer Heaters A and B Annual Emissions CAP	CO <sub>2</sub> e	8357.74
		CO <sub>2</sub>	8349.12
		CH <sub>4</sub>	0.16
		N <sub>2</sub> O	0.02
FUGS	Equipment Fugitives (5)	CO <sub>2</sub> e	2,527.00
		CO <sub>2</sub>	94.36
		CH <sub>4</sub>	97.31
FLR1	Flare (Normal Operations)	CO <sub>2</sub> e	8,446.13
		CO <sub>2</sub>	7,766.55
		CH <sub>4</sub>	26.24
		N <sub>2</sub> O	0.08
FLR1MSS	Flare (MSS)	CO <sub>2</sub> e	18,887.89
		CO <sub>2</sub>	18,240.43
		CH <sub>4</sub>	19.35
		N <sub>2</sub> O	0.55

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CO2VENT CAP	CO2 Process Vent Hydrogen Trains 1 and 2 Annual Emissions CAP	CO <sub>2</sub> e	2,539,840 (6)
		CO <sub>2</sub>	2,539,353 (6)
		CH <sub>4</sub>	19.47 (6)
CO2VENT CAP	CO2 Process Vent Hydrogen Trains 1 and 2 Annual Emissions CAP	CO <sub>2</sub> e	835,016 (7)
		CO <sub>2</sub>	834,856 (7)
		CH <sub>4</sub>	6.40 (7)
BLDWNV CAP	Condensate Blowdown Vent Trains 1 and 2 Annual Emissions Cap	CO <sub>2</sub> e	4.35
		CO <sub>2</sub>	4.27
		CH <sub>4</sub>	<0.01
STEAMV CAP	Steam Vent Trains 1 and 2 Annual Emissions Cap	CO <sub>2</sub> e	0.07
		CO <sub>2</sub>	0.07
		CH <sub>4</sub>	<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) CO<sub>2</sub> - carbon dioxide  
N<sub>2</sub>O - nitrous oxide  
CH<sub>4</sub> - methane  
CO<sub>2</sub>e - carbon dioxide equivalents based on the following Global Warming Potentials (1/2015):  
CO<sub>2</sub> (1), N<sub>2</sub>O (298), CH<sub>4</sub>(25), SF<sub>6</sub> (22,800)
- (4) Compliance with annual emission limits (tons per year) is based on a 12-month rolling period. These rates include emissions from maintenance, startup, and shutdown.
- (5) Emission rate is an estimate and is enforceable through compliance with the applicable special condition(s) and permit application representations.
- (6) The emission rate reflects the operation during the initial 180 days without the offsite Carbon Capture and Sequestration (CCS) in place.
- (7) The emission rate reflects the operation after the initial 180 days with the offsite CCS in place.

Date: \_\_\_\_\_ TBD