

DeMoss Petrie Generating Station (DMP)

POTENTIAL TO EMIT ESTIMATION

Unit Type	Number of Units	Hours of Operation	Respirable Partic. (PM10 tons/year)	Respirable Partic. (PM2.5 tons/year)	Sulfur Dioxide (SO2 tons/year)	Carbon Monoxide ² (CO tons/year)	Nitrogen Oxides ² (NOx tons/year)	VOCs (tons/year)	CO2 Equivalent (tons/year)	Combined HAPs (tons/year)
Unit 1 (MS7001EA) ¹ Natural Gas - Fired	1	2,036	5.98	5.98	1.90	13.59	250.00	1.90	100,637	0.93
	TITLE V MAJOR?		NO	NO	NO	NO	YES	NO	YES	NO
	MAJOR SOURCE THRESHOLD		100 ton/year	100 ton/year	100 ton/year	100 ton/year	100 ton/year	100 ton/year	75000 ton/year	25 ton/year

Footnotes:

1. Calculations based on turbines being exclusively natural gas fired.
2. Total annual NOx and CO emissions are capped at permit limits of 250 tpy.

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Potential to Emit for Combustion Turbine (GE Model MS7001EA)

			PTE Single Unit Operating ²
Nameplate Power Output (MW)			85
Maximum Gas Throughput (scf/hr)			872,419.6
Heat Rate (Btu/kWh)			10,420.0
Maximum Turbine Firing Rate (MMBtu/hr) ¹			889.9
Gas Heating Value (Btu/scf) ³			1020
Total Heat Input (MMBtu/yr)			1,811,475
Max Gas Throughput (scf/yr)			1,775,955,789
Operating Hours (hours/year)			2,036
<i>Emissions = (Max Turbine Firing Rate) x (Emission Factor)</i>			
PTE Emissions			Single Unit Operating ²
PM₁₀/PM_{2.5} Emission Factor (lb/MMBtu)			0.007
PTE - PM ₁₀ /PM _{2.5} Emissions (lb/hr) ¹			5.87
PTE - PM ₁₀ /PM _{2.5} Emissions (tpy)			5.98
VOC Emission Factor (lb/MMBtu) AP-42 Table 3.1-2a³			2.10E-03
PTE - VOC Emissions (lb/hr)			1.87
PTE - VOC Emissions (tpy)			1.90
Max sulfur content of natural gas (grains/100 scf)⁵			0.75
PTE - SO ₂ Emissions (lb/hr)			1.87
PTE - SO ₂ Emissions (tpy)			1.90
Lead Emission Factor (lb/MMBtu)			ND
Lead Emissions (lb/hr)			ND
Lead Emissions (tpy)			ND
CO Emissions Factor (lb/MMBtu)¹			1.50E-02
Permit Limit - CO (tpy)			250
PTE - CO (lb/hr)			13.35
PTE - CO Emissions (tpy)			13.59
NO_x Emissions Factor (lb/MMBtu) - NSPS Subpart GG			0.28
Permit Limit - NO_x (tpy)			250
PTE - NO _x Emissions (lb/hr)			245.62
PTE - NO _x Emission (tpy)			250.00
NSPS allowable standard for NO _x (ppm)			75
E (NO_x) = C_d*F_d (20.9/(20.9-15) Equation 19-1	NO_x ppm	Conversion	Operating²
C _d (NO _x lb/scf)= 75 ppm x 1.19E-7 =	75	1.19E-07	8.946E-06
F _d = 8,710 dscf/MMBtu (40 CFR Part 75 App. F, Table 1)			8,710
Greenhouse Gas Emission Factor (lb/MMBtu) AP-42 Table 3.1-2a^{3,4}			111.11
PTE - CO ₂ e (lb/hr)			98,874
PTE - CO ₂ e (tpy)			100,637

Footnotes:

¹Based on vendor data. See Appendix D.

²Calculations based on turbines being exclusively natural gas fired.

³AP-42 - version 4/00

⁴The global warming potentials used for CO₂ equivalent calculation are 21 for CH₄ and 310 for N₂O.

⁵El Paso tariff provision

DeMoss Petrie Generating Station (DMP)

DMP Potential to Emit

MS7001EA

Turbines UNIT 1
HAPs Emission Natural Gas

Maximum Turbine Firing Rate Per Unit (MMBtu/hr) = 889.9
Turbine Operating Hours (hours/year) = 2,036

Emissions = (Max Turbine Firing Rate) x (Emission Factor)

Pollutant ¹	Tables 3.1-3, 4, 5 Emission Factor (lb/MMBtu)	Unit fired on Natural Gas	
		PTE - single unit operation	
		lb/hr	tpy
1,3-Butadiene	4.30E-07	3.826E-04	0.000
Acetaldehyde	4.00E-05	3.559E-02	0.036
Acrolein	6.40E-06	5.695E-03	0.006
Benzene	1.20E-05	1.068E-02	0.011
Ethylbenzene	3.20E-05	2.848E-02	0.029
Formaldehyde	7.10E-04	6.318E-01	0.643
Napthalene	1.30E-06	1.157E-03	0.001
PAH	2.20E-06	1.958E-03	0.002
Propylene Oxide	2.90E-05	2.581E-02	0.026
Toluene	1.30E-04	1.157E-01	0.118
Xylenes	6.40E-05	5.695E-02	0.058
Arsenic	ND		
Beryllium	ND		
Cadmium	ND		
Chromium	ND		
Lead	ND		
Manganese	ND		
Mercury	ND		
Nickel	ND		
Selenium	ND		
Total HAPs		0.9142	0.9305

¹ AP-42 - version 4/00

Total HAPs (tons/year) Firing Natural Gas = 0.93

Tables 3.1-1 and 3.1-2a

Exerpt: Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines

Emission Factor (lb/MMBtu)	
Pollutant	Natural Gas
CO	1.50E-02
CO ₂	110
Methane	8.6E-03
N ₂ O	0.003
PM (condensable)	4.7E-03
PM (filterable)	1.9E-03
PM (total)	6.6E-03
Lead	ND
VOC	2.1E-03
SO ₂	0.94S
NO _x	9.90E-02

Tables 3.1-3, 4 and 5

Exerpt: Emission Factors for Hazardous Air Pollutants from Stationary Gas Turbines

Emission Factor (lb/MMBtu)

Pollutant	Natural Gas
1,3-Butadiene	0.00000043
Acetaldehyde	0.00004
Acrolein	0.0000064
Benzene	0.000012
Ethylbenzene	0.000032
Formaldehyde	0.00071
Naphthalene	0.0000013
PAH	0.0000022
Propylene Oxide	0.000029
Toluene	0.00013
Xylenes	0.000064
Arsenic	ND
Beryllium	ND
Cadmium	ND
Chromium	ND
Lead	ND
Manganese	ND
Mercury	ND
Nickel	ND
Selenium	ND

