LON C HILL REDEVELOPMENT PROJECT
LON C. HILL, LP

GHG Emission Rates per Unit Summary Table

Air Pollutant	Emission Factor (lb/MMBtu)[1, 2]	Heat Input (HHV) (MMBtu/yr)[3]	GHG Emission Rate (tpy)[4]	Global Warming Potential (100yr.)[5]	CO_2e Emission Rate (tpy)[6]
CO_2	118.8	21,136,220	1,255,634	1	1,255,634
CH_4	2.2E-03		23.30	25	582.46
N_2O	2.2E-04		2.33	298	694.29

Total GHG per Unit[7]	**1,255,659 tpy**
Total CO_2e per Unit[8]	**1,256,911 tpy**

Notes:

(1) CO_2 emission factor calculated per 40 CFR Part 75, Appendix G, Equation G-4, as referenced in §98.43(a), where:

CO2 Emission Factor = 1,040 scf/MMBtu / 385scf/lbmole * 44lb/lbmole = 118.8 lb/MMBtu

Carbon based F-factor, F_C: 1,040
Standard Molar Volume: 385
Molecular Weight CO_2, MW_{CO2}: 44

(2) CH_4 and N_2O emission factors per 40 CFR 98, Subpart C, Table C-2 for natural gas fired units.

CH4 Emission Factor = 1.0E-03 kg/MMBtu * 1 metric ton/1,000 kg * 1.1023 short ton / metric ton * 2,000 lb/short ton = 2.2E-03 lb/MMBtu

N2O Emission Factor = 1.0E-04 kg/MMBtu * 1 metric ton/1,000 kg * 1.1023 short ton / metric ton * 2,000 lb/short ton = 2.2E-04 lb/MMBtu

Where 1.1023 short ton/metric ton per 40 CFR 98, Subpart D, §98.43(a)(1)

(3) Heat Input (HHV) maximum annual heat input for all operating scenarios evaluated for both Siemens SCC6-5000F and GE S207FA.04. Detailed data is provided in the tables below.

GT+DB Heat Input = [Heat Input (MMBtu/hr) * Hours of Operation (hr/yr)]$_{unfired}$ + [Heat Input (MMBtu/hr) * Hours of Operation (hr/yr)]$_{fired}$

Siemens Scenario 3 Heat Input = [4,385 hr/yr * 2,297 MMBtu/hr]unfired + [4,375 hr/yr * 2,529 MMBtu/hr]fired = 21,136,220 MMBtu/yr

(4) Emission Rate = Emission Factor * Heat Input

CO2 Emission Rate = 118.8 lb/MMBtu * 21,136,220 MMBtu/yr * 1ton/2,000 lb = 1,255,634 tpy

(5) Global Warming potential per 40 CFR 98, Subpart A, Table A-1

(6) CO_2e (tpy) = Mass Emission Rate (tpy) * Global Warming Potential

CH4 as CO2e = 23.30 tpy * 25 = 582.46 tpy

(7) Total GHG emission rate per unit = Sum of GHG mass emission rates

Total GHG = 1,255,634 + 23.30 + 2.33 = 1,255,659 tpy

(8) Total CO2e emission rate per unit = Sum of CO2e emission rates

Total CO2e = 1,255,634 + 582.46 + 694.29 = 1,256,911 tpy

Heat Input Summary Tables

Siemens Units

Scenario	Unfired		Fired		GT+DB Heat Input (HHV) (MMBtu/yr)
	Annual Hours of Operation (hr/yr)	Heat Input (HHV) (MMBtu/hr)	Annual Hours of Operation (hr/yr)	Heat Input (HHV) (MMBtu/hr)	
Scenario 1	4,385	2,262	4,375	2,531	20,993,770
Scenario 2	4,385	2,277	4,375	2,531	21,058,204
Scenario 3	4,385	2,297	4,375	2,529	21,136,220
Scenario 4	2,949	2,262	2,188	2,531	21,014,826
	1,437	2,277	2,188	2,531	
				Max. Proposed Heat Input (HHV)	21,136,220

Performance data provided by vendor was organized as follows:

- Scenario 1, ambient temperature 45ºF, performance cases 3 (w/o DB) and 40 (w/DB)
- Scenario 2, ambient temperatur 60ºF, performance cases 6 (w/o DB) and 41 (w/DB)
- Scenario 3, ambient temperature 75ºF, performance caes 10 (w/oDB) and 11 (w/DB)
- Scenario 4, ambient temperature 45ºF (April - October) to simulate inlet cooling and performance cases 3 (w/o DB) and 40 (w/DB) and 60ºF (November - March) and performance cases 6 (w/o DB) and 41 (w/DB)