APPENDIX 8.1B

Detailed Emission Calculations

Table 8.1B-1
MEGS
Emissions and Operating Parameters for Gas Turbines

Project:	MID MEGS					Standard Conditions:
Date:	01/03/2003					Reference O2:
Case	1) Hot Base w/ chiller	2) Hot Base w/ chiller	3) Hot Base w/o chiller	4) Hot Base w/o chiller	5) Hot Low w/ chiller	6) Hot Low w/o chiller
Ambient Temperature (F)	102	102	102	102	102	102
Ambient Humidity (%)	20%	20%	20%	20%	20%	20%
Turbine Load	100%	100%	100%	100%	20%	20%
With Dilution Air	Yes	No	Yes	No	No	Yes
Inlet Chiller On/Off	on	on	off	off	on	off
Inlet Humidity	60%	60%	20%	20%	60%	20%
PAG Steam/Steam Injection/Water Injection (lbs/hr)	20,608	20,608	15,315	15,315	2,312	3,269
Turbine Fuel Flow Rates						
scfm	8,191	8,191	8,191	8,191	2,576	2,587
lbs/hr as fired	21,669.4	21,669.4	21,669.4	21,669.4	6,814.1	6,842.9
lbs/hr, dry, ash free	21,669.4	21,669.4	21,669.4	21,669.4	6,814.1	6,842.9
MMbtu/hr (HHV)	500.0	500.0	500.0	500.0	157.2	157.9
MMbtu/hr (LHV)	450.9	450.9	450.9	450.9	141.8	142.4
Duct Burner Fuel Flow Rates						
scfm	0	0	0	0	0	0
lbs/hr as fired	0	0	0	0	0	0
lbs/hr, dry, ash free	0	0	0	0	0	0
MMbtu/hr (HHV)	0.0	0.0	0.0	0.0	0.0	0.0
Total Fuel Flow Rates						
scfm	8,191	8,191	8,191	8,191	2,576	2,587
lbs/hr as fired	21,669	21,669	21,669	21,669	6,814	6,843
lbs/hr, dry, ash free	21,669	21,669	21,669	21,669	6,814	6,843
MMbtu/hr (HHV)	500.0	500.0	500.0	500.0	157.2	157.9
Gas Turbine Output (kw)	49,783	49,783	37,765	37,765	10,000	10,000
Steam Turbine Output (kw)	0	0	0	0	0	0
Total Electrical Output (kw)	49,783	49,783	37,765	37,765	10,000	10,000
Heat Rate (btu/kwh)	10044	10044	13240	13240	15723	15790
Exhaust Gas Parameters						
Exhaust Flow Rate (wacfm)	658,260	619,322	557,111	515,901	296,666	297,465
Exhaust Flow Rate (dscfm)	247,816	216,368	214,320	180,040	123,259	119,687
Exhaust Flow Rate (lbs/hr)	1,241,531	1,094,148	1,060,415	902,661	598,694	572,629
Exhaust Flow Rate (performance runs) (lbs/hr)	1,222,296	1,078,920	1,063,871	907,200	588,960	573,925
Difference	1.57%	1.41%	-0.32%	-0.50%	1.65%	-0.23%
Stack Temperature (F)	750	828	750	851	684	750
H2O, vol %, wet basis	12.40%	13.47%	10.48%	12.02%	8.59%	6.37%
H2O, mass %, wet basis	8.04%	8.76%	6.74%	7.75%	5.51%	4.05%
O2, %, dry basis (calculated)	14.97%	14.10%	14.03%	12.71%	17.17%	17.04%
CO2, %, dry basis (calculated)	3.40%	3.89%	3.92%	4.67%	2.16%	2.23%
Excess Air, %	224.53%	184.65%	182.05%	138.58%	407.37%	390.92%
Mol Wt (wet)	27.77	27.69	28.03	27.91	28.10	28.35
Diluent Concentrations						
O2 (%), dry basis	14.97%	14.10%	14.03%	12.71%	17.17%	17.04%
CO2 (%), dry basis	3.40%	3.89%	3.92%	4.67%	2.16%	2.23%
Reference O2 (%), dry basis	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
Pollutant Concentrations						
NMHC as CH4, ppmvd	2.0112	2.3035	2.3255	2.7683	1.2715	1.3150
CH4, ppmvd						
THC as CH4, ppmvd	2.0112	2.3035	2.3255	2.7683	1.2715	1.3150
CO (short term), ppmvd	6.0335	6.9104	6.9764	8.3048	3.8145	3.9450
CO (long term), ppmvd	6.0335	6.9104	6.9764	8.3048	3.8145	3.9450
NOx (short term), ppmvd	2.5139	2.8793	2.9068	3.4603	1.5894	1.6437
NOx (long term), ppmvd	2.5139	2.8793	2.9068	3.4603	1.5894	1.6437
SOx, ppmvd	0.2017	0.2310	0.2332	0.2776	0.1275	0.1319
NH3, ppmvd	10.0558	11.5173	11.6274	13.8413	6.3575	6.5750
PM10 (gr/dscf)	0.0014	0.0016	0.0016	0.0019	0.0028	0.0029

Table 8.1B-1
MEGS
Emissions and Operating Parameters for Gas Turbines

Project:	MID MEGS					Standard Conditions
Date:	01/03/2003					Reference O2:
Case	1) Hot Base w/ chiller	2) Hot Base w/ chiller	3) Hot Base w/o chiller	4) Hot Base w/o chiller	5) Hot Low w/ chiller	6) Hot Low w/o chiller
Ambient Temperature (F)	102	102	102	102	102	102
Ambient Humidity (%)	20%	20%	20%	20%	20%	20%
Turbine Load	100%	100%	100%	100%	20%	20%
With Dilution Air	Yes	No	Yes	No	No	Yes
Inlet Chiller On/Off	on	on	off	off	on	off
Inlet Humidity	60%	60%	20%	20%	60%	20%
Pollutant Concentrations at Ref. O2						
NMHC as CH4, ppmvd	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
CH4, ppmvd						
THC as CH4, ppmvd	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
CO (short term), ppmvd	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
CO (long term), ppmvd	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
NOx (short term), ppmvd	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
NOx (long term), ppmvd	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
SOx, ppmvd	0.2006	0.2006	0.2006	0.2006	0.2006	0.2006
NH3, ppmvd	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Emission Rates (lbs/MMbtu)						
NMHC as CH4	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253
CH4						
THC as CH4	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253
CO (short term)	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324
CO (long term)	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324
NOx (short term)	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906
NOx (long term)	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906
SOx	0.00101	0.00101	0.00101	0.00101	0.00101	0.00101
NH3	0.01341	0.01341	0.01341	0.01341	0.01341	0.01341
PM10	0.00600	0.00600	0.00600	0.00600	0.01908	0.01900
Emission Rates (lbs/hour)						
NMHC as CH4	1.26	1.26	1.26	1.26	0.40	0.40
CH4						
THC as CH4	1.26	1.26	1.26	1.26	0.40	0.40
CO (short term)	6.62	6.62	6.62	6.62	2.08	2.09
CO (long term)	6.62	6.62	6.62	6.62	2.08	2.09
NOx (short term)	4.53	4.53	4.53	4.53	1.42	1.43
NOx (long term)	4.53	4.53	4.53	4.53	1.42	1.43
SOx	0.51	0.51	0.51	0.51	0.16	0.16
NH3	6.71	6.71	6.71	6.71	2.11	2.12
PM10	3.00	3.00	3.00	3.00	3.00	3.00

Table 8.1B-1
MEGS
Emissions and Operating Parameters for Gas T

Project:	60	F								
Date:	15.00%									
Case	7) Hot Low w/o chiller	8) Avg Base w/ chiller	9) Avg Base w/ chiller	10) Avg Base w/o chiller	11) Avg Base w/o chiller	12) Avg Low w/ chiller	13) Avg Low w/o chiller	14) Cold Base w/ heater	15) Cold Base w/ heater	16) Cold Low w/ heater
Ambient Temperature (F)	102	67	67	67	67	67	67	15	15	15
Ambient Humidity (%)	20%	60%	60%	60%	60%	80%	60%	90%	90%	90%
Turbine Load	20%	100%	100%	100%	100%	20%	20%	100%	100%	20%
With Dilution Air	No	Yes	No	Yes	No	No	No	Yes	No	No
Inlet Chiller On/Off	off	on	on	off	off	on	off	off	off	off
Inlet Humidity	20%	80%	80%	60%	60%	80%	60%	90%	90%	90%
PAG Steam/Steam Injection/Water Injection (lbs/hr)	3,269	20,608	20,608	19,143	19,143	2,312	2,548	22,337	22,337	2,728
Turbine Fuel Flow Rates										
scfm	2,587	8,191	8,191	8,191	8,191	2,576	2,574	8,191	8,191	2,585
lbs/hr as fired	6,842.9	21,669.4	21,669.4	21,669.4	21,669.4	6,814.1	6,809.3	21,669.4	21,669.4	6,838.1
lbs/hr, dry, ash free	6,842.9	21,669.4	21,669.4	21,669.4	21,669.4	6,814.1	6,809.3	21,669.4	21,669.4	6,838.1
MMbtu/hr (HHV)	157.9	500.0	500.0	500.0	500.0	157.2	157.1	500.0	500.0	157.8
MMbtu/hr (LHV)	142.4	450.9	450.9	450.9	450.9	141.8	141.7	450.9	450.9	142.3
Duct Burner Fuel Flow Rates										
scfm	0	0	0	0	0	0	0	0	0	0
lbs/hr as fired	0	0	0	0	0	0	0	0	0	0
lbs/hr, dry, ash free	0	0	0	0	0	0	0	0	0	0
MMbtu/hr (HHV)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Fuel Flow Rates										
scfm	2,587	8,191	8,191	8,191	8,191	2,576	2,574	8,191	8,191	2,585
lbs/hr as fired	6,843	21,669	21,669	21,669	21,669	6,814	6,809	21,669	21,669	6,838
lbs/hr, dry, ash free	6,843	21,669	21,669	21,669	21,669	6,814	6,809	21,669	21,669	6,838
MMbtu/hr (HHV)	157.9	500.0	500.0	500.0	500.0	157.2	157.1	500.0	500.0	157.8
Gas Turbine Output (kw)	10,000	49,783	49,783	46,955	46,955	10,000	10,000	50,329	50,329	10,000
Steam Turbine Output (kw)	0	0	0	0	0	0	0	0	0	0
Total Electrical Output (kw)	10,000	49,783	49,783	46,955	46,955	10,000	10,000	50,329	50,329	10,000
Heat Rate (btu/kwh)	15790	10044	10044	10649	10649	15723	15712	9935	9935	15778
Exhaust Gas Parameters										
Exhaust Flow Rate (wacfm)	289,654	638,643	604,652	615,731	579,907	289,362	287,894	630,047	604,566	286,917
Exhaust Flow Rate (dscfm)	113,123	246,168	216,368	238,107	206,605	123,259	119,257	246,265	220,939	125,891
Exhaust Flow Rate (lbs/hr)	542,423	1,214,710	1,077,287	1,172,872	1,028,012	589,243	569,426	1,204,359	1,088,814	595,532
Exhaust Flow Rate (performance runs) (lbs/hr)	544,320	1,214,949	1,078,920	1,180,217	1,035,720	588,660	571,680	1,211,053	1,095,120	598,320
Difference	-0.35%	-0.02%	-0.15%	-0.62%	-0.74%	0.05%	-0.39%	-0.55%	-0.58%	-0.47%
Stack Temperature (F)	783	750	828	750	836	884	719	750	821	669
H2O, vol %, wet basis	6.64%	10.31%	11.37%	10.02%	11.21%	6.29%	6.08%	9.05%	9.97%	4.74%
H2O, mass %, wet basis	4.23%	6.63%	7.33%	6.43%	7.22%	3.99%	3.86%	5.79%	6.40%	2.99%
O2, %, dry basis (calculated)	16.81%	14.93%	14.10%	14.72%	13.77%	17.17%	17.04%	14.93%	14.24%	17.23%
CO2, %, dry basis (calculated)	2.36%	3.42%	3.89%	3.54%	4.07%	2.16%	2.23%	3.42%	3.81%	2.12%
Excess Air, %	364.56%	222.45%	184.65%	212.22%	172.27%	407.37%	391.56%	222.57%	190.45%	416.20%
Mol Wt (wet)	28.33	28.01	27.93	28.05	27.96	28.35	28.38	28.15	28.08	28.52
Diluent Concentrations										
O2 (%), dry basis	16.81%	14.93%	14.10%	14.72%	13.77%	17.17%	17.04%	14.93%	14.24%	17.23%
CO2 (%), dry basis	2.36%	3.42%	3.89%	3.54%	4.07%	2.16%	2.23%	3.42%	3.81%	2.12%
Reference O2 (%), dry basis	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
Pollutant Concentrations										
NMHC as CH4, ppmvd	1.3913	2.0246	2.3035	2.0932	2.4123	1.2715	1.3132	2.0238	2.2558	1.2493
CH4, ppmvd										
THC as CH4, ppmvd	1.3913	2.0246	2.3035	2.0932	2.4123	1.2715	1.3132	2.0238	2.2558	1.2493
CO (short term), ppmvd	4.1739	6.0739	6.9104	6.2795	7.2369	3.8145	3.9397	6.0715	6.7674	3.7479
CO (long term), ppmvd	4.1739	6.0739	6.9104	6.2795	7.2369	3.8145	3.9397	6.0715	6.7674	3.7479
NOx (short term), ppmvd	1.7391	2.5308	2.8793	2.6165	3.0154	1.5894	1.6410	2.5298	2.8198	1.5616
NOx (long term), ppmvd	1.7391	2.5308	2.8793	2.6165	3.0154	1.5894	1.6410	2.5298	2.8198	1.5616
SOx, ppmvd	0.1395	0.2030	0.2310	0.2099	0.2419	0.1275	0.1317	0.2030	0.2262	0.1253
NH3, ppmvd	6.9565	10.1231	11.5173	10.4658	12.0616	6.3575	6.5662	10.1191	11.2791	6.2466
PM10 (gr/dscf)	0.0031	0.0014	0.0016	0.0015	0.0017	0.0028	0.0029	0.0014	0.0016	0.0028

Table 8.1B-1
MEGS
Emissions and Operating Parameters for Gas T

Project:			60		F					
Date:			15.00%							
Case	7) Hot Low w/o chiller	8) Avg Base w/ chiller	9) Avg Base w/ chiller	10) Avg Base w/o chiller	11) Avg Base w/o chiller	12) Avg Low w/ chiller	13) Avg Low w/o chiller	14) Cold Base w/ heater	15) Cold Base w/ heater	16) Cold Low w/ heater
Ambient Temperature (F)	102	67	67	67	67	67	67	15	15	15
Ambient Humidity (%)	20%	60%	60%	60%	60%	60%	60%	90%	90%	90%
Turbine Load	20%	100%	100%	100%	100%	20%	20%	100%	100%	20%
With Dilution Air	No	Yes	No	Yes	No	No	No	Yes	No	No
Inlet Chiller On/Off	off	on	on	off	off	on	off	off	off	off
Inlet Humidity	20%	80%	80%	60%	80%	80%	60%	90%	90%	90%
Pollutant Concentrations at Ref. O2										
NMHC as CH4, ppmvd	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
CH4, ppmvd										
THC as CH4, ppmvd	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
CO (short term), ppmvd	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
CO (long term), ppmvd	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000	6.0000
NOx (short term), ppmvd	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
NOx (long term), ppmvd	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
SOx, ppmvd	0.2006	0.2006	0.2006	0.2006	0.2006	0.2006	0.2006	0.2006	0.2006	0.2006
NH3, ppmvd	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Emission Rates (lbs/MMbtu)										
NMHC as CH4	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253
CH4										
THC as CH4	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253	0.00253
CO (short term)	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324
CO (long term)	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324	0.01324
NOx (short term)	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906
NOx (long term)	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906	0.00906
SOx	0.00101	0.00101	0.00101	0.00101	0.00101	0.00101	0.00101	0.00101	0.00101	0.00101
NH3	0.01341	0.01341	0.01341	0.01341	0.01341	0.01341	0.01341	0.01341	0.01341	0.01341
PM10	0.01900	0.00600	0.00600	0.00600	0.00600	0.01908	0.01909	0.00600	0.00600	0.01901
Emission Rates (lbs/hour)										
NMHC as CH4	0.40	1.26	1.26	1.26	1.26	0.40	0.40	1.26	1.26	0.40
CH4										
THC as CH4	0.40	1.26	1.26	1.26	1.26	0.40	0.40	1.26	1.26	0.40
CO (short term)	2.09	6.62	6.62	6.62	6.62	2.08	2.08	6.62	6.62	2.09
CO (long term)	2.09	6.62	6.62	6.62	6.62	2.08	2.08	6.62	6.62	2.09
NOx (short term)	1.43	4.53	4.53	4.53	4.53	1.42	1.42	4.53	4.53	1.43
NOx (long term)	1.43	4.53	4.53	4.53	4.53	1.42	1.42	4.53	4.53	1.43
SOx	0.16	0.51	0.51	0.51	0.51	0.16	0.16	0.51	0.51	0.16
NH3	2.12	6.71	6.71	6.71	6.71	2.11	2.11	6.71	6.71	2.12
PM10	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Table 8.1B-2
MEGS
Calculation of Cooling Tower Emissions

Water Circulation Rate, gal/min	3,218
Drift Rate	0.0010%
TDS Level, mg/L	1620
PM10 lb/hr	0.03
PM10 emissions per cell (2 cells), lb/hr	0.01
PM10 emissions per cell (2 cells), g/s	1.64E-003

Table 8.1B-3
MEGS
Detailed Calculations for Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions

							NOx		SOx		CO		VOC		PM10	
	Base Load			Startup			Base Load	Startup	Base Load	Startup	Base Load	Startup	Base Load	Startup	Base Load	Startup
Equipment	max. hour	hrs/day	hrs/yr	max. hour	hrs/day	hrs/yr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
Gas Turbine 1, baseload	0	21	8395	0	0	0	4.53	0.00	0.51	0.00	6.62	0.00	1.26	0.00	3.00	0.00
Gas Turbine 2, baseload	0	21	8395	0	0	0	4.53	0.00	0.51	0.00	6.62	0.00	1.26	0.00	3.00	0.00
Gas Turbine 1, startups	0	0	0	1	3	365	0.00	20.00	0.00	0.51	0.00	6.62	0.00	1.26	0.00	3.00
Gas Turbine 2, startups	0	0	0	1	3	365	0.00	20.00	0.00	0.51	0.00	6.62	0.00	1.26	0.00	3.00
Cooling Tower Number 1	1	24	8760	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
Cooling Tower Number 2	1	24	8760	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00

Table 8.1B-3 (cont.)
Detailed Calculations for Maximum Hourly, Daily, and Annual Criteria Pollutant Emissions

	NOx			SOx			CO			VOC			PM10		
Equipment	Max lb/hr	Max lb/day	Total tpy	Max lb/hr	Max lb/day	Total tpy	Max lb/hr	Max lb/day	Total tpy	Max lb/hr	Max lb/day	Total tpy	Max lb/hr	Max lb/day	Total tpy
Gas Turbine 1, baseload	0.0	95.1	19.0	0.0	10.6	2.1	0.0	139.0	27.8	0.0	26.5	5.3	0.0	63.0	12.6
Gas Turbine 2, baseload	0.0	95.1	19.0	0.0	10.6	2.1	0.0	139.0	27.8	0.0	26.5	5.3	0.0	63.0	12.6
Gas Turbine 1, startups	20.0	60.0	3.7	0.5	1.5	0.1	6.6	19.9	1.2	1.3	3.8	0.2	3.0	9.0	0.5
Gas Turbine 2, startups	20.0	60.0	3.7	0.5	1.5	0.1	6.6	19.9	1.2	1.3	3.8	0.2	3.0	9.0	0.5
Cooling Tower Number 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1
Cooling Tower Number 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1
Total	40.0 lb/hr	310.2 lb/day	45.3 tpy	1.0 lb/hr	24.3 lb/day	4.4 tpy	13.2 lb/hr	317.7 lb/day	58.0 tpy	2.5 lb/hr	60.6 lb/day	11.1 tpy	6.1 lb/hr	145.3 lb/day	26.5 tpy

Table 8.1B-4
MEGS
Annual and Maximum Hourly Non-Criteria Pollutant Emissions From Turbines

Pollutant	Emission Factor lb/MMscf	1 turbine Max firing rate MMBtu/hr	Natural gas Btu/scf	Turbine Operating Hours hs/yr	1 turbine Max firing rate MMscf/hr	1 turbine Annual Avg Firing Rate MMscf/yr	1 turbine Emissions lbs/hr (each)	2 turbines Emissions lbs/hr	1 turbine Emissions tons/yr (each)	2 turbines Emissions tons/yr
Acetaldehyde	1.80E-001	500.0	1017.41	8760	0.49	4,305.1	8.85E-002	1.77E-001	3.87E-001	7.75E-001
Acrolein	3.69E-003	500.0	1017.41	8760	0.49	4,305.1	1.81E-003	3.63E-003	7.94E-003	1.59E-002
Ammonia (ppmv)	10.0	500.0	1017.41	8760	0.49	4,305.1	6.71E+000	1.34E+001	2.94E+001	5.88E+001
Benzene	3.33E-003	500.0	1017.41	8760	0.49	4,305.1	1.64E-003	3.27E-003	7.17E-003	1.43E-002
Benzo(a)anthracene	2.26E-005	500.0	1017.41	8760	0.49	4,305.1	1.11E-005	2.22E-005	4.86E-005	9.73E-005
Benzo(a)pyrene	1.39E-005	500.0	1017.41	8760	0.49	4,305.1	6.83E-006	1.37E-005	2.99E-005	5.98E-005
Benzo(b)fluoranthene	1.13E-005	500.0	1017.41	8760	0.49	4,305.1	5.55E-006	1.11E-005	2.43E-005	4.86E-005
Benzo(k)fluoranthene	1.10E-005	500.0	1017.41	8760	0.49	4,305.1	5.41E-006	1.08E-005	2.37E-005	4.74E-005
1,3-Butadiene	1.27E-004	500.0	1017.41	8760	0.49	4,305.1	6.24E-005	1.25E-004	2.73E-004	5.47E-004
Chrysene	2.52E-005	500.0	1017.41	8760	0.49	4,305.1	1.24E-005	2.48E-005	5.42E-005	1.08E-004
Dibenz(a,h)anthracene	2.35E-005	500.0	1017.41	8760	0.49	4,305.1	1.15E-005	2.31E-005	5.06E-005	1.01E-004
Ethylbenzene	3.26E-002	500.0	1017.41	8760	0.49	4,305.1	1.60E-002	3.20E-002	7.02E-002	1.40E-001
Formaldehyde	3.67E-001	500.0	1017.41	8760	0.49	4,305.1	1.80E-001	3.61E-001	7.90E-001	1.58E+000
Hexane	2.59E-001	500.0	1017.41	8760	0.49	4,305.1	1.27E-001	2.55E-001	5.58E-001	1.12E+000
Indeno(1,2,3-cd)pyrene	2.35E-005	500.0	1017.41	8760	0.49	4,305.1	1.15E-005	2.31E-005	5.06E-005	1.01E-004
Naphthalene	1.66E-003	500.0	1017.41	8760	0.49	4,305.1	8.16E-004	1.63E-003	3.57E-003	7.15E-003
Propylene	7.70E-001	500.0	1017.41	8760	0.49	4,305.1	3.78E-001	7.57E-001	1.66E+000	3.31E+000
Propylene oxide	4.78E-002	500.0	1017.41	8760	0.49	4,305.1	2.35E-002	4.70E-002	1.03E-001	2.06E-001
Toluene	7.10E-002	500.0	1017.41	8760	0.49	4,305.1	3.49E-002	6.98E-002	1.53E-001	3.06E-001
Xylene	2.61E-002	500.0	1017.41	8760	0.49	4,305.1	1.28E-002	2.57E-002	5.62E-002	1.12E-001
Total =										6.63E+001
Total (less ammonia) =										7.59E+000

Table 8.1B-5
MEGS
Non-Criteria Pollutant Emissions From Cooling Towers

Pollutant	Water Concentration mg/L	Water Circ rate (gpm)	Tower Drift Rate	1 Tower Emission Rate lbs/hr (each)	2 Towers Emission Rate lbs/hr	1 Tower Annual Emission Rate ton/yr (each)	2 Towers Annual Emission Rate tons/yr	Hourly Emission Rate Per Cell g/sec (each)	Annual Emission Rate Per Cell g/sec (each)
Arsenic	0.018	3,218	0.0010%	2.90E-007	5.80E-007	1.27E-006	2.54E-006	1.83E-008	1.83E-008
Cadmium	0.003	3,218	0.0010%	4.83E-008	9.67E-008	2.12E-007	4.23E-007	3.05E-009	3.05E-009
Chloride	0.201	3,218	0.0010%	3.24E-006	6.48E-006	1.42E-005	2.84E-005	2.04E-007	2.04E-007
Chromium III	0.015	3,218	0.0010%	2.42E-007	4.83E-007	1.06E-006	2.12E-006	1.52E-008	1.52E-008
Chromium VI	0.0051	3,218	0.0010%	8.22E-008	1.64E-007	3.60E-007	7.20E-007	5.18E-009	5.18E-009
Copper	0.081	3,218	0.0010%	1.31E-006	2.61E-006	5.72E-006	1.14E-005	8.22E-008	8.22E-008
DCE	0.013	3,218	0.0010%	2.09E-007	4.19E-007	9.17E-007	1.83E-006	1.32E-008	1.32E-008
Lead	0.012	3,218	0.0010%	1.93E-007	3.87E-007	8.47E-007	1.69E-006	1.22E-008	1.22E-008
Manganese	0.054	3,218	0.0010%	8.70E-007	1.74E-006	3.81E-006	7.62E-006	5.48E-008	5.48E-008
Nickel	0.015	3,218	0.0010%	2.42E-007	4.83E-007	1.06E-006	2.12E-006	1.52E-008	1.52E-008
TCE	0.0099	3,218	0.0010%	1.60E-007	3.19E-007	6.99E-007	1.40E-006	1.00E-008	1.00E-008
Zinc	0.321	3,218	0.0010%	5.17E-006	1.03E-005	2.27E-005	4.53E-005	3.26E-007	3.26E-007
Total =						5.28E-005	1.06E-004		

Table 8.1B-6
Gas Turbine Commissioning Profile - MEGS

Operating Mode	Hours of Operation(1)	Fuel Use MMBtu/hr (2) (HHV)	Emission Factors (lbs/MMBtu) NOx(3)	CO(4)	VOC(5)	PM10(6)	SOx(7)	Hourly Emissions (lbs/hr) NOx	CO	VOC	PM10
Turbine 1 - FSNL	**4**	**100.0**	**0.362**	**0.3972**	**0.0375**	**n/a**	**0.0010**	**36.24**	**39.72**	**3.75**	**3.00**
Turbine 2 - FSNL	4	100.0	0.362	0.3972	0.0375	n/a	0.0010	36.24	39.72	3.75	3.00
Turbine 1 - Min. Load, no SCR or ox cat	20	100.0	0.152	0.2251	0.0200	n/a	0.0010	15.22	22.51	2.00	3.00
Turbine 2 - Min. Load, no SCR or ox cat	20	100.0	0.152	0.2251	0.0200	n/a	0.0010	15.22	22.51	2.00	3.00
Turbine 1 - FSNL (if necessary)	24	100.0	0.362	0.2251	0.0200	n/a	0.0010	36.24	22.51	2.00	3.00
Turbine 2 - FSNL (if necessary)	24	100.0	0.362	0.2251	0.0200	n/a	0.0010	36.24	22.51	2.00	3.00
Turbine 1 - Multiple Load - Full SCR/ox cat	48	500.0	0.0589	0.0132	0.0025	n/a	0.0010	29.45	6.62	1.25	3.00
Turbine 2 - Multiple Load - Full SCR/ox cat	48	500.0	0.0589	0.0132	0.0025	n/a	0.0010	29.45	6.62	1.25	3.00
Total =	192										

Table 8.1B-7
MIDES
Startup Emissions (Each Turbine)

Duration, hours	1
Maximum Hour Emissions	
NOx, lbs/hr	20

Table 8.1B-8
Quarterly Emission Offset Calculations - MEGS

Pollutant	Turbine Startup Emission Rate (lbs/hr)	Turbine Baseload Emission Rate (lbs/hr)	Turbine Startup Hours (hrs/yr)	Turbine Shutdown Hours(1) (hrs/yr)	Turbine Baseload Hours (hrs/yr)	Annual Emissions Per Turbine (lbs/yr)	Annual Emissions Both Turbines (lbs/yr)
NOx	20.00	4.53	365	730	7665	42,016	84,031
VOC	1.26	1.26	365	0	8395	11,069	22,137
PM10	3.00	3.00	365	0	8395	26,280	52,560

Pollutant	Facility Annual Emissions(2) (lbs/yr)	NSR Offset Thresholds (lbs/yr)	Net Facility Annual Emissions(3) (lbs/yr)	Facility Quarterly Emissions (lbs/quarter)	Emission Offsets Required 1:0 to 1.0 ratio (lbs/quarter)	Emission Offsets Required :5 to 1.0 ratio (lbs/quarter)
NOx	84,031	20,000	64,031	16,008	16,008	24,012
VOC	22,137	20,000	2,137	534	534	801
PM10	52,560	29,200	23,360	5,840	5,840	8,760

Notes
1. This accounts for a 2-hour shutdown period associated with each startup.
2. Emissions do not include PM10 emissions for cooling towers which are exempt from permitting.
3. Facility emissions less NSR offset threshold levels.

Figure 8.1B-9

PG&E Burney Compressor Station Sulfur Data									
	No. of Hourly	Monthly Averages				Maximum Hourly			
		H2S		Total Sulfur, as S		H2S		Total Sulfur, as S	
Month/Year	Readings	ppmv	gr/100 scf	ppmv	gr/100 scf	ppmv	gr/100 scf	ppmv	gr/100 scf
Dec-00	336	0.96	0.06	5.42	0.32	1.29	0.08	6.64	0.39
Jan-01	744	0.53	0.03	4.18	0.25	0.88	0.05	5.03	0.30
Feb-01	672	0.43	0.03	3.74	0.22	0.89	0.05	4.70	0.28
Mar-01	744	0.63	0.04	4.35	0.26	1.20	0.07	6.25	0.37
Apr-01	719	1.05	0.06	4.69	0.28	1.60	0.09	6.34	0.38
May-01	744	0.93	0.05	4.72	0.28	1.35	0.08	6.02	0.36
Jun-01	720	1.17	0.07	5.68	0.34	2.36	0.14	8.21	0.49
Jul-01	744	0.96	0.06	5.43	0.32	1.49	0.09	6.77	0.40
Aug-01	743	0.91	0.05	5.43	0.32	1.65	0.10	7.29	0.43
Sep-01	720	0.88	0.05	5.08	0.30	1.32	0.08	6.81	0.40
Oct-01	744	0.83	0.05	3.84	0.23	1.57	0.09	5.96	0.35
Nov-01	720	0.83	0.05	3.96	0.23	1.17	0.07	4.83	0.29
Dec-01	408	0.98	0.06	4.17	0.25	1.28	0.08	7.61	0.45
12/18/00-12/17/01	8758	0.85	0.05	4.66	0.275	2.36	0.14	8.21	0.485

Table 8.1B-10
MID MEGS Emission Offsets Inter-Quarter Distribution (pounds)

NOx	Q1	Q2	Q3	Q4	Sum
Certificate #N-142-2	3,971	10,226	0	17,390	31,587
Certificate #N-60-2	0	9,439	51,165	922	61,526
Certificate #C-456-2	3,584	3,895	4,610	4,156	16,245
Certificate #C-456-2 Sold	0	-2,246	0	-3,311	-5,557
Total ERCs	7,555	21,314	55,775	19,157	103,801
Inter-Quarter Transfer Quantity[1]	+18,395	+4,636	-29,824	+6,793	0
ERCs Evenly Distributed	25,950	25,950	25,951	25,950	103,801
Project NOx	16,008	16,008	16,008	16,008	64,032
NOx ERCs 1.5:1	25,950	25,950	25,951	25,950	103,801
Balance (to be refunded)	9,942	9,942	9,943	9,942	39,769
VOC					
Certificate #C-456-1	513	616	819	689	2,637
Inter-Quarter Transfer Quantity[1]	+136	+33	-169	0	0
ERCs Evenly Distributed	649	649	650	689	2,637
Project VOC	534	534	534	534	2,136
VOC ERCs 1.5:1	801	801	801	801	3,204
Balance	-152	-152	-151	-112	-567
PM_{10}					
Certificate #C-27-5 (SO_2)	26,440	17,209	0	8,032	51,681
Certificate #N-224-5 (SO_2)	3,000	0	3,000	4,000	10,000
Total	29,440	17,209	3,000	12,032	61,681
Inter-Quarter Transfer Quantity[1]	-14,616	0	+11,824	+2,792	0
ERCs Evenly Distributed	14,824	17,209	14,824	14,824	59,296
Project PM_{10}	5,840	5,840	5,840	5,840	23,360
SO_2 ERCs 2.5:1	14,600	14,600	14,600	14,600	58,400
Balance (to be refunded)	224	2,609	224	224	3,281

Note: 1) NOx and VOC offsets may be moved from the 2nd and 3rd quarters to the 1st and 4th quarters pursuant to Rule 2201.4.13.8. PM_{10} offsets (and SO_2 precursors) may be moved from the 1st and 4th quarters to the 2nd and 3rd quarters pursuant to Rule 2201.4.13.7.

APPENDIX 8.1B-1

Air Quality Support Documentation

ATTACHMENT 8.1B-1
EMISSION REDUCTION CREDIT CERTIFICATES PURCHASED BY APPLICANT

San Joaquin Valley
Air Pollution Control District

Northern Regional Office • 4230 Kiernan Avenue, Suite 130 • Modesto, CA 95356-9322

Emission Reduction Credit Certificate
N-224-5

ISSUED TO: MODESTO ENERGY LIMITED PARTNER

ISSUED DATE: August 14, 2002

LOCATION OF REDUCTION: 4549 INGRAM CREEK ROAD
WESTLEY, CA 95387

For SOx Reduction In The Amount Of:

Quarter 1	Quarter 2	Quarter 3	Quarter 4
14,291 lbs	9,417 lbs	17,141 lbs	15,372 lbs

[ ] Conditions Attached

Method Of Reduction

[X] Shutdown of Entire Stationary Source
[ ] Shutdown of Emissions Units
[ ] Other

Use of these credits outside the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) is not allowed without express written authorization by the SJVUAPCD.

David L. Crow, Executive Director / APCO

Seyed Sadredin, Director of Permit Services

San Joaquin Valley
Unified Air Pollution Control District
Northern Regional Office • 4230 Kiernan Ave., Suite 130 • Modesto, CA 95356

Emission Reduction Credit Certificate
N-60-2

Issued To: HEINZ USA
2800 SOUTH CALIFORNIA STREET
STOCKTON, CA

Location of Reduction: 2800 SOUTH CALIFORNIA STREET
STOCKTON, CA

For NOx Reduction In The Amount Of:

Quarter 1	Quarter 2	Quarter 3	Quarter 4
0 lbs	9,439 lbs	51,165 lbs	922 lbs

[ ] Conditions Attached

Method Of Reduction
[ ] Shutdown of Entire Stationary Source
[ ] Shutdown of Emissions Unit
[X] Other: Retrofit of two boilers with low NOx burners

David L. Crow, APCO

Seyed Sadredin
Director of Permit Services

Date 3/30/04

San Joaquin Valley Unified Air Pollution Control District

Northern Regional Office • 4230 Kiernan Ave., Suite 130 • Modesto, CA 95356

Emission Reduction Credit Certificate N-142-2

Issued To: H.J. Heinz
Issue Date: March 11, 1999

Location of Reduction: 757 E. 11th Street
Tracy, CA

For NOx Reduction In The Amount Of:

Quarter 1	Quarter 2	Quarter 3	Quarter 4
3,971 lbs	10,226 lbs	0 lbs	17,390 lbs

[ ] Conditions Attached

Method Of Reduction
[ ] Shutdown of Entire Stationary Source
[ ] Shutdown of Emissions Unit
[√] Other: Retrofit of six boilers with low NOx burners

David L. Crow, APCO

Seyed Sadredin
Director of Permit Services

San Joaquin Valley
Air Pollution Control District

Central Regional Office • 1990 E. Gettysburg Ave. • Fresno, CA 93726

RECEIVED
MAR 2 6 2003
SAN JOAQUIN VALLEY UNIFIED
APCD-SOUTHERN REGION

Emission Reduction Credit Certificate
C-456-2

ISSUED TO: SAINT AGNES MEDICAL CENTER

ISSUED DATE: March 14, 2002

LOCATION OF REDUCTION: 1303 E HERNDON AVE
FRESNO, CA 93720

For NOx Reduction In The Amount Of:

Quarter 1	Quarter 2	Quarter 3	Quarter 4
3,584 lbs	3,895 lbs	4,610 lbs	4,156 lbs

[ ] Conditions Attached

Method Of Reduction

[ ] Shutdown of Entire Stationary Source
[ ] Shutdown of Emissions Units
[X] Other

Replacement of three existing 1100 HP Superior IC engine generators with two 3.5 MW Centaur 40 gas turbine engine generators.

Use of these credits outside the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) is not allowed without express written authorization by the SJVUAPCD.

David L. Crow, Executive Director / APCO

Seyed Sadredin, Director of Permit Services

San Joaquin Valley
Air Pollution Control District
Central Regional Office • 1990 E. Gettysburg Ave. • Fresno, CA 93726

COPY

Emission Reduction Credit Certificate
C-27-5

ISSUED TO: PIRELLI TIRE CORP.

ISSUED DATE: <unknown>

LOCATION OF REDUCTION:

For SOx Reduction In The Amount Of:

Quarter 1	Quarter 2	Quarter 3	Quarter 4
26,440 lbs	17,209 lbs	None	8,032 lbs

[ ] Conditions Attached

Method Of Reduction

[ ] Shutdown of Entire Stationary Source
[X] Shutdown of Emissions Units
[ ] Other

Use of these credits outside the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) is not allowed without express written authorization by the SJVUAPCD.

David L. Crow, Executive Director / APCO

Sayed Sadredin, Director of Permit Services

San Joaquin Valley
Air Pollution Control District

Central Regional Office • 1990 E. Gettysburg Ave. • Fresno, CA 93726

Emission Reduction Credit Certificate
C-456-1

ISSUED TO: SAINT AGNES MEDICAL CENTER

ISSUED DATE: March 14, 2002

LOCATION OF REDUCTION: 1303 E HERNDON AVE
FRESNO, CA 93720

For VOC Reduction In The Amount Of:

Quarter 1	Quarter 2	Quarter 3	Quarter 4
513 lbs	616 lbs	819 lbs	689 lbs

[ ] Conditions Attached

Method Of Reduction

[ ] Shutdown of Entire Stationary Source
[ ] Shutdown of Emissions Units
[X] Other

Replacement of three existing 1100 HP Superior IC engine generators with two 3.5 MW Centaur 40 gas turbine engine generators.

Use of these credits outside the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) is not allowed without express written authorization by the SJVUAPCD.

David L. Crow, Executive Director / APCO

Seyed Sadredin, Director of Permit Services