

Case No. 9482

Attachment 2

**CLEAN Revised Air Construction Permit
Application, Appendix B, Emissions Calculations
and NSR Applicability Analysis**

Emissions Calculations

ProEnergy Maryland Site

February 2018

Tubrine Model:
GE LM6000PC

Natural Gas Emissions for LM6000PC Burning																																													
	BASE - Gas										75% - Gas					60% - Gas			50% - Gas			BASE - FO										75% - FO					60% - FO		50% - FO						
Case	Case 1	Case 2	Case 7	Case 8	Case 3	Case 9	Case 25	Case 26	Case 27	Case 13	Case 14	Case 15	Case 31	Case 32	Case 33	Case 19	Case 37	Case 20	Case 21	Case 38	Case 39	Case 4	Case 5	Case 10	Case 11	Case 6	Case 12	Case 28	Case 29	Case 30	Case 16	Case 17	Case 18	Case 34	Case 35	Case 36	Case 22	Case 40	Case 23	Case 24	Case 41	Case 42			
Elevation (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		
Gas Compressor	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
Inlet Heating	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	No	No	Yes	Yes	
Sprint	Yes	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Evap Cooling	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	No	No	No
Temperature	95	95	59	59	0	0	0	0	59	59	59	0	0	0	0	59	0	59	59	0	0	95	95	59	59	95	59	0	0	0	59	59	59	0	0	0	59	0	59	59	0	0	0	0	0
Load %	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%	75%	75%	75%	60%	60%	50%	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%	75%	75%	75%	60%	60%	50%	50%	50%	50%	50%	50%	
Fuel Type	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	
Exhaust Mass Flow (lb/hr x 103)	791.1	730.6	869.5	843.8	689.1	827.8	884.7	878.7	790.4	770.8	754.8	806.4	804.8	804.8	725.5	747.1	670	654.5	702.5	702.5	779.7	731.7	858	830.8	689.9	813.6	876.3	867.6	867.6	772.9	755.9	738.6	795.5	792	792	714.4	736.7	657.7	640.8	691.6	691.6				
Net Power (kW)	121,013	98,815	138,296	129,250	86,687	125,258	138,949	136,596	103,405	96,625	93,640	103,911	102,133	102,133	82,468	82,851	63,975	61,993	67,642	67,642	115,399	99,877	132,431	123,037	87,591	118,828	133,717	130,740	130,740	99,003	91,964	88,815	95,973	97,735	97,735	78,943	79,715	60,902	58,810	64,739	64,739				
Net Heat Rate (BTU/kWh)	8,702	8,894	8,418	8,382	9,360	8,432	8,326	8,275	8,275	8,988	9,034	9,101	8,876	8,883	8,883	9,614	9,602	10,613	10,736	10,351	10,351	8,803	8,997	8,501	8,481	9,362	8,548	8,388	8,354	8,354	9,026	9,217	9,315	9,003	9,032	9,032	9,810	9,772	10,883	11,041	10,584	10,584			
Exhaust Temp (°F)	870	857	843	849	856	854	837	838	838	785	785	776	776	774	746	741	752	717	717	717	867	873	840	847	871	852	833	834	834	806	790	799	780	771	771	779	752	747	760	722	722				
Exhaust Temp (°R)	1330	1317	1303	1309	1316	1314	1297	1298	1298	1245	1245	1252	1236	1227	1227	1234	1206	1201	1212	1177	1177	1327	1333	1300	1307	1331	1312	1293	1294	1266	1250	1259	1240	1231	1231	1239	1212	1207	1162	1162					
Heat Input (MMBtu/hr)	360.4	301.0	397.8	370.0	278.3	360.7	395.4	385.9	385.9	318.9	299.1	292.0	316.1	310.7	310.7	272.6	273.6	234.3	229.7	241.4	241.4	344.3	304.8	381.0	353.2	278.6	343.9	379.6	369.5	369.5	303.3	287.8	281.0	305.6	299.6	299.6	263.7	265.3	226.5	222.0	234.0	234.0			
Net Fuel Rate (MMscf/hr) ¹	0.35	0.30	0.39	0.36	0.27	0.35	0.39	0.38	0.38	0.31	0.29	0.29	0.31	0.30	0.30	0.27	0.27	0.23	0.23	0.24	0.24																								
Net Fuel Rate (gal/hr) ²																																													
Exhaust MW (lb/lbmol)	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7			
Estimated Stack Gas Pressure (psia)	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69		
Estimated Stack Flow (ft3/hr)	26,778,057	24,488,460	28,834,341	28,110,929	23,079,913	27,683,234	29,203,307	29,027,615	29,027,615	25,044,497	24,423,454	24,050,951	25,366,761	25,132,087	25,132,087	22,784,978	22,930,951	20,479,240	20,188,697	21,043,541	21,043,541	26,332,645	24,823,284	28,387,469	27,635,550	23,370,082	27,166,945	28,836,820	28,572,606	28,572,606	24,903,079	24,047,525	23,666,338	25,104,865	24,812,999	24,812,999	22,527,281	22,724,237	20,203,711	19,896,577	20,805,037	20,805,037			
NOx - (Lbs/hr)	31.70	29.27	34.84	33.81	27.61	33.17	35.45	35.21	31.67	30.89	30.24	32.31	32.25	32.25	29.07	29.94	26.85	26.23	28.15	28.15	52.49	49.26	57.76	55.93	46.44	54.77	58.99	58.40	58.40	52.03	50.88	49.72	53.55	53.32	53.32	48.09	49.59	44.27	43.14	46.56	46.56				
CO (ppmvd@15%)	17	17	20	20	17	20	30	30	30	22	22	35	35	35	25	38	27	27	40	40	23	23	25	25	23	25	36	36	36	36	28	28	41	41	41	30	45	32	32	47	47				
CO (Lbs/hr)	13.12	12.12	16.97	16.46	11.43	16.15	25.89	25.72	16.96	16.54	16.20	27.54	27.48	27.48	17.70	27.70	17.65	17.24	27.41	27.41	17.50	16.42	20.93	20.26	15.48	19.84	30.78	30.47	30.47	21.11	20.65	20.18	31.62	31.68	20.91	32.34	20.53	20.01	31.71	31.71					
VOC (ppmvd@15%)	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	5	5	3	6	4	4	7	7	5	5	5	5	7	7	7	7	7	7	10	10	10	9	12	10	13	13				
VOC (Lbs/hr)	0.44	0.41	0.48	0.47	0.38	0.46	0.99	0.98	0.98	0.88	0.86	0.84	2.25	2.24	2.24	1.21	2.50	1.49	1.46	2.74	2.74	2.17	2.04	2.39	2.32	1.92	2.27	3.42	3.39	3.39	3.02	2.95	2.88	4.43	4.42	4.42	3.58	4.93	3.67	3.57	5.01	5.01			
PM Filterable (Lbs/hr) ¹	1.30	1.09	1.44	1.34	1.01	1.31	1.43	1.40	1.15	1.08	1.06	1.14	1.12	1.12	0.99	0.99	0.85	0.83	0.87	0.87	4.02	3.56	4.45	4.13	3.25	4.02	4.44	4.32	4.32	3.54	3.36	3.28	3.57	3.50	3.50	3.08	3.10	2.65	2.59	2.73	2.73				
PM Condensible (Lbs/hr) ¹	3.23	2.69	3.56	3.31	2.49	3.23	3.54	3.45	2.85	2.68	2.61	2.83	2.78	2.78	2.44	2.45	2.10	2.06	2.16	2.16	7.20	6.38	7.97	7.39	5.83	7.20	7.94	7.73	7.73	6.35	6.02	5.88	6.39	6.27	6.27	5.52	5.55	4.74	4.65	4.90	4.90				
PM Total (Lbs/hr) ¹	4.53	3.78	5.00	4.65	3.50	4.53	4.97	4.85	4.85	4.01	3.76	3.67	3.97	3.90	3.90	3.43	3.44	2.94	2.89	3.03	3.03	11.23	9.94	12.42	11.52	9.08	11.21	12.38	12.05	12.05	9.89	9.39	9.16	9.96	9.77	9.77	8.60	8.65	7.39	7.24	7.63	7.63			
SO2 - (ppmvd@15%)	0.0004	0.0003	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0100	0.0094	0.0101	0.0096	0.0091	0.0096	0.0096	0.0096	0.0089	0.0086	0.0086	0.0087	0.0086	0.0086	0.0086	0.0084	0.0082	0.0078	0.0078	0.0077	0.0077				
	Sulfur content grains per 100 SCF																				Sulfur content % wt																								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015			
SO2 (lb/hr) ²	0.27	0.22	0.29	0.27	0.21	0.27	0.29	0.28	0.28	0.24	0.																																		

ProEnergy Maryland Site

February 2018

Turbine Model: GE LM6000PC

Estimated Emissions for LM6000PC Burning Natural Gas

	100% - Gas									75% - Gas						60% - Gas		50% - Gas			
Case	Case 1	Case 2	Case 7	Case 8	Case 3	Case 9	Case 25	Case 26	Case 27	Case 13	Case 14	Case 15	Case 31	Case 32	Case 33	Case 19	Case 37	Case 20	Case 21	Case 38	Case 39
Elevation (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Gas Compressor	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inlet Heating	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
Sprint	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No
Evap Cooling	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	No
Temperature	95	95	59	59	95	59	0	0	0	59	59	59	0	0	0	59	0	59	59	0	0
Load %	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%	75%	75%	75%	60%	60%	50%	50%	50%	50%
Fuel Type	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas
Stack Height (ft)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Stack diameter (ft)	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Exhaust Temp (°F)	870	857	843	849	856	854	837	838	838	785	785	792	776	767	767	774	746	741	752	717	717
Exhaust velocity (ft/sec)	116.92	106.93	125.90	122.74	100.78	120.88	127.51	126.75	126.75	109.35	106.64	105.02	110.76	109.74	109.74	99.49	100.13	89.42	88.15	91.88	91.88
Estimated Stack Flow (ft³/hr)	26,778,057	24,488,460	28,834,341	28,110,929	23,079,913	27,683,234	29,203,307	29,027,615	29,027,615	25,044,497	24,423,454	24,050,951	25,366,761	25,132,087	25,132,087	22,784,978	22,930,951	20,479,240	20,188,697	21,043,541	21,043,541
NOx - (Lbs/hr)	31.70	29.27	34.84	33.81	27.61	33.17	35.45	35.21	35.21	31.67	30.89	30.24	32.31	32.25	32.25	29.07	29.94	26.85	26.23	28.15	28.15
CO (Lbs/hr)	13.12	12.12	16.97	16.46	11.43	16.15	25.89	25.72	25.72	16.96	16.54	16.20	27.54	27.48	27.48	17.70	27.70	17.65	17.24	27.41	27.41
VOC (Lbs/hr)	0.44	0.41	0.48	0.47	0.38	0.46	0.99	0.98	0.98	0.88	0.86	0.84	2.25	2.24	2.24	1.21	2.50	1.49	1.46	2.74	2.74
Primary PM/PM ₁₀ /PM _{2.5} Total (Lbs/hr)	4.53	3.78	5.00	4.65	3.50	4.53	4.97	4.85	4.85	4.01	3.76	3.67	3.97	3.90	3.90	3.43	3.44	2.94	2.89	3.03	3.03
SO ₂ (lb/hr)	0.50	0.42	0.56	0.52	0.39	0.50	0.55	0.54	0.54	0.45	0.42	0.41	0.44	0.43	0.43	0.38	0.38	0.33	0.32	0.34	0.34
H ₂ SO ₄ (Lbs/hr)	0.077	0.064	0.085	0.079	0.060	0.077	0.085	0.083	0.083	0.068	0.064	0.063	0.068	0.067	0.067	0.058	0.059	0.050	0.049	0.052	0.052
CO ₂ Massflow (Lbs/hr)	39641	33115	43763	40697	30618	39680	43492	42446	42446	35075	32900	32124	34776	34175	34175	29990	30097	25768	25263	26550	26550
CO ₂ Equivalent (Lb/hr)	40041	33449	44204	41107	30927	40080	43931	42874	42874	35429	33231	32447	35127	34520	34520	30292	30400	26027	25518	26818	26818

	100	75	60	50
Stack Parameters				
Height (ft)	150	150	150	150
Diameter (ft)	9	9	9	9
Temperature (deg F)	837	767	746	717
Velocity (ft/sec)	100.78	105.02	99.49	88.15
Emissions Data (lb/hr)				
NOx	35.45	32.31	29.94	28.15
CO	25.89	27.54	27.70	27.41
VOC	0.99	2.25	2.50	2.74
Primary PM/PM ₁₀ /PM _{2.5}	5.00	4.01	3.44	3.03
SO ₂	0.56	0.45	0.38	0.34
H ₂ SO ₄	0.09	0.07	0.06	0.05
CO ₂	43762.74	35075.40	30096.99	26550.11
CO ₂ e	44203.95	35429.02	30400.42	26817.78

ProEnergy Maryland Site

February 2018

Tubrine Model: GE LM6000PC

Estimated Emissions for LM6000PC Burning ULSD

	100% - FO									75% - FO						60% - FO		50% - FO			
Case	Case 4	Case 5	Case 10	Case 11	Case 6	Case 12	Case 28	Case 29	Case 30	Case 16	Case 17	Case 18	Case 34	Case 35	Case 36	Case 22	Case 40	Case 23	Case 24	Case 41	Case 42
Elevation (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Gas Compressor	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Inlet Heating	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
Sprint	Yes	No	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Evap Cooling	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	No
Temperature	95	95	59	59	95	59	0	0	0	59	59	59	0	0	0	59	0	59	59	0	0
Load %	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%	75%	75%	75%	60%	60%	50%	50%	50%	50%
Fuel Type	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Stack Height (ft)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Stack diameter (ft)	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Exhaust Temp (°F)	867	873	840	847	871	852	833	834	834	806	790	799	780	771	771	779	752	747	760	722	722
Exhaust velocity (ft/sec)	114.98	108.39	123.95	120.67	102.04	118.62	125.91	124.76	124.76	108.74	105.00	103.34	109.62	108.34	108.34	98.36	99.22	88.22	86.88	90.84	90.84
Estimated Stack Flow (ft ³ /hr)	26,332,645	24,823,284	28,387,469	27,635,550	23,370,082	27,166,945	28,836,820	28,572,606	28,572,606	24,903,079	24,047,525	23,666,338	25,104,865	24,812,999	24,812,999	22,527,281	22,724,237	20,203,711	19,896,577	20,805,037	20,805,037
NOx - (Lbs/hr)	52.49	49.26	57.76	55.93	46.44	54.77	58.99	58.40	58.40	52.03	50.88	49.72	53.55	53.32	53.32	48.09	49.59	44.27	43.14	46.56	46.56
CO (Lbs/hr)	17.50	16.42	20.93	20.26	15.48	19.84	30.78	30.47	30.47	21.11	20.65	20.18	31.82	31.68	31.68	20.91	32.34	20.53	20.01	31.71	31.71
VOC (Lbs/hr)	2.17	2.04	2.39	2.32	1.92	2.27	3.42	3.39	3.39	3.02	2.95	2.88	4.43	4.42	4.42	3.58	4.93	3.67	3.57	5.01	5.01
Primary PM/PM ₁₀ /PM _{2.5} Total (Lbs/hr)	11.23	9.94	12.42	11.52	9.08	11.21	12.38	12.05	12.05	9.89	9.39	9.16	9.96	9.77	9.77	8.60	8.65	7.39	7.24	7.63	7.63
SO ₂ (lb/hr)	0.52	0.46	0.57	0.53	0.42	0.52	0.57	0.56	0.56	0.46	0.43	0.42	0.46	0.45	0.45	0.40	0.40	0.34	0.33	0.35	0.35
H ₂ SO ₄ (Lbs/hr)	0.080	0.070	0.088	0.082	0.064	0.079	0.088	0.085	0.085	0.070	0.066	0.065	0.071	0.069	0.069	0.061	0.061	0.052	0.051	0.054	0.054
CO ₂ Massflow (Lbs/hr)	54054	47858	59818	55450	43733	53985	59605	58015	58015	47625	45189	44113	47973	47034	47034	41406	41652	35563	34852	36737	36737
CO ₂ Equivalent (Lb/hr)	54436	48196	60241	55841	44042	54366	60026	58425	58425	47962	45508	44425	48312	47367	47367	41698	41946	35815	35099	36996	36996

	100	75	60	50
Stack Parameters				
Height (ft)	150	150	150	150
Diameter (ft)	9	9	9	9
Temperature (deg F)	833	771	752	722
Velocity (ft/sec)	102.04	103.34	98.36	86.88
Emissions Data (lb/hr)				
NOx	58.99	53.55	49.59	46.56
CO	30.78	31.82	32.34	31.71
VOC	3.42	4.43	4.93	5.01
Primary PM/PM ₁₀ /PM _{2.5}	12.42	9.96	8.65	7.63
SO ₂	0.57	0.46	0.40	0.35
H ₂ SO ₄	0.09	0.07	0.06	0.05
CO ₂	59817.99	47973.21	41652.10	36736.60
CO ₂ e	60240.53	48312.07	41946.32	36996.09

Natural Gas fired LM6000PC Turbine

Turbine Heat Input		398	MMBtu/hr		30		% Capacity Factor															
Source		Load %	Operations	Emissions Rates Per Turbine																		
				NO _x		CO		VOC		PM/PM ₁₀ /PM _{2.5}		NH ₃		SO ₂ ECT		Lead		H ₂ SO ₄ ECT		CO ₂ e		
			hr/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Turbine- Natural Gas		100%	2,628	35.45	46.58	25.89	34.02	0.99	1.30	5.00	6.57	0.00	0.00	5.57E-01	7.31E-01	1.95E-04	2.56E-04	8.52E-02	1.12E-01	44,203.95	58,083.99	
		75%	2,628	32.31	42.46	27.54	36.18	2.25	2.95	4.01	5.27	0.00	0.00	4.46E-01	5.86E-01	1.95E-04	2.56E-04	6.83E-02	8.97E-02	35,429.02	46,553.74	
		60%	2,628	29.94	39.34	27.70	36.39	2.50	3.28	3.44	4.52	0.00	0.00	3.83E-01	5.03E-01	1.95E-04	2.56E-04	5.86E-02	7.70E-02	30,400.42	39,946.15	
		50%	2,628	28.15	36.99	27.41	36.02	2.74	3.60	3.03	3.99	0.00	0.00	3.38E-01	4.44E-01	1.95E-04	2.56E-04	5.17E-02	6.79E-02	26,817.78	35,238.56	
Turbine- Natural Gas	events/yr	min/event	hr/yr	lb/event	tpy	lb/event	tpy	lb/event	tpy	lb/event	tpy	lb/hr	tpy	lb/event	tpy	lb/hr	tpy	lb/event	tpy	lb/event	tpy	
Startup	250	10	41.7	3.60	0.08	3.20	0.07	0.50	0.01	0.34	0.007	0.00	0.00	3.82E-02	7.96E-04	1.95E-04	4.06E-06	5.85E-03	1.22E-04	3033.28	63.19	
Shutdown	250	8	33	3.10	0.05	2.50	0.04	0.33	0.01	0.31	0.005	0.00	0.00	3.46E-02	5.76E-04	1.95E-04	3.25E-06	5.29E-03	8.82E-05	2744.39	45.74	
Subtotal - Startups/Shutdowns					0.13		0.11		0.02		0.012		0.00		1.37E-03		7.31E-06		2.10E-04		108.93	
Total (Normal 100% and SUSD)					46.71		34.13		1.31		6.58		0.00		7.33E-01		2.64E-04		1.12E-01		58,192.92	
Total (Normal 75% and SUSD)					42.58		36.29		2.97		5.28		0.00		5.87E-01		2.64E-04		8.99E-02		46,662.67	
Total (Normal 60% and SUSD)					39.46		36.50		3.30		4.53		0.00		5.04E-01		2.64E-04		7.72E-02		40,055.09	
Total (Normal 50% and SUSD)					37.11		36.13		3.62		4.00		0.00		4.45E-01		2.64E-04		6.81E-02		35,347.50	

Notes:

- 1) Short term lb/hr rates (except for Lead), Turbine heat input and SUSD hours are from "The Performance Data R1, Feb 2018, CP Crane".
- 2) Lead emissions are calculated using emission factor from AP-42 Section 1.4, Table 1.4-2 for Natural Gas.
- 3) SUSD events/yr is from "Prairie Power Alsey Station Compliance Report".
- 4) SUSD - PM/PM₁₀/PM_{2.5}, SO₂, H₂SO₄ and CO₂e emissions are based on SUSD MMBtu/event and maximum lb/MMBtu values of each pollutant.

Lead Emission factor Natural Gas **4.90E-07** lb/MMBtu

Burning 90% Natural Gas and 10% Fuel Oil LM6000PC Turbine

Turbine Heat Input Natural Gas 398 MMBtu/hr 30 % Capacity Factor
Turbine Heat Input Fuel Oil 381 MMBtu/hr 2628 hr/yr (100% NG operation)

Source		Load %	Operations	Emissions Rates Per Turbine																		
				NO _x		CO		VOC		PM/PM ₁₀ /PM _{2.5}		NH ₃		SO ₂ ECT		Lead		H ₂ SO ₄ ECT		CO ₂ e		
				hr/yr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Turbine- Natural Gas		100%	2,365	35.45	41.92	25.89	30.62	0.99	1.17	5.00	5.91	0.00	0.00	5.57E-01	6.58E-01	1.95E-04	2.31E-04	8.52E-02	1.01E-01	44,203.95	52,275.59	
		75%	2,365	32.31	38.21	27.54	32.56	2.25	2.66	4.01	4.74	0.00	0.00	4.46E-01	5.27E-01	1.95E-04	2.31E-04	6.83E-02	8.08E-02	35,429.02	41,898.36	
		60%	2,365	29.94	35.40	27.70	32.75	2.50	2.96	3.44	4.07	0.00	0.00	3.83E-01	4.53E-01	1.95E-04	2.31E-04	5.86E-02	6.93E-02	30,400.42	35,951.54	
		50%	2,365	28.15	33.29	27.41	32.42	2.74	3.24	3.03	3.59	0.00	0.00	3.38E-01	3.99E-01	1.95E-04	2.31E-04	5.17E-02	6.11E-02	26,817.78	31,714.71	
Turbine- Fuel Oil		100%	263	58.99	7.75	30.78	4.04	3.42	0.45	12.42	1.63	0.00	0.00	0.57	7.55E-02	5.33E-03	7.01E-04	8.80E-02	1.16E-02	60,240.53	7,915.61	
		75%	263	53.55	7.04	31.82	4.18	4.43	0.58	9.96	1.31	0.00	0.00	0.46	6.06E-02	5.33E-03	7.01E-04	7.06E-02	9.28E-03	48,312.07	6,348.21	
		60%	263	49.59	6.52	32.34	4.25	4.93	0.65	8.65	1.14	0.00	0.00	0.40	5.26E-02	5.33E-03	7.01E-04	6.13E-02	8.05E-03	41,946.32	5,511.75	
		50%	263	46.56	6.12	31.71	4.17	5.01	0.66	7.63	1.00	0.00	0.00	0.35	4.64E-02	5.33E-03	7.01E-04	5.41E-02	7.10E-03	36,996.09	4,861.29	
Turbine- Natural Gas	events/yr	min/event	hr/yr	lb/event	tpy	lb/event	tpy	lb/event	tpy	lb/event	tpy	lb/hr	tpy	lb/event	tpy	lb/hr	tpy	lb/event	tpy	lb/event	tpy	
	Startup	225	10	37.5	3.60	0.07	3.20	0.06	0.50	0.01	0.34	0.006	0.00	0.00	3.82E-02	7.16E-04	1.95E-04	3.66E-06	5.85E-03	1.10E-04	3,033.28	56.87
	Shutdown	225	8	30	3.10	0.05	2.50	0.04	0.33	0.005	0.31	0.005	0.00	0.00	3.46E-02	5.18E-04	1.95E-04	2.93E-06	5.29E-03	7.93E-05	2,744.39	41.17
Turbine- Fuel Oil																						
	Startup	25	10	4.17	12.80	0.03	11.60	0.02	0.40	0.001	0.86	0.002	0.00	0.00	4.00E-02	8.33E-05	5.33E-03	1.11E-05	6.12E-03	1.28E-05	4,189.89	8.73
	Shutdown	25	8	3.3	10.90	0.02	9.90	0.02	0.40	0.001	0.75	0.0013	0.00	0.00	3.47E-02	5.78E-05	5.33E-03	8.89E-06	5.31E-03	8.86E-06	3,636.51	6.06
Subtotal - Startups/Shutdowns					0.16		0.14		0.02		0.014		0.000		1.38E-03		2.66E-05		2.11E-04		112.83	
Total (Normal 100% and SUSD)						49.83		34.80		1.63		7.56		0.00		7.35E-01		9.58E-04		1.13E-01		60,304.02
Total (Normal 75% and SUSD)						45.41		36.88		3.26		6.06		0.00		5.89E-01		9.58E-04		9.02E-02		48,359.40
Total (Normal 60% and SUSD)						42.08		37.14		3.62		5.22		0.00		5.07E-01		9.58E-04		7.76E-02		41,576.11
Total (Normal 50% and SUSD)						39.57		36.73		3.92		4.60		0.00		4.47E-01		9.58E-04		6.84E-02		36,688.82

Notes:

- 1) Short term lb/hr rates (except for Lead), Turbine heat input and SUSD hours are from "The Performance Data R1, Feb 2018, CP Crane".
- 2) Lead emissions are calculated using emission factor from AP-42 Section 1.4, Table 1.4-2 for Natural Gas and AP-42 Section 3.1, Table 3.1-5 for Distillate Oil.
- 3) SUSD events/yr is from "Prairie Power Alsey Station Compliance Report".
- 4) SUSD - PM/PM₁₀/PM_{2.5}, SO₂, H₂SO₄ and CO₂e emissions are based on SUSD MMBtu/event and maximum lb/MMBtu values of each pollutant.

Lead Emission factor Natural Gas **4.90E-07** lb/MMBtu
Lead Emission factor Distillate Oil **1.40E-05** lb/MMBtu

Black Start Generator

POTENTIAL EMISSION INVENTORY WORKSHEET								
EMISSION SOURCE TYPE								
INTERNAL COMBUSTION ENGINES								
FACILITY AND SOURCE DESCRIPTION								
Emission Source Description:				Black Start Generator				
Emission Control Method(s)/ID No.(s):				None				
Emission Point Description:				2011.53 hp Diesel Engine		1500 kW		
EMISSION ESTIMATION EQUATIONS								
Emission (lb/hr) = Emission Factor (g/kW-hr) x Engine power rating (kW) x (1 lb / 453.6 g)								
Emission (lb/hr) = Emission Factor (lb/hp-hr) x Engine power rating (hp)								
Emission (lb/hr) = Emission Factor (lb/MMBtu) x Heat Input (MMBtu/hr)								
Emission (ton/yr) = Hourly Emissions (lb/hr) x Operating Period (hrs/yr) x (1 ton / 2,000 lb)								
INPUT DATA AND EMISSIONS CALCULATIONS								
Permitted Hours: 100 hrs/yr								
Testing Hours: hrs/yr								
No. of Engines: 1				Diesel Sulfur Content: 0.0015 weight %				
Heat Input: 14.08 MMBtu/hr (HHV)				Diesel Heat Content: 7,000 Btu/hp-hr				
Pollutant	Emission Factor		Potential Emission Rates		Pollutant ¹	Emission Factor (lb/MMBtu)	Potential Emission Rates	
	g/kW-hr	lb/hp-hr	Per Unit (lb/hr)	Per Unit (tpy)			Per Unit (lb/hr)	Per Unit (tpy)
NO _x	9.20		30.4	1.52	Acetaldehyde	2.52E-05	3.55E-04	1.77E-05
CO	11.40		37.70	1.88	Acrolein	7.88E-06	1.11E-04	5.55E-06
VOC	1.30		4.3	0.215	Benzene	7.76E-04	1.09E-02	5.46E-04
SO ₂		1.21E-05	0.02	1.22E-03	Formaldehyde	7.89E-05	1.11E-03	5.55E-05
PM	0.54		1.79	0.089	Naphthalene	1.30E-04	1.83E-03	9.15E-05
PM ₁₀	0.54		1.79	0.089	PAH	2.12E-04	2.99E-03	1.49E-04
PM _{2.5}	0.54		1.79	0.089	Toluene	2.81E-04	3.96E-03	1.98E-04
Highest HAP			1.09E-02	5.46E-04	Xylenes	1.93E-04	2.72E-03	1.36E-04
Total HAPs			0.024	0.0012				
H ₂ SO ₄		9.29E-07	0.0019	9.34E-05				
Summary of GHG Emissions:								
Pollutant	Emission Factor (kg/MMBtu) ²	Emissions (metric tons/yr) ³	Emissions (US tons/yr) ⁴					
CO ₂	73.96	104.1	114.76					
CH ₄	3.0E-03	0.004	0.005					
N ₂ O	6.0E-04	0.001	0.001					
CO ₂ e ⁵	--	104.50	115.16					
SOURCES OF INPUT DATA								
Parameter				Data Source				
Power Output, Heat Content and Hours of operation				By CP Crane				
NO _x , CO, PM, PM ₁₀ , PM _{2.5} and VOC emission factor				NSPS Subpart IIII				
H ₂ SO ₄				Based on 5% conversion of SO ₂ to SO ₃ and 100% conversion of SO ₃ to H ₂ SO ₄				
SO ₂				Emission factors based on Table 3.4-1, per US EPA AP-42, Chapter 3.4 - Large Stationary Diesel & All Stationary Dual-fuel Engines				
1. HAPs				Emission factors based on Table 3.4-3, per US EPA AP-42, Chapter 3.4 - Large Stationary Diesel & All Stationary Dual-fuel Engines				
2. Based on EPA default factors in 40 CFR Part 98 Subpart C Tables C-1 and C-2 for Distillate Fuel Oil No. 2.								
3. Calculated based on the heat input, emission factors, and equations C-1b and C-8b of 40 CFR Part 98 Subpart C. CO ₂ e based on Subpart A Table A-1 factors.								
CO ₂ , CH ₄ , or N ₂ O (metric tpy) = 1E-03 * Gas (MMBtu/yr) * Emission Factor (kg/MMBtu)								
4. 1 metric ton = 1.102 US ton								
5. CO ₂ e = CO ₂ , CH ₄ , or N ₂ O (tpy) * Global Warming Potential factor (GWP)								
CO ₂ GWP				1				
CH ₄ GWP				25				
N ₂ O GWP				298				
NOTES AND OBSERVATIONS								
Assume PM = PM ₁₀ = PM _{2.5}								

Proposed Project Emissions

CT Scenario	Description	NO _x		CO		VOC		PM/PM ₁₀ /PM _{2.5}		NH ₃		SO ₂		Lead		H ₂ SO ₄		CO ₂ e	
		Turbine (tpy)	3 Turbines (tpy)	Turbine (tpy)	3 Turbines (tpy)	Turbine (tpy)	3 Turbines (tpy)	Turbine (tpy)	3 Turbines (tpy)	Turbine (tpy)	3 Turbines (tpy)	Per Turbine (tpy)	3 Turbines (tpy)	Turbine (tpy)	3 Turbines (tpy)	Turbine (tpy)	3 Turbines (tpy)	Turbine (tpy)	3 Turbines (tpy)
100% Load																			
1	Normal Operation burning NG	46.58	139.74	34.02	102.07	1.30	3.89	6.57	19.71	0.00	0.00	0.73	2.19	2.56E-04	7.69E-04	1.12E-01	3.36E-01	58084	174,252
2	Normal Operation burning NG with SUSD	46.71	140.12	34.13	102.40	1.31	3.94	6.58	19.75	0.00	0.00	0.73	2.20	2.64E-04	7.91E-04	1.12E-01	3.37E-01	58193	174,579
3	Normal Operation load burning 90% NG and 10% FO	49.67	149.02	34.67	104.00	1.62	4.85	7.55	22.64	0.00	0.00	0.73	2.20	9.32E-04	2.79E-03	1.12E-01	3.37E-01	60191	180,574
4	Normal Operation load burning 90% NG and 10% FO with SUSD	49.83	149.50	34.80	104.41	1.63	4.90	7.56	22.68	0.00	0.00	0.74	2.21	9.58E-04	2.87E-03	1.13E-01	3.38E-01	60304	180,912
75% Load																			
1	Normal Operation burning NG	42.46	127.37	36.18	108.55	2.95	8.86	5.27	15.80	0.00	0.00	0.59	1.76	2.56E-04	7.69E-04	8.97E-02	2.69E-01	46554	139,661
2	Normal Operation burning NG with SUSD	42.58	127.75	36.29	108.87	2.97	8.91	5.28	15.83	0.00	0.00	0.59	1.76	2.64E-04	7.91E-04	8.99E-02	2.70E-01	46663	139,988
3	Normal Operation load burning 90% NG and 10% FO	45.25	135.75	36.74	110.23	3.24	9.72	6.05	18.15	0.00	0.00	0.59	1.76	9.32E-04	2.79E-03	9.00E-02	2.70E-01	48247	144,740
4	Normal Operation load burning 90% NG and 10% FO with SUSD	45.41	136.22	36.88	110.65	3.26	9.77	6.06	18.19	0.00	0.00	0.59	1.77	9.58E-04	2.87E-03	9.02E-02	2.71E-01	48359	145,078
60% Load																			
1	Normal Operation burning NG	39.34	118.01	36.39	109.18	3.28	9.85	4.52	13.56	0.00	0.00	0.50	1.51	2.56E-04	7.69E-04	7.70E-02	2.31E-01	39946	119,838
2	Normal Operation burning NG with SUSD	39.46	118.39	36.50	109.51	3.30	9.90	4.53	13.59	0.00	0.00	0.50	1.51	2.64E-04	7.91E-04	7.72E-02	2.32E-01	40055	120,165
3	Normal Operation load burning 90% NG and 10% FO	41.92	125.76	37.00	111.01	3.60	10.81	5.20	15.61	0.00	0.00	0.51	1.52	9.32E-04	2.79E-03	7.74E-02	2.32E-01	41463	124,390
4	Normal Operation load burning 90% NG and 10% FO with SUSD	42.08	126.23	37.14	111.43	3.62	10.86	5.22	15.65	0.00	0.00	0.51	1.52	9.58E-04	2.87E-03	7.76E-02	2.33E-01	41576	124,728
50% Load																			
1	Normal Operation burning NG	36.99	110.96	36.02	108.07	3.60	10.81	3.99	11.96	0.00	0.00	0.44	1.33	2.56E-04	7.69E-04	6.79E-02	2.04E-01	35239	105,716
2	Normal Operation burning NG with SUSD	37.11	111.34	36.13	108.39	3.62	10.85	4.00	11.99	0.00	0.00	0.45	1.34	2.64E-04	7.91E-04	6.81E-02	2.04E-01	35347	106,042
3	Normal Operation load burning 90% NG and 10% FO	39.41	118.22	36.59	109.76	3.90	11.70	4.59	13.77	0.00	0.00	0.45	1.34	9.32E-04	2.79E-03	6.82E-02	2.05E-01	36576	109,728
4	Normal Operation load burning 90% NG and 10% FO with SUSD	39.57	118.70	36.73	110.18	3.92	11.75	4.60	13.81	0.00	0.00	0.45	1.34	9.58E-04	2.87E-03	6.84E-02	2.05E-01	36689	110,066
Black Start Generator		1.52		1.88		0.21		0.09		-		0.00		-		9.34E-05		115.16	
Proposed Project Total Emissions		151.02		113.31		11.96		22.77		0.00		2.21		2.87E-03		3.38E-01		181,027	

Notes:

1) Short term lb/hr rates (except for Lead), Turbine heat input and SUSD hours are from "The Performance Data R1, Feb 2018, CP Crane".

Turbine Hazardous Air Pollutant Emissions

GE Simple Cycle Turbine Emissions Calculation Summary of HAP Emission Rates Per Turbine

NG-Firing: Maximum CT HAP Emissions

Parameter	Units	
Maximum Heat Input (HHV):	MMBtu/hr	398
Maximum Annual Hours:	hrs/yr	2,703

Pollutant	CT Emission Factor* (lb/MMBtu)	CT Total (lb/hr)	CT Total TPY
1,3-Butadiene	4.3E-07	1.71E-04	2.31E-04
Acetaldehyde	4.0E-05	1.59E-02	2.15E-02
Acrolein	6.4E-06	2.55E-03	3.44E-03
Benzene	1.2E-05	4.77E-03	6.45E-03
Ethylbenzene	3.2E-05	1.27E-02	1.72E-02
Formaldehyde	7.1E-04	2.82E-01	3.82E-01
Naphthalene	1.3E-06	5.17E-04	6.99E-04
Polycyclic Aromatic Hydrocarbons (PAHs)	2.2E-06	8.75E-04	1.18E-03
Propylene Oxide	2.9E-05	1.15E-02	1.56E-02
Toluene	1.3E-04	5.17E-02	6.99E-02
Xylene	6.4E-05	2.55E-02	3.44E-02
Max. individual HAP			0.38
Total HAPs			0.55

Dual Fuel: Maximum CT HAP Emissions

Parameter	Units	Fuel Type	
		NG	FO
Maximum Heat Input (HHV):	MMBtu/hr	398	381
Maximum Annual Hours:	hrs/yr	2,433	270

Pollutant	CT Emission Factor NG* (lb/MMBtu)	CT Emission Factor FO† (lb/MMBtu)	CT Total NG (lb/hr)	CT Total FO (lb/hr)	CT Total TPY
1,3-Butadiene	4.3E-07	1.6E-05	1.71E-04	6.10E-03	1.03E-03
Acetaldehyde	4.0E-05		1.59E-02		1.94E-02
Acrolein	6.4E-06		2.55E-03		3.10E-03
Benzene	1.2E-05	5.5E-05	4.77E-03	2.10E-02	8.64E-03
Ethylbenzene	3.2E-05		1.27E-02		1.55E-02
Formaldehyde	7.1E-04	2.8E-04	2.82E-01	1.07E-01	3.58E-01
Naphthalene	1.3E-06	3.5E-05	5.17E-04	1.33E-02	2.43E-03
Polycyclic Aromatic Hydrocarbons (PAHs)	2.2E-06	4.0E-05	8.75E-04	1.52E-02	3.12E-03
Propylene Oxide	2.9E-05		1.15E-02		1.40E-02
Toluene	1.3E-04		5.17E-02		6.29E-02
Xylene	6.4E-05		2.55E-02		3.10E-02
Arsenic		1.1E-05		4.19E-03	5.66E-04
Beryllium		3.1E-07		1.18E-04	1.60E-05
Cadmium		4.8E-06		1.83E-03	2.47E-04
Chromium		1.1E-05		4.19E-03	5.66E-04
Lead		1.4E-05		5.33E-03	7.21E-04
Manganese		7.9E-04		3.01E-01	4.07E-02
Mercury		1.2E-06		4.57E-04	6.18E-05
Nickel		4.6E-06		1.75E-03	2.37E-04
Selenium		2.5E-05		9.53E-03	1.29E-03
Max. individual HAP					0.36
Total HAPs					0.56

Pollutant	One CT Worst Case TPY	Pollutant	One CT Worst Case TPY
1,3-Butadiene	1.03E-03	Arsenic	5.66E-04
Acetaldehyde	2.15E-02	Beryllium	1.60E-05
Acrolein	3.44E-03	Cadmium	2.47E-04
Benzene	8.64E-03	Chromium	5.66E-04
Ethylbenzene	1.72E-02	Lead	7.21E-04
Formaldehyde	3.82E-01	Manganese	4.07E-02
Naphthalene	2.43E-03	Mercury	6.18E-05
Polycyclic Aromatic Hydrocarbons (PAHs)	3.12E-03	Nickel	2.37E-04
Propylene Oxide	1.56E-02	Selenium	1.29E-03
Toluene	6.99E-02	Max. individual HAP	0.38
Xylene	3.44E-02	Total HAPs	0.56

*EPA AP-42, Table 3.1-3, April 2000.

†EPA AP-42, Table 3.1-4 and 3.1-5, April 2000.

Diesel Firewater Pump

POTENTIAL EMISSION INVENTORY WORKSHEET								
EMISSION SOURCE TYPE								
INTERNAL COMBUSTION ENGINES < 600 HP								
FACILITY AND SOURCE DESCRIPTION								
Emission Source Description:			Firewater Pump			Old - 1987		
Emission Control Method(s)/ID No.(s):			None					
Emission Point Description:			399 hp Diesel Engine					
EMISSION ESTIMATION EQUATIONS								
Emission (lb/hr) = Emission Factor (g/hp-hr) x Engine power rating (hp) x (1 lb / 453.6 g)								
Emission (lb/hr) = Emission Factor (lb/hp-hr) x Engine power rating (hp)								
Emission (lb/hr) = Emission Factor (lb/MMBtu) x Heat Input (MMBtu/hr)								
Emission (ton/yr) = Hourly Emissions (lb/hr) x Operating Period (hrs/yr) x (1 ton / 2,000 lb)								
INPUT DATA AND EMISSIONS CALCULATIONS								
Permitted Hours:			100 hrs/yr					
No. of Engines:			1			Diesel Sulfur Content: 0.0015 weight %		
Heat Input:			2.79 MMBtu/hr (HHV)			Diesel Heat Content: 7,000 Btu/hp-hr		
Pollutant	Emission Factor		Potential Emission Rates		Pollutant	Emission Factor (lb/MMBtu)	Potential Emission Rates	
	lb/MMBtu	lb/-hp-hr	Per Unit (lb/hr)	Per Unit (tpy)			Per Unit (lb/hr)	Per Unit (tpy)
NO _x		0.031	12.37	0.618	1,3-Butadiene	3.91E-05	1.09E-04	5.46E-06
CO		6.68E-03	2.67	0.133	Acetaldehyde	7.67E-04	2.14E-03	1.07E-04
VOC		2.47E-03	0.99	0.049	Acrolein	9.25E-05	2.58E-04	1.29E-05
SO ₂		2.05E-03	0.82	0.041	Benzene	9.33E-04	2.61E-03	1.30E-04
PM		2.20E-03	0.88	0.044	Formaldehyde	1.18E-03	3.30E-03	1.65E-04
PM ₁₀		2.20E-03	0.88	0.044	Naphthalene	8.48E-05	2.37E-04	1.18E-05
PM _{2.5}		2.20E-03	0.88	0.044	PAH	1.68E-04	4.69E-04	2.35E-05
Highest HAP			3.30E-03	1.65E-04	Toluene	4.09E-04	1.14E-03	5.71E-05
Total HAPs			0.0111	0.00055	Xylenes	2.85E-04	7.96E-04	3.98E-05
H ₂ SO ₄		1.57E-04	0.06	0.003				
Summary of GHG Emissions:								
Pollutant	Emission Factor (kg/MMBtu) ²	Emissions (metric tons/yr) ³	Emissions (US tons/yr) ⁴					
CO ₂	73.96	20.7	22.76					
CH ₄	3.0E-03	0.001	0.001					
N ₂ O	6.0E-04	0.000	0.000					
CO ₂ e ⁵	--	20.73	22.84					
SOURCES OF INPUT DATA								
Parameter			Data Source					
Power Output, Heat Content and Hours of operation			By CP Crane					
NO _x , CO, PM, PM ₁₀ , PM _{2.5} , SO ₂ and VOC emission factor			Emission Factors based on Table 3.3-1, per US EPA AP-42, Chapter 3.3 - Gasoline & Diesel Industrial Engines					
H ₂ SO ₄			Based on 5% conversion of SO ₂ to SO ₃ and 100% conversion of SO ₃ to H ₂ SO ₄					
HAPs			Emission factors based on Table 3.3-2, per US EPA AP-42, Chapter 3.3 - Gasoline & Diesel Industrial Engines					
4. 1 metric ton = 1.102 US ton								
5. CO ₂ e = CO ₂ , CH ₄ , or N ₂ O (tpy) * Global Warming Potential factor (GWP)								
CO ₂ GWP			1					
CH ₄ GWP			25					
N ₂ O GWP			298					
NOTES AND OBSERVATIONS								
Assume PM = PM ₁₀ = PM _{2.5}								

Emergency Generator

POTENTIAL EMISSION INVENTORY WORKSHEET																												
<i>EMISSION SOURCE TYPE</i>																												
INTERNAL COMBUSTION ENGINES																												
<i>FACILITY AND SOURCE DESCRIPTION</i>																												
Emission Source Description:		Emergency Generator		Old - 1987																								
Emission Control Method(s)/ID No.(s):		None																										
Emission Point Description:		600 hp Diesel Engine			447.4 kW																							
<i>EMISSION ESTIMATION EQUATIONS</i>																												
Emission (lb/hr) = Emission Factor (g/kW-hr) x Engine power rating (kW) x (1 lb / 453.6 g)																												
Emission (lb/hr) = Emission Factor (lb/hp-hr) x Engine power rating (hp)																												
Emission (lb/hr) = Emission Factor (lb/MMBtu) x Heat Input (MMBtu/hr)																												
Emission (ton/yr) = Hourly Emissions (lb/hr) x Operating Period (hrs/yr) x (1 ton / 2,000 lb)																												
<i>INPUT DATA AND EMISSIONS CALCULATIONS</i>																												
Permitted Hours: 100 hrs/yr																												
Testing Hours: hrs/yr																												
No. of Engines: 1				Diesel Sulfur Content: 0.0015 weight %																								
Heat Input: 4.20 MMBtu/hr (HHV)				Diesel Heat Content: 7,000 Btu/hp-hr																								
Pollutant	Emission Factor		Potential Emission Rates		Pollutant	Emission Factor (lb/MMBtu)	Potential Emission Rates																					
	lb/MMBtu	lb/hp-hr	Per Unit (lb/hr)	Per Unit (tpy)			Per Unit (lb/hr)	Per Unit (tpy)																				
NO _x		0.031	18.60	0.93	1,3-Butadiene	3.91E-05	3.91E-05	1.96E-06																				
CO		6.68E-03	4.01	0.20	Acetaldehyde	7.67E-04	3.22E-03	1.61E-04																				
VOC		2.47E-03	1.48	0.074	Acrolein	9.25E-05	3.89E-04	1.94E-05																				
SO ₂		2.05E-03	1.23	0.062	Benzene	9.33E-04	3.92E-03	1.96E-04																				
PM		2.20E-03	1.32	0.066	Formaldehyde	1.18E-03	4.96E-03	2.48E-04																				
PM ₁₀		2.20E-03	1.32	0.066	Naphthalene	8.48E-05	3.56E-04	1.78E-05																				
PM _{2.5}		2.20E-03	1.32	0.066	PAH	1.68E-04	7.06E-04	3.53E-05																				
Highest HAP			4.96E-03	2.48E-04	Toluene	4.09E-04	1.72E-03	8.59E-05																				
Total HAPs			0.016	0.0008	Xylenes	2.85E-04	1.20E-03	5.99E-05																				
H ₂ SO ₄		1.57E-04	0.0942	4.71E-03																								
Summary of GHG Emissions: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Pollutant</th> <th>Emission Factor (kg/MMBtu)²</th> <th>Emissions (metric tons/yr)³</th> <th>Emissions (US tons/yr)⁴</th> </tr> </thead> <tbody> <tr> <td>CO₂</td> <td>73.96</td> <td>31.1</td> <td>34.23</td> </tr> <tr> <td>CH₄</td> <td>3.0E-03</td> <td>0.001</td> <td>0.001</td> </tr> <tr> <td>N₂O</td> <td>6.0E-04</td> <td>0.000</td> <td>0.000</td> </tr> <tr> <td>CO₂e⁵</td> <td>--</td> <td>31.17</td> <td>34.35</td> </tr> </tbody> </table>									Pollutant	Emission Factor (kg/MMBtu) ²	Emissions (metric tons/yr) ³	Emissions (US tons/yr) ⁴	CO ₂	73.96	31.1	34.23	CH ₄	3.0E-03	0.001	0.001	N ₂ O	6.0E-04	0.000	0.000	CO ₂ e ⁵	--	31.17	34.35
Pollutant	Emission Factor (kg/MMBtu) ²	Emissions (metric tons/yr) ³	Emissions (US tons/yr) ⁴																									
CO ₂	73.96	31.1	34.23																									
CH ₄	3.0E-03	0.001	0.001																									
N ₂ O	6.0E-04	0.000	0.000																									
CO ₂ e ⁵	--	31.17	34.35																									
<i>SOURCES OF INPUT DATA</i>																												
Parameter				Data Source																								
Power Output, Heat Content and Hours of operation				By CP Crane																								
NO _x , CO, PM, PM ₁₀ , PM _{2.5} , SO ₂ and VOC emission factor				Emission Factors based on Table 3.3-1, per US EPA AP-42, Chapter 3.3 - Gasoline & Diesel Industrial Engines																								
H ₂ SO ₄				Based on 5% conversion of SO ₂ to SO ₃ and 100% conversion of SO ₃ to H ₂ SO ₄																								
HAPs				Emission factors based on Table 3.3-2, per US EPA AP-42, Chapter 3.3 - Gasoline & Diesel Industrial Engines																								
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CO ₂ GWP				1																								
CH ₄ GWP				25																								
N ₂ O GWP				298																								
<i>NOTES AND OBSERVATIONS</i>																												
Assume PM = PM ₁₀ = PM _{2.5}																												

Existing Combustion Turbine 14 MW (summer capability) (No. 2 Fuel Oil)

Pollutant	Days/yr 18 hrs/day 3			Days/yr 17 hrs/day 2.6			Days/yr 25 hrs/day 7.7			Days/yr 15 hrs/day 3.6			Days/yr 27 hrs/day 1			Maximum (2012-2016)		Average (2012-2016)	
	2016			2015			2014			2013			2012						
	tpy	lb/day	lb/hr	tpy	lb/day	lb/hr	tpy	lb/day	lb/hr	tpy	lb/day	lb/hr	tpy	lb/day	lb/hr	tpy	lb/hr	tpy	lb/hr
NO _x	5.90	656	218.67	5.10	600.00	230.77	21.00	1680.00	218.18	3.10	413.00	114.72	1.67	123.67	123.67	21.00	230.77	7.35	181.20
SO ₂	0.45	50	16.67	0.39	46.00	17.69	1.59	127.00	16.49	0.76	101	28.06	0.26	19.35	19.35	1.59	28.06	0.69	19.65
CO	0.02	2.22	0.74	0.02	2.35	0.90	0.08	6.40	0.83	0.02	2.67	0.74	0.01	0.5	0.50	0.08	0.90	0.03	0.74
VOC	0.003	0.33	0.11	0.002	0.24	0.09	0.01	0.80	0.10	0.003	0.40	0.11	0.00	0.00	0.00	0.01	0.11	0.004	0.08
PM (filterable)	0.029	3.22	1.07	0.025	2.94	1.13	0.103	8.24	1.07	2.60E-02	3.47	0.96	0.00	0.60	0.60	0.10	1.13	0.04	0.97
PM (Condensable)	0.048	5.33	1.78	0.042	4.94	1.90	0.17	13.76	1.79	0.044	5.87	1.63	0.00	1.00	1.00	0.17	1.90	0.06	1.62
PM ₁₀ (filterable)*	0.029	3.22	1.07	0.025	2.94	1.13	3.30E-04	0.026	3.38E-03	8.60E-05	0.011	3.06E-03	0.00	0.60	0.60	0.03	1.13	0.027	1.10
PM _{2.5} (filterable)	0.027	3.00	1.00	0.023	2.71	1.04	0.096	7.68	1.00	2.50E-02	3.33	0.93	0.00	0.60	0.60	0.10	1.04	0.034	0.91
Lead	9.35E-05	0.01	3.33E-03	8.11E-05	9.54E-03	3.67E-03	3.35E-04	2.68E-02	3.48E-03	8.58E-05	1.14E-02	3.17E-03	0.00	0.00	0.00	3.35E-04	3.67E-03	1.19E-04	2.73E-03
CO ₂	1,089	121,000	40,333	944	111,059	42,715	3,517	281,360	36,540	962	128,000	35,600	0.00	0.00	0.00	3,517	42,715	1,302	31,038
CH ₄	0.05	5.56	1.85	3.80E-02	4.47	1.72	1.54E-01	12.30	1.60	1.00E-02	1.33	0.37	0.00	0.00	0.00	0.15	1.85	0.05	1.11
N ₂ O	0.01	1.111	0.37	0.008	0.941	0.362	0.032	2.56	0.33	0.011	1.47	0.41	0.00	0.00	0.00	0.03	0.41	0.01	0.29
CO ₂ e	1,093.23	121,470.08	40,489.51	947.33	111,451.17	42,865.88	3,530.39	282,430.38	36,678.34	965.53	128,471.31	35,731.43	0.00	0.00	0.00	3,530.39	42,865.88	1,307.30	31,153.03
HAPS																			
Benzene	3.70E-04	4.11E-02	1.37E-02	3.19E-04	3.75E-02	1.44E-02	1.32E-03	1.06E-01	1.37E-02	NA	NA	NA	NA	NA	NA	1.32E-03	1.44E-02	6.70E-04	1.39E-02
Formaldehyde	1.88E-03	2.09E-01	6.96E-02	1.63E-03	1.92E-01	7.38E-02	6.70E-03	5.36E-01	6.96E-02	3.07E-07	4.09E-05	1.14E-05	NR	NR	NR	6.70E-03	7.38E-02	2.55E-03	5.33E-02
Arsenic	7.40E-05	8.22E-03	2.74E-03	6.40E-05	7.53E-03	2.90E-03	2.63E-04	2.10E-02	2.73E-03	2.46E-05	3.28E-03	9.11E-04	NR	NR	NR	2.63E-04	2.90E-03	1.06E-04	2.32E-03
Beryllium	2.09E-06	2.32E-04	7.74E-05	1.80E-06	2.12E-04	8.14E-05	7.40E-06	5.92E-04	7.69E-05	1.85E-05	2.47E-03	6.85E-04	NR	NR	NR	1.85E-05	6.85E-04	7.45E-06	2.30E-04
1,3-Butadiene	1.08E-04	1.19E-02	3.98E-03	9.30E-05	1.09E-02	4.21E-03	3.83E-04	3.06E-02	3.97E-03	NA	NA	NA	NA	NA	NA	3.83E-04	4.21E-03	1.95E-04	4.05E-03
Cadmium	3.23E-05	3.59E-03	1.20E-03	2.79E-05	3.28E-03	1.26E-03	1.15E-04	9.20E-03	1.19E-03	1.85E-05	2.47E-03	6.85E-04	NR	NR	NR	1.15E-04	1.26E-03	4.84E-05	1.08E-03
Chromium	7.40E-05	8.22E-03	2.74E-03	6.40E-05	7.53E-03	2.90E-03	2.63E-04	2.10E-02	2.73E-03	1.85E-05	2.47E-03	6.85E-04	NR	NR	NR	2.63E-04	2.90E-03	1.05E-04	2.26E-03
Chromium IV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.72E-10	3.49E-08	5.55E-08	4.72E-10	5.55E-08	4.72E-10	5.55E-08
Manganese	5.30E-03	5.89E-01	1.96E-01	4.58E-03	5.39E-01	2.07E-01	1.89E-02	1.51	1.96E-01	3.69E-05	4.92E-03	1.37E-03	NR	NR	NR	1.89E-02	2.07E-01	7.20E-03	1.50E-01
Mercury	8.05E-06	8.94E-04	2.98E-04	6.95E-06	8.18E-04	3.14E-04	2.87E-05	2.30E-03	2.98E-04	1.85E-05	2.47E-03	6.85E-04	NA	NA	NA	2.87E-05	6.85E-04	1.56E-05	3.99E-04
Nickel	3.09E-05	3.43E-03	1.14E-03	2.67E-05	3.14E-03	1.21E-03	1.10E-04	8.80E-03	1.14E-03	1.85E-05	2.47E-03	6.85E-04	NR	NR	NR	1.10E-04	1.21E-03	4.65E-05	1.04E-03
Naphthalene	2.35E-04	2.61E-02	8.70E-03	2.03E-04	2.39E-02	9.19E-03	8.35E-04	6.68E-02	8.68E-03	NA	NA	NA	NA	NA	NA	8.35E-04	9.19E-03	4.24E-04	8.85E-03
PAH	2.69E-04	2.98E-02	9.94E-03	2.32E-04	2.73E-02	1.05E-02	9.55E-04	7.64E-02	9.92E-03	NA	NA	NA	NA	NA	NA	9.55E-04	1.05E-02	4.85E-04	1.01E-02
Selenium	1.68E-04	1.87E-02	6.22E-03	1.45E-04	1.71E-02	6.56E-03	6.00E-04	4.80E-02	6.23E-03	9.20E-05	1.23E-02	3.41E-03	NR	NR	NR	6.00E-04	6.56E-03	2.51E-04	5.61E-03
Total HAPs																0.03	0.34	0.012	0.25

NR - not reportable.

NA = not applicable.

*PM₁₀ (filterable) maximum and average values based on emissions from 2016 and 2015. PM₆ emissions factor for 2013 and 2014 are incorrect; hence, values reported from 2012-2014 are not included.

Facility Hazardous Air Pollutant Emissions

Pollutant	Proposed Units				Existing Units						Facility Total	
	Three Simple Cycle		Black Start Generator		Firewater Pump		Emergency Generator		Combustion Turbine			
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1,3-Butadiene	1.83E-02	3.10E-03			1.09E-04	5.46E-06	3.91E-05	1.96E-06	4.05E-03	1.95E-04	2.25E-02	3.30E-03
2-Methylnaphthalene											0.00E+00	0.00E+00
3-Methylchloranthrene											0.00E+00	0.00E+00
7,12-Dimethylbenz(a)anthracene											0.00E+00	0.00E+00
Acenaphthene											0.00E+00	0.00E+00
Acenaphthylene											0.00E+00	0.00E+00
Acetaldehyde	4.77E-02	6.45E-02	3.55E-04	1.77E-05	2.14E-03	1.07E-04	3.22E-03	1.61E-04			5.35E-02	6.48E-02
Acrolein	7.64E-03	1.03E-02	1.11E-04	5.55E-06	2.58E-04	1.29E-05	3.89E-04	1.94E-05			8.40E-03	1.04E-02
Anthracene											0.00E+00	0.00E+00
Benz(a)anthracene											0.00E+00	0.00E+00
Benzene	6.29E-02	2.59E-02	1.09E-02	5.46E-04	2.61E-03	1.30E-04	3.92E-03	1.96E-04	1.39E-02	6.70E-04	9.43E-02	2.75E-02
Benzo(a)pyrene											0.00E+00	0.00E+00
Benzo(b)fluoranthene											0.00E+00	0.00E+00
Benzo(g,h,i)perylene											0.00E+00	0.00E+00
Benzo(k)fluoranthene											0.00E+00	0.00E+00
Chrysene											0.00E+00	0.00E+00
Dibenzo(a,h)anthracene											0.00E+00	0.00E+00
Dichlorobenzene											0.00E+00	0.00E+00
Ethylbenzene	3.82E-02	5.16E-02									3.82E-02	5.16E-02
Fluoranthene											0.00E+00	0.00E+00
Fluorene											0.00E+00	0.00E+00
Formaldehyde	8.47E-01	1.15E+00	1.11E-03	5.55E-05	3.30E-03	1.65E-04	4.96E-03	2.48E-04	5.33E-02	2.55E-03	9.10E-01	1.15E+00
Hexane											0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene											0.00E+00	0.00E+00
Naphthalene	4.00E-02	7.29E-03	1.83E-03	9.15E-05	2.37E-04	1.18E-05	3.56E-04	1.78E-05	8.85E-03	4.24E-04	5.13E-02	7.84E-03
PAH	4.57E-02	9.37E-03	2.99E-03	1.49E-04	4.69E-04	2.35E-05	7.06E-04	3.53E-05	1.01E-02	4.85E-04	6.00E-02	1.01E-02
Phenanthrene											0.00E+00	0.00E+00
Propylene Oxide	3.46E-02	4.68E-02									3.46E-02	4.68E-02
Pyrene											0.00E+00	0.00E+00
Toluene	1.55E-01	2.10E-01	3.96E-03	1.98E-04	1.14E-03	5.71E-05	1.72E-03	8.59E-05			1.62E-01	2.10E-01
Xylenes	7.64E-02	1.03E-01	2.72E-03	1.36E-04	7.96E-04	3.98E-05	1.20E-03	5.99E-05			8.11E-02	1.03E-01
Arsenic	1.26E-02	1.70E-03							0.0023	1.06E-04	1.49E-02	1.81E-03
Beryllium	3.54E-04	4.79E-05							2.30E-04	7.45E-06	5.85E-04	5.53E-05
Cadmium	5.49E-03	7.41E-04							0.0011	4.84E-05	6.57E-03	7.90E-04
Chromium	1.26E-02	1.70E-03							0.0023	1.05E-04	1.48E-02	1.80E-03
Cobalt											0.00E+00	0.00E+00
Lead	1.60E-02	2.16E-03									1.60E-02	2.16E-03
Manganese	9.03E-01	1.22E-01							0.150	0.007	1.05E+00	1.29E-01
Mercury	1.37E-03	1.85E-04							3.99E-04	1.56E-05	1.77E-03	2.01E-04
Nickel	5.26E-03	7.11E-04							0.0010	4.65E-05	6.30E-03	7.57E-04
Selenium	2.86E-02	3.86E-03							5.61E-03	2.51E-04	3.42E-02	4.11E-03
Maximum Individual HAP		1.15		5.46E-04		1.65E-04		2.48E-04		7.20E-03		1.15
Total HAPS		1.81		1.20E-03		5.53E-04		8.25E-04		1.21E-02		1.82

Sources: GE, 2018.
ECT, 2018.

NSR Applicability Analysis

Proposed Project Emissions

CT Scenario	Description	NO _x		CO		VOC		PM/PM ₁₀ /PM _{2.5}		NH ₃		SO ₂		Lead		H ₂ SO ₄		CO ₂ e	
		Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)	Per turbine (tpy)	3 Turbines (tpy)
100% Load																			
1	Normal Operation burning NG	46.58	139.74	34.02	102.07	1.30	3.89	6.57	19.71	0.00	0.00	7.31E-01	2.19	2.56E-04	7.69E-04	1.12E-01	3.36E-01	58,084	174,252
2	Normal Operation burning NG with SUSD	46.71	140.12	34.13	102.40	1.31	3.94	6.58	19.75	0.00	0.00	7.33E-01	2.20	2.64E-04	7.91E-04	1.12E-01	3.37E-01	58,193	174,579
3	Normal Operation load burning 90% NG and 10% FO	49.67	149.02	34.67	104.00	1.62	4.85	7.55	22.64	0.00	0.00	7.34E-01	2.20	9.32E-04	2.79E-03	1.12E-01	3.37E-01	60,191	180,574
4	Normal Operation load burning 90% NG and 10% FO with SUSD	49.83	149.50	34.80	104.41	1.63	4.90	7.56	22.68	0.00	0.00	7.35E-01	2.21	9.58E-04	2.87E-03	1.13E-01	3.38E-01	60,304	180,912
75% Load																			
1	Normal Operation burning NG	42.46	127.37	36.18	108.55	2.95	8.86	5.27	15.80	0.00	0.00	5.86E-01	1.76	2.56E-04	7.69E-04	8.97E-02	2.69E-01	46,554	139,661
2	Normal Operation burning NG with SUSD	42.58	127.75	36.29	108.87	2.97	8.91	5.28	15.83	0.00	0.00	5.87E-01	1.76	2.64E-04	7.91E-04	8.99E-02	2.70E-01	46,663	139,988
3	Normal Operation load burning 90% NG and 10% FO	45.25	135.75	36.74	110.23	3.24	9.72	6.05	18.15	0.00	0.00	5.88E-01	1.76	9.32E-04	2.79E-03	9.00E-02	2.70E-01	48,247	144,740
4	Normal Operation load burning 90% NG and 10% FO with SUSD	45.41	136.22	36.88	110.65	3.26	9.77	6.06	18.19	0.00	0.00	5.89E-01	1.77	9.58E-04	2.87E-03	9.02E-02	2.71E-01	48,359	145,078
60% Load																			
1	Normal Operation burning NG	39.34	118.01	36.39	109.18	3.28	9.85	4.52	13.56	0.00	0.00	5.03E-01	1.51	2.56E-04	7.69E-04	7.70E-02	2.31E-01	39,946	119,838
2	Normal Operation burning NG with SUSD	39.46	118.39	36.50	109.51	3.30	9.90	4.53	13.59	0.00	0.00	5.04E-01	1.51	2.64E-04	7.91E-04	7.72E-02	2.32E-01	40,055	120,165
3	Normal Operation load burning 90% NG and 10% FO	41.92	125.76	37.00	111.01	3.60	10.81	5.20	15.61	0.00	0.00	5.05E-01	1.52	9.32E-04	2.79E-03	7.74E-02	2.32E-01	41,463	124,390
4	Normal Operation load burning 90% NG and 10% FO with SUSD	42.08	126.23	37.14	111.43	3.62	10.86	5.22	15.65	0.00	0.00	5.07E-01	1.52	9.58E-04	2.87E-03	7.76E-02	2.33E-01	41,576	124,728
50% Load																			
1	Normal Operation burning NG	36.99	110.96	36.02	108.07	3.60	10.81	3.99	11.96	0.00	0.00	4.44E-01	1.33	2.56E-04	7.69E-04	6.79E-02	2.04E-01	35,239	105,716
2	Normal Operation burning NG with SUSD	37.11	111.34	36.13	108.39	3.62	10.85	4.00	11.99	0.00	0.00	4.45E-01	1.34	2.64E-04	7.91E-04	6.81E-02	2.04E-01	35,347	106,042
3	Normal Operation load burning 90% NG and 10% FO	39.41	118.22	36.59	109.76	3.90	11.70	4.59	13.77	0.00	0.00	4.46E-01	1.34	9.32E-04	2.79E-03	6.82E-02	2.05E-01	36,576	109,728
4	Normal Operation load burning 90% NG and 10% FO with SUSD	39.57	118.70	36.73	110.18	3.92	11.75	4.60	13.81	0.00	0.00	4.47E-01	1.34	9.58E-04	2.87E-03	6.84E-02	2.05E-01	36,689	110,066
Black Start Generator		1.52		1.88		0.21		0.09		-		0.00		-		9.34E-05		115.16	
Proposed Project Total Emissions		151.02		113.31		11.96		22.77		0.00		2.21		2.87E-03		3.38E-01		181,027	

Notes:

- 1) Short term 1/yr rates (except for Lead), Turbine heat input and SUSD hours are from "The Performance Data R1, Feb 2018, C.P. Crane".
- 2) Lead emissions are calculated using emission factor from AP-42 Section 1.4, Table 1.4-2 for Natural Gas and AP-42 Section 3.1, Table 3.1-5 for Distillate Oil.
- 3) SUSD events/yr is from "Prairie Power Alsey Station Compliance Report".
- 4) SUSD - PM/PM₁₀/PM_{2.5}, SO₂, H₂SO₄ and CO₂e emissions are based on SUSD MMBtu/event and maximum lb/MMBtu values of each pollutant.
- 5) Red highlights indicate the worst case emission rate for each pollutant.

Proposed Project Emissions and Comparison with the respective SERs

Pollutant	tpy	SER (tpy)	Netting Required
PM	22.77	25	No
PM ₁₀	22.77	15	Yes
PM _{2.5}	22.77	10	Yes
SO ₂	2.21	40	No
NO _x	151.02	25	Yes
CO	113.31	100	Yes
VOC	11.96	25	No
Lead	2.87E-03	0.6	No
H ₂ SO ₄	3.38E-01	7	No
CO ₂ e	181,027	75,000	Yes

Notes:

"Significant" means, in reference to a net emissions increase, a significant emissions increase or the potential of a source to emit a regulated NSR pollutant, or a rate of emissions that would equal or exceed any of the following rates (SER-Significant Emission Rates) as shown in table above.

(a) Volatile organic compounds or nitrogen oxides: 25 tons per year (tpy) in Baltimore City or Anne Arundel, Baltimore, Calvert, Carroll, Cecil, Charles, Frederick, Harford, Howard, Montgomery, and Prince George's counties;

(b) Volatile organic compounds or nitrogen oxides: 40 tpy in Allegany, Caroline, Dorchester, Garrett, Kent, Queen Anne's, St. Mary's, Somerset, Talbot, Washington, Wicomico, and Worcester counties.

C.P. Crane - New Source Review Netting Analysis

Description	NO _x	CO	PM	PM ₁₀	PM _{2.5}	VOC	SO ₂	Lead	H ₂ SO ₄	CO ₂ e
	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)
Three (3) GE LM6000 Turbine and one (1) Black Start Generator (Proposed Inc)	151.02	113.31		22.77	22.77					181,027
Baseline Actual Emissions (Units 1 & 2) (Proposed Decreases)	1,252.10	122.14		81.83	35.42					816,777
Other Contemporaneous Emissions	0.00	0.00		0.00	0.00					0.00
Net Emission Increases/Decreases	-1,101.08	-8.82		-59.06	-12.65					-635,750
New Source Review Significant Emission Rates	25	100		15	10					75,000
Major Modification (Yes/No)	No	No		No	No					No

Capacity Factor 30 %

Indicates netting is not required.



Lead				
Year	Unit 1	Unit 2	Total	2 year Rolling Ann Avg
	Tons	Tons	Tons	Tons
2014	2.50E-02	4.00E-02	6.50E-02	
2015	2.20E-02	3.60E-02	5.80E-02	6.15E-02
2016	2.10E-02	3.10E-02	5.20E-02	5.50E-02

Notes:

1) For an existing electric utility steam generating unit, "baseline actual emissions" is determined by the average rate, in tons per year, at which the unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 5-year period immediately preceding the date on which a complete application was submitted.

g) For an existing electric utility steam generating unit, "baseline actual emissions" is determined by the average rate, in tons per year, at which the unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 5-year period immediately preceding the date on which a complete application was submitted.

VOC and PM 10/MMBtu values provided by C.P. Crane, email dated Sep 6, 2017.

b) Assumed the smallest stack test value for PM where no test was conducted.

2.5 microns. These values are 67% and 29%, respectively.

NO_x Actual Emissions Data Provided by C.P. Crane

Year	Month	Unit 1				Unit 2			
		Tons	Daily Avg lbs/mmBTU	Gross MW	lbs/MWg	Tons	Daily Avg lbs/mmBTU	Gross MW	lbs/MWg
2012	January	27.1	0.460	11,247	4.81	43.9	0.315	21,138	4.16
2012	February	8.0	0.332	3,729	4.30	15.0	0.222	7,272	4.12
2012	March	8.2	0.331	5,269	3.13	0.0	#DIV/0!	0	#DIV/0!
2012	April	16.4	0.312	8,571	3.83	15.7	0.232	6,462	4.85
2012	May	123.5	0.363	59,005	4.19	163.2	0.367	69,776	4.68
2012	June	74.9	0.426	34,919	4.29	58.7	0.323	24,271	4.84
2012	July	181.7	0.400	87,159	4.17	230.2	0.429	84,697	5.44
2012	August	87.7	0.382	39,560	4.43	142.9	0.386	55,933	5.11
2012	September	100.0	0.401	46,554	4.30	74.2	0.389	29,509	5.03
2012	October	32.6	0.421	15,495	4.21	22.5	0.362	8,627	5.21
2012	November	88.3	0.382	45,670	3.87	51.2	0.377	18,611	5.50
2012	December	191.9	0.424	85,003	4.51	53.9	0.328	24,060	4.48
2013	January	73.6	0.408	33,677	4.37	56.0	0.389	20,029	5.59
2013	February	26.8	0.380	13,186	4.07	22.3	0.332	9,092	4.90
2013	March	15.5	0.405	6,394	4.83	100.1	0.392	38,099	5.25
2013	April	0.0	#DIV/0!	0	#DIV/0!	31.0	0.421	10,940	5.66
2013	May	42.6	0.352	19,465	4.37	74.1	0.375	23,921	6.19
2013	June	67.8	0.396	30,936	4.38	98.0	0.462	29,476	6.65
2013	July	120.9	0.397	56,808	4.26	154.6	0.549	54,714	5.65
2013	August	29.6	0.426	11,365	5.20	80.4	0.372	27,943	5.75
2013	September	84.5	0.401	39,566	4.27	209.7	0.492	65,688	6.39
2013	October	69.9	0.423	33,561	4.17	73.0	0.390	27,045	5.40
2013	November	131.7	0.372	63,964	4.12	138.5	0.441	50,335	5.50
2013	December	32.4	0.388	15,645	4.15	94.4	0.373	38,576	4.90
2014	January	215.5	0.406	98,723	4.37	211.8	0.477	78,438	5.40
2014	February	92.0	0.393	46,367	3.97	133.9	0.427	44,891	5.97
2014	March	56.2	0.447	24,789	4.53	147.6	0.389	56,523	5.22
2014	April	22.6	0.376	8,944	5.05	42.0	0.388	17,723	4.74
2014	May	0.0	#DIV/0!	0	#DIV/0!	34.5	0.231	31,013	2.23
2014	June	0.0	#DIV/0!	0	#DIV/0!	76.5	0.266	56,819	2.69
2014	July	0.0	#DIV/0!	0	#DIV/0!	30.0	0.208	18,605	3.23
2014	August	0.5	0.344	2,591	0.38	2.6	0.346	12,694	0.41
2014	September	2.0	0.311	3,542	1.11	14.8	0.256	9,061	3.27
2014	October	6.2	0.328	4,145	2.99	7.7	0.235	3,696	4.17
2014	November	20.9	0.403	8,173	5.12	0.0	#DIV/0!	0	#DIV/0!
2014	December	16.6	0.420	6,556	5.05	5.4	0.390	1,279	8.39
2015	January	22.7	0.415	8,084	5.61	110.5	0.503	28,084	7.87
2015	February	158.5	0.391	70,550	4.49	255.4	0.545	66,454	7.69
2015	March	54.3	0.450	18,087	6.01	77.4	0.508	21,778	7.11
2015	April	0.0	#DIV/0!	0	#DIV/0!	59.6	0.414	20,715	5.76
2015	May	0.4	0.236	0	#DIV/0!	10.6	0.243	9,481	2.23
2015	June	1.1	0.288	282	7.81	63.1	0.239	44,016	2.87
2015	July	7.4	0.274	7,491	1.97	39.0	0.220	27,753	2.81
2015	August	30.3	0.316	28,739	2.11	31.7	0.249	24,281	2.61
2015	September	34.0	0.290	34,068	2.00	20.5	0.277	16,954	2.42
2015	October	0.0	#DIV/0!	0	#DIV/0!	24.9	0.431	9,622	5.18
2015	November	0.0	#DIV/0!	0	#DIV/0!	0.0	0.017	0	#DIV/0!
2015	December	0.0	#DIV/0!	0	#DIV/0!	11.7	0.315	5,283	4.45
2016	January	60.4	0.361	31,549	3.83	53.8	0.437	27,458	3.92
2016	February	49.9	0.383	24,034	4.15	28.4	0.378	16,078	3.53
2016	March	1.2	0.400	213	11.71	1.2	0.405	285	8.48
2016	April	0.0	#DIV/0!	0	#DIV/0!	0.0	#DIV/0!	0	#DIV/0!
2016	May	4.7	0.276	2,785	3.40	0.0	#DIV/0!	0	#DIV/0!
2016	June	12.3	0.278	9,389	2.61	14.7	0.234	14,430	2.03
2016	July	26.1	0.307	26,755	1.95	46.5	0.229	45,626	2.04
2016	August	30.5	0.277	23,891	2.55	43.5	0.257	39,126	2.22
2016	September	30.0	0.267	25,098	2.39	29.7	0.272	39,807	1.49
2016	October	7.9	0.432	2,995	5.29	37.6	0.454	14,025	5.36
2016	November	1.3	0.366	321	7.97	46.9	0.586	17,418	5.39
2016	December	31.4	0.425	13,959	4.51	46.4	0.472	19,701	4.71
2017	January	10.6	0.343	3,730	5.68	49.0	0.431	18,693	5.24
2017	February	0.0	#DIV/0!	0	#DIV/0!	23.3	0.379	8,093	5.75
2017	March	1.6	0.536	244	13.50	49.2	0.444	20,477	4.81
2017	April	0.0	#DIV/0!	0	#DIV/0!	0.0	#DIV/0!	0	#DIV/0!
2017	May	0.0	#DIV/0!	0	#DIV/0!	3.9	0.267	4,792	1.64
2017	June	0.0	#DIV/0!	0	#DIV/0!	17.8	0.271	16,316	2.18
2017	July	55.1	0.268	43,283	2.55	8.5	0.216	9,482	1.80

Non Compliance

Month	Day	Year	Unit 1 (lb)	Unit 1 (ton)
6	4	2012	13924.8	6.96
8	27	2014	1795	0.90
8	28	2014	13175	6.59
9	29	2014	8198.6	4.10
7	29	2015	5029.6	2.51
8	16	2015	549.6	0.27
8	17	2015	9409.7	4.70
8	25	2015	6537.3	3.27
8	27	2015	13458.4	6.73
9	7	2015	1582.1	0.79
9	8	2015	12639.3	6.32
9	14	2015	12183.3	6.09
6	19	2016	1599.6	0.80
7	4	2016	1814.5	0.91
7	11	2016	455.8	0.23
7	13	2016	12428.6	6.21
7	14	2016	10468.1	5.23
8	10	2016	682.7	0.34
8	11	2016	2786.9	1.39
9	5	2016	521.7	0.26
7	9	2017	704.7	0.35
7	10	2017	2742.4	1.37

Non Compliance

Month	Day	Year	Unit 1 (lb)	Unit 2 (ton)
7	19	2013	33850.9	16.93
7	20	2013	27843.5	13.92
7	21	2013	24180.6	12.09
5	7	2014	7111.5	3.56
5	11	2014	9800.7	4.90
5	13	2014	10806	5.40
5	26	2014	7919	3.96
6	1	2014	8409.6	4.20
6	10	2014	756.5	0.38
6	11	2014	9311	4.66
6	17	2014	11617.7	5.81
6	23	2014	9534.5	4.77
8	18	2014	9960.3	4.98
8	20	2014	12539.5	6.27
8	21	2014	24595.5	12.30
8	22	2014	15194.8	7.60
9	2	2014	4101.2	2.05
9	11	2014	6803.4	3.40
5	10	2015	1561.5	0.78
5	11	2015	12127.8	6.06
5	18	2015	5510.4	2.76
6	5	2015	10524.5	5.26
7	29	2015	5993	3.00
8	23	2015	3099.1	1.55
8	26	2015	9448.3	4.72
8	30	2015	7117.6	3.56
9	13	2015	1096.8	0.55
6	6	2016	3406.4	1.70
6	20	2016	4054.4	2.03
8	9	2016	4980	2.49
8	31	2016	11360.2	5.68
9	6	2016	7821	3.91
9	12	2016	4464.6	2.23
9	13	2016	11397.8	5.70
9	23	2016	12848.2	6.42
9	24	2016	8547.8	4.27
9	28	2016	3674.1	1.84
5	17	2017	7638.4	3.82
6	27	2017	2040.1	1.02
6	28	2017	16875.2	8.44
7	26	2017	328.8	0.16
7	27	2017	9963.9	4.98

Highlighted cells indicate that from the monthly data, emissions from the days of non compliance has been subtracted

CO Actual Emissions Data Provided by C.P. Crane

Year	Month	Unit 1				Unit 2			
		Tons	Heat Input (MMBTu)	Gross MW	lbs/mmBTU	Tons	Heat Input (MMBTu)	Gross MW	lbs/mmBTU
2012	January	1.1	115,873	11,247	0.02	5.9	261,382	21,138	0.05
2012	February	0.8	43,989	3,729	0.04	1.1	99,126	7,272	0.02
2012	March	0.8	40,508	5,269	0.04	0.0	0	0	#DIV/0!
2012	April	1.1	90,640	8,571	0.02	1.7	91,845	6,462	0.04
2012	May	6.9	624,188	59,005	0.02	7.3	849,213	69,776	0.02
2012	June	3.5	378,980	34,919	0.02	3.8	322,367	24,271	0.02
2012	July	13.1	888,992	87,159	0.03	12.8	1,027,141	84,697	0.02
2012	August	5.3	411,022	39,560	0.03	5.7	698,387	55,933	0.02
2012	September	5.2	493,005	46,554	0.02	7.9	369,528	29,509	0.04
2012	October	1.0	160,929	15,495	0.01	2.7	106,788	8,627	0.05
2012	November	7.9	468,371	45,670	0.03	4.4	232,745	18,611	0.04
2012	December	12.6	904,213	85,003	0.03	13.7	330,027	24,060	0.08
2013	January	7.4	353,028	33,677	0.04	16.3	256,108	20,029	0.13
2013	February	2.3	133,755	13,186	0.03	1.5	116,464	9,092	0.03
2013	March	0.6	73,156	6,394	0.02	7.7	471,039	38,099	0.03
2013	April	0.0	0	0	#DIV/0!	0.7	139,138	10,940	0.01
2013	May	2.5	204,941	19,465	0.02	1.6	294,099	23,921	0.01
2013	June	2.7	321,936	30,936	0.02	2.5	375,113	29,476	0.01
2013	July	7.8	570,285	56,808	0.03	0.7	654,763	54,714	0.00
2013	August	1.0	131,372	11,365	0.02	2.4	352,293	27,943	0.01
2013	September	4.4	402,568	39,566	0.02	4.5	769,841	65,688	0.01
2013	October	2.2	330,684	33,561	0.01	4.1	344,183	27,045	0.02
2013	November	11.0	692,871	63,964	0.03	7.1	598,829	50,335	0.02
2013	December	4.0	175,674	15,645	0.05	5.4	468,791	38,576	0.02
2014	January	21.0	1,065,540	98,723	0.04	11.9	886,769	78,438	0.03
2014	February	8.2	460,740	46,367	0.04	3.8	523,081	44,891	0.01
2014	March	1.2	245,792	24,789	0.01	7.6	658,354	56,523	0.02
2014	April	1.6	100,392	8,944	0.03	2.5	223,828	17,723	0.02
2014	May	0.0	0	0	#DIV/0!	4.5	412,540	31,013	0.02
2014	June	0.0	0	0	#DIV/0!	9.0	736,284	56,819	0.02
2014	July	0.0	0	0	#DIV/0!	2.6	254,866	18,605	0.02
2014	August	0.3	31,036	2,591	0.02	0.9	162,958	12,694	0.01
2014	September	0.6	35,518	3,542	0.04	2.6	136,187	9,061	0.04
2014	October	1.0	43,177	4,145	0.05	1.2	55,402	3,696	0.04
2014	November	1.3	92,876	8,173	0.03	0.0	0	0	#DIV/0!
2014	December	1.9	77,281	6,556	0.05	0.6	24,244	1,279	0.05
2015	January	3.2	102,916	8,084	0.06	12.2	374,851	28,084	0.06
2015	February	31.7	806,396	70,550	0.08	27.0	837,963	66,454	0.06
2015	March	10.0	218,166	18,087	0.09	5.4	284,030	21,778	0.04
2015	April	0.0	0	0	#DIV/0!	4.3	262,055	20,715	0.03
2015	May	0.1	3,318	0	0.06	6.3	147,548	9,481	0.09
2015	June	0.2	8,080	282	0.05	8.3	568,989	44,016	0.03
2015	July	2.8	76,152	7,491	0.07	6.0	367,009	27,753	0.03
2015	August	9.7	310,593	28,739	0.06	9.6	316,198	24,281	0.06
2015	September	9.24	343,752	34,068	0.05	4.5	173,482	16,954	0.05
2015	October	0.0	0	0	#DIV/0!	2.6	96,818	9,622	0.05
2015	November	0.0	0	0	#DIV/0!	0.0	163	0	0.05
2015	December	0.0	0	0	#DIV/0!	0.3	53,655	5,283	0.01
2016	January	14.6	325,048	31,549	0.09	11.7	241,433	27,458	0.10
2016	February	6.1	245,769	24,034	0.05	7.4	144,795	16,078	0.10
2016	March	0.4	5,712	213	0.14	0.2	4,022	285	0.09
2016	April	0.0	0	0	#DIV/0!	0.0	0	0	#DIV/0!
2016	May	0.6	33,900	2,785	0.04	0.0	0	0	#DIV/0!
2016	June	1.6	102,739	9,389	0.03	6.1	133,470	14,430	0.09
2016	July	5.1	284,229	26,755	0.04	13.9	394,242	45,626	0.07
2016	August	2.8	253,258	23,891	0.02	8.4	384,487	39,126	0.04
2016	September	4.9	258,999	25,098	0.04	11.1	367,217	39,807	0.06
2016	October	0.2	33,134	2,995	0.01	2.6	127,745	14,025	0.04
2016	November	0.1	6,907	321	0.04	2.1	151,486	17,418	0.03
2016	December	3.6	152,060	13,959	0.05	3.9	179,706	19,701	0.04
2017	January	2.2	40,660	3,730	0.11	4.5	178,712	18,693	0.05
2017	February	0.0	0	0	#DIV/0!	2.6	78,539	8,093	0.07
2017	March	0.8	6,385	244	0.26	12.8	194,977	20,477	0.13
2017	April	0.0	0	0	#DIV/0!	0.0	0	0	#DIV/0!
2017	May	0.0	0	0	#DIV/0!	0.4	54,381	4,792	0.01
2017	June	0.0	0	0	#DIV/0!	7.1	191,090	16,316	0.07
2017	July	13.9	459,984	43,283	0.06	3.6	104,204	9,482	0.07

Non Compliance

Month	Day	Year	Unit 1 (lb)	Unit 1 (ton)
6	24	2015	2350.8	1.18
6	25	2015	341.2	0.17
7	30	2015	6554.2	3.28
9	3	2015	6212	3.11
1	27	2016	587.3	0.29
11	14	2016	1066.9	0.53

			Unit 2 (lb)	Unit 2 (ton)
12	13	2012	202.2	0.10
1	30	2013	1188.9	0.59
2	23	2013	287.8	0.14
12	17	2016	219.8	0.11

Highlighted cells indicate that from the monthly data, emissions from the days of non compliance has been subtracted

SO₂ Actual Emissions Data Provided by C.P. Crane

Year	Month	Unit 1				Unit 2			
		Tons	Heat Input (MMBTu)	Gross MW	lbs/mmBTU	Tons	Heat Input (MMBTu)	Gross MW	lbs/mmBTU
2012	January	20.238	115873.200	11247	0.35	50.9003	261381.9	21138	0.39
2012	February	8.383	43988.900	3729	0.38	19.4361	99125.8	7272	0.39
2012	March	7.693	40508.200	5269	0.38	0	0.0	0	#DIV/0!
2012	April	17.029	90640.000	8571	0.38	17.5772	91844.5	6462	0.38
2012	May	122.645	624188.400	59005	0.39	176.458	849213.3	69776	0.42
2012	June	81.867	378980.000	34919	0.43	71.5341	322366.6	24271	0.44
2012	July	183.079	888992.000	87159	0.41	225.1605	1027140.7	84697	0.44
2012	August	94.116	411022.300	39560	0.46	162.4957	698386.5	55933	0.47
2012	September	113.111	493005.100	46554	0.46	88.17455	369527.5	29509	0.48
2012	October	34.022	160928.900	15495	0.42	23.24725	106787.5	8627	0.44
2012	November	117.431	468370.800	45670	0.50	53.18945	232745.2	18611	0.46
2012	December	413.330	904213.400	85003	0.91	73.59595	330027.0	24060	0.45
2013	January	69.779	353028.000	33677	0.40	47.3512	256108.0	20029	0.37
2013	February	30.102	133755.300	13186	0.45	54.92685	116463.6	9092	0.94
2013	March	13.102	73156.000	6394	0.36	91.2684	471038.8	38099	0.39
2013	April	0.000	0.000	0	#DIV/0!	39.12115	139137.5	10940	0.56
2013	May	38.480	204941.100	19465	0.38	61.4604	294099.1	23921	0.42
2013	June	77.929	321936.400	30936	0.48	138.0209	375113.3	29476	0.74
2013	July	152.607	570284.900	56808	0.54	407.5137	654763.2	54714	1.24
2013	August	27.515	131371.500	11365	0.42	202.0958	352293.0	27943	1.15
2013	September	110.068	402568.100	39566	0.55	439.5126	769840.6	65688	1.14
2013	October	80.031	330684.000	33561	0.48	193.255	344182.6	27045	1.12
2013	November	196.415	692871.400	63964	0.57	359.2802	598829.4	50335	1.20
2013	December	36.295	175674.100	15645	0.41	108.8163	468791.4	38576	0.46
2014	January	265.965	1065539.600	98723	0.50	380.5245	886768.9	78438	0.86
2014	February	146.370	460740.100	46367	0.64	247.4171	523081.0	44891	0.95
2014	March	92.408	245791.700	24789	0.75	238.4045	658354.4	56523	0.72
2014	April	10.161	100392.300	8944	0.20	36.3553	223828.3	17723	0.32
2014	May	0.000	0.000	0	#DIV/0!	77.07325	412540.4	31013	0.37
2014	June	0.000	0.000	0	#DIV/0!	161.6726	736283.5	56819	0.44
2014	July	0.000	0.000	0	#DIV/0!	54.50305	254865.8	18605	0.43
2014	August	8.453	31036.100	2591	0.54	74.45225	162957.6	12694	0.91
2014	September	6.858	35517.700	3542	0.39	28.18255	136186.7	9061	0.41
2014	October	9.677	43177.100	4145	0.45	12.56355	55401.7	3696	0.45
2014	November	18.237	92875.500	8173	0.39	0	0.0	0	#DIV/0!
2014	December	15.417	77281.300	6556	0.40	4.3441	24244.4	1279	0.36
2015	January	24.926	102915.600	8084	0.48	164.0987	374850.9	28084	0.88
2015	February	163.585	806396.300	70550	0.41	176.9291	837963.1	66454	0.42
2015	March	47.699	218166.200	18087	0.44	65.9368	284030.1	21778	0.46
2015	April	0.000	0.000	0	#DIV/0!	61.3722	262054.6	20715	0.47
2015	May	0.396	3318.100	0	0.24	26.12655	147548.4	9481	0.35
2015	June	1.137	8079.900	282	0.28	130.6461	568989.4	44016	0.46
2015	July	14.036	76151.800	7491	0.37	66.6571	367009.1	27753	0.36
2015	August	61.653	310593.200	28739	0.40	154.0011	316198.0	24281	0.97
2015	September	68.084	343752.400	34068	0.40	36.47065	173481.8	16954	0.42
2015	October	0.000	0.000	0	#DIV/0!	19.2842	96817.7	9622	0.40
2015	November	0.000	0.000	0	#DIV/0!	0	163.2	0	0.00
2015	December	0.000	0.000	0	#DIV/0!	44.03765	53654.9	5283	1.64
2016	January	56.804	325048.000	31549	0.35	41.7559	241432.5	27458	0.35
2016	February	44.746	245769.100	24034	0.36	26.1586	144795.2	16078	0.36
2016	March	0.796	5712.400	213	0.28	0.4742	4021.7	285	0.24
2016	April	0.000	0.000	0	#DIV/0!	0	0.0	0	#DIV/0!
2016	May	6.022	33900.200	2785	0.36	0	0.0	0	#DIV/0!
2016	June	18.613	102738.600	9389	0.36	24.9708	133469.9	14430	0.37
2016	July	61.608	284229.100	26755	0.43	90.9799	394242.3	45626	0.46
2016	August	50.138	253257.500	23891	0.40	86.88335	384486.6	39126	0.45
2016	September	98.497	258999.100	25098	0.76	153.583	367216.5	39807	0.84
2016	October	17.778	33134.300	2995	1.07	63.58645	127745.3	14025	1.00
2016	November	3.404	6906.500	321	0.99	87.42835	151486.3	17418	1.15
2016	December	55.143	152059.700	13959	0.73	61.95205	179705.6	19701	0.69
2017	January	12.879	40660.200	3730	0.63	56.60015	178712.4	18693	0.63
2017	February	0.000	0.000	0	#DIV/0!	24.07755	78538.7	8093	0.61
2017	March	1.190	6384.700	244	0.37	54.78925	194976.8	20477	0.56
2017	April	0.000	0.000	0	#DIV/0!	0	0.0	0	#DIV/0!
2017	May	0.000	0.000	0	#DIV/0!	13.97845	54380.9	4792	0.51
2017	June	0.000	0.000	0	#DIV/0!	59.1261	191089.8	16316	0.62
2017	July	127.351	459984.100	43283	0.55	28.42495	104204.3	9482	0.55

Non Compliance
None

CO₂ Actual Emissions Data Provided by C.P. Crane

Year	Month	Unit 1						Unit 2							
		CO ₂ Tons	Heat Input (MMBtu)	CH ₄ Emission factor (kg/MMBtu)	CH ₄ Tons	N ₂ O Emission factor (kg/MMBtu)	N ₂ O Tons	CO ₂ e	CO ₂ Tons	Heat Input (MMBtu)	CH ₄ Emission factor (kg/MMBtu)	CH ₄ Tons	N ₂ O Emission factor (kg/MMBtu)	N ₂ O Tons	CO ₂ e
2012	January	12,152.90	115,873	1.10E-02	1.4	1.60E-03	0.2	12,248.94	27,414.00	261,382	1.10E-02	3.2	1.60E-03	0.5	27,630.65
2012	February	4,613.70	43,989	1.10E-02	0.5	1.60E-03	0.1	4,650.16	10,396.10	99,126	1.10E-02	1.2	1.60E-03	0.2	10,478.26
2012	March	4,248.60	40,508	1.10E-02	0.5	1.60E-03	0.1	4,282.18	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00
2012	April	9,506.70	90,640	1.10E-02	1.1	1.60E-03	0.2	9,581.83	9,632.70	91,845	1.10E-02	1.1	1.60E-03	0.2	9,708.83
2012	May	65,464.40	624,188	1.10E-02	7.6	1.60E-03	1.1	65,981.76	89,064.40	849,213	1.10E-02	10.3	1.60E-03	1.5	89,768.28
2012	June	39,747.60	378,980	1.10E-02	4.6	1.60E-03	0.7	40,061.72	33,809.80	322,367	1.10E-02	3.9	1.60E-03	0.6	34,077.00
2012	July	93,238.40	888,992	1.10E-02	10.8	1.60E-03	1.6	93,975.25	107,727.50	1,027,141	1.10E-02	12.5	1.60E-03	1.8	108,578.86
2012	August	43,107.70	411,022	1.10E-02	5.0	1.60E-03	0.7	43,448.38	73,247.40	698,387	1.10E-02	8.5	1.60E-03	1.2	73,826.26
2012	September	51,706.30	493,005	1.10E-02	6.0	1.60E-03	0.9	52,114.93	38,756.90	369,528	1.10E-02	4.5	1.60E-03	0.7	39,063.19
2012	October	16,878.30	160,929	1.10E-02	2.0	1.60E-03	0.3	17,011.69	11,200.00	106,788	1.10E-02	1.3	1.60E-03	0.2	11,288.51
2012	November	49,123.10	468,371	1.10E-02	5.7	1.60E-03	0.8	49,511.31	24,410.00	232,745	1.10E-02	2.8	1.60E-03	0.4	24,602.91
2012	December	94,833.90	904,213	1.10E-02	11.0	1.60E-03	1.6	95,583.37	34,613.00	330,027	1.10E-02	4.0	1.60E-03	0.6	34,886.55
2013	January	37,025.20	353,028	1.10E-02	4.3	1.60E-03	0.6	37,317.81	26,860.50	256,108	1.10E-02	3.1	1.60E-03	0.5	27,072.78
2013	February	14,028.50	133,755	1.10E-02	1.6	1.60E-03	0.2	14,139.36	12,214.40	116,464	1.10E-02	1.4	1.60E-03	0.2	12,310.93
2013	March	7,672.70	73,156	1.10E-02	0.9	1.60E-03	0.1	7,733.34	49,402.80	471,039	1.10E-02	5.7	1.60E-03	0.8	49,793.22
2013	April	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	14,592.70	139,138	1.10E-02	1.7	1.60E-03	0.2	14,708.03
2013	May	21,494.90	204,941	1.10E-02	2.5	1.60E-03	0.4	21,664.77	30,845.00	294,099	1.10E-02	3.6	1.60E-03	0.5	31,088.77
2013	June	33,764.60	321,936	1.10E-02	3.9	1.60E-03	0.6	34,031.44	37,113.00	375,113	1.10E-02	4.5	1.60E-03	0.7	37,652.26
2013	July	59,811.20	570,285	1.10E-02	6.9	1.60E-03	1.0	60,283.89	68,671.70	654,763	1.10E-02	7.9	1.60E-03	1.2	69,214.41
2013	August	13,777.80	131,372	1.10E-02	1.6	1.60E-03	0.2	13,886.69	36,948.80	352,293	1.10E-02	4.3	1.60E-03	0.6	37,240.80
2013	September	42,222.10	402,568	1.10E-02	4.9	1.60E-03	0.7	42,555.77	80,741.40	769,841	1.10E-02	9.3	1.60E-03	1.4	81,379.49
2013	October	34,681.80	330,684	1.10E-02	4.0	1.60E-03	0.6	34,955.89	36,097.90	344,183	1.10E-02	4.2	1.60E-03	0.6	36,383.18
2013	November	72,669.30	692,871	1.10E-02	8.4	1.60E-03	1.2	73,243.59	62,805.20	598,829	1.10E-02	7.3	1.60E-03	1.1	63,301.55
2013	December	18,424.60	175,674	1.10E-02	2.1	1.60E-03	0.3	18,570.21	49,167.10	468,791	1.10E-02	5.7	1.60E-03	0.8	49,555.66
2014	January	111,753.80	1,065,540	1.10E-02	12.9	1.60E-03	1.9	112,636.98	93,004.50	886,769	1.10E-02	10.8	1.60E-03	1.6	93,739.51
2014	February	48,322.30	460,740	1.10E-02	5.6	1.60E-03	0.8	48,704.19	54,860.00	523,081	1.10E-02	6.3	1.60E-03	0.9	55,293.56
2014	March	25,778.50	245,792	1.10E-02	3.0	1.60E-03	0.4	25,982.23	69,049.20	658,354	1.10E-02	8.0	1.60E-03	1.2	69,594.88
2014	April	10,529.30	100,392	1.10E-02	1.2	1.60E-03	0.2	10,612.51	23,475.30	223,828	1.10E-02	2.7	1.60E-03	0.4	23,660.82
2014	May	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	43,267.20	412,540	1.10E-02	5.0	1.60E-03	0.7	43,609.14
2014	June	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	77,222.20	736,284	1.10E-02	8.9	1.60E-03	1.3	77,832.48
2014	July	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	26,730.90	254,866	1.10E-02	3.1	1.60E-03	0.4	26,942.15
2014	August	3,254.90	31,036	1.10E-02	0.4	1.60E-03	0.1	3,280.62	17,090.90	162,958	1.10E-02	2.0	1.60E-03	0.3	17,225.97
2014	September	3,725.10	35,518	1.10E-02	0.4	1.60E-03	0.1	3,754.54	14,282.90	136,187	1.10E-02	1.7	1.60E-03	0.2	14,395.78
2014	October	4,528.60	43,177	1.10E-02	0.5	1.60E-03	0.1	4,564.39	5,810.60	55,402	1.10E-02	0.7	1.60E-03	0.1	5,856.52
2014	November	9,741.00	92,876	1.10E-02	1.1	1.60E-03	0.2	9,817.98	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00
2014	December	8,105.20	77,281	1.10E-02	0.9	1.60E-03	0.1	8,169.26	2,542.50	24,244	1.10E-02	0.3	1.60E-03	0.0	2,562.60
2015	January	10,793.70	102,916	1.10E-02	1.2	1.60E-03	0.2	10,879.00	39,314.20	374,851	1.10E-02	4.5	1.60E-03	0.7	39,624.90
2015	February	84,573.80	806,396	1.10E-02	9.8	1.60E-03	1.4	85,242.19	87,885.60	837,963	1.10E-02	10.2	1.60E-03	1.5	88,580.15
2015	March	22,881.10	218,166	1.10E-02	2.6	1.60E-03	0.4	23,061.93	29,789.50	284,030	1.10E-02	3.4	1.60E-03	0.5	30,024.92
2015	April	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	27,485.10	262,055	1.10E-02	3.2	1.60E-03	0.5	27,702.31
2015	May	347.80	3,318	1.10E-02	0.0	1.60E-03	0.0	350.55	15,475.60	147,548	1.10E-02	1.8	1.60E-03	0.3	15,593.90
2015	June	847.50	8,080	1.10E-02	0.1	1.60E-03	0.0	854.20	59,675.70	568,989	1.10E-02	6.9	1.60E-03	1.0	60,147.31
2015	July	7,986.40	76,152	1.10E-02	0.9	1.60E-03	0.1	8,049.52	38,491.00	367,009	1.10E-02	4.5	1.60E-03	0.6	38,795.20
2015	August	32,575.20	310,593	1.10E-02	3.8	1.60E-03	0.5	32,832.64	33,162.70	316,198	1.10E-02	3.8	1.60E-03	0.6	33,424.78
2015	September	36,052.50	343,752	1.10E-02	4.2	1.60E-03	0.6	36,337.42	18,194.10	173,482	1.10E-02	2.1	1.60E-03	0.3	18,337.89
2015	October	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	10,154.40	96,818	1.10E-02	1.2	1.60E-03	0.2	10,234.65
2015	November	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	16.90	163	1.10E-02	0.0	1.60E-03	0.0	17.04
2015	December	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	5,627.30	53,655	1.10E-02	0.7	1.60E-03	0.1	5,671.77
2016	January	34,091.50	325,048	1.10E-02	3.9	1.60E-03	0.6	34,360.92	25,321.30	241,433	1.10E-02	2.9	1.60E-03	0.4	25,521.41
2016	February	25,776.10	245,769	1.10E-02	3.0	1.60E-03	0.4	25,979.81	15,186.10	144,795	1.10E-02	1.8	1.60E-03	0.3	15,306.11
2016	March	599.20	5,712	1.10E-02	0.1	1.60E-03	0.0	603.93	421.60	4,022	1.10E-02	0.0	1.60E-03	0.0	424.93
2016	April	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00
2016	May	3,555.60	33,900	1.10E-02	0.4	1.60E-03	0.1	3,583.70	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00
2016	June	10,775.00	102,739	1.10E-02	1.2	1.60E-03	0.2	10,860.16	13,997.90	133,470	1.10E-02	1.6	1.60E-03	0.2	14,108.53
2016	July	29,810.20	284,229	1.10E-02	3.4	1.60E-03	0.5	30,045.79	41,347.80	394,242	1.10E-02	4.8	1.60E-03	0.7	41,674.57
2016	August	26,561.50	253,258	1.10E-02	3.1	1.60E-03	0.4	26,771.41	40,324.30	384,487	1.10E-02	4.7	1.60E-03	0.7	40,642.99
2016	September	27,163.30	258,999	1.10E-02	3.1	1.60E-03	0.5	27,377.97	38,512.70	367,217	1.10E-02	4.5	1.60E-03	0.6	38,817.07
2016	October	3,475.20	33,134	1.10E-02	0.4	1.60E-03	0.1	3,502.66	13,398.70	127,745	1.10E-02	1.5	1.60E-03	0.2	13,504.58
2016	November	724.40	6,907	1.10E-02	0.1	1.60E-03	0.0	730.12	15,887.50	151,486	1.10E-02	1.8	1.60E-03	0.3	16,013.06
2016	December	15,948.20	152,060	1.10E-02	1.8	1.60E-03	0.3	16,074.24	18,848.00	179,706	1.10E-02	2.2	1.60E-03	0.3	18,996.95
2017	January	4,264.80	40,660	1.10E-02	0.5	1.60E-03	0.1	4,298.50	18,744.00	178,712	1.10E-02	2.2	1.60E-03	0.3	18,892.13
2017	February	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	8,237.80	78,539	1.10E-02	1.0	1.60E-03	0.1	8,302.90
2017	March	669.60	6,385	1.10E-02	0.1	1.60E-03	0.0	674.89	20,450.00	194,977	1.10E-02	2.4	1.60E-03	0.3	20,611.61
2017	April	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00
2017	May	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	5,703.10	54,381	1.10E-02	0.7	1.60E-03	0.1	5,748.17
2017	June	0.00	0	1.10E-02	0.0	1.60E-03	0.0	0.00	20,041.10	191,090	1.10E-02	2.3	1.60E-03	0.3	20,199.49
2017	July	48,243.40	459,984	1.10E-02	5.6	1.60E-03	0.8	48,624.66	10,928.30	104,204	1.10E-02	1.3	1.60E-03		