Appendix A
Emissions Calculations

Table A-1 Unit 12 Baseline Look-Back Data

= lookback based on Sept. 2013 start of construction

Unit ID	Month	SO2 (tons)	annual avg of consecutive 24 mths	NOx (tons)	annual avg of consecutive 24 mths	CO2 (tons)	annual avg of consecutive 24 mths	**CO (tons)**	CO Emission Rate (lb/mmbtu)	annual avg of consecutive 24 mths	**VOC (tons)**	VOC emission rate	annual avg of consecutive 24 mths	**PM (tons)**	PM emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	**PM 10 (tons)**	PM 10 emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	**PM 2.5 (tons)**	PM 2.5 emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	CO2e (tons)	CO2e emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	Heat Input (MMBtu)	annual avg of consecutive 24 mths
12	9	0.022		1.131		4316.324		0.1089464	0.003		0.0108946	0.0003		0.239682	0.0066		0.239682	0.0066		0.239682	0.0066		4320.45	118.97		72630.916	
12	10	0		0		0		0	0.003		0	0.0003		0	0.0066		0	0.0066		0	0.0066		0	118.97		0	
12	11	0		0		0		0	0.003		0	0.0003		0	0.0066		0	0.0066		0	0.0066		0	118.97		0	
12	12	0.056	0.039	4.009	2.57	11049.294	7682.809	0.2788804	0.003	0.1939134	0.027888	0.0003	0.0193913	0.6135369	0.0066	0.4266095	0.6135369	0.0066	0.4266095	0.6135369	0.0066	0.4266095	11059.467	118.97	7689.9585	185920.27	129275.59
12	1	0.004	0.041	0.339	2.7395	829.753	8097.6855	0.0209438	0.003	0.2043853	0.0020944	0.0003	0.0204385	0.0460764	0.0066	0.4496477	0.0460764	0.0066	0.4496477	0.0460764	0.0066	0.4496477	830.56276	118.97	8105.2399	13962.558	136256.87
12	2	0.005	0.0435	0.408	2.9435	1079.66	8637.5155	0.0272494	0.003	0.21801	0.0027249	0.0003	0.021801	0.0599487	0.0066	0.479622	0.0599487	0.0066	0.479622	0.0599487	0.0066	0.479622	1080.62	118.97	8645.5499	18166.26	145340
12	3	0.058	0.0725	3.902	4.8945	11552.265	14413.648	0.2915856	0.003	0.3638028	0.0291586	0.0003	0.0363803	0.6414883	0.0066	0.8003662	0.6414883	0.0066	0.8003662	0.6414883	0.0066	0.8003662	11563.313	118.97	14427.206	194390.4	242535.2
12	4	0.017	0.081	1.14	5.4645	3280.549	16053.923	0.082802	0.003	0.4052038	0.0082802	0.0003	0.0405204	0.1821643	0.0066	0.8914483	0.1821643	0.0066	0.8914483	0.1821643	0.0066	0.8914483	3283.6493	118.97	16069.031	55201.3	270135.85
12	5	0.009	0.0855	0.55	5.7395	1760.371	16934.108	0.0444301	0.003	0.4274188	0.004443	0.0003	0.0427419	0.0977462	0.0066	0.9403214	0.0977462	0.0066	0.9403214	0.0977462	0.0066	0.9403214	1761.9499	118.97	16950.006	29620.071	284945.89
12	6	0.078	0.1245	3.943	7.711		16934.108	0.3914103	0.003	0.623124	0.039141	0.0003	0.0623124	0.8611026	0.0066	1.3708727	0.8611026	0.0066	1.3708727	0.8611026	0.0066	1.3708727	15522.027	118.97	24711.02	260940.19	415415.98
12	7	0.095	0.172	4.641	10.0315	18818.262	26343.239	0.47498	0.003	0.860614	0.047498	0.0003	0.0860614	1.044956	0.0066	1.8933507	1.044956	0.0066	1.8933507	1.044956	0.0066	1.8933507	18836.124	118.97	34129.081	316653.33	573742.65
12	8	0.074	0.209	3.364	11.7135	14673.369	33679.924	0.3703626	0.003	1.0457952	0.0370363	0.0003	0.1045795	0.8147976	0.0066	2.3007495	0.8147976	0.0066	2.3007495	0.8147976	0.0066	2.3007495	14687.344	118.97	41472.754	246908.37	697196.83
12	9	0.018	0.218	0.832	12.1295	3607.769	35483.808	0.0910558	0.003	1.0913232	0.0091056	0.0003	0.1091323	0.2003228	0.0066	2.400911	0.2003228	0.0066	2.400911	0.2003228	0.0066	2.400911	3610.9708	118.97	43278.239	60703.888	727548.78
12	10	0.007	0.2215	0.647	12.453	1377.622	36172.619	0.0347721	0.003	1.1087092	0.0034772	0.0003	0.1108709	0.0764986	0.0066	2.4391603	0.0764986	0.0066	2.4391603	0.0764986	0.0066	2.4391603	1378.9456	118.97	43967.712	23181.401	739139.48
12	11	0.016	0.2295	0.832	12.869	3086.074	37715.656	0.0778891	0.003	1.1476538	0.0077889	0.0003	0.1147654	0.171356	0.0066	2.5248383	0.171356	0.0066	2.5248383	0.171356	0.0066	2.5248383	3088.8213	118.97	45512.122	51926.053	765102.5
12	12	0.091	0.275	5.649	15.6935	18122.754	46777.033	0.4574305	0.003	1.376369	0.045743	0.0003	0.1376369	1.0063471	0.0066	3.0280118	1.0063471	0.0066	3.0280118	1.0063471	0.0066	3.0280118	18140.168	118.97	54582.206	304953.65	917579.33
12	1	0.055	0.3025	3.857	17.622	10812.475	52183.271	0.2729041	0.003	1.5128211	0.0272904	0.0003	0.1512821	0.6003891	0.0066	3.3282063	0.6003891	0.0066	3.3282063	0.6003891	0.0066	3.3282063	10822.468	118.97	59993.44	181936.08	1008547.4
12	2	0.004	0.3045	0.241	17.7425	739.153	52552.847	0.018657	0.003	1.5221496	0.0018657	0.0003	0.152215	0.0410454	0.0066	3.348729	0.0410454	0.0066	3.348729	0.0410454	0.0066	3.348729	739.87419	118.97	60363.377	12437.996	1014766.4
12	3	0.028	0.3185	1.682	18.5835	5550.105	55327.9	0.1400881	0.003	1.5921936	0.0140088	0.0003	0.1592194	0.3081939	0.0066	3.5028259	0.3081939	0.0066	3.5028259	0.3081939	0.0066	3.5028259	5555.428	118.97	63141.091	93392.082	1061462.4
12	4	0.033	0.335	1.847	19.507	6603.852	58629.826	0.1666781	0.003	1.6755327	0.0166678	0.0003	0.1675533	0.3666918	0.0066	3.6861719	0.3666918	0.0066	3.6861719	0.3666918	0.0066	3.6861719	6609.898	118.97	66446.04	111118.74	1117021.8
12	5	0.055	0.3625	2.759	20.8865	10932.784	64096.218	0.2759435	0.003	1.8135044	0.0275944	0.0003	0.1813504	0.6070757	0.0066	3.9897097	0.6070757	0.0066	3.9897097	0.6070757	0.0066	3.9897097	10943	118.97	71917.54	183962.34	1209002.9
12	6	0.07	0.3975	3.221	22.497	13865.271	71028.853	0.3499703	0.003	1.9884896	0.034997	0.0003	0.198849	0.7699346	0.0066	4.374677	0.7699346	0.0066	4.374677	0.7699346	0.0066	4.374677	13878.654	118.97	78856.867	233313.51	1325659.7
12	7	0.124	0.4595	5.313	25.1535	24570.101	83313.904	0.620158	0.003	2.2985685	0.0620158	0.0003	0.2298569	1.3643475	0.0066	5.0568508	1.3643475	0.0066	5.0568508	1.3643475	0.0066	5.0568508	24593.398	118.97	91153.566	413438.64	1532379
12	8	0.151	0.535	7.204	28.7555	29813.243	98220.525	0.7524877	0.003	2.6748124	0.0752488	0.0003	0.2674812	1.6554729	0.0066	5.8845872	1.6554729	0.0066	5.8845872	1.6554729	0.0066	5.8845872	29841.153	118.97	106074.14	501658.46	1783208.3
12	9	0.06	0.554	2.868	29.624	11961.311	102043.02	0.3019051	0.003	2.7712917	0.0301905	0.0003	0.2771292	0.6641911	0.0066	6.0968418	0.6641911	0.0066	6.0968418	0.6641911	0.0066	6.0968418	11972.548	118.97	109900.19	201270.03	1847527.8
12	10	0.026	0.567	1.279	30.2635	5094.682	104590.36	0.1285919	0.003	2.8355877	0.0128592	0.0003	0.2835588	0.2829023	0.0066	6.2382929	0.2829023	0.0066	6.2382929	0.2829023	0.0066	6.2382929	5099.5277	118.97	112449.96	85727.96	1890391.8
12	11	0.012	0.573	0.71	30.6185	2310.244	105745.48	0.0583135	0.003	2.8647444	0.0058313	0.0003	0.2864744	0.1282897	0.0066	6.3024377	0.1282897	0.0066	6.3024377	0.1282897	0.0066	6.3024377	2312.5184	118.97	113606.21	38875.656	1909829.6
12	12	0.025	0.5575	1.516	29.372	4995.192	102718.43	0.1260838	0.003	2.7883461	0.0126084	0.0003	0.2788346	0.2773843	0.0066	6.1343615	0.2773843	0.0066	6.1343615	0.2773843	0.0066	6.1343615	5000.0625	118.97	110576.51	84055.854	1858897.4
12	1	0.029	0.57	1.915	30.16	5768.503	105187.81	0.1456117	0.003	2.85068	0.0145612	0.0003	0.285068	0.3203457	0.0066	6.2714961	0.3203457	0.0066	6.2714961	0.3203457	0.0066	6.2714961	5774.4743	118.97	113048.47	97074.46	1900453.4
12	2	0.043	0.589	2.759	31.3355	8443.736	108869.84	0.2131329	0.003	2.9436218	0.0213133	0.0003	0.2943622	0.4688924	0.0066	6.4759679	0.4688924	0.0066	6.4759679	0.4688924	0.0066	6.4759679	8452.1401	118.97	116734.23	142088.6	1962414.5
12	3	0.004	0.562	0.186	29.4775	732.568	103460	0.0184896	0.003	2.8070738	0.001849	0.0003	0.2807074	0.0406772	0.0066	6.1755624	0.0406772	0.0066	6.1755624	0.0406772	0.0066	6.1755624	733.23763	118.97	111319.19	12326.429	1871382.5
12	4	0.006	0.5565	0.387	29.101	1265.042	102452.24	0.0319316	0.003	2.7816386	0.0031932	0.0003	0.2781639	0.0702495	0.0066	6.119605	0.0702495	0.0066	6.119605	0.0702495	0.0066	6.119605	1266.3006	118.97	110310.52	21287.73	1854425.8
12	5	0.004	0.554	0.181	28.9165	735.814	101939.96	0.0185702	0.003	2.7687087	0.001857	0.0003	0.2768709	0.0408545	0.0066	6.0911591	0.0408545	0.0066	6.0911591	0.0408545	0.0066	6.0911591	736.43287	118.97	109797.76	12380.144	1845805.8
12	6	0.045	0.5375	2.344	28.117	8824.283	106352.1	0.2227163	0.003	2.6843617	0.0222716	0.0003	0.2684362	0.4899759	0.0066	5.9055957	0.4899759	0.0066	5.9055957	0.4899759	0.0066	5.9055957	8832.1861	118.97	106452.84	148477.53	1789574.5
12	7	0.17	0.575	9.618	30.6055	33612.979	113749.46	0.8483878	0.003	2.8710656	0.0848388	0.0003	0.2871066	1.8664531	0.0066	6.3163443	1.8664531	0.0066	6.3163443	1.8664531	0.0066	6.3163443	33644.232	118.97	113856.89	565591.86	1914043.7
12	8	0.123	0.5995	7.089	32.468	24344.445	118585	0.6144371	0.003	2.9931029	0.0614437	0.0003	0.2993103	1.3517615	0.0066	6.5848263	1.3517615	0.0066	6.5848263	1.3517615	0.0066	6.5848263	24366.526	118.97	118696.48	409624.71	1995401.9
12	9	0.041	0.611	2.594	33.349	8105.643	120833.94	0.2046008	0.003	3.0498753	0.0204601	0.0003	0.3049875	0.4501218	0.0066	6.7097258	0.4501218	0.0066	6.7097258	0.4501218	0.0066	6.7097258	8113.7864	118.97	120947.89	136400.55	2033250.2
12	10	0.017	0.616	0.985	33.518	3376.49	121833.37	0.0852172	0.003	3.0750979	0.0085217	0.0003	0.3075098	0.1874778	0.0066	6.7652153	0.1874778	0.0066	6.7652153	0.1874778	0.0066	6.7652153	3379.429	118.97	121948.13	56811.449	2050065.3
12	11	0.032	0.624	2.175	34.1895	6394.097	123487.38	0.1613965	0.003	3.1168516	0.0161396	0.0003	0.3116852	0.3550722	0.0066	6.8570735	0.3550722	0.0066	6.8570735	0.3550722	0.0066	6.8570735	6400.4461	118.97	123603.94	107597.65	2077901.1
12	12	0.001	0.579	0.077	31.4035	215.188	114533.6	0.0054299	0.003	2.8908513	0.000543	0.0003	0.2890851	0.0119457	0.0066	6.3598728	0.0119457	0.0066	6.3598728	0.0119457	0.0066	6.3598728	215.33118	118.97	114641.53	3619.924	1927234.2
12	1	0.031	0.567	1.846	30.398	6106.738	112180.73	0.1541376	0.003	2.831468	0.0154138	0.0003	0.2831468	0.3391028	0.0066	6.2292297	0.3391028	0.0066	6.2292297	0.3391028	0.0066	6.2292297	6112.5841	118.97	112286.58	102758.41	1887645.4
12	2	0.027	0.5785	1.522	31.0385	5333.117	114477.71	0.1346024	0.003	2.8894408	0.0134602	0.0003	0.2889441	0.2961254	0.0066	6.3567697	0.2961254	0.0066	6.3567697	0.2961254	0.0066	6.3567697	5337.8843	118.97	114585.59	89734.964	1926293.8
12	3	0.002	0.5655	0.107	30.251	352.036	111878.68	0.0088841	0.003	2.8238387	0.0008884	0.0003	0.2823839	0.019545	0.0066	6.2124452	0.019545	0.0066	6.2124452	0.019545	0.0066	6.2124452	352.31395	118.97	111984.03	5922.736	1882559.2
12	4	0.066	0.582	3.984	31.3195	13076.495	115115	0.3300631	0.003	2.9055313	0.0330063	0.0003	0.2905531	0.7261389	0.0066	6.3921688	0.7261389	0.0066	6.3921688	0.7261389	0.0066	6.3921688	13089.203	118.97	115223.68	220042.09	1937020.8
12	5	0.135	0.622	7.988	33.934	26684.233	122990.73	0.6735164	0.003	3.1043177	0.0673516	0.0003	0.3104318	1.4817361	0.0066	6.829499	1.4817361	0.0066	6.829499	1.4817361	0.0066	6.829499	26709.416	118.97	123106.89	449010.94	2069545.1
12	6	0.064	0.619	4.315	34.481	12694.033	122405.11	0.3204035	0.003	3.0895343	0.0320403	0.0003	0.3089534	0.7048877	0.0066	6.7969755	0.7048877	0.0066	6.7969755	0.7048877	0.0066	6.7969755	12706.134	118.97	122520.63	213602.32	2059689.5

Table A-2 Unit 7 (boiler 39) Baseline Look-Back Data

= lookback based on Sept. 2013 start of construction

Unit ID	Month	Year	SO2 (tons)	annual avg of consecutive 24 mths	NOx (tons)	annual avg of consecutive 24 mths	CO2 (tons)	annual avg of consecutive 24 mths	CO (tons)	CO Emission Rate (lb/mmbtu)	annual avg of consecutive 24 mths	VOC (tons)	VOC emission rate	annual avg of consecutive 24 mths	PM (tons)	PM emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	PM 10 (tons)	PM 10 emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	PM 2.5 (tons)	PM 2.5 emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	SAM (tons)	SAM emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	Lead (tons)	Lead emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	HF (tons)	HF emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	CO2e (tons)	CO2e emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	Heat Input (MMBtu)	annual avg of consecutive 24 mths
39	9	2008	189.973		35.329		20042.1		2.856146	0.029		0.32501	0.0033		2.954634	0.03		1.94	0.0197		0.72881	0.0074		0.052199	0.00053		0.014773	0.00015		0.8076	0.0082		20769.11	210.88		196975.6	
39	10	2008	136.998		29.101		15662.96		2.232045	0.029		0.253991	0.0033		2.309013	0.03		1.52	0.0197		0.569556	0.0074		0.040793	0.00053		0.011545	0.00015		0.63113	0.0082		16230.82	210.88		153934.17	
39	11	2008	197.714		37.014		21691.84		3.091346	0.029		0.351774	0.0033		3.197944	0.03		2.1	0.0197		0.788826	0.0074		0.056497	0.00053		0.01599	0.00015		0.874105	0.0082		22479.41	210.88		213196.25	
39	12	2008	181.222		39.19		22046		2.996821	0.029		0.341018	0.0033		3.10016	0.03		2.04	0.0197		0.764706	0.0074		0.054769	0.00053		0.015501	0.00015		0.847377	0.0082		21792.05	210.88		206677.3	
39	1	2009	199.497		35.257		20599.1		2.832513	0.029		0.32232	0.0033		2.930186	0.03		1.92	0.0197		0.722779	0.0074		0.051767	0.00053		0.014651	0.00015		0.800917	0.0082		20597.25	210.88		195345.7	
39	2	2009	163.631		36.087		18901.7		2.599128	0.029		0.295763	0.0033		2.688753	0.03		1.77	0.0197		0.663226	0.0074		0.047501	0.00053		0.013444	0.00015		0.734926	0.0082		18900.14	210.88		179250.2	
39	3	2009	146.266		32.741		17455.17		2.400135	0.029		0.273119	0.0033		2.482899	0.03		1.63	0.0197		0.612448	0.0074		0.043865	0.00053		0.012414	0.00015		0.678659	0.0082		17453.12	210.88		165526.58	
39	4	2009	32.454		9.453		4343.374		0.597159	0.029		0.067953	0.0033		0.617751	0.03		0.41	0.0197		0.152378	0.0074		0.010914	0.00053		0.003089	0.00015		0.168852	0.0082		4342.375	210.88		41183.374	
39	5	2009	165.496		42.225		21111.7		2.902997	0.029		0.330341	0.0033		3.003101	0.03		1.97	0.0197		0.740765	0.0074		0.053055	0.00053		0.015016	0.00015		0.820847	0.0082		21109.79	210.88		200206.7	
39	6	2009	190.824		43.65		22935.4		3.153898	0.029		0.358892	0.0033		3.262653	0.03		2.14	0.0197		0.804788	0.0074		0.05764	0.00053		0.016313	0.00015		0.891792	0.0082		22934.28	210.88		217510.2	
39	7	2009	185.075		42.94		22435.3		3.085046	0.029		0.351057	0.0033		3.191427	0.03		2.1	0.0197		0.787219	0.0074		0.056382	0.00053		0.015957	0.00015		0.872323	0.0082		22433.6	210.88		212761.8	
39	8	2009	156.779		38.175		20765.56		2.855331	0.029		0.324917	0.0033		2.95379	0.03		1.94	0.0197		0.728602	0.0074		0.052184	0.00053		0.014769	0.00015		0.807369	0.0082		20763.18	210.88		196919.36	
39	9	2009	90.588		23.796		12001.37		1.650247	0.029		0.187787	0.0033		1.707152	0.03		1.12	0.0197		0.421098	0.0074		0.03016	0.00053		0.008536	0.00015		0.466622	0.0082		12000.14	210.88		113810.15	
39	10	2009	166.051		43.185		22352.9		3.073571	0.029		0.349751	0.0033		3.179556	0.03		2.09	0.0197		0.78429	0.0074		0.056172	0.00053		0.015898	0.00015		0.869079	0.0082		22350.16	210.88		211970.4	
39	11	2009	181.428		42.444		22602.1		3.107911	0.029		0.353659	0.0033		3.215081	0.03		2.11	0.0197		0.793053	0.0074		0.0568	0.00053		0.016075	0.00015		0.878789	0.0082		22599.87	210.88		214338.7	
39	12	2009	195.11		45.765		23277.6		3.201011	0.029		0.364253	0.0033		3.311391	0.03		2.17	0.0197		0.81681	0.0074		0.058501	0.00053		0.016557	0.00015		0.905114	0.0082		23276.87	210.88		220759.4	
39	1	2010	175.284		42.318		22209.6		3.068902	0.029		0.34922	0.0033		3.174726	0.03		2.08	0.0197		0.783099	0.0074		0.056087	0.00053		0.015874	0.00015		0.867758	0.0082		22316.21	210.88		211648.4	
39	2	2010	169.851		41.437		20749.5		2.866905	0.029		0.326234	0.0033		2.965764	0.03		1.95	0.0197		0.731555	0.0074		0.052395	0.00053		0.014829	0.00015		0.810642	0.0082		20847.34	210.88		197717.6	
39	3	2010	132.106		28.446		14739.31		2.036621	0.029		0.231753	0.0033		2.106849	0.03		1.38	0.0197		0.51969	0.0074		0.037221	0.00053		0.010534	0.00015		0.575872	0.0082		14809.75	210.88		140456.63	
39	4	2010	0		0		0		0	0.029		0	0.0033		0	0.03		0	0.0197		0	0.0074		0	0.00053		0	0.00015		0	0.0082		0	210.88		0	
39	5	2010	38.217		9.845		4613.986		0.63758	0.029		0.072552	0.0033		0.659566	0.03		0.43	0.0197		0.162693	0.0074		0.011652	0.00053		0.003298	0.00015		0.180281	0.0082		4636.308	210.88		43971.056	
39	6	2010	159.522		40.168		20249.86		2.798332	0.029		0.318431	0.0033		2.894827	0.03		1.9	0.0197		0.714057	0.0074		0.051142	0.00053		0.014474	0.00015		0.791253	0.0082		20348.7	210.88		192988.44	
39	7	2010	152.142		37.755		18809.05		2.586432	0.029		0.294318	0.0033		2.675619	0.03		1.76	0.0197		0.659986	0.0074		0.047269	0.00053		0.013378	0.00015		0.731336	0.0082		18807.82	210.88		178374.6	
39	8	2010	177.633	1791.931	43.889	410.105	21051.4	215323.4	2.894747	0.029	29.76241	0.329402	0.0033	3.386757	2.994566	0.03	30.7887	1.97	0.0197	20.21791	0.738659	0.0074	7.594547	0.052904	0.00053	0.543934	0.014973	0.00015	0.153944	0.818515	0.0082	8.415579	21049.8	210.88	216424.1	199637.7	2052580
39	9	2010	158.224	1776.056	41.434	413.1575	20213.2	215409	2.779301	0.029	29.72399	0.316265	0.0033	3.382385	2.875139	0.03	30.749	1.89	0.0197	20.19181	0.709201	0.0074	7.584742	0.050794	0.00053	0.543232	0.014376	0.00015	0.153745	0.785871	0.0082	8.404714	20210.31	210.88	216144.7	191675.9	2049930
39	10	2010	158.328	1786.721	44.298	420.756	21303.8	218229.4	2.935613	0.029	30.07577	0.334053	0.0033	3.422416	3.036842	0.03	31.1129	1.99	0.0197	20.43078	0.749088	0.0074	7.674508	0.053651	0.00053	0.549661	0.015184	0.00015	0.155564	0.83007	0.0082	8.504184	21346.97	210.88	218702.7	202456.1	2074191
39	11	2010	98.701	1737.215	37.054	420.776	18991.7	216879.3	2.61143	0.029	29.83582	0.297163	0.0033	3.39511	2.701479	0.03	30.8646	1.77	0.0197	20.26778	0.666365	0.0074	7.613277	0.047726	0.00053	0.545275	0.013507	0.00015	0.154323	0.738404	0.0082	8.436334	18989.6	210.88	216957.8	180098.6	2057642
39	12	2010	102.002	1697.605	34.962	418.662	15772.95	213742.8	2.168909	0.029	29.42186	0.246807	0.0033	3.348005	2.243699	0.03	30.4364	1.47	0.0197	19.98657	0.553446	0.0074	7.507647	0.039639	0.00053	0.53771	0.011218	0.00015	0.152182	0.613278	0.0082	8.319285	15771.71	210.88	213947.6	149579.97	2029094
39	1	2011	142.93	1669.321	38.788	420.4275	19957.7	213422.1	2.744195	0.029	29.3777	0.31227	0.0033	3.34298	2.838822	0.03	30.3907	1.86	0.0197	19.95658	0.700243	0.0074	7.496379	0.050153	0.00053	0.536903	0.014194	0.00015	0.151954	0.775945	0.0082	8.306798	19955.03	210.88	213626.5	189254.8	2026048
39	2	2011	117.199	1646.105	31.454	418.111	16777.4	212360	2.306851	0.029	29.23156	0.262504	0.0033	3.32635	2.386398	0.03	30.2395	1.57	0.0197	19.8573	0.588645	0.0074	7.459088	0.04216	0.00053	0.534232	0.011932	0.00015	0.151198	0.652282	0.0082	8.265476	16774.79	210.88	212563.9	159093.2	2015970
39	3	2011	110.563	1628.254	30.465	416.973	15934.05	211599.4	2.190901	0.029	29.12695	0.249309	0.0033	3.314445	2.266449	0.03	30.1313	1.49	0.0197	19.78624	0.559057	0.0074	7.432393	0.040041	0.00053	0.53232	0.011332	0.00015	0.150657	0.619496	0.0082	8.235895	15931.62	210.88	211803.1	151096.59	2008755
39	4	2011	38.251	1631.152	12.221	418.357	6160.836	212508.1	0.847198	0.029	29.25196	0.096405	0.0033	3.328672	0.876412	0.03	30.2607	0.58	0.0197	19.87116	0.216182	0.0074	7.464294	0.015483	0.00053	0.534605	0.004382	0.00015	0.151303	0.239553	0.0082	8.271245	6160.589	210.88	212712.2	58427.442	2017377
39	5	2011	54.25	1575.529	14.63	404.5595	7840.868	205872.7	1.078257	0.029	28.33959	0.122698	0.0033	3.22485	1.115439	0.03	29.3168	0.73	0.0197	19.25138	0.275142	0.0074	7.231483	0.019706	0.00053	0.517931	0.005577	0.00015	0.146584	0.304887	0.0082	8.013265	7840.789	210.88	206077.7	74362.57	1954455
39	6	2011	99.941	1530.088	25.144	395.3065	13067.89	200939	1.796854	0.029	27.66107	0.20447	0.0033	3.147639	1.858814	0.03	28.6149	1.22	0.0197	18.79045	0.458508	0.0074	7.058343	0.032839	0.00053	0.50553	0.009294	0.00015	0.143075	0.508076	0.0082	7.821407	13066.22	210.88	201143.7	123920.95	1907660
39	7	2011	142.899	1509	40.497	394.085	20505.2	199973.9	2.819483	0.029	27.52829	0.320838	0.0033	3.13253	2.916707	0.03	28.4775	1.92	0.0197	18.70025	0.719454	0.0074	7.02446	0.051528	0.00053	0.503103	0.014584	0.00015	0.142388	0.797233	0.0082	7.783862	20502.5	210.88	200178.1	194447.1	1898503
39	8	2011	139.995	1500.608	38.784	394.3895	19955.6	199568.9	2.743802	0.029	27.47253	0.312226	0.0033	3.126184	2.838416	0.03	28.4199	1.86	0.0197	18.66237	0.700142	0.0074	7.010231	0.050145	0.00053	0.502084	0.014192	0.00015	0.142099	0.775834	0.0082	7.768094	19952.17	210.88	199772.6	189227.7	1894657
39	9	2011	9.338	1459.983	3.468	384.2255	1837.05	194486.8	0.25266	0.029	26.77373	0.028751	0.0033	3.046666	0.261372	0.03	27.697	0.17	0.0197	18.18767	0.064472	0.0074	6.831918	0.004618	0.00053	0.489313	0.001307	0.00015	0.138485	0.071442	0.0082	7.570504	1837.271	210.88	194691.2	17424.8	1846464
39	10	2011	0.006	1376.96	0.014	362.64	20.979	183320.8	0.002911	0.029	25.2384	0.000331	0.0033	2.871956	0.003012	0.03	26.1087	0	0.0197	17.14471	0.000743	0.0074	6.440144	5.32E-05	0.00053	0.461254	1.51E-05	0.00015	0.130543	0.000823	0.0082	7.136376	21.17077	210.88	183526.7	200.785	1740580
39	11	2011	0.007	1286.25	0.004	341.42	9.231	172024.4	0.001282	0.029	23.68509	0.000146	0.0033	2.6952	0.001326	0.03	24.5018	0	0.0197	16.08953	0.000327	0.0074	6.043781	2.34E-05	0.00053	0.432865	6.63E-06	0.00015	0.122509	0.000362	0.0082	6.697163	9.319842	210.88	172231.4	88.39	1633454
39	12	2011	0	1188.695	0	318.5375	0	160385.6	0	0.029	22.08458	0	0.0033	2.513073	0	0.03	22.8461	0	0.0197	15.00229	0	0.0074	5.635376	0	0.00053	0.403615	0	0.00015	0.114231	0	0.0082	6.244606	0	210.88	160593		1523075
39	1	2012	0.006	1101.056	0.015	297.386	21.748	149291.6	0.002996	0.029	20.55163	0.000341	0.0033	2.338634	0.003099	0.03	21.2603	0	0.0197	13.96093	0.000765	0.0074	5.244209	5.48E-05	0.00053	0.375599	1.55E-05	0.00015	0.106302	0.000847	0.0082	5.81115	21.78643	210.88	149445.8	206.624	1417354
39	2	2012	0.016	1016.138	0.021	276.678	22.097	138927.9	0.003038	0.029	19.1197	0.000346	0.0033	2.17569	0.003143	0.03	19.779	0	0.0197	12.98821	0.000775	0.0074	4.878819	5.55E-05	0.00053	0.349429	1.57E-05	0.00015	0.098895	0.000859	0.0082	5.406259	22.09242	210.88	139033.2	209.526	1318600
39	3	2012	0	950.085	0	262.455	0	131558.3	0	0.029	18.10139	0	0.0033	2.059813	0	0.03	18.7256	0	0.0197	12.29646	0	0.0074	4.618974	0	0.00053	0.330818	0	0.00015	0.093628	0	0.0082	5.118323	0	210.88	131628.3		1248371
39	4	2012	0	950.085	0	262.455	0	131558.3	0	0.029	18.10139	0	0.0033	2.059813	0	0.03	18.7256	0	0.0197	12.29646	0	0.0074	4.618974	0	0.00053	0.330818	0	0.00015	0.093628	0	0.0082	5.118323	0	210.88	131628.3		1248371
39	5	2012	0	930.9765	0	257.5325	0	129251.3	0	0.029	17.7826	0	0.0033	2.023537	0	0.03	18.3958	0	0.0197	12.0799	0	0.0074	4.537628	0	0.00053	0.324992	0	0.00015	0.091979	0	0.0082	5.028182	0	210.88	129310.1		1226386
39	6	2012	0	851.2155	0	237.4485	0	119126.4	0	0.029	16.38343	0	0.0033	1.864321	0	0.03	16.9484	0	0.0197	11.12943	0	0.0074	4.180599	0	0.00053	0.299421	0	0.00015	0.084742	0	0.0082	4.632556	0	210.88	119135.8		1129892

Table A-3 Unit 8 (boiler 40) Baseline Look- Back Data

= lookback based on Sept. 2013 start of construction

Unit ID	Month	Year	SO2 (tons)	annual avg of consecutive 24 mths	NOx (tons)	annual avg of consecutive 24 mths	CO2 (tons)	annual avg of consecutive 24 mths	CO (tons)	CO Emission Rate (lb/mmbtu)	annual avg of consecutive 24 mths	VOC (tons)	VOC emission rate	annual avg of consecutive 24 mths	PM (tons)	PM emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	PM 10 (tons)	PM10 emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	PM 2.5 (tons)	PM2.5 emisison rate (lb/mmbtu)	annual avg of consecutive 24 mths	SAM (tons)	SAM emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	Lead (tons)	Lead emisson rate (lb/mmbtu)	annual avg of consecutive 24 mths	HF (tons)	HF emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	CO2e (tons)	CO2e emission rate (lb/mmbtu)	annual avg of consecutive 24 mths	Heat Input (MMBtu)	annual avg of consecutive 24 mths
40	9	2008	322.903		61.84		36976.5		5.430042	0.03		0.615405	0.0034		5.068039	0.028		3.801029	0.021		1.26701	0.007		0.095931	0.00053		0.02715	0.00015		1.484211	0.0082		38319.81	211.71		362002.8	
40	10	2008	286.904		53.99		34432.1		4.903199	0.03		0.555696	0.0034		4.576319	0.028		3.432239	0.021		1.14408	0.007		0.086623	0.00053		0.024516	0.00015		1.340208	0.0082		34601.87	211.71		326879.9	
40	11	2008	247.115		51.13		32425.7		4.617391	0.03		0.523304	0.0034		4.309565	0.028		3.232174	0.021		1.077391	0.007		0.081574	0.00053		0.023087	0.00015		1.262087	0.0082		32584.93	211.71		307826.1	
40	12	2008	285.726		60.93		38211.7		5.441492	0.03		0.616702	0.0034		5.078725	0.028		3.809044	0.021		1.269681	0.007		0.096133	0.00053		0.027207	0.00015		1.487341	0.0082		38400.61	211.71		362766.1	
40	1	2009	337.017		59.07		36123.1		5.138214	0.03		0.582331	0.0034		4.795666	0.028		3.59675	0.021		1.198917	0.007		0.090775	0.00053		0.025691	0.00015		1.404445	0.0082		36260.38	211.71		342547.6	
40	2	2009	272.827		59.28		33767.7		4.803288	0.03		0.544373	0.0034		4.483069	0.028		3.362302	0.021		1.120767	0.007		0.084858	0.00053		0.024016	0.00015		1.312899	0.0082		33896.8	211.71		320219.2	
40	3	2009	265.837		63.96		37042.9		5.269434	0.03		0.597203	0.0034		4.918138	0.028		3.688604	0.021		1.229535	0.007		0.093093	0.00053		0.026347	0.00015		1.440312	0.0082		37186.4	211.71		351295.6	
40	4	2009	156.716		43.66		26343.7		3.747267	0.03		0.42469	0.0034		3.497449	0.028		2.623087	0.021		0.874362	0.007		0.066202	0.00053		0.018736	0.00015		1.024253	0.0082		26444.47	211.71		249817.8	
40	5	2009	201.153		47.03		27846.9		3.961118	0.03		0.448927	0.0034		3.697044	0.028		2.772783	0.021		0.924261	0.007		0.06998	0.00053		0.019806	0.00015		1.082706	0.0082		27953.61	211.71		264074.6	
40	6	2009	264.671		62.65		37646.7		5.355216	0.03		0.606924	0.0034		4.998202	0.028		3.748651	0.021		1.24955	0.007		0.094609	0.00053		0.026776	0.00015		1.463759	0.0082		37791.76	211.71		357014.4	
40	7	2009	288.069		63.42		37462.7		5.329004	0.03		0.603954	0.0034		4.973737	0.028		3.730302	0.021		1.243434	0.007		0.094146	0.00053		0.026645	0.00015		1.456594	0.0082		37606.78	211.71		355266.9	
40	8	2009	284.68		64		38349.1		5.455143	0.03		0.61825	0.0034		5.091467	0.028		3.8186	0.021		1.272867	0.007		0.096374	0.00053		0.027276	0.00015		1.491072	0.0082		38496.94	211.71		363676.2	
40	9	2009	131.354		31.73		17966.1		2.555654	0.03		0.289641	0.0034		2.385277	0.028		1.788958	0.021		0.596319	0.007		0.04515	0.00053		0.012778	0.00015		0.698546	0.0082		18035.25	211.71		170377	
40	10	2009	251.049		63.16		35558.8		5.058261	0.03		0.57327	0.0034		4.721044	0.028		3.540783	0.021		1.180261	0.007		0.089363	0.00053		0.025291	0.00015		1.382591	0.0082		35696.15	211.71		337217.4	
40	11	2009	275.369		61.29		36304.5		5.164271	0.03		0.585284	0.0034		4.819986	0.028		3.614989	0.021		1.204996	0.007		0.091235	0.00053		0.025821	0.00015		1.411567	0.0082		36444.26	211.71		344284.7	
40	12	2009	302.9		65.27		37033.4		5.268018	0.03		0.597042	0.0034		4.916817	0.028		3.687613	0.021		1.229204	0.007		0.093068	0.00053		0.02634	0.00015		1.439925	0.0082		37176.4	211.71		351201.2	
40	1	2010	287.172		62.08		35869.9		5.12729	0.03		0.581093	0.0034		4.78547	0.028		3.589103	0.021		1.196368	0.007		0.090582	0.00053		0.025636	0.00015		1.401459	0.0082		36183.28	211.71		341819.3	
40	2	2010	250.934		52.77		31345.6		4.480637	0.03		0.507805	0.0034		4.181927	0.028		3.136446	0.021		1.045482	0.007		0.079158	0.00053		0.022403	0.00015		1.224707	0.0082		31619.85	211.71		298709.1	
40	3	2010	160.076		38.15		22855.2		3.266918	0.03		0.370251	0.0034		3.049124	0.028		2.286843	0.021		0.762281	0.007		0.057716	0.00053		0.016335	0.00015		0.892958	0.0082		23054.64	211.71		217794.6	
40	4	2010	310.204		66.24		37737.6		5.394426	0.03		0.611368	0.0034		5.034798	0.028		3.776098	0.021		1.258699	0.007		0.095302	0.00053		0.026972	0.00015		1.474476	0.0082		38068.46	211.71		359628.4	
40	5	2010	300.517		61.63		39165.8		5.598449	0.03		0.634491	0.0034		5.225219	0.028		3.918914	0.021		1.306305	0.007		0.098906	0.00053		0.027992	0.00015		1.530243	0.0082		39508.25	211.71		373229.9	
40	6	2010	302.408		68.35		39193.1		5.602347	0.03		0.634933	0.0034		5.228857	0.028		3.921643	0.021		1.307214	0.007		0.098975	0.00053		0.028012	0.00015		1.531308	0.0082		39535.76	211.71		373489.8	
40	7	2010	328.326		68.1		39646.3		5.639567	0.03		0.639151	0.0034		5.263595	0.028		3.947697	0.021		1.315899	0.007		0.099632	0.00053		0.028198	0.00015		1.541482	0.0082		39798.42	211.71		375971.1	
40	8	2010	310.248	3212.088	62.46	696.097	37241.9	413273.4	5.297862	0.03	58.95225	0.600424	0.0034	6.681255	4.944671	0.028	55.0221	3.708503	0.021	41.26658	1.236168	0.007	13.75553	0.093596	0.00053	1.04149	0.026489	0.00015	0.294761	1.448082	0.0082	16.11362	37387.01	211.71	416026	353190.8	3930150
40	9	2010	105.494	3103.383	57.08	693.716	38987.4	414278.9	5.575877	0.03	59.02517	0.631933	0.0034	6.689519	5.204151	0.028	55.09016	3.903114	0.021	41.31762	1.301038	0.007	13.77254	0.098507	0.00053	1.042778	0.027879	0.00015	0.295126	1.524073	0.0082	16.13355	39348.96	211.71	416540.6	371725.1	3935011
40	10	2010	110.622	3015.242	55.17	694.305	35235.1	414680.4	5.038187	0.03	59.09266	0.570995	0.0034	6.697169	4.702308	0.028	55.15315	3.526731	0.021	41.36487	1.175577	0.007	13.78829	0.089008	0.00053	1.04397	0.025191	0.00015	0.295463	1.377105	0.0082	16.152	35554.49	211.71	417016.9	335879.2	3939511
40	11	2010	101.031	2942.2	59.8	698.6375	35747.9	416341.5	5.112687	0.03	59.34031	0.579438	0.0034	6.725235	4.771841	0.028	55.38429	3.578881	0.021	41.53822	1.19296	0.007	13.84607	0.090324	0.00053	1.048346	0.025563	0.00015	0.296702	1.397468	0.0082	16.21969	36080.23	211.71	418764.6	340845.8	3956021
40	12	2010	114.895	2856.785	59.83	698.088	38950.5	416710.9	5.570642	0.03	59.40489	0.631339	0.0034	6.732554	5.199265	0.028	55.44456	3.899449	0.021	41.58342	1.299816	0.007	13.86114	0.098415	0.00053	1.049486	0.027853	0.00015	0.297024	1.522642	0.0082	16.23734	39312.02	211.71	419220.3	371376.1	3960326
40	1	2011	104.118	2740.335	53.21	695.158	35044.8	416171.7	5.011884	0.03	59.34172	0.568013	0.0034	6.725395	4.677758	0.028	55.38561	3.508319	0.021	41.53921	1.16944	0.007	13.8464	0.088543	0.00053	1.04837	0.025059	0.00015	0.296709	1.369915	0.0082	16.22007	35368.86	211.71	418774.5	334125.6	3956115
40	2	2011	124.354	2666.099	52.25	691.6455	32180.2	415378	4.602483	0.03	59.24132	0.521615	0.0034	6.714016	4.295651	0.028	55.2919	3.221738	0.021	41.46892	1.073913	0.007	13.82297	0.081311	0.00053	1.046597	0.023012	0.00015	0.296207	1.258012	0.0082	16.19263	32479.72	211.71	418066	306832.2	3949421
40	3	2011	140.362	2603.361	61.54	690.437	36417.3	415065.2	5.20856	0.03	59.21088	0.590303	0.0034	6.710567	4.861322	0.028	55.26349	3.645992	0.021	41.44762	1.215331	0.007	13.81587	0.092018	0.00053	1.046059	0.026043	0.00015	0.296054	1.423673	0.0082	16.18431	36756.8	211.71	417851.2	347237.3	3947392
40	4	2011	111.184	2580.595	56.46	696.8355	33673	418729.8	4.790034	0.03	59.73227	0.542871	0.0034	6.769657	4.470698	0.028	55.75011	3.353024	0.021	41.81259	1.117675	0.007	13.93753	0.084624	0.00053	1.05527	0.02395	0.00015	0.298661	1.309276	0.0082	16.32682	33803.27	211.71	421530.6	319335.6	3982151
40	5	2011	20.814	2490.426	9.504	678.0705	5396.61	407504.7	0.76765	0.03	58.13553	0.087	0.0034	6.588694	0.716474	0.028	54.25983	0.537355	0.021	40.69487	0.179118	0.007	13.56496	0.013562	0.00053	1.027061	0.003838	0.00015	0.290678	0.209824	0.0082	15.89038	5417.309	211.71	410262.4	51176.69	3875702
40	6	2011	94.438	2405.309	51.63	672.559	31813.8	404588.3	4.525453	0.03	57.72065	0.512885	0.0034	6.541674	4.223756	0.028	53.87261	3.167817	0.021	40.40446	1.055939	0.007	13.46815	0.07995	0.00053	1.019731	0.022627	0.00015	0.288603	1.236957	0.0082	15.77698	31936.12	211.71	407334.6	301696.9	3848043
40	7	2011	96.2	2309.375	50.24	665.9715	33646.8	402680.3	4.812009	0.03	57.46215	0.545361	0.0034	6.512377	4.491208	0.028	53.63134	3.368406	0.021	40.22351	1.122802	0.007	13.40784	0.085012	0.00053	1.015165	0.02406	0.00015	0.287311	1.315282	0.0082	15.70632	33958.35	211.71	405510.4	320800.6	3830810
40	8	2011	191.38	2262.725	46.08	657.008	29669.2	398340.4	4.243338	0.03	56.85625	0.480912	0.0034	6.443708	3.960449	0.028	53.06583	2.970337	0.021	39.79938	0.990112	0.007	13.26646	0.074966	0.00053	1.00446	0.021217	0.00015	0.284281	1.159846	0.0082	15.54071	29945.24	211.71	401234.6	282889.2	3790417
40	9	2011	15.399	2204.747	2.963	642.627	2269.21	390491.9	0.324575	0.03	55.74071	0.036785	0.0034	6.317281	0.302936	0.028	52.02466	0.227202	0.021	39.0185	0.075734	0.007	13.00617	0.005734	0.00053	0.984753	0.001623	0.00015	0.278704	0.088717	0.0082	15.23579	2290.523	211.71	393362.2	21638.31	3716047
40	10	2011	12.176	2085.311	6.964	614.527	4455.35	374940.2	0.637357	0.03	53.53026	0.072234	0.0034	6.066763	0.594866	0.028	49.96157	0.44615	0.021	37.47118	0.148717	0.007	12.49039	0.01126	0.00053	0.945701	0.003187	0.00015	0.267651	0.174211	0.0082	14.6316	4497.827	211.71	377763	42490.45	3568684
40	11	2011	4.473	1949.863	2.467	585.1135	1672.05	357624	0.239091	0.03	51.06767	0.027097	0.0034	5.787669	0.223152	0.028	47.66316	0.167364	0.021	35.74737	0.055788	0.007	11.91579	0.004224	0.00053	0.902195	0.001195	0.00015	0.255338	0.065352	0.0082	13.9585	1687.266	211.71	360384.5	15939.41	3404511
40	12	2011	13.417	1805.121	7.599	556.277	4941.45	341578	0.706708	0.03	48.78701	0.080094	0.0034	5.529195	0.659594	0.028	45.53455	0.494696	0.021	34.15091	0.164899	0.007	11.38364	0.012485	0.00053	0.861904	0.003534	0.00015	0.243935	0.193167	0.0082	13.33512	4987.238	211.71	344290	47113.86	3252468
40	1	2012	0.015	1661.543	0.09	525.2845	84.66	323685.4	0.012046	0.03	46.22939	0.001365	0.0034	5.239331	0.011243	0.028	43.14743	0.008432	0.021	32.36057	0.002811	0.007	10.78686	0.000213	0.00053	0.816719	6.02E-05	0.00015	0.231147	0.003293	0.0082	12.63603	85.01088	211.71	326240.8	803.088	3081959
40	2	2012	0.012	1536.082	0.102	498.9515	97.067	308061.1	0.013874	0.03	43.99601	0.001572	0.0034	4.986215	0.012949	0.028	41.06294	0.009712	0.021	30.79721	0.003237	0.007	10.26574	0.000245	0.00053	0.777263	6.94E-05	0.00015	0.21998	0.003792	0.0082	12.02558	97.91111	211.71	310479.8	924.955	2933067
40	3	2012	0	1456.044	0	479.8765	0	296633.5	0	0.03	42.36255	0	0.0034	4.801089	0	0.028	39.53838	0	0.021	29.65379	0	0.007	9.884595	0	0.00053	0.748405	0	0.00015	0.211813	0	0.0082	11.5791	0	211.71	298952.5	0	2824170
40	4	2012	0	1300.942	0	446.7565	0	277764.7	0	0.03	39.66534	0	0.0034	4.495405	0	0.028	37.02098	0	0.021	27.76574	0	0.007	9.255246	0	0.00053	0.700754	0	0.00015	0.198327	0	0.0082	10.84186	0	211.71	279918.3	0	2644356
40	5	2012	162.179	1231.773	39.83	435.8555	26911.5	271637.6	3.848772	0.03	38.7905	0.436194	0.0034	4.396257	3.592187	0.028	36.20447	2.69414	0.021	27.15335	0.898047	0.007	9.051117	0.067995	0.00053	0.685299	0.019244	0.00015	0.193953	1.051998	0.0082	10.60274	27160.78	211.71	273744.6	256584.8	2586033
40	6	2012	238.501	1199.819	46.27	424.8165	31116.3	267599.2	4.460106	0.03	38.21938	0.505479	0.0034	4.33153	4.162766	0.028	35.67142	3.122074	0.021	26.75357	1.040691	0.007	8.917855	0.078795	0.00053	0.675209	0.022301	0.00015	0.191097	1.219096	0.0082	10.44663	31474.97	211.71	269714.2	297340.4	2547959

Table A-4 Individual Unit's Baseline Actual Emissions Summary

		BAE [Unit 7]			
Source	**The 24 month period used**	**Pollutant**	**Emissions (tpy)**	**Heat input used (MMBtu)**	**Emission rate (lb/MMBtu)**
EDR	Sep 08-Aug10	SOx	1792	2,052,580	1.74610
EDR	Nov 08-Oct10	NOx	421	2,074,191	0.40594
EIQ	Nov 08-Oct10	CO	30	2,074,191	0.02893
EIQ	Nov 08-Oct10	VOC	3	2,074,191	0.00289
EIQ	Nov 08-Oct10	Lead	0.2	2,074,191	0.00015
TRI	Nov 08-Oct10	SAM	1	2,074,191	0.00053
TRI	Nov 08-Oct10	HF	9	2,074,191	0.00820
EIQ	Nov 08-Oct10	PM	35	2,074,191	0.03375
EIQ	Nov 08-Oct10	PM 10	24	2,074,191	0.02314
EIQ	Nov 08-Oct10	PM 2.5	12	2,074,191	0.01157
GHG rpt.	Nov 08-Oct10	GHG CO2e	218,703	2,074,191	210.88029
baseline fugitive PM emissions for 7 & 8 inlcuded only in unit 7 data					

BAE [Unit 8]					
Source	**The 24 month period used**	**Pollutant**	**Emissions (tpy)**	**Heat input used (MMBtu)**	**Emission rate (lb/MMBtu)**
EDR	Sep 08-Aug10	SOx	3212	3,930,150	1.63454
EDR	Dec 08-Nov10	NOx	699	3,956,021	0.35339
EIQ	May 09-Apr 11	CO	60	3,982,151	0.03013
EIQ	May 09-Apr 11	VOC	7	3,982,151	0.00352
EIQ	May 09-Apr 11	Lead	0.3	3,982,151	0.00015
TRI	May 09-Apr 11	SAM	1	3,982,151	0.00053
TRI	May 09-Apr 11	HF	16	3,982,151	0.00804
EIQ	May 09-Apr 11	PM	56	3,982,151	0.02813
EIQ	May 09-Apr 11	PM 10	42	3,982,151	0.02109
EIQ	May 09-Apr 11	PM 2.5	14	3,982,151	0.00703
GHG rpt.	May 09-Apr 11	GHG CO2e	421,531	3,982,151	211.71020

BAE [Unit 12]					
Source	**The 24 month period used**	**Pollutant**	**Emissions (tpy)**	**Heat input used (MMBtu)**	**Emission rate (lb/MMBtu)**
EDR	Dec 09-Nov11	SOx	1	2,077,901	0.0006
EDR	Jul 10- Jun 12	NOx	34	2,059,690	0.033
EIQ	Dec 09-Nov11	CO	3	2,077,901	0.003
EIQ	Dec 09-Nov11	VOC	0.3	2,077,901	0.0003
EIQ	n/a	Lead	n/a	n/a	n/a
TRI	n/a	SAM	9.8E-02	n/a	n/a
TRI	n/a	HF	n/a	n/a	n/a
EIQ	Dec 09-Nov11	PM	7	2,077,901	0.0067
EIQ	Dec 09-Nov11	PM 10	7	2,077,901	0.0066
EIQ	Dec 09-Nov11	PM 2.5	7	2,077,901	0.0066
GHG rpt.	Dec 09-Nov11	GHG CO2e	123,604	2,077,901	118.97
CT calculated PM emissions include both filterable and condensable particulate.					
PM rates from AP42 factor					

Table A-5 Unit 12 Combined Cycle PTE

PTE After Converting to CC [Unit 12 CT and HRSG]				
Pollutant	Emission Source	Emissions (tpy)		
SOx	B&V	11.7		
NOx	B&V	62		
CO	B&V	57		
VOC	B&V	47		
Lead	n/a	n/a		
SAM	B&V	7		
HF	n/a	n/a		
PM	B&V	131		
PM 10	B&V	131		
PM 2.5	B&V	131		
GHG CO2e	B&V	1011254		
Includes duct burners				
The above analysis uses PTE @ 8,760 hrs/yr				
PTE assumes that duct burners will operate 100% of unit 12 total operation.				

Table A-6.1 Auxiliary Boiler PTE

[Auxillary Boiler]				
Pollutant	Emissions (tpy)	Operating Time (hrs/yr)	Emission Rate (lbs/hr)	
PM	0.41	8760	0.093	
PM 10	0.41	8760	0.093	
PM 2.5	0.41	8760	0.093	
Nox	4	8760	0.910	
CO	3	8760	0.687	
VOC	0.32	8760	0.074	
Sox	0.12	8760	0.028	
*CO2e	9336	n/a	n/a	
18.579	MMBtu/hr			
1052	BTU/SFC	NG HHV from 2012 fuel analysis		
* from emissions calcs worksheet				
will have separate stack				

Table A-6.2 GHG PTE for the Auxiliary Boiler

Projected actual emissions after converting unit 12 to combined cycle							
Auxillary Boiler							
GHG Calculations	Pollutant	Design Rate (mmbtu/hr)	Natural Gas HHV (btu/scf)	Emission Factor (lb/mmscf)	GWP (multiplier)	Total emissions (CO2e tpy)	
	CO2	18.579	1052	120000	1	9282.44	
	N20	18.579	1052	2.2	310	52.755	
	CH4	18.579	1052	2.3	4.38	0.779	
						9336	total CO2e
HHV from 2012 fuel analysis							
Design Rate from B&V							
Emission Factors from AP42 Table 1.4-2							
GWP=global warming potential							

Table A-7 Emergency Generator PTE

PTE After Converting Unit 12 to CC [Emergency Generator-limited at 100 hrs/yr]				
Pollutant	Emission Rate Source	Emissions (tpy)	*Brake HP at full Standby	Emission Rate (grams/HP-
PM	Cummins	0.015	1102	0.12
PM 10	Cummins	0.015	1102	0.12
PM 2.5	Cummins	0.015	1102	0.12
Nox	Cummins	0.482	1102	3.97
SO2	Cummins	0.012	1102	0.10
CO	Cummins	0.056	1102	0.46
VOC	Cummins	0.006	1102	0.09
* BHP @ 1800 RPM (60Hz)				
Hours of operation/year =		100	(readiness testing)	
	1gram =	0.0022	pounds	
	HC =	0.1	Grams/HP-hr	
Hydrocarbon is comprised of		1.053	VOC	
39.8	gal/hr -Vendor Data Spec Sheet based on 3/4 Break HP			

Table A-8 Cooling Tower PTE

PTE After Converting Unit 12 to CC [Cooling Tower]			
Pollutant	Emission Source	Emissions (tpy)	Rate (lb/hr)
*PM	B&V	0.6	
**PM 10	B&V	0.57	0.13
***PM 2.5	B&V	0.34	0.078
* tpy provided by B&V		8760	hr./yr
**assuming drift eliminator @0.0005%			
***South Coast air guidance book. Final Oct. 2006, Table A			
"updated CEIDARS Table w ith PM2.5 fractions.			

Table A-9 Calculation of Significant Emissions Increase and Net Significant Emissions Increase

BAE Before Converting Unit 12 to CC [Units 7,8]		BAE Before Converting Unit 12 to CC [Unit 12]		PTE After Applying Controls [Unit 12 CT and HRSG]		PTE [Auxillary Boiler]		PTE [Cooling Tower]		[Emergency Generator] Limited at 100 hrs		Total Emissions [After converting to CC]		Threshold Levels			Test for Significant Emissions Increase: PTE (unit 12 & HRSG)-BAE (unit 12)+PTE (new sources)			Test for Significant Net Emissions: Pollutant With Significant Increase - Retired unit 7 & 8 Emissions		
Pollutant	(tpy)	Pollutant	(tpy)	Pollutant	(tpy)	Pollutant	(tpy)	Pollutant	(tpy)	Pollutant	(tpy)	Pollutant	(tpy)	Pollutant	(tpy)	Exceed?	Pollutant	(tpy)	Exceed?	Pollutant	(tpy)	Exceed?
SOx	5004	SOx	1	SOx	11.7	SOx	0.12	SOx	n/a	SOx	0.012	SOx	12	SOx	40	No	SOx	n/a	No	SOx	n/a	No
NOx	1120	NOx	34	NOx	62	NOx	4	NOx	n/a	NOx	0.482	NOx	67	NOx	40	Yes	NOx	33	No	NOx	n/a	No
CO	90	CO	3	CO	57	CO	3	CO	n/a	CO	0.056	CO	60	CO	100	No	CO	n/a	No	CO	n/a	No
VOC	10	VOC	0.3	VOC	47	VOC	0.32	VOC	n/a	VOC	0.006	VOC	47	VOC	40	Yes	VOC	47	Yes	VOC	37	No
Lead	0.5	Lead[1]	n/a	Lead[1]	n/a	Lead[1]	3.87E-05	Lead	n/a	Lead[1]	2.51E-06	Lead	4.1E-05	Lead	0.6	No	Lead	n/a	No	Lead	n/a	No
SAM	2	SAM[2]	9.8E-02	SAM[2]	7	SAM[2]	0.02	SAM	n/a	SAM[2]	0.002	SAM	7	SAM	7	Yes	SAM	6.93	No	SAM	n/a	No
HF	25	HF	n/a	HF	n/a	HF	n/a	HF	n/a	HF[3]	1.69E-05	HF	1.69E-05	HF*	3	No	HF	n/a	No	HF	n/a	No
PM	91	PM	7	PM	131	PM	0.41	PM	0.60	PM	0.015	PM	132	PM	25	Yes	PM	125	Yes	PM	34	Yes
PM10	66	PM10	7	PM10	131	PM10	0.41	PM10	0.57	PM10	0.015	PM10	132	PM10	15	Yes	PM10	125	Yes	PM10	59	Yes
PM2.5	26	PM2.5	7	PM2.5	131	PM2.5	0.41	PM2.5	0.34	PM2.5	0.015	PM2.5	132	PM2.5	10	Yes	PM2.5	125	Yes	PM2.5	99	Yes
CO2e	640234	CO2e	123604	CO2e	1011254	CO2e	9336					CO2e	1020590	CO2e	75,000	Yes	CO2e	896986	Yes	CO2e	256752	Yes

[1] AP-42 Table 3.1-2a

[1] AP-42 Table 3.1-2a

[1] AP-42 Table 1.4-2 Lead EF

[1] AP-42 Table 1.3-10, Lead EF

* Flouride Value from NSR Workshop

Units 7 & 8 will be retired

[2] 2007 Memorandum to Air Quality ODEQ (10% SO2 to SO3, then 100% to H2SO4)

[2] B&V Performance Data

[2] 10% conversion SO2 to SO3, then 100% conversion to SAM

[2] 10% conversion SO2 to SO3, then 100% conversion to SAM

[3] AP-42 Table 1.3-11

Table A-10 Riverton 12 Combined Cycle Conversion Project, Estimated Combined Cycle Annual Emissions

Controlled Yearly Stack Emissions		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Ambient Dry-Bulb Temperature	deg F	-20.9	-20.9	-20.9	-20.9	59.0	59.0	59.0	59.0	95.0	95.0	95.0	95.0	95.0	109.4	109.4	109.4	109.4	14.0	14.0
Ambient Relative Humidty	%	50.0	50.0	50.0	50.0	60.0	60.0	60.0	60.0	45.0	45.0	45.0	45.0	45.0	32.0	32.0	32.0	32.0	75.0	75.0
CTG Load		Base	Base	75.0	65.4	Base	Base	75.0	60.2	Base	Base	Base	75.0	62.8	Base	Base	75.0	64.7	Base	Base
Duct Firing Status		Maximum	Unfired	Unfired	Unfired	Maximum	Unfired	Unfired	Unfired	Maximum	Nominal	Unfired	Unfired	Unfired	Maximum	Unfired	Unfired	Unfired	Maximum	Unfired
NOx	tons/yr	67.9	59.1	50.4	43.4	62.2	53.0	42.5	36.8	57.4	56.1	47.7	39.0	34.6	55.2	46.0	37.2	34.2	67.5	58.7
CO	tons/yr	60.9	35.9	30.7	26.3	56.9	32.4	25.8	22.3	54.8	51.7	29.3	23.7	21.0	54.3	28.0	22.8	20.6	59.6	35.9
CO2	tons/yr	1,110,409	962,842	823,795	707,142	1,011,254	865,208	695,010	602,622	932,515	912,332	781,099	636,918	566,579	901,369	746,453	609,972	555,498	1,098,508	958,878
SO2	tons/yr	12.8	11.1	9.5	8.1	11.7	10.0	8.0	7.0	10.8	10.5	9.0	7.4	6.5	10.4	8.6	7.1	6.4	12.7	11.1
UHC	tons/yr	126.6	51.7	44.2	37.7	120.9	46.4	37.2	32.4	119.1	108.6	41.6	34.2	30.2	119.1	39.9	32.4	29.8	122.6	51.2
VOC	tons/yr	49.9	28.9	24.5	21.0	46.9	25.8	20.6	18.0	45.1	42.0	23.2	19.3	17.1	44.7	22.3	18.4	16.6	48.6	28.9
PM10	tons/yr	132.3	99.4	98.6	97.7	131.0	99.0	97.2	96.8	131.4	127.0	98.1	96.8	96.4	131.8	97.7	96.8	96.4	130.5	99.4
PM2.5	tons/yr	132.3	99.4	98.6	97.7	131.0	99.0	97.2	96.8	131.4	127.0	98.1	96.8	96.4	131.8	97.7	96.8	96.4	130.5	99.4

Highlighted cells represent the maximum value among all ambient and load cases for a given emissions parameter.

Notes & Assumptions

1 Emissions estimates are preliminary, are not for guarantee, and do not include any margins. Permitting margins should be applied by the permitting engineer.
2 Emissions represent steady-state operation for a given ambient condition and CTG load.
3 Tons/yr assumes 8,760 hours of operation per year and represent a single case operating for 8,760 hours.
4 A dry ambient air composition of 0.98% Ar, 78.03% N2, and 20.99% O2 is assumed.
5 Standard conditions are defined as 60.0° F, 14.696 psia.
6 The fuel gas used to determine the emissions is based on fuel data provided by Empire District Electric with sulfur content of 0.5 gr/100scf and Lower Heating Value of 20,426 Btu/lb. The fuel is unheated and is supplied at 60°F.
7 CTG Emissions used in Black & Veatch's proprietary emissions calculation sheet are based on the following:
   a) NOx (ppmvd @ 15% O2) and CO (ppmvd @ 15% O2) provided by Siemens on November 15, 2012. CTG NOx includes the effects of the DLN combustion NOx control.
   b) VOC (ppmvd @ 15% O2) provided in original Siemens V84.3A Empire District Electric Co. Guarantee Requiriements. Guarantees are applicable for ambient temperature and CTG load ranges of -5°F to 105°F and 70% to 100%, respectively. We are assuming the guarantee VOC emissions are applicable across all ambient temperatures and CTG loads in this analysis. VOC consist of total hydrocarbons excluding methane and ethane and are expressed in terms of methane (CH4).
   c) The CTG VOC/UHC ratio is assumed to be 80% for natural gas firing (typical for Siemens gas turbines).
   d) Particulates (lb/hr) provided in original Siemens V84.3A Empire District Electric Co. Guarantee Requirements. Guarantees are applicable for ambient temperature and CTG load ranges of -5°F to 105°F and 70% to 100%, respectively when operating on fuel gas with Sulfur content of 0.2 gr/100scf. We are assuming the original guarantee Particulate emissions are applicable across all ambient temperatures and CTG loads in this analysis. In addition, Particulate emissions have been adjusted to reflect latest fuel gas Sulfur content of 0.5 gr/100scf. CTG PM10 and PM2.5 emission estimates can be assumed to be at the Total PM limits.
8 Emissions include the effects of an SCR and CO Catalyst.
9 Duct burner emissions are included. The duct burner pollutant emissions are Black & Veatch estimates based on typical vendor data for natural gas operation and are based on the following assumptions:
   a) NOx, lb/MBtu (HHV) = 0.08
   b) CO, lb/MBtu (HHV) = 0.10
   c) UHC as CH4, lb/MBtu (HHV) = 0.06
   d) VOC (Non-Methane, Non-Ethane), lb/MBtu (HHV) = 0.024
   e) Particulates/PM10/PM2.5, lb/MBtu (HHV) (Front Half Only) = 0.01
   f) Particulates/PM10/PM2.5, lb/MBtu (HHV) (Front Half + Back Half) = 0.024
10 Duct Fired cases fall into two categories: Maximum and Nominal Firing. Nominally Fired cases are designed to achieve a net plant output of 250 MW at rated STG throttle pressure of 1814.7 psia. Maximum Fired cases are limited by the 105% STG throttle overpressure limit of 1905 psia.
11 NOx emissions based on SCR effectiveness to control to 2.0 ppmvd @ 15% O2. SCR Ammonia (NH3) Slip assumed to be 10.0 ppmvd @ 15% O2.
12 CO Reduction in the CO Catalyst assumed to be 80% for all cases.
13 UHC values shown do not include the effects of oxidation in the CO catalyst.
14 VOC Reduction in the CO Catalyst assumed to be 30% for all cases.
15 CO catalyst is assumed to be located after HP evaporator in the HRSG. As a result a SO2 oxidation rate of 20% in the CO catalyst was used for emission estimates. If the CO catalyst is located before HP evaporator, then SO2 oxidation rate in CO catalyst could be higher. A higher oxidation rate would reduce SO2 emissions and increase ammonium sulfate (particulates) and sulfuric acid mist. Permitting engineer should apply necessary margins if the assumed SO2 oxidation rate in CO catalyst varies from 20%.
16 SO2 oxidation rates are assumed to be 15%, 10%, 3%, and 20% in the CTG, Duct Burner, SCR, and CO Catalyst, respectively.
17 SO2 emissions do not include the effects of SO2 oxidation.
18 PM10 emissions include the effects of SO2 oxidation and represent Front + Back Half Catch. The assumption that 100% SO3 is converted to ammonium sulfates results in the "worst case" particulate emissions.
19 PM2.5 emissions include the effects of SO2 oxidation and represent Front + Back Half Catch. The assumption that 100% SO3 is converted to ammonium sulfates results in the "worst case" particulate emissions.

Table A-11 Auxiliary Boiler Conceptual Data for Calculating PTE.

Riverton Combined Cycle Conversion Project Auxiliary Boiler Conceptual Sizing/emmissions data Coen - Tim Locke (11/20/2012)				
Steam Flow	15,000	lbs/hr		
Feedwater temp	228	°F		
Feedwater Pressure	290	psig		
Enthalpy	196.9	BTU/lb.		
Steam temperature	450	°F		
Steam Pressure	250	psig		
Enthalpy	1231.176663	BTU/lb.		
Δ h =	1034.252156	BTU/lb.		
BTU output	15,513,782	BTU/hr.		
Boiler efficiency estimate	83.50%			
BTU input	18,579,380	BTU/hr.		
add for pegging steam				
temperature in	60	°F		
Enthalpy	28.4	BTU/lb.		
temperature out	228	°F		
Enthalpy	196.8	BTU/lb.		
Δ h =	168.5	BTU/lb.		
Flow	15450	lbs/hr		
Losses	2%			
Pegging steam flow	2,654,670	BTU/hr		
	2,655	lbs/hr		
Stack temperature design	300	°F		
Design input NO with pegging steam flow allowance	18,579,380	BTU/hr		
fuel flow calcs	22,662	BTU / lb.		
	820	lb / hr		
Flue gas flow wet	19.82	lb flue gas / lb of fuel		
	16,249	LBS / hr		
SCFM	3,611			
ACFM	5,178			
Stack Height	45	ft		
stack diameter	20	inch		
	2.18	ft^2		
velocity	2,373	FPM		
flow	16249	lb/hr		
Suggested emissions	ppmv (corrected to 3% O2)	lbs/ MMBTU	lbs/hr	
NO_x	40	0.049	0.91	
CO	50	0.037	0.687	
Sox (.5 gr /100 scfh)		0.0015	0.028	
PM_{10}		0.005	0.093	
VOC	10	0.004	0.074	

Table A-12.1 Vendor Information for Emergency Generator used to estimate PTE.

Power Generation

Exhaust Emission Data Sheet
750DQFAA
60 Hz Diesel Generator Set

Engine Information:

Model:	Cummins Inc. QST30-G5 NR2	Bore:	5.51 in. (139 mm)
Type:	4 Cycle, 50°V, 12 Cylinder Diesel	Stroke:	6.5 in. (165 mm)
Aspiration:	Turbocharged and Low Temperature aftercooled	Displacement:	1860 cu. in. (30.4 liters)
Compression Ratio:	14.7:1		
Emission Control Device:	Aftercooled (Air-to-Air)		

PERFORMANCE DATA	1/4 Standby	1/2 Standby	3/4 Standby	Full Standby	Full Prime
BHP @ 1800 RPM (60 Hz)	276	551	827	1102	999
Fuel Consumption (gal/Hr)	14.8	27.1	39.8	52.7	47.9
Exhaust Gas Flow (CFM)	2350	3620	4930	6310	5880
Exhaust Gas Temperature (°F)	553	686	770	816	798
EXHAUST EMISSION DATA					
HC (Total Unburned Hydrocarbons)	0.22	0.11	0.10	0.09	0.09
NOx (Oxides of Nitrogen as NO2)	5.81	4.50	3.83	3.97	3.88
CO (carbon Monoxide)	1.38	0.48	0.37	0.46	0.43
PM (Particular Matter)	0.19	0.17	0.14	0.12	0.13
SO2 (Sulfur Dioxide)	0.12	0.11	0.10	0.10	0.10
Smoke (Bosch)	0.65	0.84	0.79	0.79	0.80

All Values are Grams/HP-Hour, Smoke is Bosch #

TEST CONDITIONS

Data was recorded during steady-state rated engine speed (± 25 RPM) with full load (±2%). Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	46.5 Cetane Number, 0.035 Wt.% Sulfur; Reference ISO8178-5, 40CFR86.1313-98 Type 2-D and ASTM D975 No. 2-D.
Fuel Temperature:	99 ± 9 °F (at fuel pump inlet)
Intake Air Temperature:	77 ± 9 °F
Barometric Pressure:	29.6 ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H2O/lb dry air
Reference Standard:	ISO 8178

The NOx, HC, CO and PM emission data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may results in elevated emission levels.

Table A-12.2 Vendor Information for Emergency Generator used to estimate PTE.

Power Generation

2012 EPA Tier 2 Exhaust Emission Compliance Statement 750DQFAA Stationary Emergency 60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with U.S. EPA New Source Performance Standards for Stationary Emergency emission under the provisions of 40 CFR Part 60 Subpart IIII when tested per ISO 8178 D2.

Engine Manufacturer:	Cummins Inc
EPA Certificate Number:	CCEXL030.AAD-018
Effective Date:	06/28/2011
Date Issued:	06/28/2011
EPA Engine Family (Cummins Emissions Family):	CCEXL030.AAD (D573)
CARB / AQMD Certificate:	

Engine Information:

Model:	QST30 / QST30-G / QST30-G5 NR2	Bore:	5.51 in. (140 mm)
Engine Nameplate HP:	1490	Stroke:	6.5 in. (165 mm)
Type:	4 Cycle, 50°V, 12 Cylinder Diesel	Displacement:	1860 cu. in. (30.5 liters)
Aspiration:	Turbocharged and CAC	Compression Ratio:	14.0:1
Emission Control Device:	Electronic Control	Exhaust Stack Diameter:	2 - 8 in.

Diesel Fuel Emission Limits

D2 Cycle Exhaust Emissions

	Grams per BHP-hr			Grams per kWm-hr		
	NOx + NMHC	CO	PM	NOx + NMHC	CO	PM
Test Results - Diesel Fuel (300-4000 ppm Sulfur)	4.4	0.5	0.10	5.9	0.7	0.13
EPA Emissions Limit	4.8	2.6	0.15	6.4	3.5	0.20
Test Results - CARB Diesel Fuel (<15 ppm Sulfur)	4.0	0.5	0.08	5.4	0.7	0.11
CARB Emissions Limit	4.8	2.6	0.15	6.4	3.5	0.20

The CARB emission values are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel.
Test Methods: EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E Appendix A for Constant Speed Engines (ref. ISO8178-4, D2)

Diesel Fuel Specifications: Cetane Number: 40-48. Reference: ASTM D975 No. 2-D
Reference Conditions: Air Inlet Temperature: 25°C (77°F), Fuel Inlet Temperature: 40°C (104°F), Barometric Pressure: 100 kPa (29.53 in Hg), Humidity: 10.7 g/kg (75 grains H2O/lb) of dry air; required for NOx correction, Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to a maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.
Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

Table A-13Pipeline Natural Gas Sample Analysis Used to Calculate Auxiliary Boiler PTE.

CETCON, Inc.

Job No.: CJ-7182, CJ-7183, CJ-7184
Date: July 17, 18, 19, 2012
Customer: Empire District Electric Company

FUEL FACTOR CALCULATION BASED ON FUEL ANALYSIS

COMPONENT	MW	MOLE%	MOLES C	MOLES H	MOLES O	MOLES N	MOLES S
METHANE	16.043	90.668	90.668	362.672			
ETHANE	30.070	5.363	10.726	32.178			
ETHYLENE	28.054						
PROPANE	44.097	0.917	2.751	7.336			
PROPYLENE	42.081						
ISO-BUTANE	58.124	0.100	0.400	1.000			
N-BUTANE	58.124	0.239	0.956	2.390			
BUTYLENES	56.108						
ISO-PENTANE	72.151	0.073	0.365	0.876			
N-PENTANE	72.151						
PENTENES	70.135						
HEXANE	86.178	0.098	0.588	1.372			
HEPTANE	100.205						
OXYGEN	31.999						
NITROGEN	28.013	2.207				4.414	
HYDROGEN	2.016						
HELIUM	4.003						
ARGON	39.948						
CARBON MONOXIDE	28.010						
CARBON DIOXIDE	44.010	0.282	0.282		0.564		
WATER	18.015						
BENZENE	78.114						
TOLUENE	92.141						
ETHYLBENZENE	106.168						
XYLENE	106.168						
HYDROGEN SULFIDE	34.076						
TOTAL		99.947	106.736	407.824	0.564	4.414	
WEIGHT (LBS)			1282.0	411.0	9.0	61.8	
WEIGHT%			72.68	23.30	0.51	3.51	0.00

LHV (BTU/SCF): 949.5 = SUM [(MOLE%$_i$ • LHV$_i$) ÷ 100]
HHV (BTU/SCF): 1052.1 = SUM [(MOLE%$_i$ • HHV$_i$) ÷ 100]
DENSITY (LB/SCF): 0.0465 = SUM [(MOLE %$_i$ • DENSITY$_i$) ÷ 100]
SPECIFIC GRAVITY: 0.6091 = DENSITY (LB/SCF) ÷ DENSITY$_{AIR}$ (0.0763 LB/SCF)
GCV (BTU/LB): 22630 = HHV ÷ DENSITY
MW (LB/LBMOLE): 17.639 = SUM [(MOLE%$_i$ • MW$_i$) ÷ 100]
F_d (DSCF/MMBTU): 8673 = 10^6 • [(3.64 • %H) + (1.53 • %C) + (0.14 • %N) + (0.57 %S) - (0.46 • %O)] ÷ GCV
F_w (WSCF/MMBTU): 10661 = 10^6 • [(5.57 • %H) + (1.53 • %C) + (0.14 • %N) + (0.57 %S) - (0.46 • %O)] ÷ GCV
F_c (SCF/MMBTU): 1031 = 10^6 • (0.321 • %C) ÷ GCV
Expected F_o: 1.758 = 0.209 • F_d ÷ F_c

QA/QC Check:
Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓ Reasonableness ✓

Checked by: 8/10/2012

Operator (Signature/Date) 8/10/2012
Project Coordinator (Signature/Date) 8/10/2012

8/10/2012

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