

Appendix B
Table B-1
Operational Data
Garner Lane Oxygen Injection System
Operations, Maintenance, and Monitoring Program
Bay Shore/Brightwaters Former MGP Site
Operational Unit No. 2 (OU-2)

Weight of Oxygen Injected through Q1 2009 9,972 lbs

Operational Days		Oxygen Injected Per Month
Month 1	Apr-09	113
Month 2	May-09	306
Month 3	Jun-09	349
Total Operational Days In Q2 2009		67
Total Oxygen in Q2 2009 (Lbs)		767.74
Running Total Through Q2 2009 (Lbs)		10,739.92

Notes:

SCFH (M) = Measured flow rate
 SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
 CF/D (V) = Volume of oxygen injected per day
 PSI (M) = Measured pressure
 PSla (P) = Pressure converted to atmospheric pressure.
 n = PV/RT = Mass of Oxygen
 Temperature = Degrees Rankine
 R = Constant (0.73)

System Operating Specs

Total of 6 injection banks
 Oxygen is injected for 16 minutes during each injection cycle
 Each Injection bank operates for 4 injection cycles per day
 Each injection point injects oxygen for 64 min per day (16 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM
 Bank 1 finishes injection at 716AM
 System is recharging 716AM to 800AM
 Bank 2 starts injection at 800AM
 Bank 2 finishes injection at 816AM

System is recharging 816AM to 900AM
 Bank 3 starts injection at 900AM
 Bank 3 finishes injection at 916AM
 System is recharging from 916AM to 1000AM
 Bank 4 starts injection at 1000AM
 Bank 4 Finishes injection at 1016AM
 System is recharging from 1016AM to 1100PM
 Bank 5 starts injection at 1100AM
 Bank 5 finishes injection at 1116AM
 System is recharging from 1116AM to 1200PM
 Bank 6 starts injection at 1200PM
 Bank 6 Finishes injection at 1216PM

System is recharging from 1216AM to 100PM
 (Keep repeating cycle for coarse of day)

System Alarms

1) * The Garner Lane Oxygen Injection System was down between April 1st and April 20th 2009. The system refrigerator/dryer went down and was taken off site for inspection and maintenance. The refrigerant line was continuously freezing up.

2) The Garner Lane Oxygen Injection System was down for 4 days in May 2009 due to the same refrigerator/dryer problem encountered in April. The system was taken offline while the dryer was replaced. The system was brought back online.

		4/22/2009										6/10/2009									
		95										95									
		10.73										10.73									
		530										530									
	Depth	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2		
MID PLUME Injection Bank 1	Point 1	25	36	44.332	47.287	10.0	0.195	36	44.332	47.287	10.0	24.7	0.195	34	41.869	44.660	10.0	24.7	0.184		
	Point 2	25	34	40.138	42.814	8.0	0.162	34	40.138	42.814	8.0	22.7	0.162	34	40.138	42.814	8.0	22.7	0.162		
	Point 3	25	36	42.499	45.332	8.0	0.172	36	42.499	45.332	8.0	22.7	0.172	32	37.777	40.296	8.0	22.7	0.153		
	Point 4	25	36	42.029	44.830	7.5	0.166	36	42.029	44.830	7.5	22.2	0.166	30	35.416	37.777	8.0	22.7	0.143		
	Point 5	25	34	39.694	42.340	7.5	0.157	34	39.694	42.340	7.5	22.2	0.157	32	37.777	40.296	8.0	22.7	0.153		
	Point 6	25	34	40.578	43.283	8.5	0.168	34	40.578	43.283	8.5	23.2	0.168	32	37.777	40.296	8.0	22.7	0.153		
	Point 7	25	34	39.694	42.340	7.5	0.157	34	39.694	42.340	7.5	22.2	0.157	32	37.777	40.296	8.0	22.7	0.153		
	Point 8	25	34	40.138	42.814	8.0	0.162	34	40.138	42.814	8.0	22.7	0.162	32	37.777	40.296	8.0	22.7	0.153		
	Point 9	50	36	51.782	55.235	19.0	0.311	36	51.782	55.235	19.0	33.7	0.311	32	46.369	49.460	19.5	34.2	0.283		
	Point 10	25	36	42.499	45.332	8.0	0.172	36	42.499	45.332	8.0	22.7	0.172	30	35.416	37.777	8.0	22.7	0.143		
Total Oxygen Injected per Day (LBS)		1.823										1.823									
MID PLUME Injection Bank 2	Point 11	25	30	35.416	37.777	8.0	0.143	30	35.416	37.777	8.0	22.7	0.143	30	35.416	37.777	8.0	22.7	0.143		
	Point 12	50	30	43.788	46.707	20.0	0.271	30	43.788	46.707	20.0	34.7	0.271	30	43.788	46.707	20.0	34.7	0.271		
	Point 13	25	30	35.416	37.777	8.0	0.143	30	35.416	37.777	8.0	22.7	0.143	30	35.416	37.777	8.0	22.7	0.143		
	Point 14	68	32	51.202	54.615	27.0	0.380	32	51.202	54.615	27.0	41.7	0.380	34	54.402	58.028	27.0	41.7	0.404		
	Point 15	25	28	33.417	35.645	8.5	0.138	28	33.417	35.645	8.5	23.2	0.138	28	32.689	34.868	7.5	22.2	0.129		
	Point 16	50	28	40.275	42.960	19.0	0.242	28	40.275	42.960	19.0	33.7	0.242	28	40.275	42.960	19.0	33.7	0.242		
	Point 17	25	30	35.416	37.777	8.0	0.143	30	35.416	37.777	8.0	22.7	0.143	28	33.055	35.259	8.0	22.7	0.134		
	Point 18	66	28	45.600	48.640	28.5	0.351	28	45.600	48.640	28.5	43.2	0.351	32	53.011	56.545	30.0	44.7	0.422		
	Point 19	25	28	33.055	35.259	8.0	0.134	28	33.055	35.259	8.0	22.7	0.134	28	33.055	35.259	8.0	22.7	0.134		
	Point 20	50	28	40.275	42.960	19.0	0.242	28	40.275	42.960	19.0	33.7	0.242	30	43.152	46.029	19.0	33.7	0.259		
Total Oxygen Injected per Day (LBS)		2.188										2.188									
MID PLUME Injection Bank 3	Point 21	27	30	36.188	38.600	9.0	0.153	30	36.188	38.600	9.0	23.7	0.153	34	41.013	43.747	9.0	23.7	0.173		
	Point 22	65.5	30	49.139	52.415	29.0	0.383	30	49.139	52.415	29.0	43.7	0.383	34	56.325	60.080	30.0	44.7	0.449		
	Point 23	25	30	35.416	37.777	8.0	0.143	30	35.416	37.777	8.0	22.7	0.143	32	37.777	40.296	8.0	22.7	0.153		
	Point 24	50	30	43.152	46.029	19.0	0.259	30	43.152	46.029	19.0	33.7	0.259	34	49.267	52.552	19.5	34.2	0.300		
	Point 25	25	32	37.777	40.296	8.0	0.153	32	37.777	40.296	8.0	22.7	0.153	30	35.416	37.777	8.0	22.7	0.143		
	Point 26	25	30	35.416	37.777	8.0	0.143	30	35.416	37.777	8.0	22.7	0.143	30	35.416	37.777	8.0	22.7	0.143		
	Point 27	25	30	35.024	37.359	7.5	0.139	30	35.024	37.359	7.5	22.2	0.139	30	35.024	37.359	7.5	22.2	0.139		
	Point 28	25	32	37.777	40.296	8.0	0.153	32	37.777	40.296	8.0	22.7	0.153	30	35.416	37.777	8.0	22.7	0.143		
	Point 29	25	32	37.777	40.296	8.0	0.153	32	37.777	40.296	8.0	22.7	0.153	30	35.804	38.191	8.5	23.2	0.148		
	Point 30	25	32	37.777	40.296	8.0	0.153	32	37.777	40.296	8.0	22.7	0.153	30	35.416	37.777	8.0	22.7	0.143		
Total Oxygen Injected per Day (LBS)		1.831										1.831									
TAIL PLUME Injection Bank 4	Point 1	25	32	39.406	42.033	10.0	0.173	32	39.406	42.033	10.0	24.7	0.173	34	41.869	44.660	10.0	24.7	0.184		
	Point 2	27	30	37.315	39.803	10.5	0.168	30	37.315	39.803	10.5	25.2	0.168	32	40.196	42.876	11.0	25.7	0.184		
	Point 3	30	32	40.970	43.702	12.0	0.195	32	40.970	43.702	12.0	26.7	0.195	36	46.521	49.623	12.5	27.2	0.225		
	Point 4	35	32	41.731	44.513	13.0	0.206	32	41.731	44.513	13.0	27.7	0.206	36	47.369	50.527	13.5	28.2	0.238		
	Point 5	35	32	41.731	44.513	13.0	0.206	32	41.731	44.513	13.0	27.7	0.206	36	47.787	50.973	14.0	28.7	0.244		
	Point 6	40	30	41.187	43.932	16.0	0.225	30	41.187	43.932	16.0	30.7	0.225	38	53.012	56.547	17.0	31.7	0.299		
	Point 7	45	32	45.686	48.732	18.5	0.270	32	45.686	48.732	18.5	33.2	0.270	38	54.659	58.303	19.0	33.7	0.328		
	Point 8	45	34	48.175	51.386	18.0	0.281	34	48.175	51.386	18.0	32.7	0.281	38	54.252	57.869	18.5	33.2	0.321		
	Point 9	45	30	42.507	45.341	18.0	0.248	30	42.507	45.341	18.0	32.7	0.248	38	54.252	57.869	18.5	33.2	0.321		
	Point 10	45	32	45.686	48.732	18.5	0.270	32	45.686	48.732	18.5	33.2	0.270	34	48.906	52.166	19.0	33.7	0.294		
Total Oxygen Injected per Day (LBS)		2.242										2.242									
TAIL PLUME Injection Bank 5	Point 11	45	32	46.029	49.097	19.0	0.276	32	46.029	49.097	19.0	33.7	0.276	32	46.029	49.097	19.0	33.7	0.276		
	Point 12	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Point 13	45	32	45.686	48.732	18.5	0.270	32	45.686	48.732	18.5	33.2	0.270	32	46.029	49.097	19.0	33.7	0.276		
	Point 14	40	32	43.932	46.861	16.0	0.240	32	43.932	46.861	16.0	30.7	0.240	32	44.289	47.241	16.5	31.2	0.246		
	Point 15	35	30	39.822	42.477	14.0	0.204	30	39.822	42.477	14.0	28.7	0.204	34	45.132	48.141	14.0	28.7	0.231		
	Point 16	35	32	43.211	46.092	15.0	0.229	32	43.211	46.092	15.0	29.7	0.229	34	46.296	49.383	15.5	30.2	0.249		
	Point 17	35	32	42.477	45.309	14.0	0.217	32	42.477	45.309	14.0	28.7	0.217	30	39.822	42.477	14.0	28.7	0.204		
	Point 18	35	30	39.122	41.731	13.0	0.193	30	39.122	41.731	13.0	27.7	0.193	30	39.122	41.731	13.0	27.7	0.193		
	Point 19	35	30	39.822	42.477	14.0	0.204	30	39.822	42.477	14.0	28.7	0.204	32	42.477	45.309	14.0	28.7	0.217		
	Point 20	30	30	37.684	40.196	11.0	0.173	30	37.684	40.196	11.0	25.7	0.173	30	37.684	40.196	11.0	25.7	0.173		
Total Oxygen Injected per Day (LBS)		2.006										2.0									

Appendix B
Table B-2
Operational Data
9 N. Clinton Oxygen Injection System
Operations, Maintenance, and Monitoring Program
Bay Shore/Brightwaters Former MGP Site
Operational Unit No. 2 (OU-2)

Weight of Oxygen Injected through Q1 2009 272 lbs

O2%
R
Temp R (T)

Operational Days	Oxygen Injected Per Month
Month 1 Apr-09	30
Month 2 May-09	30
Month 3 Jun-09	29
Total Operational Days In Q2 2009	89
Total Oxygen in Q2 2009 (Lbs)	397.65
Running Total Through Q2 2009 (Lbs)	669.65

Notes:

SCFH (M) = Measured flow rate
SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
CF/D (V) = Volume of oxygen injected per day
PSI (M) = Measured pressure
PSIa (P) = Pressure converted to atmospheric pressure.
n = PV/RT = Mass of Oxygen
Temperature = Degrees Rankine
R = Constant (0.73)

System Operating Specs

Total of 6 injection banks
Oxygen is injected for 13 minutes during each injection cycle
Each Injection bank operates for 4 injection cycles per day
Each injection point injects oxygen for 52 min per day (13 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM
Bank 1 finishes injection at 713AM
System is recharging 713AM to 800AM

System is recharging 813AM to 900AM
Bank 3 starts injection at 900AM
Bank 3 finishes injection at 913AM
System is recharging from 913AM to 1000AM
Bank 4 starts injection at 1000AM
Bank 4 Finishes injection at 1013AM
System is recharging from 1013AM to 1100PM
Bank 5 starts injection at 1100AM
Bank 5 finishes injection at 1113AM
System is recharging from 1113AM to 1200PM

Bank 6 starts injection at 1200PM
System is recharging from 1213PM to 100PM
(Keep repeating cycle for coarse of day)

** Due to the request of the property owner, the sytem will not inject during the hours of 800AM and 830AM and 1100AM and 400PM.
The oxygen weights have been adjusted to icorporate this schedule.

System Alarms

The 9 North Clinton Oxygen Injection System went offline on April 20, 2009 and May 1, 2009 due to power failer. In both instances, power was restored and the system was brought back online the same day.

		4/15/2009							5/15/2009							6/30/2009						
		95							95							95						
		10.73							10.73							10.73						
		530							530							530						
	Depth	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSIa (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSIa (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSIa (P)	n=PV/RT lbs O2			
Injection Bank 1	Point 1A	30	32	40.196	34.836	11	25.7	0.150	25	31.403	27.216	11	25.7	0.117	38	48.195	41.769	11.5	26.2	0.183		
	Point 7A	30	29	35.712	30.950	10	24.7	0.128	20	24.378	21.128	9.5	24.2	0.085	38	47.266	40.964	10.5	25.2	0.172		
	Point 7B	64	30	47.130	40.846	25.5	40.2	0.274	25	39.519	34.250	26	40.7	0.233	33	52.484	45.486	26.5	41.2	0.313		
	Point 13A	25	32	36.936	32.011	7	21.7	0.116	22	25.393	22.007	7	21.7	0.080	36	42.029	36.425	7.5	22.2	0.135		
	Point 13B	52	34	49.626	43.009	20	34.7	0.249	23	33.570	29.094	20	34.7	0.169	31	45.572	39.496	20.5	35.2	0.232		
	Point 19A	25	32	37.777	32.740	8	22.7	0.124	22	25.972	22.509	8	22.7	0.085	30	36.188	31.363	9	23.7	0.124		
	Point 19B	44	34	47.432	41.108	17	31.7	0.218	20	27.901	24.181	17	31.7	0.128	40	56.241	48.742	17.5	32.2	0.262		
Total Oxygen Injected per Day (LBS)		1.259							0.897							1.422						
Injection Bank 2	Point 2A	32	25	31.403	27.216	11	25.7	0.117	25	31.707	27.479	11.5	26.2	0.120	43	55.567	48.158	12.5	27.2	0.219		
	Point 8A	45	23	32.087	27.808	17	31.7	0.147	22	30.691	26.599	17	31.7	0.141	34	47.805	41.431	17.5	32.2	0.223		
	Point 8B	64	28	43.714	37.885	25	39.7	0.251	26	40.591	35.179	25	39.7	0.233	32	50.272	43.569	25.5	40.2	0.293		
	Point 8C	25	21	24.239	21.007	7	21.7	0.076	26	30.354	26.307	7.5	22.2	0.098	36	43.425	37.635	9	23.7	0.149		
	Point 14A	25	26	31.030	26.893	8.5	23.2	0.104	25	29.837	25.858	8.5	23.2	0.100	38	45.352	39.305	8.5	23.2	0.152		
	Point 14B	52	27	38.837	33.659	19	33.7	0.189	25	36.093	31.281	19.25	33.95	0.177	36	52.355	45.375	19.75	34.45	0.261		
	Point 20A	25	26	30.354	26.307	7.5	22.2	0.098	25	29.513	25.578	8	22.7	0.097	36	42.499	36.833	8	22.7	0.140		
Point 20B	42	26	35.695	30.936	16	30.7	0.159	24	32.949	28.556	16	30.7	0.146	34	47.057	40.782	16.5	31.2	0.213			
Total Oxygen Injected per Day (LBS)		1.141							1.113							1.649						
Injection Bank 3	Point 3A	25	29	34.235	29.671	8	22.7	0.113	30	35.416	30.694	8	22.7	0.116	28	33.236	28.805	8.25	22.95	0.110		
	Point 3B	35	32	40.970	35.508	12	26.7	0.158	31	39.875	34.559	12.25	26.95	0.156	24	30.728	26.631	12	26.7	0.119		
	Point 9A	45	30	41.521	35.985	16.5	31.2	0.188	28	38.753	33.586	16.5	31.2	0.175	28	38.753	33.586	16.5	31.2	0.175		
	Point 9B	64	30	45.338	39.293	22.5	37.2	0.244	25	38.034	32.963	23	37.7	0.208	27	41.077	35.600	23	37.7	0.224		
	Point 9C	25	30	35.024	30.354	7.5	22.2	0.113	28	32.689	28.330	7.5	22.2	0.105	27	31.874	27.624	8	22.7	0.105		
	Point 15A	25	31	36.597	31.717	8	22.7	0.120	26	30.862	26.747	8.25	22.95	0.103	30	35.804	31.030	8.5	23.2	0.120		
	Point 15B	44	30	41.187	35.695	16	30.7	0.183	23	31.576	27.366	16	30.7	0.140	12	16.475	14.278	16	30.7	0.073		
Total Oxygen Injected per Day (LBS)		1.119							1.003							0.927						
Injection Bank 4	Point 4A	25	24	28.333	24.555	8	22.7	0.093	20	23.611	20.463	8	22.7	0.078	10	11.870	10.287	8.25	22.95	0.039		
	Point 4B	39	27	35.840	31.061	14	28.7	0.149	25	33.473	29.010	14.5	29.2	0.142	10	12.982	11.251	12.75	27.45	0.052		
	Point 10A	45	22	30.448	26.389	16.5	31.2	0.138	30	43.471	37.675	19.5	34.2	0.215	17	23.528	20.391	16.5	31.2	0.106		
	Point 10B	64	28	43.988	38.123	25.5	40.2	0.256	30	47.422	41.099	26	40.7	0.279	27	42.549	36.876	25.75	40.45	0.249		
	Point 10C	25	24	28.488	24.690	8.25	22.95	0.095	31	36.997	32.064	8.5	23.2	0.124	10	11.805	10.231	8	22.7	0.039		
	Point 16A	25	28	32.689	28.330	7.5	22.2	0.105	28	32.689	28.330	7.5	22.2	0.105	11	12.842	11.130	7.5	22.2	0.041		
	Point 16B	47	23	32.589	28.244	18	32.7	0.154	25	35.422	30.699	18	32.7	0.168	10	14.169	12.280	18	32.7	0.067		
Total Oxygen Injected per Day (LBS)		0.990							1.111							0.594						
Injection Bank 5	Point 5A	25	26	30.354	26.307	7.5	22.2	0.098	26	30.354	26.307	7.5	22.2	0.098	12	14.010	12.142	7.5	22.2	0.045		
	Point 5B	42	26	34.812	30.170	14.5	29.2	0.147	27	36.151	31.331	14.5	29.2	0.153	12	16.067	13.925	14.5	29.2	0.068		
	Point 11A	45	30	41.521	35.985	16.5	31.2	0.188	28	38.753	33.586	16.5	31.2	0.175	14	19.454	16.860	16.75	31.45	0.089		
	Point 11B	64	27	41.618	36.069	24	38.7	0.233	30	46.540	40.335	24.5	39.2	0.264	13	20.167	17.478	24.5	39.2	0.114		
	Point 17A	25	22	25.972	22.509	8	22.7	0.085	28	33.055	28.648	8	22.7	0.109	14	16.527	14.324	8	22.7	0.054		
	Point 17B	45	26	36.272	31.435	17	31.7	0.166	28	39.216	33.987	17.25	31.95	0.181	11	15.466	13.404	17.5	32.2	0.072		
	Point 21A	25	22	25.972	22.509	8	22.7	0.085	30	35.416	30.694	8	22.7	0.116	10	11.870	10.287	8.25	22.95	0.039		
Total Oxygen Injected per Day (LBS)		1.003							1.096							0.482						
Injection Bank 6	Point 6A	30	18	21.250	18.416	8	22.7	0.070	14	16.527	14.324	8	22.7	0.054	36	42.965	37.236	8.5	23.2	0.144		
	Point 6B	52	18	26.083	22.605	19.5	34.2	0.129	12	17.515	15.180	20	34.7	0.088	33	48.166	41.744	20	34.7	0.242		
	Point 12A	25	14	16.159	14.005	7	21.7	0.051	10	11.675	10.118	7.5	22.2	0.038	28	33.055	28.648	8	22.7	0.109		
	Point 12B	54	25	37.270	32.301	21.5	36.2	0.195	13	19.246	16.680	21	35.7	0.099	28	42.030	36.426	22	36.7	0.223		
	Point 18A	25	22	25.972	22.509	8	22.7	0.085	20	23.611	20.463	8	22.7	0.078	34	40.578	35.167	8.5	23.2	0.136		
	Point 18B	45	15	20.926	18.136	17	31.7	0.096	14	19.531	16.927	17	31.7	0.090	34	47.805	41.431	17.5	32.2	0.223		
	Point 21B	42	16	21.787	18.882	15.5	30.2	0.095	16	21.787	18.882	15.5	30.2	0.095	37	50.797	44.024	16	30.7	0.226		
Total Oxygen Injected per Day (LBS)		0.722							0.542							1.303						
System Total Per Day (LBS)		6.23							5.76							6.38						

Appendix B
Table B-3
Operational Data
34 N. Clinton Oxygen Injection System
Operations, Maintenance, and Monitoring Program
Bay Shore/Brightwaters Former MGP Site
Operational Unit No. 2 (OU-2)

Weight of Oxygen Injected through Q1 2009 595 lbs

Operational Days	Oxygen Injected Per Month	
Month 1 Apr-09	30	201
Month 2 May-09	31	256
Month 3 Jun-09	22	165
Total Operational Days In Q2 2009		83
Total Oxygen in Q2 2009 (Lbs)		621.82
Running Total Through Q2 2009 (Lbs)		1,216.82

Notes:

SCFH (M) = Measured flow rate
SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
CF/D (V) = Volume of oxygen injected per day
PSI (M) = Measured pressure
PSIa (P) = Pressure converted to atmospheric pressure.
n = PV/RT = Mass of Oxygen
Temperature = Degrees Rankine
R = Constant (0.73)

System Operating Specs

Total of 6 injection banks
Oxygen is injected for 13 minutes during each injection cycle
Each Injection bank operates for 4 injection cycles per day
Each injection point injects oxygen for 52 min per day (13 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM
Bank 1 finishes injection at 7:13AM
System is recharging 7:13AM to 8:00AM

System is recharging 8:13AM to 9:00AM
Bank 3 starts injection at 9:00AM
Bank 3 finishes injection at 9:13AM
System is recharging from 9:13AM to 10:00AM
Bank 4 starts injection at 10:00AM
Bank 4 finishes injection at 10:13AM
System is recharging from 10:13AM to 11:00PM
Bank 5 starts injection at 11:00AM
Bank 5 finishes injection at 11:13AM
System is recharging from 11:13AM to 12:00PM

Bank 6 starts injection at 12:00PM
System is recharging from 12:13PM to 1:00PM
(Keep repeating cycle for course of day)

System Alarms

The 34 North Clinton Oxygen Injection system was down for a total of 8 days in June 2009, due to an electrical problem within the compressor. The compressor was inspected and serviced by a Kaeser representative and brought back online on 6/22/09.

		4/30/2009							5/18/2009							6/19/2009						
		95							95							95						
		10.73							10.73							10.73						
		530							530							530						
	Depth	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSIa (P)	n=PV/RT lbs O ₂	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSIa (P)	n=PV/RT lbs O ₂	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSIa (P)	n=PV/RT lbs O ₂			
Injection Bank 1	Point 1A	65	22	35.201	30.508	27	41.7	0.213	35	56.002	48.535	27	41.7	0.338	32	51.508	44.640	27.5	42.2	0.315		
	Point 1B	45	24	33.745	29.245	17.5	32.2	0.157	38	53.429	46.305	17.5	32.2	0.249	32	45.341	39.295	18	32.7	0.215		
	Point 2	30	18	23.473	20.344	13	27.7	0.094	40	52.632	45.614	13.5	28.2	0.215	28	36.842	31.930	13.5	28.2	0.150		
	Point 13A	65	34	53.081	46.004	25	39.7	0.305	28	43.438	37.646	24.5	39.2	0.247	32	49.643	43.024	24.5	39.2	0.282		
	Point 13B	45	20	27.680	23.990	16.5	31.2	0.125	39	54.408	47.153	17	31.7	0.250	33	46.037	39.899	17	31.7	0.211		
	Point 14	30	18	22.166	19.210	10	24.7	0.079	39	48.510	42.042	10.5	25.2	0.177	32	39.406	34.152	10	24.7	0.141		
	Point 25A	45	28	39.062	33.854	17	31.7	0.179	30	42.181	36.557	17.5	32.2	0.197	30	42.181	36.557	17.5	32.2	0.197		
	Point 25B	30	24	29.852	25.872	10.5	25.2	0.109	38	47.266	40.964	10.5	25.2	0.172	36	44.778	38.808	10.5	25.2	0.163		
Total Oxygen Injected per Day (LBS)		1.262							1.844							1.674						
Injection Bank 2	Point 3A	65	28	44.261	38.359	26	40.7	0.261	31	49.303	42.729	26.5	41.2	0.294	29	46.401	40.215	27	41.7	0.280		
	Point 3B	45	28	37.810	32.768	15	29.7	0.163	34	45.912	39.790	15	29.7	0.197	30	40.510	35.109	15	29.7	0.174		
	Point 4	30	24	29.852	25.872	10.5	25.2	0.109	32	39.803	34.496	10.5	25.2	0.145	26	32.340	28.028	10.5	25.2	0.118		
	Point 15A	65	30	46.243	40.077	24	38.7	0.259	30	46.540	40.335	24.5	39.2	0.264	29	44.989	38.990	24.5	39.2	0.255		
	Point 15B	45	30	41.852	36.272	17	31.7	0.192	32	44.642	38.690	17	31.7	0.205	28	39.062	33.854	17	31.7	0.179		
	Point 16	30	22	27.092	23.479	10	24.7	0.097	35	42.662	36.974	9.5	24.2	0.149	27	33.249	28.816	10	24.7	0.119		
	Point 26A	45	28	39.062	33.854	17	31.7	0.179	32	44.642	38.690	17	31.7	0.205	29	40.457	35.063	17	31.7	0.186		
	Point 26B	30	24	36.994	32.061	24	38.7	0.207	28	43.438	37.646	24.5	39.2	0.247	31	47.474	41.144	23.5	38.2	0.263		
Total Oxygen Injected per Day (LBS)		1.467							1.707							1.574						
Injection Bank 3	Point 5A	65	22	35.411	30.690	27.5	42.2	0.216	30	48.288	41.850	27.5	42.2	0.295	23	37.240	32.274	28	42.7	0.230		
	Point 5B	45	18	25.111	21.763	17	31.7	0.115	34	47.057	40.782	16.5	31.2	0.213	25	34.877	30.226	17	31.7	0.160		
	Point 6	30	24	28.333	24.555	8	22.7	0.093	31	36.997	32.064	8.5	23.2	0.124	27	32.569	28.226	9	23.7	0.112		
	Point 17A	65	24	37.232	32.268	24.5	39.2	0.211	30	46.540	40.335	24.5	39.2	0.264	28	43.438	37.646	24.5	39.2	0.247		
	Point 17B	45	18	25.111	21.763	17	31.7	0.115	32	44.289	38.383	16.5	31.2	0.200	26	36.272	31.435	17	31.7	0.166		
	Point 18	30	24	29.555	25.614	10	24.7	0.106	32	39.605	34.324	10.25	24.95	0.143	24	29.852	25.872	10.5	25.2	0.109		
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Oxygen Injected per Day (LBS)		0.857							1.239							1.024						
Injection Bank 4	Point 7A	65	20	31.809	27.567	26.5	41.2	0.190	33	52.802	45.761	27	41.7	0.319	29	46.401	40.215	27	41.7	0.280		
	Point 7B	45	22	30.691	26.599	17	31.7	0.141	32	44.642	38.690	17	31.7	0.205	28	39.062	33.854	17	31.7	0.179		
	Point 8	30	18	22.389	19.404	10.5	25.2	0.082	34	42.708	37.014	11	25.7	0.159	28	35.171	30.482	11	25.7	0.131		
	Point 19A	65	32	50.894	44.108	26.5	41.2	0.304	30	47.713	41.351	26.5	41.2	0.285	26	41.351	35.838	26.5	41.2	0.247		
	Point 19B	45	20	27.901	24.181	17	31.7	0.128	32	44.642	38.690	17	31.7	0.205	26	36.272	31.435	17	31.7	0.166		
	Point 20	30	20	24.877	21.560	10.5	25.2	0.091	35	43.534	37.730	10.5	25.2	0.159	28	34.828	30.184	10.5	25.2	0.127		
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Oxygen Injected per Day (LBS)		0.935							1.331							1.130						
Injection Bank 5	Point 9A	65	30	48.001	41.601	27	41.7	0.290	29	46.401	40.215	27	41.7	0.280	27	43.201	37.441	27	41.7	0.261		
	Point 9B	45	0	0.000	0.000	0	14.7	0.000	0	0.000	0.000	0	14.7	0.000	0	0.000	0.000	0	14.7	0.000		
	Point 10	30	28	34.480	29.883	10	24.7	0.123	30	36.943	32.017	10	24.7	0.132	29	35.892	31.106	10.25	24.95	0.130		
	Point 21A	65	28	44.261	38.359	26	40.7	0.261	26	40.846	35.400	25.5	40.2	0.238	28	43.988	38.123	25.5	40.2	0.256		
	Point 21B	45	26	35.985	31.187	16.5	31.2	0.163	28	38.753	33.586	16.5	31.2	0.175	25	34.739	30.107	16.75	31.45	0.158		
	Point 22	30	28	32.319	28.009	7	21.7	0.102	28	33.055	28.648	8	22.7	0.109	27	27.339	23.694	2	16.7	0.066		
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Oxygen Injected per Day (LBS)		0.938							0.934							0.871						
Injection Bank 6	Point 11A	65	26	41.351	35.838	26.5	41.2	0.247	31	49.003	42.469	26	40.7	0.289	25	39.761	34.459	26.5	41.2	0.237		
	Point 11B	45	26	36.272	31.435	17	31.7	0.166	22	30.691	26.599	17	31.7	0.141	28	39.062	33.854	17	31.7	0.179		
	Point 12	30	28	34.480	29.883	10	24.7	0.123	32	39.803	34.496	10.5	25.2	0.145	27	33.750	29.250	10.75	25.45	0.124		
	Point 23	65	34	54.402	47.148	27	41.7	0.328	26	41.601	36.054	27	41.7	0.251	39	62.402	54.082	27	41.7	0.377		
	Point 24A	55	30	44.724	38.761	21.5	36.2	0.234	30	45.032	39.028	22	36.7	0.239	25	37.526	32.523	22	36.7	0.199		
	Point 24B	30	30	36.943	32.017	10	24.7	0.132	30	37.315	32.340	10.5	25.2	0.136	26	32.500	28.167	10.75	25.45	0.120		
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Oxygen Injected per Day (LBS)		1.231							1.201							1.237						
System Total Per Day (LBS)		6.69							8.26							7.51						

Appendix B
Table B-4
Operational Data
33 N. Clinton Oxygen Injection System
Operations, Maintenance, and Monitoring Program
Bay Shore/Brightwaters Former MGP Site
Operational Unit No. 2 (OU-2)

Weight of Oxygen Injected through Q1 2009 0 lbs

Operational Days		Oxygen Injected Per Month
Month 1	Apr-09	30
Month 2	May-09	31
Month 3	Jun-09	22
Total Operational Days In Q2 2009		83
Total Oxygen in Q2 2009 (Lbs)		547.29
Running Total Through Q 2009 (Lbs)		547.29

Notes:

SCFH (M) = Measured flow rate
 SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
 CF/D (V) = Volume of oxygen injected per day
 PSI (M) = Measured pressure
 PSia (P) = Pressure converted to atmospheric pressure.
 n = PV/RT = Mass of Oxygen
 Temperature = Degrees Rankine
 R = Constant (0.73)

System Operating Specs

Total of 6 injection banks
 Oxygen is injected for 13 minutes during each injection cycle
 Each Injection bank operates for 4 injection cycles per day
 Each injection point injects oxygen for 64 min per day (13 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM
 Bank 1 finishes injection at 7:13AM
 System is recharging 7:13AM to 8:00AM

System is recharging 8:13AM to 9:00AM
 Bank 3 starts injection at 9:00AM
 Bank 3 finishes injection at 9:13AM
 System is recharging from 9:13AM to 10:00AM
 Bank 4 starts injection at 10:00AM
 Bank 4 finishes injection at 10:13AM
 System is recharging from 10:13AM to 11:00PM
 Bank 5 starts injection at 11:00AM
 Bank 5 finishes injection at 11:13AM
 System is recharging from 11:13AM to 12:00PM

Bank 6 starts injection at 12:00PM
 System is recharging from 12:13PM to 100PM
 (Keep repeating cycle for course of day)

		4/15/2009							5/4/2009							6/19/2009						
		95							95							95						
		10.73							10.73							10.73						
		530							530							530						
	Temp R (T)	Depth	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSia (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSia (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSia (P)	n=PV/RT lbs O2		
Injection Bank 1	Point 1A	62	36	55.131	47.781	23.5	38.2	0.305	25	38.034	32.963	23	37.7	0.208	28	43.160	37.405	24	38.7	0.242		
	Point 1B	46	36	49.825	43.181	16.5	31.2	0.225	26	35.985	31.187	16.5	31.2	0.163	29	40.137	34.785	16.5	31.2	0.181		
	Point 6A	65	36	56.203	48.710	25	39.7	0.323	26	40.591	35.179	25	39.7	0.233	28	43.714	37.885	25	39.7	0.251		
	Point 6B	46	34	47.245	40.946	16.75	31.45	0.215	27	37.518	32.516	16.75	31.45	0.171	30	41.852	36.272	17	31.7	0.192		
	Point 11	46	38	52.803	45.763	16.75	31.45	0.240	24	33.216	28.788	16.5	31.2	0.150	26	36.272	31.435	17	31.7	0.166		
	Point 35	41	38	50.000	43.334	13.5	28.2	0.204	24	31.579	27.369	13.5	28.2	0.129	27	35.840	31.061	14	28.7	0.149		
	Point 40	41	38	50.221	43.525	13.75	28.45	0.207	24	31.579	27.369	13.5	28.2	0.129	26	34.513	29.911	14	28.7	0.143		
	Point 45	31	38	46.319	40.143	9.5	24.2	0.162	24	28.950	25.090	9	23.7	0.099	25	30.473	26.410	9.5	24.2	0.107		
Total Oxygen Injected per Day (LBS)		1.882							1.282							1.432						
Injection Bank 2	Point 2A	67	30	47.130	40.846	25.5	40.2	0.274	26	40.846	35.400	25.5	40.2	0.238	19	30.034	26.030	26	40.7	0.177		
	Point 2B	46	30	41.521	35.985	16.5	31.2	0.188	26	35.985	31.187	16.5	31.2	0.163	21	29.296	25.390	17	31.7	0.134		
	Point 7A	65	30	46.688	40.463	24.75	39.45	0.267	28	43.576	37.766	24.75	39.45	0.249	24	37.469	32.473	25	39.7	0.215		
	Point 7B	46	30	41.852	36.272	17	31.7	0.192	22	30.691	26.599	17	31.7	0.141	22	30.933	26.808	17.5	32.2	0.144		
	Point 12	46	30	41.687	36.128	16.75	31.45	0.190	24	33.349	28.903	16.75	31.45	0.152	24	33.482	29.017	17	31.7	0.154		
	Point 36	36	30	37.966	32.818	11.25	25.95	0.142	28	35.171	30.482	11	25.7	0.131	26	32.975	28.579	11.5	26.2	0.125		
	Point 41	41	30	39.822	34.513	14	28.7	0.165	26	34.513	29.911	14	28.7	0.143	24	32.134	27.850	14.5	29.2	0.136		
	Point 46	36	30	38.048	32.975	11.5	26.2	0.144	24	30.147	26.127	11	25.7	0.112	23	29.170	25.281	11.5	26.2	0.111		
Total Oxygen Injected per Day (LBS)		1.562							1.328							1.196						
Injection Bank 3	Point 3A	24.75	32	49.801	43.161	24.75	39.45	0.284	25	38.784	33.612	24.5	39.2	0.220	21	32.785	28.414	25	39.7	0.188		
	Point 3B	16.5	40	55.361	47.979	16.5	31.2	0.250	22	30.448	26.389	16.5	31.2	0.138	22	30.570	26.494	16.75	31.45	0.139		
	Point 8A	28.5	26	42.343	36.697	28.5	43.2	0.265	26	42.343	36.697	28.5	43.2	0.265	22	36.035	31.231	29	43.7	0.228		
	Point 8B	16.5	33	45.673	39.583	16.5	31.2	0.206	26	35.985	31.187	16.5	31.2	0.163	23	31.960	27.698	16.75	31.45	0.146		
	Point 32A	24.25	30	46.392	40.206	24.25	38.95	0.262	28	43.160	37.405	24	38.7	0.242	23	35.681	30.923	24.5	39.2	0.202		
	Point 32B	11.5	36	45.658	39.570	11.5	26.2	0.173	24	30.439	26.380	11.5	26.2	0.115	19	24.097	20.884	11.5	26.2	0.091		
	Point 37	13.5	38	50.000	43.334	13.5	28.2	0.204	24	31.579	27.369	13.5	28.2	0.129	20	26.548	23.008	14	28.7	0.110		
	Point 42	11.75	36	45.875	39.759	11.75	26.45	0.176	26	32.975	28.579	11.5	26.2	0.125	20	25.607	22.192	12	26.7	0.099		
Total Oxygen Injected per Day (LBS)		1.820							1.396							1.204						
Injection Bank 4	Point 4A	69	27	42.942	37.216	26.5	41.2	0.256	27	42.942	37.216	26.5	41.2	0.256	23	36.801	31.894	27	41.7	0.222		
	Point 4B	46	32	44.466	38.537	16.75	31.45	0.202	21	29.064	25.189	16.5	31.2	0.131	20	27.901	24.181	17	31.7	0.128		
	Point 9A	71	26	41.850	36.270	27.5	42.2	0.256	25	40.121	34.771	27.25	41.95	0.244	26	41.099	35.619	26	40.7	0.242		
	Point 9B	46	30	41.687	36.128	16.75	31.45	0.190	22	30.448	26.389	16.5	31.2	0.138	22	33.023	28.620	22	36.7	0.175		
	Point 33	42	40	53.096	46.017	14	28.7	0.221	20	26.548	23.008	14	28.7	0.110	20	29.192	25.299	20	34.7	0.147		
	Point 38	36	37	46.926	40.670	11.5	26.2	0.178	21	26.634	23.083	11.5	26.2	0.101	20	29.192	25.299	20	34.7	0.147		
	Point 43	31	36	43.654	37.833	9.25	23.95	0.151	20	24.125	20.908	9	23.7	0.083	22	33.023	28.620	22	36.7	0.175		
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Oxygen Injected per Day (LBS)		1.454							1.063							1.237						
Injection Bank 5	Point 5A	65	28	43.714	37.885	25	39.7	0.251	26	40.591	35.179	25	39.7	0.233	21	32.991	28.592	25.5	40.2	0.192		
	Point 5B	46	28	38.441	33.315	16	30.7	0.171	26	35.985	31.187	16.5	31.2	0.163	24	33.216	28.788	16.5	31.2	0.150		
	Point 10	56	30	44.102	38.222	20.5	35.2	0.225	24	35.282	30.577	20.5	35.2	0.180	23	34.051	29.511	21	35.7	0.176		
	Point 34	41	27	35.840	31.061	14	28.7	0.149	24	31.858	27.610	14	28.7	0.132	24	31.579	27.369	13.5	28.2	0.129		
	Point 39	26	28	32.319	28.009	7	21.7	0.102	24	27.702	24.008	7	21.7	0.087	21	24.517	21.248	7.5	22.2	0.079		
	Point 44	36	28	35.512	30.777	11.5	26.2	0.135	23	29.170	25.281	11.5	26.2	0.111	19	24.326	21.083	12	26.7	0.094		
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Oxygen Injected per Day (LBS)		1.032							0.906							0.820						
System Total Per Day (LBS)		7.75							5.97							5.89						