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INNOVATIVE COKE OVEN GAS CLEANING SYSTEM

FOR

RETROFIT APPLICATIONS

ENVIRONMENTAL MONITORING PROGRAM

BASELINE SAMPLING PROGRAM REPORT

VOLUME 3 - APPENDIX SECTIONS 8 - 14

PREPARED BY

L. M. STUART
BETHLEHEM STEEL CORPORATION
BETHLEHEM, PA

PREPARED FOR THE UNITED STATES DEPARTMENT OF ENERGY

UNDER COOPERATIVE AGREEMENT NO. DE-FC22-90PC89658

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APPENDIX SECTION 8 - TABLE 8-1
 SPARROWS POINT PLANT
 EQUALIZATION TANK EFFLUENT - STREAM A-24
 DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIODS

WINTER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	PH	TSS PPM	TDS PPM	CO2 PPM	ALKA- LINITY PPM	CALCIUM PPM	SODIUM PPM	SO4 PPM	CL PPM	FREE NH3 PPM	TOTAL NH3 PPM	CYANIDE PPM	THIO- CYANATE PPM	PHENOL PPM
03/19/91	4	330	9.44	.	.	0.5	603	689	206	855	2130	.	308	5.78	390	175
03/21/91	4	336e	9.81	.	.	1.0	1830	787	203	1208	2843	.	724	15.88	612	206
03/25/91	4	353	9.87	.	.	0.0	765	1170	246	1143	2560	.	244	19.60	664	186
03/26/91	4	326	9.68	.	.	0.0	753	1040	231	1245	2965	.	282	24.10	634	219
03/27/91	4	336	9.78	.	.	0.0	785	1113	181	1147	2858	.	287	11.90	584	235

SUMMER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	PH	TSS PPM	TDS PPM	CO2 PPM	ALKA- LINITY PPM	CALCIUM PPM	SODIUM PPM	SO4 PPM	CL PPM	FREE NH3 PPM	TOTAL NH3 PPM	CYANIDE PPM	THIO- CYANATE PPM	PHENOL PPM
08/19/91	4	336e	8.14	58.8	2613	5.0	324	269	305	419	2489	1025	1100	1.40	538	172
08/20/91	4	336e	8.46	45.4	1648	5.0	361	149	255	335	2058	493	700	5.20	638	173
08/21/91	4	336e	8.94	24.2	4828	1.0	70	842	225	321	2413	363	525	11.08	663	215
08/26/91	4	336e	8.18	20.5	6616	5.0	204	1205	279	431	3388	233	380	1.95	700	599
08/27/91	4	336e	9.12	24.7	6998	1.0	.	1378	256	447	3125	130	458	2.07	750	329
08/28/91	4	336e	9.41	40.8	6364	0.1	.	1405	248	407	2863	100	139	0.87	800	327

 e = Estimated Flow

APPENDIX SECTION 8 - TABLE 8-2
SPARROWS POINT PLANT
EQUALIZATION TANK EFFLUENT - STREAM A-24
DAILY AVERAGE FLOW, LBS/DAY, DURING 1991 SAMPLING PERIODS

WINTER STATISTICS (Daily Averages)											TOTAL		THIO-	
DATE	OBSER- VATIONS	FLOW GPM	TSS LB/D	TDS LB/D	CO2 LB/D	ALKA- LINITY LB/D	CALCIUM LB/D	SODIUM LB/D	SO4 LB/D	CL LB/D	NH3 LB/D	CYANIDE LB/D	CYANATE LB/D	PHENOL LB/D
03/19/91	4	330	.	.	2.0	2392	2735	818	3394	8455	1223	22.90	1549	694
03/21/91	4	336e	.	.	4.0	7391	3177	819	4877	11480	2923	64.10	2472	833
03/25/91	4	353	.	.	0.0	3248	4968	1042	4851	10870	1037	83.20	2817	788
03/26/91	4	326	.	.	0.0	2944	4068	903	4871	11601	1103	94.30	2479	857
03/27/91	4	336	.	.	0.0	3173	4496	732	4635	11549	1158	48.10	2359	949

SUMMER STATISTICS (Daily Averages)											TOTAL		THIO-	
DATE	OBSER- VATIONS	FLOW GPM	TSS LB/D	TDS LB/D	CO2 LB/D	ALKA- LINITY LB/D	CALCIUM LB/D	SODIUM LB/D	SO4 LB/D	CL LB/D	NH3 LB/D	CYANIDE LB/D	CYANATE LB/D	PHENOL LB/D
08/19/91	4	336e	238	10554	20	1309	1086	1231	1692	10052	4443	5.70	2171	693
08/20/91	4	336e	183	6656	20	1457	603	1031	1352	8310	2827	21.00	2575	697
08/21/91	4	336e	97.6	19497	4.0	284	3399	910	1296	9745	2120	44.70	2676	868
08/26/91	4	336e	82.8	26720	20	822	4867	1125	1740	13681	1535	7.90	2827	2419
08/27/91	4	336e	99.7	28261	4.0	.	5563	1034	1803	12621	1848	8.40	3029	1328
08/28/91	4	336e	165	25700	0.4	.	5674	1003	1643	11561	560	3.50	3231	1319

e = Estimated Flow

APPENDIX SECTION 8 - TABLE 8-3
 SPARROWS POINT PLANT
 EQUALIZATION TANK EFFLUENT - STREAM A-24
 DAILY AVERAGE FLOW, LBS PER 1000 TONS RUN OF
 OVEN COKE DURING 1991 SAMPLING PERIODS
 RUN OF OVEN COKE ESTIMATED AT 1.007 X FURNACE COKE

WINTER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	COKE PRODUCTION TONS	TSS LB/KT	TDS LB/KT	TOTAL NH3 LB/KT	CYANIDE LB/KT	THIO- CYANATE LB/KT	PHENOL LB/KT
03/19/91	4	330	2055	.	.	595.1	11.14	753.7	337.7
03/21/91	4	336e	2068	.	.	1413	30.99	1195.1	402.7
03/25/91	4	353	2100	.	.	493.9	39.63	1341.7	375.3
03/26/91	4	326	2069	.	.	533.0	45.57	1197.9	414.1
03/27/91	4	336	2195	.	.	527.5	21.91	1074.6	432.3

SUMMER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	COKE PRODUCTION TONS	TSS LB/KT	TDS LB/KT	TOTAL NH3 LB/KT	CYANIDE LB/KT	THIO- CYANATE LB/KT	PHENOL LB/KT
08/19/91	4	336e	2365	100.5	4462	1878	2.41	917.8	293.0
08/20/91	4	336e	2251	81.44	2957	1256	9.33	1144.1	309.7
08/21/91	4	336e	2384	40.95	8180	889.4	18.75	1122.7	364.2
08/26/91	4	336e	2344	35.32	11398	654.8	3.37	1205.9	1032
08/27/91	4	336e	2373	42.01	11907	778.6	3.54	1276.2	559.5
08/28/91	4	336e	2378	69.32	10810	235.5	1.47	1359.0	554.8

 e = Estimated Flow

APPENDIX SECTION 8 TABLE 8-4

SPARROWS POINT PLANT
COKE OVEN WASTEWATER TREATMENT PLANT PERFORMANCE
PHENOL AND CYANIDE REMOVAL EFFICIENCY

WINTER STATISTICS

DATE	OBSER- VATIONS	TREATMENT PLANT PHENOL LB/DAY	INPUTS CYANIDE LB/DAY	TREATMENT PLANT PHENOL LB/DAY	EFFLUENT CYANIDE LB/DAY	PERCENT PHENOL %	REMOVAL CYANIDE %
03/19/91	4	694	22.9	0.527	.	99.92	.
03/21/91	4	833	64.1	0.287	32.9	99.96	48.7
03/25/91	4	788	83.2	0.27 E	.	99.96	.
03/26/91	4	857	94.3	0.147	14.8	99.98	.
03/27/91	4	949	48.1	0.124	.	99.99	84.3

E=ESTIMATED BASED ON AVERAGE OF FOR PERIOD

AVERAGE PERFORMANCE FOR PERIOD = 99.96% 66.5%

SUMMER STATISTICS

DATE	OBSER- VATIONS	-TREATMENT PLANT PHENOL LB/DAY	INPUTS- CYANIDE LB/DAY	-TREATMENT PLANT PHENOL LB/DAY	EFFLUENT- CYANIDE LB/DAY	-PERCENT PHENOL %	REMOVAL- CYANIDE %
08/19/91	4	693	5.7	.	.	99.98	.
08/20/91	4	697	21.0	0.115	.	99.98	46.3
08/21/91	4	868	44.7	0.183	24.0	.	.
08/26/91	4	2419	7.9	.	.	.	**
08/27/91	4	1328	8.4 **	98.7 *	14.8 **	99.84	**
08/28/91	4	1319	3.5 **	1.982	15.3 **	.	.

* NOT TYPICAL PERFORMANCE. DATA NOT USED IN PERFORMANCE ESTIMATES
** SPECTED ANALYTICAL ERROR. DATA NOT USED IN PERFORMANCE ESTIMATES

AVERAGE PERFORMANCE FOR PERIOD = 99.93% 46.3%

AVERAGE PERFORMANCE BOTH PERIODS = 99.95% 56.4%

APPENDIX SECTION 9 - TABLE 9-1
SPARROWS POINT PLANT
AMMONIA STILL EFFLUENT - STREAM A-42
DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIOD

WINTER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	PH	TSS PPM	TDS PPM	CO2 PPM	ALKA- LINITY PPM	CALCIUM PPM	SODIUM PPM	SO4 PPM	CL PPM	FREE NH3 PPM	TOTAL NH3 PPM	CYANIDE PPM	THIO- CYANATE PPM	PHENOL PPM
03/19/91	4	22	9.17	.	.	4.5	2818	264	85	1768	5780	.	3298	22.25	1153	547
03/21/91	4	65e	9.38	.	.	1.5	1735	1026	58	1333	5670	.	1296	6.40	1036	495
03/25/91	4	71	11.13	.	.	0.0	1638	1130	74	1600	4908	.	329	11.43	1049	530
03/26/91	4	88	10.36	.	.	0.0	1588	1132	67	1815	5215	.	450	15.37	896	431
03/27/91	4	80	10.49	.	.	0.0	1540	1080	69	1385	5185	.	401	2.87	1005	414

SUMMER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	PH	TSS PPM	TDS PPM	CO2 PPM	ALKA- LINITY PPM	CALCIUM PPM	SODIUM PPM	SO4 PPM	CL PPM	FREE NH3 PPM	TOTAL NH3 PPM	CYANIDE PPM	THIO- CYANATE PPM	PHENOL PPM
08/21/91	4	65e	11.96	67.0	13530	0.1	.	3878	225	1662	5992	19	33	0.84	1075	436
08/26/91	4	65e	8.16	36.9	11125	1.8	81	3043	279	576	5513	69	113	1.00	1160	563
08/27/91	4	65e	11.85	43.5	11850	1.0	.	3525	256	679	5653	10	128	0.59	1375	582
08/28/91	4	65e	11.71	39.4	12150	0.1	.	3598	330	738	5500	15	30	0.55	1525	592

e = Estimated Flow

APPENDIX SECTION 9 - TABLE 9-2
SPARROWS POINT PLANT
AMMONIA STILL EFFLUENT - STREAM A-42
DAILY AVERAGE FLOW, LBS/DAY, DURING 1991 SAMPLING PERIOD

WINTER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	TSS LB/D	TDS LB/D	CO2 LB/D	ALKA- LINITY LB/D	CALCIUM LB/D	SODIUM LB/D	SO4 LB/D	CL LB/D	TOTAL NH3 LB/D	CYANIDE LB/D	THIO- CYANATE LB/D	PHENOL LB/D
03/19/91	4	22	.	.	1.2	745	70	23	467	1528	872	5.90	305	145
03/21/91	4	65e	.	.	1.2	1356	801	46	1041	4430	1012	5.00	809	387
03/25/91	4	71	.	.	0.0	1397	964	63	1365	4188	280	9.80	895	453
03/26/91	4	88	.	.	0.0	1679	1198	70	1920	5516	476	16.30	948	455
03/27/91	4	80	.	.	0.0	1481	1039	66	1332	4986	385	2.80	966	398

SUMMER STATISTICS (Daily Averages)

DATE	OBSER- VATIONS	FLOW GPM	TSS LB/D	TDS LB/D	CO2 LB/D	ALKA- LINITY LB/D	CALCIUM LB/D	SODIUM LB/D	SO4 LB/D	CL LB/D	TOTAL NH3 LB/D	CYANIDE LB/D	THIO- CYANATE LB/D	PHENOL LB/D
08/21/91	4	65e	52.4	10571	0.1	.	3029	176	1298	4682	25	0.70	840	341
08/26/91	4	65e	28.8	8692	1.4	63	2377	218	450	4307	88	0.80	906	440
08/27/91	4	65e	34.0	9258	0.8	.	2754	200	531	4416	100	0.50	1074	455
08/28/91	4	65e	30.7	9493	0.1	.	2811	258	576	4297	23	0.40	1191	462

e = Estimated Flow

APPENDIX SECTION 9 - TABLE 9-3
 SPARROWS POINT PLANT
 AMMONIA STILL EFFLUENT - STREAM A-42
 DAILY AVERAGE FLOW, LBS PER 1000 TONS RUN OF
 OVEN COKE DURING 1991 SAMPLING PERIODS
 RUN OF OVEN COKE ESTIMATED AT 1.007 X FURNACE COKE

WINTER STATISTICS (Daily Averages)									
DATE	OBSER- VATIONS	FLOW GPM	COKE PRODUCTION TONS	TSS LB/KT	TDS LB/KT	TOTAL NH3 LB/KT	CYANIDE LB/KT	THIO- CYANATE LB/KT	PHENOL LB/KT
03/19/91	4	22	2055	.	.	424.3	2.87	148.4	70.5
03/21/91	4	65e	2068	.	.	489.3	2.42	391.1	187.1
03/25/91	4	71	2100	.	.	133.4	4.67	426.3	215.8
03/26/91	4	88	2069	.	.	230.0	7.88	458.1	219.9
03/27/91	4	80	2195	.	.	175.4	1.28	440.0	181.3

SUMMER STATISTICS (Daily Averages)									
DATE	OBSER- VATIONS	FLOW GPM	COKE PRODUCTION TONS	TSS LB/KT	TDS LB/KT	TOTAL NH3 LB/KT	CYANIDE LB/KT	THIO- CYANATE LB/KT	PHENOL LB/KT
08/21/91	4	65e	2384	21.98	4435	10.5	0.29	352.4	143.1
08/26/91	4	65e	2344	12.29	3708	37.5	0.34	386.5	187.7
08/27/91	4	65e	2373	14.32	3901	42.1	0.21	452.5	191.7
08/28/91	4	65e	2378	12.91	3993	9.7	0.17	500.9	194.3

 e = Estimated Flow

APPENDIX SECTION 10 - Table 10-1

'A' Battery Stack Gas Analyses Stream G-1

<u>SampDate</u>	<u>Time</u>	<u>O2,%</u>	<u>Comb.,%</u>	<u>NOx,ppm</u>	<u>SO2,ppm</u>	<u>ExAir,%</u>	<u>Temp</u>
<u>Winter Sampling Period</u>							
03 19 91	1027	.	.	.	499		
03 19 91	1102	.	.	.	474		
03 19 91	1147	.	.	.	534		
03 19 91	1228	.	.	.	482		
03 20 91	0928	.	.	.	564		
03 20 91	0948	.	.	.	868		
03 20 91	1007	.	.	.	523		
03 20 91	1027	.	.	.	540		
03 25 91	1328	.	.	.	468	195	
03 25 91	1348	.	.	.	433		
03 25 91	1408	.	.	.	413		
03 25 91	1428	.	.	.	346		
03 25 91	1515	13.9	0.7	434	.		
03 25 91	1535	13.8	0.55	429	.		
03 25 91	1555	14.2	0.7	387	.		
03 25 91	1615	14.9	0.4	401	.		
03 25 91	1635	15.3	0.5	392	.		
03 26 91	0828	.	.	.	373	160	
03 26 91	0835	12.3	1.0	.	.		
03 26 91	0848	.	.	.	358		
03 26 91	0855	12.8	0.9	395	.		
03 26 91	0908	.	.	.	390		
03 26 91	0915	12.4	1.2	410	.		
03 26 91	0928	.	.	.	371		
03 26 91	0935	12.7	0.9	425	.		
03 26 91	0955	13.8	0.7	400	.		
03 26 91	1015	13.8	0.6	435	.		
03 26 91	1035	13.7	0.8	363	.		
03 26 91	1055	13.7	0.7	392	.		
03 26 91	1115	13.8	0.6	387	.		
03 26 91	1135	14.4	0.5	382	.		
03 26 91	1150	15.1	0.5	372	.		
03 26 91	1335	14.6	0.5	.	.		
03 26 91	1355	12.5	1.0	428	.		
03 26 91	1415	12.3	0.9	419	.		
03 26 91	1435	11.4	1.15	405	.		
03 26 91	1455	12.8	0.8	403	.		
03 27 91	0855	11.0	1.4	335	.	130	
03 27 91	0915	9.4	2.0	415	.		
03 27 91	0928	.	.	.	590		
03 27 91	0935	10.4	1.5	370	.		
03 27 91	0948	.	.	.	561		
03 27 91	0955	12.4	1.4	265	.		

03 27 91	1008	.	.	.	512	
03 27 91	1015	14.1	1.0	290	.	
03 27 91	1028	.	.	.	531	
03 27 91	1035	14.2	0.8	240	.	
03 27 91	1315	12.4	1.2	380	.	
03 27 91	1335	13.4	1.0	350	.	
03 27 91	1355	13.1	1.0	355	.	
03 27 91	1415	13.7	0.9	340	.	
04 01 91	1048	.	.	.	439	
04 01 91	1108	.	.	.	471	
04 01 91	1127	.	.	.	462	
04 01 91	1148	.	.	.	461	
04 02 91	0848	.	.	.	389	
04 02 91	0909	.	.	.	362	
04 02 91	0929	.	.	.	406	
04 02 91	1004	.	.	.	.	
04 03 91	0848	.	.	.	351	
04 03 91	0908	.	.	.	367	
04 03 91	0929	.	.	.	371	
04 03 91	0949	.	.	.	370	
04 08 91	1135	13.4	1.2	339	.	143
04 08 91	1155	13.1	1.0	325	.	
04 08 91	1215	12.8	1.3	332	.	
04 08 91	1235	11.8	1.1	328	.	
04 08 91	1355	12.1	1.0	337	.	
04 08 91	1415	12.3	1.3	318	.	
04 08 91	1435	12.3	0.9	339	.	
04 08 91	1455	12.2	1.25	323	.	
04 08 91	1515	12.1	1.0	339	.	
04 08 91	1535	12.3	1.2	327	.	
04 08 91	1555	12.9	0.85	306	.	
04 08 91	1615	13.6	1.1	287	.	
04 08 91	1635	12.3	0.85	303	.	
04 08 91	1655	12.8	1.0	308	.	
04 09 91	0815	11.9	1.2	397	.	143
04 09 91	0835	11.9	1.1	383	.	
04 09 91	0855	11.8	1.3	378	.	
04 09 91	0915	11.9	1.1	370	.	
04 09 91	0935	11.9	1.3	361	.	
04 09 91	0955	12.3	1.1	357	.	
04 09 91	1015	13.1	1.1	352	.	
04 09 91	1035	12.6	1.1	335	.	
04 09 91	1055	13.6	1.1	324	.	
04 09 91	1115	13.1	0.9	326	.	
04 09 91	1135	14.7	0.8	303	.	
04 09 91	1155	14.2	0.9	308	.	
04 09 91	1315	12.1	1.0	330	.	
04 09 91	1335	12.1	1.15	318	.	
04 09 91	1355	12.1	0.95	338	.	
04 09 91	1415	12.3	1.2	326	.	

04 09 91	1435	13.7	0.75	355	.	
04 09 91	1455	12.7	1.05	342	.	
04 09 91	1515	12.8	0.9	347	.	
04 09 91	1535	12.6	1.2	342	.	
04 09 91	1555	12.3	1.1	379	.	
04 09 91	1615	12.3	1.05	388	.	
04 10 91	0815	12.6	1.2	402	.	164
04 10 91	0835	12.5	1.0	392	.	
04 10 91	0655	12.7	1.15	449	.	
04 10 91	0915	12.6	1.0	416	.	
04 10 91	0935	12.7	1.25	435	.	
04 10 91	0955	13.6	1.05	369	.	
04 10 91	1015	13.8	1.2	346	.	
04 10 91	1035	13.9	0.8	356	.	
04 10 91	1055	14.5	1.1	346	.	
04 10 91	1115	15.3	0.9	349	.	

Summer Sampling Period

08 19 91	1235	11.2	1.25	287	380	130	505
08 19 91	1255	13.3	0.7	304	285		
08 19 91	1315	13.7	0.5	281	255		
08 19 91	1335	11.2	1.2	287	305		
08 20 91	0855	10.8	1.75	323	409	98	470
08 20 91	0915	11.2	1.2	329	387		
08 20 91	0935	10.8	1.5	323	418		
08 20 91	0955	11.2	1.45	311	418		
08 21 91	0855	12.3	0.9	268	240	145	470
08 21 91	0915	13.2	0.8	248	245		
08 21 91	0935	12.6	0.8	242	290		
08 21 91	0955	13.9	0.65	242	260		
08 26 91	1115	12.2	1.3	225	312	135	495
08 26 91	1135	12.2	1.1	220	299		
08 26 91	1155	13.6	0.8	225	294		
08 26 91	1215	12.2	1.05	220	317		
08 27 91	0835	10.7	2.0	281	350	100	510
08 27 91	0855	10.6	1.6	281	375		
08 27 91	0915	10.8	1.6	275	365		
08 27 91	0935	12.1	0.9	302	320		
08 28 91	0835	11.5	1.3	295	330	113	485
08 28 91	0855	11.7	1.2	290	360		
08 28 91	0915	11.2	1.2	280	400		
08 28 91	0935	12.3	1.1	285	395		

APPENDIX SECTION 10 - TABLE 10-2

SUPPLEMENTAL BASELINE SAMPLING PROGRAM
STATISTICS OF 'A' BATTERY STACK GAS ANALYSES - STREAM G-1

----- PERIOD=WINTER -----

DATE	VOL % O2	VOL % COMBUSTABLES	VOL % NOX	VOL % SO2	% EXCESS AIR	TEMPERATURE, F
03/19/91	.	.	.	496.7	.	.
03/20/91	.	.	.	623.8	.	.
03/25/91	14.4	0.57	408.6	415.0	195	.
03/26/91	13.2	0.80	401.1	373.0	160	.
03/27/91	12.4	1.22	334.0	548.5	130	.
04/01/91	.	.	.	458.4	.	.
04/02/91	.	.	.	385.7	.	.
04/03/91	.	.	.	364.8	.	.
04/08/91	12.6	1.08	322.2	.	143	.
04/09/91	12.6	1.06	348.1	.	143	.
04/10/91	13.4	1.07	386.0	.	164	.

----- PERIOD=SUMMER -----

DATE	VOL % O2	VOL % COMBUSTABLES	VOL % NOX	VOL % SO2	% EXCESS AIR	TEMPERATURE, F
08/19/91	12.4	0.91	289.8	306.2	130	505
08/20/91	11.0	1.48	321.5	408.0	98	470
08/21/91	13.0	0.79	250.0	258.8	145	470
08/26/91	12.6	1.06	222.5	305.5	135	495
08/27/91	11.1	1.53	284.8	352.5	100	510
08/28/91	11.7	1.20	287.5	371.3	113	485

APPENDIX SECTION 10 - TABLE 10-3
 SUPPLEMENTAL BASELINE SAMPLING PROGRAM
 STATISTICS OF NO. 11 BATTERY STACK GAS ANALYSES - STREAM G-2

1

DATE	VOL % O2	VOL % COMBUSTABLES	VOL % NOX	VOL % SO2	% EXCESS AIR	TEMPERATURE, F
08/19/91	16.4	0.30	44	210	305	525
08/19/91	15.8	0.40	44	225	.	.
08/19/91	15.7	0.40	54	205	.	.
08/19/91	16.3	0.30	60	200	.	.
08/20/91	16.6	0.30	57	222	360	515
08/20/91	16.7	0.30	57	201	.	.
08/20/91	16.7	0.30	63	206	.	.
08/20/91	16.8	0.30	47	206	.	.
08/21/91	16.8	0.30	46	196	400	495
08/21/91	17.3	0.35	46	149	.	.
08/21/91	17.2	0.35	61	176	.	.
08/21/91	16.8	0.35	46	198	.	.
08/26/91	16.2	1.20	45	185	320	485
08/26/91	16.1	1.10	45	190	.	.
08/26/91	16.8	1.10	45	160	.	.
08/26/91	16.2	0.70	50	185	.	.
08/27/91	16.6	0.45	50	220	340	475
08/27/91	16.3	0.50	40	195	.	.
08/27/91	16.2	0.45	45	195	.	.
08/27/91	16.8	0.45	40	185	.	.
08/28/91	16.3	0.50	45	200	350	485
08/28/91	16.8	0.40	50	155	.	.
08/28/91	16.8	0.35	60	155	.	.
08/28/91	16.4	0.50	60	160	.	.

APPENDIX SECTION 10 - TABLE 10-4
 SUPPLEMENTAL BASELINE SAMPLING PROGRAM
 STATISTICS OF NO. 11 BATTERY STACK GAS ANALYSES - STREAM G-2
 AVERAGE STACK GAS ANALYSES FOR SUMMER SAMPLING PROGRAM

DATE	VOL % O2	VOL % COMBUSTABLES	VOL % NOX	VOL % SO2	% EXCESS AIR	TEMPERATURE F
08/19/91	16.050	0.3500	50.50	210.00	305	525
08/20/91	16.700	0.3000	56.00	208.75	360	515
08/21/91	17.025	0.3375	49.75	180.25	400	495
08/26/91	16.325	1.0250	46.25	180.00	320	485
08/27/91	16.475	0.4625	43.75	198.75	340	475
08/28/91	16.575	0.4375	53.75	167.50	350	485

APPENDIX SECTION 10 TABLE 10-5

 SUPPLEMENTAL BASELINE SAMPLING PROGRAM
 STATISTICS OF NO. 12 BATTERY STACK GAS ANALYSES - STREAM G-3

DATE	VOL % O2	VOL % COMBUSTABLES	VOL % NOX	VOL % SO2	% EXCESS AIR	TEMPERATURE, F
08/19/91	14.2	0.45	87	200	233	470
08/19/91	14.8	0.30	93	155	.	.
08/19/91	15.9	0.30	82	165	.	.
08/19/91	15.1	0.25	76	220	.	.
08/20/91	13.3	0.45	107	295	176	465
08/20/91	14.7	0.25	87	250	.	.
08/20/91	13.8	0.33	107	270	.	.
08/20/91	13.6	0.35	97	275	.	.
08/21/91	15.4	0.30	67	260	260	458
08/21/91	15.1	0.40	72	240	.	.
08/21/91	15.8	0.25	67	230	.	.
08/21/91	15.8	0.20	77	210	.	.
08/26/91	14.9	0.30	71	229	225	428
08/26/91	14.7	0.30	65	204	.	.
08/26/91	15.1	0.30	60	204	.	.
08/26/91	14.5	0.30	65	204	.	.
08/27/91	14.3	0.30	76	245	220	430
08/27/91	15.7	0.30	65	250	.	.
08/27/91	14.2	0.30	76	240	.	.
08/27/91	14.4	0.30	65	245	.	.
08/28/91	15.7	0.30	65	185	213	433
08/28/91	14.8	0.30	70	195	.	.
08/28/91	14.3	0.35	80	260	.	.
08/28/91	13.4	0.40	100	260	.	.

APPENDIX SECTION 10 - TABLE 10-6

SUPPLEMENTAL BASELINE SAMPLING PROGRAM
STATISTICS OF NO. 12 BATTERY STACK GAS ANALYSES - STREAM G-3
AVERAGE STACK GAS ANALYSES FOR SUMMER SAMPLING PROGRAM

DATE	VOL % O2	VOL % COMBUSTABLES	VOL % NOX	VOL % SO2	% EXCESS AIR	TEMPERATURE F
08/19/91	15.000	0.3250	84.50	185.00	233	470
08/20/91	13.850	0.3450	99.50	272.50	176	465
08/21/91	15.525	0.2875	70.75	235.00	260	458
08/26/91	14.800	0.3000	65.25	210.25	225	428
08/27/91	14.650	0.3000	70.50	245.00	220	430
08/28/91	14.550	0.3375	78.75	225.00	213	433

APPENDIX SECTION 10 - TABLE 10-7
 SPARROWS POINT PLANT
 BLAST FURNACE GAS TO MIXING STATION - STREAM G-5
 DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIOD

Date	Ethane ppm	Propane ppm	n-Butane ppm	n-Pentane ppm	n-Hexane ppm	H2S ppm	Carbonyl Sulfide ppm	Carbon Disulfide ppm	Methane %	CO2 %	N2 %	CO %	H2 %
03/25/91	< 38.00	< 3.33	< 2.00	< 2.00	< 11.67	< 5.33	43.33	<17.67	0.06	13.33	58.00	20.00	1.57
03/26/91	<3256.25	< 79.75	< 49.00	< 5.75	<223.25	< 369.67	<17.00	<30.00	9.35	3.63	61.00	6.65	< 4.60
03/27/91	< 3.50	< 3.00	< 2.00	< 2.00	< 4.75	< 4.50	<23.00	<15.00	< 0.02	9.18	64.00	<10.58	0.85
04/01/91	76.50	< 6.00	< 2.00	< 2.00	< 5.00	< 3.75	<21.25	<12.50	0.12	12.33	60.67	17.00	1.73
04/02/91	< 5.00	<109.75	< 2.00	< 2.00	< 4.75	< 4.50	<21.00	<15.00	0.02	8.83	64.50	11.48	< 1.07
04/03/91	< 5.00	< 3.00	< 2.00	< 2.00	< 8.00	<1235.33	39.67	<10.00	0.02	14.00	58.67	19.67	1.83
08/19/91	.	.	.	.	.	.	.	.	0.02	20.50	55.00	22.50	4.18
08/20/91	.	.	.	.	.	.	.	.	0.02	20.00	53.75	21.50	4.18
08/21/91	.	.	.	.	.	.	.	.	0.02	20.75	52.50	20.75	3.15
08/26/91	.	.	.	.	.	.	.	.	0.02	22.00	51.50	20.50	3.68
08/27/91	186.67	.	.	.	197.50	.	.	.	0.50	14.00	51.25	17.00	4.70
08/28/91	.	.	.	.	.	.	.	.	0.02	22.25	50.50	19.00	3.80

APPENDIX SECTION 10 - TABLE 10-8
SPARROWS POINT PLANT
COKE OVEN GAS TO MIXING STATION - STREAM G-23
DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIOD

Date	Ethane ppm	Propane ppm	n-Butane ppm	n-Pentane ppm	n-Hexane ppm	H2S ppm	Carbonyl Sulfide PPM	Carbon Disulfide PPM	Methane %	CO2 %	N2 %	CO %	H2 %
03/25/91	16650.00	325.00	154.75	12.25	427.50	<1426.50	<22.00	<67.50	23.00	1.45	43.75	5.65	<15.33
03/26/91	16005.25	< 193.25	<113.00	8.00	253.75	<1496.50	<59.50	<42.50	<23.28	1.57	27.25	6.00	12.00
03/27/91	21000.00	265.00	207.50	23.75	2100.00	181.50	67.75	<71.25	29.50	1.97	35.00	7.08	10.75
04/01/91	27750.00	372.00	212.50	15.75	535.00	1975.00	<35.50	<71.25	36.75	1.50	24.75	8.05	18.50
04/02/91	30666.67	860.00	176.67	17.33	503.33	1576.67	<30.00	<84.33	32.00	1.65	28.25	7.18	17.00
04/03/91	25000.00	356.25	197.50	19.50	517.50	3000.00	<30.00	<75.00	39.75	1.67	21.25	8.33	18.50
08/19/91	6250.00	1027.50	158.50	.	.	.	.	.	28.50	1.82	9.50	4.40	50.00
08/20/91	5733.33	693.33	172.67	.	145.00	.	.	.	28.00	1.73	10.67	5.57	47.00
08/21/91	6850.00	1035.00	260.00	.	.	.	.	.	27.75	2.18	15.25	5.23	49.75
08/26/91	7150.00	1262.50	247.50	.	.	.	.	.	28.00	1.95	12.00	5.33	52.25
08/27/91	7400.00	.	198.75	.	.	.	.	.	29.00	1.50	7.25	4.93	52.00
08/28/91	7375.00	.	232.50	.	.	.	.	.	28.75	1.67	8.50	4.95	50.75

APPENDIX SECTION 10 - TABLE 10-9
 SPARROWS POINT PLANT
 MIXED GAS TO UNDERFIRE BURNERS - STREAM G-6
 DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIOD

Date	Ethane ppm	Propane ppm	n-Butane ppm	n-Pentane ppm	n-Hexane ppm	H2S ppm	Carbonyl Sulfide ppm	Carbon Disulfide ppm	Methane %	CO2 %	N2 %	CO %	H2 %
03/25/91	14500.00	1300.00	757.50	170.00	368.00	< 321.50	<111.25	<67.50	<40.00	2.30	27.00	5.53	9.45
03/26/91	14250.00	1150.00	642.50	134.00	390.00	725.00	< 59.00	<35.75	47.00	2.43	26.75	5.58	9.48
03/27/91	15333.33	1150.00	770.00	150.00	2600.00	< 396.67	163.33	<88.00	47.67	1.97	23.67	5.77	11.93
04/01/91	30000.00	1375.00	1387.50	137.50	687.50	1805.00	< 52.50	<79.50	47.00	1.58	19.00	6.55	17.00
04/02/91	20750.00	1247.50	460.00	141.25	450.00	1300.00	< 28.33	<66.67	<33.50	<1.55	36.50	<4.65	<12.75
04/03/91	15333.33	936.67	436.67	140.00	456.67	1933.33	< 23.33	<50.00	44.67	3.47	25.00	7.57	9.47
08/19/91	14625.00	1065.00	516.50	153.75	41.00	.	.	.	34.00	3.05	10.25	4.48	28.50
08/20/91	12975.00	1900.00	22.00	664.00	20.67	.	.	.	32.50	2.35	9.75	4.78	28.75
08/21/91	15750.00	1475.00	.	91.00	29.00	.	.	.	32.75	3.73	11.75	6.10	30.75
08/26/91	11400.00	1900.00	533.33	53.33	76.50	.	.	.	30.75	3.28	12.25	4.68	40.00
08/27/91	10400.00	1766.67	338.75	92.00	30.00	.	.	.	31.00	2.93	12.00	4.95	47.25
08/28/91	13825.00	2525.00	545.00	130.75	31.25	.	.	.	31.75	4.58	14.50	5.92	26.00

APPENDIX SECTION 10 - TABLE 10-10

COKE OVER HEATING FUELS USED DURING SAMPLING PERIODS
SPARROWS POINT PLANT

DATE	NO. 11 BATTERY COKE OVEN GAS ft3/day	NO. 12 BATTERY COKE OVEN GAS ft3/day	----- 'A' BATTERY----- COKE OVEN GAS ft3/day	BLAST FCE GAS ft3/day
WINTER SAMPLING PERIOD				
03/25/91	2,663,950	3,905,798	11,016,000	553,797
03/26/91	2,750,500	4,329,207	11,300,000	396,369
03/27/91	2,844,551	4,237,076	11,097,000	444,906
04/01/91	2,889,657	4,415,580	12,299,000	136,862
04/02/91	2,769,254	4,250,255	10,834,000	1,291,420
04/03/91	2,823,437	4,053,773	10,891,000	1,828,240
SUMMER SAMPLING PERIOD				
08/19/91	1,905,938	4,161,563	11,414,000	2,944,930
08/20/91	2,081,044	4,013,556	12,852,000	2,963,970
08/21/91	2,108,750	3,967,188	11,353,000	2,631,100
08/26/91	2,039,554	3,933,810	11,608,000	2,130,310
08/27/91	2,046,272	4,048,206	12,116,000	1,140,270
08/28/91	2,052,030	4,160,682	12,376,000	1,698,740

APPENDIX SECTION 10 - TABLE 10-11

SPARROWS POINT PLANT COKE BATTERY NO. 'A'
ESTIMATED SULFUR DIOXIDE EMISSIONS - STREAM G-1
DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIOD

----- FUELS -----				CALCULATED EXHAUST GASES SCFM-DRY	MEASURED 24 HR		SO2 LB/DAY ***
DATE	COG SCF/DAY	BFG SCF/DAY	NAT. GAS SCF/DAY		SO2 PPM *	SO2 PPM **	
WINTER SAMPLING PROGRAM					(VOL)		
03/25/91	11,016,000	553,797	0	96,282	415	332	7,765
03/26/91	11,300,000	396,369	0	84,081	373	298	6,094
03/27/91	11,097,000	444,906	0	74,074	548	438	7,888
04/01/91	12,299,000	136,862	0	87,842	458	366	7,818
04/02/91	10,834,000	1,291,420	0	80,282	386	309	6,022
04/03/91	10,891,000	1,828,240	0	82,010	365	292	5,817
				AVERAGE	FOR PERIOD		6,901
SUMMER SAMPLING PROGRAM							
08/19/91	11,414,000	2,944,930	0	81,896	306	245	4,870
08/20/91	12,852,000	2,963,970	0	78,696	322	258	4,924
08/21/91	11,353,000	2,631,100	0	85,892	259	207	4,323
08/26/91	11,608,000	2,130,310	0	83,189	306	245	4,946
08/27/91	12,116,000	1,140,270	0	71,666	352	282	5,166
08/28/91	12,376,000	1,698,740	0	78,853	371	297	5,685
				AVERAGE	FOR PERIOD		4,986

* AS MEASURED DURING FIRING PERIODS
** CALCULATED BASED ON REVERSALS OF 12 MINUTES PER HOUR WITH NO FIRING
*** CALCULATED = SCFM * 1440 * PPM SO2 * 64 / (379.4 * 1,000,000)

APPENDIX SECTION 10 - TABLE 10-12

SPARROWS POINT PLANT COKE BATTERY NO. 11
ESTIMATED SULFUR DIOXIDE EMISSIONS - STREAM G-2
DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIODS

DATE	COG SCF/DAY	FUELS BFG SCF/DAY	NAT. GAS SCF/DAY	CALCULATED EXHAUST GASES SCFM-DRY	MEASURED SO2 PPM *	24 HR SO2 PPM **	SO2 LB/DAY ***
WINTER SAMPLING PROGRAM - NO SAMPLING OF NO. 11 STACK DURING WINTER SAMPLING PERIODS							
SUMMER SAMPLING PROGRAM							
					(VOL)		
08/19/91	1,905,938	0	0	22,118	210	168	952
08/20/91	2,081,044	0	0	27,578	208	166	1,114
08/21/91	2,108,750	0	0	30,056	180	144	1,051
08/26/91	2,039,554	0	0	24,677	180	144	863
08/27/91	2,046,272	0	0	25,912	199	159	1,002
08/28/91	2,052,030	0	0	26,530	168	134	866
AVERAGE FOR PERIOD							966

* AS MEASURED DURING FIRING PERIODS
** CALCULATED BASED ON REVERSALS OF 12 MINUTES PER HOUR WITH NO FIRING
*** CALCULATED = SCFM * 1440 * PPM SO2 * 64 / (379.4 * 1,000,000)

APPENDIX SECTION 10 - TABLE 10-13

SPARROWS POINT PLANT COKE BATTERY NO. 12
ESTIMATED SULFUR DIOXIDE EMISSIONS - STREAM G-3
DAILY AVERAGE DATA COLLECTED DURING 1991 SAMPLING PERIODS

DATE	COG SCF/DAY	FUELS BFG SCF/DAY	NAT. GAS SCF/DAY	CALCULATED EXHAUST GASES SCFM-DRY	MEASURED SO2 PPM *	24HR SO2 PPM **	SO2 LB/DAY ***
WINTER SAMPLING PROGRAM - NO SAMPLING OF NO. 12 STACK DURING WINTER SAMPLING PERIODS							
SUMMER SAMPLING PROGRAM							
08/19/91	4,161,563	0	0	39,434	(VOL) 185	148	1,418
08/20/91	4,013,556	0	0	32,107	273	218	1,703
08/21/91	3,967,188	0	0	40,988	235	188	2,174
08/26/91	3,933,810	0	0	36,001	210	168	1,469
08/27/91	4,048,206	0	0	36,445	245	196	1,735
08/28/91	4,180,682	0	0	36,842	225	180	1,611
AVERAGE FOR PERIOD							1,613

* AS MEASURED DURING FIRING PERIODS
** CALCULATED BASED ON REVERSALS OF 12 MINUTES PER HOUR WITH NO FIRING
*** CALCULATED = SCFM * 1440 * PPM SO2 * 64 / (379.4 * 1,000,000)

APPENDIX SECTION 10 - TABLE 10-14

COMBINED SULFUR DIOXIDE EMISSIONS AND EMISSION FACTORS
SPARROWS POINT PLANT

BATTERIES NO. 11, NO. 12 AND 'A' BATTERY

DATE	COKE PRODUCED TON/DAY	SO2 EMISSIONS LBS/DAY	SO2 EMISSION FACTOR LBS/TON COKE
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WINTER SAMPLING PERIOD ('A' BATTERY ONLY)

03/25/91	1,352	7,765	5.743
03/26/91	1,329	6,094	4.585
03/27/91	1,469	7,888	5.370
04/01/91	1,466	7,818	5.333
04/02/91	1,372	6,022	4.389
04/03/91	1,448	5,817	4.017

AVERAGE FOR PERIOD			4.906
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SUMMER SAMPLING PERIOD (NO. 11, NO. 12 AND A BATTERIES)

08/19/91	2,365	7,190	3.040
08/20/91	2,251	7,741	3.439
08/21/91	2,384	7,548	3.166
08/26/91	2,344	7,272	3.881
08/27/91	2,373	7,903	3.102
08/28/91	2,378	8,162	3.432

AVERAGE FOR PERIOD			3.343
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**BRADFORD K. PERSE, PE, CEM
Fuels and Combustion Consultant
2029 E. Columbia Street
Allentown, PA 18103
(215) 432-9344**

April 25, 1991

Mr. Leander M. Stuart, Supervisor
Environmental Control
Homer Research Laboratories
Bethlehem Steel Corporation
Bethlehem, PA 18016

Subject: STACK TEST, SPARROWS POINT COKE OVEN BATTERY A

Dear Monty:

Stack tests measuring oxygen (excess combustion air), combustibles, and oxides of nitrogen were made at Sparrows Point Coke Oven Battery A during the weeks of March 25, 1991 and April 8, 1991 to establish base conditions for the cooperative Bethlehem Steel - U.S. Department of Energy ICCT demonstration program for the coke oven back-end gas cleaning system. As required to meet test criteria, the tests were made on three consecutive days during each of the two weeks. The tests were carried out in accordance with EPA Method 3A - Determination of Oxygen Concentration in Emissions From Stationary Sources (Instrumental Analyzer Procedure) and EPA Method 7E - Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure) except that readings were taken for about two minutes every 20 minutes, about two-thirds of the way through each oven reversal cycle, instead of continuous readings because the high concentration of particulate in the flue gas tended to block the sampling probe. A stainless steel probe was used rather than a high-temperature quartz tube as the flue gas temperature averaged about 460°F. A heated sampling line was used between the flue at the base of the stack and the analyzers. A sample dryer and a filter were used ahead of the oxygen analyzer, while a heated filter was used before the NO_x analyzer.

The instruments used were a Teledyne Model 980 Oxygen/Combustibles Analyzer and a Thermo Electron Corporation Model 10AR Chemiluminescent NO/NO_x Analyzer. Excess combustion air was determined from computer-generated curves for oxygen vs. excess air for coke oven gas and blast furnace gas.

To ensure accuracy of the test measurements, leak checks of the sampling system and analyzers were made daily, calibration of the oxygen analyzer was checked with ambient air (20.9% O₂) before each reading, calibration of the combustible cell, which we have found to be very stable, was checked with a certified calibrating gas (2.9% H₂, 3.5% CO, and 9.4% CO₂ in nitrogen) each week, and calibration of the oxides of nitrogen analyzer was checked with two certified calibrating gases (185 and 392 ppm NO in nitrogen) weekly and with one of the gases (392 ppm NO) about every two hours each day. The oxides of nitrogen analyzer was also checked with zero-gas (ambient air) before each reading.

The test results are shown in Table 1. In addition, data on coke oven gas and blast furnace gas firing rates and on total heat input to the battery are available if needed.

Bradford K. Pease, P.E.

BKP:nar

Attachments

Table 1. Sparrows Point Coke Oven Battery A Stack Test

3/25/91

<u>Time</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>Reversal</u>
3:15 PM	13.9	0.7	434	Green Side
3:35 PM	13.8	0.55	429	Red Side
3:55 PM	14.2	0.7	387	Green Side
4:15 PM	14.9	0.4	401	Red Side
4:35 PM	<u>15.3</u>	<u>0.5</u>	<u>392</u>	Green Side
Avg.	14.4	0.6	409	
	195% excess combustion air			

3/26/91

8:35 AM	12.3	1.0	-	Green Side
8:55 AM	12.8	0.9	395	Red Side
9:15 AM	12.4	1.2	410	Green Side
9:35 AM	12.7	0.9	425	Red Side
9:55 AM	13.8	0.7	400	Green Side
10:15 AM	13.8	0.6	435	Red Side
10:35 AM	13.7	0.8	363	Green Side
10:55 AM	13.7	0.7	392	Red Side
11:15 AM	13.8	0.6	387	Green Side
11:35 AM	14.4	0.5	382	Red Side
11:50 AM	15.1	0.5	372	Green Side
1:35 PM	14.6	0.5	-	Red Side
1:55 PM	12.5	1.0	428	Green Side
2:15 PM	12.3	0.9	419	Red Side
2:35 PM	11.4	1.15	405	Green Side
2:55 PM	<u>12.8</u>	<u>0.8</u>	<u>403</u>	Red Side
Avg.	13.3	0.8	403	
	160% excess air			

3/27/91

8:55 AM	11.0	1.4	335	Red Side
9:15 AM	9.4	2.0	415	Green Side
9:35 AM	10.4	1.5	370	Red Side
9:55 AM	12.4	1.4	265	Green Side
10:15 AM	14.1	1.0	290	Red Side
10:35 AM	14.2	0.8	240	Green Side
1:15 PM	12.4	1.2	380	Green Side
1:35 PM	13.4	1.0	350	Red Side
1:55 PM	13.1	1.05	355	Green Side
2:15 PM	<u>13.7</u>	<u>0.9</u>	<u>340</u>	Red Side
Avg.	12.4	1.2	334	
	130% excess air			

(Table 1. Continued)

4/8/91

<u>Time</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>Reversal</u>
11:35 AM	13.4	1.2	339	Green Side
11:55 AM	13.1	1.0	325	Red Side
12:15 PM	12.8	1.3	332	Green Side
12:35 PM	11.8	1.1	328	Red Side
1:55 PM	12.1	1.0	337	Red Side
2:15 PM	12.3	1.3	318	Green Side
2:35 PM	12.3	0.9	339	Red Side
2:55 PM	12.2	1.25	323	Green Side
3:15 PM	12.1	1.0	339	Red Side
3:35 PM	12.3	1.2	327	Green Side
3:55 PM	12.9	0.85	306	Red Side
4:15 PM	13.6	1.1	287	Green Side
4:35 PM	12.3	0.85	303	Red Side
4:55 PM	<u>12.8</u>	<u>1.0</u>	<u>308</u>	Green Side
Avg.	12.6	1.1	322	
	143% excess air			

4/9/91

8:15 AM	11.9	1.2	397	Green Side
8:35 AM	11.9	1.1	383	Red Side
8:55 AM	11.8	1.3	378	Green Side
9:15 AM	11.9	1.1	370	Red Side
9:35 AM	11.9	1.3	361	Green Side
9:55 AM	12.3	1.1	357	Red Side
10:15 AM	13.1	1.1	352	Green Side
10:35 AM	12.6	1.1	335	Red Side
10:55 AM	13.6	1.1	324	Green Side
11:15 AM	13.1	0.9	326	Red Side
11:35 AM	14.7	0.8	303	Green Side
11:55 AM	14.2	0.9	308	Red Side
1:15 PM	12.1	1.0	330	Red Side
1:35 PM	12.1	1.15	318	Green Side
1:55 PM	12.1	0.95	338	Red Side
2:15 PM	12.3	1.2	326	Green Side
2:35 PM	13.7	0.75	355	Red Side
2:55 PM	12.7	1.05	342	Green Side
3:15 PM	12.8	0.9	347	Red Side
3:35 PM	12.6	1.2	342	Green Side
3:55 PM	12.3	1.1	379	Red Side
4:15 PM	<u>12.3</u>	<u>1.05</u>	<u>388</u>	Green Side
Avg.	12.6	1.1	348	
	143% excess air			

(Table 1. Continued)

4/10/91

<u>Time</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>Reversal</u>
8:15 AM	12.6	1.2	402	Green Side
8:35 AM	12.5	1.0	392	Red Side
8:55 AM	12.7	1.15	449	Green Side
9:15 AM	12.6	1.0	416	Red Side
9:35 AM	12.7	1.25	435	Green Side
9:55 AM	13.6	1.05	369	Red Side
10:15 AM	13.8	1.2	346	Green Side
10:35 AM	13.9	0.8	356	Red Side
10:55 AM	14.5	1.1	346	Green Side
11:15 AM	<u>15.3</u>	<u>0.9</u>	<u>349</u>	Red Side
Avg.	13.4	1.1	386	
	164% excess air			

Summary

<u>Date</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>Excess Air, %</u>
3/25/91	14.4	0.6	409	195
3/26/91	13.3	0.8	403	160
3/27/91	12.4	1.2	334	130
4/8/91	12.6	1.1	322	143
4/9/91	12.6	1.1	348	143
4/10/91	13.4	1.1	386	164
Wt. Avg.	12.9	1.0	351	151
Daily Avg.	13.1	1.0	367	156

**BRADFORD K. PEASE, PE, CEM
Fuels and Combustion Consultant
2029 E. Columbia Street
Allentown, PA 18103
(215) 432-9344**

September 18, 1991

652-482

Mr. Leander M. Stuart, Supervisor
Environmental Control
Homer Research Laboratories
Bethlehem Steel Corporation
Bethlehem, PA 18016

Dear Monty:

Subject: STACK TESTS, SPARROWS POINT COKE OVEN BATTERIES

Stack tests measuring oxygen (excess combustion air), combustibles, oxides of nitrogen, and sulfur dioxide were made at Sparrows Point Coke Oven Batteries A, No. 11, and No. 12 during the weeks of August 19 and 26, 1991. This work was done to establish summer base conditions (please see my report of April 25, 1991 for winter base conditions) for the cooperative Bethlehem Steel - U. S. Department of Energy ICCT demonstration program for the coke oven back-half gas cleaning system. As required to meet test criteria, the tests were made on three consecutive days during each of the two weeks.

The tests were carried out in accordance with EPA Method 3A - Determination of Oxygen Concentration in Emissions From Stationary Sources (Instrumental Analyzer Procedure), EPA Method 6C - Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure), and EPA Method 7E - Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure) except that readings were taken periodically instead of continuously because the high concentration of particulate in the flue gases tended to block the sampling probe, sampling line, and filters. At Battery A the readings were taken for about five minutes every 20 minutes, about two-thirds of the way through each battery reversal cycle; at the other two batteries which reverse every 30 minutes instead of every 20 minutes, the readings were generally taken in 15 minute intervals near the start and end of each cycle. A stainless steel probe was used rather than a high-temperature quartz tube as the flue gas temperatures averaged about 475°F. An insulated heated sampling line was used between the probe in the flue at the base of the stack and the analyzers. A sample dryer and filter were used ahead of the oxygen analyzer, while sample conditioning systems, which included heated filters, were used before the NO_x and SO₂ analyzers.

The instruments used were a Teledyne Model 980 Oxygen/Combustibles Analyzer, a Thermo Electron Corporation Model 10AR Chemiluminescent NO/NO_x Analyzer, and a Thermo Electron Model 40 Pulsed Fluorescent SO₂ Analyzer. Excess combustion air was determined from computer-generated curves for oxygen vs. excess air. Flue gas temperatures were read from recorders in the battery control rooms.

To ensure accuracy of the test measurements, leak checks of the sampling system and analyzers were made during each test, and calibration of the instruments was checked frequently. Calibration of the oxygen analyzer was checked with ambient air (20.9% O₂) before each reading, and calibration of the combustible cell, which we have found in years of experience to be very stable, was checked each week with a certified calibrating gas (2.9% H₂, 3.5% CO, and 9.4% CO₂ in nitrogen simulating a typical flue gas with 6.4% combustibles). The NO_x and SO₂ analyzer calibrations were checked before and after each test, or six times daily, with certified calibrating gases (392 ppm NO in nitrogen and 418 ppm SO₂ in nitrogen, respectively). In addition, these two analyzers were checked with zero-gas (ambient air) before each reading. To check for linearity, the two analyzers had also been calibrated with certified calibrating gases with a significantly different concentration (185 ppm NO in nitrogen and 788 ppm SO₂ in nitrogen, respectively).

The test results are given in Tables 1 to 4. In addition, data on gas firing rates and on total heat input to the batteries are available if needed. I would like to express appreciation for the valuable assistance of Bob Greenawalt in meeting the demanding schedule of sampling at three locations each day.

Bradford K. Pease, P.E.

BPK:mts

Attachments

cc: STHerman

TABLE 1. SPARROWS POINT A COKE OVEN BATTERY STACK TEST

<u>Date/Time</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>SO., ppm</u>	<u>Reversal</u>
8/19/91					
12:35 PM	11.2	1.25	287	380	Red
12:55 PM	13.3	0.7	304	285	Green
1:15 PM	13.7	0.5	281	255	Red
1:35 PM	<u>11.2</u>	<u>1.2</u>	<u>287</u>	<u>305</u>	Green
Avg.	12.4	0.9	290	306	
130% avg. excess combustion air, 505°F avg. stack temp.					
8/20/91					
8:55 AM	10.8	1.75	323	409	Green
9:15 AM	11.2	1.2	329	387	Red
9:35 AM	10.8	1.5	323	418	Green
9:55 AM	<u>11.2</u>	<u>1.45</u>	<u>311</u>	<u>418</u>	Red
Avg.	11.0	1.5	322	408	
98% avg. excess air, 470°F avg. stack temp.					
8/21/91					
8:55 AM	12.3	0.9	268	240	Green
9:15 AM	13.2	0.8	248	245	Red
9:35 AM	12.6	0.8	242	290	Green
9:55 AM	<u>13.9</u>	<u>0.65</u>	<u>242</u>	<u>260</u>	Red
Avg.	12.9	0.8	250	259	
145% avg. excess air, 470°F avg. stack temp.					
8/26/91					
11:15 AM	12.2	1.3	225	312	Red
11:35 AM	12.2	1.1	220	299	Green
11:55 AM	13.6	0.8	225	294	Red
12:15 PM	<u>12.2</u>	<u>1.05</u>	<u>220</u>	<u>317</u>	Green
Avg.	12.6	1.1	223	306	
135% avg. excess air, 495°F avg. stack temp.					
8/27/91					
8:35 AM	10.7	2.0	281	350	Red
8:55 AM	10.6	1.6	281	375	Green
9:15 AM	10.8	1.6	275	365	Red
9:35 AM	<u>12.1</u>	<u>0.9</u>	<u>302</u>	<u>320</u>	Green
Avg.	11.1	1.5	285	353	
100% avg. excess air, 510°F avg. stack temp.					
8/28/91					
8:35 AM	11.5	1.3	295	330	Red
8:55 AM	11.7	1.2	290	360	Green
9:15 AM	11.2	1.2	280	400	Red
9:35 AM	<u>12.3</u>	<u>1.1</u>	<u>285</u>	<u>395</u>	Green
Avg.	11.7	1.2	288	371	
113% avg. excess air, 485°F avg. stack temp.					

TABLE 2. SPARROWS POINT NO. 11 COKE OVEN BATTERY STACK TEST

<u>Date/Time</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>SO., ppm</u>	<u>Reversal</u>
8/19/91					
5:35 PM	16.4	0.3	44	210	Red
5:55 PM	15.8	0.4	44	225	Yellow
6:10 PM	15.7	0.4	54	205	Yellow
6:25 PM	<u>16.3</u>	<u>0.3</u>	<u>60</u>	<u>200</u>	Red
Avg.	16.1	0.4	50	210	
305% avg. excess combustion air, 525°F avg. stack temp.					
8/20/91					
2:10 PM	16.6	0.3	57	222	Yellow
2:30 PM	16.7	0.3	57	201	Red
2:40 PM	16.7	0.3	63	206	Red
2:55 PM	<u>16.8</u>	<u>0.3</u>	<u>47</u>	<u>206</u>	Yellow
Avg.	16.7	0.3	56	209	
360% avg. excess air, 515°F avg. stack temp.					
8/21/91					
12:40 PM	16.8	0.3	46	198	Red
12:55 PM	17.3	0.35	46	149	Yellow
1:10 PM	17.2	0.35	61	176	Yellow
1:25 PM	<u>16.8</u>	<u>0.35</u>	<u>46</u>	<u>198</u>	Red
Avg.	17.0	0.3	50	180	
400% avg. excess air, 495°F avg. stack temp.					
8/26/91					
3:25 PM	16.2	1.2	45	185	Red
3:40 PM	16.1	1.1	45	190	Red
3:55 PM	16.8	1.1	45	160	Yellow
4:10 PM	<u>16.2</u>	<u>0.7</u>	<u>50</u>	<u>185</u>	Yellow
Avg.	16.3	1.0	46	180	
320% avg. excess air, 485°F avg. stack temp.					
8/27/91					
1:10 PM	16.6	0.45	50	220	Yellow
1:25 PM	16.3	0.5	40	195	Red
1:40 PM	16.2	0.45	45	195	Red
1:15 PM	<u>16.8</u>	<u>0.45</u>	<u>40</u>	<u>185</u>	Yellow
Avg.	16.5	0.5	44	199	
340% avg. excess air, 475°F avg. stack temp.					
8/28/91					
11:40 AM	16.3	0.5	45	200	Red
11:55 AM	16.8	0.4	50	155	Yellow
12:10 AM	16.8	0.35	60	155	Yellow
12:25 AM	<u>16.4</u>	<u>0.5</u>	<u>60</u>	<u>160</u>	Red
Avg.	16.6	0.4	54	168	
350% avg. excess air, 485°F avg. stack temp.					

TABLE 3. SPARROWS POINT NO. 12 COKE OVEN BATTERY STACK TEST

<u>Date/Time</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>SO., ppm</u>	<u>Reversal</u>
8/19/91					
3:20 PM	14.2	0.45	87	200	Red
3:50 PM	14.8	0.3	93	155	Yellow
4:20 PM	15.9	0.3	82	165	Red
4:50 PM	<u>15.1</u>	<u>0.25</u>	<u>76</u>	<u>220</u>	Yellow
Avg.	15.0	0.3	85	185	
233% avg. excess combustion air, 470°F avg. stack temp.					
8/20/91					
11:00 AM	13.3	0.45	107	295	Yellow
11:15 AM	14.7	0.25	87	250	Red
11:30 PM	13.8	0.33	107	270	Red
11:45 PM	<u>13.6</u>	<u>0.35</u>	<u>97</u>	<u>275</u>	Yellow
Avg.	13.9	0.35	99	273	
176% avg. excess air, 465°F avg. stack temp.					
8/21/91					
10:45 AM	15.4	0.3	67	260	Yellow
11:00 AM	15.1	0.4	72	240	Yellow
11:15 AM	15.8	0.25	67	230	Red
11:30 PM	<u>15.8</u>	<u>0.2</u>	<u>77</u>	<u>210</u>	Red
Avg.	15.5	0.3	71	235	
260% avg. excess air, 458°F avg. stack temp.					
8/26/91					
1:45 PM	14.9	0.3	71	229	Yellow
2:00 PM	14.7	0.3	65	204	Yellow
2:15 PM	15.1	0.3	60	204	Red
2:30 PM	<u>14.5</u>	<u>0.3</u>	<u>65</u>	<u>204</u>	Red
Avg.	14.8	0.3	65	210	
225% avg. excess air, 428°F avg. stack temp.					
8/27/91					
10:30 AM	14.3	0.3	76	245	Red
10:45 AM	15.7	0.3	65	250	Yellow
11:00 AM	14.2	0.3	76	240	Yellow
11:15 AM	<u>14.4</u>	<u>0.3</u>	<u>65</u>	<u>245</u>	Red
Avg.	14.7	0.3	71	245	
220% avg. excess air, 430°F avg. stack temp.					
8/28/91					
10:15 AM	15.7	0.3	65	185	Red
10:30 AM	14.8	0.3	70	195	Red
10:45 AM	14.3	0.35	80	260	Yellow
11:00 AM	<u>13.4</u>	<u>0.4</u>	<u>100</u>	<u>260</u>	Yellow
Avg.	14.6	0.3	79	225	
213% avg. excess air, 433°F avg. stack temp.					

TABLE 4. SPARROWS POINT CODE OVEN BATTERY STACK TEST
DAILY AVERAGE SUMMARY

<u>Battery/Date</u>	<u>Oxy., %</u>	<u>Comb., %</u>	<u>NO., ppm</u>	<u>SO., ppm</u>	<u>Comb. Air, %</u>	<u>Excess</u>	<u>Stack Temp., °F</u>
A Battery							
8/19	12.4	0.9	290	306	130	505	
8/20	11.0	1.5	322	408	98	470	
8/21	12.9	0.8	250	259	145	470	
8/26	12.6	1.1	223	306	135	495	
8/27	11.1	1.5	285	353	100	510	
8/28	11.7	1.2	288	371	113	485	
Avg.	12.0	1.2	276	334	120	489	
No. 11 Battery							
8/19	16.1	0.4	50	210	305	525	
8/20	16.7	0.3	56	209	360	515	
8/21	17.0	0.3	50	180	400	495	
8/26	16.3	1.0	46	180	320	485	
8/27	16.5	0.5	44	199	340	475	
8/28	16.6	0.4	54	168	350	485	
Avg.	16.5	0.5	50	191	346	497	
No. 12 Battery							
8/19	15.0	0.3	85	185	233	470	
8/20	13.9	0.3	99	273	176	465	
8/21	15.5	0.3	71	235	260	458	
8/26	14.8	0.3	65	210	225	428	
8/27	14.7	0.3	71	245	220	430	
8/28	14.6	0.3	79	225	213	433	
Avg.	14.8	0.3	78	229	221	447	

APPENDIX SECTION 11 - TABLE 11-1
 SPARROWS POINT PLANT COAL CONSUMPTION - 1991 - STREAM S-26
 TOTAL COAL CHARGED TO NO. 11 AND NO. 12 AND 'A' BATTERIES
 COAL CHARGED IS DRY NET TONS PER DAY

1

OBS	DATE	COAL TO ALL BATTERIES DRY NET TONS/DAY	COAL MOISTURE %	SULFUR CONTENT %	ASH CONTENT %	VOLATILE MATTER %	FIXED CARBON %
1	01/01/91	2397	7.98	0.80	6.19	29.05	63.96
2	01/02/91	2582	7.98	0.79	6.30	29.76	63.15
3	01/03/91	2579	7.84	0.82	6.25	28.61	64.32
4	01/04/91	2497	7.52	0.82	5.95	28.66	64.57
5	01/05/91	2699	7.35	0.81	6.30	28.42	64.47
6	01/06/91	2661	7.34	0.79	6.30	29.74	63.17
7	01/07/91	2648	9.29	0.78	6.10	30.25	62.87
8	01/08/91	2530	8.50	0.81	6.30	28.71	64.18
9	01/09/91	2655	7.84	0.79	6.15	27.72	65.34
10	01/10/91	2735	7.64	0.80	6.20	28.99	64.01
11	01/11/91	2517	8.12	0.80	6.55	29.62	63.03
12	01/12/91	2548	9.16	0.81	6.25	28.88	64.06
13	01/13/91	2829	8.35	0.80	6.15	29.87	63.18
14	01/14/91	2573	7.70	0.80	6.30	30.49	62.41
15	01/15/91	2520	8.55	0.79	6.05	29.48	63.68
16	01/16/91	2292	8.73	0.78	6.15	30.73	62.34
17	01/17/91	2643	8.38	0.80	0.06	29.94	63.26
18	01/18/91	2591	8.63	0.79	6.30	29.93	62.98
19	01/19/91	2568	7.67	0.80	6.05	29.58	63.57
20	01/20/91	2557	7.83	0.80	0.06	29.76	63.44
21	01/21/91	2723	7.42	0.80	6.05	29.41	63.74
22	01/22/91	2499	8.70	0.80	6.40	29.50	63.30
23	01/23/91	2677	7.77	0.77	6.55	30.30	62.38
24	01/24/91	2633	7.88	0.79	6.10	28.95	64.16
25	01/25/91	2401	6.94	0.80	6.20	28.73	64.27
26	01/26/91	2680	7.43	0.79	6.15	28.28	64.78
27	01/27/91	2715	7.41	0.79	6.50	29.17	63.54
28	01/28/91	2768	7.30	0.79	6.30	29.93	62.98
29	01/29/91	2578	7.75	0.80	6.25	28.99	63.96
30	01/30/91	2731	7.74	0.79	6.25	29.85	63.11
31	01/31/91	2763	6.93	0.79	6.25	29.05	63.91
32	02/01/91	2737	7.60	0.80	6.40	29.10	63.70
33	02/02/91	2824	7.13	0.79	6.50	29.70	63.01
34	02/03/91	2843	7.25	0.79	6.50	29.50	63.21
35	02/04/91	2838	7.56	0.79	6.20	29.30	63.71
36	02/05/91	2575	7.25	0.79	6.10	29.25	63.86
37	02/06/91	2755	7.25	0.81	6.10	29.90	63.19
38	02/07/91	2675	7.53	0.76	6.40	30.03	62.81
39	02/08/91	2747	7.85	0.81	6.25	29.31	63.63
40	02/09/91	2897	6.90	0.79	6.31	29.51	63.39
41	02/10/91	2859	7.25	0.79	6.31	29.51	63.39
42	02/11/91	2900	6.93	0.83	0.06	28.24	64.93
43	02/12/91	2584	6.80	0.82	6.15	30.01	63.02
44	02/13/91	2931	6.58	0.83	6.40	29.26	63.51
45	02/14/91	2864	7.04	0.81	6.38	29.68	63.13
46	02/15/91	2306	0.07	0.80	6.20	28.65	64.35
47	02/16/91	2821	6.45	0.87	0.06	27.65	65.48
48	02/17/91	2457	6.80	0.82	6.30	28.83	64.05
49	02/18/91	2729	6.75	0.86	0.06	28.50	64.64

APPENDIX SECTION 11 - TABLE 11-1
 SPARROWS POINT PLANT COAL CONSUMPTION - 1991 - STREAM S-26
 TOTAL COAL CHARGED TO NO. 11 AND NO. 12 AND 'A' BATTERIES
 COAL CHARGED IS DRY NET TONS PER DAY

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OBS	DATE	COAL TO ALL BATTERIES DRY NET TONS/DAY	COAL MOISTURE %	SULFUR CONTENT %	ASH CONTENT %	VOLATILE MATTER %	FIXED CARBON %
50	02/19/91	2886	6.63	0.87	6.50	28.15	64.48
51	02/20/91	2895	6.57	0.85	0.06	28.80	64.35
52	02/21/91	3050	6.55	0.83	6.30	29.14	63.73
53	02/22/91	2883	6.55	0.83	6.40	28.42	64.35
54	02/23/91	3054	6.55	0.84	6.20	28.81	64.15
55	02/24/91	3026	6.58	0.82	6.30	29.22	63.66
56	02/25/91	2997	6.55	0.84	0.06	28.67	64.49
57	02/26/91	3015	6.76	0.81	6.23	29.09	63.87
58	02/27/91	2982	6.86	0.83	0.06	27.28	65.89
59	02/28/91	3075	7.01	0.83	6.70	30.64	61.83
60	03/01/91	2950	6.97	0.80	6.40	29.88	62.92
61	03/02/91	2657	6.65	0.79	6.20	29.46	63.55
62	03/03/91	2518	6.97	0.81	6.20	29.07	63.92
63	03/04/91	2349	7.53	0.79	6.05	29.21	63.95
64	03/05/91	2768	6.90	0.80	6.30	30.52	62.38
65	03/06/91	2791	6.95	0.78	6.35	30.27	62.60
66	03/07/91	2805	6.94	0.82	5.95	29.17	64.06
67	03/08/91	2759	6.67	0.79	6.15	28.88	64.18
68	03/09/91	2837	7.48	0.82	6.20	29.33	63.65
69	03/10/91	2926	6.83	0.81	6.30	29.38	63.51
70	03/11/91	2680	6.92	0.80	6.35	28.65	64.20
71	03/12/91	2941	6.97	0.80	6.05	28.42	64.73
72	03/13/91	2878	6.99	0.81	6.35	28.86	63.98
73	03/14/91	2839	8.08	0.79	6.30	30.27	62.64
74	03/15/91	2893	7.64	0.78	6.45	30.12	62.65
75	03/16/91	2913	7.34	0.80	6.20	29.44	63.56
76	03/17/91	2976	7.40	0.82	6.15	28.94	64.09
77	03/18/91	2859	7.95	0.81	6.05	28.86	64.28
78	03/19/91	2845	8.12	0.80	0.06	30.58	62.62
79	03/20/91	2805	7.84	0.77	6.16	30.32	62.75
80	03/21/91	2752	7.77	0.80	0.06	29.89	63.31
81	03/22/91	2781	7.60	0.80	5.95	29.15	64.10
82	03/23/91	2662	8.30	0.81	6.05	30.05	63.09
83	03/24/91	2711	8.70	0.80	6.20	30.50	62.50
84	03/25/91	2801	9.46	0.81	6.20	30.11	62.88
85	03/26/91	2802	9.23	0.84	6.10	29.17	63.89
86	03/27/91	2917	9.81	0.81	6.35	29.75	63.09
87	03/28/91	2838	9.28	0.82	6.05	31.06	62.07
88	03/29/91	2782	8.68	0.81	6.20	30.90	62.09
89	03/30/91	2947	8.81	0.80	6.05	30.24	62.91
90	03/31/91	2869	9.01	0.77	6.10	30.99	62.14
91	04/01/91	2994	8.90	0.79	6.40	30.28	62.53
92	04/02/91	2724	8.05	0.80	6.10	30.65	62.45
93	04/03/91	2960	7.45	0.83	6.20	29.85	63.12
94	04/04/91	2860	8.67	0.80	6.60	31.43	61.17
95	04/05/91	2897	8.39	0.81	6.15	30.55	62.49
96	04/06/91	2978	7.72	0.79	6.20	30.71	62.30
97	04/07/91	3019	7.55	0.80	6.05	30.65	62.50
98	04/08/91	3051	7.24	0.80	6.35	30.69	62.16

APPENDIX SECTION 11 - TABLE 11-1
 SPARROWS POINT PLANT COAL CONSUMPTION - 1991 - STREAM S-26
 TOTAL COAL CHARGED TO NO. 11 AND NO. 12 AND 'A' BATTERIES
 COAL CHARGED IS DRY NET TONS PER DAY

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OBS	DATE	COAL TO ALL BATTERIES DRY NET TONS/DAY	COAL MOISTURE %	SULFUR CONTENT %	ASH CONTENT %	VOLATILE MATTER %	FIXED CARBON %
99	04/09/91	2881	7.69	0.78	5.95	29.37	63.90
100	04/10/91	2974	7.47	0.76	6.15	30.27	62.82
101	04/11/91	2976	6.95	0.80	6.05	30.15	0.63
102	04/12/91	3037	7.30	0.77	6.35	30.60	62.28
103	04/13/91	3041	7.60	0.77	6.15	28.80	64.28
104	04/14/91	3052	7.47	0.77	6.05	30.75	62.43
105	04/15/91	2896	8.25	0.78	6.30	29.84	63.08
106	04/16/91	3040	7.95	0.79	6.20	30.31	62.70
107	04/17/91	3108	7.55	0.79	6.20	30.31	62.70
108	04/18/91	3154	7.65	0.79	6.20	30.31	62.70
109	04/19/91	3126	8.02	0.82	6.10	28.91	64.17
110	04/20/91	3109	8.09	0.82	6.30	30.85	62.03
111	04/21/91	3149	8.25	0.78	6.40	31.89	60.93
112	04/22/91	3162	8.28	0.78	6.25	30.30	62.67
113	04/23/91	2805	8.55	0.80	6.20	29.63	63.37
114	04/24/91	3054	7.82	0.77	6.25	30.34	62.64
115	04/25/91	2938	7.94	0.76	6.15	29.92	63.17
116	04/26/91	2983	8.57	0.75	5.95	29.50	63.80
117	04/27/91	3124	8.35	0.79	6.21	30.18	62.82
118	04/28/91	2967	8.43	0.76	6.15	30.10	62.99
119	04/29/91	3049	7.74	0.79	6.20	30.15	62.86
120	04/30/91	2648	8.09	0.77	6.10	29.08	64.05
121	05/01/91	2974	8.08	0.79	6.20	30.12	62.89
122	05/02/91	2666	7.53	0.78	6.30	28.43	64.49
123	05/03/91	2552	7.50	0.79	6.70	28.26	64.25
124	05/04/91	2834	7.71	0.77	6.40	29.91	62.92
125	05/05/91	2916	7.92	0.76	6.25	29.76	63.23
126	05/06/91	2598	8.39	0.79	6.45	28.96	63.80
127	05/07/91	2514	8.37	0.81	6.55	28.78	63.86
128	05/08/91	2967	8.05	0.80	6.15	29.03	64.02
129	05/09/91	2836	8.01	0.77	0.06	29.40	63.83
130	05/10/91	2975	7.99	0.79	6.20	29.01	0.64
131	05/11/91	2524	7.83	0.79	6.20	0.29	64.01
132	05/12/91	3226	7.98	0.79	6.15	29.35	63.71
133	05/13/91	3081	7.43	0.79	6.30	27.55	65.36
134	05/14/91	3039	7.80	0.78	6.10	29.76	63.36
135	05/15/91	3104	7.57	0.80	6.50	29.39	63.31
136	05/16/91	3121	7.29	0.79	6.25	30.41	62.55
137	05/17/91	2980	8.09	0.82	6.40	29.86	62.92
138	05/18/91	3003	7.60	0.78	6.35	30.75	62.12
139	05/19/91	3160	8.04	0.77	6.15	30.19	62.89
140	05/20/91	3152	7.45	0.78	6.15	30.51	62.56
141	05/21/91	2828	7.06	0.79	6.05	29.31	63.85
142	05/22/91	2850	7.28	0.79	6.10	29.05	64.06
143	05/23/91	2923	7.50	0.84	6.10	29.20	63.86
144	05/24/91	2961	7.30	0.80	6.10	29.17	63.93
145	05/25/91	3261	6.74	0.79	6.25	29.32	63.64
146	05/26/91	2801	7.54	0.78	6.20	29.46	63.56
147	05/27/91	2951	7.45	0.81	6.05	28.99	64.15

APPENDIX SECTION 11 - TABLE 11-1
 SPARROWS POINT PLANT COAL CONSUMPTION - 1991 - STREAM S-26
 TOTAL COAL CHARGED TO NO. 11 AND NO. 12 AND 'A' BATTERIES
 COAL CHARGED IS DRY NET TONS PER DAY

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OBS	DATE	COAL TO ALL BATTERIES DRY NET TONS/DAY	COAL MOISTURE %	SULFUR CONTENT %	ASH CONTENT %	VOLATILE MATTER %	FIXED CARBON %
148	05/28/91	2616	7.18	0.77	6.20	29.45	63.58
149	05/29/91	3113	7.08	0.80	6.50	29.95	62.75
150	05/30/91	2972	7.08	0.81	6.35	29.68	63.16
151	05/31/91	3055	6.89	0.81	6.25	29.73	63.21
152	06/01/91	2878	6.67	0.78	6.25	29.60	63.37
153	06/02/91	2944	7.15	0.80	6.05	29.63	63.52
154	06/03/91	2881	6.89	0.81	0.06	29.70	63.49
155	06/04/91	2939	7.13	0.79	6.40	29.59	63.22
156	06/05/91	2857	6.95	0.82	0.06	29.66	63.52
157	06/06/91	2944	6.79	0.79	6.20	29.82	63.19
158	06/07/91	2644	7.18	0.80	6.20	29.42	63.58
159	06/08/91	2887	6.82	0.76	6.35	29.69	63.20
160	06/09/91	2998	6.73	0.82	0.06	29.40	63.78
161	06/10/91	2967	6.99	0.79	6.75	0.29	63.46
162	06/11/91	3013	6.75	0.82	6.35	28.48	64.35
163	06/12/91	2895	7.53	0.80	5.90	28.77	64.53
164	06/13/91	2886	7.02	0.79	6.50	28.67	64.04
165	06/14/91	2088	0.07	0.81	6.45	28.73	64.01
166	06/15/91	2175	6.73	0.81	6.30	28.65	64.24
167	06/16/91	2027	6.88	0.78	6.25	29.46	63.51
168	06/17/91	2554	6.93	0.75	6.15	31.09	62.01
169	06/18/91	2809	7.59	0.77	5.60	29.46	64.17
170	06/19/91	2920	7.95	0.76	5.60	29.74	63.90
171	06/20/91	2582	8.28	0.83	6.40	28.34	64.43
172	06/21/91	2813	7.09	0.80	6.25	28.78	64.17
173	06/22/91	2816	7.50	0.80	6.15	28.99	64.06
174	06/23/91	3049	7.08	0.81	6.15	28.91	64.13
175	06/24/91	3106	7.11	0.80	6.20	28.67	64.33
176	06/25/91	3232	7.05	0.79	6.35	28.69	64.17
177	06/26/91	3155	6.31	0.84	6.25	28.13	64.78
178	06/27/91	2413	5.95	0.79	6.25	29.15	63.81
179	06/28/91	3158	7.06	0.79	6.35	28.37	64.49
180	06/29/91	3199	7.61	0.79	6.25	28.26	64.70
181	06/30/91	3035	7.36	0.84	6.05	28.32	64.79
182	07/01/91	3118	5.55	0.79	6.15	27.95	65.11
183	07/02/91	3027	7.16	0.80	6.20	27.93	65.07
184	07/03/91	3045	6.54	0.81	0.06	28.62	64.57
185	07/04/91	2943	7.20	0.79	6.20	28.16	64.85
186	07/05/91	3013	7.07	0.78	6.45	28.30	64.47
187	07/06/91	2972	6.39	0.81	6.20	28.33	64.66
188	07/07/91	2998	6.70	0.79	6.35	28.69	64.17
189	07/08/91	3024	6.48	0.81	6.20	29.07	63.92
190	07/09/91	3067	6.46	0.82	6.10	28.51	64.57
191	07/10/91	2982	7.04	0.81	6.20	28.23	64.76
192	07/11/91	2912	7.23	0.80	6.50	28.91	63.79
193	07/12/91	2761	6.48	0.81	6.20	29.14	63.85
194	07/13/91	2764	6.85	0.80	6.20	29.29	63.71
195	07/14/91	3017	6.84	0.82	6.15	29.12	63.91
196	07/15/91	3095	6.99	0.79	6.05	29.15	64.01

APPENDIX SECTION 11 - TABLE 11-1
 SPARROWS POINT PLANT COAL CONSUMPTION - 1991 - STREAM S-26
 TOTAL COAL CHARGED TO NO. 11 AND NO. 12 AND 'A' BATTERIES
 COAL CHARGED IS DRY NET TONS PER DAY

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OBS	DATE	COAL TO ALL BATTERIES DRY NET TONS/DAY	COAL MOISTURE %	SULFUR CONTENT %	ASH CONTENT %	VOLATILE MATTER %	FIXED CARBON %
197	07/16/91	3045	6.70	0.78	6.40	29.57	63.25
198	07/17/91	2922	6.69	0.78	0.06	29.94	63.28
199	07/18/91	3024	7.02	0.76	6.15	29.49	63.60
200	07/19/91	3056	6.70	0.79	6.20	29.08	63.93
201	07/20/91	3018	6.42	0.80	6.20	28.80	64.20
202	07/21/91	3076	6.30	0.81	6.15	29.19	63.85
203	07/22/91	3101	6.45	0.80	6.55	29.76	62.89
204	07/23/91	3109	6.65	0.77	6.10	29.22	63.91
205	07/24/91	2926	6.79	0.80	6.30	29.25	63.65
206	07/25/91	2972	7.63	0.80	6.22	28.90	64.08
207	07/26/91	2890	7.72	0.81	0.06	29.35	63.84
208	07/27/91	2727	8.25	0.78	6.50	29.04	63.68
209	07/28/91	2962	8.15	0.79	6.25	29.21	63.75
210	07/29/91	2967	7.45	0.80	6.55	28.89	63.76
211	07/30/91	2753	7.92	0.79	6.05	29.08	64.08
212	07/31/91	2973	7.60	0.79	0.06	28.96	64.25
213	08/01/91	2820	8.14	0.81	5.95	28.77	64.47
214	08/02/91	2718	8.11	0.81	6.10	29.29	63.80
215	08/03/91	2710	6.98	0.79	0.06	29.41	63.80
216	08/04/91	3015	6.58	0.78	5.95	31.10	62.17
217	08/05/91	3083	6.53	0.77	6.05	30.55	62.63
218	08/06/91	2830	6.82	0.78	5.95	29.49	63.78
219	08/07/91	3009	6.70	0.76	6.15	31.22	61.87
220	08/08/91	3211	6.22	0.75	5.90	30.53	62.82
221	08/09/91	3004	7.85	0.79	6.35	31.07	61.79
222	08/10/91	2487	7.99	0.80	6.15	30.43	62.62
223	08/11/91	2740	7.45	0.80	6.25	29.80	63.15
224	08/12/91	3237	6.84	0.80	6.25	29.47	63.48
225	08/13/91	2896	7.93	0.81	6.60	29.59	0.63
226	08/14/91	3204	6.97	0.83	6.25	29.28	63.64
227	08/15/91	3144	7.71	0.82	6.30	28.47	64.41
228	08/16/91	2891	7.09	0.81	6.40	29.32	63.47
229	08/17/91	3242	6.74	0.80	6.20	30.08	62.92
230	08/18/91	3285	6.94	0.77	6.10	31.47	61.66
231	08/19/91	3148	7.25	0.83	5.85	29.88	63.44
232	08/20/91	3026	8.13	0.79	6.20	29.62	63.39
233	08/21/91	3181	7.72	0.79	5.70	30.15	63.36
234	08/22/91	3011	7.22	0.79	5.90	29.98	63.33
235	08/23/91	3349	6.53	0.78	6.45	29.24	63.53
236	08/24/91	3055	7.61	0.79	6.10	29.45	63.66
237	08/25/91	2892	7.15	0.77	6.50	29.04	63.69
238	08/26/91	3105	6.79	0.77	6.20	29.41	63.62
239	08/27/91	3216	0.07	0.77	6.10	29.70	63.43
240	08/28/91	3163	6.63	0.77	6.45	29.87	62.91
241	08/29/91	3126	7.02	0.78	5.90	30.20	63.12
242	08/30/91	3048	6.71	0.78	6.20	30.33	62.69
243	08/31/91	2929	6.92	0.78	0.06	30.10	63.12
244	09/01/91	3235	6.80	0.78	6.65	29.91	62.66
245	09/02/91	2984	6.73	0.78	6.10	30.03	63.09

APPENDIX SECTION 11 - TABLE 11-1
 SPARROWS POINT PLANT COAL CONSUMPTION - 1991 - STREAM S-26
 TOTAL COAL CHARGED TO NO. 11 AND NO. 12 AND 'A' BATTERIES
 COAL CHARGED IS DRY NET TONS PER DAY

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OBS	DATE	COAL TO ALL BATTERIES DRY NET TONS/DAY	COAL MOISTURE %	SULFUR CONTENT %	ASH CONTENT %	VOLATILE MATTER %	FIXED CARBON %
246	09/03/91	3065	6.85	0.77	6.30	29.80	63.13
247	09/04/91	3161	6.75	0.75	6.15	30.86	62.24
248	09/05/91	3157	7.13	0.79	6.05	30.53	62.63
249	09/06/91	3077	7.50	0.82	6.45	29.71	63.02
250	09/07/91	3132	6.44	0.78	6.25	29.73	63.24
251	09/08/91	3185	6.45	0.74	6.05	30.46	62.75
252	09/09/91	3251	7.25	0.80	6.20	29.50	63.50
253	09/10/91	3187	7.01	0.79	5.85	30.09	63.27
254	09/11/91	2994	6.70	0.79	5.90	30.17	63.14
255	09/12/91	3288	6.90	0.77	6.15	29.96	63.12
256	09/13/91	3163	6.67	0.76	6.15	29.76	63.33
257	09/14/91	3172	6.59	0.78	6.50	28.24	64.48
258	09/15/91	3129	6.99	0.78	6.50	30.94	61.78
259	09/16/91	2586	6.90	0.80	6.15	29.90	63.15
260	09/17/91	3208	6.63	0.79	0.06	29.53	63.68
261	09/18/91	3102	7.06	0.76	5.90	30.28	63.06
262	09/19/91	3325	7.06	0.81	6.15	28.90	64.14
263	09/20/91	3032	7.67	0.80	6.05	29.30	63.85
264	09/21/91	3386	7.40	0.77	6.25	28.25	64.73
265	09/22/91	3278	7.79	0.77	6.35	28.62	64.26
266	09/23/91	3259	6.45	0.79	6.10	29.31	63.80
267	09/24/91	3254	7.25	0.80	6.35	30.75	62.10
268	09/25/91	3269	6.97	0.75	6.30	30.01	62.94
269	09/26/91	3262	7.89	0.74	5.90	31.06	62.30
270	09/27/91	3275	7.04	0.78	6.65	30.03	62.54
271	09/28/91	3225	6.89	0.75	6.50	30.53	62.22
272	09/29/91	3225	7.97	0.78	6.45	29.96	62.81
273	09/30/91	3294	8.06	0.84	6.70	28.04	64.42
274	10/01/91	3129	7.44	0.80	6.75	28.30	64.15
275	10/02/91	3259	7.50	0.79	6.25	29.86	63.10
276	10/03/91	3258	7.85	0.83	6.15	30.34	62.68
277	10/04/91	3271	7.76	0.82	6.10	28.52	64.56
278	10/05/91	3174	7.86	0.81	6.35	29.27	63.57
279	10/06/91	3150	7.98	0.81	6.45	29.61	63.13
280	10/07/91	3280	7.70	0.78	6.30	28.70	64.22
281	10/08/91	3253	7.65	0.82	6.30	29.75	63.13
282	10/09/91	3143	8.99	0.78	6.50	30.19	62.53
283	10/10/91	3229	7.69	0.79	6.40	29.20	63.61
284	10/11/91	3241	7.64	0.75	5.95	30.20	63.10
285	10/12/91	3343	8.03	0.74	5.80	31.08	62.38
286	10/13/91	3207	8.40	0.80	6.45	29.80	62.95
287	10/14/91	3327	6.59	0.77	5.60	30.51	63.12
288	10/15/91	3196	8.42	0.79	6.65	29.60	62.96
289	10/16/91	3261	7.58	0.80	6.90	28.21	64.09
290	10/17/91	2803	7.71	0.81	6.05	28.80	64.34
291	10/18/91	3214	8.60	0.78	0.06	30.83	62.39
292	10/19/91	3172	7.62	0.76	6.25	30.11	62.88
293	10/20/91	3311	7.45	0.80	6.30	30.05	62.85
294	10/21/91	3336	7.29	0.79	6.05	29.53	63.63

APPENDIX SECTION 11 - TABLE 11-1
 SPARROWS POINT PLANT COAL CONSUMPTION - 1991 - STREAM S-26
 TOTAL COAL CHARGED TO NO. 11 AND NO. 12 AND 'A' BATTERIES
 COAL CHARGED IS DRY NET TONS PER DAY

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OBS	DATE	COAL TO ALL BATTERIES DRY NET TONS/DAY	COAL MOISTURE %	SULFUR CONTENT %	ASH CONTENT %	VOLATILE MATTER %	FIXED CARBON %
295	10/22/91	3148	7.77	0.82	6.55	30.14	62.49
296	10/23/91	3280	7.94	0.82	6.55	28.50	64.13
297	10/24/91	3233	7.45	0.79	6.15	27.15	65.91
298	10/25/91	3260	6.93	0.76	6.35	29.63	63.26
299	10/26/91	2713	7.70	0.79	6.35	29.16	63.70
300	10/27/91	3411	7.44	0.79	6.10	27.75	65.36
301	10/28/91	3365	7.15	0.80	6.30	30.46	62.44
302	10/29/91	3328	7.09	0.80	6.25	29.26	63.69
303	10/30/91	3260	7.36	0.79	6.20	30.12	62.89
304	10/31/91	3368	6.83	0.79	6.15	29.59	63.47
305	11/01/91	3223	7.40	0.78	6.30	30.02	62.90
306	11/02/91	3386	6.65	0.81	6.40	28.72	64.07
307	11/03/91	3276	7.21	0.78	6.40	29.24	63.58
308	11/04/91	3425	6.14	0.79	6.65	29.58	62.98
309	11/05/91	3276	7.20	0.79	6.25	30.12	62.84
310	11/06/91	3326	6.99	0.79	0.06	30.22	62.99
311	11/07/91	3307	7.04	0.77	6.10	29.80	63.33
312	11/08/91	3302	7.10	0.76	6.10	30.52	62.62
313	11/09/91	3369	6.37	0.78	6.30	30.04	62.88
314	11/10/91	3355	6.67	0.76	6.10	30.80	62.34
315	11/11/91	3380	7.10	0.76	6.20	30.68	62.36
316	11/12/91	3273	7.60	0.75	6.25	32.27	60.73
317	11/13/91	3322	7.40	0.78	6.40	29.61	63.21
318	11/14/91	3305	7.55	0.77	6.10	31.06	62.07
319	11/15/91	3332	7.32	0.76	0.06	29.13	64.11
320	11/16/91	3338	8.35	0.78	6.15	30.38	62.69
321	11/17/91	3321	7.76	0.76	6.25	30.21	62.78
322	11/18/91	3324	7.43	0.75	0.06	30.76	62.49
323	11/19/91	3232	7.38	0.75	6.05	31.15	62.05
324	11/20/91	3325	7.55	0.76	6.10	29.76	63.38
325	11/21/91	3248	7.47	0.75	0.06	29.41	63.84
326	11/22/91	3309	7.62	0.75	6.20	30.29	62.76
327	11/23/91	3255	8.40	0.77	6.15	30.18	62.90
328	11/24/91	3091	8.60	0.76	6.20	30.48	62.56
329	11/25/91	2986	8.49	0.77	6.20	30.26	62.77
330	11/26/91	2723	8.80	0.76	0.06	29.27	63.97
331	11/27/91	2495	9.20	0.77	6.20	29.39	63.64
332	11/28/91	2398	9.21	0.77	6.20	29.84	63.19
333	11/29/91	2183	8.61	0.77	6.20	30.10	62.93
334	11/30/91	1768	8.35	0.74	6.05	30.41	62.80
335	12/01/91	1743	9.10	0.75	6.15	29.33	63.77
336	12/02/91	1614	8.85	0.77	6.20	30.10	62.93
337	12/03/91	961	8.98	0.78	6.10	29.28	63.84
338	12/04/91	599	.	.	.	.	.

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APPENDIX SECTION 11 - TABLE 11-2
SPARROWS POINT PLANT COKE PRODUCTION - 1991 - STREAM S-27
NO. 11 AND NO. 12 AND 'A' BATTERIES
COKE PRODUCTION SHOWN IS TONS PER DAY OF FURNACE COKE
(RUN OF OVEN COKE IS ESTIMATED AT 1.007 X FURNACE COKE)

DATE	BATTERY 11+12 COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	'A' BATTERY COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	TOTAL FCE COKE PRODUCTION TONS/DAY	ESTIMATED RUN OF OVEN COKE TONS/DAY
01/01/91	685	0.56	0.45	8.16	90.83	1119	0.56	0.55	7.95	90.94	1804	1817
01/02/91	670	0.59	0.42	8.20	90.79	1205	0.59	0.63	8.95	89.83	1875	1888
01/03/91	702	0.56	0.68	8.60	90.16	1248	0.58	0.57	8.54	90.31	1950	1964
01/04/91	678	0.58	0.54	8.18	90.70	1156	0.56	0.42	8.37	90.65	1834	1847
01/05/91	725	0.62	0.69	8.35	90.34	1321	0.59	0.43	8.48	90.50	2046	2060
01/06/91	710	0.61	0.96	8.78	89.65	1279	0.62	0.40	8.76	90.22	1989	2003
01/07/91	607	0.63	0.59	8.96	89.82	1307	0.60	0.63	9.00	89.77	1914	1927
01/08/91	671	0.67	0.64	8.40	90.29	1209	0.68	0.44	8.50	90.38	1880	1893
01/09/91	662	0.68	0.48	8.46	90.38	1310	0.67	0.72	7.97	90.64	1972	1986
01/10/91	682	0.65	0.69	7.86	90.80	1378	0.67	0.59	8.23	90.51	2060	2074
01/11/91	637	0.69	0.58	8.04	90.69	1192	0.73	0.67	8.43	90.17	1829	1842
01/12/91	682	0.67	0.86	8.56	89.91	1240	0.68	0.98	9.12	89.22	1922	1935
01/13/91	679	0.68	0.58	8.35	90.39	1432	0.64	0.61	8.42	90.33	2111	2126
01/14/91	644	0.62	0.77	8.42	90.19	1210	0.64	0.48	8.18	90.70	1854	1867
01/15/91	707	0.66	0.51	8.25	90.58	1181	0.63	0.45	8.40	90.52	1888	1901
01/16/91	649	0.63	0.53	8.02	90.82	992	0.61	0.41	8.39	90.59	1641	1652
01/17/91	692	0.61	0.92	8.82	89.65	1278	0.57	0.59	8.69	90.15	1970	1984
01/18/91	652	0.64	0.72	8.51	90.13	1226	0.61	0.55	8.57	90.27	1878	1891
01/19/91	696	0.65	0.56	8.14	90.65	1226	0.65	0.47	8.03	90.85	1922	1935
01/20/91	688	0.65	0.50	9.11	89.74	1222	0.62	0.44	9.10	89.84	1910	1923
01/21/91	676	0.67	0.55	8.85	89.93	1312	0.61	0.56	9.35	89.48	1988	2002
01/22/91	684	0.66	0.53	8.51	90.30	1188	0.64	0.91	8.74	89.71	1872	1885
01/23/91	676	0.62	0.55	8.51	90.32	1258	0.64	0.86	7.97	90.53	1934	1948
01/24/91	702	0.65	0.29	8.32	90.74	1282	0.63	0.41	8.42	90.54	1984	1998
01/25/91	574	0.63	0.42	8.16	90.79	1186	0.62	0.44	8.50	90.44	1760	1772
01/26/91	712	0.62	0.55	8.46	90.37	1321	0.62	0.63	9.98	88.77	2033	2047
01/27/91	689	0.66	0.38	8.62	90.34	1352	0.62	0.42	8.42	90.54	2041	2055
01/28/91	652	0.64	0.28	8.77	90.31	1359	0.64	0.26	8.94	90.16	2011	2025
01/29/91	697	0.65	0.48	8.21	90.66	1245	0.64	0.42	8.70	90.24	1942	1956
01/30/91	664	.	.	.	.	1321	.	.	.	.	1985	1999
01/31/91	667	0.66	0.41	8.46	90.47	1413	0.64	0.50	8.70	90.16	2080	2095
02/01/91	660	0.65	0.44	8.47	90.44	1345	0.62	0.71	8.82	89.85	2005	2019
02/02/91	684	0.65	0.43	8.61	90.31	1427	0.68	0.49	8.17	90.66	2111	2126
02/03/91	700	0.70	0.62	9.61	89.07	1429	0.64	0.53	9.29	89.54	2129	2144
02/04/91	707	0.64	0.54	8.43	90.39	1369	0.64	0.63	9.76	88.97	2076	2091
02/05/91	676	0.61	0.49	8.75	90.15	1258	0.61	0.62	8.59	90.18	1934	1948
02/06/91	711	0.64	0.62	9.27	89.47	1291	0.65	0.60	9.70	89.05	2002	2016
02/07/91	655	0.64	0.56	9.77	89.03	1338	0.66	0.48	8.64	90.22	1993	2007
02/08/91	707	0.68	0.71	8.15	90.46	1301	0.66	0.48	8.85	90.01	2008	2022
02/09/91	751	0.67	0.60	8.20	90.53	1419	0.66	0.48	8.94	89.92	2170	2185
02/10/91	740	0.66	0.48	8.94	89.92	1402	0.67	0.60	8.20	90.53	2142	2157
02/11/91	674	0.69	0.46	8.15	90.70	1473	0.69	0.63	8.77	89.91	2147	2162
02/12/91	545	0.65	0.64	8.17	90.54	1381	0.64	0.65	8.40	90.31	1926	1939
02/13/91	747	0.68	0.58	8.64	90.10	1400	0.66	0.58	8.72	90.04	2147	2162
02/14/91	737	0.70	0.53	8.23	90.54	1405	0.69	0.63	8.61	90.07	2142	2157
02/15/91	354	0.68	0.43	7.96	90.93	1335	0.66	0.53	8.72	90.09	1689	1701
02/16/91	665	0.71	0.51	9.32	89.46	1490	0.68	0.39	8.59	90.34	2155	2170
02/17/91	782	0.69	0.58	8.09	90.64	1071	0.67	0.51	9.06	89.76	1853	1866

APPENDIX SECTION 11 - TABLE 11-2
 SPARROWS POINT PLANT COKE PRODUCTION - 1991 - STREAM S-27
 NO. 11 AND NO. 12 AND 'A' BATTERIES
 COKE PRODUCTION SHOWN IS TONS PER DAY OF FURNACE COKE
 (RUN OF OVEN COKE IS ESTIMATED AT 1.007 X FURNACE COKE)

DATE	BATTERY 11+12 COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	'A' BATTERY COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	TOTAL FCE COKE PRODUCTION TONS/DAY	ESTIMATED RUN OF OVEN COKE TONS/DAY
02/18/91	744	0.64	0.56	8.80	90.00	1268	0.67	0.44	8.83	90.06	2012	2026
02/19/91	789	0.66	0.50	8.65	90.19	1403	0.66	0.30	9.03	90.01	2192	2207
02/20/91	744	0.67	0.54	8.37	90.42	1386	0.71	0.30	8.21	90.78	2130	2145
02/21/91	743	0.73	0.41	8.10	90.76	1551	0.68	0.33	8.46	90.53	2294	2310
02/22/91	741	0.69	0.42	8.22	90.67	1390	0.70	0.38	8.23	90.69	2131	2146
02/23/91	787	0.67	0.38	8.25	90.70	1518	0.68	0.96	8.40	89.96	2305	2321
02/24/91	784	0.67	0.57	8.49	90.27	1490	0.66	0.46	9.01	89.87	2274	2290
02/25/91	773	0.69	0.36	8.26	90.69	1436	0.65	0.39	8.83	90.13	2209	2224
02/26/91	772	0.67	0.49	8.14	90.70	1497	0.71	0.68	9.14	89.47	2269	2285
02/27/91	749	0.70	0.80	8.34	90.16	1483	0.71	0.81	8.58	89.90	2232	2248
02/28/91	764	0.70	0.31	8.13	90.86	1511	0.69	0.57	8.33	90.41	2275	2291
03/01/91	733	0.68	0.57	8.34	90.41	1414	0.67	0.92	8.45	89.96	2147	2162
03/02/91	790	0.66	0.64	8.58	90.12	1201	0.65	0.59	8.85	89.91	1991	2005
03/03/91	793	0.67	0.62	9.00	89.71	1102	0.66	0.57	8.46	90.31	1895	1908
03/04/91	806	0.66	0.44	8.61	90.29	960	0.62	0.36	9.04	89.98	1766	1778
03/05/91	731	0.63	0.44	8.31	90.62	1298	0.62	0.43	8.75	90.20	2029	2043
03/06/91	747	0.63	0.68	7.86	90.83	1327	0.60	0.76	8.91	89.73	2074	2089
03/07/91	722	0.63	0.62	8.66	90.09	1364	0.63	0.50	8.33	90.54	2086	2101
03/08/91	751	0.67	0.23	8.13	90.97	1329	0.66	0.32	8.31	90.71	2080	2095
03/09/91	776	0.68	0.60	8.38	90.34	1353	0.68	0.42	7.99	90.91	2129	2144
03/10/91	753	0.68	0.45	8.42	90.45	1442	0.63	0.54	9.99	88.84	2195	2210
03/11/91	775	0.67	0.34	8.14	90.85	1251	0.64	0.46	8.67	90.23	2026	2040
03/12/91	732	0.65	0.40	8.20	90.75	1450	0.64	0.40	8.44	90.52	2182	2197
03/13/91	775	0.68	0.57	7.90	90.85	1395	0.67	0.41	8.67	90.25	2170	2185
03/14/91	697	0.68	0.58	8.14	90.60	1347	0.63	0.54	8.88	89.95	2044	2058
03/15/91	760	0.66	0.42	8.08	90.84	1392	0.67	0.59	8.91	89.83	2152	2167
03/16/91	762	0.66	0.68	8.02	90.64	1421	0.63	0.46	8.31	90.60	2183	2198
03/17/91	804	0.67	0.49	8.77	90.07	1438	0.68	0.60	8.79	89.93	2242	2258
03/18/91	755	0.65	0.50	9.13	89.72	1401	0.64	0.42	8.48	90.46	2156	2171
03/19/91	695	0.67	0.49	8.00	90.84	1346	0.63	0.36	8.50	90.51	2041	2055
03/20/91	700	0.65	0.20	8.20	90.95	1383	0.65	0.33	8.43	90.59	2083	2098
03/21/91	663	0.66	0.45	8.13	90.76	1391	0.66	0.48	8.64	90.22	2054	2068
03/22/91	669	0.69	0.55	8.10	90.66	1387	0.68	0.56	8.30	90.46	2056	2070
03/23/91	682	0.77	0.58	8.35	90.30	1300	0.74	0.58	8.78	89.90	1982	1996
03/24/91	656	0.60	0.43	9.26	89.71	1354	0.57	0.71	9.26	89.46	2010	2024
03/25/91	742	0.58	0.63	9.02	89.77	1343	0.60	0.78	9.57	89.05	2085	2100
03/26/91	735	0.61	0.63	8.10	90.66	1320	0.60	0.77	8.83	89.80	2055	2069
03/27/91	721	0.61	0.50	8.65	90.24	1459	0.57	0.52	8.70	90.21	2180	2195
03/28/91	757	0.59	0.47	9.07	89.87	1334	0.58	0.65	8.26	90.51	2091	2106
03/29/91	734	0.61	0.32	8.14	90.93	1319	0.60	0.49	8.65	90.26	2053	2067
03/30/91	749	0.60	0.35	8.13	90.92	1441	0.58	0.50	8.45	90.47	2190	2205
03/31/91	745	0.59	0.50	8.54	90.37	1371	0.58	0.65	8.87	89.90	2116	2131
04/01/91	769	0.59	0.39	8.03	90.99	1456	0.60	0.55	8.77	90.08	2225	2241
04/02/91	602	0.56	0.46	8.58	90.40	1362	0.55	0.50	8.20	90.75	1964	1978
04/03/91	771	0.54	0.43	8.65	90.38	1438	0.58	0.45	8.57	90.40	2209	2224
04/04/91	749	0.61	0.46	7.91	91.02	1350	0.58	0.61	9.20	89.61	2099	2114
04/05/91	738	0.61	0.55	8.39	90.45	1379	0.59	0.61	8.67	90.13	2117	2132
04/06/91	740	0.60	0.42	8.20	90.78	1463	0.58	0.46	8.40	90.56	2203	2218

APPENDIX SECTION 11 - TABLE 11-2
 SPARROWS POINT PLANT COKE PRODUCTION - 1991 - STREAM S-27
 NO. 11 AND NO. 12 AND 'A' BATTERIES
 COKE PRODUCTION SHOWN IS TONS PER DAY OF FURNACE COKE
 (RUN OF OVEN COKE IS ESTIMATED AT 1.007 X FURNACE COKE)

DATE	BATTERY 11+12 COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	'A' BATTERY COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	TOTAL FCE COKE PRODUCTION TONS/DAY	ESTIMATED RUN OF OVEN COKE TONS/DAY
04/07/91	771	0.64	0.43	8.54	90.39	1463	0.56	0.56	8.76	90.12	2234	2250
04/08/91	766	0.61	0.59	8.32	90.48	1491	0.59	0.53	8.35	90.53	2257	2273
04/09/91	739	0.55	0.38	8.43	90.64	1371	0.52	0.75	9.95	88.78	2110	2125
04/10/91	770	0.57	0.42	8.35	90.66	1440	0.58	0.55	8.72	90.15	2210	2225
04/11/91	746	0.55	0.35	7.75	91.35	1469	0.55	0.45	8.33	90.67	2215	2231
04/12/91	713	0.57	0.53	8.37	90.53	1483	0.56	0.45	8.67	90.32	2196	2211
04/13/91	765	0.57	0.70	8.57	90.16	1531	0.56	0.60	8.29	90.55	2296	2312
04/14/91	746	0.62	0.47	8.78	90.13	1510	0.60	0.49	8.49	90.42	2256	2272
04/15/91	767	0.64	0.58	8.04	90.74	1394	0.61	0.44	8.64	90.31	2161	2176
04/16/91	720	0.58	0.43	8.04	90.95	1497	0.56	0.49	8.52	90.43	2217	2233
04/17/91	768	0.60	0.61	8.90	89.89	1540	0.56	0.48	8.51	90.45	2308	2324
04/18/91	744	0.59	0.42	8.34	90.65	1598	0.57	0.49	8.76	90.18	2342	2358
04/19/91	763	0.59	0.56	8.34	90.51	1553	0.57	0.46	8.26	90.71	2316	2332
04/20/91	750	0.60	0.41	8.41	90.58	1546	0.58	0.35	8.73	90.34	2296	2312
04/21/91	751	0.62	0.37	9.11	89.90	1549	0.59	0.56	9.97	88.88	2300	2316
04/22/91	773	0.62	0.54	9.13	89.71	1576	0.58	0.39	9.25	89.78	2349	2365
04/23/91	735	.	.	.	.	1334	.	.	.	.	2069	2083
04/24/91	757	0.60	.	8.18	.	1511	.	.	.	.	2268	2284
04/25/91	770	0.59	0.34	8.79	90.28	1422	.	.	.	.	2192	2207
04/26/91	745	0.59	0.33	8.45	90.63	1489	0.57	0.54	8.71	90.18	2234	2250
04/27/91	772	0.56	0.49	8.30	90.65	1552	0.57	0.33	8.62	90.48	2324	2340
04/28/91	750	0.61	0.90	8.37	90.12	1458	0.54	0.50	8.52	90.44	2208	2223
04/29/91	740	0.56	0.32	8.93	90.19	1506	0.54	0.37	8.23	90.86	2246	2262
04/30/91	752	0.59	0.50	8.28	90.63	1241	0.60	0.57	8.68	90.15	1993	2007
05/01/91	731	0.59	0.58	8.46	90.37	1442	0.57	0.54	9.00	89.89	2173	2188
05/02/91	734	0.62	0.51	8.51	90.36	1245	0.55	0.44	9.12	89.89	1979	1993
05/03/91	670	0.55	0.63	9.09	89.73	1267	0.60	0.46	8.38	90.56	1937	1951
05/04/91	733	0.61	0.42	8.30	90.67	1381	0.62	0.61	8.99	89.78	2114	2129
05/05/91	685	0.61	0.55	8.10	90.74	1493	0.59	0.48	8.71	90.22	2178	2193
05/06/91	750	0.59	0.37	8.15	90.89	1207	0.40	0.88	8.58	90.14	1957	1971
05/07/91	762	0.61	0.28	8.32	90.79	1107	0.58	0.34	8.48	90.60	1869	1882
05/08/91	759	0.59	0.40	8.41	90.60	1474	0.60	0.38	8.22	90.80	2233	2249
05/09/91	663	0.25	0.50	8.43	90.82	1464	0.58	0.75	8.37	90.30	2127	2142
05/10/91	754	0.56	0.38	8.31	90.75	1457	0.57	0.50	8.28	90.65	2211	2226
05/11/91	766	0.59	0.24	8.27	90.90	1135	0.58	0.40	8.37	90.65	1901	1914
05/12/91	788	0.57	0.46	8.37	90.60	1633	0.61	0.53	8.46	90.40	2421	2438
05/13/91	770	0.59	0.52	8.41	90.48	1586	0.59	0.41	8.41	90.59	2356	2372
05/14/91	726	0.59	0.55	7.96	90.90	1503	0.58	0.28	8.30	90.84	2229	2245
05/15/91	767	0.59	0.50	7.93	90.98	1561	0.59	0.30	8.11	91.00	2328	2344
05/16/91	752	0.59	0.40	8.45	90.56	1563	0.55	0.44	8.09	90.92	2315	2331
05/17/91	730	0.61	0.57	8.52	90.30	1459	0.56	0.52	9.50	89.42	2189	2204
05/18/91	650	0.61	0.40	8.40	90.59	1571	0.62	0.46	8.40	90.52	2221	2237
05/19/91	759	0.59	0.29	8.23	90.89	1591	.	.	.	.	2350	2366
05/20/91	778	0.63	0.36	8.06	90.95	1559	0.60	0.35	8.27	90.78	2337	2353
05/21/91	730	0.57	0.52	8.07	90.84	1351	0.62	0.44	7.89	91.05	2081	2096
05/22/91	660	0.61	0.44	8.38	90.57	1485	0.60	0.45	8.49	90.46	2145	2160
05/23/91	783	0.57	0.23	8.09	91.11	1414	0.58	0.34	8.33	90.75	2197	2212
05/24/91	728	0.58	0.40	7.79	91.23	1463	0.54	0.36	8.30	90.80	2191	2206

APPENDIX SECTION 11 - TABLE 11-2
 SPARROWS POINT PLANT COKE PRODUCTION - 1991 - STREAM S-27
 NO. 11 AND NO. 12 AND 'A' BATTERIES
 COKE PRODUCTION SHOWN IS TONS PER DAY OF FURNACE COKE
 (RUN OF OVEN COKE IS ESTIMATED AT 1.007 X FURNACE COKE)

DATE	BATTERY 11+12 COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	'A' BATTERY COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	TOTAL FCE COKE PRODUCTION TONS/DAY	ESTIMATED RUN OF OVEN COKE TONS/DAY
05/25/91	795	0.60	0.25	8.00	91.15	1653	0.59	0.33	8.50	90.58	2448	2465
05/26/91	766	0.61	0.41	8.08	90.90	1333	0.58	0.43	8.04	90.95	2099	2114
05/27/91	782	0.59	0.96	8.04	90.41	1441	0.58	0.91	8.31	90.20	2223	2239
05/28/91	686	0.60	0.94	8.18	90.28	1234	0.57	0.46	9.10	89.87	1920	1933
05/29/91	760	0.61	0.63	9.10	89.66	1561	0.57	0.52	9.31	89.60	2321	2337
05/30/91	735	0.58	0.61	8.68	90.13	1487	0.57	0.46	8.26	90.71	2222	2238
05/31/91	731	.	.	.	.	1512	.	.	.	.	2243	2259
06/01/91	762	0.56	0.48	8.06	90.90	1390	0.58	0.61	9.96	88.85	2152	2167
06/02/91	766	0.59	0.54	8.06	90.81	1436	0.60	1.16	8.58	89.66	2202	2217
06/03/91	775	0.61	0.72	8.09	90.58	1379	.	.	.	.	2154	2169
06/04/91	728	0.61	0.52	8.56	90.31	1430	.	.	.	.	2158	2173
06/05/91	744	0.59	0.40	8.50	90.51	1393	.	.	.	.	2137	2152
06/06/91	737	0.62	0.52	8.60	90.26	1462	.	.	.	.	2199	2214
06/07/91	705	0.57	0.49	8.20	90.74	1236	.	.	.	.	1941	1955
06/08/91	750	0.58	0.41	8.32	90.69	1409	0.56	0.40	8.71	90.33	2159	2174
06/09/91	732	0.61	0.50	8.05	90.84	1516	0.60	0.48	8.29	90.63	2248	2264
06/10/91	730	0.60	0.62	8.39	90.39	1504	0.63	0.48	8.89	90.00	2234	2250
06/11/91	741	0.62	0.51	9.26	89.61	1499	0.61	0.86	9.35	89.18	2240	2256
06/12/91	715	0.63	0.69	8.37	90.31	1471	0.62	0.78	8.62	89.98	2186	2201
06/13/91	743	0.62	0.53	8.77	90.08	1438	0.60	0.45	8.38	90.57	2181	2196
06/14/91	610	0.61	0.37	8.97	90.05	1478	0.61	0.60	8.87	89.92	2088	2103
06/15/91	743	0.62	0.60	8.50	90.28	1432	0.60	0.85	9.16	89.39	2175	2190
06/16/91	701	0.60	0.49	8.44	90.47	1326	0.59	0.90	8.78	89.73	2027	2041
06/17/91	743	0.55	0.52	8.15	90.78	1138	0.57	0.68	8.73	90.02	1881	1894
06/18/91	604	0.59	0.41	8.26	90.74	1501	0.61	0.50	8.40	90.49	2105	2120
06/19/91	706	0.56	0.56	8.42	90.46	1476	0.53	0.50	8.52	90.45	2182	2197
06/20/91	731	0.54	0.38	8.37	90.71	1226	0.53	0.15	8.58	90.74	1957	1971
06/21/91	735	0.59	0.28	8.18	90.95	1347	0.56	0.50	8.42	90.52	2082	2097
06/22/91	603	0.60	0.61	8.03	90.76	1423	0.55	0.75	9.24	89.46	2122	2137
06/23/91	746	0.60	0.49	8.26	90.65	1552	0.58	0.50	9.40	89.52	2298	2314
06/24/91	731	0.56	0.43	8.70	90.31	1617	0.56	0.50	8.58	90.36	2348	2364
06/25/91	719	0.58	0.57	8.16	90.69	1682	0.56	0.65	8.35	90.44	2401	2418
06/26/91	757	0.56	0.63	7.88	90.93	1641	0.53	0.67	8.06	90.74	2398	2415
06/27/91	771	0.60	0.93	9.06	89.41	1044	.	.	.	.	1815	1828
06/28/91	691	0.59	0.54	8.64	90.23	1662	0.55	0.58	9.10	89.77	2353	2369
06/29/91	736	0.60	0.42	9.33	89.65	1692	0.62	0.44	8.65	90.29	2428	2445
06/30/91	709	0.60	0.61	8.37	90.42	1594	0.61	0.49	8.51	90.39	2303	2319
07/01/91	793	0.58	0.37	8.09	90.96	1581	0.57	0.33	8.30	90.80	2374	2391
07/02/91	713	0.59	0.45	8.10	90.86	1539	0.59	0.77	8.50	90.14	2252	2268
07/03/91	749	0.58	0.66	8.28	90.48	1553	0.59	0.65	9.02	89.74	2302	2318
07/04/91	728	.	.	.	.	1508	.	.	.	.	2236	2252
07/05/91	778	0.61	0.70	7.95	90.74	1502	0.67	0.44	8.20	90.69	2280	2296
07/06/91	749	0.53	0.45	8.09	90.93	1505	0.55	0.32	8.56	90.57	2254	2270
07/07/91	758	0.66	0.37	8.30	90.67	1507	0.58	0.38	8.77	90.27	2265	2281
07/08/91	740	0.61	0.33	8.26	90.80	1535	0.58	0.62	8.53	90.27	2275	2291
07/09/91	729	0.59	0.32	8.32	90.77	1558	.	.	.	.	2287	2303
07/10/91	729	0.59	0.33	8.35	90.73	1535	.	.	.	.	2264	2280
07/11/91	750	0.64	0.65	8.60	90.11	1446	0.59	0.45	8.20	90.76	2196	2211

APPENDIX SECTION 11 - TABLE 11-2
 SPARROWS POINT PLANT COKE PRODUCTION - 1991 - STREAM S-27
 NO. 11 AND NO. 12 AND 'A' BATTERIES
 COKE PRODUCTION SHOWN IS TONS PER DAY OF FURNACE COKE
 (RUN OF OVEN COKE IS ESTIMATED AT 1.007 X FURNACE COKE)

DATE	BATTERY 11+12 COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	'A' BATTERY COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	TOTAL FCE COKE PRODUCTION TONS/DAY	ESTIMATED RUN OF OVEN COKE TONS/DAY
07/12/91	735	0.63	0.50	8.25	90.62	1342	0.60	0.46	8.90	90.04	2077	2092
07/13/91	598	0.65	0.92	8.10	90.33	1478	0.57	0.73	8.80	89.90	2076	2091
07/14/91	718	0.57	0.53	8.18	90.72	1552	0.58	0.56	8.47	90.39	2270	2286
07/15/91	766	0.55	0.42	8.11	90.92	1562	0.55	0.23	8.35	90.87	2328	2344
07/16/91	710	0.57	0.49	8.45	90.49	1546	0.53	0.54	8.37	90.56	2256	2272
07/17/91	763	0.60	0.56	8.35	90.49	1404	0.57	0.44	8.42	90.57	2167	2182
07/18/91	669	0.56	0.40	8.82	90.22	1550	0.58	0.46	8.33	90.63	2219	2235
07/19/91	746	0.56	0.44	7.96	91.04	1537	0.55	0.69	8.99	89.77	2283	2299
07/20/91	717	0.55	0.37	8.58	90.50	1549	0.54	0.42	8.57	90.47	2266	2282
07/21/91	736	0.61	0.30	7.72	91.37	1563	0.56	0.39	7.96	91.09	2301	2317
07/22/91	732	0.57	0.37	7.60	91.46	1573	0.57	0.30	7.92	91.21	2305	2321
07/23/91	705	0.57	0.71	9.23	89.49	1571	0.54	0.57	8.34	90.55	2276	2292
07/24/91	699	0.55	0.45	8.16	90.84	1487	0.56	0.43	7.94	91.07	2186	2201
07/25/91	742	0.58	0.46	8.41	90.55	1498	0.54	0.49	8.71	90.26	2240	2256
07/26/91	673	0.56	0.58	8.80	90.06	1448	0.55	0.61	8.41	90.43	2121	2136
07/27/91	716	0.57	0.46	8.34	90.63	1325	0.56	0.59	8.32	90.53	2041	2055
07/28/91	707	0.56	0.45	8.23	90.76	1519	0.56	0.75	8.24	90.45	2226	2242
07/29/91	721	0.58	0.33	8.11	90.98	1516	0.57	0.49	8.39	90.55	2237	2253
07/30/91	661	0.62	0.35	7.73	91.30	1352	0.56	0.45	7.96	91.03	2013	2027
07/31/91	743	0.52	0.48	7.80	91.20	1496	0.50	0.44	8.84	90.22	2239	2255
08/01/91	649	0.55	0.37	8.51	90.57	1415	0.56	0.40	8.60	90.44	2064	2078
08/02/91	700	0.59	0.64	8.35	90.42	1306	0.57	0.47	8.63	90.33	2006	2020
08/03/91	545	0.56	0.49	8.35	90.60	1458	0.56	0.57	8.90	89.97	2003	2017
08/04/91	699	0.58	0.53	8.49	90.40	1498	0.57	0.43	8.22	90.78	2197	2212
08/05/91	691	0.56	0.69	9.89	88.86	1594	0.57	0.41	9.18	89.84	2285	2301
08/06/91	677	.	.	.	.	1360	.	.	.	.	2037	2051
08/07/91	683	.	.	.	.	1506	.	.	.	.	2189	2204
08/08/91	699	0.54	0.45	8.00	91.01	1680	0.53	0.44	7.98	91.05	2379	2396
08/09/91	645	0.52	0.29	8.12	91.07	1510	0.50	0.39	8.06	91.05	2155	2170
08/10/91	722	.	.	.	.	1123	.	.	.	.	1845	1858
08/11/91	429	.	.	.	.	1617	.	.	.	.	2046	2060
08/12/91	718	0.52	0.48	7.92	91.08	1691	0.55	0.46	8.01	90.98	2409	2426
08/13/91	651	0.55	0.55	8.36	90.54	1517	0.55	0.61	8.30	90.54	2168	2183
08/14/91	729	0.56	0.55	8.55	90.34	1659	0.56	0.46	8.49	90.49	2388	2405
08/15/91	687	0.60	0.62	8.09	90.69	1693	0.55	0.72	8.24	90.49	2380	2397
08/16/91	689	0.57	0.41	7.96	91.06	1434	0.56	0.51	8.38	90.55	2123	2138
08/17/91	671	0.59	0.70	8.19	90.52	1742	0.57	0.46	8.72	90.25	2413	2430
08/18/91	713	0.61	0.69	7.63	91.07	1696	0.58	0.39	8.05	90.98	2409	2426
08/19/91	707	0.61	0.63	8.39	90.37	1642	0.60	0.47	8.65	90.28	2349	2365
08/20/91	668	0.59	0.55	8.02	90.84	1567	0.59	0.56	8.05	90.80	2235	2251
08/21/91	691	.	.	.	.	1676	0.56	0.23	7.43	91.78	2367	2384
08/22/91	719	0.54	0.40	7.84	91.22	1525	.	.	.	.	2244	2260
08/23/91	676	0.57	0.53	7.72	91.18	1757	0.55	0.28	7.87	91.30	2433	2450
08/24/91	727	0.60	0.67	8.26	90.47	1563	0.59	0.43	8.13	90.85	2290	2306
08/25/91	733	0.59	0.94	7.90	90.57	1444	0.59	0.70	8.37	90.34	2177	2192
08/26/91	708	0.57	0.50	8.05	90.88	1620	0.59	0.60	8.34	90.47	2328	2344
08/27/91	681	0.57	0.76	7.93	90.74	1676	0.56	0.55	8.37	90.52	2357	2373
08/28/91	711	0.58	0.50	8.09	90.83	1650	0.55	0.47	8.78	90.20	2361	2378

APPENDIX SECTION 11 - TABLE 11-2
 SPARROWS POINT PLANT COKE PRODUCTION - 1991 - STREAM S-27
 NO. 11 AND NO. 12 AND 'A' BATTERIES
 COKE PRODUCTION SHOWN IS TONS PER DAY OF FURNACE COKE
 (RUN OF OVEN COKE IS ESTIMATED AT 1.007 X FURNACE COKE)

DATE	BATTERY 11+12 COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	'A' BATTERY COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	TOTAL FCE COKE PRODUCTION TONS/DAY	ESTIMATED RUN OF OVEN COKE TONS/DAY
08/29/91	714	0.55	0.82	8.09	90.54	1611	0.55	0.48	8.68	90.29	2325	2341
08/30/91	700	0.59	0.69	8.20	90.52	1564	0.58	0.57	8.72	90.13	2264	2280
08/31/91	712	0.61	0.70	8.12	90.57	1468	0.59	0.46	8.46	90.49	2180	2195
09/01/91	696	0.56	0.48	8.26	90.70	1717	0.58	0.51	8.31	90.60	2413	2430
09/02/91	725	0.61	0.59	8.26	90.54	1497	0.58	0.42	8.37	90.63	2222	2238
09/03/91	708	0.55	0.80	9.00	89.65	1582	0.57	0.67	8.47	90.29	2290	2306
09/04/91	692	0.60	0.45	8.11	90.84	1642	0.57	0.41	8.45	90.57	2334	2350
09/05/91	656	0.52	0.36	8.27	90.85	1624	0.51	0.37	7.88	91.24	2280	2296
09/06/91	700	0.55	0.33	8.90	90.22	1600	0.53	0.30	9.30	89.87	2300	2316
09/07/91	727	0.52	0.42	9.25	89.81	1614	0.52	0.58	8.74	90.16	2341	2357
09/08/91	697	0.54	0.45	8.48	90.53	1665	0.53	0.62	8.06	90.79	2362	2379
09/09/91	718	0.54	0.42	7.93	91.11	1718	0.54	0.56	8.33	90.57	2436	2453
09/10/91	668	0.61	0.50	8.09	90.80	1658	0.52	0.62	8.36	90.50	2326	2342
09/11/91	660	0.52	0.56	8.09	90.83	1515	0.49	0.62	8.20	90.69	2175	2190
09/12/91	664	0.54	0.41	7.98	91.07	1746	0.53	0.42	8.33	90.72	2410	2427
09/13/91	714	0.52	0.64	8.32	90.52	1613	0.52	0.47	8.60	90.41	2327	2343
09/14/91	706	0.51	0.56	8.58	90.35	1684	0.49	0.60	9.17	89.74	2390	2407
09/15/91	715	0.55	0.50	7.88	91.07	1594	0.56	0.66	8.67	90.11	2309	2325
09/16/91	716	0.52	0.38	8.76	90.34	1214	0.51	0.47	9.11	89.91	1930	1944
09/17/91	687	0.52	0.49	8.20	90.79	1669	0.52	0.49	8.64	90.35	2356	2372
09/18/91	673	0.55	0.66	8.35	90.44	1631	0.51	0.71	8.34	90.44	2304	2320
09/19/91	729	0.55	0.44	8.37	90.64	1778	0.58	0.49	8.31	90.62	2507	2525
09/20/91	699	0.54	0.49	8.31	90.66	1577	0.55	0.55	8.44	90.46	2276	2292
09/21/91	716	0.56	0.40	7.86	91.18	1854	0.59	0.42	8.52	90.47	2570	2588
09/22/91	718	0.54	0.55	8.21	90.70	1761	0.54	0.88	8.17	90.41	2479	2496
09/23/91	683	0.56	0.54	7.74	91.16	1710	0.55	0.70	8.05	90.70	2393	2410
09/24/91	699	0.58	0.63	8.05	90.74	1706	0.57	0.70	8.34	90.39	2405	2422
09/25/91	679	0.57	0.47	7.86	91.10	1710	0.53	0.47	8.02	90.98	2389	2406
09/26/91	688	0.54	0.48	8.26	90.72	1716	0.50	0.26	8.56	90.68	2404	2421
09/27/91	652	0.53	0.42	8.16	90.89	1728	0.52	0.39	7.94	91.15	2380	2397
09/28/91	687	0.50	0.45	8.34	90.71	1704	0.50	0.34	8.30	90.86	2391	2408
09/29/91	687	0.57	0.44	8.54	90.45	1718	0.56	0.60	9.25	89.59	2405	2422
09/30/91	709	0.59	0.46	8.66	90.29	1773	0.58	0.42	8.35	90.65	2482	2499
10/01/91	588	0.58	0.38	8.65	90.39	1733	0.58	0.60	8.86	89.96	2321	2337
10/02/91	693	0.59	0.53	8.54	90.34	1739	0.58	0.48	8.97	89.97	2432	2449
10/03/91	696	0.59	0.58	9.05	89.78	1723	0.59	0.45	8.69	90.27	2419	2436
10/04/91	716	0.58	0.53	8.55	90.34	1718	0.55	0.70	9.22	89.53	2434	2451
10/05/91	692	0.58	0.46	8.38	90.58	1692	0.56	0.50	8.50	90.44	2384	2401
10/06/91	676	.	.	.	.	1681	.	.	.	.	2357	2373
10/07/91	710	0.57	0.49	8.05	90.89	1769	0.58	0.57	8.86	89.99	2479	2496
10/08/91	680	0.56	0.53	8.37	90.54	1698	0.56	0.58	8.33	90.53	2378	2395
10/09/91	679	0.54	0.57	9.23	89.66	1658	0.57	0.68	8.94	89.81	2337	2353
10/10/91	717	0.56	0.82	8.65	89.97	1710	0.56	0.68	8.28	90.48	2427	2444
10/11/91	700	0.53	0.47	8.34	90.66	1710	0.55	0.59	8.75	90.11	2410	2427
10/12/91	687	0.53	0.36	8.31	90.80	1776	0.53	0.43	8.92	90.12	2463	2480
10/13/91	690	0.52	0.46	8.30	90.72	1706	0.53	0.35	8.77	90.35	2396	2413
10/14/91	723	0.55	0.56	8.43	90.46	1742	0.52	0.48	8.52	90.48	2465	2482
10/15/91	660	0.54	0.54	8.18	90.74	1685	0.54	0.32	8.01	91.13	2345	2361

APPENDIX SECTION 11 - TABLE 11-2
 SPARROWS POINT PLANT COKE PRODUCTION - 1991 - STREAM S-27
 NO. 11 AND NO. 12 AND 'A' BATTERIES
 COKE PRODUCTION SHOWN IS TONS PER DAY OF FURNACE COKE
 (RUN OF OVEN COKE IS ESTIMATED AT 1.007 X FURNACE COKE)

DATE	BATTERY 11+12 COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	'A' BATTERY COKE PRODUCTION TONS/DAY	SULFUR %	VOLATILE MATTER %	ASH CONTENT %	FIXED CARBON %	TOTAL FCE COKE PRODUCTION TONS/DAY	ESTIMATED RUN OF OVEN COKE TONS/DAY
10/16/91	718	0.54	0.70	8.14	90.62	1758	0.53	0.82	8.84	89.81	2476	2493
10/17/91	711	0.55	0.55	8.55	90.35	1404	0.52	0.46	8.71	90.31	2115	2130
10/18/91	646	0.56	0.52	8.44	90.48	1657	0.60	0.61	8.65	90.14	2303	2319
10/19/91	704	0.59	0.64	8.05	90.72	1657	0.60	0.50	8.67	90.23	2361	2378
10/20/91	691	.	.	.	.	1775	.	.	.	.	2466	2483
10/21/91	709	0.54	0.40	8.08	90.98	1788	0.49	0.54	8.25	90.72	2497	2514
10/22/91	647	0.57	0.50	8.31	90.62	1654	0.51	0.80	8.55	90.14	2301	2317
10/23/91	730	0.54	0.45	8.61	90.40	1753	0.60	0.60	8.33	90.47	2483	2500
10/24/91	719	0.56	0.47	8.04	90.93	1764	0.54	0.53	8.00	90.93	2483	2500
10/25/91	659	0.58	0.53	7.64	91.25	1720	0.57	0.57	7.97	90.89	2379	2396
10/26/91	719	0.55	0.51	8.16	90.78	1321	0.53	0.49	7.93	91.05	2040	2054
10/27/91	720	.	.	.	.	1882	.	.	.	.	2602	2620
10/28/91	694	0.56	0.65	8.14	90.65	1802	0.56	0.82	8.48	90.14	2496	2513
10/29/91	704	0.56	0.59	8.12	90.73	1736	0.55	0.72	8.26	90.47	2440	2457
10/30/91	695	0.56	0.72	7.73	90.99	1731	0.56	0.66	7.98	90.80	2426	2443
10/31/91	726	0.55	0.52	7.82	91.11	1795	0.56	0.65	7.95	90.84	2521	2539
11/01/91	656	0.56	0.43	7.70	91.31	1686	0.55	0.42	8.00	91.03	2342	2358
11/02/91	719	0.43	0.37	9.04	90.16	1838	0.54	0.37	8.22	90.87	2557	2575
11/03/91	686	0.56	0.35	7.82	91.27	1774	0.54	0.38	7.95	91.13	2460	2477
11/04/91	732	0.57	0.50	7.73	91.20	1832	0.53	0.45	8.35	90.67	2564	2582
11/05/91	669	0.54	0.51	7.70	91.25	1708	0.53	0.79	8.05	90.63	2377	2394
11/06/91	706	0.54	0.39	7.82	91.25	1767	0.53	0.54	8.27	90.66	2473	2490
11/07/91	670	0.55	0.76	7.87	90.82	1800	0.55	0.64	8.06	90.75	2470	2487
11/08/91	687	0.55	0.34	7.94	91.17	1759	0.56	0.44	8.04	90.96	2446	2463
11/09/91	707	0.54	0.35	8.12	90.99	1803	0.56	0.65	8.10	90.69	2510	2528
11/10/91	707	0.52	0.38	8.00	91.10	1773	0.53	0.40	8.12	90.95	2480	2497
11/11/91	678	0.52	0.38	7.97	91.13	1781	0.54	0.62	8.11	90.73	2459	2476
11/12/91	637	0.52	0.49	8.15	90.84	1701	0.50	0.62	8.23	90.65	2338	2354
11/13/91	702	0.51	0.55	7.91	91.03	1784	0.50	0.42	8.11	90.97	2486	2503
11/14/91	689	0.52	0.44	7.87	91.17	1746	0.53	0.38	8.16	90.93	2435	2452
11/15/91	665	0.52	0.55	7.85	91.08	1781	0.52	0.54	8.13	90.81	2446	2463
11/16/91	677	0.77	0.71	7.90	90.62	1800	0.51	0.52	8.01	90.96	2477	2494
11/17/91	687	0.54	0.31	7.94	91.21	1782	0.54	0.48	8.00	90.98	2469	2486
11/18/91	693	0.55	0.49	8.04	90.92	1764	0.54	0.65	8.05	90.76	2457	2474
11/19/91	646	0.52	0.55	8.04	90.89	1686	0.52	0.50	8.00	90.98	2332	2348
11/20/91	699	0.52	0.55	7.94	90.99	1785	0.50	0.60	7.91	90.99	2484	2501
11/21/91	681	0.51	0.30	7.78	91.41	1754	0.51	0.70	7.76	91.03	2435	2452
11/22/91	635	0.53	0.67	7.84	90.96	1763	0.49	0.63	8.03	90.85	2398	2415
11/23/91	673	0.54	0.70	7.67	91.09	1748	0.52	0.35	8.00	91.13	2421	2438
11/24/91	688	0.54	0.40	7.18	91.88	1604	0.52	0.39	7.40	91.69	2292	2308
11/25/91	648	0.52	0.46	7.57	91.45	1511	0.53	0.31	7.77	91.39	2159	2174
11/26/91	625	0.54	0.42	7.42	91.62	1359	0.55	0.35	7.63	91.47	1984	1998
11/27/91	650	0.55	0.51	7.88	91.06	1162	0.55	0.69	7.96	90.80	1812	1825
11/28/91	681	0.52	0.43	8.82	90.23	1109	.	.	.	.	1790	1803
11/29/91	580	0.59	0.72	8.15	90.54	1045	0.57	0.84	8.22	90.37	1625	1636
11/30/91	641	0.56	0.75	8.59	90.10	767	0.56	1.11	9.16	89.17	1408	1418
12/01/91	631	.	.	.	.	799	.	.	.	.	1430	1440
12/02/91	745	.	.	.	.	866	.	.	.	.	1611	1622

[illegible]

BETHLEHEM STEEL
Sparrows Point Plant

Interoffice Correspondence
Environmental Health, Control & Safety

Ref: August 13, 1991

From: G. T. Adams
To: D. Saul
Subject: INDUSTRIAL HYGIENE SURVEY
COAL CHEMICAL PLANTS, COKE OVENS

During July 1991, Environmental Health, Control & Safety conducted an industrial hygiene survey at "A" and "B" Coal Chemical Plants. Employees' exposures to benzene, toluene, xylene and total hydrocarbons were monitored. Two overexposures to benzene were detected. One overexposure was detected in the breathing zone of the "A" Plant Utility Operator #5 (JCN 2690) and the other was detected in the breathing zone of a Maintenance Technician (JCN 1050) working in the Benzene Plant.

Please post copies of the survey results showing the detected exposures.

G. T. Adams
Env. Health Engineer

GTA:kam
cc: R. J. Weinoffer
M. E. Beechener
File: Benzene-Coal Chemical

INDUSTRIAL HYGIENE SURVEY
COAL CHEMICAL PLANTS - COKE OVENS
SPARROWS POINT PLANT

<u>EMPLOYEE</u>	<u>PLANT</u>	<u>POSITION (JCN)</u>	<u>DATE</u>	<u>AIR CONTAMINANT</u>			
				<u>TOTAL HYDRO-(1) CARBONS (mg/m³)</u>	<u>BENZENE (ppm)</u>	<u>TOLUENE (ppm)</u>	<u>XYLENE (ppm)</u>
217-40-8597	A	Utilityman-2460	7/3/91	2.7	LDL (3)	LDL	LDL
218-46-8829	A	Oper. Engineer-2620	7/3/91	0.95	LDL	LDL	LDL
218-46-4177	A	Utility Operator #2-2630	7/3/91	1.6	LDL	LDL	LDL
215-64-9097	A	Utility Operator #3-2670	7/3/91	1.2	LDL	LDL	LDL
220-30-6458	A	Maintenance Technician	7/3/91	0.39	LDL	LDL	LDL
212-34-1736	A	Utility Operator #5-2680	7/5/91	1.5	0.21	LDL	LDL
217-20-3938	A	Utility Operator #5-2690	7/5/91	7.97	1.3*	0.22	LDL
213-36-1353	A	Oper. Engineer #1-2740	7/5/91	LDL	LDL	LDL	LDL
215-30-6427	A	Maint. Engineer-2755	7/5/91	0.69	LDL	LDL	LDL
216-28-3392	(2)	Maintenance Technician	7/8/91	2.2	0.36	LDL	LDL
218-34-0464	A&B	Maintenance Technician	7/8/91	1.5	LDL	LDL	LDL
219-30-6019	(2)	Maintenance Technician	7/8/91	8.04	1.2*	0.17	LDL
242-38-6327	A&B	Maintenance Technician	7/8/91	1.3	LDL	LDL	LDL
238-68-7942	B	Utility Operator #1-2970	7/17/91	3.1	0.35	LDL	LDL
218-42-1841	B	Utility Operator #2-3010	7/17/91	3.1	0.44	LDL	LDL
213-62-4968	B	Utility Operator #4-2980	7/17/91	5.11	0.47	LDL	LDL
212-46-7505	B	Oper. Engineer-2880	7/17/91	4.1	0.27	LDL	LDL
219-60-6789	B	Utility Helper-3280	7/17/91	1.1	LDL	LDL	LDL
218-44-8921	A&B	Motor Inspector	7/29/91	1.1	LDL	LDL	LDL
218-46-6801	A&B	Motor Inspector	7/29/91	1.3	LDL	LDL	LDL
216-34-7012	A&B	Motor Inspector	7/29/91	0.75	LDL	LDL	LDL
223-52-0609	A&B	Motor Inspector	7/29/91	0.89	LDL	LDL	LDL
MOSH PEL				(A)	1.0	100	100

(*) Concentration exceeded MOSH PEL

(1) Total hydrocarbon concentration was calculated as hexane

(2) Worked in Benzene Plant which is part of "A" Plant

(3) Less than detection limit: Benzene 0.15 ppm, Toluene 0.14 ppm, Xylene 0.13 ppm

(A) MOSH PEL for hexane - 180 mg/m³

BETHLEHEM STEEL
Sparrows Point Plant

Interoffice Correspondence
Environmental Health, Control & Safety

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Ref: September 12, 1991

From: G. T. Adams
To: D. Saul
Subject: HYDROGEN SULFIDE & AMMONIA SURVEY
COAL CHEMICAL PLANTS - COKE OVENS

During August 1991, Environmental Health & Safety conducted a industrial hygiene survey in "A" and "B" Coal Chemical Plants to monitor employees' exposures to hydrogen sulfide and ammonia. No overexposures were detected in the breathing zones of the monitored employees.

Please inform the monitored employees of the survey results.

G. T. Adams
Env. Health Engineer

GTA:kam
cc: M. E. Beechener
File: Hydrogen Sulfide-Coal Chemical
✓ Ammonia-Coal Chemical

INDUSTRIAL HYGIENE SURVEY
HYDROGEN SULFIDE & AMMONIA
COAL CHEMICAL PLANTS - COKE OVENS
SPARROWS POINT PLANT

<u>Employee</u>	<u>Plant</u>	<u>Position (JCN)</u>	<u>Date</u>	<u>Air Contaminant</u>	
				<u>Hydrogen Sulfide (ppm)</u>	<u>Ammonia (ppm)</u>
216-58-3253	A	Utility Operator #1-2780	8/7/91	BDL ⁽¹⁾	BDL
218-46-4177	A	Utility Operator #2-2630	8/8/91	BDL	BDL
215-30-7859	A	Utility Operator #5-2680	8/8/91	BDL	BDL
217-20-3938	A	Utility Operator #5-2690	8/8/91	BDL	BDL
217-40-8597	A&B	Utilityman-2460	8/9/91	BDL	BDL
218-46-8829	A	Operating Eng. #2-2620	8/9/91	BDL	BDL
218-34-0464	A&B	Maintenance Tech.	8/14/91	BDL	BDL
416-36-6327	A&B	Maintenance Tech.	8/14/91	BDL	BDL
242-38-6327	A&B	Maintenance Tech.	8/14/91	BDL	BDL
216-54-4117	A&B	Maintenance Tech.	8/14/91	BDL	BDL
212-36-9934	B	Operating Eng.-2880	8/7/91	BDL	BDL
238-68-7942	B	Utility Operator #1-2970	8/7/91	BDL*	BDL
212-62-9135	B	Utility Operator #4-2980	8/7/91	6.9	BDL
213-64-8134	B	Utility Operator #2-3010	8/9/91	BDL	BDL
098-60-3009	B	Motor Inspector	8/15/91	BDL	BDL
218-46-6801	B	Motor Inspector	8/15/91	BDL	BDL
223-52-0609	B	Motor Inspector	8/15/91	BDL	BDL
218-36-4549	B	Motor Inspector	8/15/91	BDL	2.75
213-36-1353	A	Operating Eng. #1-2740	8/30/91	BDL	BDL
215-28-5801	A	Maint. Opr. Eng. -2755	8/30/91	BDL	BDL
10SH PEL				10*	35 (STEL)

Sampling Method: Hydrogen Sulfide - Draeger Diffusion Tubes #6733091 -
Detection Limit - 1.3 ppm
Ammonia - Draeger Diffusion Tubes #8101301 -
Detection Limit - 2.5 ppm

1) BDL - Below Detection Limit

8-HOUR TWA

**CARBON MONOXIDE GENERAL AREA MONITORING
COKE OVENS
SPARROWS POINT PLANT**

COAL CHEMICAL "A" PLANT

<u>Location</u>	<u>Position</u>	<u>JCN</u>	<u>Date</u>	<u>Concentration*</u>
Gas Handling	Operating Engineer #2	2620	7/17/91	4.0 ppm
	Utility Operator #2	2620	7/17/91	8.8 ppm
Light Oil Recovery	Utility Operator #5	2680	7/10/91	4.9 ppm
	Utility Operator #5	2690	7/10/91	4.9 ppm
Sulphate Recovery	Utility Operator #3	2670	7/17/91	6.0 ppm
Gas Booster	Operating Engineer #1	2740	7/10/91	9.3 ppm
	Maint. Oper. Engineer	2755	7/10/91	9.3 ppm
Desulphurizing	Utility Operator #1	2780	7/10/91	5.8 ppm

COAL CHEMICAL "B" PLANT

<u>Location</u>	<u>Position</u>	<u>JCN</u>	<u>Date</u>	<u>Concentration*</u>
Gas Handling	Operating Engineer	2880	7/26/91	5.0 ppm
Light Oil Recovery	Utility Operator #2	3010	7/26/91	3.2 ppm
Sulphate Recovery Ammonia Stills	Utility Operator #1	2970	7/26/91	5.3 ppm
	Utility Operator #4	2980	7/26/91	0.3 ppm
Acid Handling	Acid Plant Helper	3070	7/26/91	4.5 ppm

* Time Weighted Average concentrations (parts per million-ppm)

Instrumentation used to monitor carbon monoxide levels:

Interscan Model 7140 Carbon Monoxide Monitor & Analyzer

BCM

CHAIN OF CUSTODY RECORD

ORDER NUMBER _____

PROJ NO.		PROJECT NAME				NO. OF CONTAINERS	ANALYSES										KEY AQ-Aqueous S-Solid A-Air L-Liquid O-Other	REMARKS/ANALYSES
SAMPLERS.							Free + Total NH ₃ + CW5	Ni + Co	SO ₄ + Cl	CO ₂ + TSS	phenol	CN	TYPE	FIELD ANALYSES				
BCM NUMBER (Lab Only)	DATE	TIME	COMP	GRAB	STATION LOCATION													
Beth. Steel - S.T. Herman																		
	3/25	0920		X	Ammonia Still Eff.	1					X					AQ		
	"	"		X	Ammonia Still Eff.	1				X						"		
	"	"		X	Ammonia Still Eff.	1			X							"		
	"	"		X	Ammonia Still Eff.	1	X									"		
	"	"		X	Ammonia Still Eff.	1		X								"		
	"	"		X	Ammonia Still Eff.	1					X					"		
	3/25	1015		X	Ammonia Still Eff.	1					X					AQ		
	"	"		X	Ammonia Still Eff.	1				X						"		
	"	"		X	Ammonia Still Eff.	1			X							"		
	"	"		X	Ammonia Still Eff.	1	X									"		
	"	"		X	Ammonia Still Eff.	1		X								"		
	"	"		X	Ammonia Still Eff.	1					X					"		

***NOTE ANY KNOWN OR SUSPECTED HAZARDS

Empties dispatched by:	Date/Time	Received by: (SIGNATURE)	Relinquished by: (SIGNATURE)	Date/Time	Received by: (SIGNATURE)
Relinquished by: (SIGNATURE)	Date/Time	Received for Laboratory by: (SIGNATURE)	Date/Time	(Shipping/Receiving) Remarks Airbill Number:	
S.T. Herman	3/25/1730	[Signature]	3/25/1730		

Distribution: Original to Lab file; Yellow to Project Manager;
Pink to Sampler; Gold to be retained by Sampler in field.

CUSTODY SEALS
INTACT (Y,N,NA)

APPENDIX SECTION 14 - TABLE 14-1
SPARROWS POINT PLANT
COKE PRODUCTION DATA - #11 BATTERY

BATTERY #11	# OVENS PUSHED	GROSS COKING TIME	AVG FLUE TEMP F	GROSS BTU /LB DRY COAL	AVG CHG /OVEN NET TON	NATURAL COAL CHG NET TON	DRY COAL CHG NET TON	HIGH VOL DRY COAL NET TON	LOW VOL DRY COAL NET TON	DRY RUN OF OVEN COKE	COKE BREEZE NET TON
Jan-91	581	25:17	2,144	2,701	15.58	9,051	8,335	6,254	3,083	6,252	143
Feb-91	510	24:25	2,143	2,687	15.77	8,043	7,484	5,614	1,870	5,629	132
Mar-91	593	23:16	2,143	2,569	15.77	9,338	8,608	6,457	2,151	6,432	109
Apr-91	589	22:40	2,144	2,465	15.77	9,291	8,555	6,417	2,138	6,361	115
May-91	600	22:58	2,147	2,345	15.78	9,469	8,748	6,561	2,187	6,559	122
Jun-91	547	24:21	2,136	2,068	15.74	8,608	7,999	5,999	2,000	6,015	90
Jul-91	557	24:41	2,109	1,918	15.90	8,857	8,245	6,183	2,062	6,215	103
Aug-91	524	26:17	2,120	2,118	15.92	8,344	7,743	5,806	1,937	5,778	147
Sep-91	499	26:41	2,122	2,072	15.88	7,922	7,363	5,521	1,842	5,500	135
Oct-91	510	27:01	2,139	2,105	15.84	8,078	7,462	5,597	1,866	5,593	118
Nov-91	481	27:41	2,155	2,136	15.68	7,541	6,967	5,225	1,742	5,184	152
Dec-91	26	24:00	2,170	3,192	15.80	222	202	152	51	561	17
Average	501		2,139	2,365	15.79	7,897	7,309	5,482	1,911	5,507	115

APPENDIX SECTION 14 - TABLE 14-2
SPARROWS POINT PLANT
COKE PRODUCTION DATA - #12 BATTERY

BATTERY #12	# OVENS PUSHED	GROSS COKING TIME	AVG FLUE TEMP F	GROSS BTU /LB DRY COAL	AVG CHG /OVEN NET TON	NATURAL COAL CHG NET TON	DRY COAL CHG NET TON	HIGH VOL DRY COAL NET TON	LOW VOL DRY COAL NET TON	DRY RUN OF OVEN COKE	COKE BREEZE NET TON
Jan-91	1390	24:21	2142	1509	15.58	21660	19940	14957	4983	14958	156
Feb-91	1316	25:34	2149	1483	15.77	20749	19310	14484	4827	14532	144
Mar-91	1536	25:11	2146	1442	15.78	24237	22347	16761	5586	16703	116
Apr-91	1511	24:47	2148	1487	15.77	23835	21942	16458	5485	16316	120
May-91	1516	23:51	2125	1444	15.78	23929	22108	16581	5527	16578	132
Jun-91	1448	25:52	2135	1311	15.74	22788	21176	15882	5294	15931	96
Jul-91	1477	26:13	2114	1328	15.90	23489	21858	16393	5465	16474	222
Aug-91	1420	27:15	2141	1472	15.93	22623	21001	15750	5251	15666	153
Sep-91	1420	26:22	2133	1431	15.88	22543	20952	15713	5239	15648	145
Oct-91	1474	24:32	2144	1443	15.84	23343	21555	16166	5388	16150	126
Nov-91	1424	23:46	2150	1442	15.67	22320	20618	15464	5154	15344	162
Dec-91	239	23:56	2127	1583	15.75	2976	2708	2031	677	2648	87
Average:	1,348		2,138	1,448	15.78	21,208	19,626	14,720	4,906	14,746	138

APPENDIX SECTION 14 - TABLE 14-3
SPARROWS POINT PLANT
COKE PRODUCTION DATA - "A" BATTERY

BATTERY "A"	# OVENS PUSHED	GROSS COKING TIME	AVG FLUE TEMP F	GROSS BTU /LB DRY COAL	AVG CHG /OVEN NET TON	NATURAL COAL CHG NET TON	DRY COAL CHG NET TON	HIGH VOL DRY COAL NET TON	LOW VOL DRY COAL NET TON	DRY RUN OF OVEN COKE	COKE BREEZE NET TON
Jan-91	1,698	25:47	2,214	1,495	33.58	57,027	52,514	39,386	13,128	39,402	434
Feb-91	1,678	25:20	2,180	1,403	33.56	56,318	52,411	39,309	13,101	39,439	372
Mar-91	1,788	26:38	2,190	1,482	33.91	60,640	55,896	41,923	13,973	41,774	141
Apr-91	1,883	25:11	2,197	1,454	34.18	64,357	59,259	44,445	14,814	44,056	84
May-91	1,927	26:15	2,184	1,503	33.53	64,605	59,697	44,774	14,923	44,572	120
Jun-91	1,824	26:50	2,192	1,430	34.08	62,163	57,761	43,321	14,440	43,466	72
Jul-91	1,975	25:37	2,158	1,403	33.82	66,791	62,156	46,617	15,539	46,482	205
Aug-91	2,042	24:47	2,195	1,387	34.30	70,038	65,031	48,773	16,258	48,523	261
Sep-91	2,080	23:32	2,189	1,305	34.58	71,931	66,845	50,134	16,711	49,925	207
Oct-91	2,216	24:19	2,188	1,294	34.65	76,784	70,906	53,180	17,726	53,121	184
Nov-91	2,052	23:51	2,167	1,237	34.93	71,678	66,268	49,701	16,566	49,408	236
Dec-91	110	20:57	2,211	1,926	35.39	2,267	2,064	1,548	515	2,653	72
Average:	1,773		2,189	1,443	34.21	60,383	55,901	41,926	13,975	41,902	199

APPENDIX SECTION 14 - TABLE 14-4
SPARROWS POINT PLANT
COKE PRODUCTION DATA - COMBINED BATTERIES

BATTERY TOTALS	# OVENS PUSHED	GROSS COKING TIME	NATURAL COAL CHG NET TON	DRY COAL CHG NET TON	HIGH VOL DRY COAL NET TON	LOW VOL DRY COAL NET TON	DRY RUN OF OVEN COKE	COKE BREEZE NET TON
Jan-91	3669	25:10	87,738	80,789	60,597	21,194	60,612	733
Feb-91	3504	25:02	85,110	79,205	59,407	19,798	59,600	648
Mar-91	3917	25:34	94,215	86,851	65,141	21,710	64,909	366
Apr-91	3983	24:40	97,483	89,756	67,320	22,437	66,733	319
May-91	4043	24:43	98,003	90,553	67,916	22,637	67,709	374
Jun-91	3819	26:07	93,559	86,936	65,202	21,734	65,412	258
Jul-91	4009	25:43	99,137	92,259	69,193	23,066	69,171	530
Aug-91	3986	25:03	101,005	93,775	70,329	23,446	69,967	561
Sep-91	3999	24:56	102,396	95,160	71,368	23,792	71,073	487
Oct-91	4200	24:43	108,205	99,923	74,943	24,980	74,864	428
Nov-91	3957	24:17	101,539	93,853	70,390	23,462	69,936	550
Dec-91	375	23:00	5,465	4,974	3,731	1,243	5,862	176
Average:	3,622		89,488	82,836	62,128	20,792	62,154	453
Total:	43,461		1,073,855	994,034	745,537	249,499	745,848	5,430

Coke Oven Gas Production - Sparrows Point - March 1991

To " "
'A' Bell, INTERNAL USE
DESCRIPTION

DATE	CUBIC FEET OF COKE OVEN GAS PRODUCED			UNDERFIRING COKE OVEN GAS CONSUMED			BLEND	ENRICHING	COKE OVEN GAS	BLAST FURNACE	BATTERIES
	"A" PLANT	"B" PLANT	TOTAL	# 11 BATTERY	# 12 BATTERY	"C" BATTERY	GAS	GAS	TO THE ONE	UNDERFIRING GAS	
									PURGE	CONSUMED	
03/01/91	19,360,000	10,629,762	29,989,762	3,033,612	4,222,600	11,361,000	297,750	0	11,074,789	1,322,370	300
03/02/91	18,160,202	10,330,000	28,710,202	2,971,356	4,263,129	11,004,000	230,000	0	9,429,307	1,294,000	0
03/03/91	14,640,000	10,540,000	25,180,000	2,024,325	4,189,204	10,679,000	75,000	0	7,412,391	800,633	0
03/04/91	14,734,026	10,135,760	24,869,786	2,789,970	4,102,030	9,990,000	425,000	0	7,561,910	672,379	0
03/05/91	16,341,110	11,072,903	28,214,013	2,937,000	4,117,464	10,533,000	062,300	0	9,744,049	662,642	0
03/06/91	16,116,064	11,270,070	27,386,934	2,092,100	3,060,625	10,929,000	775,000	0	8,930,121	522,502	300
03/07/91	17,203,146	11,535,505	28,740,651	3,140,430	4,277,330	11,200,000	170,300	0	9,070,303	930,029	13,750
03/08/91	17,520,694	11,257,700	28,778,402	3,022,063	4,150,250	10,609,000	66,250	0	10,922,919	929,201	0
03/09/91	17,236,600	11,036,562	28,293,242	2,710,409	4,066,030	10,041,000	140,000	0	10,326,923	097,350	0
03/10/91	18,370,164	11,046,196	30,224,360	2,062,677	4,206,905	11,200,000	46,250	0	11,000,440	1,034,210	0
03/11/91	18,509,520	11,476,925	29,986,445	2,770,694	4,120,629	10,030,000	2,006,250	0	10,162,912	954,673	0
03/12/91	18,403,670	11,004,436	29,568,114	2,046,496	3,735,020	10,304,000	735,000	0	11,706,790	463,936	0
03/13/91	18,096,700	11,531,076	29,627,776	2,916,663	3,953,046	11,041,000	321,250	0	11,193,017	910,073	0
03/14/91	18,412,074	11,466,305	29,878,459	2,900,015	4,017,745	10,901,000	200,000	0	11,630,099	911,213	200,350
03/15/91	18,159,926	11,147,976	29,307,902	3,049,122	4,202,741	11,555,000	625,000	0	9,076,039	477,205	1,500
03/16/91	18,192,120	11,793,132	29,985,252	2,363,704	4,007,730	11,157,000	27,500	0	12,229,210	1,001,340	0
03/17/91	18,150,004	11,903,920	30,054,732	2,023,750	4,057,500	11,103,000	05,000	0	11,905,402	006,206	0
03/18/91	15,919,344	11,600,669	27,600,013	2,066,023	4,326,072	11,041,000	35,000	0	9,311,910	619,191	0
03/19/91	18,900,453	11,557,092	30,450,345	2,430,070	3,900,606	11,664,000	032,300	0	11,531,169	43,936	0
03/20/91	18,500,200	11,703,231	30,217,511	2,631,250	3,053,100	11,930,000	625,000	0	11,130,073	211,065	0
03/21/91	18,455,464	11,209,224	29,664,680	2,725,540	4,202,101	11,747,000	37,500	0	10,072,459	609,932	0
03/22/91	17,517,400	11,306,196	28,823,676	2,022,303	4,140,972	11,700,000	007,500	0	9,140,020	204,972	1,000
03/23/91	15,714,000	11,195,332	26,909,332	2,426,122	3,646,000	10,929,000	025,000	0	10,002,370	1,021,760	0
03/24/91	17,911,234	11,006,435	29,797,669	2,433,719	3,000,412	11,316,000	075,000	0	11,970,530	700,745	0
03/25/91	19,764,624	11,237,107	31,001,011	2,663,950	3,900,790	11,046,000	1,070,000	0	12,341,063	032,797	0
03/26/91	19,067,664	11,506,130	31,373,794	2,730,500	4,329,207	11,300,000	1,025,000	0	11,969,007	356,369	0
03/27/91	18,319,140	11,005,036	29,404,176	2,044,351	4,237,076	11,097,000	030,000	0	10,375,509	444,906	0
03/28/91	18,271,950	11,330,616	29,602,566	2,737,531	4,367,037	11,021,000	075,000	0	10,304,990	005,402	0
03/29/91	16,450,270	11,344,990	27,003,260	3,131,146	4,291,930	11,230,000	150,000	0	8,974,536	404,966	0
03/30/91	18,569,003	11,050,040	30,419,051	2,529,769	4,103,997	10,902,000	07,500	0	12,714,905	1,250,940	0
03/31/91	18,132,606	11,000,710	30,021,356	2,611,771	4,103,100	11,025,000	110,500	0	11,900,957	1,004,070	0
TOTALS	330,016,100	351,006,120	901,902,300	06,703,065	126,960,379	344,962,000	14,422,750	0	320,767,306	23,630,121	224,700
NTD											

Coke Oven Gas Production - Sparrows Point - April 1991

[illegible]

Coke Oven Gas Production - Sparrows Point - August 1991

Coke Oven Gas Production - Sparrows Point - August 1991												11	12
REPORTED GAS VALUES				UNIFORMING COKE OVEN GAS (COMBINED)			BLEND	REWORKING	COKE OVEN GAS	BLAST FURNACE	BATTERIES	11	12
DATE	CUBIC FEET OF COKE OVEN GAS PRODUCED			11 BATTERY	12 BATTERY	"A" BATTERY	cut off order - estimates -	GAS	GAS	TO THE GAS PUMPS	UNIFORMING GAS COMBINED	11	12
	"A" PLANT	"B" PLANT	TOTAL										
08/01/91	21,238,100	9,922,900	31,161,000	2,839,327	3,793,939	12,322,000	300,000	0	0	12,494,534	290,855	0	0
08/02/91	19,782,350	10,854,936	30,637,286	2,839,327	3,793,939	11,621,000	300,000	0	0	12,371,830	469,817	0	0
08/03/91	21,991,200	8,415,000	30,406,200	2,839,327	3,793,939	11,330,000	300,000	0	0	12,053,734	165,086	0	0
08/04/91	21,891,950	10,385,235	32,197,185	2,839,327	4,193,939	12,255,000	300,000	0	0	12,086,719	378,935	0	0
08/05/91	23,250,914	10,078,640	33,329,552	2,839,327	3,893,939	11,007,000	300,000	0	0	15,000,856	249,037	0	0
08/06/91	21,400,075	11,073,375	32,473,450	2,239,327	4,093,939	11,794,000	300,000	0	0	14,035,704	207,092	0	0
08/07/91	25,112,680	11,497,015	36,610,695	2,167,194	3,927,273	11,550,000	300,000	0	0	12,610,836	670,413	0	0
08/08/91	24,091,409	10,031,000	34,123,409	2,167,194	3,927,272	12,385,000	300,000	0	0	15,342,831	233,357	0	0
08/09/91	23,760,033	10,374,419	34,134,452	2,167,194	3,927,272	11,355,000	300,000	0	0	16,373,906	497,057	0	0
08/10/91	16,900,594	10,910,833	27,811,427	2,300,194	3,927,272	10,203,000	300,000	0	0	11,170,161	265,127	0	0
08/11/91	23,241,275	6,172,625	29,413,900	2,167,194	3,927,272	10,563,000	300,000	0	0	12,436,434	271,770	0	0
08/12/91	25,530,200	10,719,357	36,249,557	2,167,194	3,927,272	12,503,000	300,000	0	0	17,274,171	912,279	0	0
08/13/91	20,553,700	8,011,660	28,565,360	2,167,194	3,927,272	12,451,000	300,000	0	0	10,513,974	517,742	0	0
08/14/91	24,402,331	10,093,441	34,495,772	2,267,194	4,327,272	12,273,000	300,000	0	0	16,214,306	577,100	0	0
08/15/91	23,070,244	9,696,532	32,766,776	2,167,194	3,957,272	11,770,000	300,000	0	0	15,300,310	766,776	0	0
08/16/91	22,637,470	11,201,685	33,839,155	2,182,405	3,972,326	12,940,000	300,000	0	0	14,444,424	333,206	0	0
08/17/91	25,646,400	9,005,920	34,652,320	1,936,224	3,919,039	12,451,000	300,000	0	0	16,925,237	201,012	0	0
08/18/91	25,725,624	10,026,571	35,752,195	2,221,053	4,092,361	12,164,000	300,000	0	0	17,774,704	679,415	0	0
08/19/91	23,019,400	10,263,996	33,283,396	1,905,930	4,161,363	11,414,000	300,000	0	0	16,304,035	2,944,930	0	0
08/20/91	24,113,000	10,460,040	34,573,040	2,001,044	4,013,356	12,052,000	300,000	0	0	15,334,320	2,963,970	0	0
08/21/91	22,230,900	9,173,075	31,403,975	2,100,730	3,967,100	11,353,000	300,000	0	0	13,003,437	2,631,100	0	0
08/22/91	22,530,736	10,630,440	33,161,176	2,205,000	4,239,600	12,304,000	300,000	0	0	14,100,400	630,140	0	0
08/23/91	24,374,316	9,000,927	33,375,243	2,125,794	4,400,035	11,706,000	300,000	0	0	15,570,334	1,243,200	0	0
08/24/91	22,040,535	10,253,070	32,293,605	2,324,046	4,200,035	11,540,000	300,000	0	0	13,920,664	1,544,300	0	0
08/25/91	19,941,446	10,126,678	30,068,124	2,125,794	4,203,739	11,406,000	300,000	0	0	11,932,391	1,530,040	0	0
08/26/91	23,700,200	10,391,532	34,171,040	2,039,354	3,933,010	11,600,000	300,000	0	0	16,230,476	2,130,310	0	0
08/27/91	24,304,426	10,222,950	34,507,376	2,046,272	4,040,206	12,116,000	300,000	0	0	15,036,030	1,140,270	0	0
08/28/91	23,065,534	10,275,000	34,141,422	2,032,030	4,160,602	12,376,000	300,000	0	0	15,232,710	1,630,740	0	0
08/29/91	23,005,220	10,231,600	33,316,800	2,211,363	4,330,750	11,592,000	300,000	0	0	14,054,355	399,030	0	0
08/30/91	22,176,100	9,919,260	22,095,440	2,139,069	4,113,221	11,707,000	300,000	0	0	13,036,150	017,530	0	0
08/31/91	22,340,700	10,041,053	32,182,641	2,060,667	3,964,321	11,617,000	300,000	0	0	15,240,453	1,023,330	0	0
TOTALS	709,927,904	314,295,057	1,024,222,961	66,006,911	125,310,343	367,207,000	9,300,000	0	0	455,590,707	20,745,267	0	0
NTD													

DATE

FILMED

7/26/94

END