One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

Permit expired
Oct 4, 2003

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BUREAU OF AIR REGULATION

GULF POWER
A SOUTHERN COMPANY

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November 12, 2003

Mr. Jeffrey F. Koerner
Florida Department of Environmental Protection
Division of Air Resources Management
2600 Blair Stone Road
Mail Station #5510
Tallahassee, Florida 32399-2400

RE: Final Biomass Report for Plant Crist Electric Generating Plant
Air Permit No. 0330045-004-AC

Dear Mr. Koerner:

Attached please find one copy of the Final Biomass Report for Plant Crist and report certification by the Responsible Official. The referenced report covers testing that was conducted on Unit 4 from December 2002 through May 2003. The results indicate that we can co-fire approximately 7% by weight of biomass, which accounts for approximately 4% of the unit's generation.

If you should have any questions regarding this report please feel free to call me at (850) 444-6527 or Mike Markey at (850) 444-6573.

Sincerely,

Dwain Waters, Q.E.P.

G. Dwain Waters, QEP
Air Quality Programs Supervisor

Cc: J.O. Vick, Gulf Power Company
Charles Howton, Gulf Power Company
Terry Wright, Gulf Power Company
John Dominey, Gulf Power Company
Sandra Veazey, FDEP, Northwest District

CERTIFICATION BY RESPONSIBLE OFFICIAL

"I, the undersigned, am the responsible official, as defined in Chapter 62-210.200, F.A.C., for the Title V source for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate and complete."

Responsible Official Signature:

Gene L. Ussery, Jr. **Vice-President of Power Generation**	11-14-03 **Date:**

Carbonaceous Test Burn – DRY SAWDUST
Crist Unit 4 Test Final Report
11/11/03

Charles T. Howton – Gulf Power Company

Kimberly L. LeRoy – Gulf Power Company

Bobby S. Watkins – Gulf Power Company

Doug Boylan – Southern Company Services

Executive Summary

On August 28, 2002 Gulf Power Company and the Florida Department of Environmental Protection signed an agreement for the purpose of helping ensure compliance with ozone ambient air quality standards are met within the Pensacola, Florida Metropolitan Planning Area (PFMPA). The first phase of the agreement was the installation of new Selective Catalytic Reduction (SCR) controls on Crist unit 7. The second phase was to complete engineering feasibility studies addressing NOx reduction technologies on Crist Units 4, 5 and/or 6 to achieve the 0.2 lbs/MMBtu emission limit by May 1, 2005; and implementation of emission reduction activities on Crist Units 4, 5, and/or 6 by May 1, 2006.

The utilization of biomass was considered as a test case for reducing NOx for Units 4 and 5. In order to test the feasibility of this alternative, an air construction permit for Units 4 & 5 was secured to test four carbonaceous fuels including sawdust, sander dust, wood chips and switchgrass. The permit was issued on December 9, 2002 with an expiration date of October 4, 2003. A final report, within 90 days of permit expiration, is a condition of the construction permit. This report summarizes two test burns (Phase I and Phase II) of dry sawdust conducted at Plant Crist Unit 4. Phases I and II took place December 17-19, 2002 and February 18-21, 2003, respectively. A total of approximately 256 tons of sawdust was burned at Plant Crist. The purpose of these tests was to determine the NO_x reduction potential of the carbonaceous fuel dry sawdust and to determine if this fuel has the commercial potential as a renewable energy source. The objectives of Phase I were to determine the handling and operational characteristics associated with co-firing as well as take an initial look at how co-firing might affect emissions and unit performance and the potential to reduce NO_x emissions. The objectives of Phase II were to focus on improving unit stability by co-firing a lower percentage of sawdust (7% by weight dry sawdust), streamline the sawdust metering and mixing process, and determine the effect of co-firing on emissions and boiler efficiency.

The test results indicate that sawdust can be successfully co-fired with coal. Stable unit operation was maintained with 7% by weight dry sawdust co-firing, with about 4% of the generation (3.2 MW) was renewable energy produced from the sawdust. At higher concentrations (8% or more by weight) of sawdust, there were difficulties maintaining stable unit operation. Manual control of the unit was necessary because of problems related to the feeder and pulverizer, and by some sawdust bypassing the feeder paddles.

Galatia coal was burned during Phase I, and Drummond and Galatia was burned during Phase II. NOx and CO levels emissions did not appear to be significantly affected by co-firing dry sawdust during stable unit operating conditions. A small amount of VOC's were detected during the Phase II testing at concentrations ranging from 0.00296 to 0.0002 lb/MMBtu. This is unexplained because VOC's were not detected during a single test series in December. During stable unit operations, (i.e. 7% dry sawdust by weight), sulfur, mercury and lead emissions were reduced by up to 3.9%, 3.5% and 3.7%, respectively. Additionally, CO_2 had a reduction of up to about 4% while co-firing biomass.

Introduction

The co-firing of dry sawdust in existing fossil plants was investigated to see if it could offer a cost effective means of producing renewable energy as well as perhaps for reducing NOx emissions. The units are designed to burn fossil fuels (coal, oil and gas), and the properties of biomass are somewhat different from these fossil fuels. Therefore, tests were designed to determine the amount of biomass which could be safely co-fired with coal, and the changes in emissions and costs associated with that co-firing.

Objective

There were two phases of testing. In the first phase, the objective of these tests was to determine the handling and operational characteristics associated with co-firing sawdust with coal in Plant Crist Unit 4 as well as take a first look at the effects of co-firing on unit emissions and performance. The findings from Phase I laid the foundation for the objectives of Phase II which were to focus on improving unit stability by co-firing a lower percentage of sawdust (7% by weight dry sawdust compared with 8% in Phase I), streamline the sawdust metering and mixing process, and determine the effect of co-firing on emissions and boiler efficiency.

Instrumentation and Measurements

Sanders Engineering & Analytical Services, Inc. was contracted to perform stack testing for this study. Measurements were made of particulate emissions, NO_x, CO and VOC emissions during these tests with the applicable EPA procedures. Particulate emissions tests relating to this site operations was conducted using EPA Method 17. In addition, 40CFR, Part 60, Appendix A, Methods 1, 2, 3a, 4, and 7e were utilized.

Plant instrumentation was used to record mill performance. Fly ash samples were taken from ESP hoppers for unburned carbon analysis. Control room data were used to monitor the unit operation and stability.

Fuels

The carbonaceous fuel co-fired was dry sawdust obtained from two local sources. In Phase I, Swift Lumber and Mobile Forest Products supplied sawdust. Mobile Forest Products supplied all of the sawdust for Phase II. The material appeared to be clean and fine material, with occasional chips or slivers.

Figure 1: Moisture Content and Heating Value for the Sawdust Co-fired

Phase	Vendor	Moisture (% by weight)	Heating Value(as received)
I	Swift Lumber	8.9	8177 Btu/lb
I	Mobile Forest	8.93	7943 Btu/lb
II	Mobile Forest	9.74	7829 Btu/lb

Phase I testing used Galatia coal. The coal for the second and third day of testing was much wetter than for the previous two days due to local rainfall. During Phase II, the coal for the baseline coal-alone testing was Galatia coal. Coal for the first day of co-firing testing was a combination of Galatia and Drummond coals. Drummond coal was

FIGURE 2: PLANT CRIST FIRING RATE FOR COAL AND SAWDUST

Date	Co-Firing Hours	Daily Sawdust (Tons)	Sawdust Tons Per Hour	Sawdust Ave Heat Input/Hr	Daily Coal (Tons)	Coal Tons Per Hour	Coal Ave Heat Input/Hr	Daily Carb. Fuel (Tons)	Average Testing mmBtu/hr	Total Daily mmBtu/hr	Daily Percent of Permit Limit
12/18/2002	5	9.87	1.97	31.83	125.38	25.08	606.47	135.25	NA	638.30	58.20
12/19/2002	24	46.77	1.95	31.41	560.58	23.36	564.93	607.35	699.70	596.34	54.38
12/20/2002	24	38.05	1.59	25.56	456.15	19.01	459.68	494.20	NA	485.24	44.25
2/18/2003	24	32.14	1.34	20.97	715.27	29.80	720.81	747.41	813.20	741.78	67.64
2/19/2003	21	35.39	1.69	26.38	492.76	23.46	567.52	528.15	NA	593.91	54.15
2/20/2003	24	45.37	1.89	29.60	551.59	22.98	555.87	596.96	781.50	585.47	53.38
2/21/2003	24	24.42	1.02	15.93	269.78	11.24	271.87	294.20	769.50	287.80	26.24
2/22/2003	4	10.73	2.68	42.01	118.57	29.64	716.92	129.30	NA	758.93	69.20
3/4/2003	11	24.76	2.25	35.25	328.97	29.91	723.32	353.73	NA	758.57	69.17
3/7/2003	10	18.11	1.81	28.36	240.64	24.06	582.01	258.75	NA	610.37	55.65
Totals	171	285.61	NA	NA	3859.69	NA	NA	4145.30	NA	NA	NA

1 = Average Testing Rate from Test Reports
2 = Evaluation of Heat Input Related to Daily Totals
Assumed Biomass on 3/4 & 3/7 at 7% by weight

NA = Not Applicable
Permit limit 1096.7 MMBtu/hr

@ 43% tph

8.7 Sawdust → 3.7
8.7 Sander → 3.7
6.7 switch → 2.9
10.9 woodchip → 4.7

used co-firing Days 2 through 4. The coal and sawdust during this time frame were much wetter than the first day due to a considerable amount of local rainfall. As a result of the shift in coal during the Phase II test period, another baseline coal-alone test was conducted with Drummond coal on May 2, 2003.

One method of determining the sawdust co-firing percentage was by monitoring weight of coal and sawdust with the coal handling system. There were two reclaims and two belts, but only one scale. The coal-reclaim and its rate of coal flow were initially measured with no sawdust addition and the belt rate upstream of the sawdust-reclaim calibrated. The weight of sawdust in a bobcat bucket was determined by calculation. Then the rate of sawdust co-firing was determined by the bobcat bucket rate into an estimated rate of coal. The scales in this case weighed the resulting mix. Therefore, percentage of sawdust was based on the total weight of mixed coal and sawdust and the number of bobcat buckets added to determine the actual mixture concentration of sawdust. Scale and bucket methods were compared with other techniques involving chemical analysis of sawdust, coal, and fuel mixture samples.

Test Procedure

Three days of testing were performed during Phase I and four days during Phase II. The first day of each phase was a baseline test firing 100% coal. Emissions data, ash LOI, unit performance data, and mill operation data were taken throughout the testing. Phase I testing determined 8% of sawdust by weight could not be comfortably co-fired with coal, maintaining stable unit operation. During Phase II testing, sawdust percentage was reduced, and the bunker was several times charged with a mixture estimated at 7% sawdust by weight and measurements of mill operations. Data on emissions and unit performance, were taken. Because of coal changes that occurred during Phase II, a second baseline test at 100% coal was conducted to determine any relevant changes.

Heat input was monitored to ensure that the permitted maximum heat input was not exceeded during the biomass testing project. As illustrated in Figure 2, the permitted fuel limits were not exceeded. Heat input values for testing can be found in Appendices A-F.

Test Results and Discussion

Sawdust Percentage

The coal belt speed, belt scales, and bobcat bucket were used to control an approximate percentage mix of sawdust with coal. However, because of some uncertainty of the bobcat bucket weight, samples of the mix were taken to provide another measure of the actual weight percentage of sawdust in the fuel. The mixed coal-sawdust fuel samples were analyzed for heating value and for sulfur content. Based upon the heating values for the coal and sawdust alone, the percentage of sawdust in the mixture could be calculated.

Analysis indicated that the percentage of sawdust of Phase I testing averaged about 8% by weight. The sawdust represents about 5% of the unit generation, or about 4 MW at full load operation. During Phase II testing, roughly 4% of the generation (about 3.2 MW) was from co-firing sawdust (about 7% by weight). This was consistent with values calculated from heating value analyses for coal, sawdust, and mixed samples.

Operations

There was difficulty in attaining stable operating conditions during the Phase I testing; however, operating conditions appeared to be more stable during Phase II. This is most likely due to operating at a slightly reduced sawdust percentage. The operational instability of the Phase I testing can be seen in Figure 3. These figures show the range of variability in measured test parameters, with wider ranges reflecting less stable operation.

Figure 3: Phase I operating conditions – max and min test readings

Properties	Coal Alone	Mix
MW	80.4 – 81.3	77.3 – 80.5
Steam	617 – 635	606 – 674
Air Flow	654 – 676	652 – 663
O_2 A	2.41 – 2.72	2.01 – 3.1
O_2 B	2.31 – 2.6	1.78 – 3.06

The spread of O2 values with co-firing was particularly wide, and the values cycled throughout the test. Load could not be held steady, as seen in the 10% variation in unit steam flow. These unsteady conditions can have a large impact on the evaluation of emissions with co-firing.

There were several factors which contributed, and sorting the relative magnitude of each will be difficult. Discussion with operators indicated that at full load with coal alone, the pulverizers are near their operational limits. As a result, the presence of the sawdust caused problems for the feeders and mills as the energy content per unit volume of the biomass is much less than that of coal. Therefore, fluctuations in fuel mixture with time cause stability issues for the control system.

The other factor is coal moisture. During the first day of testing, the coal appeared to be much drier than it was in later tests. The stickiness of the wet coal is believed to have contributed in part to the difficulty in maintaining constant conditions for testing. Coal moisture was higher for the December 18 tests than for baseline. However, on the 19^{th}, coal moisture was actually a little lower, although the coal appeared to be more self-adhesive.

Unit operation in Phase II was much more stable. Figure 4 shows that the swing in variables was comparable for coal alone and for coal-sawdust co-firing. The operating conditions appeared to be more stable during the Phase II testing in comparison to Phase I, most likely due to operating at a slightly reduced sawdust percentage. The boiler controls and mill exhauster were operated manually the first day. On Days 2 and 3, all controls were on automatic. On the last day of testing, all of the controls with exception of the ID Fan were operated manually. Co-firing the sawdust with coal was just as stable as firing coal alone.

Figure 4: Phase II operating conditions – max and min test readings

Properties	Coal Alone	Mix (02/21/03)
MW	80.0 – 81.5	79.0 – 81.5
Steam	614 – 633	619 – 635
Air Flow	635 – 673	710 – 723
O_2 A	2.0 – 2.7	3.0 – 3.4
O_2 B	2.4 – 3.12	3.7 – 4.0

ESP Operation - As required by permit, ESP parameters were monitored for Crist Unit 4. Field voltages and amperages, arcs/sparks per minute, kilowatts and firing angle were monitored and recorded at the beginning and end of each required particulate matter run. No adjustments were made to the ESP during the carbonaceous fuel testing project. In fact, the ESP operation while firing the sawdust was comparable to that of firing coal alone. Data sheets for ESP operation are located in Appendices A-F.

Heat Input – Monitoring of heat input was previously mentioned in the test procedure section of this report. The permit limits of 97.7 MMBtu/hr biomass and the weight totals of 8.7 tons of sawdust per hour as well as 6288 tons of sawdust were not exceeded during the implementation of the testing. These requirements are included in the construction permit located in Appendix H.

Handling

There were some initial problems controlling the sawdust flow through separate feed that were overcome during the Phase I testing. There was also some indication that at 8% sawdust and coal mixture stratified in the bunker due to aerodynamic separation; however, good mixing was obtained from transfer points in the bunker.

The bunker ran out of the carbonaceous fuel mixture around 2300 hours the first day of Phase II testing. A quantity of coal was added to the bunker to keep the unit on line until testing would resume the next day. There was a considerable amount of rainfall the second day of testing, and as a result, the outdoor sawdust hopper was extremely wet. When the sawdust was fed into the hopper, the handlers had trouble getting the sawdust to slide through. It had a tendency to stick to the walls of the hopper.

Fugitive dust emissions were not an issue during Phase I or II testing. Sawdust which was input into the unit had an average moisture content of 8.7%. In addition, there were several rainfall events during testing.

Mill Operation and issues

During the Phase I testing, the pulverizer filled with coal/sawdust mix, requiring shutting down the mill due to overload and resulting in unit upset at 8% sawdust co-firing. Part of the problem may have also been related to wet coal. Adjustments were made to the scraper blades and the slide gates on all feeders. The problem seemed to occur most frequently with D mill. This is the top mill and has a significant effect on operation of the unit. A fire also occurred in the tempering air inlet duct of D Mill, which was extinguished with a water hose. The sawdust and coal laid out in the tempering air inlet duct in a severe instance of the mill overloading. The mill had to be shut down. When it was restored to operation, this material caught on fire. Mill amps did not appear to change much with the introduction of sawdust; however, the mill roller displacement increased about 1/16 inch.

During the Phase II testing, all of the mills were loaded up about three hours into the first day of testing. This issue was resolved in an hour after the feeder adjustments were made. The mill amps and temperature were within normal operating range. There were several problems with 4D Mill. It heavily loaded a few times during co-firing test Day 1. A piece of coal ignited in the tempering air duct, but was punched out in the pyrite section by an operator. 4D Mill had to be taken out of service during the Night Shift due to a plugged Coal Pipe. Eight Gas Guns were put in service while 4D Mill was out for maintenance. On Day 2, 4D Mill was taken out of service because the journal locked up locked up. This was caused by a plugged Coal Pipe and was not indicative of the sawdust. Water was the culprit. Testing that day (Day 2) had to be canceled due to problems associated with 4D Mill. Before the testing began on Day 3, 4D Mill loaded, and there was a small fire in the tempering air duct (due to coal igniting) which was punched out as well. There were no problems with the Mills after the testing began on Day 3 or Day 4.

Efficiency

The dry gas loss is the energy from the burning of the fuel which is lost with the hot gases exiting up the stack. Dry gas losses were estimated from available data in these tests, and the results indicate little or no effect of co-firing on dry gas loss. These losses were comparable to the losses associated with firing coal alone. The moisture of the dry sawdust should not give any substantial losses compared with coal on the average. Fly ash LOI was fairly comparable for all tests with the exception of the co-firing test #3 for Phase I. LOI averaged 3 to 5 percent for the first two tests but measured between 11.7 and 15.7 percent for the third test. This test was conducted at a lower O2 than the other tests. However, higher CO measurements would also be expected if the O2 were responsible, and this was not seen. The reason for this very different result is not known, but is probably related to the unstable Phase I operating conditions. Fly ash LOI averaged 5 percent (4 – 6 percent range) for Phase II and is considered acceptable and typical of normal levels.

Emissions

Firm conclusions related to the effect of co-firing on emissions could not be made during Phase I because of unstable operating conditions during the sawdust co-firing. Therefore, additional testing, under more stable conditions, was conducted during the Phase II testing.

A summary of emissions data collected by Sanders Engineering is presented in Figure 5. This table details results of NOx, CO, particulate, and Volatile Organic Compounds (VOC) measured during Phase I, Phase II, and the follow-up baseline coal test in May. Measurements of furnace exit O2 are helpful in interpreting the data, particularly as NOx and CO levels depend on combustion excess air levels. Single control room O2 readings were available for each test, and these are also presented in the table.

Based on these data, the following observations from the data were made:

NO_x – As required by permit, NOx, SO_2 and Opacity readings were documented by the continuous emissions monitor system (Appendix I). In the Phase I baseline tests , the observed NO_x emissions were low and consistent at about 0.4 lb/MMBtu. During the Phase I co-firing tests, NO_x started out at about 0.8 to 0.9 lb/MMBtu, and drifted gradually lower with time until it reached about 0.39 where the NO_x value steadied until the end of the test. Because of the instability of these tests, no conclusions were made regarding NOx emission reductions for Phase I.

Figure 6 shows Sanders NOx measurements from the Phase II tests, plotted with Control Room furnace exit O2 level.

Date	Time	Fuel	Run	CR O2 %	NOx Lb/MMBtu	CO Lb/MMBtu	Particulate Lb/MMBtu	VOC Lb/MMBtu
12/17/2002	8:07-9:07	g	1	2.54	ND	0.0105	0.018	0
	9:56-10:56	g	2	2.57	ND	0.009	0.012	0
	11:33-12:33	g	3	2.42	ND	0.0106	0.003	0
12/19/2002	12:04-13:04	g/s	1	2.84	ND	0.0527	0.004	0
	13:35-14:36	g/s	2	2.32	ND	0.0452	0.004	0
	15:25-17:00	g/s	3	2.32	ND	0.0217	0.006	0
2/18/2003	9:47-10:47	g/d/s	1	2.93	0.447	0.01262	NR	0.00296
	12:34-13:34	g/d/s	2	3.59	0.510	0.00855	NR	0.00249
	13:55-14:55	g/d/s	3	3.33	0.509	0.00776	NR	0.00156
2/20/2003	15:00-16:00	d/s	1	3.1	0.502	0.00498	NR	0.000423
	16:16-17:18	d/s	2	3.85	0.493	0.00693	NR	0.000319
	17:37-18:37	d/s	3	3.85	0.490	0.00619	NR	0.0002
2/21/2003	8:14-9:14	d/s	1	3.36	0.506	0.00657	NR	0.000301
	9:27-10:27	d/s	2	3.71	0.485	0.00574	NR	0.000225
	10:41-11:41	d/s	3	3.55	0.497	0.00673	NR	0.000356
5/2/2003	6:35-7:35	d	1	2.85	0.390	0.00591	0.017	0
	8:24-9:24	d	2	2.85	0.395	0.00594	0.019	0
	10:04-11:04	d	3	2.8	0.396	0.00497	0.016	0

Figure 5: Emissions - Sanders Test Data Summary
NR = data not collected, g = Galatia coal, d = Drummond coal, s = sawdust
Note: All Particulate Tests Below 0.025lb/MMBtu
ND = Not Reported by Sanders (Data Acquired by CEMS System)

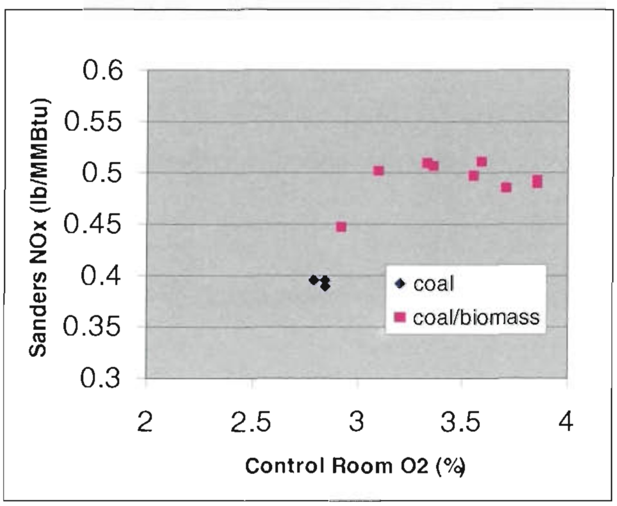

Figure 6: Sanders NOx data plotted with available control room O2

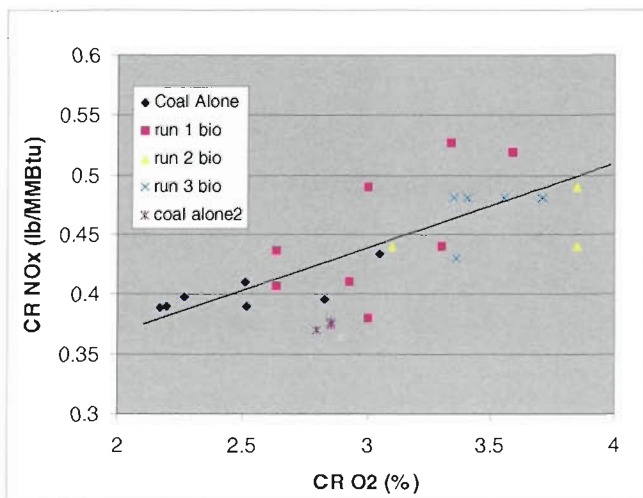

Figure 7: Hourly full load control room NOx data plotted with hourly control room O2

Phase II results were more conclusive regarding NOx emissions. Figure 6 illustrates NOx emissions for carbonaceous fuel being slightly higher than baseline coal operations. This is believed to be related to a higher O_2 operation level during biomass firing. Hourly full load data were taken of Control Room O_2 and Control Room NOx (from CEMS) over several days. These are plotted in Figure 7 and show that the coal alone and biomass co-firing data are comparable. An increase NOx emissions correlates with increased excess air.

CO – In Phase I, CO appeared to be higher with co-firing than for coal-alone; however, the CO readings may have been increased by the upsets of the unit due to unstable operations during the Phase I testing. During Phase II the CO readings were similar for coal and carbonaceous fuel firing.

Figure 8 shows a plot of the Sanders CO data during stable tests plotted with available control room O2 data. Based on this figure, there does not appear to be an influence of dry sawdust co-firing on CO emissions.

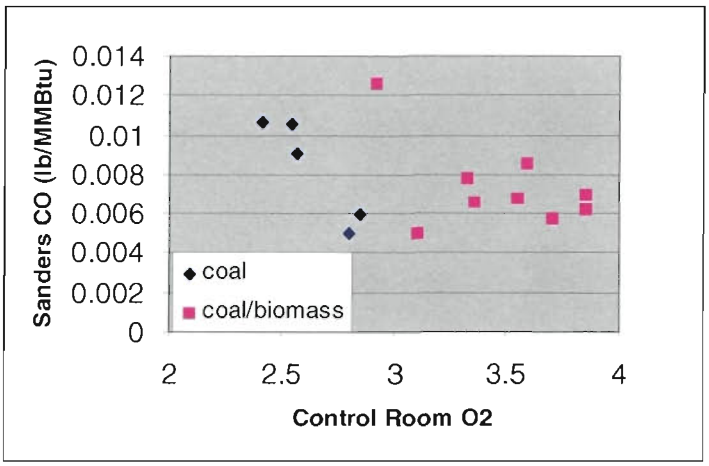

Figure 8: Sanders (CO) data plotted with available control room O2

Particulate – Particulate emissions as measured by Sanders are presented in Figure 9. This data indicates that particulate emissions with dry sawdust co-firing is comparible to and probably less than that of coal alone.

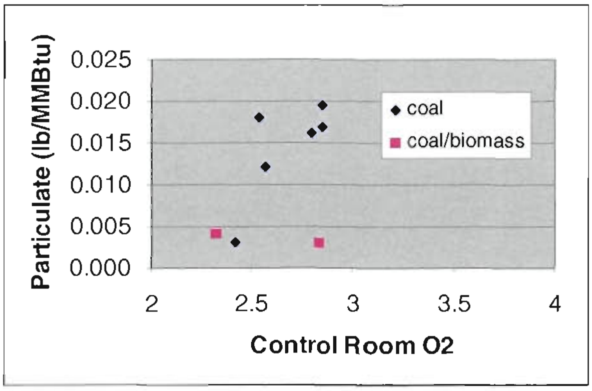

Figure 9: Sanders particulate measurements plotted with available control room O2

Sulfur, mercury and lead – Sulfur, mercury, and lead contents of the sawdust are lower than those of the coal. Therefore, for these parameters emissions during co-firing can be expected to be less than that of coal alone operation and should be reduced by the amount of the sulfur, mercury and lead per Btu in the two fuels. For 4 % of energy, the emissions reductions during co-firing are as follows: Sulfur – 3.9%, Mercury – 3.5% and Lead – 3.7%. Figure 10 is a summary of the various concentrations of sulfur, mercury, lead, heating value, moisture, nitrogen, and fluorine.

Figure 10: Analytical Results for Coal and Carbonaceous Fuel Testing

Fuel	HV (Btu/lb)	Moisture (% by weight)	Nitrogen (% by weight)	Sulfur (% by weight)	Ash (% by weight)	Fluorine (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)
Galatia	11985	12.30	1.54	1.03	6.11	26.67	22.27	0.09
Drummond	11470	13.01	1.30	0.47	5.18	16.67	2.00	0.075
Mobile Forestry	7943	8.93	0.08	0.02	0.47	10	0.2	0.01
Swift Lumber	8177	8.47	0.06	0.02	0.42	7.67	0.13	0.01

Note: All values are from As Received sample data.

Heating Value – As illustrated in the table above, the sawdust supplied by Mobile Forestry and Swift Lumber have a much lower heating value than coal. These two fuels range from 7943 Btu/lb to 8177 Btu/lb respectively.

Nitrogen – The levels detected in the fuels used for testing show that the nitrogen content for the sawdust is much lower (0.08 and 0.06 % by weight) than that of coal (1.54 and 1.30 % by weight).

Ash – Sampling required by our permit indicates that the ash percentage by weight is much lower for sawdust than coal. With Galatia and Drummond coals, the ash content by weight was 6.1% and 5.2% respectively. Ash resistivity and particulate size distribution testing was not conducted pursuant to the low particulate emissions observed during the study (< 0.025 lb/MMBtu). As illustrated previously in Figure 5, all particulate test results were below the threshold value of 0.025 lb/MMBtu.

VOC – Volatile Organic Compounds (VOC) were not detected in either the baseline for Phases I and II or co-firing case for Phase I; however, low level VOC concentrations were detected during the co-firing for Phase II. The VOC emissions averaged 0.000981 lbs/MMBtu. This is within acceptable levels, but the measurement of any VOC, which occurred only in the February test series, was unexpected and remains unexplained.

CO_2 - Net CO_2 emissions to the atmosphere are reduced due to displacing fossil fuel with a carbonaceous fuel material. At 7% sawdust co-firing by weight, the net CO_2 emissions to the atmosphere while co-firing has an estimated reduction of approximately 4% which equates to the percentage of energy co-firing achieved during Phase II and I, respectively.

Conclusions

Based on the results and full analysis of data from both tests (Phases I and II), the following conclusions and observations are made:

1. Sawdust was successfully co-fired with coal at Plant Crist Unit 4.
2. Roughly 4% of generation (3.2 MW) can be successfully co-fired with sawdust (about 7% by weight). Operational problems can be expected at higher carbonaceous feed rates without a better feed system.
3. All emissions were within permitted levels.
4. NO_x emissions were slightly higher during co-firing. NOx emissions with and without co-firing were comparable when O_2 levels were taken into account. CO during stable operation would be comparable between coal and carbonaceous. Particulates were not adversely impacted by co-firing and are expected to be slightly lower with co-firing as with coal alone.
5. The VOC's detected during Phase II co-firing testing were low and occurred during three carbonaceous fuel tests.
6. Co-firing the sawdust does not appear to reduce efficiency in any appreciable way. The moisture loss is expected to be not much different from coal, and there did not appear to be a dry-gas loss penalty with the sawdust.
7. CO_2 has an estimated reduction by the percentage of energy co-firing achieved.
8. Sulfur and the metals such as Lead and Mercury have an estimated reduction by a percentage slightly less than the percentage of fuel displaced by the sawdust.
9. If sawdust is co-fired commercially, it is recommended to mix the predetermined amount of sawdust on the coal pile.
10. Overall, the carbonaceous fuel milled well and no dust problems were detected. There were minor problems with the hoppers when the fuel was wet. There was an instance of mill problems which was corrected through scraper blade and slide gate adjustments. D Mill encountered some problems due to coal pipe pluggage, but none were pertaining to the sawdust.

APPENDICES

Appendix A – May 2, 2003 Baseline Coal Only Emission Tests

Appendix B – February 18, 2003 Carbonaceous Material (Saw Dust) Test Burn Emission Tests

Appendix C - February 21, 2003 Carbonaceous Material (Saw Dust) Test Burn Emission Tests

Appendix D - February 20, 2003 Carbonaceous Material (Saw Dust) Test Burn Emission Tests

Appendix E – December 19, 2002 Carbonaceous Material (Saw Dust) Test Burn Emission Test

Appendix F – December 17, 2002 Baseline Coal Only Emission Tests

Appendix G – Biomass Testing Laboratory Data

Appendix H – Air Permit No. 0330045-004-AC

Appendix I – Continuous Emission Monitor Data for CO_2, NOx, SO_2 and Generation

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

June 4, 2003

Ms. Sandra Veazey
Florida Department of Environmental Protection
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Sandra
~~Ms. Veazey~~:

PLANT CRIST UNIT 4 – AIR PERMIT NO.: 0330045-004-AC
BASELINE COAL ONLY EMISSION TESTS

Please find attached one copy of the Baseline Coal Only Emission Tests Report for Plant Crist Unit 4 as required under Rule 62-297.310(8), FAC.

The emission testing was conducted by Sanders Engineering and Analytical Services, Inc. and Supervised by Gulf Power's Environmental Affairs Department. This testing was conducted to provide baseline data for analysis of the test burn of Carbonaceous Material (saw dust).

Should you have any questions concerning these reports, please call Dwain Waters at (850) 444-6527.

Sincerely,

James O Vick

James O. Vick
Manager of Environmental Affairs

Enclosure:
Attachments:

Cc: J. W. Martin — J. M. Dominey — T. L. Wright
G. D. Waters — Charles Howton
file ENG 10-1-15 PCT *CR4* CORR

RECEIVED
JUN 1 1 2003
NORTHWEST FLORIDA
DEP

One Energy Place
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A SOUTHERN COMPANY

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	G. D. Waters	Charles Howton	
	file ENG 10-1-15 PCT *CR4* CORR		

CERTIFICATION BY RESPONSIBLE OFFICIAL

"I, the undersigned, am the responsible official, as defined in Chapter 62-210.200, F.A.C., for Gulf Power Title V sources for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate and complete."

Responsible Official Signature:

G. L. Ussery Jr.
Vice-President of Power Generation

6-10-03
Date:

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

PARTICULATE, CARBON MONOXIDE, NITROGEN OXIDES, OXYGEN, TOTAL VOLATILE ORGANIC COMPOUNDS, AND EXEMPT VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST REPORT BASELINE STUDY

FOR

GULF POWER COMPANY

Plant Crist, Unit 4
Pensacola, Florida

SEAS

May 2, 2003

1568 LEROY STEVENS ROAD
MOBILE, ALABAMA 36695
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SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.
An Environmental Engineering Firm Specializing in Air Emissions Measurement and Permitting
www.sandersengineering.com EMAIL: sanders@sandersengineering.com
Phone: 251-633-4120 1568 Leroy Stevens Rd.
Fax: 251-633-2285 Mobile, AL 36695

REPORT CERTIFICATION

I have reviewed the "Particulate, Carbon Monoxide, Nitrogen Oxides, Oxygen, Total Volatile Organic Compounds, and Exempt Volatile Organic Compounds Emissions Test Report Baseline Study" for the testing performed for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. I hereby certify that it is authentic and accurate to the best of my knowledge.

Date: 5/7/03

Signature:
Johnny W. Sanders, P.E., M.P.H.
President

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS) performed a baseline study while burning coal for particulate, carbon monoxide, nitrogen oxides, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. The testing was conducted May 2, 2003. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 1, 2, 3a, 4, 7e, 10, 17, and SEAS 2518.** Further discussions of the test methods are included later in the report.

The purpose of the testing was to gain additional information regarding the emission characteristics of the unit while burning coal. The tests were conducted by Mr. Joseph Sanders, Mr. John Rampulla, Mr. Isaac Smith, and Mr. Clifton Haigler of Sanders Engineering & Analytical Services, Inc., and were coordinated with Mr. Kevin Beaty of Gulf Power Company.

2. DESCRIPTION OF SAMPLING PROGRAM

The sampling program consisted of particulate, carbon monoxide, nitrogen oxides, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions testing in compliance with US EPA methods. The following is a brief description of these types of tests.

2.1. Particulate Emissions Testing

The particulate sample was extracted from the stack isokinetically through a stainless steel nozzle and probe onto a pre-weighed glass fiber filter. The sample was taken at a series of points across the stack. Each point represented an equal area of stack. The isokinetic sampling rate and volumetric flow rate was monitored by an S-type pitot tube attached to the probe. Calibrations of the particulate testing equipment including pitots, thermocouples, magnehelics, and other measurement devices are included in Appendix A. A detailed description of the testing procedures and schematic of the sampling train is presented in Section 6. The field data is included in Appendix B. Sample calculations of Run 1 are presented in Appendix C.

2.2. Carbon Monoxide, Nitrogen Oxides, and Oxygen Emissions Testing

Gaseous emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe, a moisture removal system, and into instruments specifically designed for the measurement of the particular pollutant of interest. The instruments responded linearly to concentrations of the pollutants. The output of the instruments is a continuous analog voltage which is digitized and input into a PC based data acquisition system. The PC data acquisition system polls the instrument 1000 times per second. The computer averages these readings into one-second averages during calibrations and one minute averages at other times. These one second and one minute averages are written to the hard disk each minute to ensure no data loss due to power failure or other inadvertent occurrence. The computer stores in memory all calibration and stack gas analyses during each run. The average for each calibration and for each independent run were averaged for the time of the runs. A description of the testing procedures is included in Section 7. The Protocol 1 gas certifications are included in Appendix D.

2.3. Volatile Organic Compounds Emissions Testing

Volatile organic compounds emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe and heated teflon line into a gas chromatograph equipped with a flame ionization detector. The chromatograph divided the compounds into four specific organic compounds and one group of organic compounds. The four specific compounds are methane, acetylene, ethylene, and ethane. The group of compounds are all compounds which contain three or more carbon atoms (Propane+). The chromatograph was injected with a combination of these gases to ensure separation and then calibrated with Protocol 1 gases of propane. The calibration curve for propane was used to convert the area of each peak representing each compound into its equivalent part per million as propane. A description of the testing procedure is included in Section 8. The Protocol 1 gas certifications and calibration graph of propane versus peak area are included in Appendix C. A line loss/system check was performed at the beginning and end of each test by injecting a Protocol 1 propane in nitrogen calibration gas at the probe and measuring the concentration with at least two injections of the chromatograph. Appendix C contains a table which shows the results of these system checks. The raw data is corrected for the line loss/system check if greater than five percent. Example chromatograms are included in Appendix E.

3. SUMMARY AND DISCUSSION OF RESULTS

There were no unusual problems experienced during the performance of the testing. During the performance of the testing the average heat input, as based on F-factor calculations, was 840 million Btu per hour. The results of the particulate emissions testing are presented in Table I. The results for the emissions testing are presented in Table II. The quality assurance calculations for the carbon monoxide, oxygen, and nitrogen oxides testing are presented in Tables III through V, respectively. A graphical representation of the carbon monoxide, oxygen, and nitrogen oxides concentrations are presented in Figure 1. The volatile organic compounds stack gas analysis is presented in Table VI.

Example chromatograms of a combination of a gas containing methane, acetylene, ethylene, ethane, and propane are shown in Appendix D. The purpose of these chromatograms is to show the gas chromatograph column performance in separating each of these compounds. Also included in Appendix D is the representative chromatogram of stack gas showing the only non-exempt volatile organic compounds.

The results of the testing for each parameter are as follows:

PARAMETER	Emission Rate
Particulate	0.0174 lbs/mmBtu
Carbon Monoxide	4.7 lbs/hr
Nitrogen Oxides	331 lbs/hr
Volatile Organic Compounds	0.0 lbs/hr

TABLE I. SUMMARY OF PARTICULATE EMISSIONS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE STUDY

Title of Run		RUN 1	RUN 2	RUN 3
Date of Test	Month/Day/Year	5/2/2003	5/2/2003	5/2/2003
Sampling Time -Start	Military	0634	0822	1005
Sampling Time -Stop	Military	0740	0928	1112
Oxygen F Factor	SDCF/MMBTU	9780	9780	9780
Stack Static Pressure	Inches Water	-1.00	-1.00	-1.00
Barometric Pressure	Inches Mercury	29.97	29.97	29.97
Average Orifice Pressure (ΔH)	Inches Water	1.2	1.1	1.2
Meter Correction Factor		1.063	1.063	1.063
Average Meter Temperature	Degrees F	76.4	84.6	88.9
Oxygen Concentration	Percent O2	6.8	6.7	7.0
Carbon Dioxide Concentration	Percent CO2	12.0	12.0	12.0
Volume of Gas Metered	Cubic Feet	34.860	33.965	36.280
Volume of Water Collected	Milliliters	77.0	80.0	75.0
Sampling Time	Minutes	64	64	64
Nozzle Diameter	Inches	0.210	0.215	0.215
Average Stack Temperature	Deg. F	297.3	301.7	304.7
Area of Stack	Square Feet	92.1350	92.1350	92.1350
Weight of Solids Collected	Milligrams	19.3	21.5	18.5
Number of Points Sampled		32	32	32
Avg. Sqr. Root Velocity Press.	Inches Water	0.8834	0.8499	0.8740

RESULTS OF COMPUTATIONS

		RUN 1	RUN 2	RUN 3	Average
Volume of Gas Sampled	Standard Dry Cubic Feet	36.627	35.143	37.248	
Molecular Wt. of Stack Gas	LB/LB-MOLE	29.094	29.008	29.144	29.082
Water vapor in Stack Gas	Percent	9.0	9.7	8.7	9.1
Average Stack Gas Velocity	Feet per second	59.2	57.2	58.8	58.4
Stack Gas Flow Rate	Standard Dry Cubic Feet Per Minute	207,438	197,807	204,853	203,366
Stack Gas Flow Rate	Standard Wet Cubic Feet Per Minute	227,965	219,002	224,268	223,745
Stack Gas Flow Rate	Actual Cubic Feet Per Minute	327,242	316,179	325,057	322,826
Stack Gas Flow Rate	Pounds Dry Air per Hour	935,952	892,495	924,287	917,578
Particulate Concentration	Grains per Standard Dry Cubic Foot	0.00811	0.00942	0.00765	0.00840
Particulate Concentration	Grains per Actual Cubic Foot	0.00514	0.00589	0.00482	0.00529
Particulate Emission Rate	Pounds per Hour	14.43	15.97	13.43	14.61
Particulate Emission Rate	Pounds per Million Btu (O2 F Factor)	0.0168	0.0194	0.0161	0.0174
Heat Input (O2 F Factor)	Million Btu per Hour	859	825	836	840
Isokinetic Rate	Percent	105.7	101.5	103.9	

TABLE II. SUMMARY OF EMISSIONS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE STUDY

TEST	START TIME Military	STOP TIME Military	STACK GAS FLOWRATE (sdcfm)	WATER VAPOR IN STACK GAS (percent)	F FACTOR Oxygen (Dry) (sdcf/MMbtu)	OXYGEN (Dry) (measured) (Percent)	OXYGEN (Wet) (calculated) (Percent)	Nitrogen Oxides Emissions (ppm-dry)	Nitrogen Oxides Emissions (ppm-wet)	Nitrogen Oxides Emissions (O2 F factor) (lbs/MMbtu)	Nitrogen Oxides Emissions (lbs/hour)	Nitrogen Oxides Emissions (Tons/Year)
RUN 1	6:35	7:35	207,438	9.0	9780	6.8	6.2	225.7	205.4	0.390	335.4	1469.2
RUN 2	8:24	9:24	197,807	9.7	9780	6.7	6.1	230.3	208.0	0.395	326.4	1429.5
RUN 3	10:04	11:04	204,853	8.7	9780	7.0	6.4	226.0	206.5	0.396	331.7	1453.0
Average			**203,366**	**9.1**		**6.8**	**6.2**	**227**	**207**	**0.393**	**331**	**1451**

TEST	START TIME Military	STOP TIME Military	Carbon Monoxide Emissions (ppm-dry)	Carbon Monoxide Emissions (ppm-wet)	Carbon Monoxide Emissions (O2 F factor) (lbs/MMbtu)	Carbon Monoxide Emissions (lbs/hour)	Carbon Monoxide Emissions (Tons/Year)	Volatile Organic Compounds Emissions (O2 F factor) (lbs/MMbtu)	Volatile Organic Compounds Emissions (lbs/hour)	Volatile Organic Compounds Emissions (Tons/Year)
RUN 1	6:35	7:35	5.60	5.10	0.00591	5.1	22.2	0.0000	0.0	0.0
RUN 2	8:24	9:24	5.68	5.13	0.00594	4.9	21.5	0.0000	0.0	0.0
RUN 3	10:04	11:04	4.64	4.24	0.00497	4.2	18.2	0.0000	0.0	0.0
Average			**5.31**	**4.82**	**0.00561**	**4.7**	**20.6**	**0.0000**	**0.0**	**0.0**

TABLE III. CARBON MONOXIDE TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000	ANALYZER ID.	TECO MODEL 48	
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	901	901.0	0.0	0.0
Mid Range Gas	449	458.0	-9.0	-0.9
Low Range Gas	37.8	37.7	0.1	0.0

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	CARBON MONOXIDE CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*0.0*	*453.3*									
6:35	*7:35*	Run 1	*5.7*	*0.1*	*452.6*	*449.0*	*1000.0*	0.0	0.0	0.0	-0.5	-0.5	-0.1	**5.6**
8:24	*9:24*	Run 2	*5.8*	*0.1*	*449.0*	*449.0*	*1000.0*	0.0	0.0	0.0	-0.5	-0.9	-0.4	**5.7**
10:04	*11:04*	Run 3	*5.2*	*1.0*	*451.1*	*449.0*	*1000.0*	0.0	0.1	0.1	-0.9	-0.7	0.2	**4.6**

TABLE IV. OXYGEN TESTING QUALITY ASSURANCE

GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE

Analyzer Calibration Data

INITIAL ANALYZER SPAN (%) =	25.0		ANALYZER ID.	HORIBA CMA 331A
	CYLINDER VALUE Percent	ANALYZER RESPONSE (Percent)	DIFFERENCE (Percent)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	20.9	20.9	0.0	0.0
Mid Range Gas	5.1	5.1	0.0	0.0

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	stop time of Run	RUN #	ANALYZER stack gas concentration uncorrected (Percent)	system Zero (Percent)	system upscale (Percent)	CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (Percent)	ANALYZER SPAN (Percent)	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	OXYGEN CONCENTRATION (Percent-Dry)
		INITIAL SYSTEM		0.1	5.1									
Time	Time	Run 1	6.8	0.0	5.1	5.1	25.0	0.4	0.0	-0.4	0.0	0.0	0.0	6.8
Time	Time	Run 2	6.7	0.0	5.1	5.1	25.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7
Time	Time	Run 3	7.0	0.0	5.1	5.1	25.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0

TABLE V. NITROGEN OXIDES TESTING QUALITY ASSURANCE

GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =		1000	ANALYZER ID	TECO MODEL 10
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	866	866.0	0.0	0.0
Mid Range Gas	466	471.8	-5.8	-0.6

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	NITROGEN OXIDES CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*0.0*	*471.9*									
6:35	*7:35*	Run 1	*225.7*	*0.7*	*459.3*	*466.0*	*1000.0*	0.0	0.1	0.1	0.0	-1.3	-1.3	225.7
8:24	*9:24*	Run 2	*226.0*	*0.6*	*453.9*	*466.0*	*1000.0*	0.1	0.1	0.0	-1.3	-1.8	-0.5	230.3
10:04	*11:04*	Run 3	*221.2*	*1.2*	*456.2*	*466.0*	*1000.0*	0.1	0.1	0.1	-1.8	-1.6	0.2	226.0

Figure 1. Graphical Representation of Stack Gas Concentrations
Plant Crist, Unit 4
Baseline Study

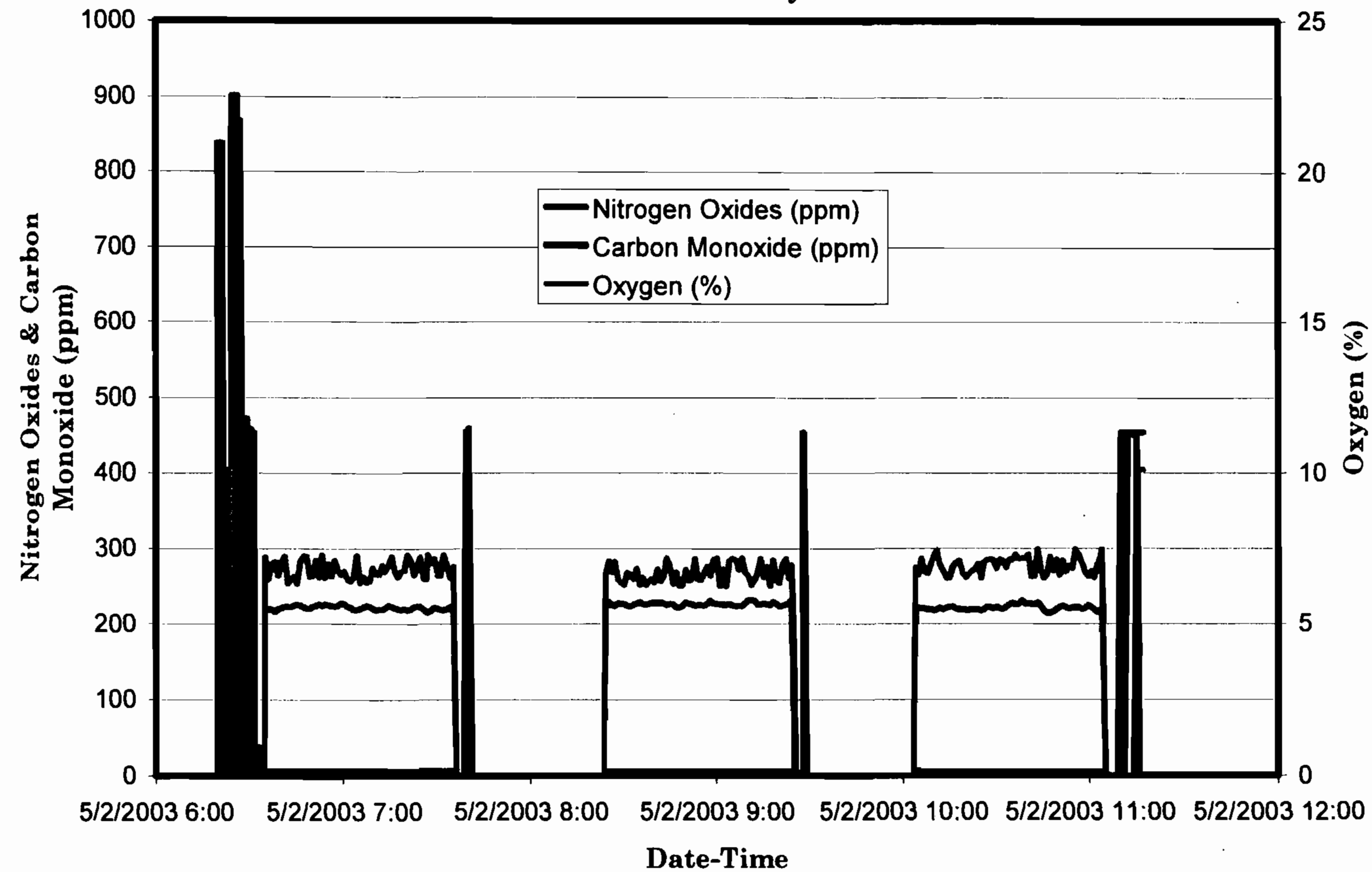


Table VI. Results of Gas Chromatographic Analysis of Stack Gases for VOC
GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE STUDY

Injection Number	Run Name	Injection Time	Methane Peak Area	Acetylene Peak Area	Ethylene Peak Area	Ethane Peak Area	Propane Peak Area	Methane ppm as propane	Acetylene ppm as propane	Ethylene ppm as propane	Ethane ppm as propane	Propane ppm as propane	Line Loss Percent	TOTAL VOC ppm as propane	TOTAL VOC ppm as propane Corrected For Line Loss
1	Initial Line Loss	5:46 AM					254206					8.8			
2	Initial Line Loss	5:51 AM					251664					8.7			
3	Initial Line Loss	5:56 AM					252389					8.7			
Average	nitial Line Loss						252753					8.7	7.4%		
System Check Cylinder Value (ppm)												9.4			
1	Run 1	5/2/2003 6:36	14253	0	0	0	0	0.5	0.0	0.0	0.0	0.0		0.0	0.0
2	Run 1	5/2/2003 6:41	16601	0	0	0	0	0.6	0.0	0.0	0.0	0.0		0.0	0.0
3	Run 1	5/2/2003 6:46	15478	0	0	0	0	0.5	0.0	0.0	0.0	0.0		0.0	0.0
4	Run 1	5/2/2003 6:51	11609	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
5	Run 1	5/2/2003 6:56	8582	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
6	Run 1	5/2/2003 7:01	8352	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
7	Run 1	5/2/2003 7:06	8566	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
8	Run 1	5/2/2003 7:11	8759	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
9	Run 1	5/2/2003 7:16	8960	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
10	Run 1	5/2/2003 7:21	9006	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
11	Run 1	5/2/2003 7:26	9092	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
12	Run 1	5/2/2003 7:31	9268	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
Number of Injections			12	12	12	12	12	12	12	12	12	12			
Average	Run 1		10711	0	0	0	0	0.4	0.0	0.0	0.0	0.0	7.59%	0.0	0.0
1	Run 1 Line Loss	5/2/2003 7:36					252621					8.7			
2	Run 1 Line Loss	5/2/2003 7:41					255242					8.8			
3	Run 1 Line Loss	5/2/2003 7:46					248613					8.6			
Average	Run 1 Line Loss						252159					8.7			
1	Run 2	5/2/2003 8:24	10667	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
2	Run 2	5/2/2003 8:29	6421	0	0	0	0	0.2	0.0	0.0	0.0	0.0		0.0	0.0
3	Run 2	5/2/2003 8:34	6328	0	0	0	0	0.2	0.0	0.0	0.0	0.0		0.0	0.0
4	Run 2	5/2/2003 8:39	6445	0	0	0	0	0.2	0.0	0.0	0.0	0.0		0.0	0.0
5	Run 2	5/2/2003 8:44	6516	0	0	0	0	0.2	0.0	0.0	0.0	0.0		0.0	0.0
6	Run 2	5/2/2003 8:49	6435	0	0	0	0	0.2	0.0	0.0	0.0	0.0		0.0	0.0
7	Run 2	5/2/2003 8:59	6401	0	0	0	0	0.2	0.0	0.0	0.0	0.0		0.0	0.0
8	Run 2	5/2/2003 9:04	15302	0	0	0	0	0.5	0.0	0.0	0.0	0.0		0.0	0.0
9	Run 2	5/2/2003 9:09	13035	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
10	Run 2	5/2/2003 9:14	11486	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
11	Run 2	5/2/2003 9:19	16376	0	0	0	0	0.6	0.0	0.0	0.0	0.0		0.0	0.0
12	Run 2	5/2/2003 9:24	16249	0	0	0	0	0.6	0.0	0.0	0.0	0.0		0.0	0.0
Number of Injections			12	12	12	12	12	12	12	12	12	12			
Average	Run 2		10139	0	0	0	0	0.3	0.0	0.0	0.0	0.0	5.49%	0.0	0.0
1	Run 2 Line Loss	5/2/2003 9:29					260578					9.0			
2	Run 2 Line Loss	5/2/2003 9:34					256617					8.8			
3	Run 2 Line Loss	5/2/2003 9:39					256501					8.8			
Average	Run 2 Line Loss						257899					8.9			
1	Run 3	5/2/2003 10:04	11285	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
2	Run 3	5/2/2003 10:09	9422	0	0	0	0	0.3	0.0	0.0	0.0	0.0		0.0	0.0
3	Run 3	5/2/2003 10:14	10474	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
4	Run 3	5/2/2003 10:19	10465	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
5	Run 3	5/2/2003 10:24	11872	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
6	Run 3	5/2/2003 10:29	12631	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
7	Run 3	5/2/2003 10:34	12333	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
8	Run 3	5/2/2003 10:39	12834	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
9	Run 3	5/2/2003 10:44	13344	0	0	0	0	0.5	0.0	0.0	0.0	0.0		0.0	0.0
10	Run 3	5/2/2003 10:49	12734	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
11	Run 3	5/2/2003 10:54	12279	0	0	0	0	0.4	0.0	0.0	0.0	0.0		0.0	0.0
12	Run 3	5/2/2003 10:59	13820	0	0	0	0	0.5	0.0	0.0	0.0	0.0		0.0	0.0
Number of Injections			12	12	12	12	12	12	12	12	12	12			
Average	Run 3		11958	0	0	0	0	0.4	0.0	0.0	0.0	0.0	6.65%	0.0	0.0
1	Run 3 Line Loss	5/2/2003 11:04					261501					9.0			
2	Run 3 Line Loss	5/2/2003 11:09					252836					8.7			
3	Run 3 Line Loss	5/2/2003 11:14					249898					8.6			
Average	Run 3 Line Loss						254745					8.8			

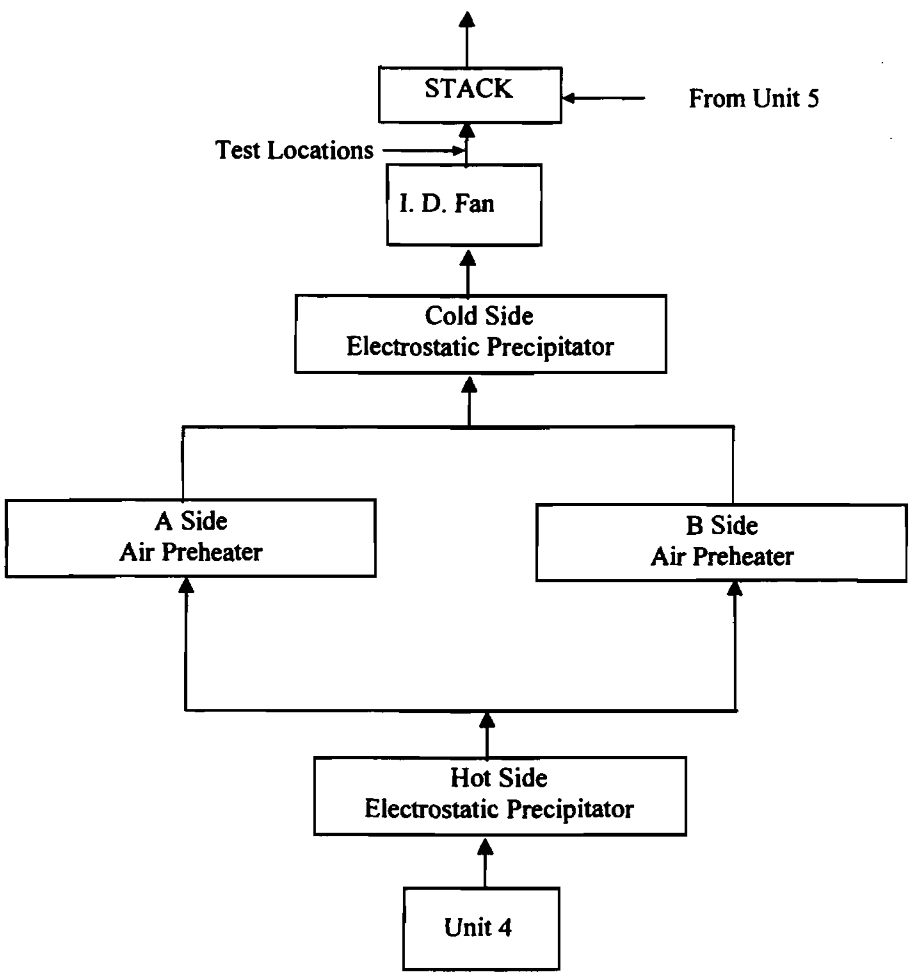
4. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by barge, and loaded directly onto the conveyor feeding the plant or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 36 to 48 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators.

4.1. Source Air Flow

As shown in Figure 2, the flue gases exit the boiler and flow through a hot side precipitator. The exhaust gases are separated into ducts A and B before entering air preheaters. The exhaust gases are combined before entering a cold side ESP. The flue gases exiting the cold side ESP are exhausted through a stack into the atmosphere.

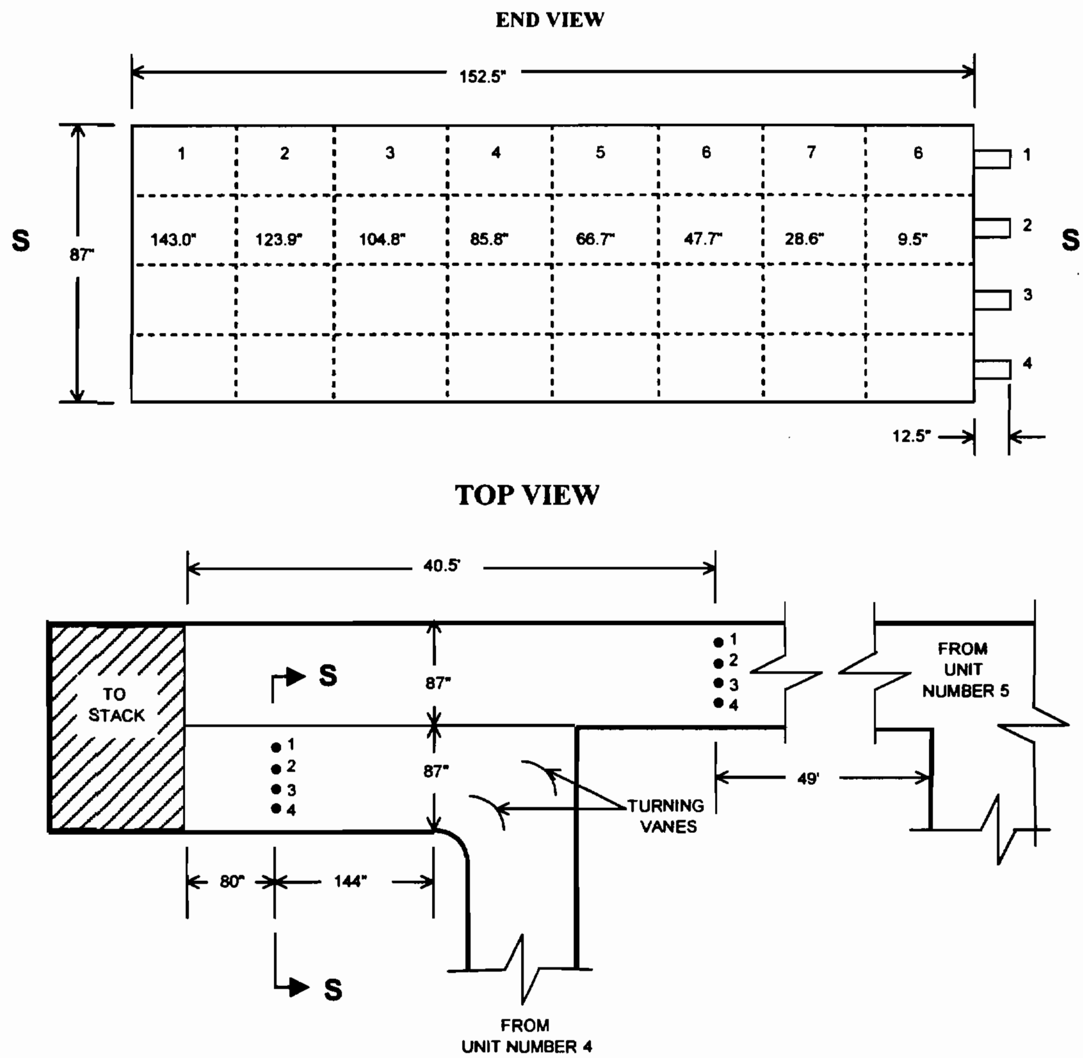
Figure 2. Air Flow Schematic



5. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 3. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 32 points.

Figure 3. Sample Point Locations

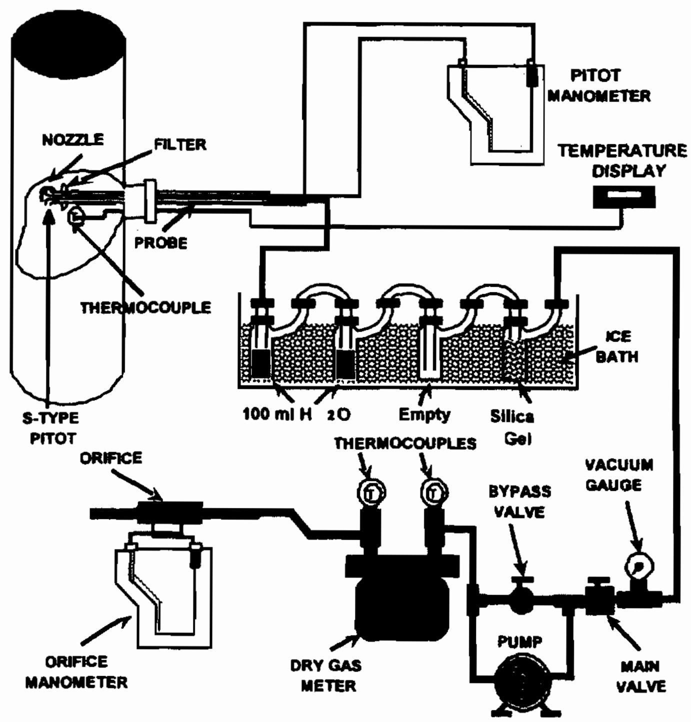


6. PARTICULATE SAMPLING PROCEDURE (EPA Method 17)

The sampling procedure utilized is that specified in **40 CFR, Part 60, Appendix A, Method 17**. A brief description of this procedure is as follows:

The first impingers were partially filled with 100 milliliters of deionized water. The next impinger was left empty to act as a moisture trap. Preweighed 6 to 16 mesh indication silica gel was added to the last impinger. The sampling equipment manufactured by Lear Siegler (Model 100) or Sanders Engineering (Model 200) was assembled as shown in the attached drawing. The system was leak checked by plugging the inlet to the nozzle and pulling a 15 inch mercury vacuum. A leakage rate not in excess of 0.02 cubic feet per minute was considered acceptable. The inside dimensions of the stack liner were measured and recorded. The required number of sampling points was marked on the probe for easy visibility. The range of velocity pressure, percent moisture, and temperature of the effluent gases were determined. From this data the correct nozzle size and the nomograph multiplication factor were determined.

Figure 4. Particulate Sampling Train



Crushed ice was placed around the impingers. The nozzle was placed on the first traverse point with the tip pointing directly into the gas stream. The pump was started immediately and the flow adjusted to isokinetic sampling conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point and isokinetic sampling was re-established. This was performed for each point until the run was completed. Readings were taken at each point and recorded on the field data sheet. At the conclusion of each run, the pump was turned off, final readings recorded, and final system leak checks were performed.

6.1. PARTICULATE SAMPLE RECOVERY

Care was exercised in moving the collection train to the sample recovery area to minimize the loss of collected sample or the gain of extraneous particulate matter. The volume of water in the impingers was measured, the silica gel impinger weighed, and these were recorded on the field data sheet. The nozzle and all sample-exposed surfaces were washed with reagent grade acetone into a clean sample container. A brush was used to loosen any adhering particulate matter and subsequent washings were placed into the container. The filter was carefully removed from the fritted support and placed in a clean separate sample container. A sample of the acetone used in the washing was saved for a blank laboratory analysis.

6.2. PARTICULATE ANALYTICAL PROCEDURES

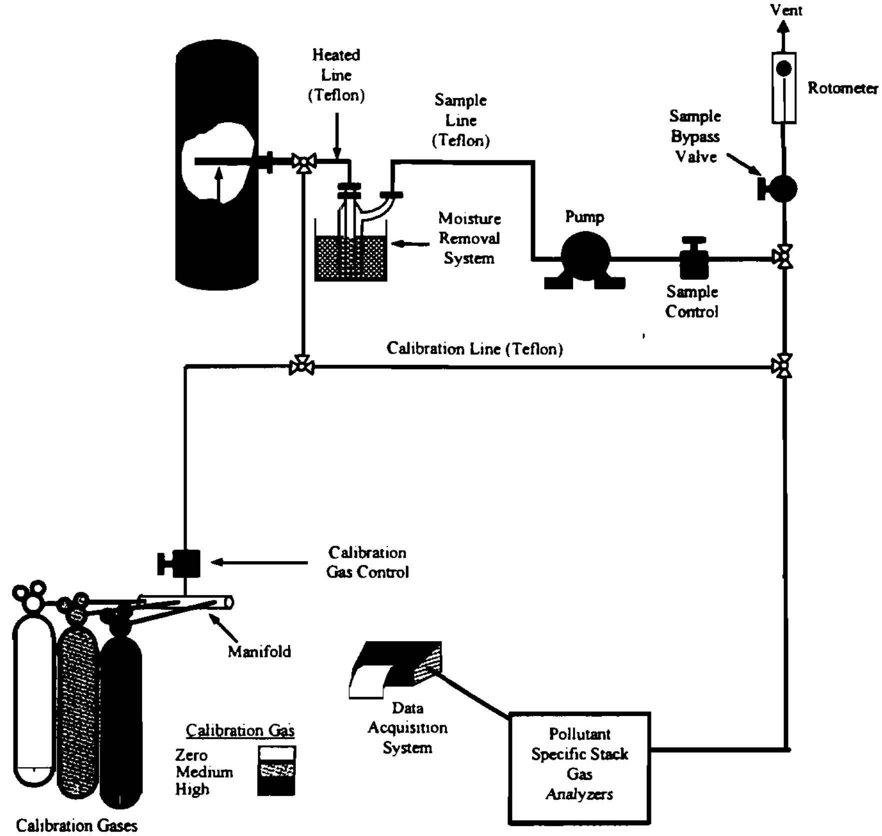
The filter and any loose particulate matter were transferred from the sample container to a clean, tared weighing dish. The filter was placed in a desiccator for at least 24 hours and then weighed to the nearest 0.1 milligram until a constant weight was obtained. The original weight of the filter was deducted and the weight gain was recorded to the nearest 0.1 milligram.

The wash solution was transferred to a clean, tared beaker. The solution was evaporated to dryness, desiccated to a constant weight, and the weight gain was recorded to the nearest 0.1 milligram.

7. CARBON MONOXIDE AND OXYGEN SAMPLING PROCEDURE (EPA METHODS 3A AND 10)

The sampling procedures utilized are those specified in **40 CFR, Part 60, Appendix A, Methods 3a and 10** as modified by the governing regulatory agency. A brief description of these procedures is as follows:

Figure 5. Carbon Monoxide and Oxygen Sampling Procedure



The sample was removed from the stack through a stainless steel probe and passes through a three-way valve and condenser moisture removal system. Teflon® line was used to transport the sample through a transport pump and a flow control valve. From this point the sample was routed into a manifold with a bypass valve, an analyzer sample flow control valve, and to an analyzer specific for the pollutant of interest. Each analyzer produces a voltage analogue output proportional to the concentration of pollutant present in the gas. A schematic of the sampling train is presented in the attached drawing.

Each instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. Zero air is introduced directly to each instrument to establish a baseline and check the zero reading of the instrument. A high range

calibration gas was introduced directly to each instrument. The instrument was allowed to fully respond to the calibration gas. Each analyzer was adjusted, if needed, to the correct value. A linear calibration curve was calculated from this data and stored on computer. Next, a mid-range calibration gas was introduced directly to each instrument. The percent error between each measured value and the corresponding calibration value was calculated. If any of the readings indicated a difference of more than ±2 percent of the span the analyzer was recalibrated.

The high or mid gas and zero gas were then introduced to the system at the three-way valve before the condenser. The response value for each of these gases was recorded. If these measured values differed significantly from the calibration values the sampling system was checked and repaired until the system check met EPA specifications.

To begin sampling, the three-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the data recorder was marked for the beginning of the run. After the required sampling time, the data recorder was marked for the end of the run. At the end of each run the three-way valve was switched to allow introduction of the zero and calibration gas to the system. From these data the calibration bias and drift were calculated. If the bias values were greater than ±5 percent of the span, or the drift was greater than three percent of the span, the run was invalidated. To begin the next run the three-way valve was switched to allow sampling of the stack gas and the next run was started. This procedure was repeated until all runs were complete.

7.1. Sample Recovery & Analysis

After the tests were completed the data was reduced to give an average concentration in parts per million for each run. This average concentration was then corrected for the analyzer zero and span bias and drift using the equation:

$$C\ gas = \frac{(C - Co)\quad Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

Co = Average of Initial and final system calibration responses for the zero gas, ppm.

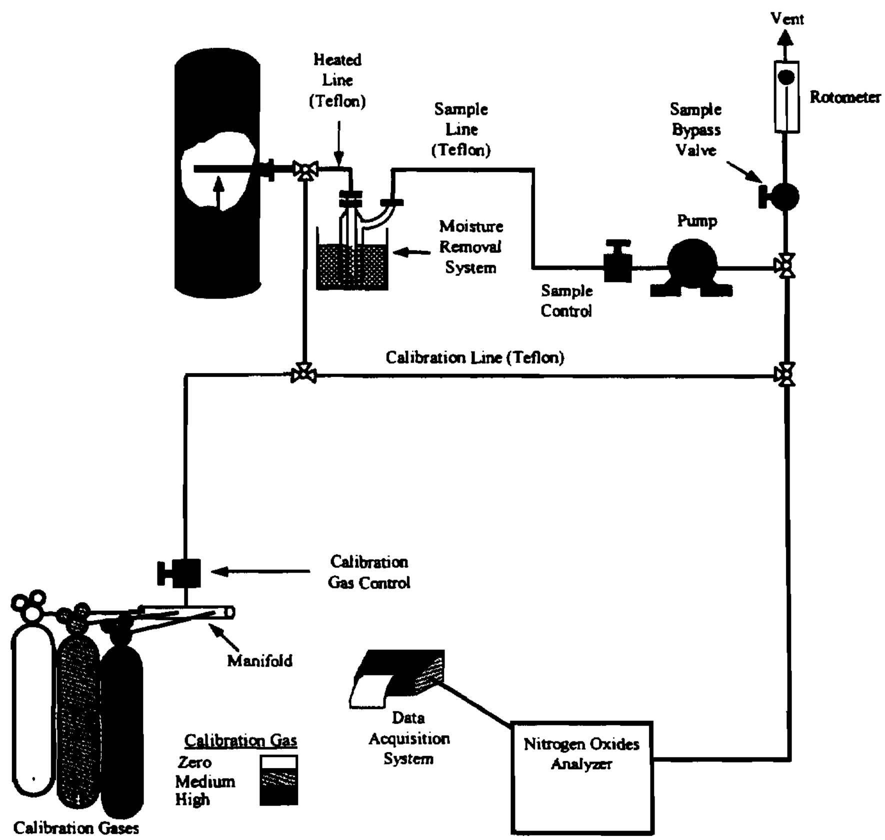
Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

Cma = Actual concentration of the scale calibration gas, ppm.

8. NITROGEN OXIDES SAMPLING PROCEDURE (EPA Methods 7e)

The sampling procedures utilized are those specified in **40 CFR, Part 60, Appendix A, Method 7e** as modified by the governing regulatory agency. A brief description of these procedures is as follows:

Figure 6. Nitrogen Oxides Sampling Train



The sample is removed from the stack through a stainless steel probe and passes through a three-way valve and condenser moisture removal system. Teflon® line is used to transport the sample through a transport pump and a flow control valve. From this point the sample is routed into a manifold with a bypass valve, an analyzer sample flow control valve, and to a nitrogen oxides analyzer. The analyzer produces a voltage analogue output proportional to the concentration of pollutant present in the gas. A schematic of the sampling train is presented in the attached drawing.

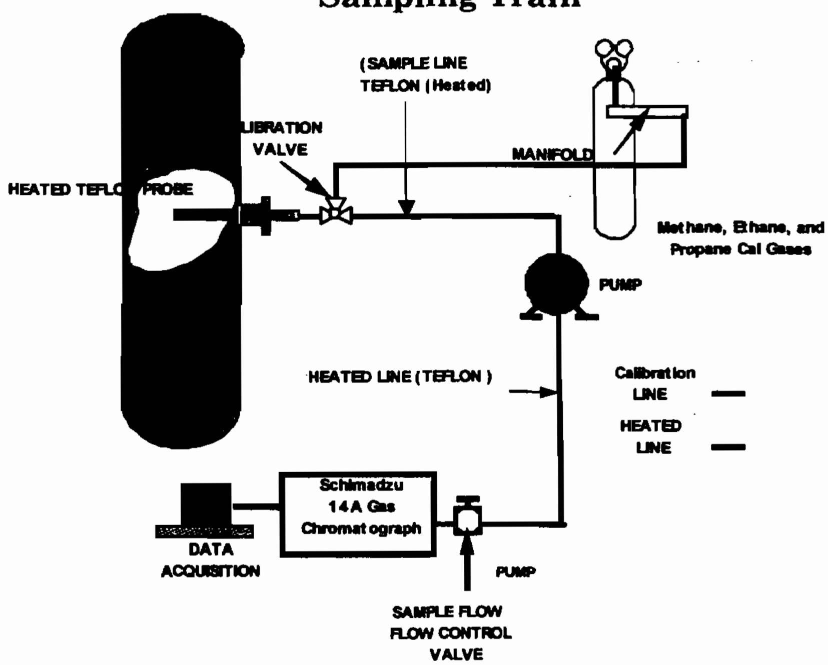
The instrument is allowed to warm up for at least 30 minutes before it is initially calibrated. Zero air is introduced directly to each instrument to establish a baseline and check the zero reading of the instrument. A high range calibration gas is introduced directly to each instrument. The instrument is allowed to fully respond to the calibration gas. Each analyzer is adjusted, if needed, to the correct value. A linear calibration curve is calculated from this data and stored on computer. Next, a mid-range calibration gas is introduced directly to each instrument. The percent error between each measured value and the corresponding calibration value is calculated. If any of the readings indicate a difference of more than ± 2 percent of the span the analyzer is recalibrated.

The high or mid gas and zero gas are then introduced to the system at the three-way valve before the condenser. The response value for each of these gases is recorded. If these measured values differ significantly from the calibration values the sampling system is checked and repaired until the system check meets EPA specifications.

To begin sampling, the three-way valve is switched to allow the instrument to sample the stack gas. Twice the system response time is allowed to elapse before the data recorder is marked for the beginning of the run. After the required sampling time, the data recorder is marked for the end of the run. At the end of each run the three-way valve is switched to allow introduction of the zero and calibration gas to the system. From these data the calibration bias and drift are calculated. If the bias values are greater than ± 5 percent of the span, or the drift is greater than ± 3 percent of the span, the run is invalidated. To begin the next run the three-way valve is switched to allow sampling of the stack gas and the next run is started. This procedure is repeated until all runs are complete.

9. NON-EXEMPT VOLATILE ORGANIC COMPOUND SAMPLING BY GAS CHROMATOGRAPHY (SEAS Method 2518)

Figure 7. Non-Exempt Volatile Organic Compounds Sampling Train



Gaseous organic emission sampling (gas chromatography) was performed per **SEAS Method 2518**. Non-exempt volatile organic compounds emissions testing was performed by a system similar to that depicted in the attached figure.

A heated stainless steel probe and heated teflon sample line was used to draw a sample from the emission source. Stack gases were continuously drawn through the sample lines. The sample lines were leak checked prior to and after all testing.

A small portion of the gas sample was pumped into the on-line gas chromatograph sample loop. The gas chromatograph sample loop was operated at approximately 30 ml/min flow, and was continuously purged with stack gas. Sample was introduced into the gas chromatograph by automatic actuation of the sample valve at a predetermined time. The gas chromatograph was fitted with a column of sufficient physical and chemical characteristics to allow separation of the constituents. The chromatograph was operated in such a manner as to get five separate peaks. The first four were for specific compounds in the following order:

methane, acetylene, ethylene, and ethane. The fifth peak was a back flush of the column which contained all organic compounds containing three or more carbon atoms (Propane+). The first four peaks were allowed to elute with the gases flowing through the column in the normal direction. After ethane elutes, the column is backflushed through the operation of a 10-port valve to elute the combined volatile organic compounds to the detector.

In order to ensure only organic compounds were measured, the chromatograph was equipped with a flame ionization detector. Each test run was conducted for at least sixty minutes, with the chromatograph performing as many injections as could be completed given the physical and chemical characteristics of the stack gas.

Calibration of the gas chromatograph was performed using EPA Protocol 1 cylinders of propane in nitrogen. Calibrations were made with a high, mid, and low concentration gas. Using these gas standards, a three-point calibration curve based on area count was generated for combined volatile organic compounds as propane. SEAS used a Shimadzu GC-14A for this testing program. The GC was equipped with an FID and integrator system. Volatile organic compound concentrations were determined by the peak area count of the sample versus the calibration curve. The calibration curve for propane was input to the data acquisition system for the acetylene and ethylene. Therefore, the concentrations generated by the data acquisition system for acetylene, ethylene, and combined volatile organic compounds were each reported on a propane equivalent basis. At the conclusion of testing, the calibration curve of the instrument was verified by injection of a propane calibration standard. If the calibration was maintained within twenty percent, the data was accepted. Otherwise, the data was either corrected for drift or the data was discarded and a new test conducted.

The concentration of non-exempt volatile organic compounds in the stack gas was calculated by summing of the ethylene concentration (propane equivalent) plus the acetylene concentration (propane equivalent) plus the combined volatile organic compound concentration (propane equivalent).

10. QUALITY ASSURANCE

In order to ensure the accuracy of all the data collected in the field and at the laboratory, SEAS has instituted a comprehensive quality assurance and quality control program. New or repaired items which require calibration are calibrated before their initial use in the field. Equipment whose calibration may change with use are calibrated before and after each use. When an item is found to be out of calibration, the unit is either discarded or repaired, and then recalibrated before being returned to service. All equipment is periodically recalibrated in full regardless of the results of the regular inspections or its present calibration status. Calibrations are performed in a manner consistent with the EPA reference methods recommended in the "Quality Assurance Handbook for Air Pollution Measurement Systems" published by the US Environmental Protection Agency. To the maximum degree possible all calibrations are traceable to the National Institute of Standards & Technology (NIST).

In order to ensure that the test will be performed in a timely manner without undue delays, SEAS sampling vans are equipped with duplicate sampling devices for almost every device needed to perform the test. If a particular device is broken or does not pass inspection, a second device is available immediately at the site for use. Any device which appears to be outside calibration, or in need of repair is tagged in the field and repaired, calibrated, or discarded immediately upon return to the laboratory.

10.1. CALIBRATIONS

Certain pieces of equipment need to be calibrated before and after each test. Those items include the pitot tubes, the differential pressure gauges, the dry gas meter, and the nozzles used for the particulate testing. The following is a brief description of the calibration procedures for each of these important devices.

10.1.1. PITOT TUBES

All pitot tubes are the S-type as required by EPA Reference Method 2 (40 CFR, Part 60, Appendix A, Method 2). This method contains certain geometric standards for the construction of S-type pitot tubes. All of SEAS pitot tubes are constructed according to these standards. According to the EPA any pitot tube constructed to these standards will have a coefficient of 0.84 ± 0.02. To ensure the exact value of SEAS pitot tubes, all pitot tubes are initially calibrated in SEAS wind tunnel to determine the exact pitot coefficient. This coefficient should not change unless the pitot is physically damaged. Each pitot tube is checked before going to the field to make sure it meets the geometry as specified. Any pitot tube which does not meet the specifications is not used in the test.

10.1.2. DIFFERENTIAL PRESSURE GAUGES

SEAS uses several different types of pressure gauges including oil tube manometers, water tube manometers, magnehelics, and current output electronic load cells. Each of these devices are inspected before taken to the field and are inspected for leaks during each test. The magnehelics and load cells are tested against an incline manometer water gauge to ensure accuracy.

10.1.3. TEMPERATURE SENSORS

All temperature sensors used in SEAS sampling program are either mercury in-glass thermometers or type K thermocouples. These thermocouples are a physical device which produce a voltage proportional to the temperature. The thermocouple reading device is calibrated before and after each series of tests to ensure accuracy of $\pm$ 2 percent. The calibration of the thermocouple is accomplished by NIST traceable calibrated reference thermocouple potentiometer system.

10.1.4. NOZZLES

The inside diameter of each nozzle is measured to the nearest 0.001 inches prior to its initial use. Upon arriving in the field each nozzle is again measured with a micrometer on three different points on the diameter to ensure its original measurement and that the nozzle is perfectly round. If the difference between the maximum and minimum diameters measured does not exceed 0.003 inches, the nozzle is acceptable; otherwise, this nozzle is discarded and another is selected. At the end of each test the nozzles are again remeasured on three different points on the diameter to ensure that during the test the nozzle has not become dented or deformed.

10.1.5. DRY GAS METER

The dry gas meter is calibrated every six months against a spirometer transfer standard. It is again calibrated before and after each use in the field. During the semiannual calibration, a five point calibration is made at a minimum of one-half inch water column orifice pressure up to four inches water column orifice pressure. Before and after each test, the dry gas meter is again recalibrated at

three repetitions at a representative flow rate experienced during the test. If the final calibration does not agree with the initial calibration within five percent the calibration which yields the lowest volume of sample pulled is used in the calculations and the dry gas meter is repaired and recalibrated.

10.1.6. ORIFICE

The flow meter orifice is used to establish isokinetic sampling rates during the test. The orifice is calibrated with the dry gas meter at the same time under the same conditions. The orifice is calibrated over a wide range of flow rates and the arithmetic mean of the orifice calibration is used for sampling purposes. The orifice is recalibrated every time the gas meter is recertified.

APPENDIX A QUALITY CONTROL OF PARTICLATE TESTING EQUIPMENT

INITIAL METER BOX CALIBRATION

Calibrated By: FLR **BOX #:** S-100 **Date:** 3/14/2003

			Orifice #:	1	Orifice #:	3	Orifice #:	8	Reference Meter #		Unit	RUN 4	RUN 5	
		Unit	RUN 1	RUN 2	RUN 1	RUN 2	RUN 1	RUN 2	Field Meter	DH	In. H_2O	3.00	5.00	
Meter	ΔH	In. H_2O	0.75	0.75	1.25	1.25	1.52	1.52	*Initial* Gas Volume		$Ft.^3$	494.039	503.693	
Initial Gas Volume		Ft^3	524.100	526.400	531.800	534.800	496.300	502.100	*Final* Gas Volume		$Ft.^3$	500.314	514.807	
Final Gas Volume		$Ft.^3$	526.400	528.700	534.800	537.800	502.100	510.800	*Initial* Temp. Out		°F	53	60	
Initial Temp. Out		°F	74	75	76	76	71	71	*Final* Temp. Out		°F	56	62	
Final Temp. Out		°F	75	75	76	76	71	71	Reference	Y	*Dimensionless*	1.000	1.000	
Vacuum		In. Hg	19	19	18	18	18	18	*Initial* Gas Volume		$Ft.^3$	535.051	545.718	
Ambient Temp.		°F	73	74	75	75	65	65	*Final* Gas Volume		$Ft.^3$	541.895	557.927	
Barometric Pressure		In. Hg	30.00	30.00	30.00	30.00	30.00	30.00	*Initial* Temp.		°F	65	68	
Time		sec	304	304	307	308	544	813	*Final* Temp.		°F	65	69	
K'			0.3735	0.3735	0.4677	0.4677	0.5200	0.5200	Barometric Pressure		In. Hg	30.40	30.400	
CALCULATIONS									Time		sec	420	600	
Total Meter Gas Volume		Actual $Ft.^3$	2.300	2.300	3.000	3.000	5.800	8.700						
Time		Minutes	5.067	5.067	5.117	5.133	9.067	13.550						
Volume through the Meter		*SDCF without Y*	2.281	2.279	2.971	2.971	5.802	8.703						
Volume through the Orifice		*SDCF*	2.459	2.457	3.104	3.114	6.173	9.225						
Calculated Y		*Dimensionless*	**1.078**	**1.078**	**1.045**	**1.048**	**1.064**	**1.060**				1.061	1.070	**1.063**
	Difference	*Allowable 0.02*	0.015	0.015	-0.018	-0.015	0.001	-0.003				-0.002	0.007	
Calculated DH@			**1.753**	**1.756**	**1.867**	**1.867**	**1.819**	**1.819**				1.753	1.875	**1.814**
	Difference	*Allowable 0.2*	-0.061	-0.057	0.053	0.053	0.005	0.005				-0.061	0.061	

Magnehelic Calibrations

Device	Calibration	Delta P	
	Standard	Magnehelic	
Units	inches water	inches water	*Percent*
Reading	Reference	Sample	*Error*
1	1.70	1.75	2.9
2	0.78	0.80	2.6
3	0.22	0.22	0.0

Allowed Error = 5% of Reading

Thermocouple Calibrations

Device	Calibration	Thermocouple	
	Standard	Detector	
Units	Degrees F.	Degrees F.	*Percent*
Reading	Reference	Sample	*Error*
1	70	71	0.2
2	250	253	0.4
3	500	498	-0.2

Allowed Error = 1.5% of Absolute Temperature (Degrees Rankin);
Absolute Temperature = Temperature in Degrees Fahrenheit. + 460

Final Meter Box Calibration Check by Critical Orifice

Calibrated By: JBR **Date 5/2/03/** **METER BOX #: S-100**

		Units	RUN 1	RUN 2	RUN 3		
			Orifice # 8				
Meter	**ΔH**	In. H_2O	1.52	1.52	1.52		
	Initial **Gas Volume**	$Ft.^3$	951.800	955.900	960.600		
	Final **Gas Volume**	$Ft.^3$	955.900	960.600	975.700		
	Initial **Temp. In**	°F	78	78	79		
	Initial **Temp. Out**	°F	78	78	79		
	Final **Temp. In**	°F	78	78	79		
	Final **Temp. Out**	°F	78	78	79		
Vacuum (must be > 16.0)		In. Hg	18	18	18		
	Ambient **Temp.**	°F	75	75	75		
	Barometric Pressure	In. Hg	29.95	29.95	29.95		
	Time	sec	380	439	1403		
	K'		0.5200	0.5200	0.5200		
CALCULATIONS							
Total Meter Gas Volume		$Ft.^3$	4.100	4.700	15.100		
	Time	Minutes	6.333	7.317	23.383		
Vm = Volume through the Meter		*SDCF without Y*	4.041	4.633	14.856	**Final Average**	**Initial Average**
Vcr = Volume through the Orifice		*SDCF*	4.264	4.926	15.745		
	Calculated Y	*Dimensionless*	**1.055**	**1.063**	**1.060**	**1.059**	**1.063**
	Calculated ΔH@		**1.839**	**1.839**	**1.835**	**1.838**	**1.814**

Magnehelic Calibrations

Device	Calibration	Delta P	
	Standard	Magnehelic	
Units	inches water	inches water	*Percent*
Reading	Reference	Sample	*Error*
1	0.20	0.20	*0.0*
2	0.75	0.74	*-1.3*
3	1.50	1.48	*-1.3*

Allowed Error = 5% of Reading

Thermocouple Calibrations

Device	Calibration	Thermocouple	
	Standard	Detector	
Units	Degrees F.	Degrees F.	*Percent*
Reading	Reference	Sample	*Error*
1	100	100	*0.0*
2	250	251	*0.1*
3	500	501	*0.1*

Allowed Error = 1.5% of Absolute Temperature (Degrees Rankin);
Absolute Temperature = Temperature in Degrees Fahrenheit. + 460

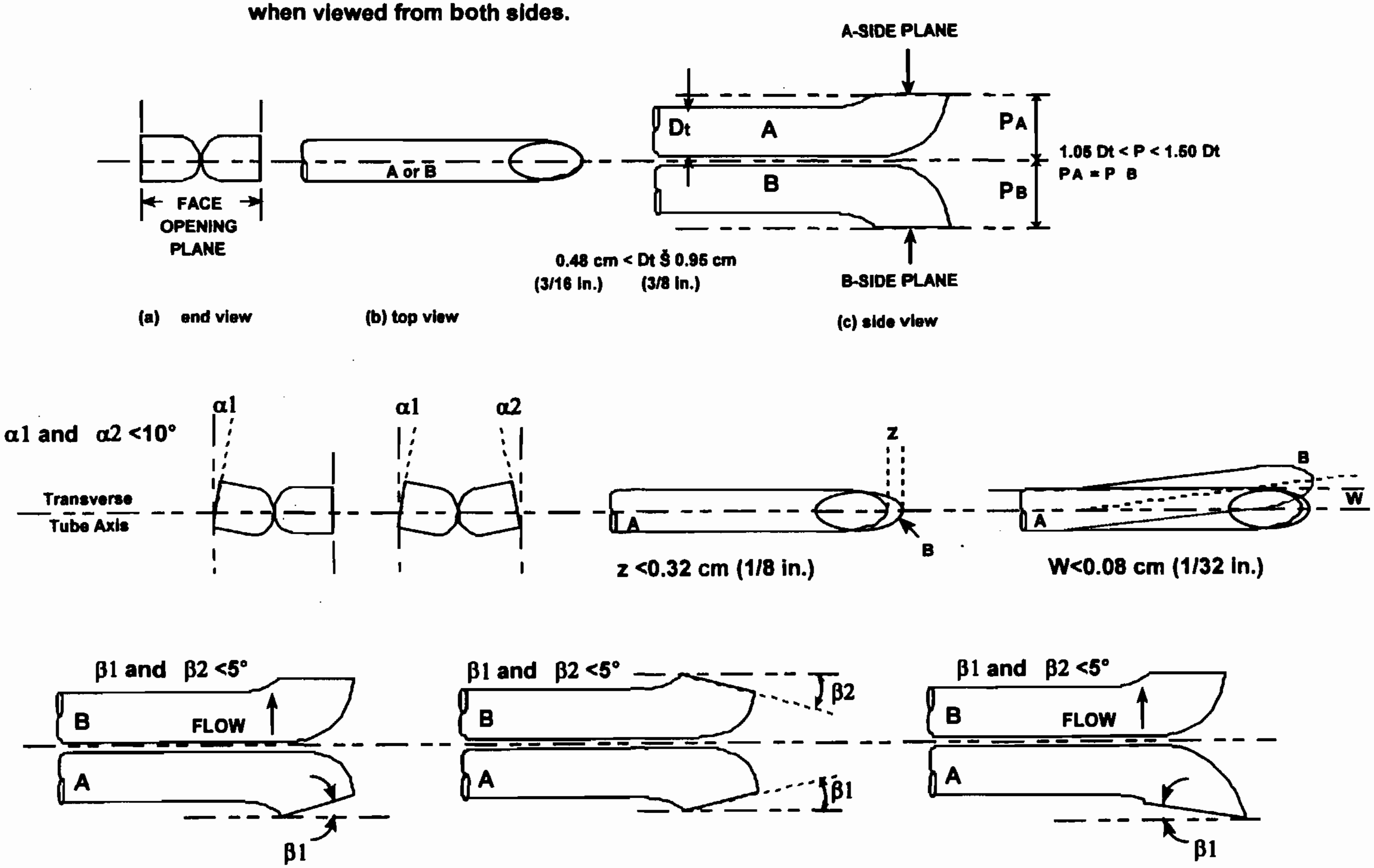
Magnehelic Calibration

	Box 100						Box 101							Box 100-a				
Ser. No.	**WO21 JY**	**R1090 8AG71**	**R9807 314022**	**R977110 5290**	**6AG44 7**	**R97022 7GJ31**	**R00630 1YR86**	**R22D**	**A980821 7983**	**R90061 6G721**	**R98120 2CA55**	**R90101 5D102**		**R08F 2**	**R97020 3**	**R10629J A82**	**R10613 MR42**	**R90124 RI119**
Span (In H2O)	**0.25**	**0.5**	**2**	**5**	**10**	**25**	**0.25**	**0.5**	**2**	**5**	**10**	**25**		**0.5**	**2**	**5**	**10**	**25**
Reference Reading @ 0% Span (in H2O)	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Device Reading (in H2O)	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00		0.00	0.00	0.00	0.00	0.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Reference Reading @ 50% Span (in H2O)	0.125	0.250	1.00	2.45	5.00	12.50	0.125	0.25	1.00	2.500	4.80	12.50		0.25	1.00	2.50	5.00	13.00
Device Reading (in H2O)	0.125	0.250	1.00	2.50	5.00	12.50	0.125	0.25	0.96	2.500	5.00	12.55		0.25	1.00	2.50	5.00	13.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00		0.00	0.00	0.00	0.00	0.00
Reference Reading @ 90% Span (in H2O)	0.225	0.45	1.80	4.45	9.00	22.50	0.24	0.44	1.80	4.50	9.00	24.00		0.45	1.80	4.50	9.00	24.00
Device Reading (in H2O)	0.225	0.450	1.80	4.45	9.00	22.50	0.240	0.45	1.80	4.500	9.20	24.00		0.45	1.80	4.50	9.00	24.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00		0.00	0.00	0.00	0.00	0.00

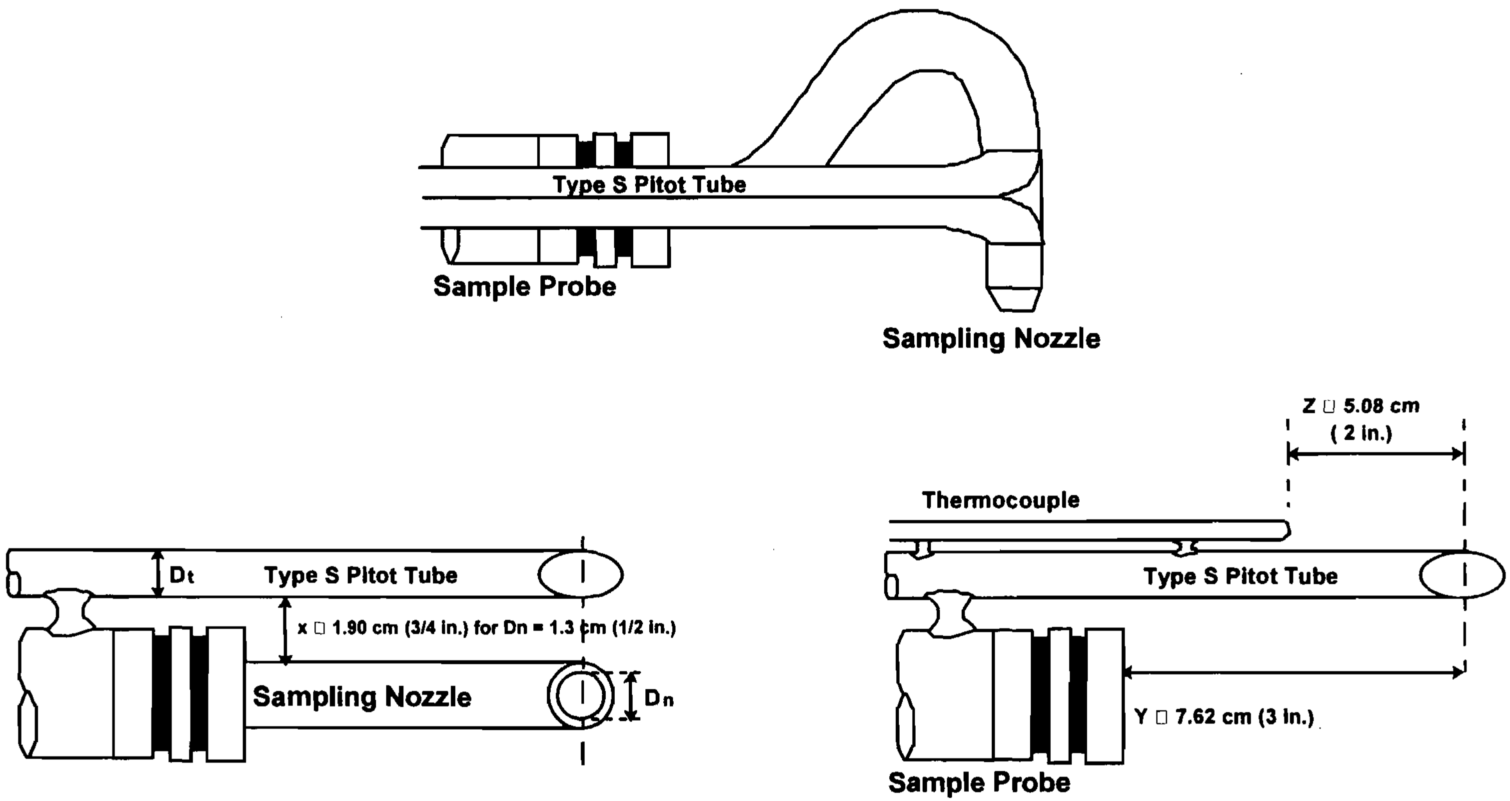
	Box 102						Box 103					
Ser. No.	**10819 DR2**	**R1090 2AG18**	**R5031 5EB93**	**810629T A87**		**R10722 MC5**	**R05E**	**R96040 2CA34**	**R20202 CF1**	**WOB KJM**	**R360**	
Span (In H2O)	**0.25**	**0.5**	**2**	**5**		**25**	**0.25**	**0.5**	**1**	**2**	**5**	**25**
Reference Reading @ 0% Span (in H2O)	0.000	0.000	0.00	0.00		0.00	0.000	0.000	0.00	0.00	0.00	0.00
Device Reading (in H2O)	0.000	0.000	0.00	0.00		0.00	0.000	0.000	0.00	0.00	0.00	0.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reference Reading @ 50% Span (in H2O)	0.130	0.250	1.00	2.40		12.80	0.125	0.245	0.50	1.00	2.40	12.50
Device Reading (in H2O)	0.125	0.255	1.02	2.50		12.50	0.121	0.250	0.50	1.03	2.50	13.00
% Difference (Allowed = 0.05)	0.04	0.02	0.02	0.04		0.02	0.03	0.02	0.00	0.03	0.04	0.04
Reference Reading @ 90% Span (in H2O)	0.240	0.490	1.90	4.70		24.20	0.235	0.440	0.90	1.90	4.90	24.00
Device Reading (in H2O)	0.240	0.490	1.90	4.75		24.00	0.230	0.450	0.90	1.90	5.00	24.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.01		0.01	0.02	0.02	0.00	0.00	0.02	0.00
Cailbration Date 06-17-02 By J. RAMPULLA												

Type S pitot tube construction details:

a) end view; face opening planes perpendicular to transverse axis.
b) top view; face opening planes parallel to longitudinal axis.
c) side view; both legs of equal length and centerlines coincident, when viewed from both sides.



Sampling Nozzle, Thermocouple, and Probe Configuration



APPENDIX B FIELD DATA SHEETS FOR PARTICULATE TESTING

Sanders Engineering & Analytical Services, Inc.

1568 Leroy Stevens Rd.
Mobile, Al. 36695

Office: (251) 633-4120
Fax: (251) 633-2285

COMPANY Gulf Power Company DATE 05-02-03 DGM# S-400

PLANT Crist Pensacola OPERATOR JEf Jr ΔHa 1.814

UNIT 4 - Scale METHOD 17 PROBE (Max Length Allowed) ______

	Run 1	Run 2	Run 3
Nozzle Calibration Pre	210 / 210 / 210	215 / 215 / 215	215 / 215 / 215
Nozzle Calibration Post	210 / 210 / 210	215 / 215 / 215	215 / 215 / 215
Average	210	215	215
Filter Number	3236	3237	3238
Meter Reading Final	876.760	910.965	947.680
Meter Reading Initial	841.900	877.000	911.400
Meter Reading Net	34.860	33.965	36.28
Leak Check System Pre	15" / 0.001	15" / 0.007	15" / 0.004
Leak Check System Post	10" / 0.004	10" / 0.001	10" / 0.01
Leak Check Pitot Pre	✓ / ✓	✓ / ✓	✓ / ✓
Leak Check Pitot Post	✓ / ✓	✓ / ✓	✓ / —

VOLUME OF LIQUID WATER COLLECTED

	Run 1 Imp 1	Imp 2	Imp 3	Imp 4	Run 2 Imp 1	Imp 2	Imp 3	Imp 4	Run 3 Imp 1	Imp 2	Imp 3	Imp 4
Final	165	104	0	1804	170	100	4	1810	165	100	5	1815
Initial	100	100	0	1796	100	100	0	1804	100	100	0	1810
Net	65	4	0	8.0	70	0	4	6	65	0	5	5
Total	77.0				80.0				75.0			

	Run 1	Run 2	Run 3
Gas Analysis O_2	6.8	6.7	7.0
CO_2	12.0	12.0	12.0
CO			
Static (in. H_2O)	-1.00	-1.00	-1.00
Barometric (in. Hg)	29.97	29.97	29.97

Form Revised 8/24/02

Page 1 of ______

Port # / Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Temperature °F Gas Stream	Temperature °F Imp.	Temperature °F Gas Meter	Vac. (In. Hg)
1-1	06 :34	841.900	1.11	1.53	296		60	75	4.0
2	:36	842.9	1.18	1.63	297		✓	75	4.0
3	:38	844.5	1.03	1.42	297		✓	75	3.0
4	:40	845.8	0.89	1.23	298		✓	75	3.0
5	:42	846.9	0.60	0.83	297		✓	75	2.0
6	:44	847.9	0.60	0.83	297		60	75	2.0
7	:46	848.9	0.68	0.44	297		✓	75	2.0
8	:48	849.7	0.65	0.90	297		✓	75	2.0
1-1	:50	851.1	1.15	1.58	297		✓	75	2.0
2	:52	851.9	1.03	1.42	297		✓	75	2.0
3	:54	853.5	0.95	1.31	297		✓	75	2.0
4	:56	854.5	0.72	0.99	297		✓	75	2.0
5	:58	855.7	0.50	0.69	297		✓	75	2.0
8	07 :00	856.0	0.72	0.99	298		✓	75	2.0
7	:02	857.5	0.67	0.93	298		✓	76	2.0
8	:04	858.4	0.67	0.93	298		✓	76	2.0
2-1	08 :07	859.4	0.85	1.17	296		64	76	2.0
2	:09	860.6	0.90	1.24	296		64	76	2.0
3	:11	861.5	1.03	1.42	298		✓	76	2.0
4	:13	862.6	0.96	1.32	298		✓	76	2.0
5	:15	864.1	0.62	0.85	298		✓	76	2.0
6	:17	865.0	0.62	0.85	297		✓	77	2.0
7	:19	865.9	0.77	1.06	297		✓	77	2.0
8	:21	867.0	0.90	1.24	296		65	77	3.0
3-1	07 :24	867.9	0.90	1.24	298		✓	78	3.0
2	:26	868.9	1.00	1.37	298		✓	78	3.0
3	:28	870.8	0.85	1.17	298		✓	78	3.0
4	:30	871.6	0.88	1.21	298		✓	78	3.0
5	:32	872.9	0.60	0.83	298		✓	79	3.0
6	:34	873.7	0.65	0.90	298		✓	79	3.0
7	:36	874.6	0.77	1.06	298		✓	79	3.0
8	:38	875.7	0.95	1.31	298		67	79	3.0
stop	Stop 7:40	876.760							

Company: Gulf Power Date: 05-02-05 F

Site: Crist Unit 4 Baseline Run #: 1

Port # / Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Gas Stream	Imp.	Gas Meter	Vac. (In. Hg)
1-1	08:22	877.000	1.05	1.59	301	/	65	82	4.0
2	:24	878.00	1.00	1.51	301		✓	82	4.0
3	:26	878.8	1.00	1.51	301		✓	82	4.0
4	:28	880.5	0.84	1.27	302		✓	85	4.0
5	:30	881.4	0.59	0.89	302		65	85	4.0
6	:32	882.4	0.64	0.97	301		✓	85	4.0
7	:34	883.4	0.64	0.97	301		✓	85	4.0
8	:36	884.3	0.64	0.97	300		✓	85	4.0
2-1	08:39	885.37	1.00	1.51	302		60	83	4.0
2	:41	886.3	1.00	1.51	302		✓	83	4.0
3	:43	887.9	0.68	1.03	302		✓	83	4.0
4	:45	889.1	0.68	1.03	302		✓	84	4.0
5	:47	890.0	0.55	0.83	302		✓	84	3.0
6	:49	891.0	0.55	0.83	302		✓	84	3.0
7	:51	891.8	0.55	0.83	301		✓	84	3.0
8	:53	893.1	0.64	0.97	301		✓	84	3.0
3-1	:55	894.1	0.98	1.48	301		✓	84	3.0
2	:57	895.2	0.78	1.18	301		✓	84	3.0
3	:59	896.3	0.78	1.18	301		✓	85	4.0
4	09:01	897.5	0.69	1.04	301		60	85	3.5
5	:03	898.7	0.56	0.85	301		✓	85	2.0
6	:05	899.7	0.56	0.85	301		✓	85	2.0
7	:07	900.5	0.59	0.89	301		✓	86	2.5
8	:09	901.7	0.58	0.89	301		✓	86	2.5
4-1	09:12	902.45	0.75	1.14	303		✓	86	4.0
2	:14	903.3	0.68	1.03	303		✓	86	3.0
3	:16	904.5	0.76	1.15	303		64	86	3.0
4	:18	905.6	0.86	1.30	304		✓	86	3.0
5	:20	906.6	0.62	0.94	303		✓	86	3.5
6	:22	907.8	0.64	0.97	303		✓	86	3.5
7	:24	908.9	0.75	1.14	302		64	86	3.5
8	:26	910.0	0.83	1.26	302		65	86	3.5
stop	09:28	910.965							

Company: Gulf Power Co Date: ________ F

Site: Plant Crist Unit 4 Boiler Run #: 2

Port # / Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F: Stack	Temperature °F: Gas Stream	Temperature °F: Imp.	Temperature °F: Gas Meter	Vac. (In. Hg)
1-1	10 :05	911.400	1.14	1.73	305	/	60	88	4.0
2	:07	912.8	1.09	1.65	305		✓	87	4.0
3	:09	914.6	0.93	1.40	305		✓	87	4.0
4	:11	915.5	0.89	1.34	305		✓	88	4.0
5	:13	917.7	0.58	0.88	305		✓	87	1.5
6	:15	918.1	0.67	1.01	305		62	87	2.0
7	:17	918.8	0.65	0.98	302		✓	88	2.0
8	:19	919.9	0.65	0.98	302		✓	88	2.0
2-1	:22	920.9	1.15	1.74	304		✓	88	4.0
2	:24	922.2	1.00	1.51	304		✓	89	4.0
3	:26	923.6	1.09	1.65	305		✓	88	4.5
4	:28	925.2	0.97	1.46	306		✓	88	4.5
5	:30	926.6	0.55	0.83	305		✓	88	2.0
6	:32	927.7	0.64	0.96	305		68	86	2.0
7	:34	928.5	0.64	0.46	305		✓	88	2.0
8	:36	929.3	0.63	0.95	305		✓	89	2.0
3-1	:39	930.3	1.20	1.81	305		✓	89	5.0
2	:41	931.7	0.81	1.22	305		✓	89	4.5
3	:43	932.4	0.76	1.15	305		✓	89	4.5
4	:45	934.3	0.56	0.85	305		✓	89	2.0
5	:47	935.2	0.56	0.85	305		✓	90	2.0
6	:49	936.2	0.65	0.98	305		✓	90	2.0
7	:51	937.3	0.66	0.99	305		✓	90	2.0
8	:53	938.1	0.66	0.99	305		✓	90	2.0
4-1	:56	939.2	0.66	0.99	305		62	90	2.0
2	:58	940.2	0.66	0.99	305		✓	90	2.0
3	11 :00	941.1	0.75	1.13	304		✓	90	2.0
4	:02	942.7	0.78	1.17	304		✓	91	2.0
5	:04	943.6	0.62	0.94	304		✓	91	2.0
6	:06	944.7	0.62	0.94	305		✓	91	2.0
7	:08	945.8	0.74	1.12	305		✓	91	2.0
8	:10	946.8	0.84	1.27	305		64	91	2.0
stop	11 :12	947.680							

Company: Gulf Power Company Date: 05-02-03

Site: Plant Crist Unit 4 Baseline Run #: 3

LABORATORY ANALYSIS & CHAIN OF CUSTODY

COMPANY/PLANT: GPCO Crist

UNIT #: 4 DATE OF TEST: 5-2-03 TYPE OF TEST: ☐ M-5 ☒ M-17 ☐ OTHER ____

SAMPLE #	RELINQUISHED BY:	RECEIVED BY:	TIME:	DATE:	REASON FOR CHANGE
3236					
3237	[illegible]	[illegible]	15:18	5-2-03	Analysis
3238					

RUN # 1	FILTER # 3236	BEAKER 4	RUN #	FILTER #	BEAKER
FINAL WEIGHT	133.4	WASH (ML) 66700.3	FINAL WEIGHT		WASH (ML)
INITIAL WEIGHT	117.0	66697.4	INITIAL WEIGHT		
DIFFERENCE	16.4	2.9	DIFFERENCE		
CORRECTED TOTAL WEIGHT		19.3	CORRECTED TOTAL WEIGHT		
RUN # 2	FILTER # 3237	BEAKER 96	RUN #	FILTER #	BEAKER
FINAL WEIGHT	142.2	WASH (ML) 62300.3	FINAL WEIGHT		WASH (ML)
INITIAL WEIGHT	124.3	62296.7	INITIAL WEIGHT		
DIFFERENCE	17.9	3.6	DIFFERENCE		
CORRECTED TOTAL WEIGHT		21.5	CORRECTED TOTAL WEIGHT		
RUN # 3	FILTER # 3238	BEAKER 99	RUN #	FILTER #	BEAKER
FINAL WEIGHT	135.7	WASH (ML) 62684.1	FINAL WEIGHT		WASH (ML)
INITIAL WEIGHT	117.8	62683.5	INITIAL WEIGHT		
DIFFERENCE	17.9	0.6	DIFFERENCE		
CORRECTED TOTAL WEIGHT		18.5	CORRECTED TOTAL WEIGHT		

WASH SOLVENT BLANK (ML)		BEAKER # / WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		

APPENDIX C SAMPLE CALCULATIONS

Sample Calculations, Run 1
GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE STUDY

Absolute Stack Pressure (inches Mercury)

$$P_s = P_{bar} + \frac{\overline{P_g}}{13.6}$$

P_g = Stack Static Pressure (inches Water) =	(1.00)
P_{bar} = Barometric Pressure (inches Mercury) =	29.97
P_s =	29.90

Absolute Pressure at the Dry Gas Meter (inches Mercury)

$$P_m = P_{bar} + \frac{\overline{\Delta H}}{13.6}$$

P_{bar} = Barometric Pressure (inches Mercury) =	29.97
ΔH = Average pressure difference of orifice (inches Water) =	1.15
P_m =	30.05

Average Stack Gas Velocity (feet per second)

$$V_s = K_p C_p \overline{\sqrt{\Delta P}} \sqrt{\frac{\overline{T_s}}{M_s P_s}}$$

Kp = Pitot tube constant $\sqrt{\frac{(\text{lb/lb - mole})\ (\text{inches Hg})}{(°\text{R})\ (\text{inches H2O})}}$ =	85.49
C_p = Pitot tube coefficient (dimensionless) =	0.84
$\overline{\sqrt{\Delta P}}$ = Velocity head of stack gas (inches H2O) =	0.8834
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	757.3
M_s = Molecular weight of stack gas; wet basis (lb/lb mole) =	29.09
P_s = Absolute stack pressure (inches Mercury) =	29.90
V_s =	59.20

Volume of Gas Sampled Measured by Dry Gas Meter

(corrected to standard conditions, SDCF)

$$Vm(Std) = K_1 V_m Y \left[\frac{P_{bar} + \frac{\overline{\Delta H}}{13.6}}{\overline{T_m}} \right]$$

K_1 = Degrees R/inches Mercury = 17.64

V_m = Volume of gas sample as measured by dry gas meter (actual cubic feet) = 34.860

Y = Dry gas meter calibration factor (dimensionless) = 1.063

P_{bar} = Barometric Pressure (inches Mercury) = 29.97

Δ H = Average pressure difference of orifice (inches H2O) = 1.15

T_s = Average absolute temperature of the dry gas, Degrees R (Degrees F+460) = 536.4

$V_{m\ (Std)}$ = 36.627

Volume of Water Vapor in Gas Sample

(corrected to standard conditions, SDCF)

$$V_{w\ (Std)} = 0.04707\ V_{lc}$$

V_{lc} = Total volume of liquid collected in impingers and silica gel (milliliters) = 77.0

$V_{w\ (Std)}$ = 3.624

Water Vapor in the Gas Stream proportion by volume (dimensionless)

$$B_{ws} = \frac{V_{w(Std)}}{V_{m(Std)} + V_{w(Std)}}$$

$V_{w\ (std)}$ = Volume of water in gas sample (corrected to standard conditions) = 3.624

$V_{m(std)}$ = Volume of sample measured by dry gas meter (standard conditions) = 36.627

B_{ws} = 0.0900

Molecular Weight of Stack Gas (dry basis, lb/lb mole)

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2 + \%CO)$$

$\%CO_2$ = Number percent by volume (dry basis from gas analysis) = 12.00

$\%O_2$ = Number percent by volume (dry basis from gas analysis) = 6.80

$\%N_2$+%CO = Number percent by volume (dry basis from gas analysis) = 81.20

M_d = 30.19

Molecular Weight of Stack Gas (wet basis, lb/lb mole)

$$M_s = M_d(1 - B_{ws}) + 18(B_{ws})$$

M_d = Molecular weight of stack gas (dry basis, lb/lb mole) =	30.19
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.090
M_s =	29.09

Volumetric Flow Rate (actual cubic feet per minute)

$$Q_a = (V_s)(A_s)(60)$$

V_s = Average stack gas velocity (feet per second) =	59.20
A_s = Cross sectional area of stack (feet squared) =	92.135
Q_a =	327,242

Volumetric Flow Rate (standard dry cubic feet per minute)

$$Q_s = Q_a(1 - B_{ws})\frac{(528)}{\overline{T_s}}\frac{(P_s)}{29.92}$$

Q_a = Volumetric flow rate (actual cubic feet per minute) =	327,242
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.090
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	757.3
P_s = Absolute stack pressure (inches Mercury) =	29.90
Q_s =	207,438

Volumetric Flow Rate (standard wet cubic feet per minute)

$$Q_{sw} = Q_a\frac{(528)}{\overline{T_s}}\frac{(P_s)}{29.92}$$

Q_a = Volumetric flow rate (actual cubic feet per minute) =	327,242
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	757.3
P_s = Absolute stack pressure (inches Mercury) =	29.90
Q_{sw} =	227,965

Particulate Mass Rate (pounds per hour)

$$PMR = (Cs)(Qs)\frac{(60)}{7000}$$

Cs =Polutant concentration (grains per standard dry cubic foot) = 0.0081
Q_a = Volumetric flow rate (standard dry cubic feet per minute) = 207,438
PMR = 14.428

Particulate Concentration (grains per standard dry cubic foot)

$$C_s = 0.0154\frac{M_n}{V_{m(Std)}}$$

Mn = Total amount ofPolutant collected (milligrams) = 19.3
$V_{m(Std)}$ = Volume of stack gas sampled (corrected to standard conditions) = 36.627
C_s = 0.00811

Particulate Concentration (grains per actual cubic foot)

$$C_a = 0.0154\frac{M_n}{V_{n\,(actual)}}$$

Mn = Total amount ofPolutant collected (milligrams) = 19.3
$V_{n\,(actual)}$ = Volume sampled at stack conditions (actual cubic feet) = 57.805
C_a = 0.00514

Percent of Isokinetic Sampling

$$I = \frac{100\ V_n}{(60)\ \varnothing\ V_s\ A_n}$$

V_n = Volume sampled at stack conditions through nozzle (actual cubic feet) = 57.805
V_s = Average stack gas velocity (feet per second) = 59.20
A_n = Cross-sectional area of nozzle (feet squared) = 0.000241
$\varnothing$ = Sampling Time (minutes) = 64
I = 105.7

Volume of Gas Sampled Through Nozzle (actual cubic feet)

$$V_n = \left[(0.002669)(V_{lc}) + Y\frac{V_m}{T_m}\left(P_{bar} + \frac{\overline{\Delta H}}{13.6}\right)\right]\frac{\overline{T_s}}{P_s}$$

V_{lc} = Total volume of liquid collected in impingers and silica gel (milliliters) =	77.0
Y = Dry gas meter calibration factor (dimensionless) =	1.063
V_m = Volume of gas sample as measured by dry gas meter (actual cubic feet) =	34.860
T_m = Average absolute temperature of dry gas meter, Degrees R (Degrees F+460) =	536.4
P_{bar} = Barometric Pressure (inches Mercury) =	29.97
ΔH = Average pressure difference of orifice (inches Water) =	1.15
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	757.3
P_s = Absolute stack pressure (inches Mercury) =	29.90
V_n =	57.805

Emission Rate in Pounds Per Million Btu (EPA Oxygen F Factor)

$$E = C_d\, F_{O2}\left(\frac{20.9}{20.9 - \%O_2}\right)$$

Cd = Pollutant concentration (pounds per standard dry cubic foot) =	0.0000012
F_{O2} = Oxygen based F factor (SDCF/mmBtu for bituminous coal) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	6.8
E_{O2} =	0.0168

Unit Operating Rate-Million Btu per Hour

$$UOR = \left(\frac{PMR}{E_{O2}}\right)$$

E_{O2} = Emission Rate in Pounds Per Million Btu (EPA Oxygen F Factor) =	0.0168
PMR = Pollutant Mass Rate (pounds per hour) =	14.42838734
UOR=	859

Nitrogen Oxides Emission Rate in Pounds per Hour

$$E_{lb/hour\ x} = \frac{MW_x}{385,000,000} C_{ppm_x} Q_{std} 60$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	46.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	225.71
Qstd = Volumetric flow rate (standard dry cubic feet per minute) =	207438
$E_{lb/hour}$ =	335.43

Nitrogen Oxides Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws}) C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
Cppmx = Pollutant Concentration (parts per million, dry basis) =	225.71
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.09
Cppmwetx	205.39

Nitrogen Oxides Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	46.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	225.71
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	6.81683
E_{O2} =	0.390

Carbon Monoxide Emission Rate in Pounds per Hour

$$E_{lb/hour\ x} = \frac{MW_x}{385,000,000} C_{ppm_x} Q_{std} 60$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	CO
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	5.60
Qstd = Volumetric flow rate (standard dry cubic feet per minute) =	207438
$E_{lb/hour}$ =	5.07

Carbon Monoxide Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws}) C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	CO
Cppmx = Pollutant Concentration (parts per million, dry basis) =	5.60
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.09
Cppmwetx	5.10

Carbon Monoxide Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	SO2
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	5.60
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	6.81683
E_{O2} =	0.00591

Volatile Organtic Compounds Emission Rate in Pounds per Hour

$$E_{\text{lb/hour } x} = \frac{MW_x}{385,000,000} C_{ppm_x} Q_{std} 60$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	VOC
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	44.10
Cppmx = Pollutant Concentration (parts per million, dry basis) =	0.00
Qstd = Volumetric flow rate (standard dry cubic feet per minute) =	207438
$E_{lb/hour}$ =	0.00

Volatile Organtic Compounds Concentration (dry Wet)

$$C_{ppmx} = \frac{C_{ppmwetx}}{(1 - B_{ws})}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	VOC
Cppmwetx = Pollutant Concentration (parts per million, wet basis) =	0.00
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.090
Cppmx	0.00

Volatile Organtic Compounds Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	TRS
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	34.08
Cppmx = Pollutant Concentration (parts per million, dry basis) =	0.00
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	6.81683
E_{O2} =	0.0000

APPENDIX D GAS CERTIFICATIONS

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1326

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE:
P.O. NO. 10/22/02
ORDER NO. 4991
6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02

Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/ 956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/ 925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/ 914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02

STEVE ESKA ANALYST

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:
INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/21/02
P.O. NO. 4991
ORDER NO. 6561069-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1920 psig CGA: 660 Analysis Date: 10/21/02
Shelf Life: 24 MONTHS Expiration Date: 10/21/04

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC27763	SULFUR DIOXIDE	450 ppm	449 ppm	1.5 ppm
	NITRIC OXIDE	450 ppm	465.0 ppm	1.3 ppm
	CARBON MONOXIDE	450 ppm	449 ppm	1.7 ppm
	CARBON DIOXIDE	11.5 %	11.61 %	0.043 %
	NITROGEN	BALANCE	BALANCE	
	NOX		466.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/933E	CC-121091	501PPM SO2 IN N2	10/24/02
GMIS/955E	CC30622	495PPM NO IN N2	12/04/02
GMIS/924E	CC-17292	503PPM CO IN N2	10/30/02
GMIS/914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/21/02
STEVE ESKA ANALYST

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/22/02
P.O. NO. 4991
ORDER NO. 6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02

Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02

STEVE ESKA ANALYST

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:
INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/21/02
P.O. NO. 4991
ORDER NO. 6561069-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1920 psig CGA: 660 Analysis Date: 10/21/02

Shelf Life: 24 MONTHS Expiration Date: 10/21/04

		Nominal	Actual	Uncertainty
CC27763	SULFUR DIOXIDE	450 ppm	449 ppm	1.5 ppm
	NITRIC OXIDE	450 ppm	465.0 ppm	1.3 ppm
	CARBON MONOXIDE	450 PPM	449 ppm	1.7 ppm
	CARBON DIOXIDE	11.5 %	11.61 %	0.043 %
	NITROGEN	BALANCE	BALANCE	
	NOX		466.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 931E	CC-121091	501PPM SO_2 IN N_2	10/24/02
GMIS/ 955E	CC30622	495PPM NO IN N_2	12/04/02
GMIS/ 924E	CC-17292	503PPM CO IN N_2	10/30/02
GMIS/ 914E	CC111038	14.00% CO_2 IN N_2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/21/02
STEVE ESKA ANALYST

MG 23301/C

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-585

CERTIFICATE OF ACCURACY: Interference Free™ Multi-Component EPA Protocol Gas

Assay Laboratory
SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: PTCONO
Project No.: 04-04803-001

Customer
SCOTT SPECIALTY GASES

LADEQ
9810 BAY AREA BLVD
PASADENA TX 77507

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM053585 Certification Date: 4/10/02 Exp. Date: 4/09/2004
Cylinder Pressure***: 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
CARBON MONOXIDE	37.8	PPM	+/- 1%	Direct NIST and NMi
NITRIC OXIDE	173	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	174.	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMi standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1678	6/01/02	ALM066443	49.16 PPM	CARBON MONOXIDE
NTRM	10/01/04	ALM038120	500.7 PPM	NO/N2

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400260	04/08/02	FTIR
FTIR System/8220/AAB9400260	04/08/02	FTIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

CARBON MONOXIDE

First Triad Analysis	Second Triad Analysis	Calibration Curve
Date:04/03/02 Response Unit:PPM	Date:04/10/02 Response Unit: PPM	Concentration = A + Bx + Cx2 + Dx3 + Ex4
Z1 = -1.47600 R1 = 49.14539 T1 = 37.91769	Z1 = -1.08850 R1 = 49.17556 T1 = 37.82392	r = 0.999990
R2 = 49.17972 Z2 = -1.45920 T2 = 37.93871	R2 = 49.18882 Z2 = -1.04380 T2 = 37.61763	Constants: A = 0.000000
Z3 = -1.47600 T3 = 37.92800 R3 = 49.15489	Z3 = -1.08820 T3 = 37.78305 R3 = 49.13780	B = 1.000000 C = 0.000000
Avg. Concentration: 37.93 PPM	Avg. Concentration: 37.81 PPM	D = 0.000000 E = 0.000000

NITRIC OXIDE

First Triad Analysis	Second Triad Analysis	Calibration Curve
Date:04/03/02 Response Unit:PPM	Date:04/10/02 Response Unit: PPM	Concentration = A + Bx + Cx2 + Dx3 + Ex4
Z1 = 0.12720 R1 = 501.0022 T1 = 173.4043	Z1 = 0.02530 R1 = 500.3259 T1 = 173.0887	r = 0.999990
R2 = 500.5084 Z2 = 0.13740 T2 = 173.5834	R2 = 500.8187 Z2 = 0.03810 T2 = 173.1711	Constants: A = 0.000000
Z3 = 0.27460 T3 = 173.4795 R3 = 500.5882	Z3 = 0.15280 T3 = 172.9858 R3 = 500.9543	B = 1.000000 C = 0.000000
Avg. Concentration: 173.5 PPM	Avg. Concentration: 173.1 PPM	D = 0.000000 E = 0.000000

APPROVED BY: WILLIAM MORGAN

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE:
P.O. NO. 07/03/02
ORDER NO. 4011
6367637-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 2025 psig CGA: 590 Analysis Date: 06/18/02

Shelf Life: 60 MONTH Expiration Date: 06/18/07

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
150-736	OXYGEN	5 %	5.06 %	0.03 %
	NITROGE	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 907E	CC13342	9.99 % O2/N2	05/17/04

INSTRUMENTATION

Instrument	Analytical Principle
SERVOMEX	PARAMAGNETIC DETECTION

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

Steve Eska 7/3/02
ANALYST

STEVE ESKA

MG 23301/C

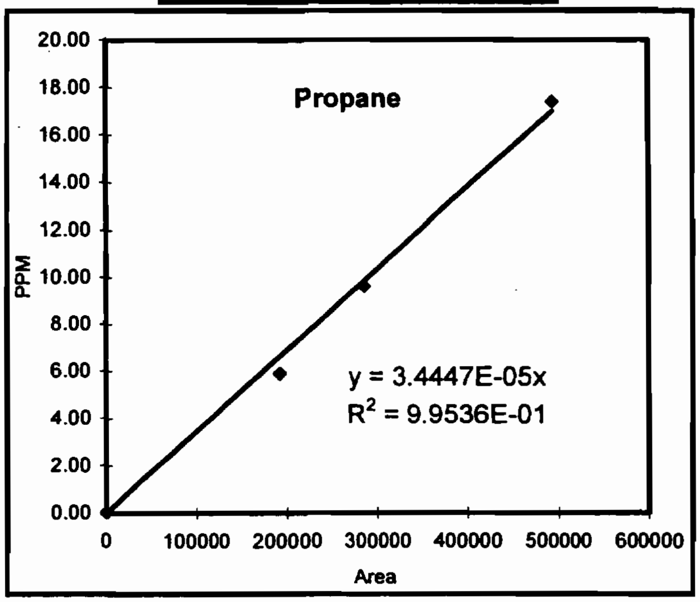
Gas Ghromatograph VOC Calibration Data
GULF POWER COMPANY
PLANT CRIST, UNIT 4
BASELINE STUDY

Point Number 1	
Gas	Propane
Concentration ppm	17.400
GC Injection	AREA
1	493014
2	493136
3	493254
AVERAGE	493135
GC Injection	% Difference
1	-0.0245
2	0.00027
3	0.02420

Point Number 2	
Gas	Propane
Concentration ppm	9.600
GC Injection	AREA
1	285674
2	282152
3	288296
AVERAGE	285374
GC Injection	% Difference
1	0.1
2	-1.1
3	1.0

Point Number 3	
Gas	Propane
Concentration ppm	5.900
GC Injection	AREA
1	194262
2	188365
3	193682
AVERAGE	192103
GC Injection	% Difference
1	1.1
2	-1.9
3	0.8

Propane	
area	ppm
493135	17.40
285374	9.60
192103	5.90
0.0	0

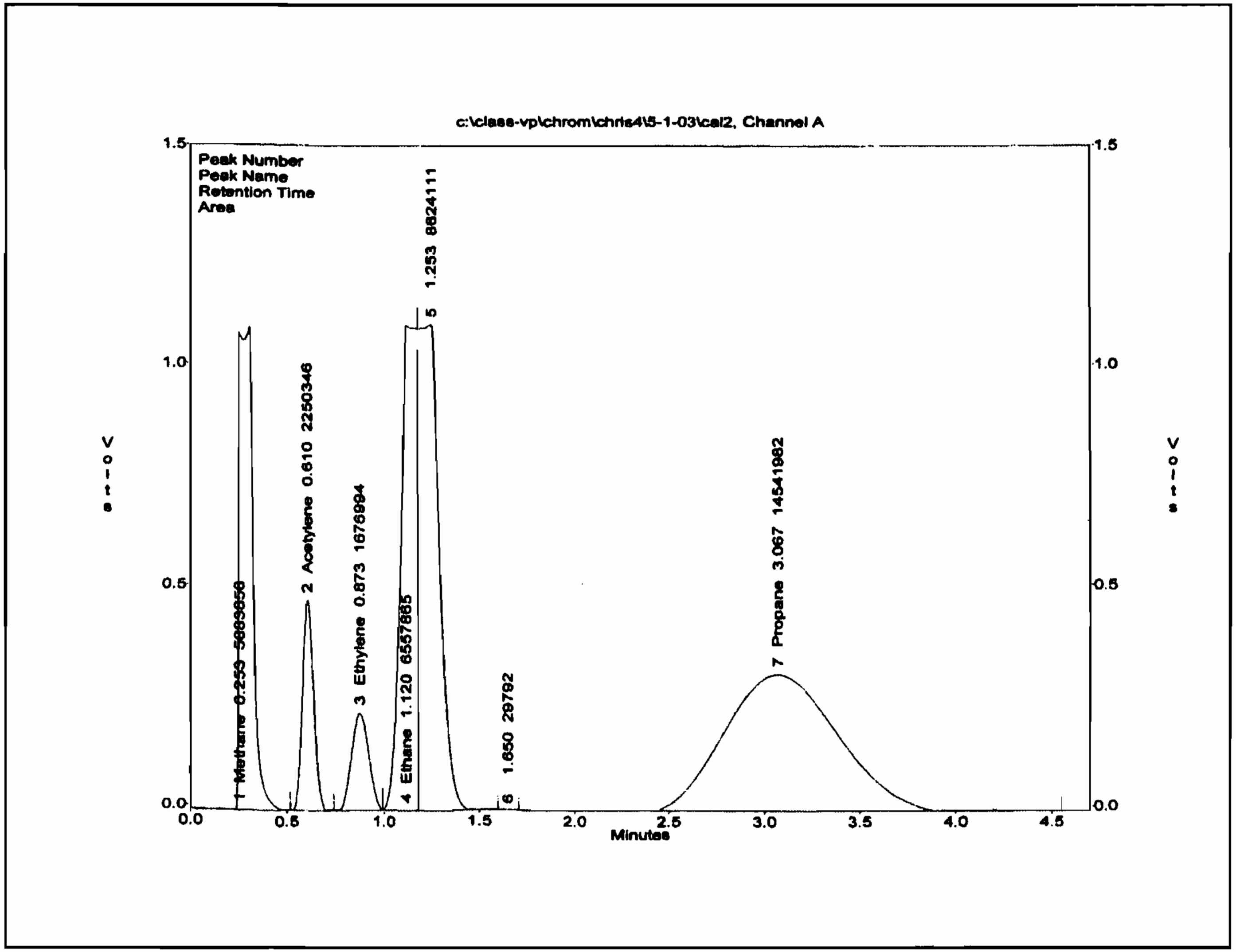


Dilution Factor Calculation		
EPA Cylinder Vaslue (ppm) = 49.3		
	GC Area	GC ppm
Inj. #1	12071	49.300
Inj. #2	12069	49.300
Inj. #3	12072	49.300
Average	12071	49.300
Dilution Factor =		1.000
Dilution Factor = Cylinder (ppm)/GC (ppm)		

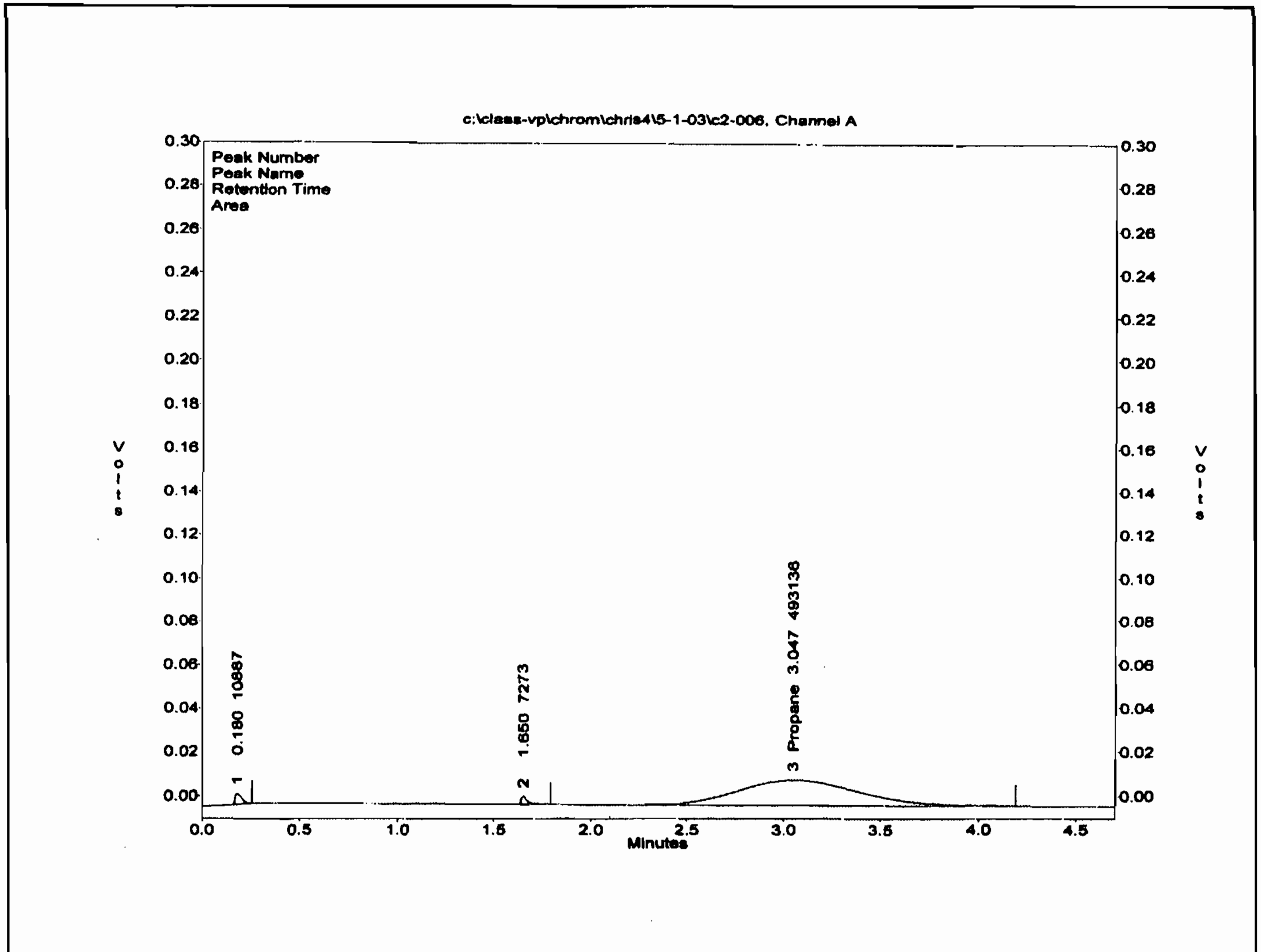
Calibration Factors	
Y=CX	Propane
Coefficient	3.445E-05

APPENDIX E EXAMPLE CHROMATOGRAMS

GAS CHROMATOGRAM DEMONSTRATING COLUMN PERFORMANCE SEPERATING C-1 THROUGH C-3+ COMPOUNDS (METHANE, ACETYLENE, ETHYLENE, ETHANE, AND PROPANE +)



GAS CHROMATOGRAPHIC INJECTION OF 17.4 PARTS PER MILLION CALIBRATION GAS



Crist 4

Baseline Coal Only Test

Maximum Allowable Heat Input: 1096.7 mmBtu/hr

Steady State May 02, 2003							
Run #	Load Gross MW	Start Time	End Time	Duration (Hours)	coal flow from LDMS (tons)	Coal Analysis Btu / lb	LDMS results mmBtu's/hr
1	80.1	06:34	07:40	1.10	36.60	11824	786.8
2	79.8	08:22	09:28	1.10	36.15	12008	789.3
3	80.5	10:05	11:12	1.12	37.20	11967	797.3
	80.1					**Average**	791.1
						Percent of Max Allowable	72%
						Load Limit if % < 90%	88

CEMS OPACITY DATA
Crist 4 Baseline Coal Only

Date	CEM Hour	Minutes									
		00	6	12	18	24	30	36	42	48	54
Steady State Testing											
05/02/03	6							9.1	9.1	8.9	8.8
05/02/03	7	8.4	8.5	8.7	8.5	8.5	8.4	8.4	8.4		
05/02/03	8					8.3	8.2	8.2	8.4	8.1	8.3
05/02/03	9	8.5	8.5	8.4	8.2	8.5	8.3				
05/02/03	10	8.7	8.6	8.8	8.5	8.2	8.5	8.3	8.3	8.2	8.3
05/02/03	11	8.5	8.4	8.7							

Gulf Power Plant Crist Unit 4
Baseline Coal Only Test Notes
Steady State Testing 05/02/03

Run #1

Start Time		Notes
CDT	CEMS	No operational problems noted.
07:34	06:34	NOTE: CEMS time, not Central Daylight Time (CDT), is used on Sander's test report.
Stop Time		
CDT	CEMS	
08:40	07:40	

Run #2

Start Time		Notes
CDT	CEMS	No operational problems noted.
09:22	08:22	
Stop Time		
CDT	CEMS	
10:28	09:28	

Run #3

Start Time		Notes
CDT	CEMS	No operational problems noted.
11:05	10:05	
Stop Time		
CDT	CEMS	
12:12	11:12	

Coal Bas[redacted]e Drumond

Crist Plant Particulate Compliance Test Control Room Data

Unit 4 Date 5/2/03

Check one: [ ] Sootblowing [X] Steady-State (no sootblowing)

Unit Operator: Roberts

Run	CEMS Time	Pulverizer Coal Integrators (x 100 pounds) A	B	C	D	Generation Digital Meter MW	Gross Generation Integrator MWhr	Main Steam Total Flow (x 10e6 lb/hr)	Boiler Air Flow (x 10e6 lb/hr)	Excess O2 Econ Outlet % A	Excess O2 Econ Outlet % B	Opacity 6 min Avg %	ID Fan Amps A	ID Fan Amps B	Gas Temp Air Htr Outlet deg F A	Gas Temp Air Htr Outlet deg F B	Soot Blowing Status	Data taken by (Initials)
#1 Start	0634					82	984497	119864	678	3.2	2.5	9.1	240		280	293	N.A	
#1 End	0746	181917	503547	183908	998942	82	984588	119969	684	2.5	3.2	8.4	240		281	294	N.A	
		181981	503785	183902	999146	82												
#2 Start	8:22	182088	503859	184023	999274	82	984644	119972	681	3.2	2.5	8.3	240		281	295		
#2 End	9:25	182247	504038	184208	999425	82	984733	119977	668	3.2	2.5	8.5	240		281	295		
#3 Start	1022	182342	504143	184312	999590	82	984784	119980	684	3.1	2.5	8.6	240		280	294		
#3 End	11:22	182512	504316	184511	999785	83.2	984877	119985	680	3.2	2.4	8.7	240		278	292		

Operational Comments

Run #1	
Run #2	
Run #3	

Inside Operator: Roberts

Outside Operator (Coal Samples): Davis

Laboratoryman (Ash Samples): Rest

Electrician (ESP Readings): Boyd

Coal Baseline Drummond

Crist Particulate Compliance Test Precipitator Data

Unit 4 Date 5/2/03 Run # 1 ☐ Sootblow ☑ Steady State

HOT SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 6:34 Data taken by 5-2-03								
A	10	0	28	247	.17	30	5	80
B	26	0	45	292	.40	30	11	76
C	26	0	55	248	.28	28	7	89
D	25	0	49	269	.19	26	12	103
E	30	0	28	285	.17	25	6	81
F	0	0	53	284	.42	21	13	100
Run Stop Time 7:40 Data taken by 5-2-03								
A	8	0	28	249	.17	30	5	80
B	26	0	46	280	.34	32	9	77
C	25	0	48	265	.23	28	8	98
D	25	0	60	296	.42	26	12	101
E	30	0	25	270	.16	24	6	62
F	0	0	52	285	.42	21	13	100

COLD SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 6:34 Data taken by 5-2-03								
A	0	0	45	410	.30	40	15	120
B	0	0	62	256	.52	9	2	65
C	0	0	54	424	.35	37	19	130
Run End Time 7:40 Data taken by 5-2-03								
A	0	0	46	408	.31	39	15	120
B	0	0	63	262	.52	10	2	65
C	0	0	53	423	.35	37	19	130

Comments

Coal Baseline Drummond

Crist Particulate Compliance Test Precipitator Data

Unit 4 Date 5/2/03 Run # 2 ☐ Sootblow ☑ Steady State

HOT SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 8:22 Data taken by 5-2-03								
A	10	0	27	249	.17	31	5	80
B	26	0	43	276	.37	32	10	79
C	25	0	42	265	.26	28	10	91
D	25	0	38	240	.35	26	11	94
E	31	0	22	287	.18	24	6	82
F	0	0	52	287	.42	21	13	100
Run Stop Time 9:28 Data taken by 5-2-03								
A	4	0	28	247	.11	30	5	80
B	25	0	40	279	.33	31	9	55
C	25	0	49	265	.30	29	14	100
D	25	0	45	275	.43	26	11	94
E	29	0	25	268	.17	24	3	66
F	3	0	51	289	.41	21	13	100

COLD SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 8:22 Data taken by 5-2-03								
A	0	0	46	409	.30	39	15	120
B	0	0	63	262	.53	10	2	65
C	0	0	53	422	.35	37	19	130
Run End Time 9:28 Data taken by 5-2-03								
A	0	0	45	406	.30	39	15	120
B	0	0	63	263	.54	10	2	65
C	0	0	52	420	.34	37	18	130

Comments

Coal Baseline Drumond

Crist Particulate Compliance Test Precipitator Data

Unit 4 Date 5/2/03 Run # 3 ☐ Sootblow ☑ Steady State

HOT SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 10:05 Data taken by 5-2-03								
A	3	0	28	248	.17	28	5	73
B	26	0	44	290	.38	29	9	77
C	25	0	36	248	.44	29	7	72
D	25	0	53	265	.35	26	10	94
E	30	0	23	279	.16	25	5	78
F	0	0	51	288	.41	21	13	100
Run Stop Time 11:12 Data taken by 5-2-03								
A	8	0	20	212	.17	30	5	64
B	26	0	48	268	.37	32	10	72
C	25	0	38	252	.27	29	13	105
D	25	0	65	287	.40	26	16	102
E	29	0	25	268	.14	26	7	69
F	0	0	51	289	.41	21	13	100

COLD SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 10:05 Data taken by 5-2-03								
A	0	0	45	408	.30	40	15	120
B	0	0	63	263	.53	10	2	65
C	0	0	53	421	.35	37	19	130
Run End Time 11:12 Data taken by 5-2-03								
A	1	1	38	377	.31	40	15	120
B	0	0	64	264	.54	10	2	65
C	0	2	53	421	.36	37	19	130

Comments

HOT SIDE 4 & 5 PROGRAM 1.

09-

8	7	6	5	NUMBER

GROUP NO. ①	FIELD NAME ②	REPEAT TIME ③	LIFT HEIGHT ④⑤ (LIFT / IMPACTS / FREQUENCY); ON TIME ⑥ (HRS / MIN / SEC); ON TIME ⑦ (ON TIME / INTENSITY)	REST TIME ⑧	P.O.R. TIME ⑨	RAP DIRECTION ⑩	STARTING RAPPER ⑪	(REST) MODE ⑫	ANTI-COINCIDENCE GROUP ⑬	DUTY CYCLES ⑭ FIELD	DUTY CYCLES ACG	DUTY CYCLES INTERLEAVE
1	H4P1	2:05	10	4:0		Asc.	1	MK3	1			
2	H4P2	4:03	10				7		1			
3	H4P3	6:05	10				13		1			
4	H4P4	10:07	10				19		1			
5	H4P5	13:13	10				25		1			
6	H4P6	16:01	10				31		1			
7	H4P7	21:07	10				37		1			
8	H4P8	26:11	10				43		1			
9	H4P9	31:37	10				49		1			
10	H4W	5:01	5sec/100%				1		2			
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												

D

C

B

UNIT 4 COLD

200

8	7	6	5	NUMBER	3

GROUP NO.	FIELD NAME	REPEAT TIME	LIFT HEIGHT: LIFT / ON TIME: HRS / ON TIME: ON TIME	IMPACTS / MIN / INTENSITY	FREQUENCY / SEC	REST TIME	P.O.R. TIME	RAP DIRECTION	STARTING RAPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACG	DUTY CYCLES INTERLEAVE
1	C4LA	1:03 2:03	3.6	1	1	0:10	-	ASC	01	MAX	1	48	179	3
2	C4TA	1:59 3:59	3.6	1	1	0:10	-	ASC	04	MAX	1	25	179	1
3	C4LB	3:01 6:01	3.6	1	1	0:10	-	ASC	07	MAX	1	17	179	1
4	C4TB	3:51 9:51	3.6	1	1	0:10	-	ASC	10	MAX	1	13	179	1
5	C4LC	6:17 15:17	3.6	1	1	0:10	-	ASC	13	MAX	1	8	179	0
6	C4TC	7:03 25:03	3.6	1	1	0:10	-	ASC	16	MAX	1	7	179	0
7	C4EA	2:01	3.4	1	1	0:10	-	ASC	01	MAX	1	33	179	2
8	C4EB	3:59	3.4	1	1	0:10	-	ASC	05	MAX	1	17	179	1
9	C4EC	6:03	3.4	1	1	0:10	-	ASC	09	MAX	1	11	179	1
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														

D

C

B

UNIT 5 COLD

8 | 7 | 6 | 5 | NUMBER

GROUP NO. (1)	FIELD NAME (2)	REPEAT TIME (3)	LIFT HEIGHT (4)(5): LIFT / IMPACTS / FREQUENCY; ON TIME (6): HRS / MIN / SEC; ON TIME (7): ON TIME / INTENSITY	REST TIME SEC (8)	P.O.R. TIME (9)	RAP DIRECTION (10)	STARTING RAPPER (11)	(REST) MODE (12)	ANTI-COINCIDENCE GROUP (13)	DUTY CYCLES (14) FIELD	ACC	INTERLEAVE
1	CS-1	2:03	5.0 4FT	2.0		ASC.	1	MA.	1	10	17	3
2	CS-2	5:13	5.0	2.0		ASC.	4	MA.	1	4	17	1
3	CS-[illegible]	9:19	[illegible]	2.0		ASC.	7	MA.	1	1	17	0
4	[illegible]	13:03	[illegible]	2.0		ASC.	10	MA.	1	1	17	0
5	[illegible]	6:00	[illegible]	2.0		ASC.	13	MA.	1	1	17	0
6												
7												
8												
9												
10												
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23												
24												
25												

CRIST PLANT LOI WORKSHEET

	DATE =	5/2/2003			
HOPPER	CRUCIBLE NUMBER	CRUCIBLE WEIGHT	CRUCIBLE AND SAMPLE WEIGHT	POST FURNACE WEIGHT	LOI
UNIT 4 - 3 0830	3	15.6358	16.6360	16.5010	13.50
UNIT 4 - 6 0830	1	15.5515	16.5549	16.4577	9.69
UNIT 4-3 1030	8	15.2678	16.2683	16.1163	15.19
UNIT 4-6 1030	41	15.4547	16.4599	16.3765	8.30
UNIT 4-3 1215	15	14.8995	15.9001	15.7825	11.75
UNIT4-6 1215	2	16.8624	17.8727	17.7512	12.03

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03
Laboratory Account CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN1
Drummond Coal Baseline Run 1

Laboratory ID Number : AH13531

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	5.55	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13339	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	48	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.61	% By Weight
Lead, Dry Basis	ASTM D6357	3.2	mg/kg
Mercury, Dry	ASTM D6414	0.106	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.36	% By Weight
Ash, As Received	ASTM D 5142	4.92	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11824	Btu/lb
Fluorine, As Received	ASTM D 5987	43	mg/kg
Sulfur, As Received	ASTM D 4239	0.54	% By Weight
Lead, As Received	ASTM D6357	2.8	mg/kg
Mercury, As Received	ASTM D6414	0.094	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	14.37	% By Weight
Barium, Ignited Basis	ASTM D 3683	2089.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.16	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.06	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.45	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.08	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.16	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.91	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ______________________
Supervision________________________

Date : 5/28/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03
Laboratory Account CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN1
Drummond Coal Baseline Run 1

Laboratory ID Number : AH13531

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.36	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	0.90	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.70	% By Weight
Lead, Ignited Basis	ASTM D 6357	57.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	27.15	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.62	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.23	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.75	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.18	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.40	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	57.57	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.49	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.25	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.17	% By Weight
Barium Oxide, Ignited	ASTM D 3683	2332.4	mg/kg
Lead Oxide, Ignited	ASTM D 6357	65.7	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14123	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.457	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ____________________
Supervision ____________________

Date : 5/28/2003

smk/coal

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03

Laboratory Account CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN2
Drummond Coal Baseline Run 2

Laboratory ID Number : AH13532

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	4.42	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13491	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	64	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	2.1	mg/kg
Mercury, Dry	ASTM D6414	0.096	mg/kg
As Received			
Moisture, Total	ASTM D 2013	10.99	% By Weight
Ash, As Received	ASTM D 5142	3.93	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12008	Btu/lb
Fluorine, As Received	ASTM D 5987	57	mg/kg
Sulfur, As Received	ASTM D 4239	0.51	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.085	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	15.60	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.37	% By Weight
Barium, Ignited Basis	ASTM D 3683	2690.	mg/kg
Iron, Ignited Basis	ASTM D 3682	5.46	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.48	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.14	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.01	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.14	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ____________________
Supervision____________________

Date : 5/28/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03
Laboratory Account CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN2
Drummond Coal Baseline Run 2

Laboratory ID Number : AH13532

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.37	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.05	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.78	% By Weight
Lead, Ignited Basis	ASTM D 6357	48.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	29.48	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.92	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.81	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.80	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.32	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	53.78	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.62	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.30	% By Weight
Barium Oxide, Ignited	ASTM D 3683	3003.4	mg/kg
Lead Oxide, Ignited	ASTM D 6357	55.4	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14115	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.423	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ____________________
Supervision____________________

Date : 5/28/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03

Laboratory Account CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN3
Drummond Coal Baseline Run 3

Laboratory ID Number : AH13533

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	4.09	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13522	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	40	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.61	% By Weight
Lead, Dry Basis	ASTM D6357	2.1	mg/kg
Mercury, Dry	ASTM D6414	0.096	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.50	% By Weight
Ash, As Received	ASTM D 5142	3.62	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11967	Btu/lb
Fluorine, As Received	ASTM D 5987	35	mg/kg
Sulfur, As Received	ASTM D 4239	0.54	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.085	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.82	% By Weight
Barium, Ignited Basis	ASTM D 3683	2910.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.51	% By Weight
Iron, Ignited Basis	ASTM D 3682	6.54	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.55	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.14	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.21	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.60	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ____________________
Supervision____________________

Date : 5/28/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03
Laboratory Account CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN3
Drummond Coal Baseline Run 3

Laboratory ID Number : AH13533

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.17	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.67	% By Weight
Lead, Ignited Basis	ASTM D 6357	52.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.11	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.11	% By Weight
Iron Oxide, Ignited	ASTM D 3682	9.35	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.91	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.32	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.46	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.77	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.92	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.12	% By Weight
Barium Oxide, Ignited	ASTM D 3683	3249.0	mg/kg
Lead Oxide, Ignited	ASTM D 6357	60.0	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14099	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.451	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ______________________
Supervision______________________

Date : 5/28/2003

smk/coal

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

April 1, 2003

Ms. Sandra Veazey
Florida Department of Environmental Protection
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Ms. Veazey:

PLANT CRIST UNIT 4 – AIR PERMIT NO.: 0330045-004-AC
CARBONACEOUS MATERIAL (SAW DUST) TEST BURN EMISSION TESTS

Please find attached one copy of the Carbonaceous Material(saw dust) Test Burn Emission Tests Report for Plant Crist Unit 4 as required under Rule 62-297.310(8), FAC.

The emission testing was conducted by Sanders Engineering and Analytical Services, Inc. and Supervised by Gulf Power's Environmental Affairs Department,on 02/18, 02/20 and 02/21. This testing was conducted to determine the feasibility of carbonaceous fuel use in an emissions reduction program for Units 4 and 5 at Plant Crist.

Should you have any questions concerning these reports, please call me at (850) 444-6527.

Sincerely,
Dwain Waters O.F.P.

G. Dwain Waters
Air Quality Programs Supervisor

Enclosure:
Attachments:

Cc: J. W. Martin J. M. Dominey T. L. Wright Charles Howton
file ENG 10-1-15 PCT *CR4* CORR

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APR 0 3 2003
NORTHWEST FLORIDA
DEP

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

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CERTIFICATION BY RESPONSIBLE OFFICIAL

"I, the undersigned, am the responsible official, as defined in Chapter 62-210.200, F.A.C., for Gulf Power Title V sources for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate and complete."

Responsible Official Signature:

4-1-03

G. L. Usse[illegible]
Vice-President of Power Generation

Date:

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

BASELINE STUDY WHILE BURNING CARBONACEOUS MATERIAL FOR NITROGEN OXIDES, CARBON MONOXIDE, OXYGEN, TOTAL VOLATILE ORGANIC COMPOUNDS, AND EXEMPT VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST REPORT

FOR

GULF POWER COMPANY
Plant Crist, Unit 4
Pensacola, Florida

SEAS

February 18, 2003

1568 LEROY STEVENS ROAD
MOBILE, ALABAMA 36695
(251) 633-4120
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E-MAIL: sanders@sandersengineering.com

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.
An Environmental Engineering Firm Specializing in Air Emissions Measurement and Permitting
www.sandersengineering.com EMAIL: sanders@sandersengineering.com
Phone: 251-633-4120
Fax: 251-633-2285
1568 Leroy Stevens Rd.
Mobile, AL 36695

REPORT CERTIFICATION

I have reviewed the "Baseline Study While Burning Carbonaceous Material for Nitrogen Oxides, Carbon Monoxide, Oxygen, Total Volatile Organic Compounds, and Exempt Volatile Organic Compounds Emissions Test Report" for the testing performed for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. I hereby certify that it is authentic and accurate to the best of my knowledge.

Date: 3/5/03

Signature: ______________________
Johnny W. Sanders, P.E., M.P.H.
President

TABLE OF CONTENTS

LIST OF TABLES

ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS) performed a baseline study while burning carbonaceous material for nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. The testing was conducted February 18, 2003. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 3a, 7e, 10, and SEAS 2518**. Method 2518 is a gas chromatic method for the separation of exempt voc's (methane and ethane) from non-exempt voc's. Further discussions of the test methods are included later in the report.

The purpose of the testing was to demonstrate compliance with the rules and regulations of the U. S. Environmental Protection Agency, and to meet the necessary requirements contained in the permit to operate issued by the Florida Department of Environmental Protection. The tests were conducted by Mr. Joseph Sanders and Mr. LeBarron Rudolph of Sanders Engineering & Analytical Services, Inc., and were coordinated with Mr. Kevin Beaty of Gulf Power Company. The Florida Department of Environmental Protection was notified so a representative could be present to observe the testing.

The results of the testing prove Unit 4 to be in compliance with the nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions limitations contained in the permit to operate issued by the Florida Department of Environmental Protection.

2. DESCRIPTION OF SAMPLING PROGRAM

The sampling program consisted of nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions testing in compliance with US EPA methods. The following is a brief description of these types of tests.

2.1. Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions Testing

Nitrogen oxides, carbon monoxide, and oxygen emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe, a moisture removal system, and into instruments specifically designed for the measurement of the particular pollutant of interest. The instruments responded linearly to concentrations of the pollutants. The output of the instruments is a continuous analog voltage which is digitized and input into a PC based data acquisition system. The PC data acquisition system polls the instrument 1000 times per second. The computer averages these readings into one-second averages during calibrations and one minute averages at other times. These one second and one minute averages are written to the hard disk each minute to ensure no data loss due to power failure or other inadvertent occurrence. The computer stores in memory all calibration and stack gas analyses during each run. The averages for each calibration and for each independent run were averaged for the time of the runs. Descriptions of the testing procedures are included in Sections 6 and 7. Sample calculations of Run 1 are included in Appendix B. The Protocol 1 gas certifications are included in Appendix C.

2.2. Volatile Organic Compounds Emissions Testing

Volatile organic compounds emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe and heated teflon line into a gas chromatograph equipped with a flame ionization detector. The chromatograph divided the compounds into four specific organic compounds and one group of organic compounds. The four specific compounds are methane, acetylene, ethylene, and ethane. The groups of compounds are all compounds which contain three or more carbon atoms (Propane+). The chromatograph was injected with a combination of these gases to ensure separation and then calibrated with Protocol 1 gases of propane. The calibration curve for propane was used to convert the area of each peak representing each compound into its equivalent part per million as propane. A description of the testing procedure is included in Section 8. The Protocol 1 gas certifications and calibration graph of propane versus peak area are included in Appendix C. A line loss/system check was performed at the beginning and end of each test by injecting Protocol 1 propane in nitrogen calibration gas at the probe and measuring the concentration with at least two injections of the chromatograph. Appendix C contains a table which shows the results of these system checks. The raw data is corrected for the line loss/system check if greater than five percent. Example chromatograms are included in Appendix D. Operational data as supplied by a representative of Gulf Power Company is included in Appendix E.

3. SUMMARY AND DISCUSSION OF RESULTS

There were no unusual problems experienced during the performance of the testing. The results for the nitrogen oxides, carbon monoxide, oxygen, and volatile organic compounds emissions testing are presented in Table I. A graphical representation of the nitrogen oxides, carbon monoxide, and oxygen concentrations are presented in Figure 1. The quality assurance calculations for the nitrogen oxides, carbon monoxide, and oxygen testing are presented in Tables II through IV, respectively. The volatile organic compounds stack gas analysis is presented in Table V.

Example chromatograms of a combination of a gas containing methane, acetylene, ethylene, ethane, and propane are shown in Appendix D. The purpose of these chromatograms is to show the gas chromatograph column performance in separating each of these compounds. Also included in Appendix D is the representative chromatogram of stack gas showing the only non-exempt volatile organic compounds.

The results of the testing for each parameter are as follows:

PARAMETER	Emission Rate (lbs/MMbtu)
Nitrogen Oxides	0.489
Carbon Monoxide	0.00964
Volatile Organic Compounds	0.00233

TABLE I. NITROGEN OXIDES, CARBON MONOXIDE, OXYGEN, AND VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/18/2003

TEST	START TIME Military	STOP TIME Military	WATER VAPOR IN STACK GAS (percent)	F FACTOR Oxygen (Dry) (sdcf/MMbtu)	OXYGEN (Dry) (measured) (Percent)	Nitrogen Oxides Emissions (ppm-dry)	Nitrogen Oxides Emissions (O2 F factor) (lbs/MMbtu)	Carbon Monoxide Emissions (ppm-dry)	Carbon Monoxide Emissions (ppm-wet)	Carbon Monoxide Emissions (O2 F factor) (lbs/MMbtu)	Volatile Organic Compounds Emissions (ppm-wet)	Volatile Organic Compounds Emissions (ppm-dry)	Volatile Organic Compounds Emissions (O2 F factor) (lbs/MMbtu)
RUN 1	9:47	10:47	8.00	9780	7.42	247.85	0.447	11.44	10.53	0.01262	1.57	1.71	0.00296
RUN 2	12:34	13:34	8.00	9780	7.83	274.35	0.510	7.52	6.92	0.00855	1.28	1.39	0.00249
RUN 3	13:55	14:55	8.00	9780	7.88	272.62	0.509	6.80	6.25	0.00776	0.80	0.87	0.00156
Average			**8.00**		**7.71**	**264.94**	**0.489**	**8.59**	**7.90**	**0.00964**	**1.22**	**1.32**	**0.00233**

Figure 1. Graphical Representation of Stack Gas Concentrations While Burning Carbonaceous Material

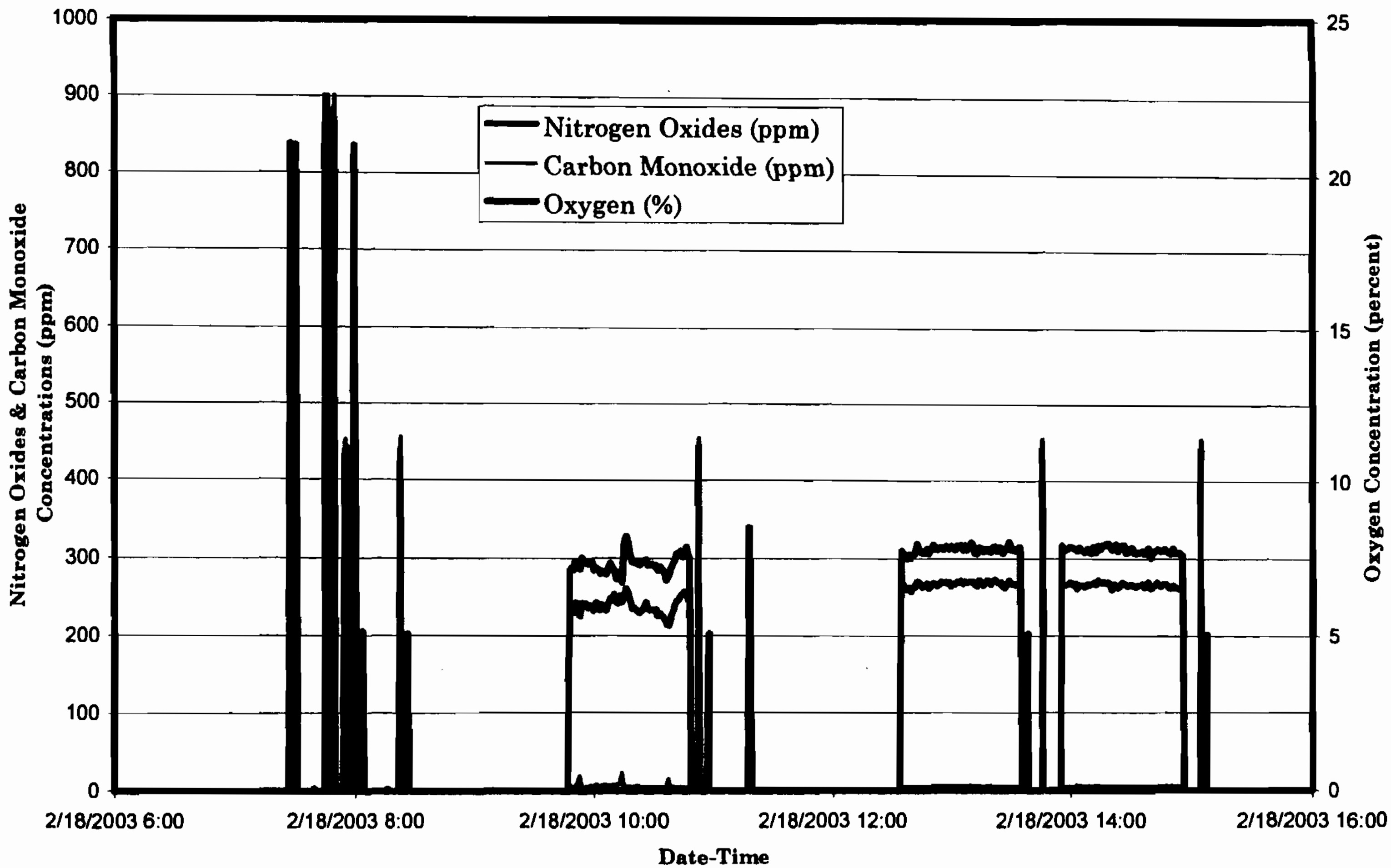


TABLE II. OXYGEN TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/18/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (%) =	25.0		ANALYZER ID.	HORIBA 331A
	CYLINDER VALUE Percent	ANALYZER RESPONSE (Percent)	DIFFERENCE (Percent)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	20.9	20.9	0.0	0.0
Mid Range Gas	5.1	5.1	0.0	0.0

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (Percent)*	*system Zero (Percent)*	*system upscale (Percent)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (Percent)*	*ANALYZER SPAN (Percent)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	OXYGEN CONCENTRATION (Percent-Dry)
		INITIAL SYSTEM		*0.1*	*5.0*									
9:47	*10:47*	Run 1	*7.3*	*0.1*	*5.1*	*5.1*	*25.0*	0.4	0.4	0.0	-0.4	0.0	0.4	7.4
12:34	*13:34*	Run 2	*7.8*	*0.0*	*5.1*	*5.1*	*25.0*	0.4	0.0	-0.4	0.0	0.0	0.0	7.8
13:55	*14:55*	Run 3	*7.8*	*0.0*	*5.0*	*5.1*	*25.0*	0.0	0.0	0.0	0.0	-0.4	-0.4	7.9

TABLE III. NITROGEN OXIDES TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/18/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000		ANALYZER ID.	HORIBA 311
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	866	866.0	0.0	0.0
Mid Range Gas	454.7	440.0	14.7	1.6

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	NITROGEN OXIDES CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*-4.0*	*436.2*									
9:47	*10:47*	Run 1	*238.6*	*0.1*	*442.5*	*454.7*	*1000.0*	-0.4	0.0	0.4	-0.4	0.3	0.6	247.9
12:34	*13:34*	Run 2	*267.4*	*2.6*	*442.1*	*454.7*	*1000.0*	0.0	0.3	0.3	0.3	0.2	0.0	274.3
13:55	*14:55*	Run 3	*266.2*	*5.0*	*440.8*	*454.7*	*1000.0*	0.3	0.5	0.2	0.2	0.1	-0.1	272.6

TABLE IV. CARBON MONOXIDE TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/18/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000		ANALYZER ID.	HORIBA 331A
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	901	901.0	0.0	0.0
Mid Range Gas	442.5	451.3	-8.8	-0.9

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	-FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	CARBON MONOXIDE CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*-7.2*	*448.8*									
9:47	*10:47*	Run 1	*6.8*	*-2.8*	*453.8*	*442.5*	*1000.0*	-0.7	-0.3	0.4	-0.3	0.3	0.5	11.4
12:34	*13:34*	Run 2	*5.9*	*-0.9*	*454.3*	*442.5*	*1000.0*	-0.3	-0.1	0.2	0.3	0.3	0.1	7.5
13:55	*14:55*	Run 3	*5.8*	*-1.5*	*454.7*	*442.5*	*1000.0*	-0.1	-0.2	-0.1	0.3	0.3	0.0	6.8

Table V: Results of Gas Chromatographic Analysis of Stack Gases for Volatile Organic Compounds

Gulf Power Company
Plant Crist, Unit 4
Carbonaceous Material
2/18/2003

Injection Number	Run Name	Injection Time	Methane Peak Area	Acetylene Peak Area	Ethylene Peak Area	Ethane Peak Area	Propane Peak Area	Methane ppm as propane	Acetylene ppm as propane	Ethylene ppm as propane	Ethane ppm as propane	Propane ppm as propane	Line Loss Percent	TOTAL VOC ppm as propane	TOTAL VOC ppm as propane Corrected For Line Loss
1	Initial Line Loss						11594					47.4			
2	Initial Line Loss											0.0			
3	Initial Line Loss											0.0			
Average	**Initial Line Loss**						11594					47.4	4.9%		
System Check Cylinder Value (ppm)												49.8			
1	Run 1	9:48 AM	-215	-9	-33	156	346	0.0	0.0	0.0	0.6	1.4		1.4	1.4
2	Run 1	9:53 AM	-188	-2	-11	59	362	0.0	0.0	0.0	0.2	1.6		1.6	1.6
3	Run 1	9:58 AM	-218	-2	-25	98	401	0.0	0.0	0.0	0.4	1.6		1.6	1.6
4	Run 1	10:03 AM	-225	-2	-18	55	399	0.0	0.0	0.0	0.2	1.6		1.6	1.6
5	Run 1	10:08 AM	-224	-2	-49	104	407	0.0	0.0	0.0	0.4	1.7		1.7	1.7
6	Run 1	10:13 AM	-221	-2	-79	91	416	0.0	0.0	0.0	0.4	1.7		1.7	1.7
7	Run 1	10:18 AM	-216	2	-65	72	376	0.0	0.0	0.0	0.3	1.5		1.5	1.6
8	Run 1	10:23 AM	-177	-2	-63	88	392	0.0	0.0	0.0	0.4	1.6		1.6	1.6
9	Run 1	10:28 AM	-211	2	-15	86	403	0.0	0.0	0.0	0.4	1.6		1.7	1.7
10	Run 1	10:33 AM	-218	-2	21	66	307	0.0	0.0	0.1	0.3	1.3		1.3	1.3
11	Run 1	10:38 AM	-169	-2	-1	185	402	0.0	0.0	0.0	0.8	1.6		1.6	1.7
12	Run 1	10:43 AM	-210	-2	5	99	387	0.0	0.0	0.0	0.4	1.6		1.6	1.6
Number of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
Average	**Run 1**		-208	-2	-28	97	385	0.0	0.0	0.0	0.2	0.9	0.72%	0.9	1.0
1	Run 1 Line Loss	10:58 AM					11959					48.8			
2	Run 1 Line Loss	11:03 AM					12153					49.6			
3	Run 1 Line Loss	11:08 AM					12202					49.8			
Average	**Run 1 Line Loss**						12105					49.4			
1	Run 2	11:13 AM	-207	-11	1	23	197	0.0	0.0	0.0	0.1	0.8		0.8	0.8
2	Run 2	12:47 PM	-176	-6	13	42	208	0.0	0.0	0.1	0.2	0.8		0.9	0.9
3	Run 2	12:52 PM	-214	-7	23	66	401	0.0	0.0	0.1	0.3	1.6		1.7	1.7
4	Run 2	12:57 PM	-216	2	-79	90	498	0.0	0.0	0.0	0.4	2.0		2.0	2.1
5	Run 2	1:02 PM	-179	-2	-15	184	356	0.0	0.0	0.0	0.8	1.5		1.5	1.5
6	Run 2	1:07 PM	-222	-2	-63	99	407	0.0	0.0	0.0	0.4	1.7		1.7	1.7
7	Run 2	1:12 PM	-220	-2	1	100	397	0.0	0.0	0.0	0.4	1.6		1.6	1.6
8	Run 2	1:17 PM	-224	-2	-1	6	259	0.0	0.0	0.0	0.0	1.1		1.1	1.1
9	Run 2	1:22 PM	-231	-4	-1	60	238	0.0	0.0	0.0	0.2	1.0		1.0	1.0
10	Run 2	1:27 PM	-225	-4	-8	99	252	0.0	0.0	0.0	0.4	1.0		1.0	1.0
11	Run 2	1:32 PM	-221	-1	-11	11	345	0.0	0.0	0.0	0.0	1.4		1.4	1.4
12	Run 2	1:37 PM	-224	-8	3	24	209	0.0	0.0	0.0	0.1	0.9		0.9	0.9
Number of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
Average	**Run 2**		-218	-4	-11	67	314	0.0	0.0	0.0	0.2	0.8	0.72%	0.8	0.8
1	Run 2 Line Loss	1:55 PM					12202					49.8			
2	Run 2 Line Loss	2:00 PM					12184					49.8			
3	Run 2 Line Loss	2:05 PM					11929					48.7			
Average	**Run 2 Line Loss**						12105					49.4			
1	Run 3	2:10 PM	-214	5	-2	183	170	0.0	0.0	0.0	0.7	0.7		0.7	0.7
2	Run 3	2:15 PM	-201	-4	-49	82	147	0.0	0.0	0.0	0.3	0.6		0.6	0.6
3	Run 3	2:20 PM	-178	-7	-53	79	255	0.0	0.0	0.0	0.3	1.0		1.0	1.0
4	Run 3	2:25 PM	-184	-7	-59	59	204	0.0	0.0	0.0	0.2	0.8		0.8	0.8
5	Run 3	2:30 PM	-188	-4	-56	55	227	0.0	0.0	0.0	0.2	0.9		0.9	0.9
6	Run 3	2:35 PM	-182	-5	-48	62	203	0.0	0.0	0.0	0.3	0.8		0.8	0.8
7	Run 3	2:40 PM	-175	-6	-20	52	234	0.0	0.0	0.0	0.2	1.0		1.0	1.0
8	Run 3	2:45 PM	-169	-7	-24	65	176	0.0	0.0	0.0	0.3	0.7		0.7	0.7
9	Run 3	2:50 PM	-213	-12	-6	60	137	0.0	0.0	0.0	0.2	0.6		0.6	0.6
10	Run 3	2:55 PM	-192	83	-1	41	241	0.0	0.3	0.0	0.2	1.0		1.3	1.3
11	Run 3	3:00 PM	-196	-8	6	75	163	0.0	0.0	0.0	0.3	0.7		0.7	0.7
12	Run 3	3:05 PM	-197	84	2	44	205	0.0	0.3	0.0	0.2	0.8		1.2	1.2
Number of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
Average	**Run 3**		-191	9	-28	71	197	0.0	0.0	0.0	0.2	0.5	4.42%	0.5	0.5
1	Run 3 Line Loss	3:11 PM					11563					47.2			
2	Run 3 Line Loss	3:16 PM					11640					47.5			
3	Run 3 Line Loss	3:21 PM					11769					48.1			
Average	**Run 3 Line Loss**						11654					47.6			

TABLE VI. EXEMPT VOLATILE ORGANIC COMPOUNDS TEST RESULTS

Gulf Power Company
Plant Crist, Unit 4
Carbonaceous Material
02/18/03

Run Number	Start Time	Stop Time	Uncorrected (wet)						Line Loss Fraction	CORRECTED (wet)
			Methane ppm as propane	Acetylene ppm as propane	Ethylene ppm as propane	Ethane ppm as propane	Propane ppm as propane	Total VOC non-exempt as propane (ppm)		TOTAL VOC NON-EXEMPT as propane (ppm)
1	9:48 AM	10:48 AM	0.00	0.000817	0.00531	0.237	0.943	0.949	0.00724	0.956
2	11:13 AM	12:13 PM	0.00	0.000408	0.00837	0.164	0.768	0.777	0.00721	0.783
3	2:10 PM	3:10 PM	0.00	0.0361	0.00163	0.175	0.482	0.519	0.0442	0.543
Average			0.00	0.0121	0.00511	0.192	0.731	0.748	0.0196	0.761

Methane & Ethane Concentrations may be higher than reported.
These compounds are sometimes found at concentrations higher than the instrument can detect

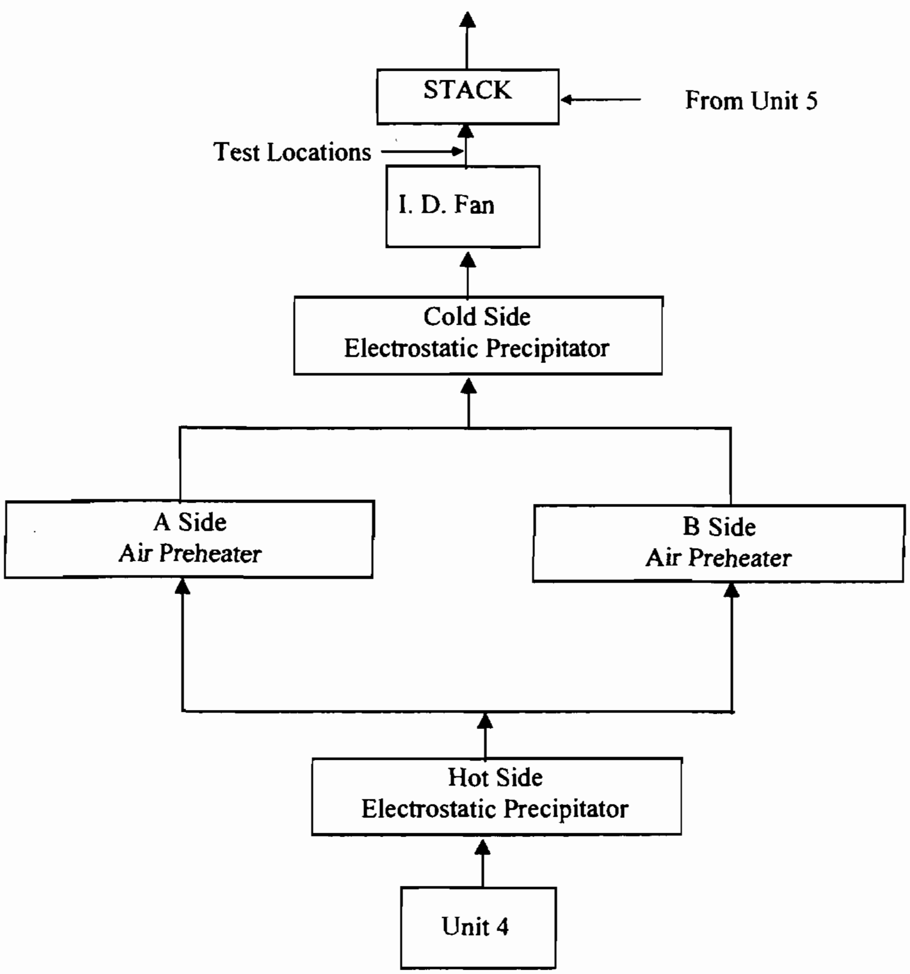
4. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by barge, and loaded directly onto the conveyor feeding the plant or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 36 to 48 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators. In addition to the coal fired in the boiler saw dust was added from a hopper to the conveyor belt transporting the coal to the boiler.

4.1. Source Air Flow

As shown in Figure 2, the flue gases exit the boiler and flow through a hot side precipitator. The exhaust gases are separated into ducts A and B before entering air preheaters. The exhaust gases are combined before entering a cold side ESP. The flue gases exiting the cold side ESP are exhausted through a stack into the atmosphere.

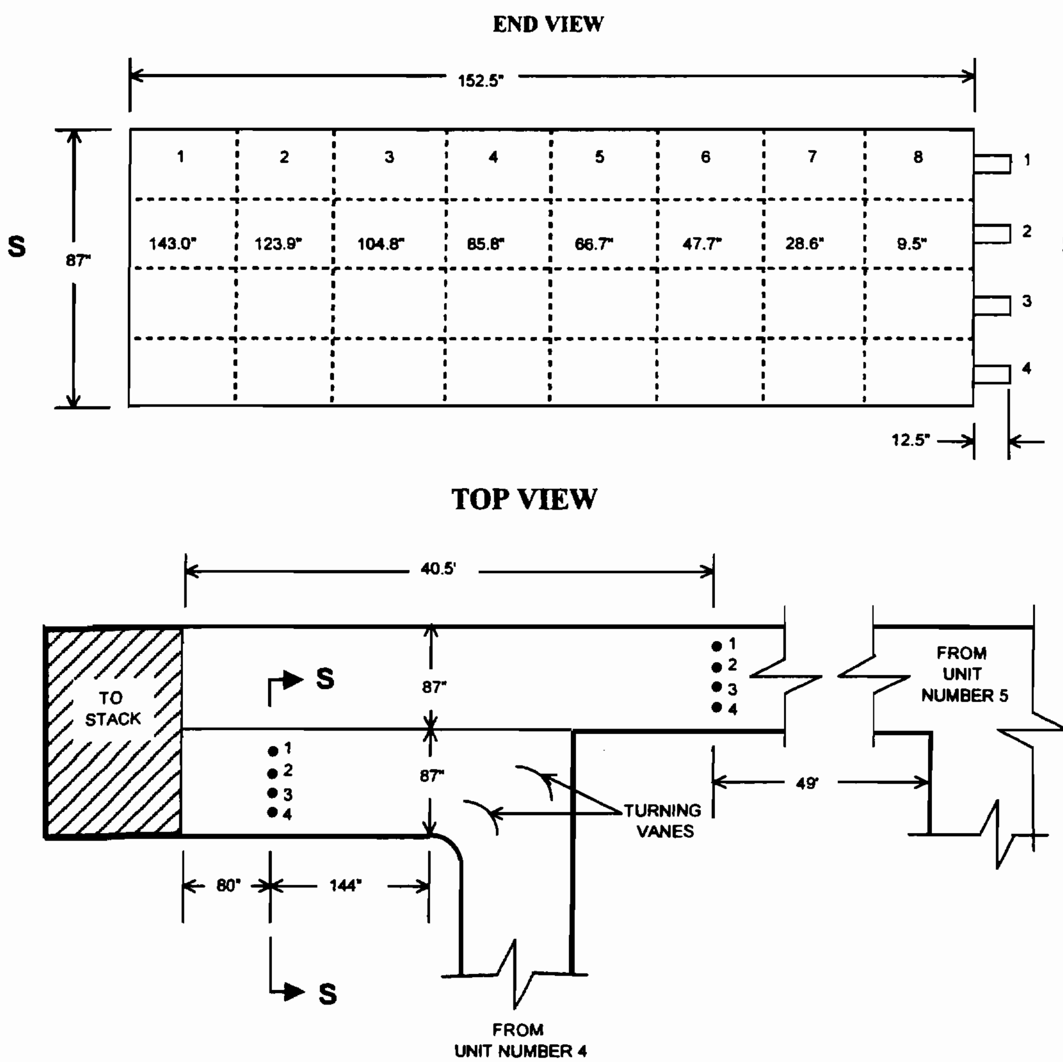
Figure 2. Air Flow Schematic



5. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 3. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 32 points.

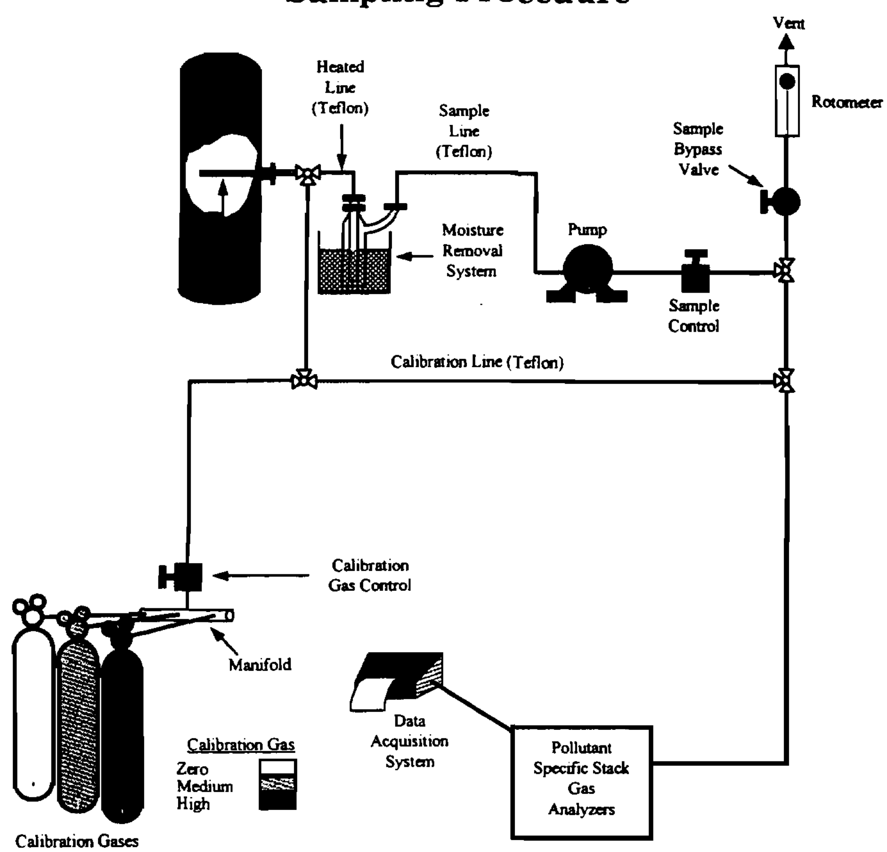
Figure 3. Sample Point Locations



6. CARBON MONOXIDE AND OXYGEN SAMPLING PROCEDURE (EPA METHODS 3A AND 10)

The sampling procedures utilized are those specified in **40 CFR, Part 60, Appendix A, Methods 3a and 10** as modified by the governing regulatory agency. A brief description of these procedures is as follows:

Figure 4. Carbon Monoxide and Oxygen Sampling Procedure



The sample was removed from the stack through a stainless steel probe and passes through a three-way valve and condenser moisture removal system. Teflon® line was used to transport the sample through a transport pump and a flow control valve. From this point the sample was routed into a manifold with a bypass valve, an analyzer sample flow control valve, and to an analyzer specific for the pollutant of interest. Each analyzer produces a voltage analogue output proportional to the concentration of pollutant present in the gas. A schematic of the sampling train is presented in the attached drawing.

Each instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. Zero air is introduced directly to each instrument to establish a baseline and check the zero reading of the instrument. A high range calibration gas was introduced directly to each instrument. The instrument was allowed to fully respond to the calibration gas. Each analyzer was adjusted, if

needed, to the correct value. A linear calibration curve was calculated from this data and stored on computer. Next, a mid-range calibration gas was introduced directly to each instrument. The percent error between each measured value and the corresponding calibration value was calculated. If any of the readings indicated a difference of more than ±2 percent of the span the analyzer was recalibrated.

The high or mid gas and zero gas were then introduced to the system at the three-way valve before the condenser. The response value for each of these gases was recorded. If these measured values differed significantly from the calibration values the sampling system was checked and repaired until the system check met EPA specifications.

To begin sampling, the three-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the data recorder was marked for the beginning of the run. After the required sampling time, the data recorder was marked for the end of the run. At the end of each run the three-way valve was switched to allow introduction of the zero and calibration gas to the system. From these data the calibration bias and drift were calculated. If the bias values were greater than ±5 percent of the span, or the drift was greater than three percent of the span, the run was invalidated. To begin the next run the three-way valve was switched to allow sampling of the stack gas and the next run was started. This procedure was repeated until all runs were complete.

6.1. Sample Recovery & Analysis

After the tests were completed the data was reduced to give an average concentration in parts per million for each run. This average concentration was then corrected for the analyzer zero and span bias and drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

Co = Average of Initial and final system calibration responses for the zero gas, ppm.

Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

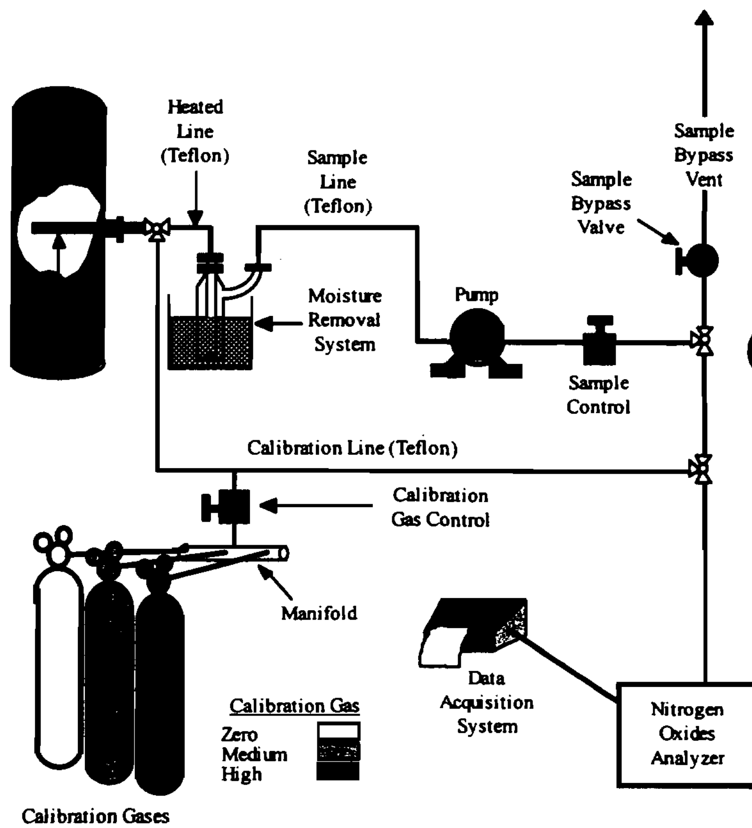
Cma = Actual concentration of the scale calibration gas, ppm.

7. NITROGEN OXIDES PROCEDURE (EPA Method 7e)

The sampling procedure utilized is that specified in 40 CFR, Part 60, Appendix A, Method 7e. A brief description of this procedure is as follows:

The sample was removed from the stack through a stainless steel probe and passed through a 3-way valve and an impinger moisture removal system. Teflon line was used to transport the sample through a sample transport pump and a sample flow control valve. From this point the sample is routed into a manifold with a bypass valve, then to an analyzer sample flow control valve and on to a chemiluminescent NO-NO_X gas analyzer. The analyzer uses a chemiluminescent principal based on the reaction of ozone with nitrogen oxides to provide a voltage analogue output proportional to the concentration of oxides of nitrogen present in the sample. A schematic of the sampling train is presented in the attached drawing.

Figure 5. Nitrogen Oxides Sampling Procedure



The instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. A high range calibration gas, between 80 to 90 percent of the span value, was introduced directly to the instrument. The instrument was allowed to fully respond to the calibration gas and the analyzer was adjusted to the correct value. Next, a mid- range calibration gas, between 50 to 60 percent of the span,

was introduced directly to the instrument. Next zero air was introduced directly to the instrument to check the zero reading of the instrument. If any of the readings indicated a difference of more than ±2% of the span, the analyzer was recalibrated. The high, middle and zero gasses were then introduced to the system at the 3-way valve. The calibration gases utilized were either EPA Protocol I gases or were generated by using EPA Method 205. The response value for each of these gases was recorded.

To begin sampling, the 3-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the chart was marked for the beginning of the run. After the required sampling time, the chart was marked for the end of the run. At the end of each run the 3-way valve was switched to allow introduction of the calibration gas which was closest in value to the exhaust gas NO_X concentration. Zero air was introduced to the system. The zero and calibration drift were recorded. If the drift values were greater than ±5% of the span, the run was invalidated. The 3-way valve was switched to allow sampling of the stack gas, and the next run was begun. This procedure was repeated until all runs were completed.

7.1.1. Sample Recovery & Analysis

After the tests were completed, the data was reduced to give an average NO_X concentration in ppm for each run. This average concentration was then corrected for the analyzer zero and span drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

Co = Average of Initial and final system calibration responses for the zero gas, ppm.

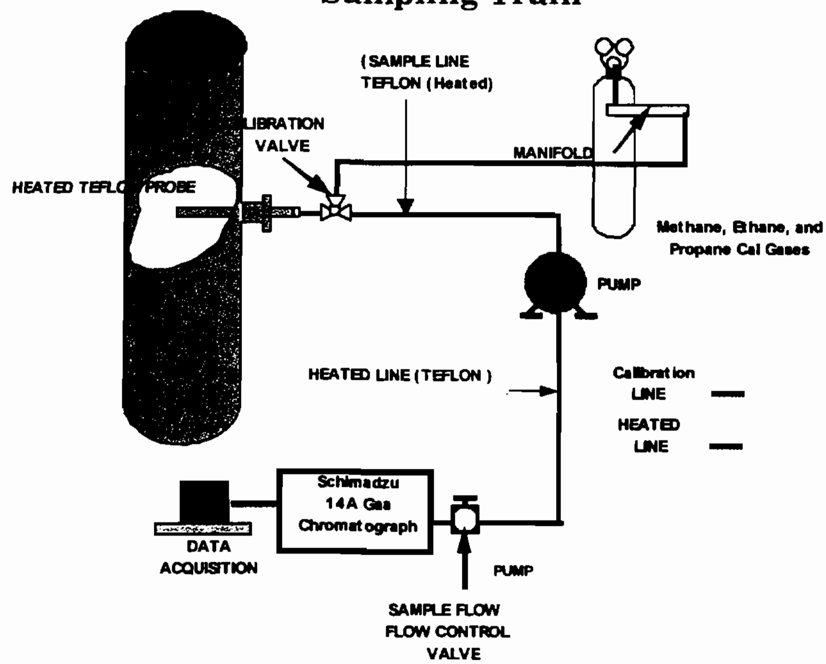
Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

Cma = Actual concentration of the scale calibration gas, ppm.

8. NON-EXEMPT VOLATILE ORGANIC COMPOUND SAMPLING BY GAS CHROMATOGRAPHY (SEAS Method 2518)

Gaseous organic emission sampling (gas chromatography) was performed per **SEAS Method 2518**. Non-exempt volatile organic compounds emissions testing was performed by a system similar to that depicted in the attached figure.

Figure 6. Non-Exempt Volatile Organic Compounds Sampling Train



A heated stainless steel probe and heated teflon sample line was used to draw a sample from the emission source. Stack gases were continuously drawn through the sample lines. The sample lines were leak checked prior to and after all testing.

A small portion of the gas sample was pumped into the on-line gas chromatograph sample loop. The gas chromatograph sample loop was operated at approximately 30 ml/min flow, and was continuously purged with stack gas. Sample was introduced into the gas chromatograph by automatic actuation of the sample valve at a predetermined time. The gas chromatograph was fitted with a column of sufficient physical and chemical characteristics to allow separation of the constituents. The chromatograph was operated in such a manner as to get five separate peaks. The first four were for specific compounds in the following order:

methane, acetylene, ethylene, and ethane. The fifth peak was a back flush of the column which contained all organic compounds containing three or more carbon atoms (Propane+). The first four peaks were allowed to elute with the gases flowing through the column in the normal direction. After ethane elutes, the column is backflushed through the operation of a 10-port valve to elute the combined volatile organic compounds to the detector.

In order to ensure only organic compounds were measured, the chromatograph was equipped with a flame ionization detector. Each test run was conducted for at least sixty minutes, with the chromatograph performing as many injections as could be completed given the physical and chemical characteristics of the stack gas.

Calibration of the gas chromatograph was performed using EPA Protocol 1 cylinders of propane in nitrogen. Calibrations were made with a high, mid, and low concentration gas. Using these gas standards, a three-point calibration curve based on area count was generated for combined volatile organic compounds as propane. SEAS used a Shimadzu GC-14A for this testing program. The GC was equipped with an FID and integrator system. Volatile organic compound concentrations were determined by the peak area count of the sample versus the calibration curve. The calibration curve for propane was input to the data acquisition system for the acetylene and ethylene. Therefore, the concentrations generated by the data acquisition system for acetylene, ethylene, and combined volatile organic compounds were each reported on a propane equivalent basis. At the conclusion of testing, the calibration curve of the instrument was verified by injection of a propane calibration standard. If the calibration was maintained within twenty percent, the data was accepted. Otherwise, the data was either corrected for drift or the data was discarded and a new test conducted.

The concentration of non-exempt volatile organic compounds in the stack gas was calculated by summing of the ethylene concentration (propane equivalent) plus the acetylene concentration (propane equivalent) plus the combined volatile organic compound concentration (propane equivalent).

9. QUALITY ASSURANCE

In order to ensure the accuracy of all the data collected in the field and at the laboratory, SEAS has instituted a comprehensive quality assurance and quality control program. New or repaired items which require calibration are calibrated before their initial use in the field. Equipment whose calibration may change with use is calibrated before and after each use. When an item is found to be out of calibration, the unit is either discarded or repaired, and then recalibrated before being returned to service. All equipment is periodically recalibrated in full regardless of the results of the regular inspections or its present calibration status. Calibrations are performed in a manner consistent with the EPA reference methods recommended in the "Quality Assurance Handbook for Air Pollution Measurement Systems" published by the US Environmental Protection Agency. To the maximum degree possible all calibrations are traceable to the National Institute of Standards & Technology (NIST).

In order to ensure that the test will be performed in a timely manner without undue delays, SEAS sampling vans are equipped with duplicate sampling devices for almost every device needed to perform the test. If a particular device is broken or does not pass inspection, a second device is available immediately at the site for use. Any device which appears to be outside calibration, or in need of repair is tagged in the field and repaired, calibrated, or discarded immediately upon return to the laboratory.

9.1.1. CALIBRATIONS

Certain pieces of equipment need to be calibrated before and after each test. Those items include the pitot tubes, the differential pressure gauges, the dry gas meter, and the nozzles used for the particulate testing. The following is a brief description of the calibration procedures for each of these important devices.

9.1.2. PITOT TUBES

All pitot tubes are the S-type as required by EPA Reference Method 2 (40 CFR, Part 60, Appendix A, Method 2). This method contains certain geometric standards for the construction of S-type pitot tubes. All of SEAS pitot tubes are constructed according to these standards. According to the EPA any pitot tube constructed to these standards will have a coefficient of 0.84 ± 0.02. To ensure the exact value of SEAS pitot tubes, all pitot tubes are initially calibrated in SEAS wind tunnel to determine the exact pitot coefficient. This coefficient should not change unless the pitot is physically damaged. Each pitot tube is checked before going to the field to make sure it meets the geometry as specified. Any pitot tube which does not meet the specifications is not used in the test.

9.1.3. DIFFERENTIAL PRESSURE GAUGES

SEAS uses several different types of pressure gauges including oil tube manometers, water tube manometers, magnehelics, and current output electronic load cells. Each of these devices are inspected before taken to the field and are inspected for leaks during each test. The magnehelics and load cells are tested against an incline manometer water gauge to ensure accuracy.

9.1.4. TEMPERATURE SENSORS

All temperature sensors used in SEAS sampling program are either mercury in-glass thermometers or type K thermocouples. These thermocouples are physical devices which produce a voltage proportional to the temperature. The thermocouple reading device is calibrated before and after each series of tests to ensure accuracy of $\pm$ 2 percent. The calibration of the thermocouple is accomplished by NIST traceable calibrated reference thermocouple potentiometer system.

9.1.5. NOZZLES

The inside diameter of each nozzle is measured to the nearest 0.001 inches prior to its initial use. Upon arriving in the field each nozzle is again measured with a micrometer on three different points on the diameter to ensure its original measurement and that the nozzle is perfectly round. If the difference between the maximum and minimum diameters measured does not exceed 0.003 inches, the nozzle is acceptable; otherwise, this nozzle is discarded and another is selected. At the end of each test the nozzles are again remeasured on three different points on the diameter to ensure that during the test the nozzle has not become dented or deformed.

9.1.6. DRY GAS METER

The dry gas meter is calibrated every six months against a spirometer transfer standard. It is again calibrated before and after each use in the field. During the semiannual calibration, a five point calibration is made at a minimum of one-half inch water column orifice pressure up to four inches water column orifice pressure. Before and after each test, the dry gas meter is again recalibrated at

three repetitions at a representative flow rate experienced during the test. If the final calibration does not agree with the initial calibration within five percent the calibration which yields the lowest volume of sample pulled is used in the calculations and the dry gas meter is repaired and recalibrated.

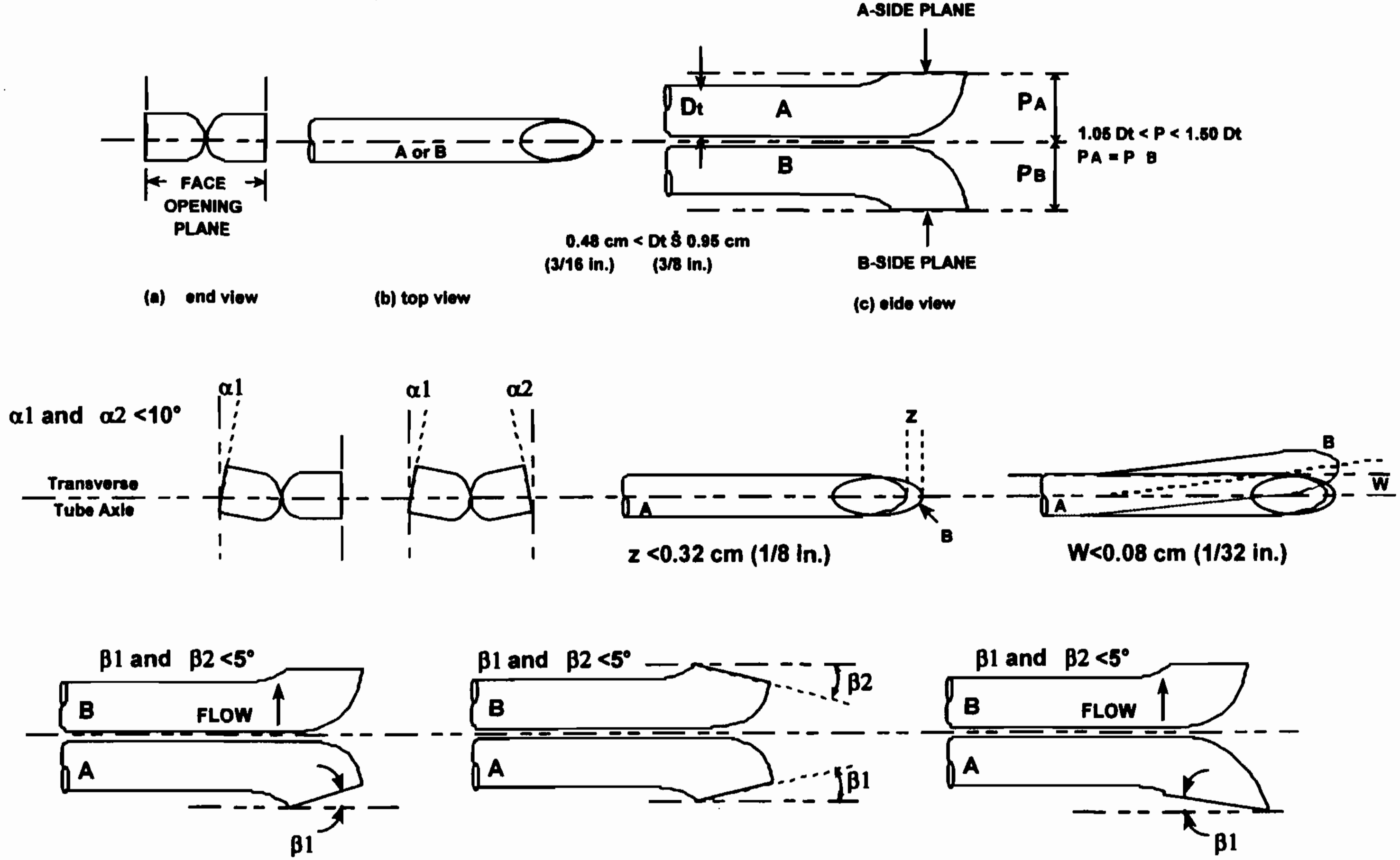
9.1.7. ORIFICE

The flow meter orifice is used to establish isokinetic sampling rates during the test. The orifice is calibrated with the dry gas meter at the same time under the same conditions. The orifice is calibrated over a wide range of flow rates and the arithmetic mean of the orifice calibration is used for sampling purposes. The orifice is recalibrated every time the gas meter is recertified.

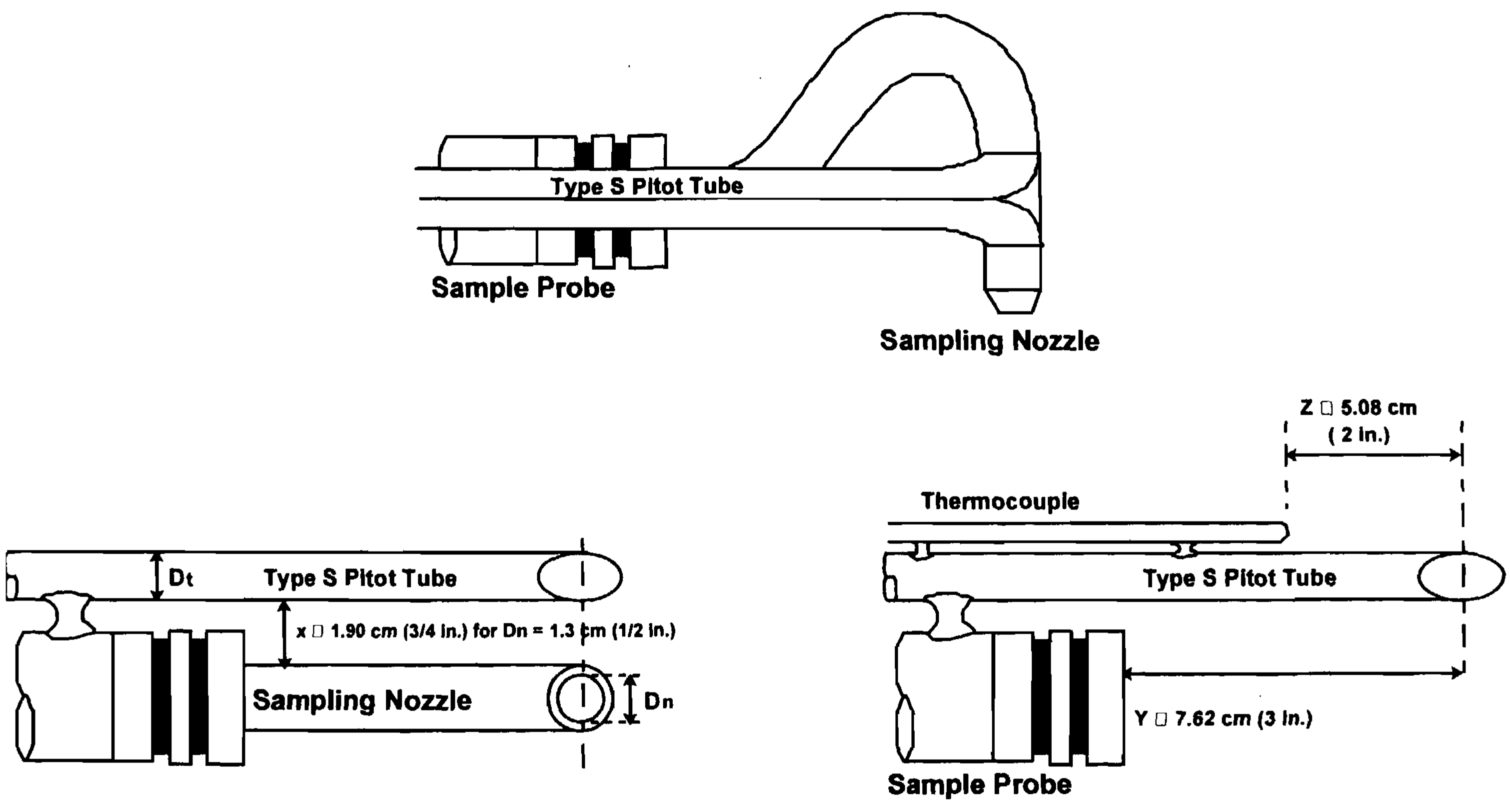
APPENDIX A QUALITY CONTROL OF TESTING EQUIPMENT

Type S pitot tube construction details:

a) end view; face opening planes perpendicular to transverse axis.
b) top view; face opening planes parallel to longitudinal axis.
c) side view; both legs of equal length and centerlines coincident, when viewed from both sides.



Sampling Nozzle, Thermocouple, and Probe Configuration



APPENDIX B SAMPLE CALCULATIONS

Nitrogen Oxides Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws}) C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
Cppmx = Pollutant Concentration (parts per million, dry basis) =	247.85
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.08
Cppmwetx	228.03

Nitrogen Oxides Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	46.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	247.85
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	7.42
E_{O2} =	0.447

Carbon Monoxide Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws})C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	CO
Cppmx = Pollutant Concentration (parts per million, dry basis) =	11.44
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.08
Cppmwetx	10.53

Carbon Monoxide Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385{,}000{,}000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	SO2
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	11.44
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	7.42
E_{O2} =	0.0126

Volatile Organtic Compounds Concentration (dry Wet)

$$C_{ppmx} = \frac{C_{ppmwetx}}{(1 - B_{ws})}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	VOC
Cppmwetx = Pollutant Concentration (parts per million, wet basis) =	1.57
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.08
Cppmx	1.71

Volatile Organtic Compounds Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	TRS
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	34.08
Cppmx = Pollutant Concentration (parts per million, dry basis) =	1.71
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	7.41818
E_{O2} =	0.00296

APPENDIX C GAS CERTIFICATIONS

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE:
P.O. NO. 07/03/02
ORDER NO. 4011
6367637-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 2025 psig CGA: 590 Analysis Date: 06/18/02
Shelf Life: 60 MONTH Expiration Date: 06/18/07

Cylinder No.	Constituents	Nominal	Actual	Uncertainty
150-736	OXYGEN	5 %	5.06 %	0.03 %
	NITROGE	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 907E	CC13342	9.99 % O2/N2	05/17/04

INSTRUMENTATION

Instrument	Analytical Principle
SERVOMEX	PARAMAGNETIC DETECTION

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

Steve Eska 7/3/02
ANALYST

STEVE ESKA

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1326

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/22/02
P.O. NO. 4991
ORDER NO. 6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02
Shelf Life: 24 MONTH Expiration Date: 10/22/04

		Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/ 956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/ 925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/ 914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02

STEVE ESKA ANALYST

MG 23301/C

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS

EPA Protocol Gas

CUSTOMER
Montgomery Gas&Gear
3340 BIRMINGHAM HWY
MONTGOMERY, AL 361080000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC033012B
EXPIRATION DATE	:	03-Nov-2004
CERTIFICATION DATE	:	11-Nov-2002
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24066079
LOT NUMBER	:	530177

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
CARBON DIOXIDE	11.50 %	11.57 %	+/-1.00% NIST Traceable	11/04/02
CARBON MONOXIDE	450.00 ppm	442.5 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
NITRIC OXIDE	450.00 ppm	454.7 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
SULFUR DIOXIDE	450.00 ppm	449 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
TOTAL OXIDES OF NITROGEN		454.8 ppm		
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81674	00060413	XC018783B	6.89 +/- 0.04 % CO2/N2	02/01/04
NTRM 81680	98060414	XC014406B	494.70 +/- 4.00 ppm CO/N2	07/01/06
SRM 2735	141-B-31	CALD14326	781.80 +/- 3.90 ppm NITRIC OXIDE	02/01/04
NTRM 81661	97060304	XC005122B	485.00 +/- 4.80 ppm SO2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens 5E DD721	NonDispersive Infrared	10/11/02
Siemens Ultramat 6E-N9-782	NonDispersive Infrared	10/25/02
Nicolet 560 ADU9800406 NO/NO2	FTIR	10/31/02
Nicolet 560 ADU9800406	FTIR	10/16/02

Page: 1 Of 1

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A Delaware Corporation

QA Approved

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1326

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:
INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE:
P.O. NO. 10/22/02
ORDER NO. 4991
6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02
Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/ 936E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/ 925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/ 914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02
STEVE ESKA ANALYST

MG 23301/C

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Montgomery Gas&Gear
3340 BIRMINGHAM HWY
MONTGOMERY, AL 361080000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC0330128
EXPIRATION DATE	:	03-Nov-2004
CERTIFICATION DATE	:	11-Nov-2002
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24066079
LOT NUMBER	:	530177

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
CARBON DIOXIDE	11.50 %	11.57 %	+/-1.00% NIST Traceable	11/04/02
CARBON MONOXIDE	450.00 ppm	442.5 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
NITRIC OXIDE	450.00 ppm	454.7 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
SULFUR DIOXIDE	450.00 ppm	449 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
TOTAL OXIDES OF NITROGEN		454.8 ppm		
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81674	00060413	XC0187838	6.89 +/- 0.04 % CO2/N2	02/01/04
NTRM 81680	98060414	XC0144068	494.70 +/- 4.00 ppm CO/N2	07/01/06
SRM 2735	141-B-31	CAL014326	781.80 +/- 3.90 ppm NITRIC OXIDE	02/01/04
NTRM 81661	97060304	XC0051228	486.00 +/- 4.80 ppm SO2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens 5E DD721	NonDispersive Infrared	10/11/02
Siemens Ultramat 6E-N9-782	NonDispersive Infrared	10/25/02
Nicolet 560 ADU9800406 NO/NO2	FTIR	10/31/02
Nicolet 560 ADU9800406	FTIR	10/16/02

Page: 1 Of 1

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A Delaware Corporation

QA Approved [signature]

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Montgomery Gas&Gear
3340 BIRMINGHAM HWY
MONTGOMERY, AL 361080000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC003276B
EXPIRATION DATE	:	17-Nov-2005
CERTIFICATION DATE	:	18-Nov-2002
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24004681
LOT NUMBER	:	532305

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceablity Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. I.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	[illegible]
PROPANE	50.00 ppm	[illegible] ppm	+/-1.00% NIST Traceable	[illegible]
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81667	00060109	XC019568B	48.10 +/- 0.40 ppm C3H8/AIR	02/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	11/14/02

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Page: 1 Of 1

QA Approved

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
SANDERS ENGINEERING & ANALYTIC
1568 LEROY STEVENS RD
MOBILE, AL 366959182

CUSTOMER PO NO: CT092801A
Previous Certification Date(s):

CYLINDER NO	: XC026923B
EXPIRATION DATE	: 10/18/04
CERTIFICATION DATE	: 10/19/01
CYLINDER PRESSURE	: 2000 psig
PRODUCT ID NO	: 02001832
LOT NUMBER	: 466155

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. I.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Date
PROPANE	30.00 ppm	30.4 ppm	+/-1.00% NIST Traceable	10/19/01
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81667	00060109	XC019586B	48.10 +/- 0.40 ppm C3H8/AIR	02/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	10/16/01

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Page: 1 Of 1

QA Approved Carmen Davis

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
SANDERS ENGINEERING & ANALYTIC
1568 LEROY STEVENS RD
MOBILE, AL 366959182

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC013178B
EXPIRATION DATE	:	03/12/04
CERTIFICATION DATE	:	03/13/01
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	02007102
LOT NUMBER	:	434169

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
PROPANE	85.00 ppm	85.7 ppm	+/-1.00% NIST Traceable	03/12/01
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81668	99060211	XC0034458	93.90 +/- 0.60 ppm C3H8/AIR	01/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	03/10/01

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Page: 1 Of 1

QA Approved A. Lattanze

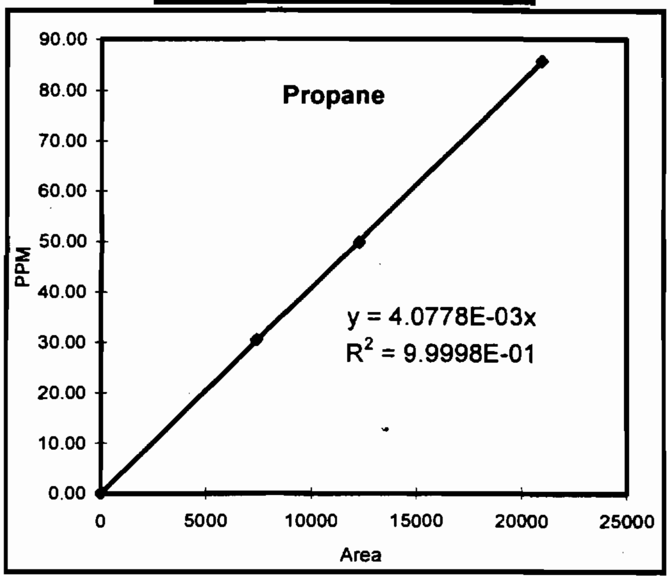
Gas Chromatograph VOC Calibration Data
Gulf Power Company
Plant Crist, Unit 4
Carbonaceous Material
2/18/2003

Point Number 1	
Gas	Propane
Concentration ppm	85.700
GC Injection	AREA
1	20004
2	21518
3	21476
AVERAGE	20999
GC Injection	% Difference
1	-4.7
2	2.5
3	2.3

Point Number 2	
Gas	Propane
Concentration ppm	49.800
GC Injection	AREA
1	12518
2	11926
3	12339
AVERAGE	12261
GC Injection	% Difference
1	2.1
2	-2.7
3	0.6

Point Number 3	
Gas	Propane
Concentration ppm	30.400
GC Injection	AREA
1	7516
2	7338
3	7414
AVERAGE	7423
GC Injection	% Difference
1	1.3
2	-1.1
3	-0.1

Propane	
area	ppm
20999	85.70
12261	49.80
7423	30.40
0.0	0

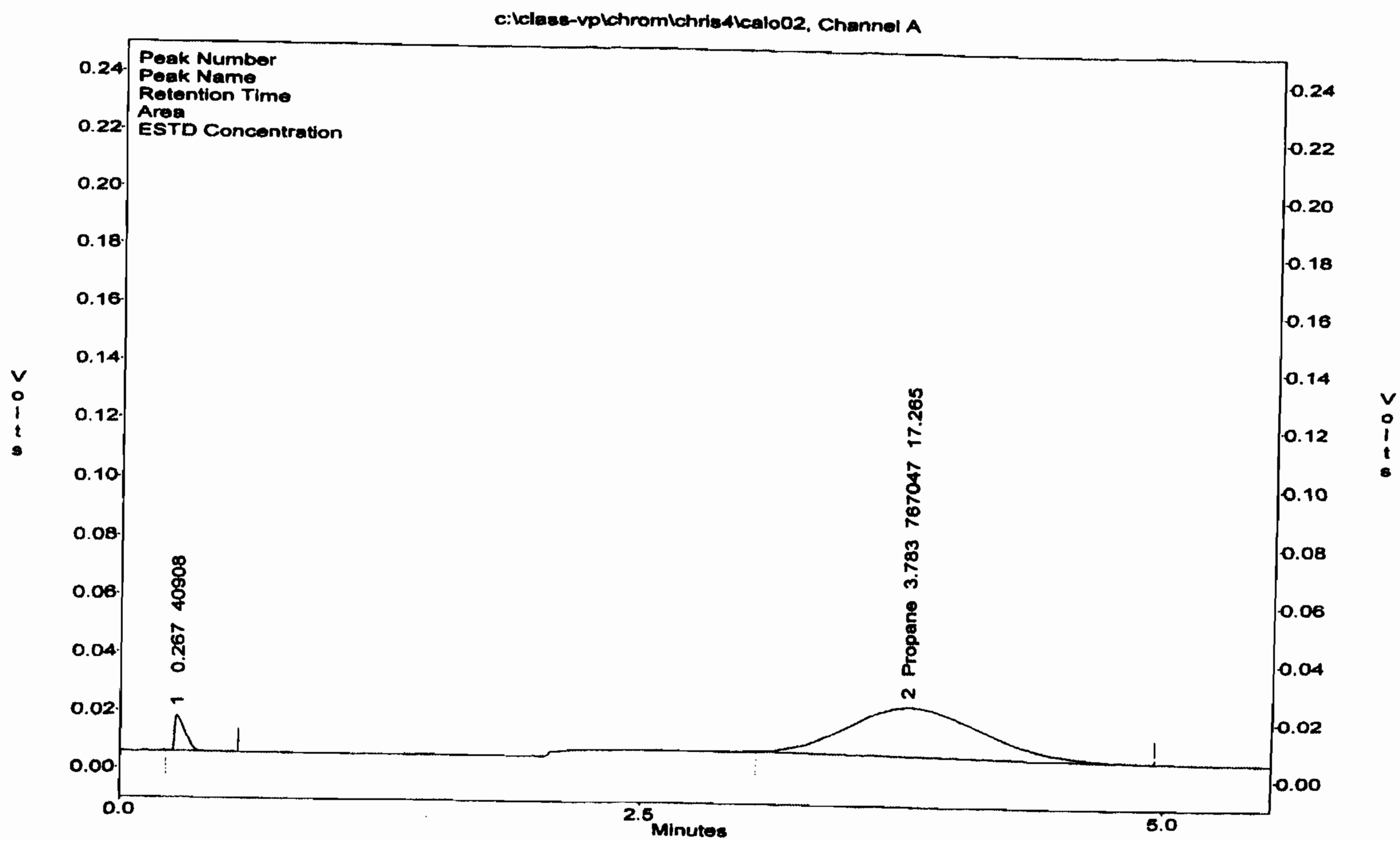


Dilution Factor Calculation		
EPA Cylinder Vaslue (ppm) = 49.3		
	GC Area	GC ppm
Inj. #1	12071	49.222
Inj. #2	12069	49.215
Inj. #3	12072	49.227
Average	12071	49.221
Dilution Factor =		1.0016
Dilution Factor = Cylinder (ppm)/GC (ppm)		

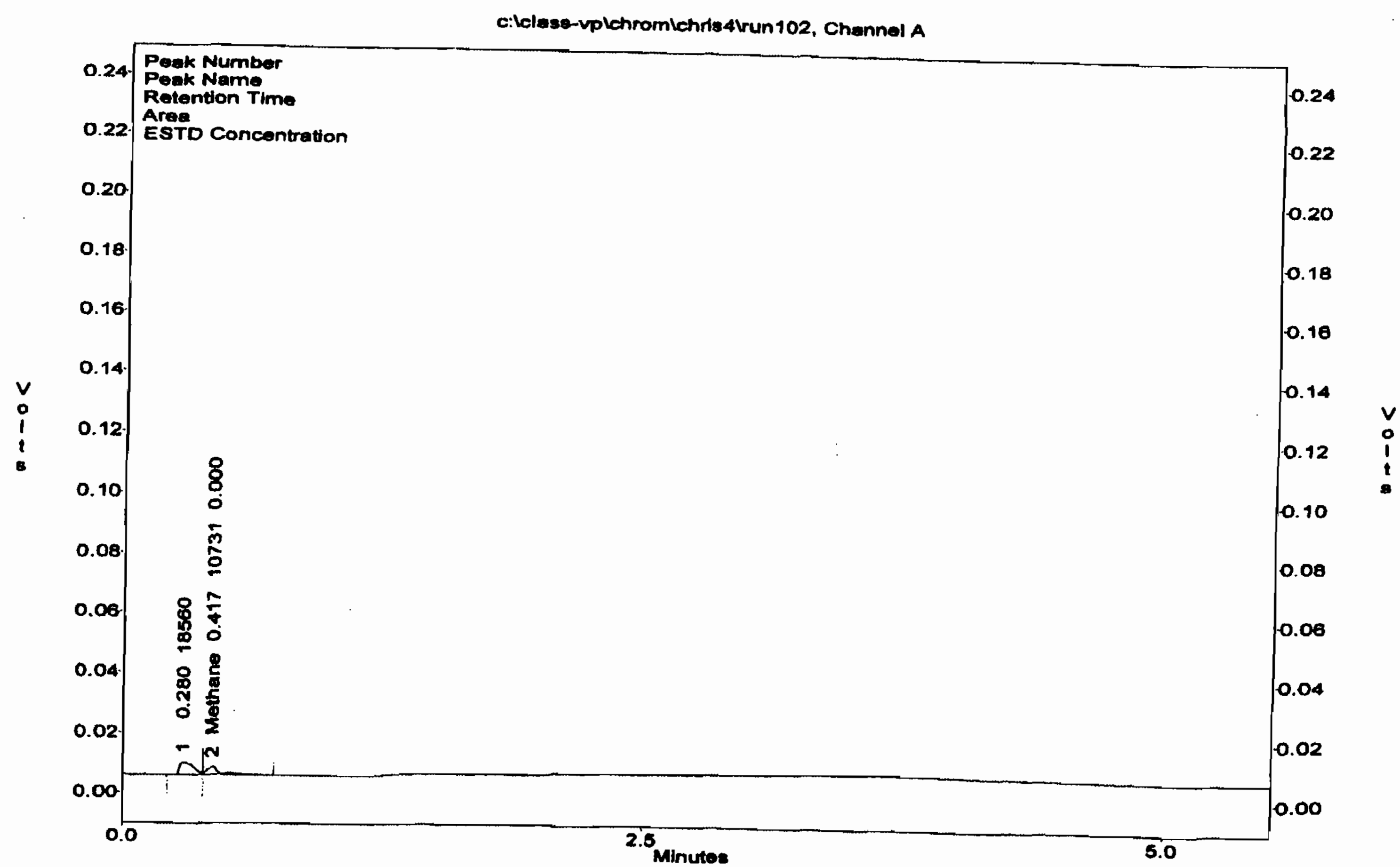
Calibration Factors	
Y=CX	Propane
Coefficient	4.078E-03

APPENDIX E EXAMPLE CHROMATOGRAMS

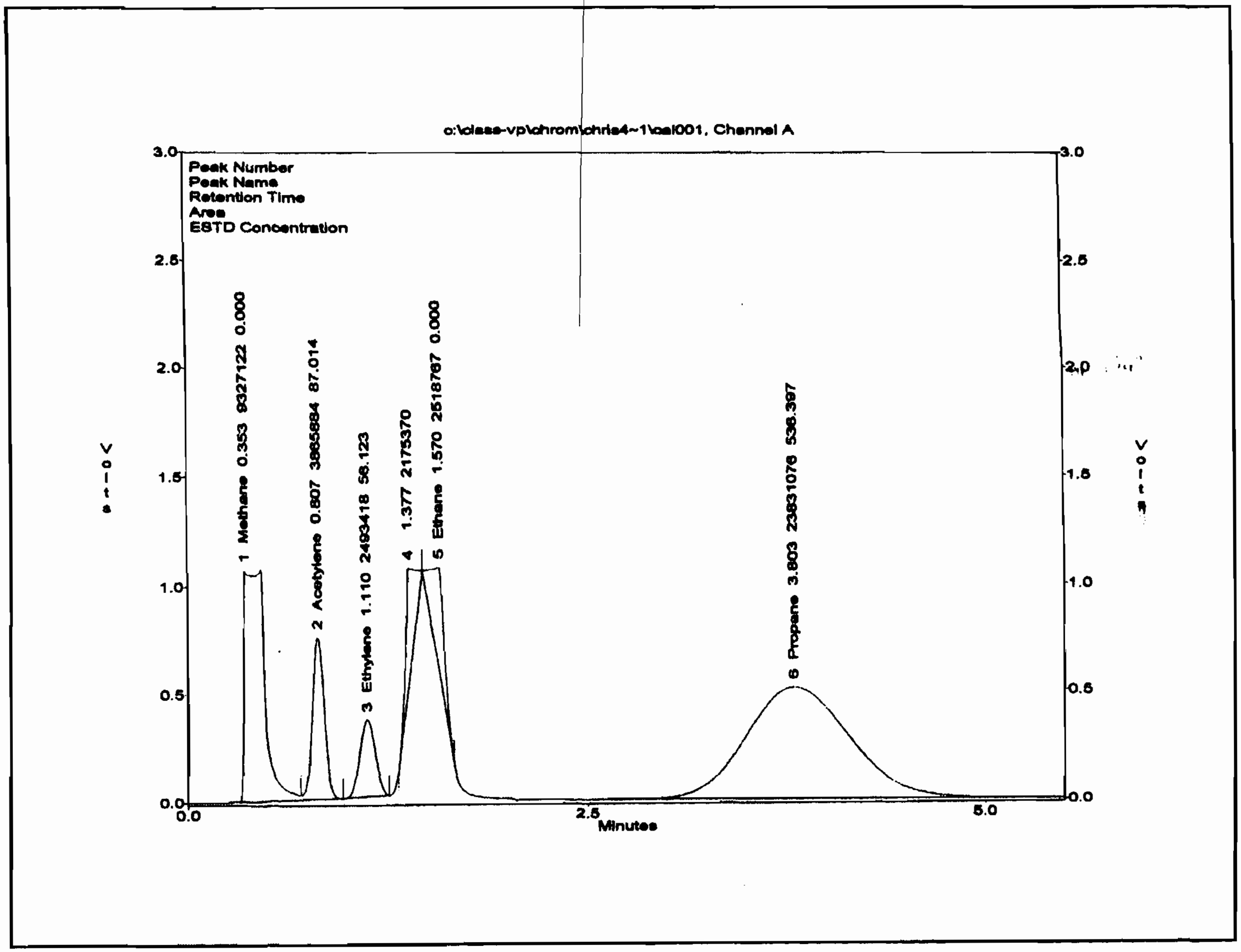
GAS CHROMATOGRAPHIC INJECTION OF 17.4 PARTS PER MILLION CALIBRATION GAS



GAS CHROMATOGRAPHIC INJECTION OF STACK GAS



GAS CHROMATOGRAM DEMONSTRATING COLUMN PERFORMANCE SEPERATING C-1 THROUGH C-3+ COMPOUNDS (METHANE, ACETYLENE, ETHYLENE, ETHANE, AND PROPANE+)



APPENDIX E OPERATIONAL DATA

Crist 4 Carbonaceous Material (saw dust) Test Maximum Allowable Heat Input: 1096.7 mmBtu/hr							
Steady State February 18, 2003							
					coal flow	Coal	LDMS
Run #	Load	Start	End	Duration	from LDMS	Analysis	results
	Gross MW	Time	Time	(Hours)	(tons)	Btu / lb	mmBtu's/hr
1	81.8	09:48	10:49	1:02	36.00	11688	827.7
2	76.7	12:34	13:34	1:00	34.50	11688	806.5
3	80.8	13:55	14:59	1:07	36.75	11688	805.4
	79.8					**Average**	813.2
						Percent of Max Allowable	74%
						Load Limit if % < 90%	88

CEMS OPACITY DATA

Crist 4 Carbonaceous Material (saw dust) test Burn

Date	CEM Hour	Minutes									
		00	6	12	18	24	30	36	42	48	54
Steady State Testing											
02/18/03	9									5.0	5.4
02/18/03	10	5.8	5.5	5.6	5.8	5.7	5.3	5.6	5.5	5.2	5.1
02/18/03	11										
02/18/03	12							5.5	5.2	5.8	6.4
02/18/03	13	6.7	6.1	6.7	7.3	7.5	6.7	6.4			10.2
02/18/03	14	13.5	13.9	12.9	10.7	8.4	6.9	6.5	6.7	6.5	7.9

Gulf Power Plant Crist Unit 4
Carbonaceous Material (saw dust) Test Burn Test Notes
Steady State Testing 02/18/03

Run #1

Start Time		Notes
CDT	CEMS	Fuel Mix 95% coal 5% saw dust by weight
09:48	09:48	NOTE: CEMS time, not Central Daylight Time (CDT), is used on Sander's test report.
Stop Time		No operational problems noted during run
CDT	CEMS	B and D mills loaded up after run.
10:49	10:49	

Run #2

Start Time		Notes
CDT	CEMS	No operational problems noted.
12:34	12:34	
Stop Time		
CDT	CEMS	
13:34	13:34	

Run #3

Start Time		Notes
CDT	CEMS	No operational problems noted.
13:55	13:55	
Stop Time		
CDT	CEMS	
14:59	14:59	

Carbonaceous Fuel Test Burn

Test 2

Crist Plant — Test Control Room Data

Unit 4 Date 2/18/03

Check one: [ ] Sootblowing [ ] Steady-State (no sootblowing)

Unit Operator: L.T. Smith

Run	CEMS Time	Pulverizer Coal Integrators (x 100 pounds) A	B	C	D	Generation Digital Meter MW	Gross Generation Integrator MWhr	Main Steam Total Flow (x 10e6 lb/hr)	Boiler Air Flow (x 10e6 lb/hr)	Excess O2 Econ Outlet % A	B	Opacity 6 min Avg %	ID Fan Amps A	B	Gas Temp Air Htr Outlet deg F A	B	Soot Blowing Status	Data taken by (Initials)
#1 Start	948	941191	269180	898119	715610	855880	92.2	638	690	320	296	5.40	250		288	288		LTS
#1 End	1049	941385	269325	898299	715821	81.3	855965	661	710	263	267	5.10	250		285	291		
#2 Start	1234	941639	269560	898565	716145	74.8	856096	625	702	315	357	7.10	260		281	286		LTS.
#2 End	134	941809	269706	898731	716346	79.2	856180	640	729	317	358	6.70	260		279	286		LTS
#3 Start	1355	941866	269758	898785	716412	79.2	856208	634	728	345	387	12.40	250		278	245		LTS.
#3 End	1459	942051	269912	898956	716620	82.4	856294	644	731	316	388	6.0	250		277	286		LTS

Operational Comments

Run #1	
Run #2	
Run #3	

Inside Operator L.T. Smith

Outside Operator (Coal Samples) Gorham - Swilley - Jordan

Laboratoryman (Ash Samples) ____

Electrician (ESP Readings) ____

Operator Pulling Fly Ash Murphy

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 18-Feb-03
Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05268

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.71	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13327	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.69	% By Weight
Lead, Dry Basis	ASTM D6357	9.4	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.30	% By Weight
Ash, As Received	ASTM D 5142	5.01	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11688	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.61	% By Weight
Lead, As Received	ASTM D6357	8.2	mg/kg
Mercury, As Received	ASTM D6414	0.066	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.85	% By Weight
Barium, Ignited Basis	ASTM D 3683	1720.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.87	% By Weight
Iron, Ignited Basis	ASTM D 3682	6.47	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.11	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.38	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.60	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 3/25/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 18-Feb-03

Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05268

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.54	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.63	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	164.7	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.28	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.62	% By Weight
Iron Oxide, Ignited	ASTM D 3682	9.25	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.25	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.66	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.77	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.73	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.07	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14134	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.518	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 3/25/2003

smk/coa

HOT SIDE 4 Program 1 9-

8 7 6 5 NUMBER

GROUP NO.	FIELD NAME	REPEAT TIME	LIFT HEIGHT (LIFT / IMPACTS / FREQUENCY); ON TIME (HRS / MIN / SEC); ON TIME (ON TIME / INTENSITY)	REST TIME	P.O.R. TIME	RAP DIRECTION	STARTING RAPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACC	DUTY CYCLES INTERNE
1	H4P1	2:05	10	4.0		ASC.	1	MAX	1			
2	H4P2	4:03	10				7		1			
3	H4P3	6:05	10				13		1			
4	H4P4	10:07	10				19		1			
5	H4P5	13:13	10				25		1			
6	H4P6	16:01	10				31		1			
7	H4P7	21:07	10				37		1			
8	H4P8	26:11	10				43		1			
9	H4P9	31:37	10				49		1			
10	H4W	5:01	5SEC/100%				1		2			
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												

C[redacted]IT 4 COLD

LOC

8 | 7 | 6 | 5 | NUMBER

GROUP NO.	FIELD NAME	REPEAT TIME	LIFT HEIGHT: LIFT / ON TIME: HRS / ON TIME: ON TIME	IMPACTS / MIN / INTENSITY	FREQUENCY / SEC	REST TIME	P.O.R. TIME	RIP DIRECTION	STARTING RIPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES: FIELD	ACC	INTERBEA
1	C4LA	1:03 2:03	3.6	1	1	0:10	-	ASC	01	MAX	1	48	179	3
2	C4TA	1:59 3:59	3.6	1	1	0:10	-	ASC	04	MAX	1	25	179	1
3	C4LB	3:01 6:01	3.6	1	1	0:10	-	ASC	07	MAX	1	17	179	1
4	C4TB	3:51 9:51	3.6	1	1	0:10	-	ASC	10	MAX	1	13	179	1
5	C4LC	6:17 15:17	3.6	1	1	0:10	-	ASC	13	MAX	1	8	179	0
6	C4TC	7:03 25:03	3.6	1	1	0:10	-	ASC	16	MAX	1	7	179	0
7	C4EA	2:01	3.4	1	1	0:10	-	ASC	01	MAX	1	33	179	2
8	C4EB	3:59	3.4	1	1	0:10	-	ASC	05	MAX	1	17	179	1
9	C4EC	6:03	3.4	1	1	0:10	-	ASC	09	MAX	1	11	179	1
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
23														

D

C

B

8	7	6	5	NUMBER	3

GROUP NO. (1)	FIELD NAME (2)	REPEAT TIME (3)	LFT HEIGHT (4)(5): LFT / IMPACTS / FREQUENCY; ON TIME (6): HRS / MIN / SEC; ON TIME (7): ON TIME / INTENSITY	REST TIME SEC (8)	P.O.R. TIME (9)	RAP DIRECTION (10)	STARTING RAPPER (11)	(REST) MODE (12)	ANTI-COINCIDENCE GROUP (13)	DUTY CYCLES (14) FIELD	ACG	INTERWEAVE
1	CSP1	2:03	5.0 4FT	2.0		ASC.	1	MAX	1	10	17	3
2	CSP2	5:13	5.0	2.0		ASC.	4	MAX	1	4	17	1
3	CSP3	9:19	5.0	2.0		ASC.	7	MAX	1	1	17	0
4	CSP4	13:03	5.0	2.0		ASC.	10	MAX	1	1	17	0
5	CSW	6:00	5.0	2.0		ASC.	13	MAX	1	1	17	0
6												
7												
8												
9												
10												
11												
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17												
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21												
22												
23												
24												

D

C

B

Crist 4, Carbonaceous fuel Test Precipitator Data

Unit 4 Date 2/18/03 Run # 1 Sootblow Steady State

HOT SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 0948 Data taken by KB								
A	23	0	22	231	.15	26	007	67
B	27	0	31	293	.43	31	008	70
C	24	0	71	292	.40	29	22	115
D	25	0	64	272	.59	25	28	104
E	11	0	29	280	.22	20	008	85
F	0	0	95	328	.90	21	30	130
Run Stop Time 1049 Data taken by KB								
A	26	0	30	236	.16	28	04	66
B	27	0	59	287	.21	30	07	81
C	24	0	65	322	.57	29	18	109
D	24	0	88	323	.48	26	20	104
E	11	0	32	294	.15	24	07	88
F	1	0	94	328	.89	21	30	130

COLD SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 0948 Data taken by KB								
A	5	0	37	490	.29	40	16	141
B	0	0	57	390	.37	42	18	115
C	0	0	59	300	.51	38	02	160
Run End Time 1049 Data taken by KB								
A	9	0	37	491	.29	39	13	150
B	0	0	57	390	.37	42	18	115
C	0	0	59	300	.52	38	2	160

Comments

Crist 4, CARbonaceous fuel Test Precipitator Data

Unit 4 Date 2/18/03 Run # 2 Sootblow Steady State

HOT SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1234 Data taken by KB								
A	16	0	31	235	.19	27	3	68
B	26	0	57	274	.48	37	14	82
C	24	0	75	297	.47	29	12	105
D	21	0	68	323	.57	26	17	114
E	10	0	33	283	.14	23	7	83
F	3	0	92	340	.87	22	29	130
Run Stop Time 1334 Data taken by KB								
A	16	0	20	235	.18	29	5	50
B	27	0	33	274	.31	30	6	47
C	25	0	36	279	.56	29	17	108
D	23	0	77	291	.68	27	24	125
E	11	0	33	250	.13	24	7	90
F	0	0	94	336	.87	22	29	130

COLD SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1234 Data taken by KB								
A	5	0	37	491	.29	43	16	150
B	4	0	57	392	.37	42	18	115
C	0	0	59	300	.51	38	1	160
Run End Time 1334 Data taken by KB								
A	11	0	37	454	.29	43	16	147
B	6	0	57	390	.37	42	18	115
C	0	0	59	300	.52	38	2	160

Comments

Crist 4. Carbonaceous fuel Test Precipitator Data

Unit 4 Date 2/18/03 Run # 3 Sootblow Steady State

HOT SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1355 Data taken by KB								
A	13	0	29	202	.14	29	5	80
B	25	0	28	245	.17	30	6	75
C	25	0	61	293	.44	29	23	117
D	19	0	85	306	.71	27	22	123
E	11	0	27	279	.17	25	6	84
F	0	0	93	336	.87	22	29	130
Run Stop Time ~~1355~~ 1459 Data taken by KB								
A	11	0	20	242	.18	29	5	80
B	25	0	29	267	.26	30	6	64
C	25	0	48	268	.51	29	20	106
D	21	0	72	325	.54	26	19	110
E	11	0	27	265	.16	23	7	83
F	0	0	94	334	.87	22	29	130

COLD SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1355 Data taken by KB								
A	12	0	32	493	.28	44	16	150
B	1	0	56	393	.36	42	18	115
C	0	0	58	299	.54	38	1	160
Run End Time 1459 Data taken by KB								
A	9	0	36	491	.29	42	16	150
B	0	0	56	391	.37	42	18	115
C	0	0	58	299	.51	38	1	160

Comments

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03
Laboratory Account CRI04SP
Received Date : 20-Feb-03

Description : Gulf Power Plant Crist Unit 4

Scale Comp. Run 1

Laboratory ID Number : AH05116

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	5.80	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13196	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	28	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.53	% By Weight
Lead, Dry Basis	ASTM D6357	3.4	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	13.13	% By Weight
Ash, As Received	ASTM D 5142	5.04	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11463	Btu/lb
Fluorine, As Received	ASTM D 5987	24	mg/kg
Sulfur, As Received	ASTM D 4239	0.46	% By Weight
Lead, As Received	ASTM D6357	3.0	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
Lead, Ignited Basis	ASTM D 6357	58.6	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14008	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.402	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________
Supervision__________________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03

Laboratory Account CRI04SP
Received Date : 20-Feb-03

Description : Gulf Power Plant Crist Unit 4

Scale Comp. Run 2

Laboratory ID Number : AH05117

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	5.98	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13533	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	31	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.00	% By Weight
Lead, Dry Basis	ASTM D6357	18.1	mg/kg
Mercury, Dry	ASTM D6414	0.074	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.74	% By Weight
Ash, As Received	ASTM D 5142	5.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11809	Btu/lb
Fluorine, As Received	ASTM D 5987	27	mg/kg
Sulfur, As Received	ASTM D 4239	0.87	% By Weight
Lead, As Received	ASTM D6357	15.8	mg/kg
Mercury, As Received	ASTM D6414	0.065	mg/kg
Ignited as Element			
Lead, Ignited Basis	ASTM D 6357	303.4	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14394	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.739	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________
Supervision______________________

Date : 3/25/2003

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03
Laboratory Account CRI04SP
Received Date : 20-Feb-03

Description : Gulf Power Plant Crist Unit 4

Scale Comp. Run 3

Laboratory ID Number : AH05118

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	6.44	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13410	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	34	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.00	% By Weight
Lead, Dry Basis	ASTM D6357	19.0	mg/kg
Mercury, Dry	ASTM D6414	0.117	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.47	% By Weight
Ash, As Received	ASTM D 5142	5.64	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11738	Btu/lb
Fluorine, As Received	ASTM D 5987	30	mg/kg
Sulfur, As Received	ASTM D 4239	0.88	% By Weight
Lead, As Received	ASTM D6357	16.6	mg/kg
Mercury, As Received	ASTM D6414	0.102	mg/kg
Ignited as Element			
Lead, Ignited Basis	ASTM D 6357	295.8	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14333	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.746	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control Supervision ______________________

Date : 3/25/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03
Laboratory Account CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05249

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	3.88	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13459	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	15	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.47	% By Weight
Lead, Dry Basis	ASTM D6357	1.7	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	9.37	% By Weight
Ash, As Received	ASTM D 5142	3.52	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12198	Btu/lb
Fluorine, As Received	ASTM D 5987	14	mg/kg
Sulfur, As Received	ASTM D 4239	0.43	% By Weight
Lead, As Received	ASTM D6357	1.5	mg/kg
Mercury, As Received	ASTM D6414	0.058	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.90	% By Weight
Calcium, Ignited Basis	ASTM D 3682	2.11	% By Weight
Barium, Ignited Basis	ASTM D 3683	2578.	mg/kg
Iron, Ignited Basis	ASTM D 3682	3.79	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.69	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.09	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.04	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.97	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ______________________
Supervision__________________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03
Laboratory Account CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05249

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.41	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.09	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.70	% By Weight
Lead, Ignited Basis	ASTM D 6357	44.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.26	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.95	% By Weight
Iron Oxide, Ignited	ASTM D 3682	5.42	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.14	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.21	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.25	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.56	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.55	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.22	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.17	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14002	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.349	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control
Supervision

Date : 3/25/2003

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 19-Feb-03
Laboratory Account CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05250

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	4.39	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13397	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	15	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.44	% By Weight
Lead, Dry Basis	ASTM D6357	1.7	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	8.79	% By Weight
Ash, As Received	ASTM D 5142	4.00	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12219	Btu/lb
Fluorine, As Received	ASTM D 5987	14	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.6	mg/kg
Mercury, As Received	ASTM D6414	0.068	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	14.46	% By Weight
Barium, Ignited Basis	ASTM D 3683	2473.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.99	% By Weight
Iron, Ignited Basis	ASTM D 3682	3.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.32	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ____________________
Supervision____________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins	Customer Account : CRI04SP
Gulf Power Co.	Sample Date : 19-Feb-03
	Laboratory Account CRI04SP
Description : Gulf Power Plant Crist Unit 4	Received Date : 21-Feb-03

Raw Coal

Laboratory ID Number : AH05250

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.37	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.05	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	38.3	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	27.32	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.78	% By Weight
Iron Oxide, Ignited	ASTM D 3682	4.57	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.01	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.31	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14012	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.328	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ____________________

Supervision________________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03
Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05270

Test Name	Reference	Result	Units
Mercury in Coal, NBS 1632c	EPA 3051	0.09673	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.00	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13210	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.48	% By Weight
Lead, Dry Basis	ASTM D6357	2.0	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.22	% By Weight
Ash, As Received	ASTM D 5142	4.39	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11596	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.42	% By Weight
Lead, As Received	ASTM D6357	1.8	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.91	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.78	% By Weight
Barium, Ignited Basis	ASTM D 3683	2137.	mg/kg
Iron, Ignited Basis	ASTM D 3682	4.61	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.08	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 3/25/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.10	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13181	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.86	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.02	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.47	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.01	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	3.6	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.47	% By Weight
Ash, As Received	ASTM D 5142	4.46	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11537	Btu/lb
Carbon, As Received	ASTM D 5373	66.40	% By Weight
Hydrogen, As Received	ASTM D 5373	4.39	% By Weight
Nitrogen, As Received	ASTM D 5373	1.29	% By Weight
Oxygen, As Received	ASTM D 3176	10.51	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.47	% By Weight
Lead, As Received	ASTM D6357	3.2	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**______________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.97	% By Weight
Barium, Ignited Basis	ASTM D 3683	1861.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.65	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.83	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.09	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.39	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.68	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	71.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.40	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.31	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.90	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.82	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.53	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.20	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13889	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.410	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**____________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.70	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13207	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.20	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.01	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.52	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.00	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	3.8	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.56	% By Weight
Ash, As Received	ASTM D 5142	4.11	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11548	Btu/lb
Carbon, As Received	ASTM D 5373	66.63	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.33	% By Weight
Oxygen, As Received	ASTM D 3176	10.49	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.50	% By Weight
Lead, As Received	ASTM D6357	3.3	mg/kg
Mercury, As Received	ASTM D6414	0.066	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**____________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.54	% By Weight
Barium, Ignited Basis	ASTM D 3683	2115.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.28	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.18	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.82	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.45	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.71	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	81.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.58	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.67	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.42	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.24	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.61	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.28	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13858	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.432	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.05	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13258	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.07	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.48	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.92	% By Weight
Fluorine, Dry Basis	ASTM D 5987	22	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.55	% By Weight
Lead, Dry Basis	ASTM D6357	3.5	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.91	% By Weight
Ash, As Received	ASTM D 5142	4.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Carbon, As Received	ASTM D 5373	66.25	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.29	% By Weight
Oxygen, As Received	ASTM D 3176	10.38	% By Weight
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.0	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

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Bobby Watkins

Quality Control ____________________ **Supervision**________________________ **Date :** 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP

Description : Gulf Plant Crist Unit #4

Received Date : 26-Feb-03

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.35	% By Weight
Barium, Ignited Basis	ASTM D 3683	1858.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.14	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.19	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.38	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.65	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Lead, Ignited Basis	ASTM D 6357	68.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.22	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.35	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.44	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.00	% By Weight
General			

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Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13963	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.415	lbs/mmBTU

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Quality Control ____________________ ***Supervision*** ____________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury in Coal, NBS 1632c	EPA 3051	0.09568	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.95	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13185	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.26	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.85	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.80	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.65	% By Weight
Lead, Dry Basis	ASTM D6357	2.3	mg/kg
Mercury, Dry	ASTM D6414	0.086	mg/kg
As Received			
Moisture, Total	ASTM D 2013	13.01	% By Weight
Ash, As Received	ASTM D 5142	5.18	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11470	Btu/lb
Carbon, As Received	ASTM D 5373	65.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.22	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.26	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.57	% By Weight
Lead, As Received	ASTM D6357	2.0	mg/kg

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Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury, As Received	ASTM D6414	0.075	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.78	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.42	% By Weight
Barium, Ignited Basis	ASTM D 3683	2103.	mg/kg
Iron, Ignited Basis	ASTM D 3682	6.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.31	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.55	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.33	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.49	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	37.9	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.99	% By Weight
Iron Oxide, Ignited	ASTM D 3682	8.86	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.58	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.66	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.44	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.72	% By Weight

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TO: Kevin Beaty
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Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14019	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.493	lbs/mmBTU

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Comments:

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Kim Leroy
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Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.85	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13292	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.84	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.31	% By Weight
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.58	% By Weight
Lead, Dry Basis	ASTM D6357	4.4	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.90	% By Weight
Ash, As Received	ASTM D 5142	4.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11577	Btu/lb
Carbon, As Received	ASTM D 5373	66.06	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.72	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.51	% By Weight
Lead, As Received	ASTM D6357	3.8	mg/kg
Mercury, As Received	ASTM D6414	0.065	mg/kg
Ignited as Element			

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Quality Control ____________________ **Supervision**________________________ **Date :** 4/2/2003

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Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.21	% By Weight
Barium, Ignited Basis	ASTM D 3683	1968.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.76	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.41	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.14	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.23	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.43	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.74	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Lead, Ignited Basis	ASTM D 6357	89.7	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.96	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.46	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.12	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.58	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.35	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
General			

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Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

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Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13970	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.436	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**_________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.64	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13203	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.32	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.97	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.50	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.03	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	4.2	mg/kg
Mercury, Dry	ASTM D6414	0.054	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.99	% By Weight
Ash, As Received	ASTM D 5142	4.08	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11620	Btu/lb
Carbon, As Received	ASTM D 5373	67.17	% By Weight
Hydrogen, As Received	ASTM D 5373	4.37	% By Weight
Nitrogen, As Received	ASTM D 5373	1.32	% By Weight
Oxygen, As Received	ASTM D 3176	10.59	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.7	mg/kg
Mercury, As Received	ASTM D6414	0.048	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.25	% By Weight
Barium, Ignited Basis	ASTM D 3683	1960.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.89	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.94	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.10	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.58	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.44	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.54	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Lead, Ignited Basis	ASTM D 6357	91.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.64	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.06	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.33	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.87	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.59	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
General			

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13845	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.409	lbs/mmBTU

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Comments:

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Quality Control ______________________ **Supervision**______________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.41	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13046	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.94	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.44	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.85	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.46	% By Weight
Lead, Dry Basis	ASTM D6357	2.2	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.27	% By Weight
Ash, As Received	ASTM D 5142	4.75	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11445	Btu/lb
Carbon, As Received	ASTM D 5373	65.74	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.26	% By Weight
Oxygen, As Received	ASTM D 3176	11.27	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.39	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	1952.	mg/kg
Iron, Ignited Basis	ASTM D 3682	4.01	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	27.86	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.36	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.97	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.55	% By Weight
Lead, Ignited Basis	ASTM D 6357	40.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.41	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	5.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	59.60	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.49	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.93	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.92	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13792	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.353	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**__________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03
Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05270

Test Name	Reference	Result	Units
Potassium, Ignited Basis	ASTM D 3682	1.05	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.75	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.38	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.02	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.58	% By Weight
Lead, Ignited Basis	ASTM D 6357	39.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.39	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.59	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.18	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.26	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	57.23	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.51	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.05	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.97	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13905	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.363	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 3/25/2003

smk/ooa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03

Laboratory Account : CRISTSP
Received Date : 25-Feb-03

Description : Gulf Power - Plant Crist

Sawdust Composite

Laboratory ID Number : AH05566

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.28	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8674	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	11	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.03	% By Weight
Lead, Dry Basis	ASTM D6357	0.1	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	9.74	% By Weight
Ash, As Received	ASTM D 5142	0.25	% By Weight
Heat of Combustion, As Received	ASTM D 5865	7829	Btu/lb
Fluorine, As Received	ASTM D 5987	10	mg/kg
Sulfur, As Received	ASTM D 4239	0.03	% By Weight
Lead, As Received	ASTM D6357	0.1	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	1.66	% By Weight
Barium, Ignited Basis	ASTM D 3683	1402.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	29.36	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.82	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	7.07	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.46	% By Weight
Potassium, Ignited Basis	ASTM D 3682	17.77	% By Weight
Silicon, Ignited Basis	ASTM D 3682	3.09	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 3/25/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03
Laboratory Account : CRISTSP
Received Date : 25-Feb-03

Description : Gulf Power - Plant Crist

Sawdust Composite

Laboratory ID Number : AH05566

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	1.11	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	3.88	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.04	% By Weight
Lead, Ignited Basis	ASTM D 6357	25.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	3.14	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	41.08	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.17	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	11.72	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	3.35	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	21.41	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	6.61	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	9.70	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8698	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.035	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 3/25/2003

smk/coa

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

BASELINE STUDY WHILE BURNING CARBONACEOUS MATERIAL FOR NITROGEN OXIDES, CARBON MONOXIDE, OXYGEN, TOTAL VOLATILE ORGANIC COMPOUNDS, AND EXEMPT VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST REPORT

FOR

GULF POWER COMPANY
Plant Crist, Unit 4
Pensacola, Florida

February 21, 2003

1568 LEROY STEVENS ROAD
MOBILE, ALABAMA 36695
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FAX: (251) 633-2285
E-MAIL: sanders@sandersengineering.com

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.
An Environmental Engineering Firm Specializing in Air Emissions Measurement and Permitting
www.sandersengineering.com EMAIL: sanders@sandersengineering.com
Phone: 251-633-4120 1568 Leroy Stevens Rd.
Fax: 251-633-2285 Mobile, AL 36695

REPORT CERTIFICATION

I have reviewed the "Baseline Study While Burning Carbonaceous Material for Nitrogen Oxides, Carbon Monoxide, Oxygen, Total Volatile Organic Compounds, and Exempt Volatile Organic Compounds Emissions Test Report" for the testing performed for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. I hereby certify that it is authentic and accurate to the best of my knowledge.

Date: 3/5/03

Signature: ______________________
Johnny W. Sanders, P.E., M.P.H.
President

TABLE OF CONTENTS

LIST OF TABLES

ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS) performed a baseline study while burning carbonaceous material for nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. The testing was conducted February 21, 2003. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 3a, 7e, 10, and SEAS 2518**. Method 2518 is a gas chromatic method for the separation of exempt voc's (methane and ethane) from non-exempt voc's. Further discussions of the test methods are included later in the report.

The purpose of the testing was to demonstrate compliance with the rules and regulations of the U. S. Environmental Protection Agency, and to meet the necessary requirements contained in the permit to operate issued by the Florida Department of Environmental Protection. The tests were conducted by Mr. Joseph Sanders and Mr. LeBarron Rudolph of Sanders Engineering & Analytical Services, Inc., and were coordinated with Mr. Kevin Beaty of Gulf Power Company. The Florida Department of Environmental Protection was notified so a representative could be present to observe the testing.

The results of the testing prove Unit 4 to be in compliance with the nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions limitations contained in the permit to operate issued by the Florida Department of Environmental Protection.

2. DESCRIPTION OF SAMPLING PROGRAM

The sampling program consisted of nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions testing in compliance with US EPA methods. The following is a brief description of these types of tests.

2.1. Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions Testing

Nitrogen oxides, carbon monoxide, and oxygen emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe, a moisture removal system, and into instruments specifically designed for the measurement of the particular pollutant of interest. The instruments responded linearly to concentrations of the pollutants. The output of the instruments is a continuous analog voltage which is digitized and input into a PC based data acquisition system. The PC data acquisition system polls the instrument 1000 times per second. The computer averages these readings into one-second averages during calibrations and one minute averages at other times. These one second and one minute averages are written to the hard disk each minute to ensure no data loss due to power failure or other inadvertent occurrence. The computer stores in memory all calibration and stack gas analyses during each run. The averages for each calibration and for each independent run were averaged for the time of the runs. Descriptions of the testing procedures are included in Sections 6 and 7. Sample calculations of Run 1 are included in Appendix B. The Protocol 1 gas certifications are included in Appendix C.

2.2. Volatile Organic Compounds Emissions Testing

Volatile organic compounds emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe and heated teflon line into a gas chromatograph equipped with a flame ionization detector. The chromatograph divided the compounds into four specific organic compounds and one group of organic compounds. The four specific compounds are methane, acetylene, ethylene, and ethane. The groups of compounds are all compounds which contain three or more carbon atoms (Propane+). The chromatograph was injected with a combination of these gases to ensure separation and then calibrated with Protocol 1 gases of propane. The calibration curve for propane was used to convert the area of each peak representing each compound into its equivalent part per million as propane. A description of the testing procedure is included in Section 8. The Protocol 1 gas certifications and calibration graph of propane versus peak area are included in Appendix C. A line loss/system check was performed at the beginning and end of each test by injecting Protocol 1 propane in nitrogen calibration gas at the probe and measuring the concentration with at least two injections of the chromatograph. Appendix C contains a table which shows the results of these system checks. The raw data is corrected for the line loss/system check if greater than five percent. Example chromatograms are included in Appendix D. Operational data as supplied by a representative of Gulf Power Company is included in Appendix E.

3. SUMMARY AND DISCUSSION OF RESULTS

There were no unusual problems experienced during the performance of the testing. The results for the nitrogen oxides, carbon monoxide, oxygen, and volatile organic compounds emissions testing are presented in Table I. A graphical representation of the nitrogen oxides, carbon monoxide, and oxygen concentrations are presented in Figure 1. The quality assurance calculations for the nitrogen oxides, carbon monoxide, and oxygen testing are presented in Tables II through IV, respectively. The volatile organic compounds stack gas analysis is presented in Table V.

Example chromatograms of a combination of a gas containing methane, acetylene, ethylene, ethane, and propane are shown in Appendix D. The purpose of these chromatograms is to show the gas chromatograph column performance in separating each of these compounds. Also included in Appendix D is the representative chromatogram of stack gas showing the only non-exempt volatile organic compounds.

The results of the testing for each parameter are as follows:

PARAMETER	Emission Rate (lbs/MMbtu)
Nitrogen Oxides	0.496
Carbon Monoxide	0.00635
Volatile Organic Compounds	0.000294

TABLE I. NITROGEN OXIDES, CARBON MONOXIDE, OXYGEN, AND VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST RESULTS

GULF POWER COMPANY

PLANT CRIST, UNIT4

CARBONACEOUS MATERIAL

2/21/2003

TEST	START TIME Military	STOP TIME Military	WATER VAPOR IN STACK GAS (percent)	F FACTOR Oxygen (Dry) (sdcf/MMbtu)	OXYGEN (Dry) (measured) (Percent)	Nitrogen Oxides Emissions (ppm-dry)	Nitrogen Oxides Emissions (O2 F factor) (lbs/MMbtu)	Carbon Monoxide Emissions (ppm-dry)	Carbon Monoxide Emissions (O2 F factor) (lbs/MMbtu)	Volatile Organic Compounds Emissions (ppm-wet)	Volatile Organic Compounds Emissions (ppm-dry)	Volatile Organic Compounds Emissions (O2 F factor) (lbs/MMbtu)
RUN 1	8:14	9:14	8.00	9780	8.16	265.03	0.506	5.63	0.00657	0.151	0.164	0.000301
RUN 2	9:27	10:27	8.00	9780	7.96	258.05	0.485	5.00	0.00574	0.115	0.125	0.000225
RUN 3	10:41	11:41	8.00	9780	7.96	264.48	0.497	5.86	0.00673	0.181	0.197	0.000356
Average			**8.00**		**8.02**	**262.52**	**0.496**	**5.50**	**0.00635**	**0.149**	**0.162**	**0.000294**

Figure 1. Graphical Representation of Stack Gas Concentrations While Burning Carbonaceous Material

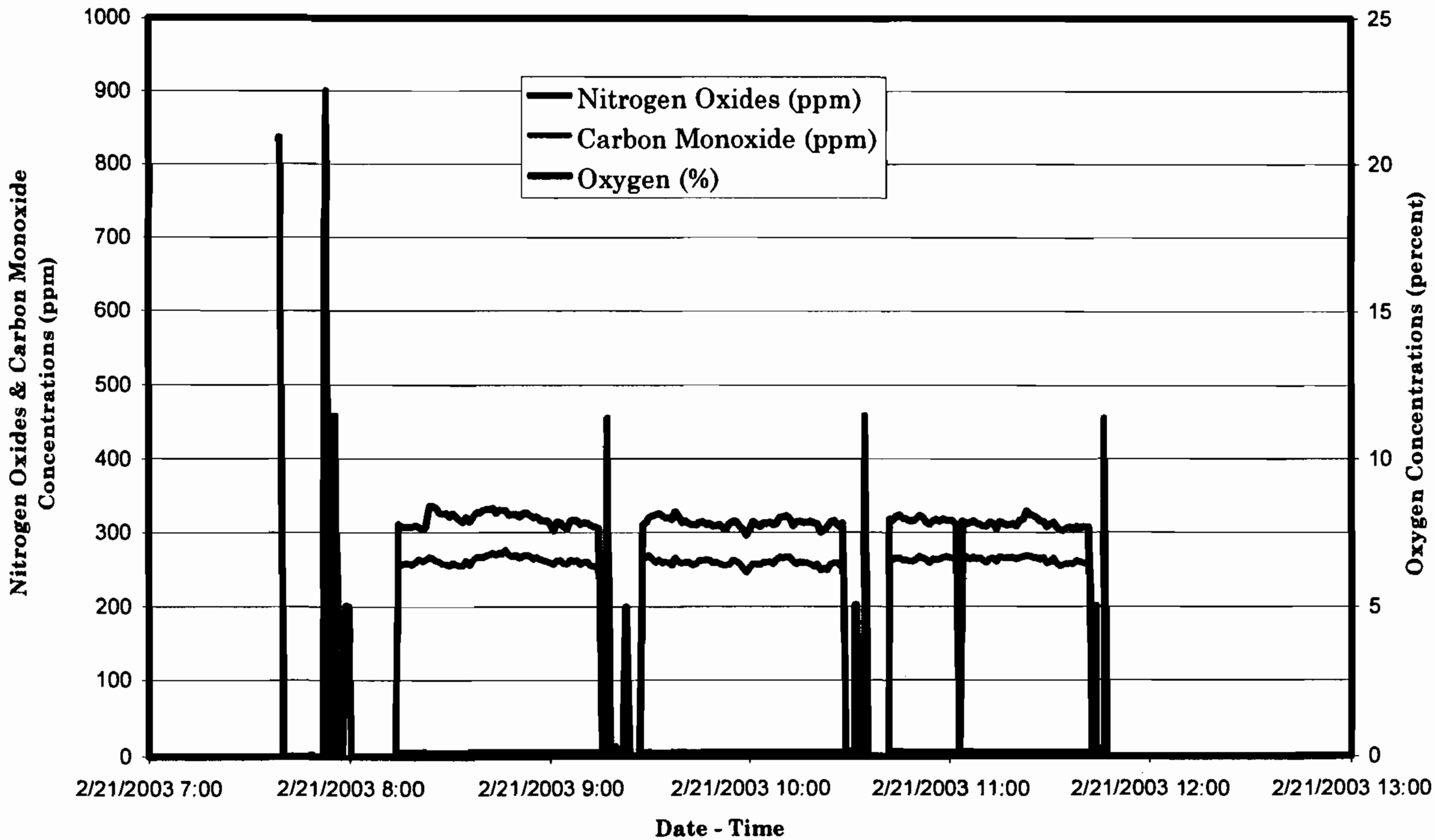


TABLE II. OXYGEN TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT4
CARBONACEOUS MATERIAL
2/21/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (%) =	25.0		ANALYZER ID.	HORIBA CMA
	CYLINDER VALUE Percent	ANALYZER RESPONSE (Percent)	DIFFERENCE (Percent)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	20.9	20.9	0.0	0.0
Mid Range Gas	5.1	5.0	0.1	0.4

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (Percent)*	*system Zero (Percent)*	*system upscale (Percent)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (Percent)*	*ANALYZER SPAN (Percent)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	OXYGEN CONCENTRATION (Percent-Dry)
		INITIAL SYSTEM		*0.0*	*5.0*									
8:14	*9:14*	Run 1	*8.0*	*0.0*	*5.0*	*5.1*	*25.0*	0.0	0.0	0.0	0.0	0.0	0.0	8.2
9:27	*10:27*	Run 2	*7.8*	*0.0*	*5.0*	*5.1*	*25.0*	0.0	0.0	0.0	0.0	0.0	0.0	8.0
10:41	*11:41*	Run 3	*7.8*	*0.0*	*5.0*	*5.1*	*25.0*	0.0	0.0	0.0	0.0	0.0	0.0	8.0

TABLE III. NITROGEN OXIDES TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT4
CARBONACEOUS MATERIAL
2/21/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000	ANALYZER ID	HORIBA CLA	
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	865	865.0	0.0	0.0
Mid Range Gas	454.7	441.1	13.6	1.4

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	NITROGEN OXIDES CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*0.3*	*440.7*									
8:14	*9:14*	**Run 1**	*262.6*	*11.4*	*452.0*	*454.7*	*1000.0*	0.0	1.1	1.1	0.0	1.1	1.1	265.0
9:27	*10:27*	**Run 2**	*259.2*	*9.8*	*445.3*	*454.7*	*1000.0*	1.1	1.0	-0.2	1.1	0.4	-0.7	258.0
10:41	*11:41*	**Run 3**	*264.2*	*11.8*	*447.6*	*454.7*	*1000.0*	1.0	1.2	0.2	0.4	0.7	0.2	264.5

TABLE IV. CARBON MONOXIDE TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT4
CARBONACEOUS MATERIAL
2/21/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000		ANALYZER ID	HORIBA CMA 331A
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	901	901.0	0.0	0.0
Mid Range Gas	442.5	457.7	-15.2	-1.5

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	CARBON MONOXIDE CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*-0.9*	*457.2*									
8:14	*9:14*	Run 1	*5.6*	*0.5*	*454.5*	*442.5*	*1000.0*	-0.1	0.1	0.1	-0.1	-0.3	-0.3	5.6
9:27	*10:27*	Run 2	*5.3*	*-0.2*	*456.9*	*442.5*	*1000.0*	0.1	0.0	-0.1	-0.3	-0.1	0.2	5.0
10:41	*11:41*	Run 3	*5.5*	*-0.9*	*455.3*	*442.5*	*1000.0*	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	5.9

Table V. Results of Gas Chromatographic Analysis of Stack Gases for Volatile Organic Compounds
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/21/2003

Injection Number	Run Name	Injection Time	Methane Peak Area	Acetylene Peak Area	Ethylene Peak Area	Ethane Peak Area	Propane Peak Area	Methane ppm as propane	Acetylene ppm as propane	Ethylene ppm as propane	Ethane ppm as propane	Propane ppm as propane	Line Loss Percent	TOTAL VOC ppm as propane	TOTAL VOC ppm as propane Corrected For Line Loss
1	Initial Line Loss						11578					49.4			
2	Initial Line Loss											0.0			
3	Initial Line Loss											0.0			
Average	Initial Line Loss						11578					49.4	0.8%		
System Check Cylinder Value (ppm)												49.8			
1	Run 1	8:14 AM	-187	12	1	-12	7	0.0	0.1	0.0	0.0	0.0		0.1	0.1
2	Run 1	8:18 AM	-179	5	-2	-8	97	0.0	0.0	0.0	0.0	0.4		0.4	0.4
3	Run 1	8:23 AM	-176	-4	-2	3	50	0.0	0.0	0.0	0.0	0.2		0.2	0.2
4	Run 1	8:28 AM	-186	-1	1	7	67	0.0	0.0	0.0	0.0	0.3		0.3	0.3
5	Run 1	8:33 AM	-187	0	4	6	90	0.0	0.0	0.0	0.0	0.4		0.4	0.4
6	Run 1	8:38 AM	-196	-2	-1	-13	61	0.0	0.0	0.0	0.0	0.3		0.3	0.3
7	Run 1	8:43 AM	-194	8	1	-2	46	0.0	0.0	0.0	0.0	0.2		0.2	0.2
8	Run 1	8:48 AM	-195	4	-5	4	88	0.0	0.0	0.0	0.0	0.4		0.4	0.4
9	Run 1	8:53 AM	-189	0	-3	11	32	0.0	0.0	0.0	0.0	0.1		0.1	0.1
10	Run 1	8:58 AM	-185	-4	0	4	45	0.0	0.0	0.0	0.0	0.2		0.2	0.2
11	Run 1	9:03 AM	-182	-4	2	-8	25	0.0	0.0	0.0	0.0	0.1		0.1	0.1
12	Run 1	9:08 AM	-181	8	-4	3	52	0.0	0.0	0.0	0.0	0.2		0.3	0.3
Number of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
Average	Run 1		-186	2	-1	0	55	0.0	0.0	0.0	0.0	0.1	0.36%	0.2	0.2
1	Run 1 Line Loss	9:13 AM					11655					49.7			
2	Run 1 Line Loss	9:18 AM					11589					49.5			
3	Run 1 Line Loss	9:22 AM					11634					49.7			
Average	Run 1 Line Loss						11626					49.6			
1	Run 2	9:28 AM	-158	-3	2	5	90	0.0	0.0	0.0	0.0	0.4		0.4	0.4
2	Run 2	9:33 AM	-158	0	-1	31	35	0.0	0.0	0.0	0.1	0.1		0.1	0.1
3	Run 2	9:38 AM	-151	8	-3	20	52	0.0	0.0	0.0	0.1	0.2		0.3	0.3
4	Run 2	9:43 AM	-149	2	-1	20	36	0.0	0.0	0.0	0.1	0.2		0.2	0.2
5	Run 2	9:48 AM	-148	-2	-6	22	38	0.0	0.0	0.0	0.1	0.2		0.2	0.2
6	Run 2	9:53 AM	-157	-1	-2	18	26	0.0	0.0	0.0	0.1	0.1		0.1	0.1
7	Run 2	9:58 AM	-145	-4	-5	28	35	0.0	0.0	0.0	0.1	0.1		0.1	0.1
8	Run 2	10:03 AM	-144	-2	-12	24	60	0.0	0.0	0.0	0.1	0.3		0.3	0.3
9	Run 2	10:08 AM	-165	-4	15	8	33	0.0	0.0	0.1	0.0	0.1		0.2	0.2
10	Run 2	10:13 AM	-151	0	9	2	6	0.0	0.0	0.0	0.0	0.0		0.1	0.1
11	Run 2	10:18 AM	-151	-1	6	6	32	0.0	0.0	0.0	0.0	0.1		0.2	0.2
12	Run 2	10:22 AM	-170	-14	5	19	44	0.0	0.0	0.0	0.1	0.2		0.2	0.2
Number of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
Average	Run 2		-153	-2	1	17	41	0.0	0.0	0.0	0.0	0.1	0.69%	0.1	0.1
1	Run 2 Line Loss	10:26 AM					11412					48.7			
2	Run 2 Line Loss	10:32 AM					11760					50.2			
3	Run 2 Line Loss	10:36 AM					11589					49.5			
Average	Run 2 Line Loss						11587					49.5			
1	Run 3	10:41 AM	-160	-1	-2	-6	184	0.0	0.0	0.0	0.0	0.8		0.8	0.8
2	Run 3	10:46 AM	-157	-5	-3	9	163	0.0	0.0	0.0	0.0	0.7		0.7	0.7
3	Run 3	10:51 AM	-171	2	4	15	134	0.0	0.0	0.0	0.1	0.6		0.6	0.6
4	Run 3	10:56 AM	26	-1	-1	14	53	0.1	0.0	0.0	0.1	0.2		0.2	0.2
5	Run 3	11:01 AM	-168	-3	-3	4	29	0.0	0.0	0.0	0.0	0.1		0.1	0.1
6	Run 3	11:06 AM	-164	-4	-4	37	62	0.0	0.0	0.0	0.2	0.3		0.3	0.3
7	Run 3	11:10 AM	-170	-5	1	10	41	0.0	0.0	0.0	0.0	0.2		0.2	0.2
8	Run 3	11:15 AM	-156	-4	-3	11	55	0.0	0.0	0.0	0.0	0.2		0.2	0.2
9	Run 3	11:19 AM	-162	-9	5	17	41	0.0	0.0	0.0	0.1	0.2		0.2	0.2
10	Run 3	11:23 AM	-145	-3	13	16	-8	0.0	0.0	0.1	0.1	0.0		0.1	0.1
11	Run 3	11:28 AM	-167	16	-3	11	40	0.0	0.1	0.0	0.0	0.2		0.2	0.2
12	Run 3	11:33 AM	31	-11	-4	3	-1	0.1	0.0	0.0	0.0	0.0		0.0	0.0
Number of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
Average	Run 3		-129	-2	0	12	66	0.0	0.0	0.0	0.0	0.2	0.75%	0.2	0.2
1	Run 3 Line Loss	11:37 AM					11443					48.8			
2	Run 3 Line Loss	11:42 AM					11572					49.4			
3	Run 3 Line Loss	11:47 AM					11725					50.0			
Average	Run 3 Line Loss						11580					49.4			

TABLE VI. EXEMPT VOLATILE ORGANIC COMPOUNDS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
02/21/03

Run Number	Start Time	Stop Time	Uncorrected (wet) Methane ppm as propane	Acetylene ppm as propane	Ethylene ppm as propane	Ethane ppm as propane	Propane ppm as propane	Total VOC non-exempt as propane (ppm)	Line Loss Fraction	CORRECTED (wet) TOTAL VOC NON-EXEMPT as propane (ppm)
1	8:14 AM	9:14 AM	0.0000	0.00788	0.00192	0.00810	0.141	0.150	0.00517	0.151
2	9:28 AM	10:28 AM	0.0000	0.00213	0.00788	0.0433	0.104	0.114	0.00851	0.115
3	10:41 AM	11:41 AM	0.0121	0.00384	0.00490	0.0313	0.171	0.180	0.00911	0.181
Average			**0.0040**	**0.00462**	**0.00490**	**0.0276**	**0.138**	**0.148**	**0.00759**	**0.149**

Methane & Ethane Concentrations may be higher than reported.
These compounds are sometimes found at concentrations higher than the instrument can detect

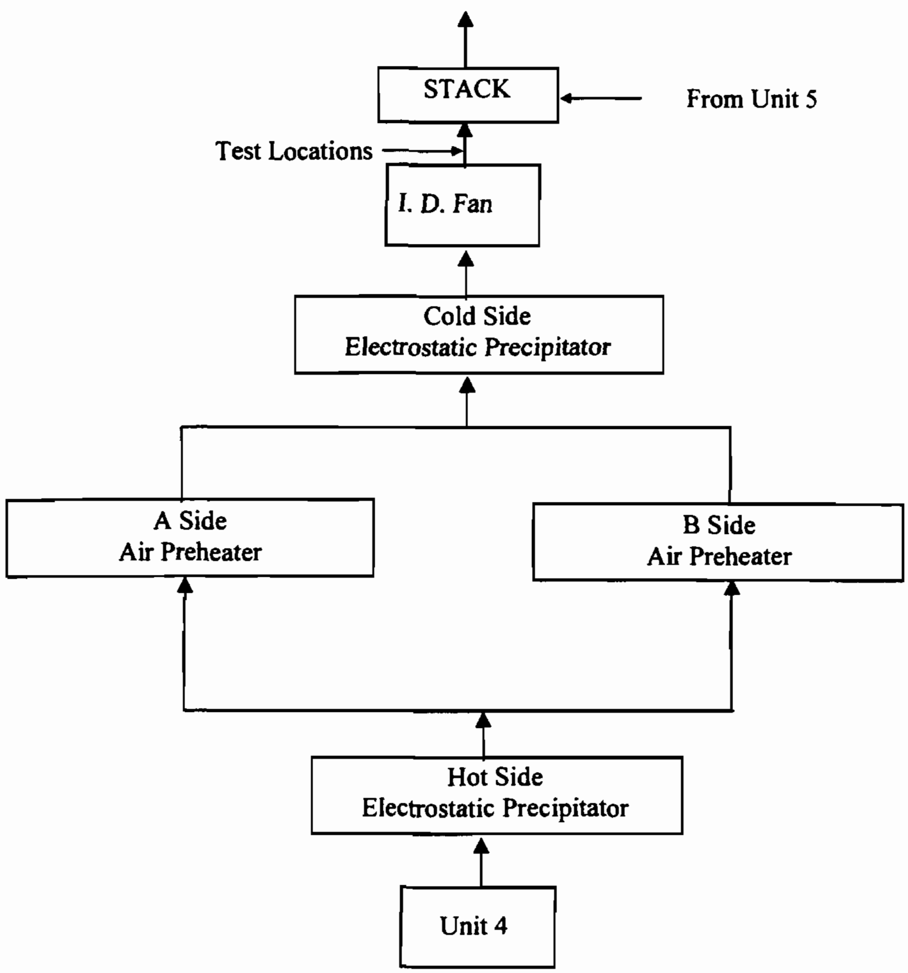
4. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by barge, and loaded directly onto the conveyor feeding the plant or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 36 to 48 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators. In addition to the coal fired in the boiler saw dust was added from a hopper to the conveyor belt transporting the coal to the boiler.

4.1. Source Air Flow

As shown in Figure 2, the flue gases exit the boiler and flow through a hot side precipitator. The exhaust gases are separated into ducts A and B before entering air preheaters. The exhaust gases are combined before entering a cold side ESP. The flue gases exiting the cold side ESP are exhausted through a stack into the atmosphere.

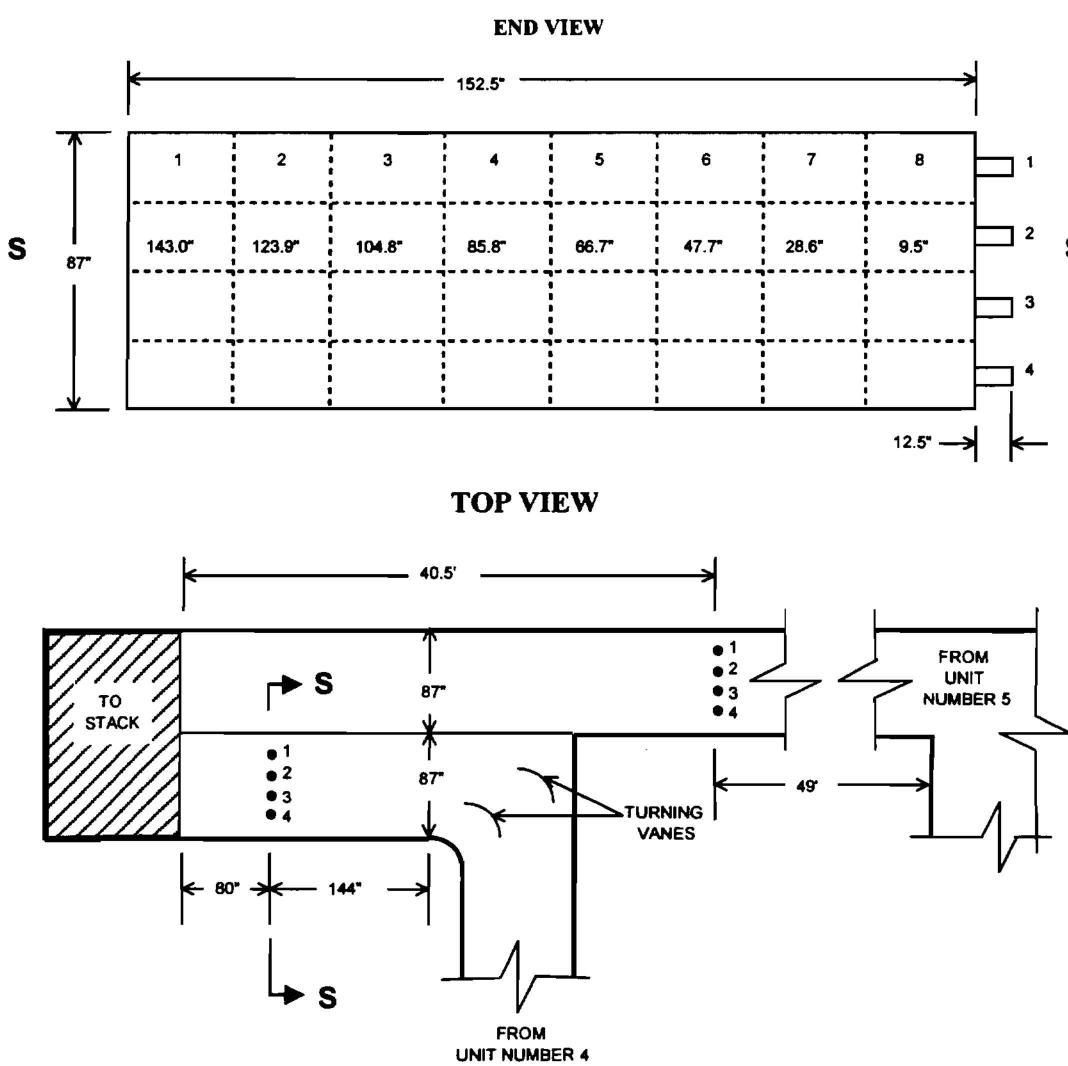
Figure 2. Air Flow Schematic



5. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 3. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 32 points.

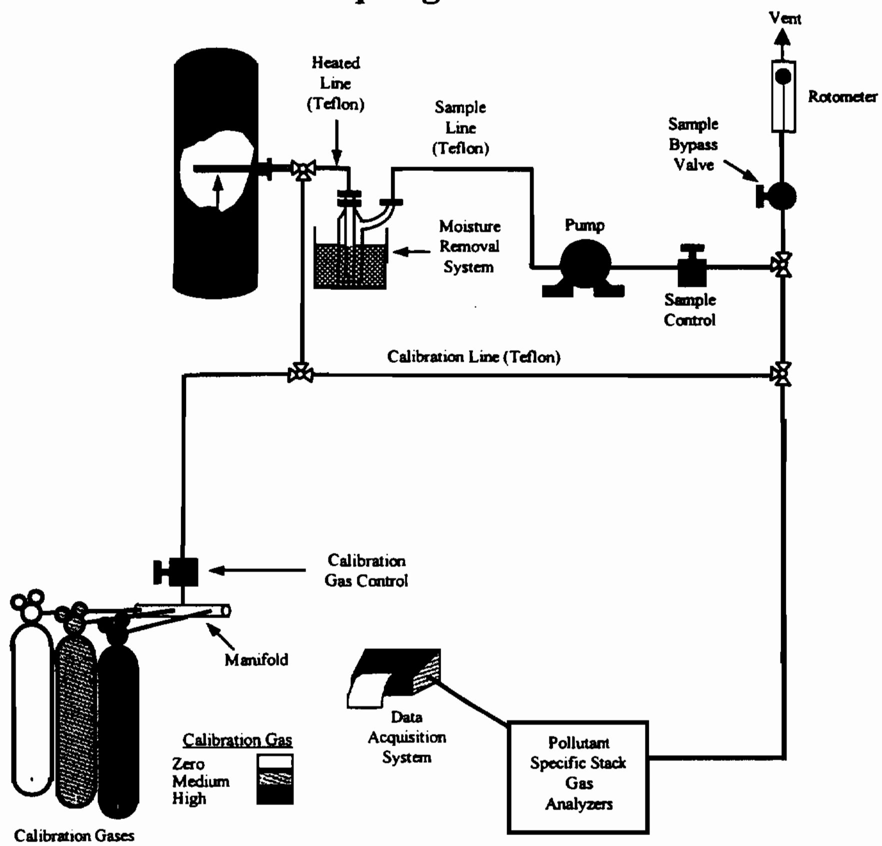
Figure 3. Sample Point Locations



6. CARBON MONOXIDE AND OXYGEN SAMPLING PROCEDURE (EPA METHODS 3A AND 10)

The sampling procedures utilized are those specified in **40 CFR, Part 60, Appendix A, Methods 3a and 10** as modified by the governing regulatory agency. A brief description of these procedures is as follows:

Figure 4. Carbon Monoxide and Oxygen Sampling Procedure



The sample was removed from the stack through a stainless steel probe and passes through a three-way valve and condenser moisture removal system. Teflon® line was used to transport the sample through a transport pump and a flow control valve. From this point the sample was routed into a manifold with a bypass valve, an analyzer sample flow control valve, and to an analyzer specific for the pollutant of interest. Each analyzer produces a voltage analogue output proportional to the concentration of pollutant present in the gas. A schematic of the sampling train is presented in the attached drawing.

Each instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. Zero air is introduced directly to each instrument to establish a baseline and check the zero reading of the instrument. A high range calibration gas was introduced directly to each instrument. The instrument was allowed to fully respond to the calibration gas. Each analyzer was adjusted, if

needed, to the correct value. A linear calibration curve was calculated from this data and stored on computer. Next, a mid-range calibration gas was introduced directly to each instrument. The percent error between each measured value and the corresponding calibration value was calculated. If any of the readings indicated a difference of more than ± 2 percent of the span the analyzer was recalibrated.

The high or mid gas and zero gas were then introduced to the system at the three-way valve before the condenser. The response value for each of these gases was recorded. If these measured values differed significantly from the calibration values the sampling system was checked and repaired until the system check met EPA specifications.

To begin sampling, the three-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the data recorder was marked for the beginning of the run. After the required sampling time, the data recorder was marked for the end of the run. At the end of each run the three-way valve was switched to allow introduction of the zero and calibration gas to the system. From these data the calibration bias and drift were calculated. If the bias values were greater than ± 5 percent of the span, or the drift was greater than three percent of the span, the run was invalidated. To begin the next run the three-way valve was switched to allow sampling of the stack gas and the next run was started. This procedure was repeated until all runs were complete.

6.1. Sample Recovery & Analysis

After the tests were completed the data was reduced to give an average concentration in parts per million for each run. This average concentration was then corrected for the analyzer zero and span bias and drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

Co = Average of Initial and final system calibration responses for the zero gas, ppm.

Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

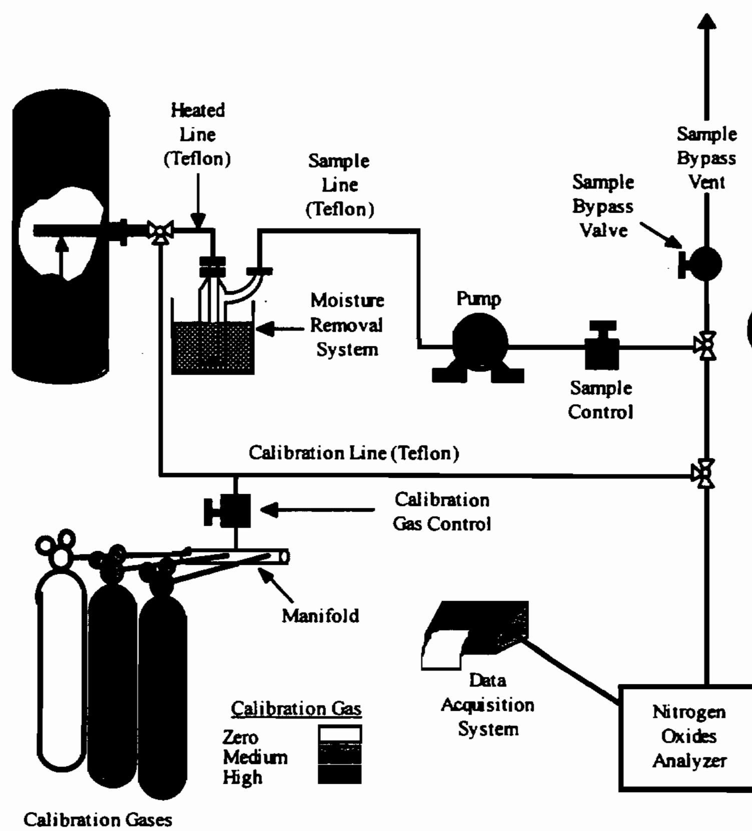
Cma = Actual concentration of the scale calibration gas, ppm.

7. NITROGEN OXIDES PROCEDURE (EPA Method 7e)

The sampling procedure utilized is that specified in 40 CFR, Part 60, Appendix A, Method 7e. A brief description of this procedure is as follows:

The sample was removed from the stack through a stainless steel probe and passed through a 3-way valve and an impinger moisture removal system. Teflon line was used to transport the sample through a sample transport pump and a sample flow control valve. From this point the sample is routed into a manifold with a bypass valve, then to an analyzer sample flow control valve and on to a chemiluminescent NO-NO_X gas analyzer. The analyzer uses a chemiluminescent principal based on the reaction of ozone with nitrogen oxides to provide a voltage analogue output proportional to the concentration of oxides of nitrogen present in the sample. A schematic of the sampling train is presented in the attached drawing.

Figure 5. Nitrogen Oxides Sampling Procedure



The instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. A high range calibration gas, between 80 to 90 percent of the span value, was introduced directly to the instrument. The instrument was allowed to fully respond to the calibration gas and the analyzer was adjusted to the correct value. Next, a mid- range calibration gas, between 50 to 60 percent of the span,

was introduced directly to the instrument. Next zero air was introduced directly to the instrument to check the zero reading of the instrument. If any of the readings indicated a difference of more than $\pm$2% of the span, the analyzer was recalibrated. The high, middle and zero gasses were then introduced to the system at the 3-way valve. The calibration gases utilized were either EPA Protocol I gases or were generated by using EPA Method 205. The response value for each of these gases was recorded.

To begin sampling, the 3-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the chart was marked for the beginning of the run. After the required sampling time, the chart was marked for the end of the run. At the end of each run the 3-way valve was switched to allow introduction of the calibration gas which was closest in value to the exhaust gas NO_X concentration. Zero air was introduced to the system. The zero and calibration drift were recorded. If the drift values were greater than $\pm$5% of the span, the run was invalidated. The 3-way valve was switched to allow sampling of the stack gas, and the next run was begun. This procedure was repeated until all runs were completed.

7.1.1. Sample Recovery & Analysis

After the tests were completed, the data was reduced to give an average NO_X concentration in ppm for each run. This average concentration was then corrected for the analyzer zero and span drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

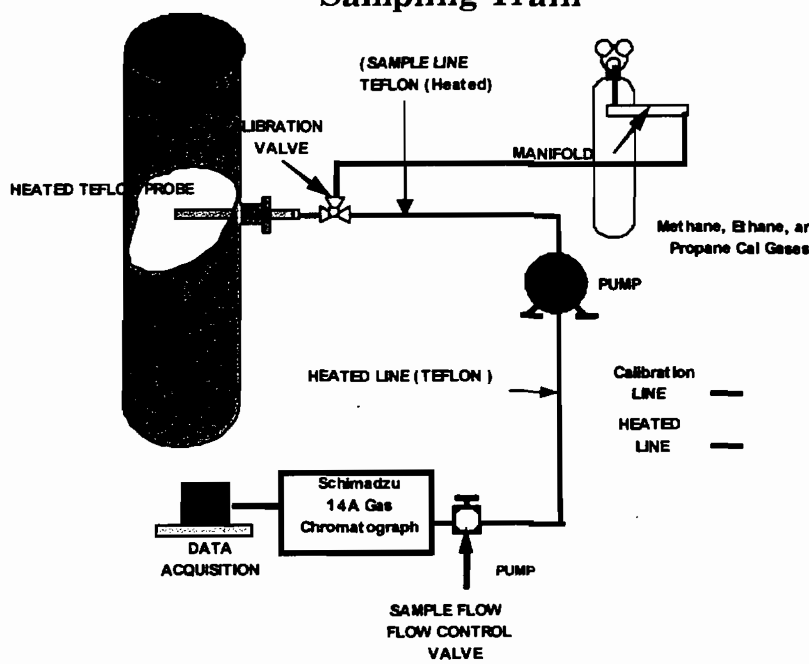
Co = Average of Initial and final system calibration responses for the zero gas, ppm.

Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

Cma = Actual concentration of the scale calibration gas, ppm.

8. NON-EXEMPT VOLATILE ORGANIC COMPOUND SAMPLING BY GAS CHROMATOGRAPHY (SEAS Method 2518)

Figure 6. Non-Exempt Volatile Organic Compounds Sampling Train



Gaseous organic emission sampling (gas chromatography) was performed per **SEAS Method 2518**. Non-exempt volatile organic compounds emissions testing was performed by a system similar to that depicted in the attached figure.

A heated stainless steel probe and heated teflon sample line was used to draw a sample from the emission source. Stack gases were continuously drawn through the sample lines. The sample lines were leak checked prior to and after all testing.

A small portion of the gas sample was pumped into the on-line gas chromatograph sample loop. The gas chromatograph sample loop was operated at approximately 30 ml/min flow, and was continuously purged with stack gas. Sample was introduced into the gas chromatograph by automatic actuation of the sample valve at a predetermined time. The gas chromatograph was fitted with a column of sufficient physical and chemical characteristics to allow separation of the constituents. The chromatograph was operated in such a manner as to get five separate peaks. The first four were for specific compounds in the following order:

methane, acetylene, ethylene, and ethane. The fifth peak was a back flush of the column which contained all organic compounds containing three or more carbon atoms (Propane+). The first four peaks were allowed to elute with the gases flowing through the column in the normal direction. After ethane elutes, the column is backflushed through the operation of a 10-port valve to elute the combined volatile organic compounds to the detector.

In order to ensure only organic compounds were measured, the chromatograph was equipped with a flame ionization detector. Each test run was conducted for at least sixty minutes, with the chromatograph performing as many injections as could be completed given the physical and chemical characteristics of the stack gas.

Calibration of the gas chromatograph was performed using EPA Protocol 1 cylinders of propane in nitrogen. Calibrations were made with a high, mid, and low concentration gas. Using these gas standards, a three-point calibration curve based on area count was generated for combined volatile organic compounds as propane. SEAS used a Shimadzu GC-14A for this testing program. The GC was equipped with an FID and integrator system. Volatile organic compound concentrations were determined by the peak area count of the sample versus the calibration curve. The calibration curve for propane was input to the data acquisition system for the acetylene and ethylene. Therefore, the concentrations generated by the data acquisition system for acetylene, ethylene, and combined volatile organic compounds were each reported on a propane equivalent basis. At the conclusion of testing, the calibration curve of the instrument was verified by injection of a propane calibration standard. If the calibration was maintained within twenty percent, the data was accepted. Otherwise, the data was either corrected for drift or the data was discarded and a new test conducted.

The concentration of non-exempt volatile organic compounds in the stack gas was calculated by summing of the ethylene concentration (propane equivalent) plus the acetylene concentration (propane equivalent) plus the combined volatile organic compound concentration (propane equivalent).

9. QUALITY ASSURANCE

In order to ensure the accuracy of all the data collected in the field and at the laboratory, SEAS has instituted a comprehensive quality assurance and quality control program. New or repaired items which require calibration are calibrated before their initial use in the field. Equipment whose calibration may change with use is calibrated before and after each use. When an item is found to be out of calibration, the unit is either discarded or repaired, and then recalibrated before being returned to service. All equipment is periodically recalibrated in full regardless of the results of the regular inspections or its present calibration status. Calibrations are performed in a manner consistent with the EPA reference methods recommended in the "Quality Assurance Handbook for Air Pollution Measurement Systems" published by the US Environmental Protection Agency. To the maximum degree possible all calibrations are traceable to the National Institute of Standards & Technology (NIST).

In order to ensure that the test will be performed in a timely manner without undue delays, SEAS sampling vans are equipped with duplicate sampling devices for almost every device needed to perform the test. If a particular device is broken or does not pass inspection, a second device is available immediately at the site for use. Any device which appears to be outside calibration, or in need of repair is tagged in the field and repaired, calibrated, or discarded immediately upon return to the laboratory.

9.1.1. CALIBRATIONS

Certain pieces of equipment need to be calibrated before and after each test. Those items include the pitot tubes, the differential pressure gauges, the dry gas meter, and the nozzles used for the particulate testing. The following is a brief description of the calibration procedures for each of these important devices.

9.1.2. PITOT TUBES

All pitot tubes are the S-type as required by EPA Reference Method 2 (40 CFR, Part 60, Appendix A, Method 2). This method contains certain geometric standards for the construction of S-type pitot tubes. All of SEAS pitot tubes are constructed according to these standards. According to the EPA any pitot tube constructed to these standards will have a coefficient of 0.84 $\pm$ 0.02. To ensure the exact value of SEAS pitot tubes, all pitot tubes are initially calibrated in SEAS wind tunnel to determine the exact pitot coefficient. This coefficient should not change unless the pitot is physically damaged. Each pitot tube is checked before going to the field to make sure it meets the geometry as specified. Any pitot tube which does not meet the specifications is not used in the test.

9.1.3. DIFFERENTIAL PRESSURE GAUGES

SEAS uses several different types of pressure gauges including oil tube manometers, water tube manometers, magnehelics, and current output electronic load cells. Each of these devices are inspected before taken to the field and are inspected for leaks during each test. The magnehelics and load cells are tested against an incline manometer water gauge to ensure accuracy.

9.1.4. TEMPERATURE SENSORS

All temperature sensors used in SEAS sampling program are either mercury in-glass thermometers or type K thermocouples. These thermocouples are physical devices which produce a voltage proportional to the temperature. The thermocouple reading device is calibrated before and after each series of tests to ensure accuracy of ± 2 percent. The calibration of the thermocouple is accomplished by NIST traceable calibrated reference thermocouple potentiometer system.

9.1.5. NOZZLES

The inside diameter of each nozzle is measured to the nearest 0.001 inches prior to its initial use. Upon arriving in the field each nozzle is again measured with a micrometer on three different points on the diameter to ensure its original measurement and that the nozzle is perfectly round. If the difference between the maximum and minimum diameters measured does not exceed 0.003 inches, the nozzle is acceptable; otherwise, this nozzle is discarded and another is selected. At the end of each test the nozzles are again remeasured on three different points on the diameter to ensure that during the test the nozzle has not become dented or deformed.

9.1.6. DRY GAS METER

The dry gas meter is calibrated every six months against a spirometer transfer standard. It is again calibrated before and after each use in the field. During the semiannual calibration, a five point calibration is made at a minimum of one-half inch water column orifice pressure up to four inches water column orifice pressure. Before and after each test, the dry gas meter is again recalibrated at

three repetitions at a representative flow rate experienced during the test. If the final calibration does not agree with the initial calibration within five percent the calibration which yields the lowest volume of sample pulled is used in the calculations and the dry gas meter is repaired and recalibrated.

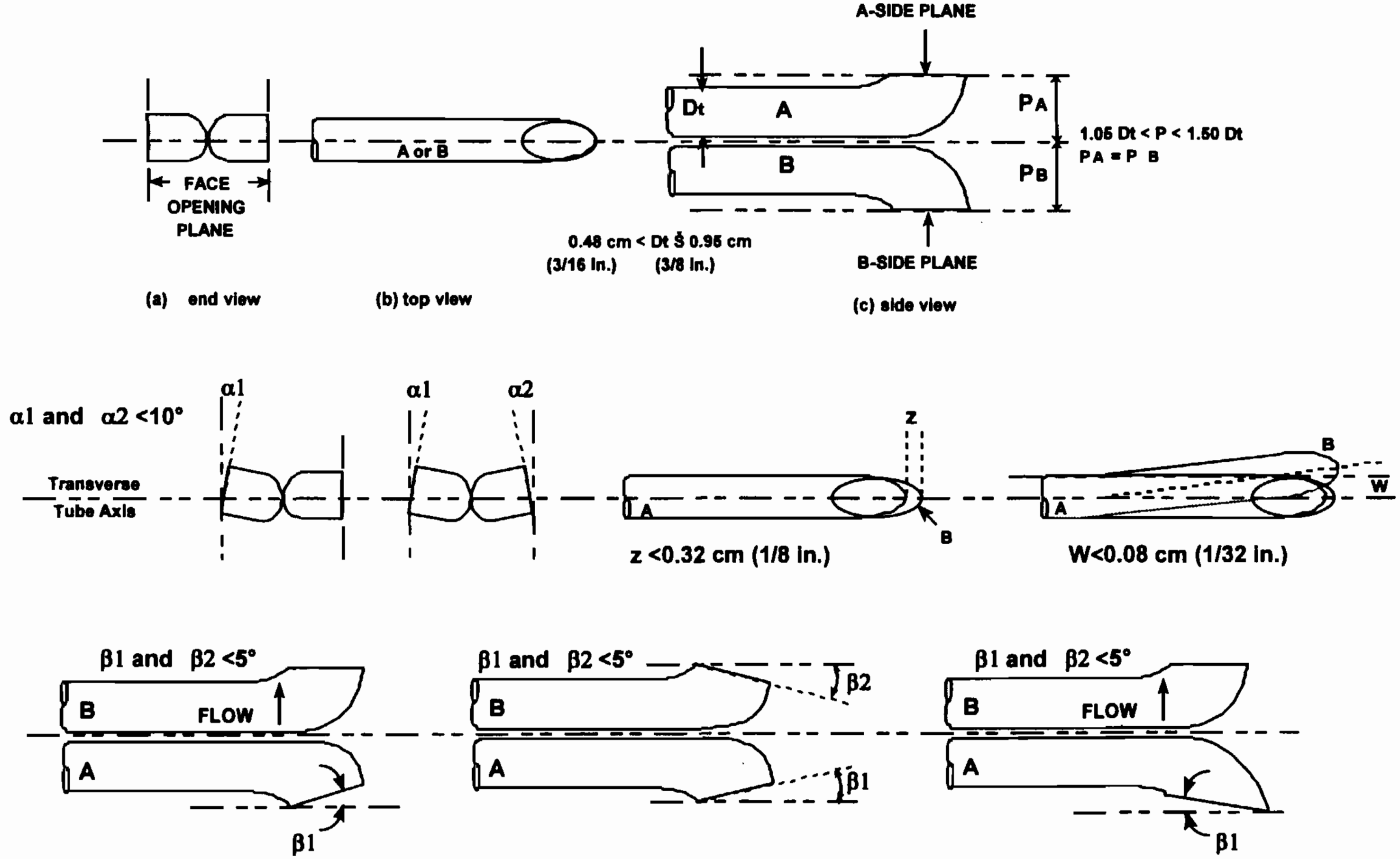
9.1.7. ORIFICE

The flow meter orifice is used to establish isokinetic sampling rates during the test. The orifice is calibrated with the dry gas meter at the same time under the same conditions. The orifice is calibrated over a wide range of flow rates and the arithmetic mean of the orifice calibration is used for sampling purposes. The orifice is recalibrated every time the gas meter is recertified.

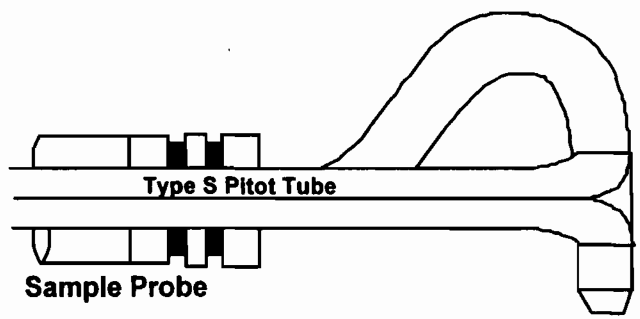
APPENDIX A QUALITY CONTROL OF TESTING EQUIPMENT

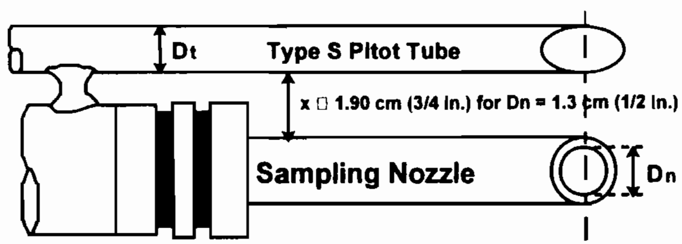
Type S pitot tube construction details:

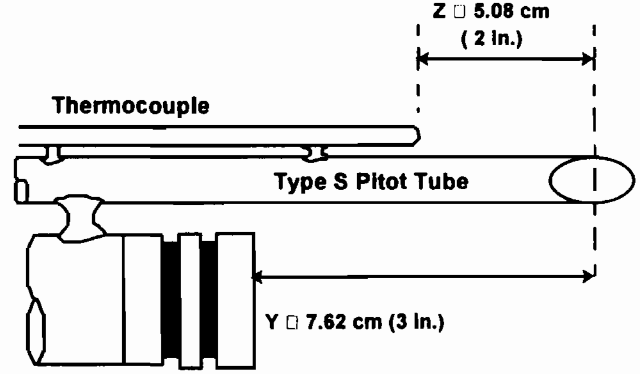
a) end view; face opening planes perpendicular to transverse axis.
b) top view; face opening planes parallel to longitudinal axis.
c) side view; both legs of equal length and centerlines coincident, when viewed from both sides.



Sampling Nozzle, Thermocouple, and Probe Configuration







APPENDIX B SAMPLE CALCULATIONS

Nitrogen Oxides Concentration **(ppm Wet)**

$$C_{ppmwetx} = (1 - B_{ws}) C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
Cppmx = Pollutant Concentration (parts per million, dry basis) =	265.03
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.08
Cppmwetx	243.82

Nitrogen Oxides Emissions Pounds Per Million Btu
(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	46.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	265.03
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	8.16
E_{O2} =	0.506

Carbon Monoxide Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws})C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	CO
Cppmx = Pollutant Concentration (parts per million, dry basis) =	5.63
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.08
Cppmwetx	5.18

Carbon Monoxide Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385{,}000{,}000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	SO2
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	5.63
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	8.16
E_{O2} =	0.00657

Volatile Organtic Compounds Concentration (dry Wet)

$$C_{ppmx} = \frac{C_{ppmwetx}}{(1 - B_{ws})}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	VOC
Cppmwetx = Pollutant Concentration (parts per million, wet basis) =	0.15
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.08
Cppmx	0.16

Volatile Organtic Compounds Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	TRS
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	34.08
Cppmx = Pollutant Concentration (parts per million, dry basis) =	0.16
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	8.16
E_{O2} =	0.000301

APPENDIX C GAS CERTIFICATIONS

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE:
P.O. NO. 07/03/02
ORDER NO. 4011
6367637-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 2025 psig CGA: 590 Analysis Date: 06/18/02

Shelf Life: 60 MONTH Expiration Date: 06/18/07

Cylinder No.	Constituents	Nominal	Actual	Uncertainty
150-736	OXYGEN	5 %	5.06 %	0.03 %
	NITROGE	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 907E	CC13342	9.99 % O2/N2	05/17/04

INSTRUMENTATION

Instrument	Analytical Principle
SERVOMEX	PARAMAGNETIC DETECTION

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

Steve Eska 7/3/02
ANALYST

STEVE ESKA

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:
INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/22/02
P.O. NO. 4991
ORDER NO. 6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02
Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/ 956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/ 925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/ 914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02

STEVE ESKA ANALYST

MG 23301/C

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Montgomery Gas&Gear
3340 BIRMINGHAM HWY
MONTGOMERY, AL 361080000

CUSTOMER PO NO:
Previous Certification Date(s):

CYLINDER NO	:	XC0330128
EXPIRATION DATE	:	03-Nov-2004
CERTIFICATION DATE	:	11-Nov-2002
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24066079
LOT NUMBER	:	530177

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
CARBON DIOXIDE	11.50 %	11.57 %	+/-1.00% NIST Traceable	11/04/02
CARBON MONOXIDE	450.00 ppm	442.5 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
NITRIC OXIDE	450.00 ppm	454.7 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
SULFUR DIOXIDE	450.00 ppm	449 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
TOTAL OXIDES OF NITROGEN		454.8 ppm		
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81674	00060413	XC0167838	8.89 +/- 0.04 % CO2/N2	02/01/04
NTRM 81680	98060414	XC0144088	494.70 +/- 4.00 ppm CO/N2	07/01/06
SRM 2735	141-B-31	CAL014326	781.80 +/- 3.90 ppm NITRIC OXIDE	02/01/04
NTRM 81661	97060304	XC0051228	486.00 +/- 4.80 ppm SO2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens 5E DD721	NonDispersive Infrared	10/11/02
Siemens Ultramat 6E-N9-782	NonDispersive Infrared	10/25/02
Nicolet 560 ADU9800406 NO/NO2	FTIR	10/31/02
Nicolet 560 ADU9800406	FTIR	10/16/02

Page: 1 Of 1

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A Delaware Corporation

QA Approved W. Gonzalez

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1326

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/22/02
P.O. NO. 4991
ORDER NO. 6561069-02-01

CYLINDER NO. — CONSTITUENTS CONCENTRATION: — NOMINAL — ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig — CGA: 660 — Analysis Date: 10/22/02
Shelf Life: 24 MONTH — Expiration Date: 10/22/04

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02

STEVE ESKA — ANALYST

MG 23301/C

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Montgomery Gas&Gear
3340 BIRMINGHAM HWY
MONTGOMERY, AL 361080000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC033012B
EXPIRATION DATE	:	03-Nov-2004
CERTIFICATION DATE	:	11-Nov-2002
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24066079
LOT NUMBER	:	530177

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
CARBON DIOXIDE	11.50 %	11.57 %	+/-1.00% NIST Traceable	11/04/02
CARBON MONOXIDE	450.00 ppm	442.5 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
NITRIC OXIDE	450.00 ppm	454.7 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
SULFUR DIOXIDE	450.00 ppm	449 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
TOTAL OXIDES OF NITROGEN		454.8 ppm		
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81674	00060413	XC018783B	8.89 +/- 0.04 % CO2/N2	02/01/04
NTRM 81680	98060414	XC014408B	494.70 +/- 4.00 ppm CO/N2	07/01/06
SRM 2735	141-B-31	CAL014326	781.80 +/- 3.90 ppm NITRIC OXIDE	02/01/04
NTRM 81661	97060304	XC005122B	486.00 +/- 4.80 ppm SO2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens 5E DD721	NonDispersive Infrared	10/11/02
Siemens Ultramat 6E-N9-782	NonDispersive Infrared	10/25/02
Nicolet 560 ADU9800406 NO/NO2	FTIR	10/31/02
Nicolet 560 ADU9800406	FTIR	10/16/02

Page: 1 Of 1

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QA Approved

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Montgomery Gas&Gear
3340 BIRMINGHAM HWY
MONTGOMERY, AL 361080000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC0032768
EXPIRATION DATE	:	17-Nov-2005
CERTIFICATION DATE	:	18-Nov-2002
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24004681
LOT NUMBER	:	532305

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. I.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
PROPANE	50.00 ppm	49.8 ppm	+/-1.00% NIST Traceable	11/18/02
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81667	00060109	XC0195888	48.10 +/- 0.40 ppm C3H8/AIR	02/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	11/14/02

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Page: 1 Of 1

QA Approved

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
SANDERS ENGINEERING & ANALYTIC
1568 LEROY STEVENS RD
MOBILE, AL 366959182

CUSTOMER PO NO: CT092801A
Previous Certification Date(s):

CYLINDER NO	:	XC028923B
EXPIRATION DATE	:	10/18/04
CERTIFICATION DATE	:	10/19/01
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	02001832
LOT NUMBER	:	466155

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
PROPANE	30.00 ppm	30.4 ppm	+/-1.00% NIST Traceable	10/19/01
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81667	00060109	XC019588B	48.10 +/- 0.40 ppm C3H8/AIR	02/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	10/16/01

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Page: 1 Of 1

QA Approved Carmen Davis

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
SANDERS ENGINEERING & ANALYTIC
1568 LEROY STEVENS RD
MOBILE, AL 366959182

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC0131788
EXPIRATION DATE	:	03/12/04
CERTIFICATION DATE	:	03/13/01
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	02007102
LOT NUMBER	:	434169

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. *All Values certified to be +/-1% NIST Traceable.*

Do Not Use This Cylinder below 150 psig. I.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
PROPANE	85.00 ppm	85.7 ppm	+/-1.00% NIST Traceable	03/12/01
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81668	99060211	XC0034458	93.90 +/- 0.60 ppm C3H8/AIR	01/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	03/10/01

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Page: 1 Of 1

QA Approved A. [signature]

Gas Chromatograph VOC Calibration Data

Gulf Power Company

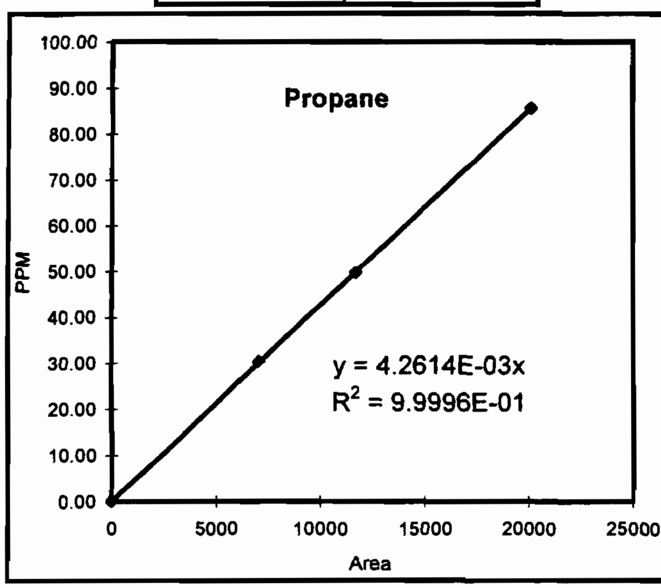
Plant Crist, Unit 4

Carbonaceous Material

2/21/2003

Point Number 1	
Gas	Propane
Concentration ppm	85.700
GC Injection	AREA
1	20012
2	20271
3	20076
AVERAGE	20120
GC Injection	% Difference
1	-0.5
2	0.8
3	-0.2

Propane	
area	ppm
20120	85.70
11719	49.80
7054	30.40
0.0	0



Point Number 2	
Gas	Propane
Concentration ppm	49.800
GC Injection	AREA
1	11874
2	11704
3	11580
AVERAGE	11719
GC Injection	% Difference
1	1.3
2	-0.1
3	-1.2

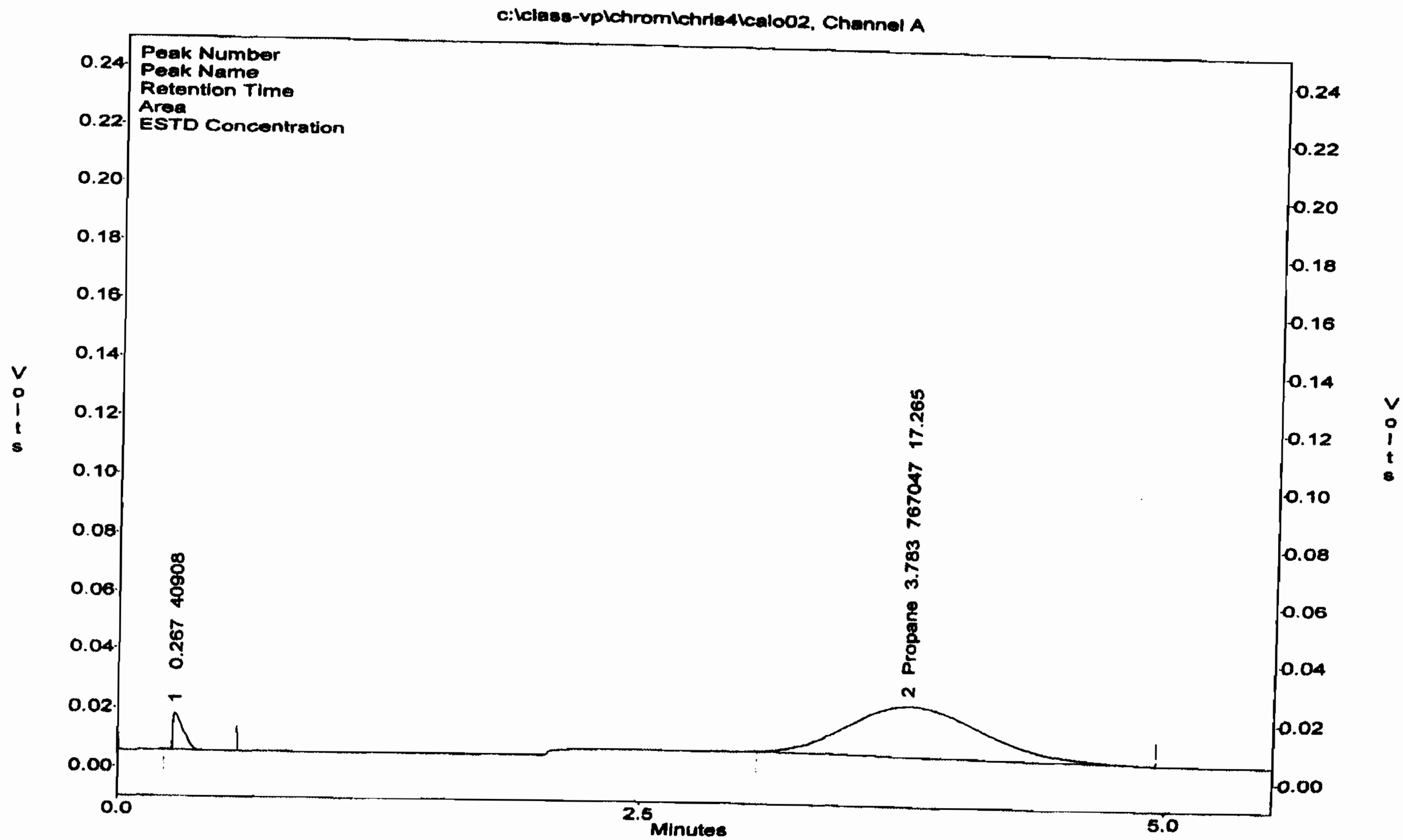
Dilution Factor Calculation		
EPA Cylinder Vaslue (ppm) = 49.3		
	GC Area	GC ppm
Inj. #1	121774	49.300
Inj. #2	125320	49.300
Inj. #3	123308	49.300
Average	123467	49.300
Dilution Factor =		1.000
Dilution Factor = Cylinder (ppm)/GC (ppm)		

Point Number 3	
Gas	Propane
Concentration ppm	30.400
GC Injection	AREA
1	7096
2	7074
3	6993
AVERAGE	7054
GC Injection	% Difference
1	0.6
2	0.3
3	-0.9

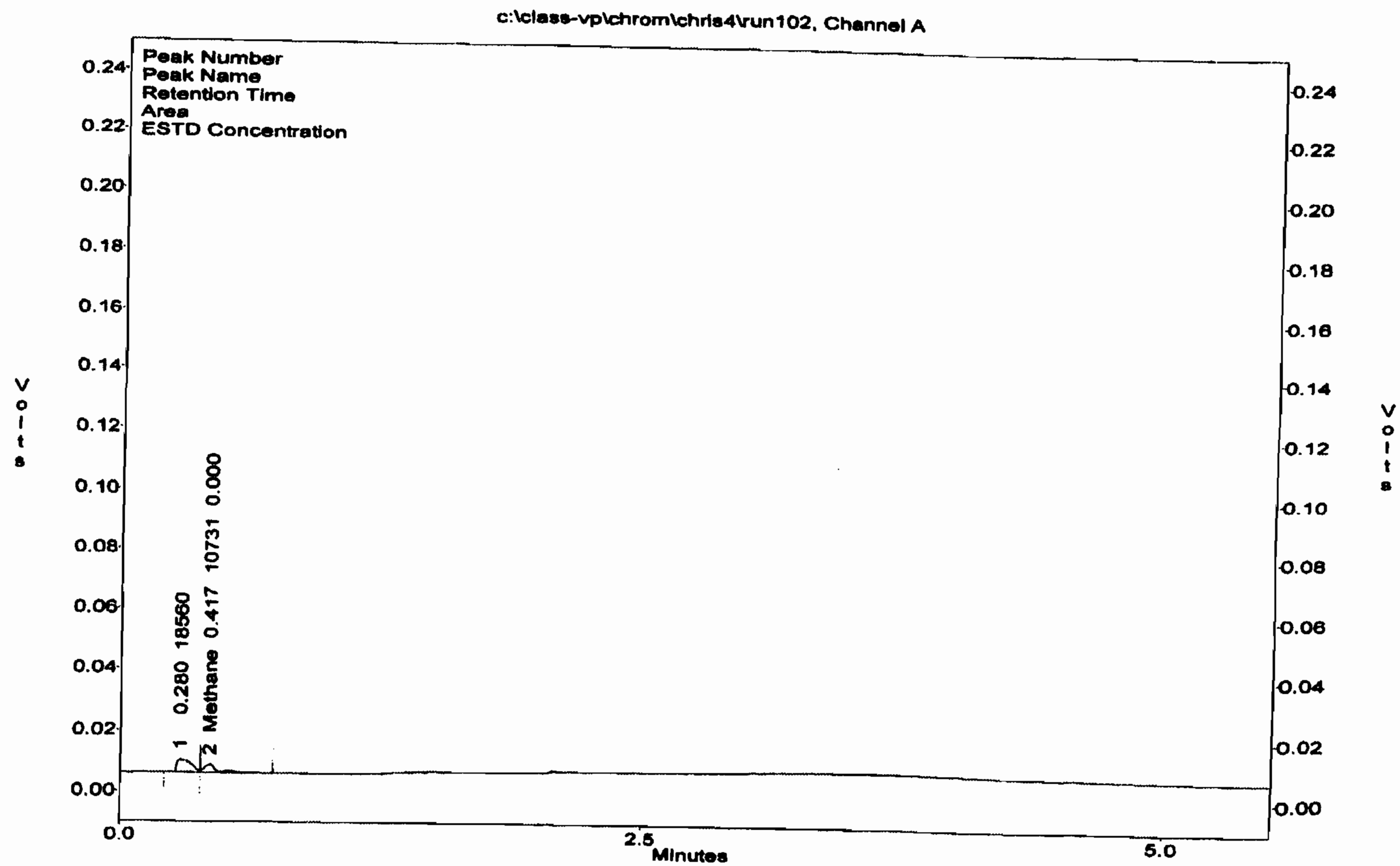
Calibration Factors	
Y=CX	Propane
Coefficient	4.261E-03

APPENDIX E EXAMPLE CHROMATOGRAMS

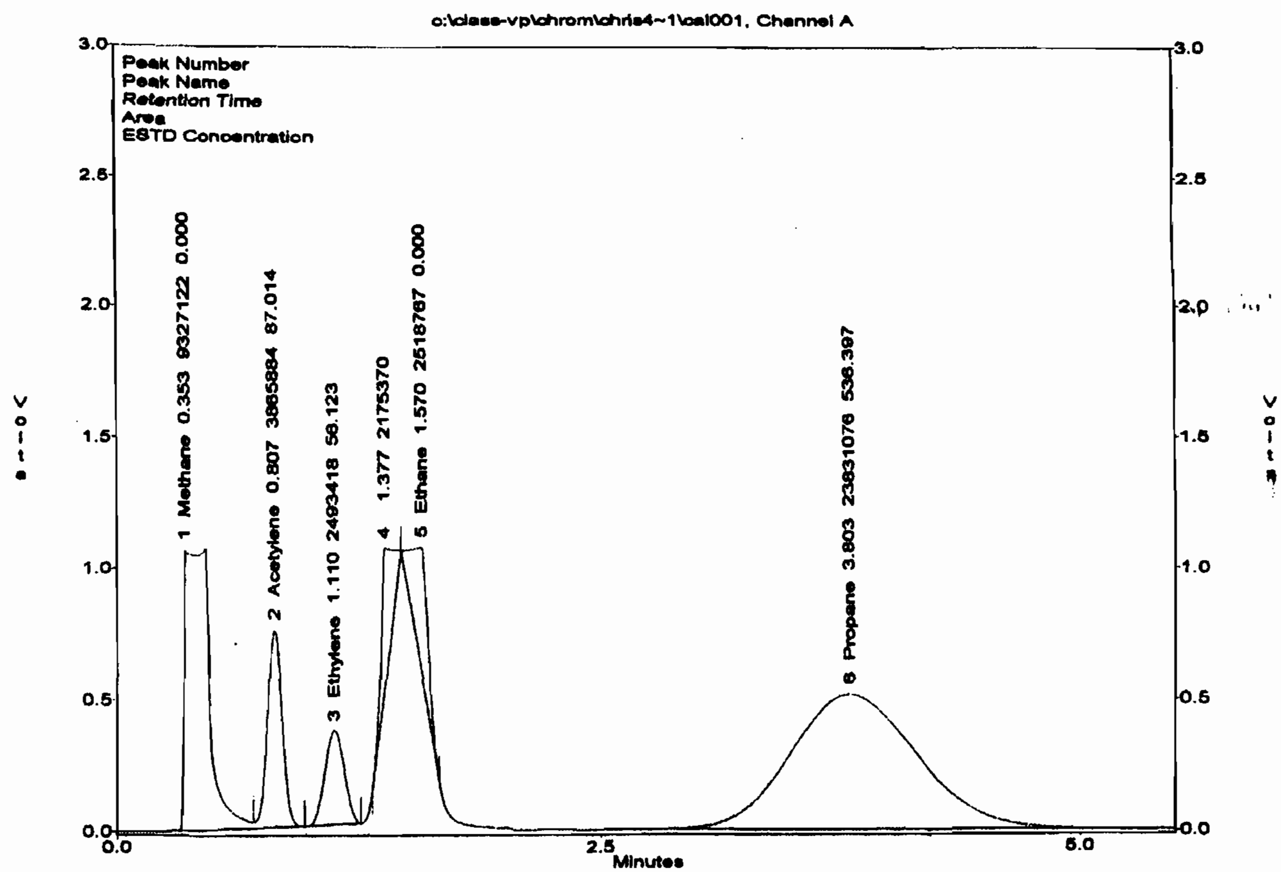
GAS CHROMATOGRAPHIC INJECTION OF 17.4 PARTS PER MILLION CALIBRATION GAS



GAS CHROMATOGRAPHIC INJECTION OF STACK GAS



GAS CHROMATOGRAM DEMONSTRATING COLUMN PERFORMANCE SEPERATING C-1 THROUGH C-3+ COMPOUNDS (METHANE, ACETYLENE, ETHYLENE, ETHANE, AND PROPANE+)



APPENDIX E OPERATIONAL DATA

Crist 4 Carbonaceous Material (saw dust) Test							
Maximum Allowable Heat Input: 1096.7 mmBtu/hr							
Steady State February 21, 2003							
					coal flow	Coal	LDMS
Run #	Load	Start	End	Duration	from LDMS	Analysis	results
	Gross MW	Time	Time	(Hours)	(tons)	Btu / lb	mmBtu's/hr
1	81	08:14	09:14	1.00	33.75	11451	772.9
2	80.3	09:28	10:28	1.00	33.30	11451	762.6
3	80	10:42	11:42	1.00	33.75	11451	772.9
	80.4					**Average**	769.5
						Percent of Max Allowable	70%
						Load Limit if % < 90%	88

CEMS OPACITY DATA

Crist 4 Carbonaceous Material (saw dust) test Burn

Date	CEM Hour	Minutes									
		00	6	12	18	24	30	36	42	48	54
Steady State Testing											
02/21/03	8			5.3	5.4	5.4	5.6	5.4	5.4	5.5	5.6
02/21/03	9	5.5	5.3	5.3	5.4		5.2	5.3	5.5	5.7	5.4
02/21/03	10	5.2	5.1	5.1	5.3	5.4	5.2		5.2	5.1	5.1
02/21/03	11	5.2	5.3	5.2	5.3	5.2	5.5	5.3	5.3	5.3	

Gulf Power Plant Crist Unit 4
Carbonaceous Material (saw dust) Test Burn Test Notes
Steady State Testing 02/21/03

Run #1

Start Time		Notes
CDT	**CEMS**	Fuel Mix 95% coal 5% saw dust by weight
08:14	08:14	NOTE: CEMS time, not Central Daylight Time (CDT), is used on Sander's test report.
Stop Time		No operational problems noted during run
CDT	**CEMS**	
09:14	09:14	

Run #2

Start Time		Notes
CDT	**CEMS**	No operational problems noted.
09:28	09:28	
Stop Time		
CDT	**CEMS**	
10:28	10:28	

Run #3

Start Time		Notes
CDT	**CEMS**	No operational problems noted.
10:42	10:42	
Stop Time		
CDT	**CEMS**	
11:42	11:42	

Crist Plant Carbonaceous Fuel Test Control Room Data

Test 4

Unit 4 Date 2/21/03

Check one: [ ] Sootblowing [ ] Steady-State (no sootblowing)

Unit Operator : Resto

Run	Clock Time	Pulverizer Coal Integrators (x 100 pounds) A	B	C	D	Generation Digital Meter MW	Gross Generation Integrator MWhr	Main Steam Total Flow (x 10e6 lb/hr)	Boiler Air Flow (x 10e6 lb/hr)	Excess O2 Econ Outlet % A	B	Opacity 6 min Avg %	ID Fan Amps A	B	Gas Temp Air Htr Outlet deg F A	B	Soot Blowing Status	Data taken by (Initials)
#1 Start	08:14	951628	278669	909228	721022	81	860415	630	724	3.2	3.5	5.4	250		269	275	NO	OR
#1 End	09:14	951794	278822	909406	721197	81	860495	632	719	3.1	3.8	5.4	250		271	277	NO	OR
#2 Start	09:28	951831	278849	909443	721237	79.7	860513	618	724	3.6	4.2	5.2	249		271	277	NO	OR
#2 End	10:28	952004	278998	909621	721422	81	860596	626	720	3.2	4.0	5.2	250		271	278	NO	OR
#3 Start	10:42	952037	279035	909661	721465	79	860614	616	716	3.3	4.2	5.1	250		271	278	NO	OR
#3 End	11:42	952201	279191	909829	721663	81	860695	630	714	3.2	3.6	5.3	250		271	276	NO	OR

Operational Comments

Run #1	
Run #2	
Run #3	

Inside Operator Resto

Outside Operator (Coal Samples) Roberts

Laboratoryman (Ash Samples) ____

Electrician (ESP Readings) ____

Operator Pulling Fly Ash Davis

- 08:22 - D-MILL LOADING UP
- ALL CONTROLS ON MANUAL

ieneral Test Laboratory
'.O. Box 2641
Iirmingham, Alabama 35291
205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO:	Bobby Watkins Gulf Power Co.	Customer Account :	1CRI04
		Sample Date :	21-Feb-03
		Laboratory Account :	1CRI04
escription :	Gulf Power Plant Crist Unit 4	Received Date :	25-Feb-03

SAWDUST Composite

aboratory ID Number : AH05513

est Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.52	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13154	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	16	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.48	% By Weight
Lead, Dry Basis	ASTM D6357	2.6	mg/kg
Mercury, Dry	ASTM D6414	0.084	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.95	% By Weight
Ash, As Received	ASTM D 5142	4.81	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11451	Btu/lb
Fluorine, As Received	ASTM D 5987	14	mg/kg
Sulfur, As Received	ASTM D 4239	0.42	% By Weight
Lead, As Received	ASTM D6357	2.3	mg/kg
Mercury, As Received	ASTM D6414	0.073	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.23	% By Weight
Barium, Ignited Basis	ASTM D 3683	2073.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.82	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.63	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.72	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.05	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.33	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.40	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ______________________ **Supervision**__________________________ Date : 3/25/2003

smk/coa

Seneral Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 21-Feb-03
Laboratory Account : 1CRI04
Received Date : 25-Feb-03

escription : Gulf Power Plant Crist Unit 4

SAWDUST Composite

aboratory ID Number : AH05513

est Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.44	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.83	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Lead, Ignited Basis	ASTM D 6357	46.5	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.00	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.55	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.62	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.19	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.11	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.60	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.48	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.59	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.57	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13923	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.365	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ______________________ **Supervision**__________________________ Date : 3/25/2003

smk/coa

8 | 7 | 6 | 5 | NUMBER

GROUP NO.	FIELD NAME	REPEAT TIME	LIFT HEIGHT: LIFT / IMPACTS / FREQUENCY; ON TIME: HRS / MIN / SEC; ON TIME: ON TIME / INTENSITY	REST TIME	P.O.R. TIME	RAP DIRECTION	STARTING RAPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACC	DUTY CYCLES INTERLEA
1	H4P1	2:05	10	4.0		Asc.	1	MAX	1			
2	H4P2	4:03	10				7		1			
3	H4P3	6:05	10				13		1			
4	H4P4	10:07	10				19		1			
5	H4P5	13:13	10				25		1			
6	H4P6	16:01	10				31		1			
7	H4P7	21:07	10				37		1			
8	H4P8	26:11	10				43		1			
9	H4P9	31:37	10				49		1			
10	H4W	5:01	5 sec/100%				1		2			
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
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23												
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D

C

B

8 7 6 5 NUMBER

GROUP NO. ①	FIELD NAME ②	REPEAT TIME ③	LIFT HEIGHT ④⑤ / LIFT · ON TIME ⑥ / HRS · ON TIME ⑦ / ON TIME	IMPACTS / MIN	FREQUENCY / SEC / INTENSITY	REST TIME ⑧	P.O.R. TIME ⑨	RAP DIRECTION ⑩	STARTING RAPPER ⑪	(REST) MODE ⑫	ANTI-COINCIDENCE GROUP ⑬	DUTY CYCLES FIELD ⑭	DUTY CYCLES ACG	DUTY CYCLES INTERLEAVE
1	C4LA	1:03 2:03	3.6	1	1	0:10	-	ASC	01	MAX	1	48	179	3
2	C4TA	1:59 3:59	3.6	1	1	0:10	-	ASC	04	MAX	1	25	179	1
3	C4LB	3:01 6:01	3.6	1	1	0:10	-	ASC	07	MAX	1	17	179	1
4	C4TB	3:51 9:51	3.6	1	1	0:10	-	ASC	10	MAX	1	13	179	1
5	C4LC	6:17 15:17	3.6	1	1	0:10	-	ASC	13	MAX	1	8	179	0
6	C4TC	7:03 25:03	3.6	1	1	0:10	-	ASC	16	MAX	1	7	179	0
7	C4EA	2:01	3.4	1	1	0:10	-	ASC	01	MAX	1	33	179	2
8	C4EB	3:59	3.4	1	1	0:10	-	ASC	05	MAX	1	17	179	1
9	C4EC	6:03	3.4	1	1	0:10	-	ASC	09	MAX	1	11	179	1
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														

8 | 7 | 6 | 5 | NUMBER | 3

GROUP NO. ①	FIELD NAME ②	MIN. REPEAT TIME ③	LIFT HEIGHT ④⑤ / LIFT, IMPACTS, FREQUENCY / ON TIME ⑥ HRS, MIN, SEC / ON TIME ⑦ ON TIME, INTENSITY	REST TIME SEC. ⑧	P.O.R. TIME ⑨	RAP DIRECTION ⑩	STARTING RAPPER ⑪	(REST) MODE ⑫	ANTI-COINCIDENCE GROUP ⑬	DUTY CYCLES ⑭ FIELD	ACC	INTERLEAVE
1	CSP1	2:03	5.0 4FT	2.0		ASC.	1	MAX	1	10	17	3
2	CSP2	5:13	5.0	2.0		ASC.	4	MAX	1	4	17	1
3	CSP3	9:19	5.0	2.0		ASC.	7	MAX	1	1	17	0
4	CSP4	13:03	5.0	2.0		ASC.	10	MAX	1	1	17	0
5	CSW	6:00	5.0	2.0		ASC.	13	MAX	1	1	17	0
6												
7												
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D

C

B

Crist 4 Carbonaceous fuel Test Precipitator Data

Unit 4 Date 2/21/03 Run # 1 Sootblow Steady State

HOT SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 0814 Data taken by KB								
A	17	0	30	236	.17	29	1	58
B	26	0	22	227	.19	29	6	64
C	25	0	39	280	.41	27	18	95
D	25	0	64	277	.40	27	24	110
E	11	0	33	283	.14	23	6	84
F	4	0	97	338	.86	22	29	130
Run Stop Time 0914 Data taken by KB								
A	16	0	19	198	.17	29	5	80
B	27	0	58	295	.59	31	14	87
C	26	0	68	288	.49	29	21	99
D	26	0	67	300	.40	26	22	104
E	12	0	28	241	.18	22	5	78
F	0	0	92	336	.86	22	29	130

COLD SIDE PRECIPITATOR

Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 0814 Data taken by KB								
A	3	0	37	487	.29	42	16	150
B	0	0	57	387	.37	41	18	115
C	0	0	59	297	.51	38	1	160
Run End Time 0914 Data taken by KB								
A	0	0	37	487	.29	42	16	150
B	0	0	57	387	.37	41	18	115
C	0	0	59	296	.57	38	2	160

Comments

Crist 4 Carbonaceous fuel Test Precipitator Data

Unit 4 Date 2/21/03 Run # 2 Sootblow Steady State

HOT SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 0928 Data taken by KB								
A	7	0	27	208	.16	28	4	77
B	29	0	28	247	.50	27	8	66
C	25	0	60	287	.43	28	11	101
D	25	0	64	260	.34	26	15	110
E	10	0	32	282	.13	27	6	78
F	0	0	92	336	.85	22	29	130
Run Stop Time 1028 Data taken by KB								
A	15	0	22	209	.18	28	5	80
B	27	0	49	309	.54	32	13	68
C	25	0	66	278	.66	29	19	97
D	24	0	97	306	.59	23	20	128
E	11	0	35	281	.19	24	9	85
F	3	0	92	335	.86	22	29	130

COLD SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 0928 Data taken by KB								
A	9	0	37	488	.29	42	16	150
B	2	0	57	388	.37	41	18	115
C	0	0	58	291	.51	38	1	160
Run End Time 1028 Data taken by KB								
A	5	0	37	487	.29	39	12	150
B	0	0	57	386	.37	41	18	115
C	0	0	58	296	.51	38	2	160

Comments

Crist 4, Carbonaceous Fuel Test Precipitator Data

Unit 4 Date 2/21/03 Run # 3 Sootblow Steady State

HOT SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1042	Data taken by KB							
A	8	0	24	236	.11	25	3	68
B	24	0	57	323	.41	32	11	79
C	25	0	73	301	.43	29	23	102
D	21	0	77	304	.74	26	21	112
E	11	0	27	278	.17	24	7	79
F	6	0	97	338	.87	22	29	131
Run Stop Time	Data taken by							
A	17	0	31	235	.15	28	3	8
B	26	0	33	282	.34	30	8	69
C	27	0	65	316	.65	28	19	120
D	24	0	73	315	.68	25	16	110
E	12	0	27	287	.08	22	2	53
F	2	0	93	335	.85	22	28	120

COLD SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1042	Data taken by KB							
A	5	0	37	486	.29	43	16	150
B	0	0	57	387	.37	41	18	115
C	0	0	59	296	.51	38	2	160
Run End Time	Data taken by							
A	4	0	38	486	.29	43	16	150
B	0	0	58	386	.37	41	18	115
C	0	0	59	296	.58	~~3~~ 32	2	160

Comments

ɜneral Test Laboratory
O. Box 2641
rmingham, Alabama 35291
)5) 664 - 6081

CERTIFICATE OF ANALYSIS

O: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

scription : Gulf Plant Crist Unit #4

Scale Composite Run #1

boratory ID Number : AH05721

st Name	Reference	Result	Units
Dry Basis			
.sh, Dry	ASTM D 5142	5.10	% By Weight
leat of Combustion, Dry	ASTM D 5865	13181	Btu/lb
:arbon, Dry Basis	ASTM D 5373	75.86	% By Weight
lydrogen, Dry Basis	ASTM D 5373	5.02	% By Weight
litrogen, Dry Basis	ASTM D 5373	1.47	% By Weight
)xygen, Dry Basis	ASTM D 3176	12.01	% By Weight
luorine, Dry Basis	ASTM D 5987	20	mg/kg
;ulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
.ead, Dry Basis	ASTM D6357	3.6	mg/kg
/lercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
/loisture, Total	ASTM D 2013	12.47	% By Weight
ish, As Received	ASTM D 5142	4.46	% By Weight
leat of Combustion, As Received	ASTM D 5865	11537	Btu/lb
:arbon, As Received	ASTM D 5373	66.40	% By Weight
lydrogen, As Received	ASTM D 5373	4.39	% By Weight
litrogen, As Received	ASTM D 5373	1.29	% By Weight
)xygen, As Received	ASTM D 3176	10.51	% By Weight
luorine, As Received	ASTM D 5987	18	mg/kg
;ulfur, As Received	ASTM D 4239	0.47	% By Weight
.ead, As Received	ASTM D6357	3.2	mg/kg
/lercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ Supervision ____________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.97	% By Weight
Barium, Ignited Basis	ASTM D 3683	1861.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.65	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.83	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.09	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.39	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.68	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	71.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.40	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.31	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.90	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.82	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.53	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.20	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision** ______________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1
Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13889	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.410	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.70	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13207	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.20	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.01	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.52	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.00	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	3.8	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.56	% By Weight
Ash, As Received	ASTM D 5142	4.11	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11548	Btu/lb
Carbon, As Received	ASTM D 5373	66.63	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.33	% By Weight
Oxygen, As Received	ASTM D 3176	10.49	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.50	% By Weight
Lead, As Received	ASTM D6357	3.3	mg/kg
Mercury, As Received	ASTM D6414	0.066	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision** ______________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.54	% By Weight
Barium, Ignited Basis	ASTM D 3683	2115.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.28	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.18	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.82	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.45	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.71	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	81.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.58	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.67	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.42	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.24	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.61	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.28	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13858	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.432	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.05	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13258	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.07	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.48	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.92	% By Weight
Fluorine, Dry Basis	ASTM D 5987	22	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.55	% By Weight
Lead, Dry Basis	ASTM D6357	3.5	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.91	% By Weight
Ash, As Received	ASTM D 5142	4.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Carbon, As Received	ASTM D 5373	66.25	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.29	% By Weight
Oxygen, As Received	ASTM D 3176	10.38	% By Weight
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.0	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.35	% By Weight
Barium, Ignited Basis	ASTM D 3683	1858.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.14	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.19	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.38	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.65	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Lead, Ignited Basis	ASTM D 6357	68.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.22	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.35	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.44	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.00	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**______________________ Date : 4/2/2003

smk/coa

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P.O. Box 2641
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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

)escription : Gulf Plant Crist Unit #4

Scale Composite Run #3

.aboratory ID Number : AH05723

'est Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13963	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.415	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury in Coal, NBS 1632c	EPA 3051	0.09568	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.95	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13185	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.26	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.85	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.80	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.65	% By Weight
Lead, Dry Basis	ASTM D6357	2.3	mg/kg
Mercury, Dry	ASTM D6414	0.086	mg/kg
As Received			
Moisture, Total	ASTM D 2013	13.01	% By Weight
Ash, As Received	ASTM D 5142	5.18	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11470	Btu/lb
Carbon, As Received	ASTM D 5373	65.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.22	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.26	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.57	% By Weight
Lead, As Received	ASTM D6357	2.0	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury, As Received	ASTM D6414	0.075	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.78	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.42	% By Weight
Barium, Ignited Basis	ASTM D 3683	2103.	mg/kg
Iron, Ignited Basis	ASTM D 3682	6.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.31	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.55	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.33	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.49	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	37.9	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.99	% By Weight
Iron Oxide, Ignited	ASTM D 3682	8.86	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.58	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.66	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.44	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.72	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14019	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.493	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.85	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13292	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.84	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.31	% By Weight
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.58	% By Weight
Lead, Dry Basis	ASTM D6357	4.4	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.90	% By Weight
Ash, As Received	ASTM D 5142	4.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11577	Btu/lb
Carbon, As Received	ASTM D 5373	66.06	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.72	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.51	% By Weight
Lead, As Received	ASTM D6357	3.8	mg/kg
Mercury, As Received	ASTM D6414	0.065	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.21	% By Weight
Barium, Ignited Basis	ASTM D 3683	1968.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.76	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.41	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.14	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.23	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.43	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.74	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Lead, Ignited Basis	ASTM D 6357	89.7	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.96	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.46	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.12	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.58	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.35	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
General			

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Quality Control ____________________ **Supervision**____________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13970	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.436	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision** ____________________________ Date : 4/2/2003

smk/coa

ieneral Test Laboratory
'.O. Box 2641
3irmingham, Alabama 35291
205) 664 - 6081

CERTIFICATE OF ANALYSIS

ΓO: Kevin Beaty Gulf Power Co.	Customer Account : CRI04SP Sample Date : 21-Feb-03
	Laboratory Account : CRI04SP
escription : Gulf Plant Crist Unit #4	Received Date : 26-Feb-03

Scale Composite Run #2

aboratory ID Number : AH05726

əst Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.64	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13203	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.32	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.97	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.50	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.03	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	4.2	mg/kg
Mercury, Dry	ASTM D6414	0.054	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.99	% By Weight
Ash, As Received	ASTM D 5142	4.08	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11620	Btu/lb
Carbon, As Received	ASTM D 5373	67.17	% By Weight
Hydrogen, As Received	ASTM D 5373	4.37	% By Weight
Nitrogen, As Received	ASTM D 5373	1.32	% By Weight
Oxygen, As Received	ASTM D 3176	10.59	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.7	mg/kg
Mercury, As Received	ASTM D6414	0.048	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

neral Test Laboratory
). Box 2641
mingham, Alabama 35291
i5) 664 - 6081

CERTIFICATE OF ANALYSIS

): Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

scription : Gulf Plant Crist Unit #4

Scale Composite Run #2

›oratory ID Number : AH05726

:t Name	Reference	Result	Units
luminum, Ignited Basis	ASTM D 3682	13.25	% By Weight
arium, Ignited Basis	ASTM D 3683	1960.	mg/kg
alcium, Ignited Basis	ASTM D 3682	1.89	% By Weight
on, Ignited Basis	ASTM D 3682	4.94	% By Weight
lagnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
hosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
otassium, Ignited Basis	ASTM D 3682	1.10	% By Weight
ilicon, Ignited Basis	ASTM D 3682	26.58	% By Weight
odium, Ignited Basis	ASTM D 3682	0.44	% By Weight
ulfur, Ignited Basis	ASTM D 5016	1.54	% By Weight
itanium, Ignited Basis	ASTM D 3682	0.62	% By Weight
ead, Ignited Basis	ASTM D 6357	91.0	mg/kg
Ignited as Oxide			
luminum Oxide, Ignited	ASTM D 3682	25.04	% By Weight
:alcium Oxide, Ignited	ASTM D 3682	2.64	% By Weight
on Oxide, Ignited	ASTM D 3682	7.06	% By Weight
lagnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
'hosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
'otassium Oxide, Ignited	ASTM D 3682	1.33	% By Weight
ilicon Dioxide, Ignited	ASTM D 3682	56.87	% By Weight
iodium Oxide, Ignited	ASTM D 3682	0.59	% By Weight
iulfur Trioxide, Ignited	ASTM D 5016	3.85	% By Weight
'itanium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
General			

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Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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'O: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

escription : Gulf Plant Crist Unit #4

Scale Composite Run #2

iboratory ID Number : AH05726

est Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13845	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.409	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.41	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13046	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.94	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.44	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.85	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.46	% By Weight
Lead, Dry Basis	ASTM D6357	2.2	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.27	% By Weight
Ash, As Received	ASTM D 5142	4.75	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11445	Btu/lb
Carbon, As Received	ASTM D 5373	65.74	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.26	% By Weight
Oxygen, As Received	ASTM D 3176	11.27	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision** ________________________ Date : 4/2/2003

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Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

scription : Gulf Plant Crist Unit #4

Scale Composite Run #3

boratory ID Number : AH05727

st Name	Reference	Result	Units
luminum, Ignited Basis	ASTM D 3682	12.39	% By Weight
alcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
arium, Ignited Basis	ASTM D 3683	1952.	mg/kg
on, Ignited Basis	ASTM D 3682	4.01	% By Weight
lagnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
hosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
otassium, Ignited Basis	ASTM D 3682	1.02	% By Weight
ilicon, Ignited Basis	ASTM D 3682	27.86	% By Weight
odium, Ignited Basis	ASTM D 3682	0.36	% By Weight
ulfur, Ignited Basis	ASTM D 5016	1.97	% By Weight
itanium, Ignited Basis	ASTM D 3682	0.55	% By Weight
ead, Ignited Basis	ASTM D 6357	40.8	mg/kg
Ignited as Oxide			
luminum Oxide, Ignited	ASTM D 3682	23.41	% By Weight
alcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
ron Oxide, Ignited	ASTM D 3682	5.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	59.60	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.49	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.93	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.92	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

scription : Gulf Plant Crist Unit #4

Scale Composite Run #3

boratory ID Number : AH05727

st Name	Reference	Result	Units
leat of Combustion, MAF	ASTM D 5865	13792	Btu/lb
;ulfur, lbs/mmBTU	ASTM D 3180	0.353	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision** ____________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

'O: Kevin Beaty
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Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account CRI04SP
Received Date : 26-Feb-03

escription : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

iboratory ID Number : AH05724

ɘst Name	Reference	Result	
Mercury in Coal, NBS 1632c	EPA 3051	0.09568	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.95	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13185	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.65	% By Weight
Lead, Dry Basis	ASTM D6357	2.3	mg/kg
Mercury, Dry	ASTM D6414	0.086	mg/kg
As Received			
Moisture, Total	ASTM D 2013	13.01	% By Weight
Ash, As Received	ASTM D 5142	5.18	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11470	Btu/lb
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.57	% By Weight
Lead, As Received	ASTM D6357	2.0	mg/kg
Mercury, As Received	ASTM D6414	0.075	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.78	% By Weight
Barium, Ignited Basis	ASTM D 3683	2103.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.42	% By Weight
Iron, Ignited Basis	ASTM D 3682	6.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision ______________________

Date : 3/25/2003

smk/coal

eneral Test Laboratory
.O. Box 2641
irmingham, Alabama 35291
:05) 664 - 6081

CERTIFICATE OF ANALYSIS

'O: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account CRI04SP
Received Date : 26-Feb-03

əscription : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

ıboratory ID Number : AH05724

ɪst Name	Reference	Result	
ʔotassium, Ignited Basis	ASTM D 3682	1.31	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.55	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.33	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.49	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	37.9	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.99	% By Weight
ron Oxide, Ignited	ASTM D 3682	8.86	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.58	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.66	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.44	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.72	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14019	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.493	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision________________________

Date : 3/25/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	4.85	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13292	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.58	% By Weight
Lead, Dry Basis	ASTM D6357	4.4	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.90	% By Weight
Ash, As Received	ASTM D 5142	4.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11577	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.51	% By Weight
Lead, As Received	ASTM D6357	3.8	mg/kg
Mercury, As Received	ASTM D6414	0.065	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.21	% By Weight
Barium, Ignited Basis	ASTM D 3683	1968.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.76	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.41	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.14	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.23	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision______________________

Date : 3/25/2003

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ieneral Test Laboratory
'.O. Box 2641
iirmingham, Alabama 35291
205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account CRI04SP
Received Date : 26-Feb-03

escription : Gulf Plant Crist Unit #4

Scale Composite Run #1

aboratory ID Number : AH05725

est Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.43	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.74	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Lead, Ignited Basis	ASTM D 6357	89.7	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.96	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.46	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.12	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.58	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.35	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13970	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.436	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

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Supervision________________________

Date : 3/25/2003

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	4.64	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13203	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	4.2	mg/kg
Mercury, Dry	ASTM D6414	0.054	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.99	% By Weight
Ash, As Received	ASTM D 5142	4.08	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11620	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.7	mg/kg
Mercury, As Received	ASTM D6414	0.048	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.25	% By Weight
Barium, Ignited Basis	ASTM D 3683	1960.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.89	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.94	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.10	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.58	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________
Supervision________________________

Date : 3/25/2003

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ᐣ.O. Box 2641
ɜirmingham, Alabama 35291
205) 664 - 6081

CERTIFICATE OF ANALYSIS

ꓔO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account CRI04SP
Received Date : 26-Feb-03

escription : Gulf Plant Crist Unit #4

Scale Composite Run #2

aboratory ID Number : AH05726

est Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.44	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.54	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Lead, Ignited Basis	ASTM D 6357	91.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.64	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.06	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.33	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.87	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.59	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13845	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.409	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

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Supervision____________________

Date : 3/25/2003

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irmingham, Alabama 35291
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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account CRI04SP
Received Date : 26-Feb-03

escription : Gulf Plant Crist Unit #4

Scale Composite Run #3

aboratory ID Number : AH05727

est Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	5.41	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13046	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.46	% By Weight
Lead, Dry Basis	ASTM D6357	2.2	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.27	% By Weight
Ash, As Received	ASTM D 5142	4.75	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11445	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.39	% By Weight
Barium, Ignited Basis	ASTM D 3683	1952.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.01	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	27.86	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________
Supervision____________________

Date : 3/25/2003

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CERTIFICATE OF ANALYSIS

O: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account CRI04SP
Received Date : 26-Feb-03

scription : Gulf Plant Crist Unit #4

Scale Composite Run #3

boratory ID Number : AH05727

st Name	Reference	Result	
odium, Ignited Basis	ASTM D 3682	0.36	% By Weight
sulfur, Ignited Basis	ASTM D 5016	1.97	% By Weight
itanium, Ignited Basis	ASTM D 3682	0.55	% By Weight
.ead, Ignited Basis	ASTM D 6357	40.8	mg/kg
Ignited as Oxide			
luminum Oxide, Ignited	ASTM D 3682	23.41	% By Weight
alcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
ron Oxide, Ignited	ASTM D 3682	5.73	% By Weight
lagnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
hosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
otassium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
ilicon Dioxide, Ignited	ASTM D 3682	59.60	% By Weight
odium Oxide, Ignited	ASTM D 3682	0.49	% By Weight
ulfur Trioxide, Ignited	ASTM D 5016	4.93	% By Weight
itanium Oxide, Ignited	ASTM D 3682	0.92	% By Weight
General			
leat of Combustion, MAF	ASTM D 5865	13792	Btu/lb
ulfur, lbs/mmBTU	ASTM D 3180	0.353	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision__________________________

Date : 3/25/2003

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eneral Test Laboratory
.O. Box 2641
irmingham, Alabama 35291
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CERTIFICATE OF ANALYSIS

'O: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 19-Feb-03
Laboratory Account CRI04SP
Received Date : 21-Feb-03

ɜscription : Gulf Power Plant Crist Unit 4

Raw Coal

ıboratory ID Number : AH05250

ɪst Name	Reference	Result	
Dry Basis			
\sh, Dry	ASTM D 5142	4.39	% By Weight
ɺeat of Combustion, Dry	ASTM D 5865	13397	Btu/lb
⁼luorine, Dry Basis	ASTM D 5987	15	mg/kg
ɜulfur, Dry Basis	ASTM D 4239	0.44	% By Weight
ɹead, Dry Basis	ASTM D6357	1.7	mg/kg
Vlercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	8.79	% By Weight
Ash, As Received	ASTM D 5142	4.00	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12219	Btu/lb
Fluorine, As Received	ASTM D 5987	14	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.6	mg/kg
Mercury, As Received	ASTM D6414	0.068	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	14.46	% By Weight
Barium, Ignited Basis	ASTM D 3683	2473.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.99	% By Weight
Iron, Ignited Basis	ASTM D 3682	3.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.32	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control Supervision ____________________

Date : 3/25/2003

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). Box 2641
mingham, Alabama 35291
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CERTIFICATE OF ANALYSIS

): Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 19-Feb-03
Laboratory Account CRI04SP
Received Date : 21-Feb-03

scription : Gulf Power Plant Crist Unit 4

Raw Coal

ɔoratory ID Number : AH05250

;t Name	Reference	Result	
odium, Ignited Basis	ASTM D 3682	0.37	% By Weight
ulfur, Ignited Basis	ASTM D 5016	2.05	% By Weight
itanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
ead, Ignited Basis	ASTM D 6357	38.3	mg/kg
Ignited as Oxide			
luminum Oxide, Ignited	ASTM D 3682	27.32	% By Weight
:alcium Oxide, Ignited	ASTM D 3682	2.78	% By Weight
'on Oxide, Ignited	ASTM D 3682	4.57	% By Weight
lagnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
'hosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
'otassium Oxide, Ignited	ASTM D 3682	1.01	% By Weight
;ilicon Dioxide, Ignited	ASTM D 3682	56.31	% By Weight
;odium Oxide, Ignited	ASTM D 3682	0.50	% By Weight
;ulfur Trioxide, Ignited	ASTM D 5016	5.12	% By Weight
'itanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			
leat of Combustion, MAF	ASTM D 5865	14012	Btu/lb
;ulfur, lbs/mmBTU	ASTM D 3180	0.328	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ____________________
Supervision________________________

Date : 3/25/2003

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ıeral Test Laboratory
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ningham, Alabama 35291
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CERTIFICATE OF ANALYSIS

): Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03
Laboratory Account : 1CRI04
Received Date : 21-Feb-03

ɜcription : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

ɔoratory ID Number : AH05270

t Name	Reference	Result	Units
ercury in Coal, NBS 1632c	EPA 3051	0.09673	mg/kg
Dry Basis			
sh, Dry	ASTM D 5142	5.00	% By Weight
eat of Combustion, Dry	ASTM D 5865	13210	Btu/lb
luorine, Dry Basis	ASTM D 5987	21	mg/kg
ulfur, Dry Basis	ASTM D 4239	0.48	% By Weight
ead, Dry Basis	ASTM D6357	2.0	mg/kg
lercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
loisture, Total	ASTM D 2013	12.22	% By Weight
.sh, As Received	ASTM D 5142	4.39	% By Weight
leat of Combustion, As Received	ASTM D 5865	11596	Btu/lb
luorine, As Received	ASTM D 5987	18	mg/kg
;ulfur, As Received	ASTM D 4239	0.42	% By Weight
.ead, As Received	ASTM D6357	1.8	mg/kg
Aercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
\luminum, Ignited Basis	ASTM D 3682	12.91	% By Weight
;alcium, Ignited Basis	ASTM D 3682	1.78	% By Weight
3arium, Ignited Basis	ASTM D 3683	2137.	mg/kg
ron, Ignited Basis	ASTM D 3682	4.61	% By Weight
Aagnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
³hosphorus, Ignited Basis	ASTM D 3682	0.08	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision____________________ Date : 3/25/2003

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ıeral Test Laboratory
ı. Box 2641
ningham, Alabama 35291
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CERTIFICATE OF ANALYSIS

): Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03
Laboratory Account : 1CRI04
Received Date : 21-Feb-03

scription : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

ıoratory ID Number : AH05270

t Name	Reference	Result	Units
otassium, Ignited Basis	ASTM D 3682	1.05	% By Weight
licon, Ignited Basis	ASTM D 3682	26.75	% By Weight
odium, Ignited Basis	ASTM D 3682	0.38	% By Weight
ulfur, Ignited Basis	ASTM D 5016	2.02	% By Weight
tanium, Ignited Basis	ASTM D 3682	0.58	% By Weight
ead, Ignited Basis	ASTM D 6357	39.0	mg/kg
Ignited as Oxide			
luminum Oxide, Ignited	ASTM D 3682	24.39	% By Weight
alcium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
on Oxide, Ignited	ASTM D 3682	6.59	% By Weight
lagnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
hosphorus Pentoxide, Ignited	ASTM D 3682	0.18	% By Weight
otassium Oxide, Ignited	ASTM D 3682	1.26	% By Weight
ilicon Dioxide, Ignited	ASTM D 3682	57.23	% By Weight
odium Oxide, Ignited	ASTM D 3682	0.51	% By Weight
ulfur Trioxide, Ignited	ASTM D 5016	5.05	% By Weight
itanium Oxide, Ignited	ASTM D 3682	0.97	% By Weight
General			
leat of Combustion, MAF	ASTM D 5865	13905	Btu/lb
ulfur, lbs/mmBTU	ASTM D 3180	0.363	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision____________________ Date : 3/25/2003

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CERTIFICATE OF ANALYSIS

): John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03

Laboratory Account : CRISTSP

scription : Gulf Power - Plant Crist

Received Date : 25-Feb-03

Sawdust Composite
ɔoratory ID Number : AH05566

t Name	Reference	Result	Units
Dry Basis			
sh, Dry	ASTM D 5142	0.28	% By Weight
eat of Combustion, Dry	ASTM D 5865	8674	Btu/lb
luorine, Dry Basis	ASTM D 5987	11	mg/kg
ulfur, Dry Basis	ASTM D 4239	0.03	% By Weight
ead, Dry Basis	ASTM D6357	0.1	mg/kg
lercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
loisture, Total	ASTM D 2013	9.74	% By Weight
sh, As Received	ASTM D 5142	0.25	% By Weight
leat of Combustion, As Received	ASTM D 5865	7829	Btu/lb
luorine, As Received	ASTM D 5987	10	mg/kg
ulfur, As Received	ASTM D 4239	0.03	% By Weight
ead, As Received	ASTM D6357	0.1	mg/kg
lercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
luminum, Ignited Basis	ASTM D 3682	1.66	% By Weight
larium, Ignited Basis	ASTM D 3683	1402.	mg/kg
alcium, Ignited Basis	ASTM D 3682	29.36	% By Weight
ron, Ignited Basis	ASTM D 3682	0.82	% By Weight
lagnesium, Ignited Basis	ASTM D 3682	7.07	% By Weight
hosphorus, Ignited Basis	ASTM D 3682	1.46	% By Weight
otassium, Ignited Basis	ASTM D 3682	17.77	% By Weight
ilicon, Ignited Basis	ASTM D 3682	3.09	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 3/25/2003

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CERTIFICATE OF ANALYSIS

): John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03

Laboratory Account : CRISTSP

scription : Gulf Power - Plant Crist

Received Date : 25-Feb-03

Sawdust Composite

oratory ID Number : AH05566

t Name	Reference	Result	Units
odium, Ignited Basis	ASTM D 3682	1.11	% By Weight
ulfur, Ignited Basis	ASTM D 5016	3.88	% By Weight
tanium, Ignited Basis	ASTM D 3682	0.04	% By Weight
ead, Ignited Basis	ASTM D 6357	25.1	mg/kg
Ignited as Oxide			
luminum Oxide, Ignited	ASTM D 3682	3.14	% By Weight
alcium Oxide, Ignited	ASTM D 3682	41.08	% By Weight
on Oxide, Ignited	ASTM D 3682	1.17	% By Weight
lagnesium Oxide, Ignited	ASTM D 3682	11.72	% By Weight
hosphorus Pentoxide, Ignited	ASTM D 3682	3.35	% By Weight
otassium Oxide, Ignited	ASTM D 3682	21.41	% By Weight
ilicon Dioxide, Ignited	ASTM D 3682	6.61	% By Weight
odium Oxide, Ignited	ASTM D 3682	1.50	% By Weight
ulfur Trioxide, Ignited	ASTM D 5016	9.70	% By Weight
itanium Oxide, Ignited	ASTM D 3682	0.07	% By Weight
General			
leat of Combustion, MAF	ASTM D 5865	8698	Btu/lb
ulfur, lbs/mmBTU	ASTM D 3180	0.035	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 3/25/2003

smk/coa

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

BASELINE STUDY WHILE BURNING CARBONACEOUS MATERIAL FOR NITROGEN OXIDES, CARBON MONOXIDE, OXYGEN, TOTAL VOLATILE ORGANIC COMPOUNDS, AND EXEMPT VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST REPORT

FOR

GULF POWER COMPANY
Plant Crist, Unit 4
Pensacola, Florida

February 20, 2003

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REPORT CERTIFICATION

I have reviewed the "Baseline Study While Burning Carbonaceous Material for Nitrogen Oxides, Carbon Monoxide, Oxygen, Total Volatile Organic Compounds, and Exempt Volatile Organic Compounds Emissions Test Report" for the testing performed for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. I hereby certify that it is authentic and accurate to the best of my knowledge.

Date: 3/5/03

Signature:
Johnny W. Sanders, P.E., M.P.H.
President

TABLE OF CONTENTS

LIST OF TABLES

ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS) performed a baseline study while burning carbonaceous material for nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. The testing was conducted February 20, 2003. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 3a, 7e, 10, and SEAS 2518**. Method 2518 is a gas chromatic method for the separation of exempt voc's (methane and ethane) from non-exempt voc's. Further discussions of the test methods are included later in the report.

The purpose of the testing was to demonstrate compliance with the rules and regulations of the U. S. Environmental Protection Agency, and to meet the necessary requirements contained in the permit to operate issued by the Florida Department of Environmental Protection. The tests were conducted by Mr. Joseph Sanders and Mr. LeBarron Rudolph of Sanders Engineering & Analytical Services, Inc., and were coordinated with Mr. Kevin Beaty of Gulf Power Company. The Florida Department of Environmental Protection was notified so a representative could be present to observe the testing.

The results of the testing prove Unit 4 to be in compliance with the nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions limitations contained in the permit to operate issued by the Florida Department of Environmental Protection.

2. DESCRIPTION OF SAMPLING PROGRAM

The sampling program consisted of nitrogen oxides, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions testing in compliance with US EPA methods. The following is a brief description of these types of tests.

2.1. Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions Testing

Nitrogen oxides, carbon monoxide, and oxygen emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe, a moisture removal system, and into instruments specifically designed for the measurement of the particular pollutant of interest. The instruments responded linearly to concentrations of the pollutants. The output of the instruments is a continuous analog voltage which is digitized and input into a PC based data acquisition system. The PC data acquisition system polls the instrument 1000 times per second. The computer averages these readings into one-second averages during calibrations and one minute averages at other times. These one second and one minute averages are written to the hard disk each minute to ensure no data loss due to power failure or other inadvertent occurrence. The computer stores in memory all calibration and stack gas analyses during each run. The averages for each calibration and for each independent run were averaged for the time of the runs. Descriptions of the testing procedures are included in Sections 6 and 7. Sample calculations of Run 1 are included in Appendix B. The Protocol 1 gas certifications are included in Appendix C.

2.2. Volatile Organic Compounds Emissions Testing

Volatile organic compounds emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe and heated teflon line into a gas chromatograph equipped with a flame ionization detector. The chromatograph divided the compounds into four specific organic compounds and one group of organic compounds. The four specific compounds are methane, acetylene, ethylene, and ethane. The groups of compounds are all compounds which contain three or more carbon atoms (Propane+). The chromatograph was injected with a combination of these gases to ensure separation and then calibrated with Protocol 1 gases of propane. The calibration curve for propane was used to convert the area of each peak representing each compound into its equivalent part per million as propane. A description of the testing procedure is included in Section 8. The Protocol 1 gas certifications and calibration graph of propane versus peak area are included in Appendix C. A line loss/system check was performed at the beginning and end of each test by injecting Protocol 1 propane in nitrogen calibration gas at the probe and measuring the concentration with at least two injections of the chromatograph. Appendix C contains a table which shows the results of these system checks. The raw data is corrected for the line loss/system check if greater than five percent. Example chromatograms are included in Appendix D. Operational data as supplied by a representative of Gulf Power Company is included in Appendix E.

3. SUMMARY AND DISCUSSION OF RESULTS

There were no unusual problems experienced during the performance of the testing. The results for the nitrogen oxides, carbon monoxide, oxygen, and volatile organic compounds emissions testing are presented in Table I. A graphical representation of the nitrogen oxides, carbon monoxide, and oxygen concentrations are presented in Figure 1. The quality assurance calculations for the nitrogen oxides, carbon monoxide, and oxygen testing are presented in Tables II through IV, respectively. The volatile organic compounds stack gas analysis is presented in Table V.

Example chromatograms of a combination of a gas containing methane, acetylene, ethylene, ethane, and propane are shown in Appendix D. The purpose of these chromatograms is to show the gas chromatograph column performance in separating each of these compounds. Also included in Appendix D is the representative chromatogram of stack gas showing the only non-exempt volatile organic compounds.

The results of the testing for each parameter are as follows:

PARAMETER	Emission Rate (lbs/MMbtu)
Nitrogen Oxides	0.495
Carbon Monoxide	0.00603
Volatile Organic Compounds	0.000314

TABLE I. NITROGEN OXIDES, CARBON MONOXIDE, OXYGEN, AND VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/20/2003

TEST	START TIME Military	STOP TIME Military	WATER VAPOR IN STACK GAS (percent)	F FACTOR Oxygen (Dry) (sdcf/MMbtu)	OXYGEN (Dry) (measured) (Percent)	Nitrogen Oxides Emissions (ppm-dry)	Nitrogen Oxides Emissions (O2 F factor) (lbs/MMbtu)	Carbon Monoxide Emissions (ppm-dry)	Carbon Monoxide Emissions (O2 F factor) (lbs/MMbtu)	Volatile Organic Compounds Emissions (ppm-wet)	Volatile Organic Compounds Emissions (ppm-dry)	Volatile Organic Compounds Emissions (O2 F factor) (lbs/MMbtu)
RUN 1	15:00	16:00	8.0	9780	8.3	260.47	0.502	4.23	0.00498	0.210	0.228	0.000423
RUN 2	16:18	17:18	8.0	9780	8.2	257.79	0.493	5.93	0.00693	0.160	0.174	0.000319
RUN 3	17:37	18:37	8.0	9780	8.2	256.44	0.490	5.30	0.00619	0.100	0.109	0.000200
Average			8.0		8.2	258.24	0.495	5.15	0.00603	0.157	0.170	0.000314

Figure 1. Graphical Representation of Stack Gas Concentrations While Burning Carbonaceous Material

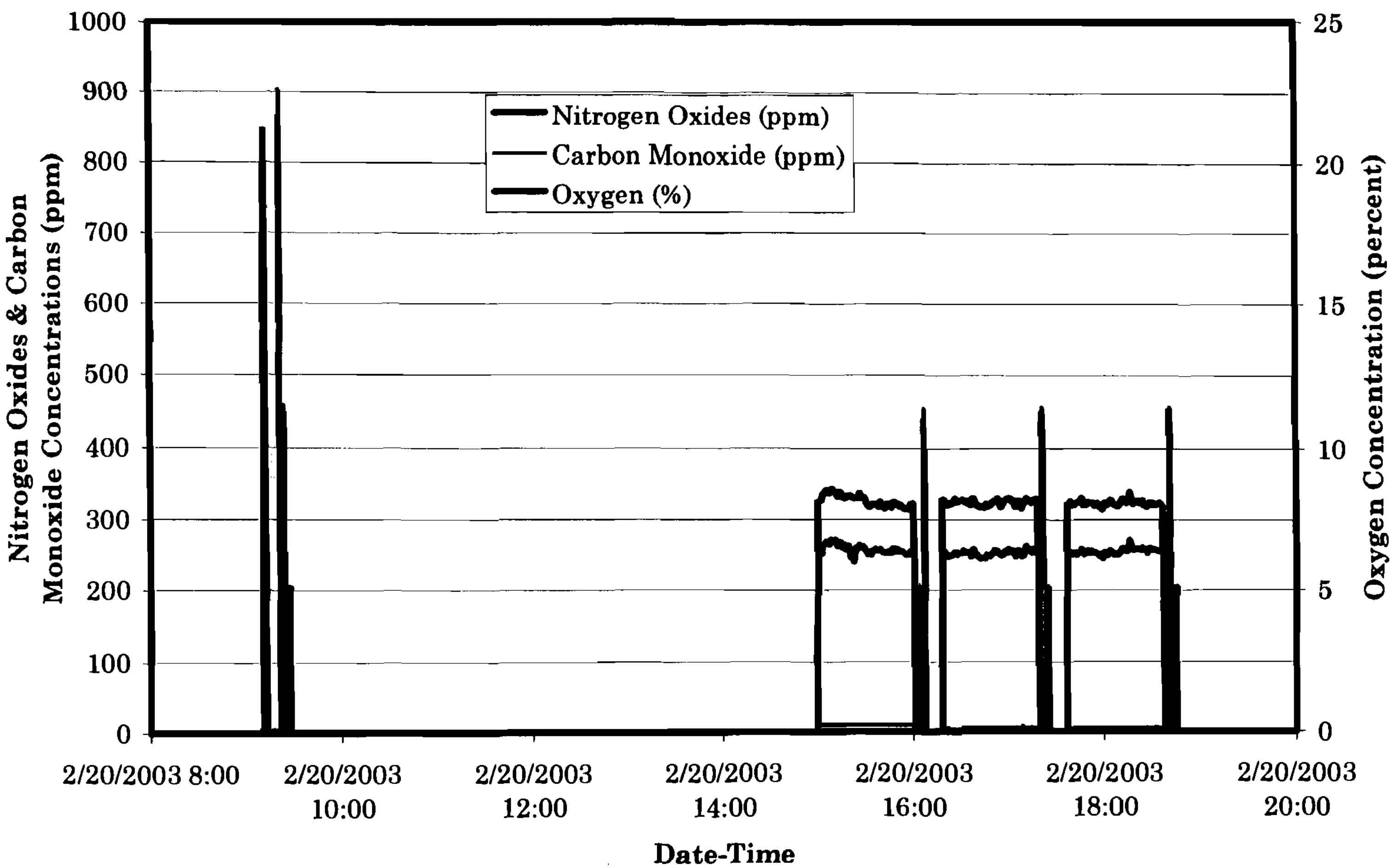


TABLE II. OXYGEN TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/20/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (%) =		25.0	ANALYZER ID.	HORIBA CMA 331A
	CYLINDER VALUE Percent	ANALYZER RESPONSE (Percent)	DIFFERENCE (Percent)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	20.9	20.9	0.0	0.0
Mid Range Gas	5.1	5.0	0.1	0.4

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (Percent)*	*system Zero (Percent)*	*system upscale (Percent)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (Percent)*	*ANALYZER SPAN (Percent)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	OXYGEN CONCENTRATION (Percent-Dry)
		INITIAL SYSTEM		*0.0*	*5.0*									
15:00	*16:00*	**Run 1**	*8.2*	*0.0*	*5.1*	*5.1*	*25.0*	0.0	0.0	0.0	0.0	0.4	0.4	8.3
16:18	*17:18*	**Run 2**	*8.1*	*0.0*	*5.0*	*5.1*	*25.0*	0.0	0.0	0.0	0.4	0.0	-0.4	8.2
17:37	*18:37*	**Run 3**	*8.1*	*0.0*	*5.1*	*5.1*	*25.0*	0.0	0.0	0.0	0.0	0.4	0.4	8.2

TABLE III. NITROGEN OXIDES TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/20/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000		ANALYZER ID	HORIBA CLA
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	865	865.0	0.0	0.0
Mid Range Gas	454.7	443.6	11.1	1.1

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	NITROGEN OXIDES CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*1.8*	*443.2*									
15:00	*16:00*	Run 1	*253.3*	*2.7*	*437.8*	*454.7*	*1000.0*	0.2	0.3	0.1	0.0	-0.6	-0.5	260.5
16:18	*17:18*	Run 2	*252.4*	*5.0*	*446.7*	*454.7*	*1000.0*	0.3	0.5	0.2	-0.6	0.3	0.9	257.8
17:37	*18:37*	Run 3	*255.0*	*4.3*	*450.4*	*454.7*	*1000.0*	0.5	0.4	-0.1	0.3	0.7	0.4	256.4

TABLE IV. CARBON MONOXIDE TESTING QUALITY ASSURANCE
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
2/20/2003

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000	ANALYZER ID.	HORIBA CMA	
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	901	901.0	0.0	0.0
Mid Range Gas	442.5	457.1	-14.6	-1.5

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	CARBON MONOXIDE CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		*1.0*	*456.2*									
16:00	*16:00*	Run 1	*3.9*	*-1.9*	*452.9*	*442.5*	*1000.0*	0.1	-0.2	-0.3	-0.1	-0.4	-0.3	**4.2**
16:18	*17:18*	Run 2	*4.7*	*-0.9*	*454.5*	*442.5*	*1000.0*	-0.2	-0.1	0.1	-0.4	-0.3	0.2	**5.9**
17:37	*18:37*	Run 3	*4.5*	*-1.0*	*454.2*	*442.5*	*1000.0*	-0.1	-0.1	0.0	-0.3	-0.3	0.0	**5.3**

Table V. Results of Gas Chromatographic Analysis of Stack Gases for Volatile Organic Compounds
Gulf Power Company
Plant Crist, Unit 4
Carbonaceous Material
2/20/2003

ction mber	Run Name	Injection Time	Methane Peak Area	Acetylene Peak Area	Ethylene Peak Area	Ethane Peak Area	Propane Peak Area	Methane ppm as propane	Acetylene ppm as propane	Ethylene ppm as propane	Ethane ppm as propane	Propane ppm as propane	Line Loss Percent	TOTAL VOC ppm as propane	TOTAL VOC ppm as propane Corrected For Line Loss
1	Initial Line Loss						11678					49.3			
2	Initial Line Loss											0.0			
3	Initial Line Loss											0.0			
rage	nitial Line Loss						11678					49.3	1.1%		
ystem Check Cylinder Value (ppm)												49.8			
1	Run 1	3:08 PM	0	0	2	8	68	0.0	0.0	0.0	0.0	0.3		0.3	0.3
2	Run 1	3:13 PM	0	0	1	0	79	0.0	0.0	0.0	0.0	0.3		0.3	0.3
3	Run 1	3:18 PM	0	0	10	32	99	0.0	0.0	0.0	0.1	0.4		0.5	0.5
4	Run 1	3:23 PM	0	0	21	38	86	0.0	0.0	0.1	0.2	0.4		0.5	0.5
5	Run 1	3:28 PM	0	0	12	29	80	0.0	0.0	0.1	0.1	0.3		0.4	0.4
6	Run 1	3:33 PM	0	0	4	22	66	0.0	0.0	0.0	0.1	0.3		0.3	0.3
7	Run 1	3:38 PM	0	0	17	31	38	0.0	0.0	0.1	0.1	0.2		0.2	0.2
8	Run 1	3:43 PM	0	0	21	29	60	0.0	0.0	0.1	0.1	0.3		0.3	0.3
9	Run 1	3:48 PM	0	0	13	23	80	0.0	0.0	0.1	0.1	0.3		0.4	0.4
10	Run 1	3:53 PM	0	0	13	26	69	0.0	0.0	0.1	0.1	0.3		0.3	0.4
11	Run 1	3:58 PM	0	0	9	24	58	0.0	0.0	0.0	0.1	0.2		0.3	0.3
12	Run 1	4:03 PM	0	0	10	0	58	0.0	0.0	0.0	0.0	0.2		0.3	0.3
er of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
erage	Run 1		0	0	11	22	70	0.0	0.0	0.0	0.1	0.2	0.55%	0.2	0.2
1	Run 1 Line Loss	4:08 PM					11586					49.3			
2	Run 1 Line Loss	4:13 PM					11609					49.4			
3	Run 1 Line Loss	4:21 PM					11721					49.9			
erage	Run 1 Line Loss						11639					49.5			
1	Run 2	4:31 PM	0	0	9	16	62	0.0	0.0	0.0	0.1	0.3		0.3	0.3
2	Run 2	4:36 PM	0	0	9	16	57	0.0	0.0	0.0	0.1	0.2		0.3	0.3
3	Run 2	4:41 PM	0	0	4	25	89	0.0	0.0	0.0	0.1	0.4		0.4	0.4
4	Run 2	4:46 PM	0	0	0	17	43	0.0	0.0	0.0	0.1	0.2		0.2	0.2
5	Run 2	4:51 PM	0	7	1	9	24	0.0	0.0	0.0	0.0	0.1		0.1	0.1
6	Run 2	4:56 PM	0	37	2	24	58	0.0	0.2	0.0	0.1	0.2		0.4	0.4
7	Run 2	5:01 PM	0	6	0	25	28	0.0	0.0	0.0	0.1	0.1		0.1	0.1
8	Run 2	5:06 PM	32	1	7	13	33	0.1	0.0	0.0	0.1	0.1		0.2	0.2
9	Run 2	5:11 PM	0	15	8	23	33	0.0	0.1	0.0	0.1	0.1		0.2	0.2
10	Run 2	5:16 PM	0	48	0	16	42	0.0	0.2	0.0	0.1	0.2		0.4	0.4
11	Run 2	5:21 PM	0	0	0	4	18	0.0	0.0	0.0	0.0	0.1		0.1	0.1
12	Run 2	5:26 PM	0	12	2	26	29	0.0	0.1	0.0	0.1	0.1		0.2	0.2
er of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
erage	Run 2		3	11	4	16	43	0.0	0.0	0.0	0.0	0.1	6.41%	0.1	0.1
1	Run 2 Line Loss	5:31 PM					10893					46.4			
2	Run 2 Line Loss	5:35 PM					10976					46.7			
3	Run 2 Line Loss	5:40 PM					10990					46.8			
erage	Run 2 Line Loss						10953					46.6			
1	Run 3	5:50 PM	0	0	22	10	63	0.0	0.0	0.1	0.0	0.3		0.4	0.4
2	Run 3	5:55 PM	0	0	0	23	21	0.0	0.0	0.0	0.1	0.1		0.1	0.1
3	Run 3	6:00 PM	0	0	0	27	64	0.0	0.0	0.0	0.1	0.3		0.3	0.3
4	Run 3	6:05 PM	0	0	0	18	50	0.0	0.0	0.0	0.1	0.2		0.2	0.2
5	Run 3	6:10 PM	0	0	0	29	21	0.0	0.0	0.0	0.1	0.1		0.1	0.1
6	Run 3	6:15 PM	0	0	4	31	6	0.0	0.0	0.0	0.1	0.0		0.0	0.0
7	Run 3	6:20 PM	0	0	0	23	20	0.0	0.0	0.0	0.1	0.1		0.1	0.1
8	Run 3	6:25 PM	0	0	0	27	28	0.0	0.0	0.0	0.1	0.1		0.1	0.1
9	Run 3	6:30 PM	0	4	0	19	21	0.0	0.0	0.0	0.1	0.1		0.1	0.1
10	Run 3	6:35 PM	0	0	2	28	75	0.0	0.0	0.0	0.1	0.3		0.3	0.3
11	Run 3	6:40 PM	0	0	0	28	28	0.0	0.0	0.0	0.1	0.1		0.1	0.1
12	Run 3	6:45 PM	0	0	0	15	27	0.0	0.0	0.0	0.1	0.1		0.1	0.1
er of Injections			12	12	12	12	12	20.0	20.0	20.0	20.0	20.0			
verage	Run 3		0	0	2	23	35	0.0	0.0	0.0	0.1	0.1	6.41%	0.1	0.1
1	Run 3 Line Loss	5:31 PM					10893					46.4			
2	Run 3 Line Loss	5:35 PM					10976					46.7			
3	Run 3 Line Loss	5:40 PM					10990					46.8			
verage	Run 3 Line Loss						10953					46.6			

TABLE VI. EXEMPT VOLATILE ORGANIC COMPOUNDS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST, UNIT 4
CARBONACEOUS MATERIAL
02/20/03

Run Number	Start Time	Stop Time	Uncorrected (wet)						Line Loss Fraction	CORRECTED (wet) TOTAL VOC NON-EXEMPT as propane (ppm)
			Methane ppm as propane	Acetylene ppm as propane	Ethylene ppm as propane	Ethane ppm as propane	Propane ppm as propane	Total VOC non-exempt as propane (ppm)		
1	3:08 PM	12:00 AM	0.00000	0.0000	0.0283	0.0557	0.179	0.207	0.00711	0.208
2	4:31 PM	12:00 AM	0.00680	0.0268	0.00892	0.0448	0.110	0.145	0.0656	0.156
3	5:50 PM	12:00 AM	0.00000	0.00085	0.00595	0.0591	0.090	0.097	0.0656	0.104
Average			0.00227	0.00920	0.0144	0.0532	0.126	0.150	0.0461	0.156

Methane & Ethane Concentrations may be higher than reported.
These compounds are sometimes found at concentrations higher than the instrument can detect

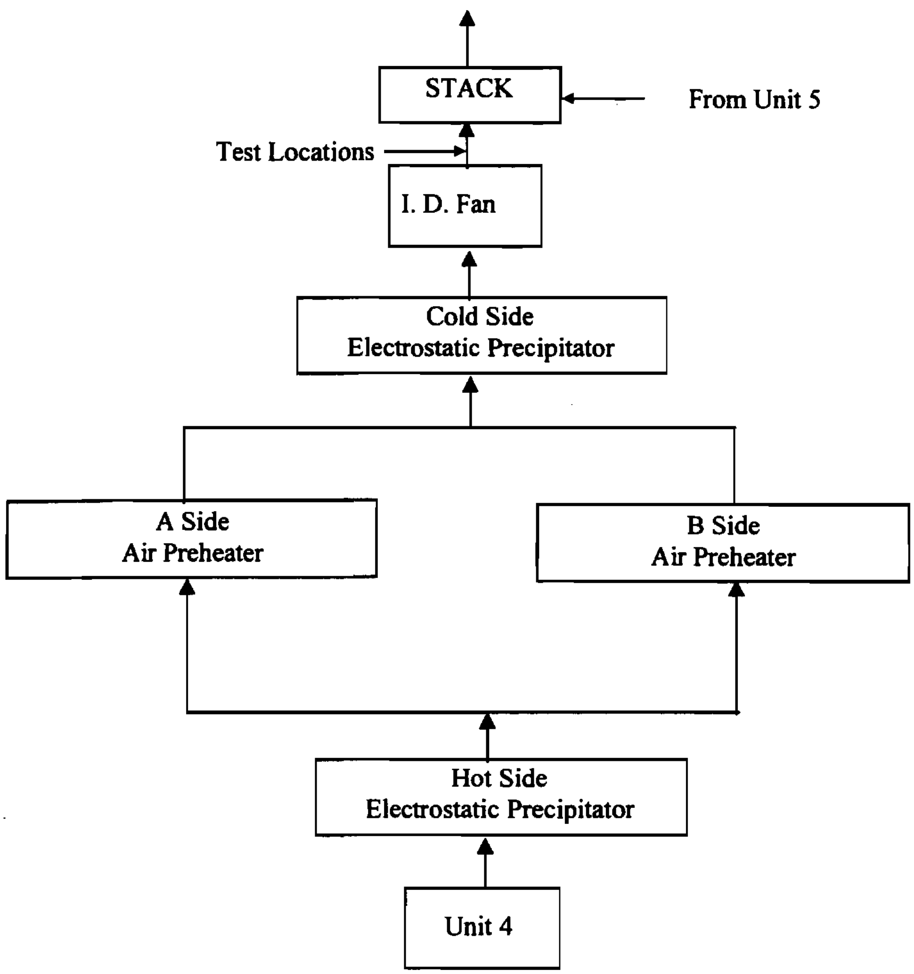
4. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by barge, and loaded directly onto the conveyor feeding the plant or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 36 to 48 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators. In addition to the coal fired in the boiler saw dust was added from a hopper to the conveyor belt transporting the coal to the boiler.

4.1. Source Air Flow

As shown in Figure 2, the flue gases exit the boiler and flow through a hot side precipitator. The exhaust gases are separated into ducts A and B before entering air preheaters. The exhaust gases are combined before entering a cold side ESP. The flue gases exiting the cold side ESP are exhausted through a stack into the atmosphere.

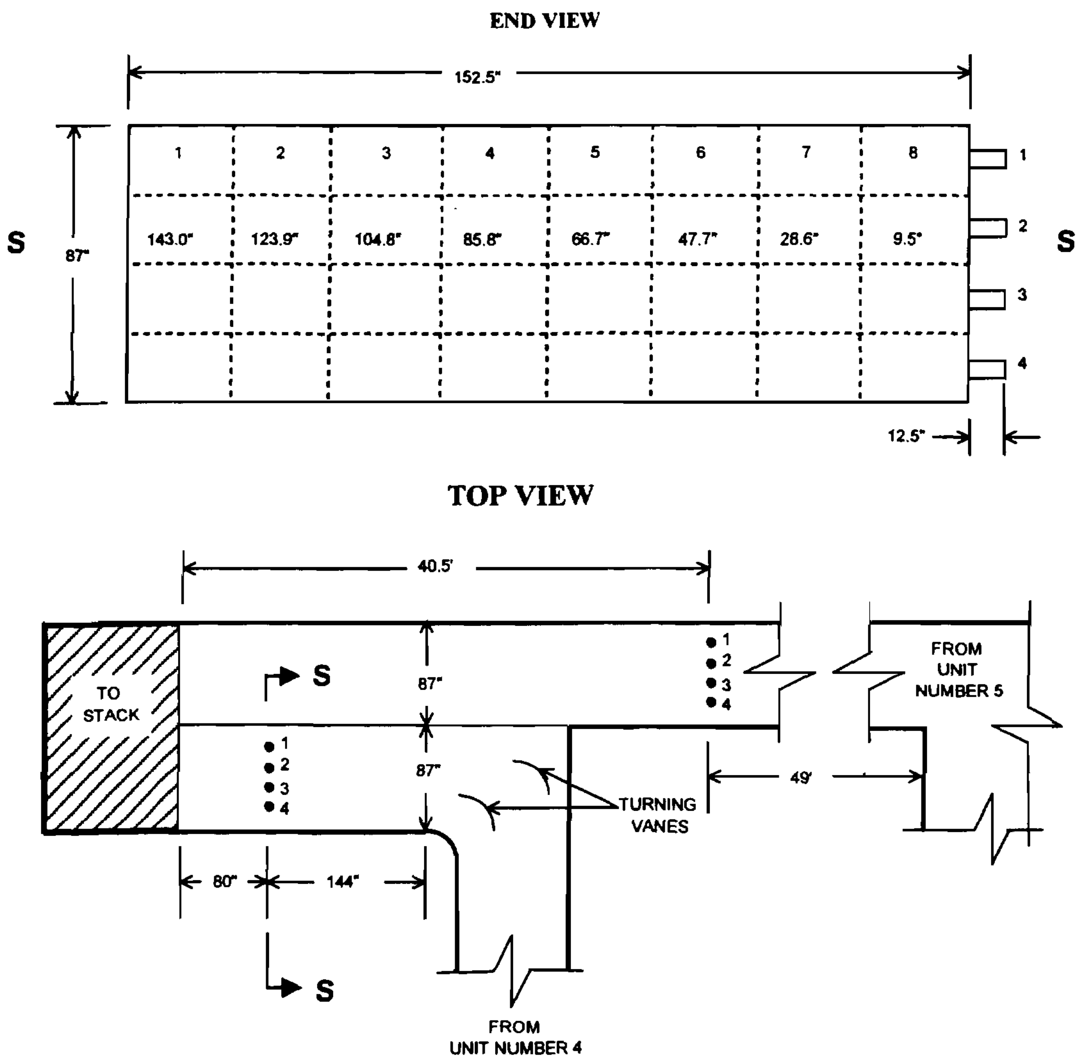
Figure 2. Air Flow Schematic



5. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 3. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 32 points.

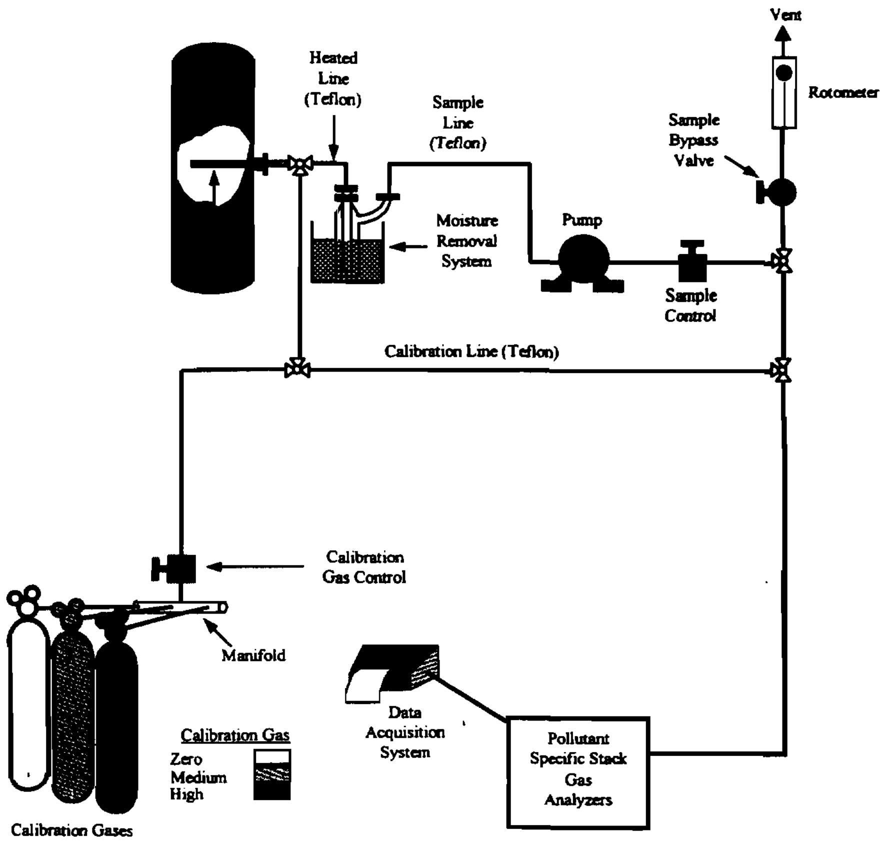
Figure 3. Sample Point Locations



6. CARBON MONOXIDE AND OXYGEN SAMPLING PROCEDURE (EPA METHODS 3A AND 10)

The sampling procedures utilized are those specified in **40 CFR, Part 60, Appendix A, Methods 3a and 10** as modified by the governing regulatory agency. A brief description of these procedures is as follows:

Figure 4. Carbon Monoxide and Oxygen Sampling Procedure



The sample was removed from the stack through a stainless steel probe and passes through a three-way valve and condenser moisture removal system. Teflon® line was used to transport the sample through a transport pump and a flow control valve. From this point the sample was routed into a manifold with a bypass valve, an analyzer sample flow control valve, and to an analyzer specific for the pollutant of interest. Each analyzer produces a voltage analogue output proportional to the concentration of pollutant present in the gas. A schematic of the sampling train is presented in the attached drawing.

Each instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. Zero air is introduced directly to each instrument to establish a baseline and check the zero reading of the instrument. A high range calibration gas was introduced directly to each instrument. The instrument was allowed to fully respond to the calibration gas. Each analyzer was adjusted, if

needed, to the correct value. A linear calibration curve was calculated from this data and stored on computer. Next, a mid-range calibration gas was introduced directly to each instrument. The percent error between each measured value and the corresponding calibration value was calculated. If any of the readings indicated a difference of more than ±2 percent of the span the analyzer was recalibrated.

The high or mid gas and zero gas were then introduced to the system at the three-way valve before the condenser. The response value for each of these gases was recorded. If these measured values differed significantly from the calibration values the sampling system was checked and repaired until the system check met EPA specifications.

To begin sampling, the three-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the data recorder was marked for the beginning of the run. After the required sampling time, the data recorder was marked for the end of the run. At the end of each run the three-way valve was switched to allow introduction of the zero and calibration gas to the system. From these data the calibration bias and drift were calculated. If the bias values were greater than ±5 percent of the span, or the drift was greater than three percent of the span, the run was invalidated. To begin the next run the three-way valve was switched to allow sampling of the stack gas and the next run was started. This procedure was repeated until all runs were complete.

6.1. Sample Recovery & Analysis

After the tests were completed the data was reduced to give an average concentration in parts per million for each run. This average concentration was then corrected for the analyzer zero and span bias and drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

Co = Average of Initial and final system calibration responses for the zero gas, ppm.

Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

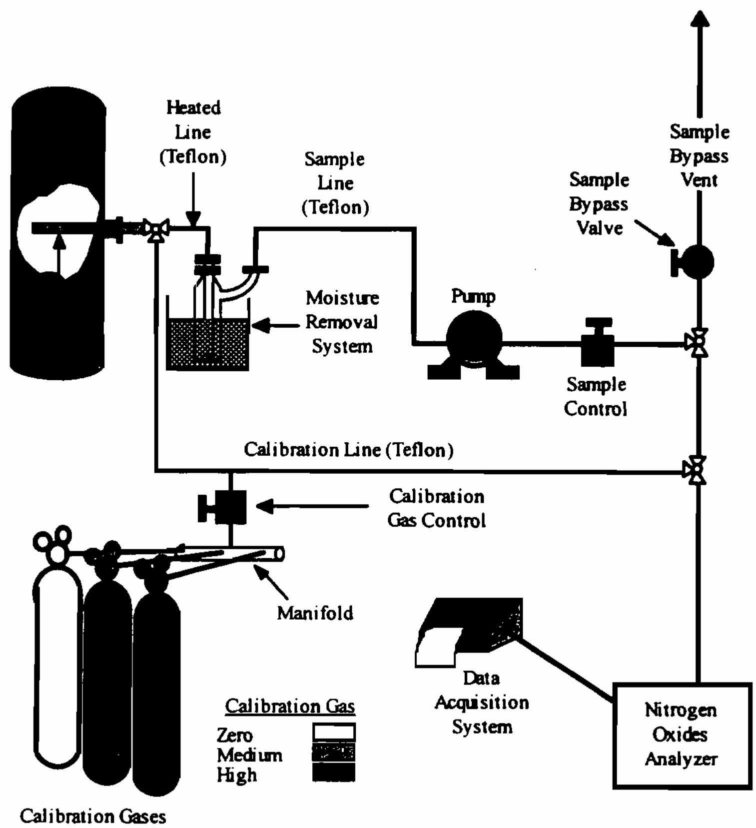
Cma = Actual concentration of the scale calibration gas, ppm.

7. NITROGEN OXIDES PROCEDURE (EPA Method 7e)

The sampling procedure utilized is that specified in 40 CFR, Part 60, Appendix A, Method 7e. A brief description of this procedure is as follows:

The sample was removed from the stack through a stainless steel probe and passed through a 3-way valve and an impinger moisture removal system. Teflon line was used to transport the sample through a sample transport pump and a sample flow control valve. From this point the sample is routed into a manifold with a bypass valve, then to an analyzer sample flow control valve and on to a chemiluminescent NO-NO_X gas analyzer. The analyzer uses a chemiluminescent principal based on the reaction of ozone with nitrogen oxides to provide a voltage analogue output proportional to the concentration of oxides of nitrogen present in the sample. A schematic of the sampling train is presented in the attached drawing.

Figure 5. Nitrogen Oxides Sampling Procedure



The instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. A high range calibration gas, between 80 to 90 percent of the span value, was introduced directly to the instrument. The instrument was allowed to fully respond to the calibration gas and the analyzer was adjusted to the correct value. Next, a mid- range calibration gas, between 50 to 60 percent of the span,

was introduced directly to the instrument. Next zero air was introduced directly to the instrument to check the zero reading of the instrument. If any of the readings indicated a difference of more than $\pm$2% of the span, the analyzer was recalibrated. The high, middle and zero gasses were then introduced to the system at the 3-way valve. The calibration gases utilized were either EPA Protocol I gases or were generated by using EPA Method 205. The response value for each of these gases was recorded.

To begin sampling, the 3-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the chart was marked for the beginning of the run. After the required sampling time, the chart was marked for the end of the run. At the end of each run the 3-way valve was switched to allow introduction of the calibration gas which was closest in value to the exhaust gas NO_X concentration. Zero air was introduced to the system. The zero and calibration drift were recorded. If the drift values were greater than $\pm$5% of the span, the run was invalidated. The 3-way valve was switched to allow sampling of the stack gas, and the next run was begun. This procedure was repeated until all runs were completed.

7.1.1. Sample Recovery & Analysis

After the tests were completed, the data was reduced to give an average NO_X concentration in ppm for each run. This average concentration was then corrected for the analyzer zero and span drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

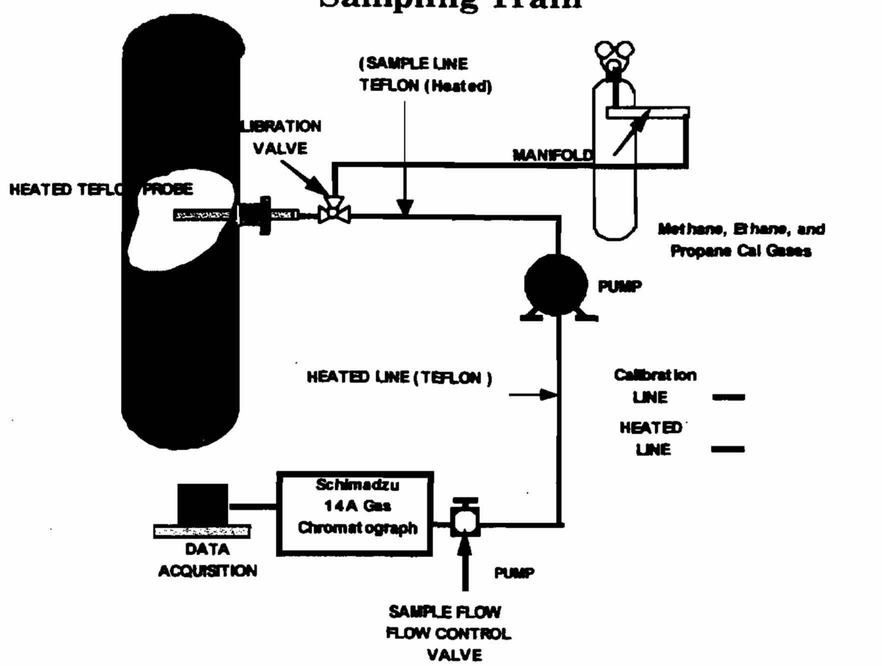
Co = Average of Initial and final system calibration responses for the zero gas, ppm.

Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

Cma = Actual concentration of the scale calibration gas, ppm.

8. NON-EXEMPT VOLATILE ORGANIC COMPOUND SAMPLING BY GAS CHROMATOGRAPHY (SEAS Method 2518)

Figure 6. Non-Exempt Volatile Organic Compounds Sampling Train



Gaseous organic emission sampling (gas chromatography) was performed per **SEAS Method 2518**. Non-exempt volatile organic compounds emissions testing was performed by a system similar to that depicted in the attached figure.

A heated stainless steel probe and heated teflon sample line was used to draw a sample from the emission source. Stack gases were continuously drawn through the sample lines. The sample lines were leak checked prior to and after all testing.

A small portion of the gas sample was pumped into the on-line gas chromatograph sample loop. The gas chromatograph sample loop was operated at approximately 30 ml/min flow, and was continuously purged with stack gas. Sample was introduced into the gas chromatograph by automatic actuation of the sample valve at a predetermined time. The gas chromatograph was fitted with a column of sufficient physical and chemical characteristics to allow separation of the constituents. The chromatograph was operated in such a manner as to get five separate peaks. The first four were for specific compounds in the following order:

methane, acetylene, ethylene, and ethane. The fifth peak was a back flush of the column which contained all organic compounds containing three or more carbon atoms (Propane+). The first four peaks were allowed to elute with the gases flowing through the column in the normal direction. After ethane elutes, the column is backflushed through the operation of a 10-port valve to elute the combined volatile organic compounds to the detector.

In order to ensure only organic compounds were measured, the chromatograph was equipped with a flame ionization detector. Each test run was conducted for at least sixty minutes, with the chromatograph performing as many injections as could be completed given the physical and chemical characteristics of the stack gas.

Calibration of the gas chromatograph was performed using EPA Protocol 1 cylinders of propane in nitrogen. Calibrations were made with a high, mid, and low concentration gas. Using these gas standards, a three-point calibration curve based on area count was generated for combined volatile organic compounds as propane. SEAS used a Shimadzu GC-14A for this testing program. The GC was equipped with an FID and integrator system. Volatile organic compound concentrations were determined by the peak area count of the sample versus the calibration curve. The calibration curve for propane was input to the data acquisition system for the acetylene and ethylene. Therefore, the concentrations generated by the data acquisition system for acetylene, ethylene, and combined volatile organic compounds were each reported on a propane equivalent basis. At the conclusion of testing, the calibration curve of the instrument was verified by injection of a propane calibration standard. If the calibration was maintained within twenty percent, the data was accepted. Otherwise, the data was either corrected for drift or the data was discarded and a new test conducted.

The concentration of non-exempt volatile organic compounds in the stack gas was calculated by summing of the ethylene concentration (propane equivalent) plus the acetylene concentration (propane equivalent) plus the combined volatile organic compound concentration (propane equivalent).

9. QUALITY ASSURANCE

In order to ensure the accuracy of all the data collected in the field and at the laboratory, SEAS has instituted a comprehensive quality assurance and quality control program. New or repaired items which require calibration are calibrated before their initial use in the field. Equipment whose calibration may change with use is calibrated before and after each use. When an item is found to be out of calibration, the unit is either discarded or repaired, and then recalibrated before being returned to service. All equipment is periodically recalibrated in full regardless of the results of the regular inspections or its present calibration status. Calibrations are performed in a manner consistent with the EPA reference methods recommended in the "Quality Assurance Handbook for Air Pollution Measurement Systems" published by the US Environmental Protection Agency. To the maximum degree possible all calibrations are traceable to the National Institute of Standards & Technology (NIST).

In order to ensure that the test will be performed in a timely manner without undue delays, SEAS sampling vans are equipped with duplicate sampling devices for almost every device needed to perform the test. If a particular device is broken or does not pass inspection, a second device is available immediately at the site for use. Any device which appears to be outside calibration, or in need of repair is tagged in the field and repaired, calibrated, or discarded immediately upon return to the laboratory.

9.1.1. CALIBRATIONS

Certain pieces of equipment need to be calibrated before and after each test. Those items include the pitot tubes, the differential pressure gauges, the dry gas meter, and the nozzles used for the particulate testing. The following is a brief description of the calibration procedures for each of these important devices.

9.1.2. PITOT TUBES

All pitot tubes are the S-type as required by EPA Reference Method 2 (40 CFR, Part 60, Appendix A, Method 2). This method contains certain geometric standards for the construction of S-type pitot tubes. All of SEAS pitot tubes are constructed according to these standards. According to the EPA any pitot tube constructed to these standards will have a coefficient of 0.84 ± 0.02. To ensure the exact value of SEAS pitot tubes, all pitot tubes are initially calibrated in SEAS wind tunnel to determine the exact pitot coefficient. This coefficient should not change unless the pitot is physically damaged. Each pitot tube is checked before going to the field to make sure it meets the geometry as specified. Any pitot tube which does not meet the specifications is not used in the test.

9.1.3. DIFFERENTIAL PRESSURE GAUGES

SEAS uses several different types of pressure gauges including oil tube manometers, water tube manometers, magnehelics, and current output electronic load cells. Each of these devices are inspected before taken to the field and are inspected for leaks during each test. The magnehelics and load cells are tested against an incline manometer water gauge to ensure accuracy.

9.1.4. TEMPERATURE SENSORS

All temperature sensors used in SEAS sampling program are either mercury in-glass thermometers or type K thermocouples. These thermocouples are physical devices which produce a voltage proportional to the temperature. The thermocouple reading device is calibrated before and after each series of tests to ensure accuracy of $\pm$ 2 percent. The calibration of the thermocouple is accomplished by NIST traceable calibrated reference thermocouple potentiometer system.

9.1.5. NOZZLES

The inside diameter of each nozzle is measured to the nearest 0.001 inches prior to its initial use. Upon arriving in the field each nozzle is again measured with a micrometer on three different points on the diameter to ensure its original measurement and that the nozzle is perfectly round. If the difference between the maximum and minimum diameters measured does not exceed 0.003 inches, the nozzle is acceptable; otherwise, this nozzle is discarded and another is selected. At the end of each test the nozzles are again remeasured on three different points on the diameter to ensure that during the test the nozzle has not become dented or deformed.

9.1.6. DRY GAS METER

The dry gas meter is calibrated every six months against a spirometer transfer standard. It is again calibrated before and after each use in the field. During the semiannual calibration, a five point calibration is made at a minimum of one-half inch water column orifice pressure up to four inches water column orifice pressure. Before and after each test, the dry gas meter is again recalibrated at

three repetitions at a representative flow rate experienced during the test. If the final calibration does not agree with the initial calibration within five percent the calibration which yields the lowest volume of sample pulled is used in the calculations and the dry gas meter is repaired and recalibrated.

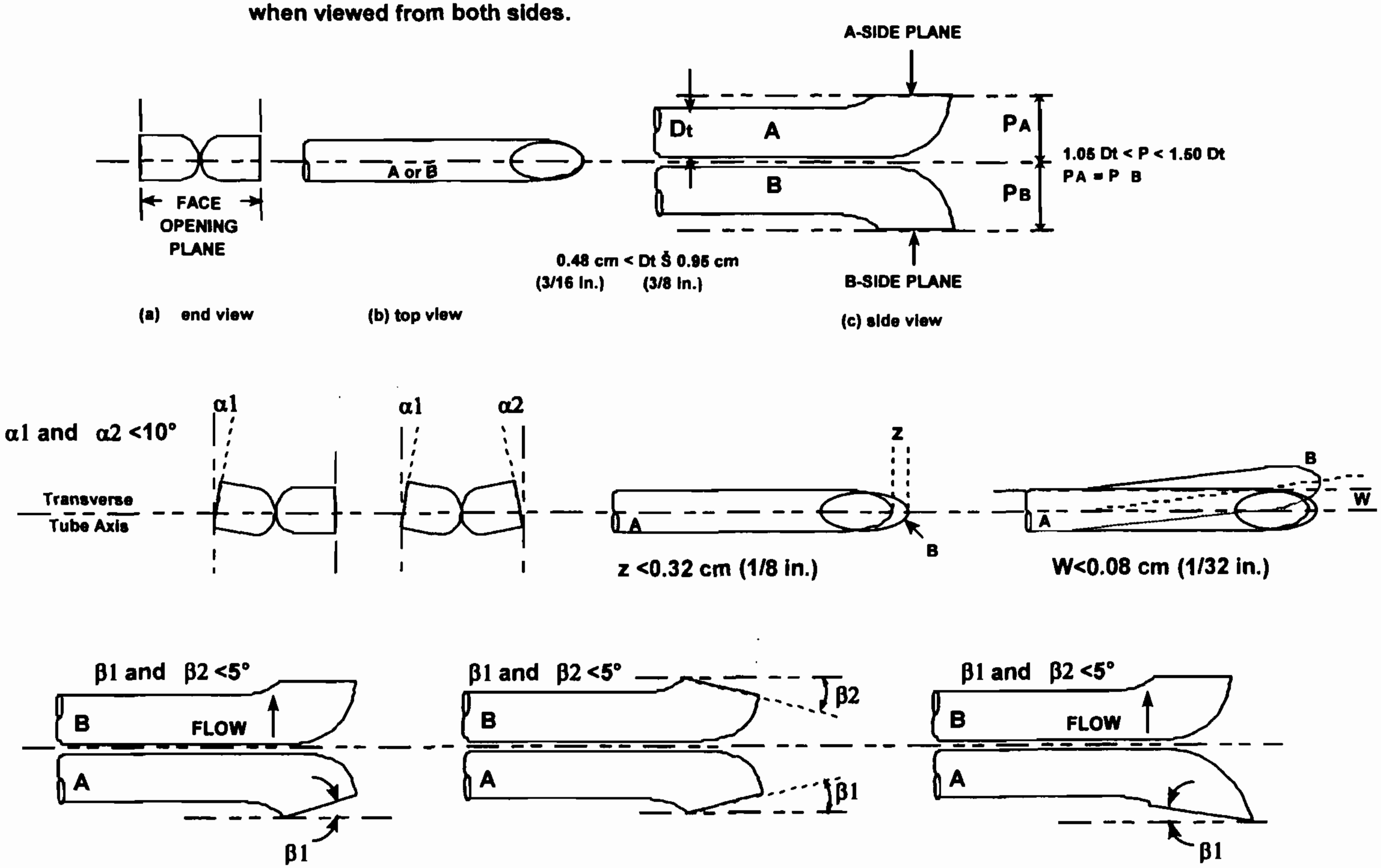
9.1.7. ORIFICE

The flow meter orifice is used to establish isokinetic sampling rates during the test. The orifice is calibrated with the dry gas meter at the same time under the same conditions. The orifice is calibrated over a wide range of flow rates and the arithmetic mean of the orifice calibration is used for sampling purposes. The orifice is recalibrated every time the gas meter is recertified.

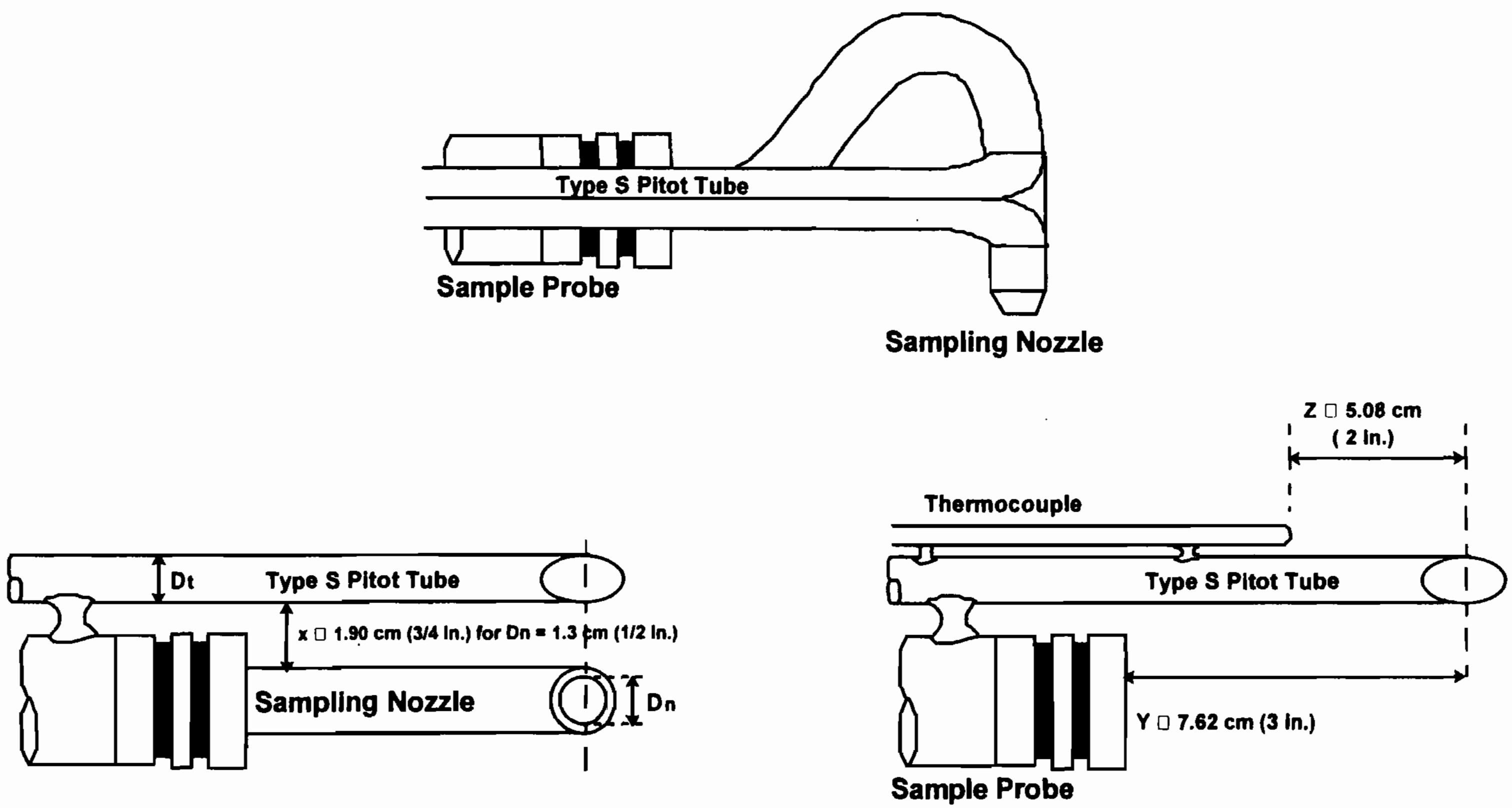
APPENDIX A QUALITY CONTROL OF TESTING EQUIPMENT

Type S pitot tube construction details:

a) end view; face opening planes perpendicular to transverse axis.
b) top view; face opening planes parallel to longitudinal axis.
c) side view; both legs of equal length and centerlines coincident, when viewed from both sides.



Sampling Nozzle, Thermocouple, and Probe Configuration



APPENDIX B SAMPLE CALCULATIONS

Nitrogen Oxides Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws})C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
Cppmx = Pollutant Concentration (parts per million, dry basis) =	260.47
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.08
Cppmwetx	239.64

Nitrogen Oxides Emissions Pounds Per Million Btu
(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	NOx
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	46.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	260.47
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	8.28
E_{O2} =	0.502

Carbon Monoxide Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws})C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) = CO
Cppmx = Pollutant Concentration (parts per million, dry basis) = 4.23
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) = 0.08
Cppmwetx 3.89

Carbon Monoxide Emissions Pounds Per Million Btu
(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2}\left(\frac{20.9}{20.9 - \%O_2}\right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) = SO2
MWx = Molecular weight of compound (dry basis, lb/lb mole) = 28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) = 4.23
F_{O2} = Oxygen based F factor (SDCF/mmBtu) = 9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) = 8.28
E_{O2} = 0.00498

Volatile Organtic Compounds Concentration (dry Wet)

$$C_{ppmx} = \frac{C_{ppmwetx}}{(1 - B_{ws})}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	VOC
Cppmwetx = Pollutant Concentration (parts per million, wet basis) =	0.210
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.080
Cppmx	0.228

Volatile Organtic Compounds Emissions Pounds Per Million Btu

(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	TRS
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	34.08
Cppmx = Pollutant Concentration (parts per million, dry basis) =	0.23
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	8.28
E_{O2} =	0.000423

APPENDIX C GAS CERTIFICATIONS

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE:
P.O. NO. 07/03/02
ORDER NO. 4011
6367637-01-01

CYLINDER NO.	CONSTITUENTS CONCENTRATION:	NOMINAL	ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 2025 psig
CGA: 590
Analysis Date: 06/18/02
Shelf Life: 60 MONTH
Expiration Date: 06/18/07

		Nominal	Actual	Uncertainty
150-736	OXYGEN	5 %	5.06 %	0.03 %
	NITROGE	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 907E	CC13342	9.99 % O2/N2	05/17/04

INSTRUMENTATION

Instrument	Analytical Principle
SERVOMEX	PARAMAGNETIC DETECTION

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

Steve Eska 7/3/02
ANALYST

STEVE ESKA

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE:
P.O. NO. 10/22/02
ORDER NO. 4991
6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02
Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/ 936E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/ 925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/ 914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02
STEVE ESKA ANALYST

MG 23301/C

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER		CYLINDER NO	: XC033012B
Montgomery Gas&Gear		EXPIRATION DATE	: 03-Nov-2004
3340 BIRMINGHAM HWY		CERTIFICATION DATE	: 11-Nov-2002
MONTGOMERY, AL 361060000		CYLINDER PRESSURE	: 2000 psig
		PRODUCT ID NO	: 24066079
CUSTOMER PO NO:		LOT NUMBER	: 530177
Previous Certification Date(s):			

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. I.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
CARBON DIOXIDE	11.50 %	11.57 %	+/-1.00% NIST Traceable	11/04/02
CARBON MONOXIDE	450.00 ppm	442.5 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
NITRIC OXIDE	450.00 ppm	454.7 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
SULFUR DIOXIDE	450.00 ppm	449 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
TOTAL OXIDES OF NITROGEN		454.8 ppm		
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81674	00060413	XC018783B	6.89 +/- 0.04 % CO2/N2	02/01/04
NTRM 81680	98060414	XC014408B	494.70 +/- 4.00 ppm CO/N2	07/01/06
SRM 2735	141-B-31	CAL014326	781.80 +/- 3.90 ppm NITRIC OXIDE	02/01/04
NTRM 81661	97060304	XC005122B	486.00 +/- 4.80 ppm SO2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens 5E DD721	NonDispersive Infrared	10/11/02
Siemens Ultramat 6E-N9-782	NonDispersive Infrared	10/25/02
Nicolet 560 ADU9800406 NO/NO2	FTIR	10/31/02
Nicolet 560 ADU9800406	FTIR	10/16/02

Page: 1 Of 1

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A Delaware Corporation

QA Approved [signature]

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/22/02
P.O. NO. 4991
ORDER NO. 6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02
Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02
STEVE ESKA ANALYST

MG 23301/C

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS

EPA Protocol Gas

CUSTOMER		CYLINDER NO	:	XC033012B
Montgomery Gas&Gear		EXPIRATION DATE	:	03-Nov-2004
3340 BIRMINGHAM HWY		CERTIFICATION DATE	:	11-Nov-2002
MONTGOMERY, AL 361080000		CYLINDER PRESSURE	:	2000 psig
		PRODUCT ID NO	:	24066079
CUSTOMER PO NO:		LOT NUMBER	:	530177

Previous Certification Date(s):

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. I.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
CARBON DIOXIDE	11.50 %	11.57 %	+/-1.00% NIST Traceable	11/04/02
CARBON MONOXIDE	450.00 ppm	442.5 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
NITRIC OXIDE	450.00 ppm	454.7 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
SULFUR DIOXIDE	450.00 ppm	449 ppm	+/-1.00% NIST Traceable	11/04/02 & 11/11/02
TOTAL OXIDES OF NITROGEN		454.8 ppm		
NITROGEN	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81674	00060413	XC018783B	6.89 +/- 0.04 % CO2/N2	02/01/04
NTRM 81680	98060414	XC014408B	494.70 +/- 4.00 ppm CO/N2	07/01/06
SRM 2735	141-B-31	CAL014326	781.80 +/- 3.90 ppm NITRIC OXIDE	02/01/04
NTRM 81661	97060304	XC005122B	486.00 +/- 4.80 ppm SO2/N2	07/01/06

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens 5E DD721	NonDispersive Infrared	10/11/02
Siemens Ultramat 6E-N9-782	NonDispersive Infrared	10/25/02
Nicolet 560 ADU9800406 NO/NO2	FTIR	10/31/02
Nicolet 560 ADU9800406	FTIR	10/16/02

Page: 1 Of 1

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A Delaware Corporation

QA Approved

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS
EPA Protocol Gas

CUSTOMER
Montgomery Gas&Gear
3340 BIRMINGHAM HWY
MONTGOMERY, AL 361080000

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC003276B
EXPIRATION DATE	:	17-Nov-2005
CERTIFICATION DATE	:	18-Nov-2002
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	24004681
LOT NUMBER	:	532305

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. I.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
PROPANE	50.00 ppm	49.8 ppm	+/-1.00% NIST Traceable	11/18/02
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81667	00060109	XC0195688	48.10 +/- 0.40 ppm C3H8/AIR	02/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	11/14/02

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QA Approved

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS

EPA Protocol Gas

CUSTOMER
SANDERS ENGINEERING & ANALYTIC
1568 LEROY STEVENS RD
MOBILE, AL 366959182

CUSTOMER PO NO: CT092801A

Previous Certification Date(s):

CYLINDER NO	:	XC026923B
EXPIRATION DATE	:	10/18/04
CERTIFICATION DATE	:	10/19/01
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	02001832
LOT NUMBER	:	466155

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
PROPANE	30.00 ppm	30.4 ppm	+/-1.00% NIST Traceable	10/19/01
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81667	00060109	XC019588B	48.10 +/- 0.40 ppm C3H8/AIR	02/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	10/16/01

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Page: 1 Of 1

QA Approved

BOC GASES

Assay Laboratory
BOC GASES
600 Union Landing Road
Riverton,NJ 08077
(609) 829 7878

CERTIFICATE OF ANALYSIS

EPA Protocol Gas

CUSTOMER
SANDERS ENGINEERING & ANALYTIC
1568 LEROY STEVENS RD
MOBILE, AL 366959182

CUSTOMER PO NO:

Previous Certification Date(s):

CYLINDER NO	:	XC013178B
EXPIRATION DATE	:	03/12/04
CERTIFICATION DATE	:	03/13/01
CYLINDER PRESSURE	:	2000 psig
PRODUCT ID NO	:	02007102
LOT NUMBER	:	434169

ANALYTICAL INFORMATION

This calibration standard has been certified per the 1997 EPA Traceability Protocol, Document EPA-600/97/121, Using Procedure G1. All Values certified to be +/-1% NIST Traceable.

Do Not Use This Cylinder below 150 psig. i.e. 1.0 Megapascal

Analytical Results

Components	Requested Mixture	Certified Concentration	Analytical Uncertainty	Assay Dates
PROPANE	85.00 ppm	85.7 ppm	+/-1.00% NIST Traceable	03/12/01
AIR	BALANCE GAS			

CALIBRATION STANDARDS USED IN ASSAY

Type	LOT ID	Cylinder No	Concentration	Expiration
NTRM 81668	99060211	XC003445B	93.90 +/- 0.60 ppm C3H8/AIR	01/01/03

ANALYTICAL INSTRUMENTS USED IN ASSAY

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
H-P 5890 3022A29265	Gas Chromatography	03/10/01

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A Delaware Corporation

Page: 1 Of 1

QA Approved

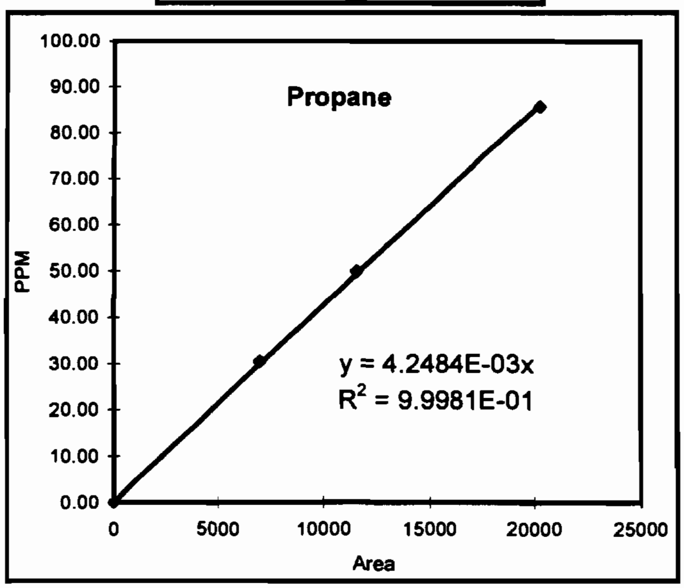
Gas Chromatograph VOC Calibration Data
Gulf Power Company
Plant Crist, Unit 4
Carbonaceous Material
2/20/2003

Point Number 1	
Gas	Propane
Concentration ppm	85.700
GC Injection	AREA
1	20242
2	20233
3	20371
AVERAGE	20282
GC Injection	% Difference
1	-0.2
2	-0.2
3	0.4

Point Number 2	
Gas	COS
Concentration ppm	49.800
GC Injection	AREA
1	11560
2	11655
3	
AVERAGE	11608
GC Injection	% Difference
1	-0.4
2	0.4
3	-100.0

Point Number 3	
Gas	COS
Concentration ppm	30.400
GC Injection	AREA
1	6999
2	7013
3	7072
AVERAGE	7028
GC Injection	% Difference
1	-0.4
2	-0.2
3	0.6

Propane	
area	ppm
20282	85.70
11608	49.80
7028	30.40
0.0	0

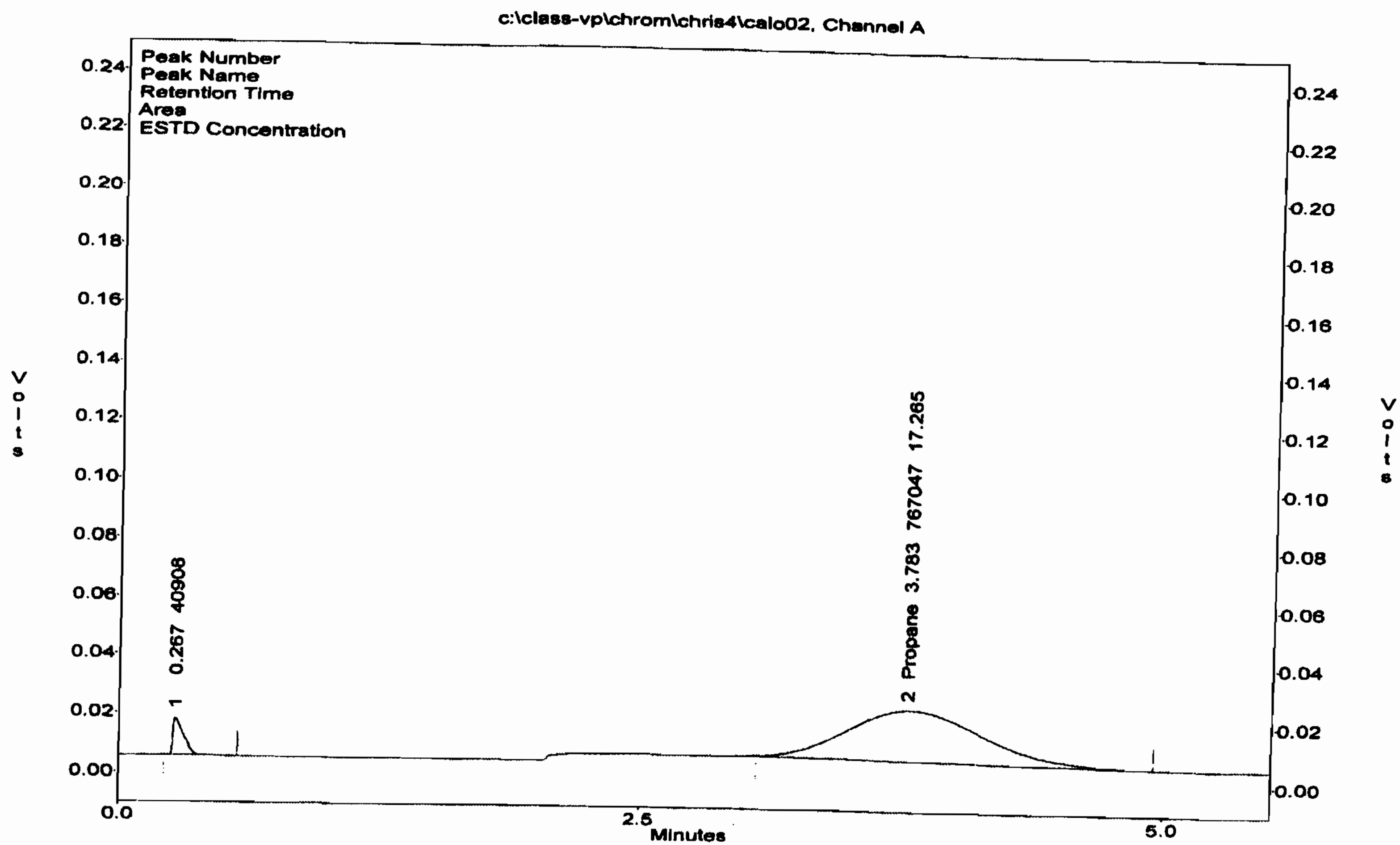


Dilution Factor Calculation EPA Cylinder Vaslue (ppm) = 49.3		
	GC Area	GC ppm
Inj. #1	121774	49.300
Inj. #2	125320	49.300
Inj. #3	123308	49.300
Average	123467	49.300
Dilution Factor =		1.000
Dilution Factor = Cylinder (ppm)/GC (ppm)		

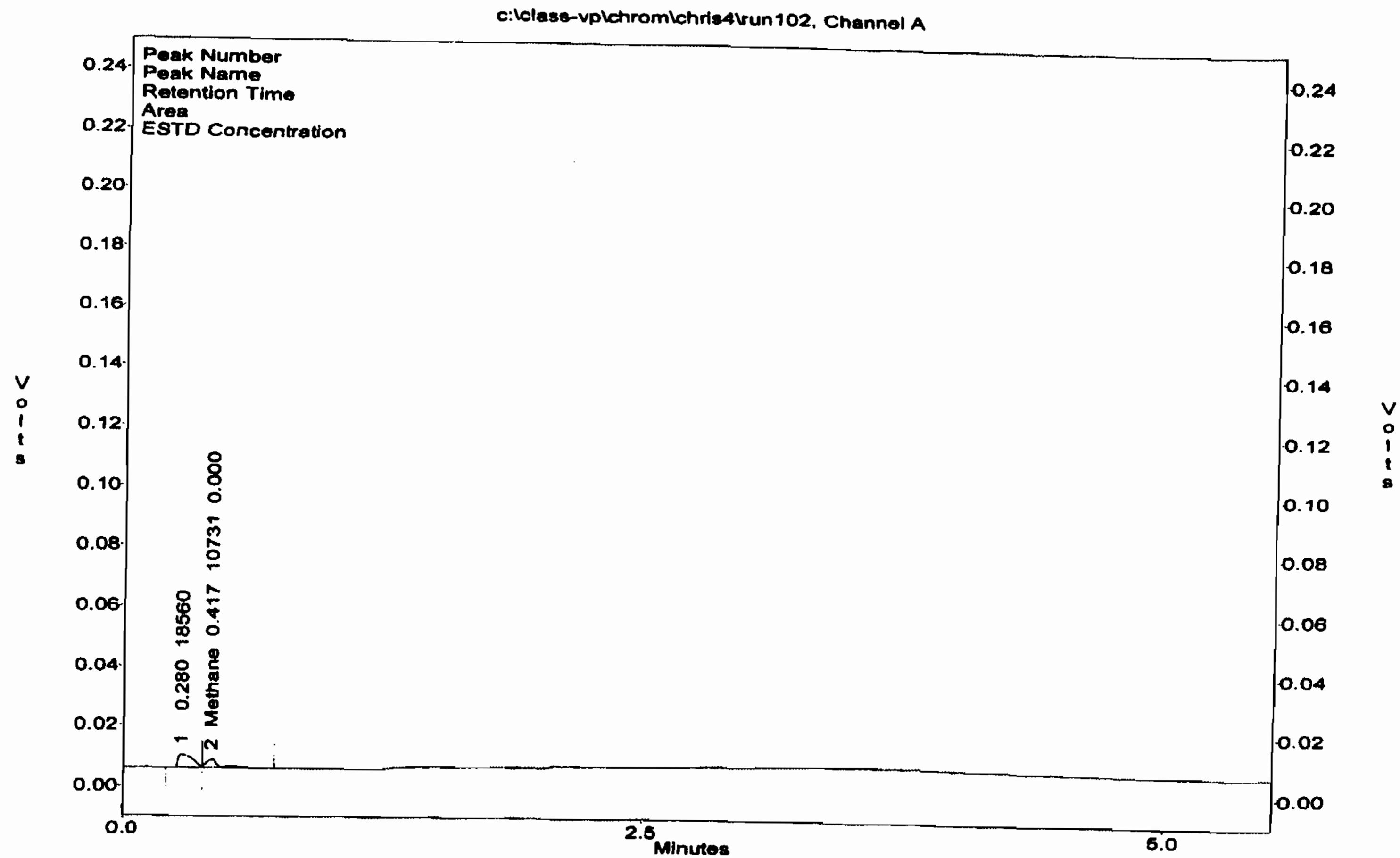
Calibration Factors	
Y=CX	Propane
Coefficient	4.248E-03

APPENDIX E EXAMPLE CHROMATOGRAMS

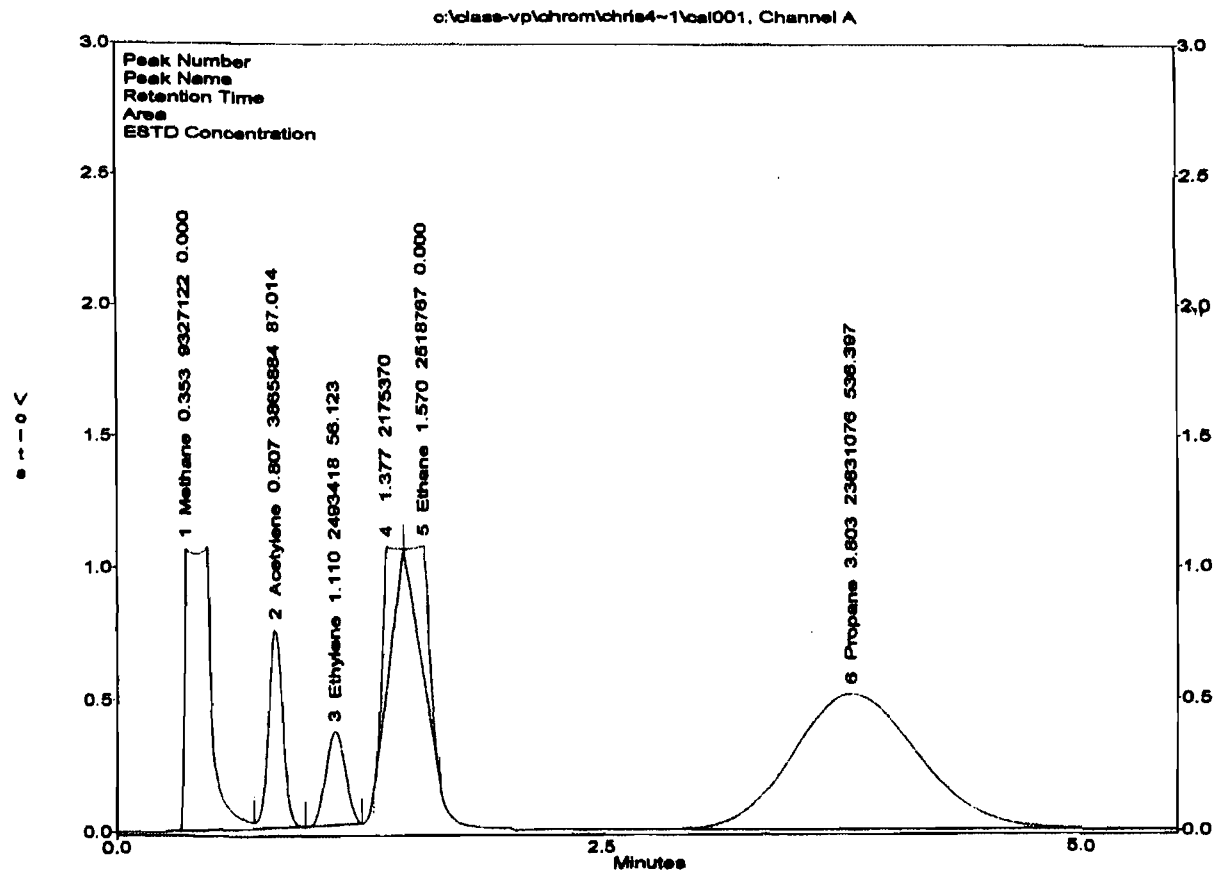
GAS CHROMATOGRAPHIC INJECTION OF 17.4 PARTS PER MILLION CALIBRATION GAS



GAS CHROMATOGRAPHIC INJECTION OF STACK GAS



GAS CHROMATOGRAM DEMONSTRATING COLUMN PERFORMANCE SEPERATING C-1 THROUGH C-3+ COMPOUNDS (METHANE, ACETYLENE, ETHYLENE, ETHANE, AND PROPANE+)



APPENDIX E OPERATIONAL DATA

Crist 4 **Carbonaceous Material (saw dust) Test**							
Maximum Allowable Heat Input: 1096.7 mmBtu/hr							
Steady State February 20, 2003							
					coal flow	Coal	LDMS
Run #	Load	Start	End	Duration	from LDMS	Analysis	results
	Gross MW	Time	Time	(Hours)	(tons)	Btu / lb	mmBtu's/hr
1	81.4	15:00	16:00	1.00	34.35	11578	795.4
2	79.8	16:18	17:18	1.00	33.60	11578	778.0
3	79.5	17:37	18:37	1.00	33.30	11578	771.1
	80.2					**Average**	781.5
						Percent of Max Allowable	71%
						Load Limit if % < 90%	88

CEMS OPACITY DATA
Crist 4 Carbonaceous Material (saw dust) test Burn

Date	CEM Hour	Minutes									
		00	6	12	18	24	30	36	42	48	54
Steady State Testing											
02/20/03	15	8.1	8.8	8.3	7.8	6.8	7.2	6.5	6.2	6.1	5.8
02/20/03	16	6.0			6.1	6.3	5.9	6.1	6.1	6.0	6.3
02/20/03	17	6.3	6.0	6.0	5.9			5.8	5.9	5.9	5.9
02/20/03	18	5.8	5.9	6.1	6.1	6.1	6.2	6.1	6.1		

Gulf Power Plant Crist Unit 4
Carbonaceous Material (saw dust) Test Burn Test Notes
Steady State Testing 02/20/03

Run #1

Start Time		Notes
CDT	**CEMS**	Fuel Mix 95% coal 5% saw dust by weight
15:00	15:00	NOTE: CEMS time, not Central Daylight Time (CDT), is used on Sander's test report.
Stop Time		No operational problems noted during run
CDT	**CEMS**	"D" band wall sootblowers were blown
16:00	16:00	

Run #2

Start Time		Notes
CDT	**CEMS**	No operational problems noted.
16:18	16:18	
Stop Time		
CDT	**CEMS**	
17:18	17:18	

Run #3

Start Time		Notes
CDT	**CEMS**	No operational problems noted.
17:37	17:37	
Stop Time		
CDT	**CEMS**	
18:37	18:37	

Crist Plant CArbonaceous fuel Test Control Room Data TEST 3

Unit 4 Date 2/20/03

Check one: [ ] Sootblowing [ ] Steady-State (no sootblowing)

Unit Operator : NICK

Run	CEMS Time	Pulverizer Coal Integrators (x 100 pounds) A	B	C	D	Generation Digital Meter MW	Gross Generation Integrator MWhr	Main Steam Total Flow (x 10e6 lb/hr)	Boiler Air Flow (x 10e6 lb/hr)	Excess O2 Econ Outlet % A	Excess O2 Econ Outlet % B	Opacity 6 min Avg %	ID Fan Amps A	ID Fan Amps B	Gas Temp Air Htr Outlet deg F A	Gas Temp Air Htr Outlet deg F B	Soot Blowing Status	Data taken by (Initials)
#1 Start	1500	949265	276167	906841	719041	80.8	66.9	623	762	3.8	4.4	8.1	270		269	274	NO	GN
#1 End	1600	949456	276343	907016	719189	82	79.7	630	738	3.7	4.1	5.8	250		273	277	"D" BAND	GN
#2 Start	1618	949510	276395	907068	719232	79.6	82	618	718	3.5	3.9	6.3	250		273	278	NO	GN
#2 End	1718	949690	276577	907235	719378	80.1	81.1	620	720	3.4	4.0	5.9	250		278	278	NO	GN
#3 Start	17:37	949747	276638	907289	719429	79.3	81.1	613	712	3.5	3.6	5.9	249		274	279	NO	NR
#3 End	18:37	949936	276838	907464	719584	79.6	80.0	615	718	3.6	4.2	6.0	240		276	279	NO	NR

Operational Comments

Run #1	BLEW "D" BAND (LOW WALL) SOOT BLOWERS
Run #2	
Run #3	

Inside Operator Nicol

Outside Operator (Coal Samples) P. Lee

Laboratoryman (Ash Samples)

Electrician (ESP Readings)

Operator Pulling Fly Ash Potts

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 20-Feb-03

Laboratory Account : 1CRI04
Received Date : 25-Feb-03

Description : Gulf Power Plant Crist Unit 4

SAWDUST Composite

Laboratory ID Number : AH05512

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.33	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13278	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	22	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	4.5	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.80	% By Weight
Ash, As Received	ASTM D 5142	4.65	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11578	Btu/lb
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	0.50	% By Weight
Lead, As Received	ASTM D6357	3.9	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.15	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.66	% By Weight
Barium, Ignited Basis	ASTM D 3683	1887.	mg/kg
Iron, Ignited Basis	ASTM D 3682	5.37	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.10	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.33	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ______________________ **Supervision**__________________________ Date : 3/25/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 20-Feb-03
Laboratory Account : 1CRI04
Received Date : 25-Feb-03

Description : Gulf Power Plant Crist Unit 4

SAWDUST Composite

Laboratory ID Number : AH05512

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.78	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Lead, Ignited Basis	ASTM D 6357	84.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.85	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.68	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.33	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.33	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.45	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14026	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.429	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ______________________ **Supervision** ____________________________ Date : 3/25/2003

smk/coa

HOT SIDE 4 ¢ – PROGRAM 1

B 7 6 5 NUMBER

GROUP NO.	FIELD NAME	REPEAT TIME	LIFT HEIGHT (LIFT / IMPACTS / FREQUENCY) / ON TIME (HRS / MIN / SEC) / ON TIME (ON TIME / INTENSITY)	REST TIME	P.O.R. TIME	RAP DIRECTION	STARTING RAPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACG	DUTY CYCLES INTERBEA
1	H4P1	2:05	10	4.0		Asc.	1	MAX	1			
2	H4P2	4:03	10				7		1			
3	H4P3	6:05	10				13		1			
4	H4P4	10:07	10				19		1			
5	H4P5	13:13	10				25		1			
6	H4P6	16:01	10				31		1			
7	H4P7	21:07	10				37		1			
8	H4P8	26:11	10				43		1			
9	H4P9	31:37	10				49		1			
10	H4W	5:01	5 SEC/100%				1		2			
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

D

C

B

a J 4 COLD LOC

8 | 7 | 6 | 5 | NUMBER

D

GROUP NO. (1)	FIELD NAME (2)	REPEAT TIME (3)	LIFT HEIGHT (4)(5) / LIFT / ON TIME (6) / HRS / ON TIME (7) / ON TIME	IMPACTS / MIN	FREQUENCY / SEC / INTENSITY	REST TIME (8)	P.O.R. TIME (9)	RAP DIRECTION (10)	STARTING RAPPER (11)	(REST) MODE (12)	ANTI-COINCIDENCE GROUP (13)	DUTY CYCLES FIELD (14)	DUTY CYCLES ACG	DUTY CYCLES INTERLEAVE
1	C4LA	1:03 2:03	3.6	1	1	0:10	-	ASC	01	MAX	1	48	179	3
2	C4TA	1:59 3:59	3.6	1	1	0:10	-	ASC	04	MAX	1	25	179	1
3	C4LB	3:01 6:01	3.6	1	1	0:10	-	ASC	07	MAX	1	17	179	1
4	C4TB	3:51 9:51	3.6	1	1	0:10	-	ASC	10	MAX	1	13	179	1
5	C4LC	6:17 15:17	3.6	1	1	0:10	-	ASC	13	MAX	1	8	179	0
6	C4TC	7:03 25:03	3.6	1	1	0:10	-	ASC	16	MAX	1	7	179	0
7	C4EA	2:01	3.4	1	1	0:10	-	ASC	01	MAX	1	33	179	2
8	C4EB	3:59	3.4	1	1	0:10	-	ASC	05	MAX	1	17	179	1
9	C4EC	6:03	3.4	1	1	0:10	-	ASC	09	MAX	1	11	179	1
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														

C

B

8 | 7 | 6 | 5 | NUMBER | 3

GROUP NO.	FIELD NAME	REPEAT TIME (MIN)	LIFT HEIGHT (LIFT / IMPACTS / FREQUENCY); ON TIME (HRS / MIN / SEC); ON TIME / INTENSITY	REST TIME SEC	P.O.R. TIME	RAP DIRECTION	STARTING RAPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACC	DUTY CYCLES INTERWEAVE
1	CSP1	2:03	5.0 4FT	2.0		ASC.	1	MAX	1	10	17	3
2	CSP2	5:13	5.0	2.0		ASC.	4	MAX	1	4	17	1
3	CSP3	9:19	5.0	2.0		ASC.	7	MAX	1	1	17	0
4	CSP4	13:03	5.0	2.0		ASC.	10	MAX	1	1	17	0
5	CSW	6:00	5.0	2.0		ASC.	13	MAX	1	1	17	0
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												

D

C

B

Crist 4 Carbonaceous Fuel Test Precipitator Data

Unit 4 Date 2/20/03 Run # 1 Sootblow Steady State

HOT SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1500 Data taken by KB								
A	4	0	19	241	.18	29	5	80
B	25	0	45	294	.4	32	15	84
C	25	0	62	279	.35	28	9	88
D	25	0	57	275	.31	26	9	88
E	11	0	27	269	.20	22	6	79
F	1	0	91	339	.85	22	29	130
Run Stop Time 1600 Data taken by KB								
A	7	0	24	242	.18	29	5	80
B	25	0	53	297	.55	32	14	87
C	24	0	61	317	.38	27	16	114
D	24	0	62	322	.52	27	15	96
E	11	0	33	305	.16	24	9	89
F	2	0	91	337	.85	22	28	130

COLD SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1500 Data taken by KB								
A	5	0	37	487	.29	39	16	150
B	1	0	56	388	.37	42	18	115
C	0	0	58	294	.51	38	1	160
Run End Time 1600 Data taken by KB								
A	10	0	37	486	.29	43	16	150
B	2	0	56	388	.37	42	18	115
C	0	0	58	293	.51	38	1	160

Comments

Crist 4, Carbonaceous fuel Test Precipitator Data

Unit 4 Date 2/20/03 Run # 2 Sootblow Steady State

HOT SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1618		Data taken by KB						
A	8	0	30	243	.14	26	2	63
B	25	0	62	293	.65	31	17	94
C	25	0	61	291	.41	29	21	123
D	25	0	55	269	.47	26	16	103
E	10	0	29	288	.23	25	11	81
F	1	0	90	339	.84	22	28	130
Run Stop Time 1718		Data taken by KB						
A	4	0	30	238	.18	29	5	80
B	25	0	60	300	.46	31	11	80
C	25	0	55	265	.52	27	15	123
D	25	0	66	291	.39	26	16	114
E	11	0	36	282	.21	22	3	65
F	0	0	92	337	.85	22	29	130

COLD SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1618		Data taken by KB						
A	10	0	33	445	.29	43	16	150
B	1	0	57	388	.37	42	18	115
C	0	0	58	293	.51	38	1	160
Run End Time 1718		Data taken by KB						
A	6	0	37	431	.23	42	16	150
B	0	0	57	387	.37	42	18	115
C	0	0	58	295	.51	38	1	160

Comments

Crist 4, Carbonaceous Fuel Test Precipitator Data

Unit 4 Date 2/20/03 Run # 3 Sootblow Steady State

HOT SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1737 Data taken by KB								
A	10	0	30	200	.12	27	5	80
B	26	0	40	270	.45	31	13	82
C	25	0	55	277	.37	27	15	111
D	25	0	60	277	.37	26	15	105
E	11	0	27	268	.17	25	10	77
F	9	0	91	341	.85	22	29	130
Run Stop Time 1837 Data taken by KB								
A	8	0	26	240	.18	29	5	80
B	24	0	70	301	.56	28	8	63
C	26	0	89	277	.64	25	20	112
D	25	0	59	288	.35	26	17	115
E	11	0	40	277	.19	23	6	76
F	0	0	92	335	.82	22	29	130

COLD SIDE PRECIPITATOR								
Precipitator Cabinet	Sparks per Minute	Arcs per Minute	Primary Amps	Primary Volts	Secondary Amps	Secondary K Volts	Kilowatts	Firing Angle
Run Start Time 1737 Data taken by KB								
A	5	0	37	477	.29	43	16	150
B	0	0	57	387	.37	42	18	115
C	0	0	58	295	.51	38	1	160
Run End Time 1837 Data taken by KB								
A	8	0	34	488	.24	40	16	150
B	0	0	57	387	.37	42	18	115
C	0	0	58	293	.50	38	1	160

Comments

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.10	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13181	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.86	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.02	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.47	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.01	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	3.6	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.47	% By Weight
Ash, As Received	ASTM D 5142	4.46	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11537	Btu/lb
Carbon, As Received	ASTM D 5373	66.40	% By Weight
Hydrogen, As Received	ASTM D 5373	4.39	% By Weight
Nitrogen, As Received	ASTM D 5373	1.29	% By Weight
Oxygen, As Received	ASTM D 3176	10.51	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.47	% By Weight
Lead, As Received	ASTM D6357	3.2	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP

Description : Gulf Plant Crist Unit #4

Received Date : 26-Feb-03

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.97	% By Weight
Barium, Ignited Basis	ASTM D 3683	1861.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.65	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.83	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.09	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.39	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.68	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	71.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.40	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.31	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.90	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.82	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.53	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.20	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			

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Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

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TO: Kevin Beaty
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Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13889	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.410	lbs/mmBTU

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.70	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13207	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.20	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.01	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.52	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.00	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	3.8	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.56	% By Weight
Ash, As Received	ASTM D 5142	4.11	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11548	Btu/lb
Carbon, As Received	ASTM D 5373	66.63	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.33	% By Weight
Oxygen, As Received	ASTM D 3176	10.49	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.50	% By Weight
Lead, As Received	ASTM D6357	3.3	mg/kg
Mercury, As Received	ASTM D6414	0.066	mg/kg
Ignited as Element			

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Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.54	% By Weight
Barium, Ignited Basis	ASTM D 3683	2115.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.28	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.18	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.82	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.45	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.71	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	81.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.58	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.67	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.42	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.24	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.61	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.28	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13858	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.432	lbs/mmBTU

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Quality Control ____________________ **Supervision** ________________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.05	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13258	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.07	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.48	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.92	% By Weight
Fluorine, Dry Basis	ASTM D 5987	22	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.55	% By Weight
Lead, Dry Basis	ASTM D6357	3.5	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.91	% By Weight
Ash, As Received	ASTM D 5142	4.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Carbon, As Received	ASTM D 5373	66.25	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.29	% By Weight
Oxygen, As Received	ASTM D 3176	10.38	% By Weight
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.0	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Bobby Watkins

Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

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TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.35	% By Weight
Barium, Ignited Basis	ASTM D 3683	1858.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.14	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.19	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.38	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.65	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Lead, Ignited Basis	ASTM D 6357	68.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.22	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.35	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.44	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.00	% By Weight
General			

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Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13963	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.415	lbs/mmBTU

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Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury in Coal, NBS 1632c	EPA 3051	0.09568	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.95	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13185	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.26	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.85	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.80	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.65	% By Weight
Lead, Dry Basis	ASTM D6357	2.3	mg/kg
Mercury, Dry	ASTM D6414	0.086	mg/kg
As Received			
Moisture, Total	ASTM D 2013	13.01	% By Weight
Ash, As Received	ASTM D 5142	5.18	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11470	Btu/lb
Carbon, As Received	ASTM D 5373	65.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.22	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.26	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.57	% By Weight
Lead, As Received	ASTM D6357	2.0	mg/kg

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Quality Control ______________________ **Supervision** ____________________________ Date : 4/2/2003

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Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury, As Received	ASTM D6414	0.075	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.78	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.42	% By Weight
Barium, Ignited Basis	ASTM D 3683	2103.	mg/kg
Iron, Ignited Basis	ASTM D 3682	6.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.31	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.55	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.33	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.49	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	37.9	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.99	% By Weight
Iron Oxide, Ignited	ASTM D 3682	8.86	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.58	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.66	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.44	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.72	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

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Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14019	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.493	lbs/mmBTU

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Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.85	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13292	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.84	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.31	% By Weight
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.58	% By Weight
Lead, Dry Basis	ASTM D6357	4.4	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.90	% By Weight
Ash, As Received	ASTM D 5142	4.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11577	Btu/lb
Carbon, As Received	ASTM D 5373	66.06	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.72	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.51	% By Weight
Lead, As Received	ASTM D6357	3.8	mg/kg
Mercury, As Received	ASTM D6414	0.065	mg/kg
Ignited as Element			

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.21	% By Weight
Barium, Ignited Basis	ASTM D 3683	1968.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.76	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.41	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.14	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.23	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.43	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.74	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Lead, Ignited Basis	ASTM D 6357	89.7	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.96	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.46	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.12	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.58	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.35	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**__________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13970	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.436	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**___________________________ Date : 4/2/2003

smk/coa

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Birmingham, Alabama 35291
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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.64	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13203	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.32	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.97	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.50	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.03	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	4.2	mg/kg
Mercury, Dry	ASTM D6414	0.054	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.99	% By Weight
Ash, As Received	ASTM D 5142	4.08	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11620	Btu/lb
Carbon, As Received	ASTM D 5373	67.17	% By Weight
Hydrogen, As Received	ASTM D 5373	4.37	% By Weight
Nitrogen, As Received	ASTM D 5373	1.32	% By Weight
Oxygen, As Received	ASTM D 3176	10.59	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.7	mg/kg
Mercury, As Received	ASTM D6414	0.048	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.25	% By Weight
Barium, Ignited Basis	ASTM D 3683	1960.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.89	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.94	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.10	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.58	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.44	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.54	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Lead, Ignited Basis	ASTM D 6357	91.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.64	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.06	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.33	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.87	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.59	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

smk/coa

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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13845	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.409	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
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Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.41	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13046	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.94	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.44	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.85	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.46	% By Weight
Lead, Dry Basis	ASTM D6357	2.2	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.27	% By Weight
Ash, As Received	ASTM D 5142	4.75	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11445	Btu/lb
Carbon, As Received	ASTM D 5373	65.74	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.26	% By Weight
Oxygen, As Received	ASTM D 3176	11.27	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.39	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	1952.	mg/kg
Iron, Ignited Basis	ASTM D 3682	4.01	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	27.86	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.36	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.97	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.55	% By Weight
Lead, Ignited Basis	ASTM D 6357	40.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.41	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	5.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	59.60	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.49	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.93	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.92	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**____________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13792	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.353	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**__________________________ Date : 4/2/2003

smk/csa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	5.10	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13181	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	3.6	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.47	% By Weight
Ash, As Received	ASTM D 5142	4.46	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11537	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.47	% By Weight
Lead, As Received	ASTM D6357	3.2	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.97	% By Weight
Barium, Ignited Basis	ASTM D 3683	1861.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.65	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.83	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.09	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control Supervision ____________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.39	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.68	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	71.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.40	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.31	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.90	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.82	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.53	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.20	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13889	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.410	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision______________________

Date : 3/25/2003

smk/coal

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	4.70	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13207	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	3.8	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.56	% By Weight
Ash, As Received	ASTM D 5142	4.11	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11548	Btu/lb
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.50	% By Weight
Lead, As Received	ASTM D6357	3.3	mg/kg
Mercury, As Received	ASTM D6414	0.066	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.54	% By Weight
Barium, Ignited Basis	ASTM D 3683	2115.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.28	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.18	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.82	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________
Supervision ____________________

Date : 3/25/2003

smk/coal

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.45	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.71	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	81.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.58	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.67	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.42	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.24	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.61	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.28	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13858	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.432	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision______________________

Date : 3/25/2003

smk/coal

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account CRI04SP

Description : Gulf Plant Crist Unit #4

Received Date : 26-Feb-03

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	5.05	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13258	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	22	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.55	% By Weight
Lead, Dry Basis	ASTM D6357	3.5	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.91	% By Weight
Ash, As Received	ASTM D 5142	4.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.0	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.35	% By Weight
Barium, Ignited Basis	ASTM D 3683	1858.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.14	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.19	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.38	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision______________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.65	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Lead, Ignited Basis	ASTM D 6357	68.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.22	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.35	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.44	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.00	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13963	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.415	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________
Supervision______________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 19-Feb-03
Laboratory Account CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05250

Test Name	Reference	Result	
Dry Basis			
Ash, Dry	ASTM D 5142	4.39	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13397	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	15	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.44	% By Weight
Lead, Dry Basis	ASTM D6357	1.7	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	8.79	% By Weight
Ash, As Received	ASTM D 5142	4.00	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12219	Btu/lb
Fluorine, As Received	ASTM D 5987	14	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.6	mg/kg
Mercury, As Received	ASTM D6414	0.068	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	14.46	% By Weight
Barium, Ignited Basis	ASTM D 3683	2473.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.99	% By Weight
Iron, Ignited Basis	ASTM D 3682	3.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.32	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ____________________
Supervision ____________________

Date : 3/25/2003

smk/coal

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 19-Feb-03

Laboratory Account CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05250

Test Name	Reference	Result	
Sodium, Ignited Basis	ASTM D 3682	0.37	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.05	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	38.3	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	27.32	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.78	% By Weight
Iron Oxide, Ignited	ASTM D 3682	4.57	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.01	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.31	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14012	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.328	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ____________________
Supervision________________________

Date : 3/25/2003

smk/

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03

Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05270

Test Name	Reference	Result	Units
Mercury in Coal, NBS 1632c	EPA 3051	0.09673	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.00	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13210	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.48	% By Weight
Lead, Dry Basis	ASTM D6357	2.0	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.22	% By Weight
Ash, As Received	ASTM D 5142	4.39	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11596	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.42	% By Weight
Lead, As Received	ASTM D6357	1.8	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.91	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.78	% By Weight
Barium, Ignited Basis	ASTM D 3683	2137.	mg/kg
Iron, Ignited Basis	ASTM D 3682	4.61	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.08	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________ Date : 3/25/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03
Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05270

Test Name	Reference	Result	Units
Potassium, Ignited Basis	ASTM D 3682	1.05	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.75	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.38	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.02	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.58	% By Weight
Lead, Ignited Basis	ASTM D 6357	39.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.39	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.59	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.18	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.26	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	57.23	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.51	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.05	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.97	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13905	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.363	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ______________________ Date : 3/25/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03

Laboratory Account : CRISTSP

Description : Gulf Power - Plant Crist

Received Date : 25-Feb-03

Sawdust Composite

Laboratory ID Number : AH05566

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.28	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8674	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	11	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.03	% By Weight
Lead, Dry Basis	ASTM D6357	0.1	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	9.74	% By Weight
Ash, As Received	ASTM D 5142	0.25	% By Weight
Heat of Combustion, As Received	ASTM D 5865	7829	Btu/lb
Fluorine, As Received	ASTM D 5987	10	mg/kg
Sulfur, As Received	ASTM D 4239	0.03	% By Weight
Lead, As Received	ASTM D6357	0.1	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	1.66	% By Weight
Barium, Ignited Basis	ASTM D 3683	1402.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	29.36	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.82	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	7.07	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.46	% By Weight
Potassium, Ignited Basis	ASTM D 3682	17.77	% By Weight
Silicon, Ignited Basis	ASTM D 3682	3.09	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ______________________ Date : 3/25/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03

Laboratory Account : CRISTSP
Received Date : 25-Feb-03

Description : Gulf Power - Plant Crist

Sawdust Composite

Laboratory ID Number : AH05566

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	1.11	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	3.88	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.04	% By Weight
Lead, Ignited Basis	ASTM D 6357	25.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	3.14	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	41.08	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.17	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	11.72	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	3.35	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	21.41	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	6.61	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	9.70	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8698	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.035	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 3/25/2003

smk/coa

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

January 13, 2003

Ms. Sandra Veazey
Florida Department of Environmental Protection
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Ms. ~~Veazey~~ Sandra:

PLANT CRIST UNIT 4 – AIR PERMIT NO.: 0330045-004-AC
CARBONACEOUS MATERIAL (SAW DUST) TEST BURN EMISSION TESTS

Please find attached one copy of the Carbonaceous Material(saw dust) Test Burn Emission Tests Report for Plant Crist Unit 4 as required under Rule 62-297.310(8), FAC.

The emission testing was conducted by Sanders Engineering and Analytical Services, Inc. and Supervised by Gulf Power's Environmental Affairs Department. This testing was conducted to determine the feasibility of carbonaceous fuel use in an emissions reduction program for Units 4 and 5 at Plant Crist.

Should you have any questions concerning these reports, please call Dwain Waters at (850) 444-6527.

Sincerely,

Jim Vick

James O. Vick
Manager of Environmental Affairs

Enclosure:
Attachments:

Cc: J. W. Martin   J. M. Dominey   T. L. Wright
G. D. Waters   Charles Howton
file ENG 10-1-15 PCT *CR4* CORR

RECEIVED
JAN 1 3 2003
NORTHWEST FLORIDA
DEP

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

CARBONACEOUS MATERIAL TEST BURN
SAWDUST
PARTICULATE, CARBON MONOXIDE, OXYGEN, TOTAL VOLATILE ORGANIC COMPOUNDS, AND EXEMPT VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST REPORT

FOR
GULF POWER COMPANY

Plant Crist, Unit 4
Pensacola, Florida

December 19, 2002

1568 LEROY STEVENS ROAD
MOBILE, ALABAMA 36695
(251) 633-4120
FAX: (251) 633-2285
E-MAIL: sanders@sandersengineering.com

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.
An Environmental Engineering Firm Specializing in Air Emissions Measurement and Permitting
www.sandersengineering.com EMAIL: sanders@sandersengineering.com
Phone: 251-633-4120 1568 Leroy Stevens Rd.
Fax: 251-633-2285 Mobile, AL 36695

REPORT CERTIFICATION

I have reviewed the "Carbonaceous Material Test Burn Sawdust Particulate, Carbon Monoxide, Oxygen, Total Volatile Organic Compounds, and Exempt Volatile Organic Compounds Emissions Test Report" for the testing performed for Gulf Power Company on Unit 4 located at the Plant Crist facility. I hereby certify that it is authentic and accurate to the best of my knowledge.

Date: 1/7/03

Signature: ______________
Johnny W. Sanders, P.E. M.P.H.
President

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS) performed a baseline study while burning carbonaceous material for particulate, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. The testing was conducted December 19, 2002. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 1, 2, 3a, 4, 10, 17, and SEAS 2518.** Method 2518 is a gas chromatic method for the separation of exempt voc's (methane and ethane) from non-exempt voc's. Further discussions of the test methods are included later in the report.

The purpose of the testing was to gain additional information regarding the emission characteristics of the unit while burning carbonaceous material. The tests were conducted by Mr. Spencer Edwards, Mr. Joseph Sanders, and Mr. Clint Sanders of Sanders Engineering & Analytical Services, Inc., and were coordinated with Mr. Kevin Beaty of Gulf Power Company.

2. DESCRIPTION OF SAMPLING PROGRAM

The sampling program consisted of particulate, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions testing in compliance with US EPA methods. The following is a brief description of these types of tests.

2.1. Particulate Emissions Testing

The particulate sample was extracted from the stack isokinetically through a stainless steel nozzle and probe onto a pre-weighed glass fiber filter. The sample was taken at a series of points across the stack. Each point represented an equal area of stack. The isokinetic sampling rate and volumetric flow rate was monitored by an S-type pitot tube attached to the probe. Calibrations of the particulate testing equipment including pitots, thermocouples, magnehelics, and other measurement devices are included in Appendix A. A detailed description of the testing procedures and schematic of the sampling train is presented in Section 6. The field data is included in Appendix B. Sample calculations of Run 1 are presented in Appendix C.

2.2. Carbon Monoxide and Oxygen Emissions Testing

Gaseous emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe, a moisture removal system, and into instruments specifically designed for the measurement of the particular pollutant of interest. The instruments responded linearly to concentrations of the pollutants. The output of the instruments is a continuous analog voltage which is digitized and input into a PC based data acquisition system. The PC data acquisition system polls the instrument 1000 times per second. The computer averages these readings into one-second averages during calibrations and one minute averages at other times. These one second and one minute averages are written to the hard disk each minute to ensure no data loss due to power failure or other inadvertent occurrence. The computer stores in memory all calibration and stack gas analyses during each run. The average for each calibration and for each independent run were averaged for the time of the runs. A description of the testing procedures is included in Section 7. The Protocol 1 gas certifications are included in Appendix D.

2.3. Volatile Organic Compounds Emissions Testing

Volatile organic compounds emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe and heated teflon line into a gas chromatograph equipped with a flame ionization detector. The chromatograph divided the compounds into four specific organic compounds and one group of organic compounds. The four specific compounds are methane, acetylene, ethylene, and ethane. The group of compounds are all compounds which contain three or more carbon atoms (Propane+). The chromatograph was injected with a combination of these gases to ensure separation and then calibrated with Protocol 1 gases of propane. The calibration curve for propane was used to convert the area of each peak representing each compound into its equivalent part per million as propane. A description of the testing procedure is included in Section 8. The Protocol 1 gas certifications and calibration graph of propane versus peak area are included in Appendix C. A line loss/system check was performed at the beginning and end of each test by injecting a Protocol 1 propane in nitrogen calibration gas at the probe and measuring the concentration with at least two injections of the chromatograph. Appendix C contains a table which shows the results of these system checks. The raw data is corrected for the line loss/system check if greater than five percent. Example chromatograms are included in Appendix E.

3. SUMMARY AND DISCUSSION OF RESULTS

There were no unusual problems experienced during the performance of the testing. During the performance of the testing the average heat input, as based on F-factor calculations, was 783.01 million Btu per hour. The results of the particulate emissions testing are presented in Table I. The results for the carbon monoxide and volatile organic compounds emissions testing are presented in Table II. The quality assurance calculations for the carbon monoxide and oxygen testing are presented in Tables III and IV, respectively. A graphical representation of the carbon monoxide concentrations are presented in Figure 1. The volatile organic compounds stack gas analysis is presented in Table V.

Example chromatograms of a combination of a gas containing methane, acetylene, ethylene, ethane, and propane are shown in Appendix D. The purpose of these chromatograms is to show the gas chromatograph column performance in separating each of these compounds. Also included in Appendix D is the representative chromatogram of stack gas showing the only non-exempt volatile organic compounds.

The results of the testing for each parameter are as follows:

PARAMETER	Emission Rate
Particulate	0.005 lbs/mmBtu
Carbon Monoxide	31.4 lbs/hr
Volatile Organic Compounds	0.0 lbs/hr

TABLE I. SUMMARY OF PARTICULATE EMISSIONS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST
UNIT 4

Title of Run		RUN 1	RUN 2	RUN 3
Date of Test	Month/Day/Year	12/19/02	12/19/02	12/19/02
Sampling Time -Start	Military	1204	1337	1525
Sampling Time -Stop	Military	1306	1437	1702
Oxygen F Factor	SDCF/MMBTU	9726	9726	9726
Stack Static Pressure	Inches Water	-0.90	-0.90	-0.90
Barometric Pressure	Inches Mercury	29.75	29.75	29.75
Average Orifice Pressure (ΔH)	Inches Water	2.0	1.9	1.8
Meter Correction Factor		1.008	1.008	1.008
Average Meter Temperature	Degrees F	71.7	72.3	71.5
Oxygen Concentration	Percent O2	7.0	7.0	7.3
Carbon Dioxide Concentration	Percent CO2	13.5	12.0	12.5
Volume of Gas Metered	Cubic Feet	42.560	41.985	40.805
Volume of Water Collected	Milliliters	85.0	82.0	82.0
Sampling Time	Minutes	60	60	60
Nozzle Diameter	Inches	0.248	0.248	0.248
Average Stack Temperature	Deg. F	272.0	272.8	273.4
Area of Stack	Square Feet	92.1350	92.1350	92.1350
Weight of Solids Collected	Milligrams	5.4	5.6	7.5
Number of Points Sampled		30	30	30
Avg. Sqr. Root Velocity Press.	Inches Water	0.8176	0.8046	0.7938

RESULTS OF COMPUTATIONS

		RUN 1	RUN 2	RUN 3	Average
Volume of Gas Sampled	Standard Dry Cubic Feet	42.553	41.918	40.790	
Molecular Wt. of Stack Gas	LB/LB-MOLE	29.371	29.171	29.228	29.257
Water vapor in Stack Gas	Percent	8.6	8.4	8.6	8.6
Average Stack Gas Velocity	Feet per second	53.8	53.1	52.4	53.1
Stack Gas Flow Rate	Standard Dry Cubic Feet Per Minute	194,550	192,329	189,057	191,979
Stack Gas Flow Rate	Standard Wet Cubic Feet Per Minute	212,842	210,038	206,946	209,942
Stack Gas Flow Rate	Actual Cubic Feet Per Minute	297,411	293,813	289,725	293,650
Stack Gas Flow Rate	Pounds Dry Air per Hour	877,803	867,779	853,016	866,199
Particulate Concentration	Grains per Standard Dry Cubic Foot	0.00195	0.00206	0.00283	0.00228
Particulate Concentration	Grains per Actual Cubic Foot	0.00128	0.00135	0.00185	0.00149
Particulate Emission Rate	Pounds per Hour	3.3	3.4	4.6	3.7
Particulate Emission Rate	Pounds per Million Btu (O2 F Factor)	0.004	0.004	0.006	0.005
Heat Input (O2 F Factor)	Million Btu per Hour	798.21	789.10	761.72	783.01
Isokinetic Rate	Percent	100.2	99.8	98.8	

TABLE II. CARBON MONOXIDE AND VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST RESULTS

GULF POWER COMPANY
PLANT CRIST
UNIT 4

TEST	START TIME Military	STOP TIME Military	STACK GAS FLOWRATE (sdcfm)	WATER VAPOR IN STACK GAS (percent)	F FACTOR Oxygen (Dry) (sdcf/MMbtu)	OXYGEN (Dry) (measured) (Percent)	OXYGEN (Wet) (calculated) (Percent)	Carbon Monoxide Emissions (ppm-dry)	Carbon Monoxide Emissions (ppm-wet)	Carbon Monoxide Emissions (O2 F factor) (lbs/MMbtu)	Carbon Monoxide Emissions (lbs/hour)	Carbon Monoxide Emissions (Tons/Year)
RUN 1	12:04	13:04	194550	8.6	9780	7.0	6.4	49.44	45.19	0.0527	42.0	183.8
RUN 2	13:36	14:36	192329	8.4	9780	6.9	6.3	42.62	39.02	0.0452	35.8	156.6
RUN 3	15:25	17:00	189057	8.6	9780	7.1	6.5	20.08	18.34	0.0217	16.6	72.5
Average			**191979**	**8.6**		**7.0**	**6.4**	**37.38**	**34.19**	**0.0399**	**31.4**	**137.7**

TEST	START TIME Military	STOP TIME Military	Volatile Organic Compounds Emissions (ppm-wet)	Volatile Organic Compounds Emissions (ppm-dry)	Volatile Organic Compounds Emissions (O2 F factor) (lbs/MMbtu)	Volatile Organic Compounds Emissions (lbs/hour)	Volatile Organic Compounds Emissions (Tons/Year)
RUN 1	12:04	13:04	0.00	0.00	0.0000	0.0	0.0
RUN 2	13:36	14:36	0.00	0.00	0.0000	0.0	0.0
RUN 3	15:25	17:00	0.00	0.00	0.0000	0.0	0.0
Average			**0.00**	**0.00**	**0.00**	**0.0**	**0.0**

TABLE III. CARBON MONOXIDE TESTING QUALITY ASSURANCE

GULF POWER COMPANY

PLANT CRIST

UNIT 4

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =		1000	ANALYZER ID.	HORIBA 331A
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	*0*	*0.0*	0.0	0.0
High Range Gas	*901*	*901.0*	0.0	0.0
Mid Range Gas	*50*	*51.8*	-1.8	-0.2

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry							system zero bias & drift			system upscale bias & drift			test results
start time of Run	RUN #	*ANALYZER stack gas concentration uncorrected (PPM)*	*system Zero (PPM)*	*system upscale (PPM)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)*	*ANALYZER SPAN (PPM)*	INITIAL SYSTEM ZERO CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	CARBON MONOXIDE CONCENTRATION (PPM-DRY)
	<	INITIAL SYSTEM	*1.1*	*48.6*									
12:04	*1* Run 1	*48.7*	*-1.0*	*49.9*	*50.0*	*1000.0*	0.1	-0.1	-0.2	-0.3	-0.2	0.1	49.4
13:36	*1* Run 2	*41.9*	*-1.2*	*48.8*	*50.0*	*1000.0*	-0.1	-0.1	0.0	-0.2	-0.3	-0.1	42.6
15:25	*1* Run 3	*19.5*	*0.0*	*50.1*	*50.0*	*1000.0*	-0.1	0.0	0.1	-0.3	-0.2	0.1	20.1

TABLE IV. OXYGEN TESTING QUALITY ASSURANCE

GULF POWER COMPANY
PLANT CRIST
UNIT 4

Analyzer Calibration Data

INITIAL ANALYZER SPAN (%) =	25.0		ANALYZER ID	O2
	CYLINDER VALUE Percent	ANALYZER RESPONSE (Percent)	DIFFERENCE (Percent)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	*0*	*0.0*	0.0	0.0
High Range Gas	*20.9*	*20.9*	0.0	0.0
Mid Range Gas	*10*	*10.1*	-0.1	-0.4

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (Percent)*	*system Zero (Percent)*	*system upscale (Percent)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (Percent)*	*ANALYZER SPAN (Percent)*	INITIAL SYSTEM ZERO CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	OXYGEN CONCENTRATION (Percent-Dry)
		INITIAL SYSTEM		*0.0*	*20.9*									
12:04	*13:04*	Run 1	*7.0*	*0.1*	*20.9*	*20.9*	*25.0*	0.0	0.4	0.4	0.0	0.0	0.0	7.0
13:36	*14:36*	Run 2	*7.0*	*0.1*	*21.1*	*20.9*	*25.0*	0.4	0.4	0.0	0.0	0.8	0.8	6.9
15:25	*15:58*	Run 3	*7.3*	*0.1*	*21.1*	*20.9*	*25.0*	0.4	0.4	0.0	0.8	0.8	0.0	7.1

FIGURE 1. CARBON MONOXIDE AND OXYGEN STACK GAS CONCENTRATIONS

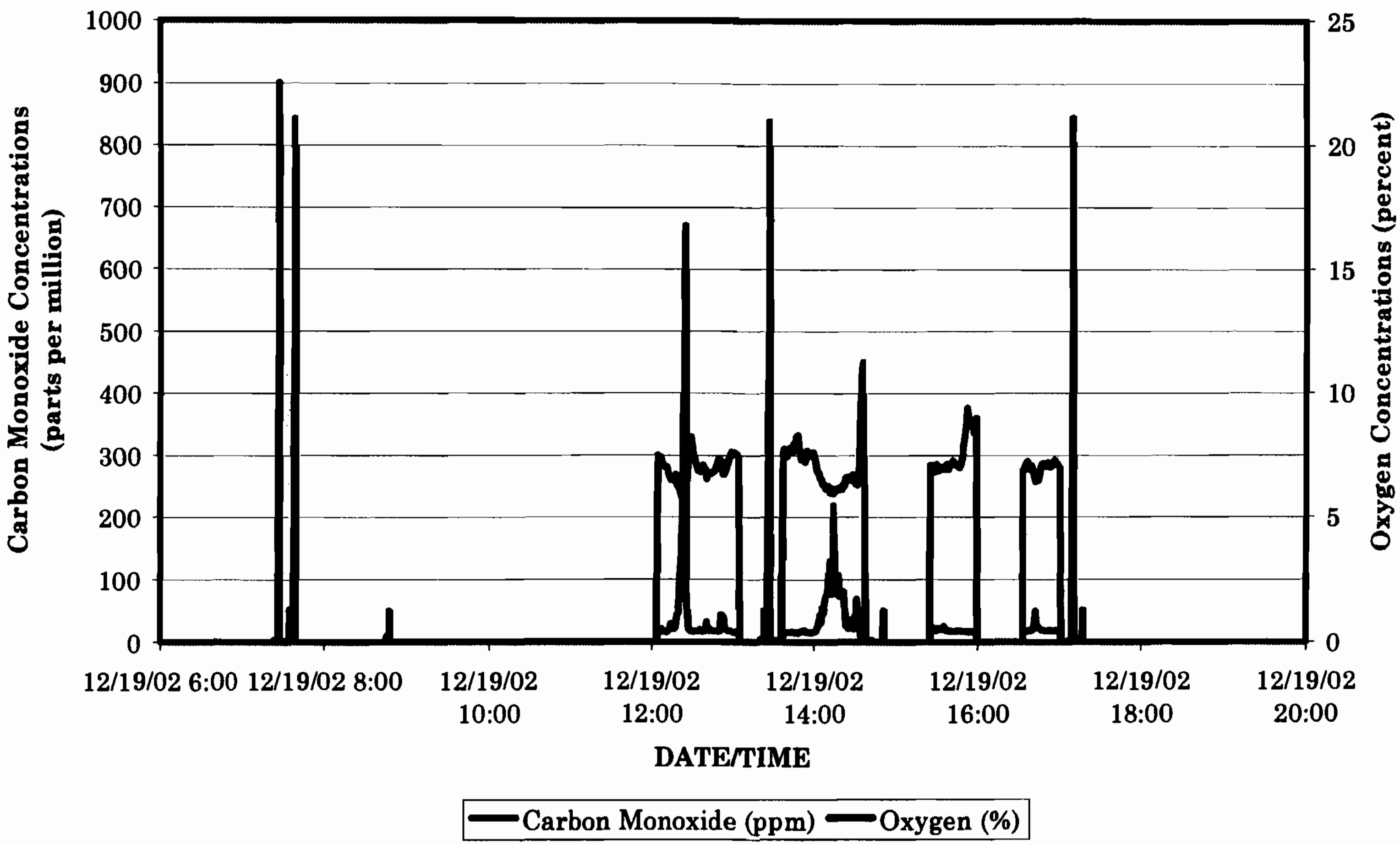


TABLE V. VOLATILE ORGANIC COMPOUNDS STACK GAS ANALYSIS

	Injection Number	Injection Time	Acetylene area	Ethylene area	Propane area	Total area	Total VOC ppm	Corrected ppm Line Loss
system check 5.9			0	0	271862	271862	6.25	
system check 5.9			0	0	267150	267150	6.10	
Run 1	Injection 1	11:59:14	0	0	0	0	0.00	
Run 1	Injection 2	12:05:14	0	0	0	0	0.00	
Run 1	Injection 3	12:11:14	0	0	0	0	0.00	
Run 1	Injection 4	12:17:14	0	0	0	0	0.00	
Run 1	Injection 5	12:23:14	0	0	0	0	0.00	
Run 1	Injection 6	12:29:14	0	0	0	0	0.00	
Run 1	Injection 7	12:35:14	0	0	0	0	0.00	
Run 1	Injection 8	12:41:14	0	0	0	0	0.00	
Run 1	Injection 9	12:47:14	0	0	0	0	0.00	
Run 1	Injection 10	12:53:14	0	0	0	0	0.00	
Run 1	**Average**		**0.0**	**0.0**	**0**	**0**	**0.00**	**0.00**
system check 5.9			0	0	271862	271862	6.21	
system check 5.9			0	0	267150	267150	6.10	-4.38%
Run 2	Injection 1	13:31:56	0	0	0	0	0.00	
Run 2	Injection 2	13:37:56	0	0	0	0	0.00	
Run 2	Injection 3	13:43:56	0	0	0	0	0.00	
Run 2	Injection 4	13:49:56	0	0	0	0	0.00	
Run 2	Injection 5	13:55:56	0	0	0	0	0.00	
Run 2	Injection 6	14:01:56	0	0	0	0	0.00	
Run 2	Injection 7	14:07:56	0	0	0	0	0.00	
Run 2	Injection 8	14:13:56	0	0	0	0	0.00	
Run 2	Injection 9	14:19:56	0	0	0	0	0.00	
Run 2	Injection 10	14:25:56	0	0	0	0	0.00	
Run 2	**Average**		**0.0**	**0.0**	**0**	**0**	**0.00**	**0.00**
system check 5.9			0	0	251447	251447	5.75	
system check 5.9			0	0	275360	275360	6.29	-2.01%
Run 3	Injection 1	15:20:06	0	0	0	0	0.00	
Run 3	Injection 2	15:26:06	0	0	0	0	0.00	
Run 3	Injection 3	15:32:06	0	0	0	0	0.00	
Run 3	Injection 4	15:38:06	0	0	0	0	0.00	
Run 3	Injection 5	15:44:06	0	0	0	0	0.00	
Run 3	Injection 6	15:50:06	0	0	0	0	0.00	
Run 3	Injection 7	16:28:15	0	0	0	0	0.00	
Run 3	Injection 8	16:34:15	0	0	0	0	0.00	
Run 3	Injection 9	16:40:15	0	0	0	0	0.00	
Run 3	Injection 10	16:46:15	0	0	0	0	0.00	
Run 3	**Average**		**0.0**	**0.0**	**0**	**0**	**0.00**	**0.00**
system check 5.9			0	0	279729	279729	6.39	
system check 5.9			0	0	250214	250214	5.72	-2.62%

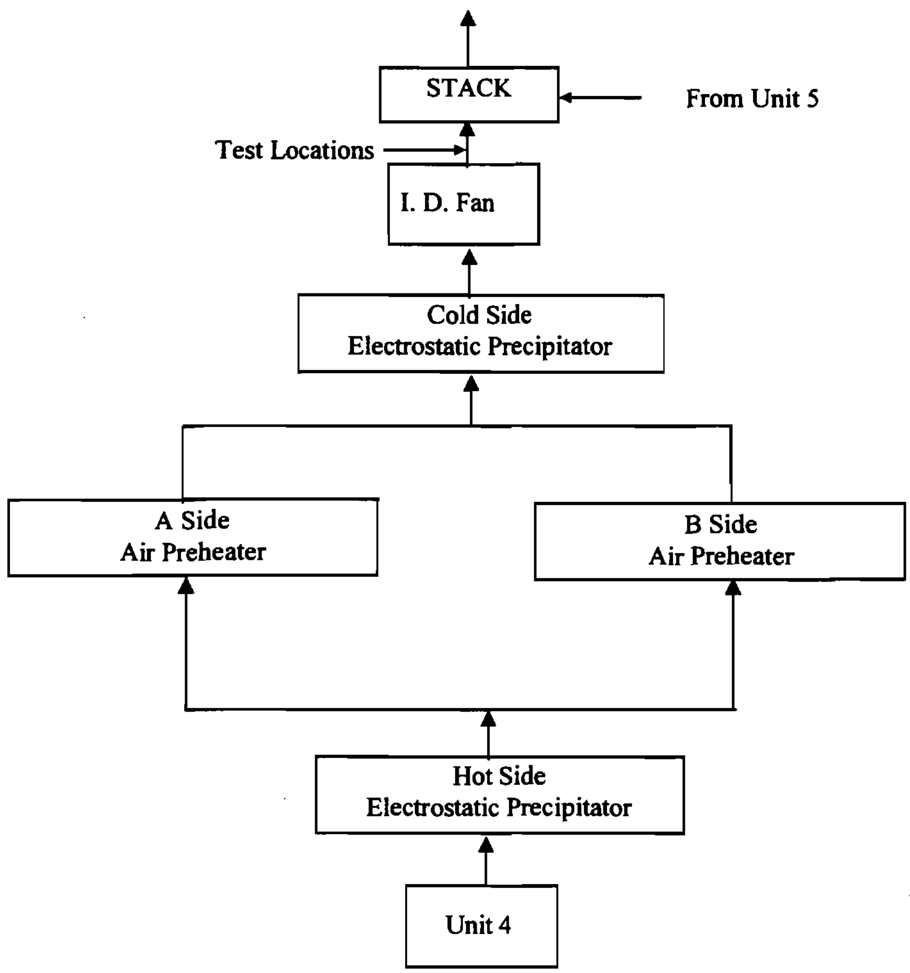
4. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by barge, and loaded directly onto the conveyor feeding the plant or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 36 to 48 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators. In addition to the coal fired in the boiler saw dust was added from a hopper to the conveyor belt transporting the coal to the boiler.

4.1. Source Air Flow

As shown in Figure 2, the flue gases exit the boiler and flow through a hot side precipitator. The exhaust gases are separated into ducts A and B before entering air preheaters. The exhaust gases are combined before entering a cold side ESP. The flue gases exiting the cold side ESP are exhausted through a stack into the atmosphere.

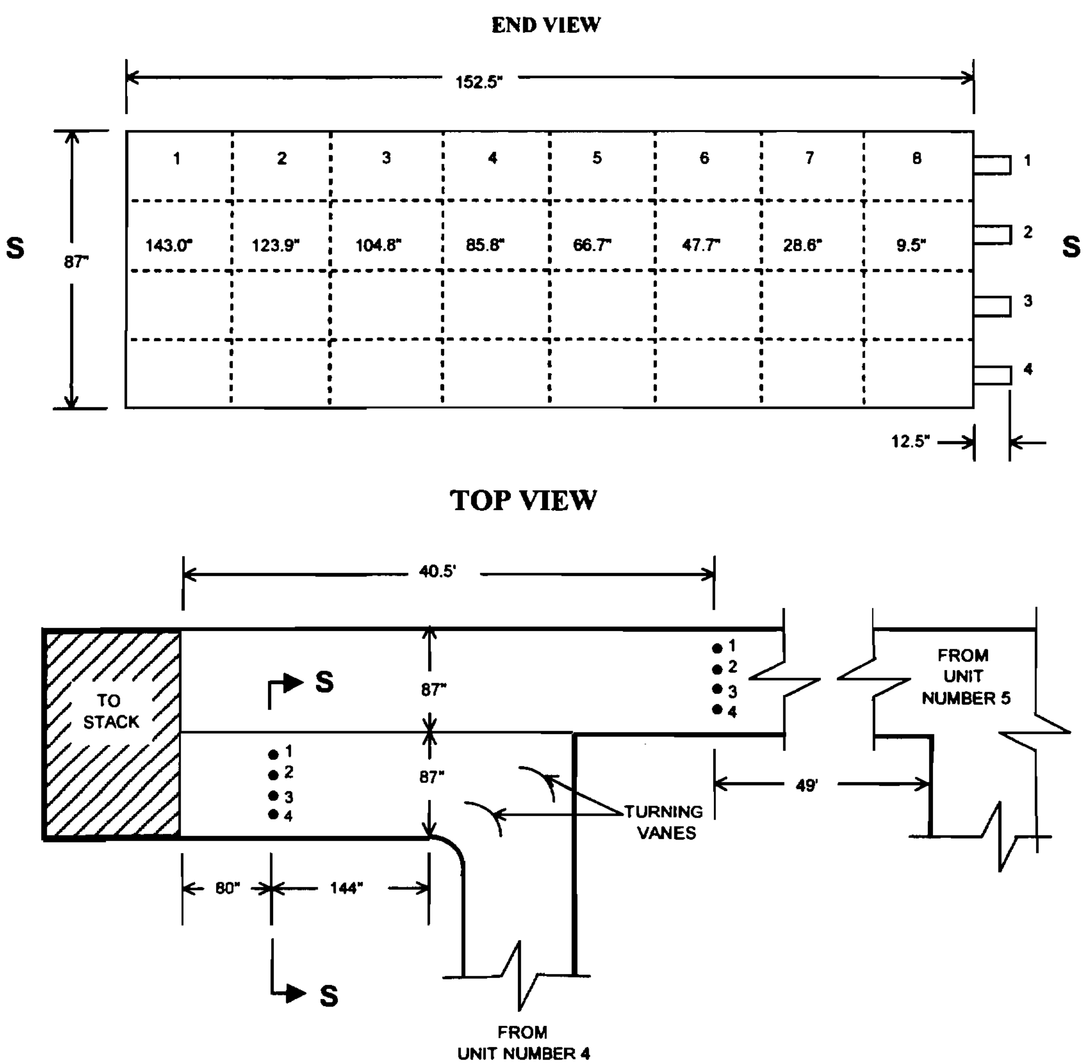
Figure 2. Air Flow Schematic



5. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 3. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 32 points.

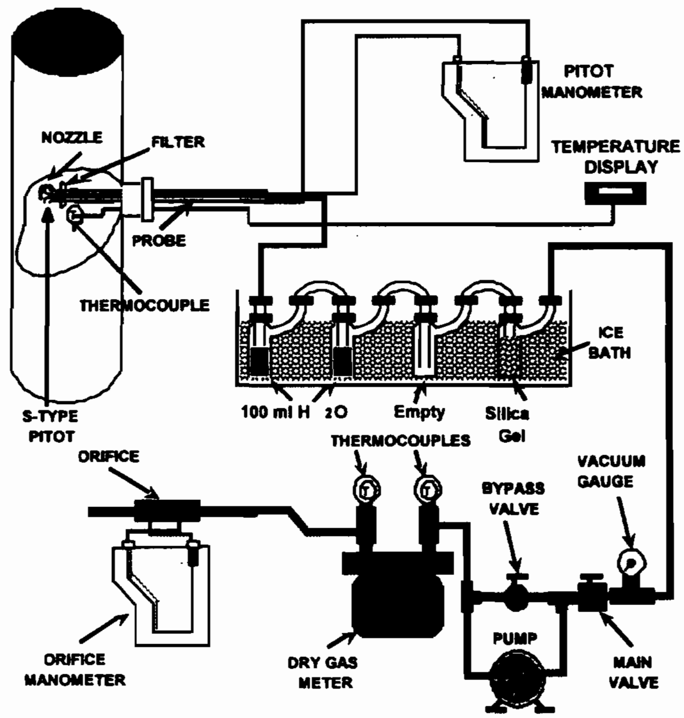
Figure 3. Sample Point Locations



6. PARTICULATE SAMPLING PROCEDURE (EPA Method 17)

The sampling procedure utilized is that specified in **40 CFR, Part 60, Appendix A, Method 17**. A brief description of this procedure is as follows:

Figure 4. Particulate Sampling Train



The first impingers were partially filled with 100 milliliters of deionized water. The next impinger was left empty to act as a moisture trap. Preweighed 6 to 16 mesh indication silica gel was added to the last impinger. The sampling equipment manufactured by Lear Siegler (Model 100) or Sanders Engineering (Model 200) was assembled as shown in the attached drawing. The system was leak checked by plugging the inlet to the nozzle and pulling a 15 inch mercury vacuum. A leakage rate not in excess of 0.02 cubic feet per minute was considered acceptable. The inside dimensions of the stack liner were measured and recorded. The required number of sampling points was marked on the probe for easy visibility. The range of velocity pressure, percent moisture, and temperature of the effluent gases were determined. From this data the correct nozzle size and the nomograph multiplication factor were determined.

Crushed ice was placed around the impingers. The nozzle was placed on the first traverse point with the tip pointing directly into the gas stream. The pump was started immediately and the flow adjusted to isokinetic sampling conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point and isokinetic sampling was re-established. This was performed for each point until the run was completed. Readings were taken at each point and recorded on the field data sheet. At the conclusion of each run, the pump was turned off, final readings recorded, and final system leak checks were performed.

6.1. PARTICULATE SAMPLE RECOVERY

Care was exercised in moving the collection train to the sample recovery area to minimize the loss of collected sample or the gain of extraneous particulate matter. The volume of water in the impingers was measured, the silica gel impinger weighed, and these were recorded on the field data sheet. The nozzle and all sample-exposed surfaces were washed with reagent grade acetone into a clean sample container. A brush was used to loosen any adhering particulate matter and subsequent washings were placed into the container. The filter was carefully removed from the fritted support and placed in a clean separate sample container. A sample of the acetone used in the washing was saved for a blank laboratory analysis.

6.2. PARTICULATE ANALYTICAL PROCEDURES

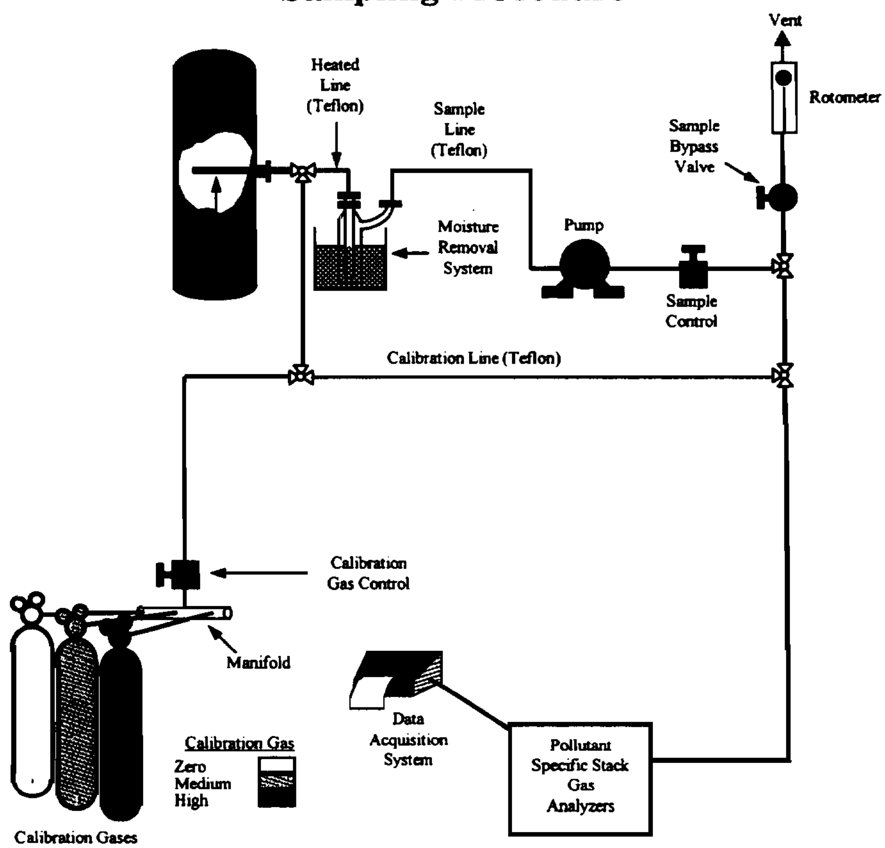
The filter and any loose particulate matter were transferred from the sample container to a clean, tared weighing dish. The filter was placed in a desiccator for at least 24 hours and then weighed to the nearest 0.1 milligram until a constant weight was obtained. The original weight of the filter was deducted and the weight gain was recorded to the nearest 0.1 milligram.

The wash solution was transferred to a clean, tared beaker. The solution was evaporated to dryness, desiccated to a constant weight, and the weight gain was recorded to the nearest 0.1 milligram.

7. CARBON MONOXIDE AND OXYGEN SAMPLING PROCEDURE (EPA METHODS 3A AND 10)

The sampling procedures utilized are those specified in **40** <u>**CFR**</u>**, Part 60, Appendix A, Methods 3a and 10** as modified by the governing regulatory agency. A brief description of these procedures is as follows:

Figure 5. Carbon Monoxide and Oxygen Sampling Procedure



The sample was removed from the stack through a stainless steel probe and passes through a three-way valve and condenser moisture removal system. Teflon® line was used to transport the sample through a transport pump and a flow control valve. From this point the sample was routed into a manifold with a bypass valve, an analyzer sample flow control valve, and to an analyzer specific for the pollutant of interest. Each analyzer produces a voltage analogue output proportional to the concentration of pollutant present in the gas. A schematic of the sampling train is presented in the attached drawing.

Each instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. Zero air is introduced directly to each instrument to establish a baseline and check the zero reading of the instrument. A high range

calibration gas was introduced directly to each instrument. The instrument was allowed to fully respond to the calibration gas. Each analyzer was adjusted, if needed, to the correct value. A linear calibration curve was calculated from this data and stored on computer. Next, a mid-range calibration gas was introduced directly to each instrument. The percent error between each measured value and the corresponding calibration value was calculated. If any of the readings indicated a difference of more than ± 2 percent of the span the analyzer was recalibrated.

The high or mid gas and zero gas were then introduced to the system at the three-way valve before the condenser. The response value for each of these gases was recorded. If these measured values differed significantly from the calibration values the sampling system was checked and repaired until the system check met EPA specifications.

To begin sampling, the three-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the data recorder was marked for the beginning of the run. After the required sampling time, the data recorder was marked for the end of the run. At the end of each run the three-way valve was switched to allow introduction of the zero and calibration gas to the system. From these data the calibration bias and drift were calculated. If the bias values were greater than ± 5 percent of the span, or the drift was greater than three percent of the span, the run was invalidated. To begin the next run the three-way valve was switched to allow sampling of the stack gas and the next run was started. This procedure was repeated until all runs were complete.

7.1. Sample Recovery & Analysis

After the tests were completed the data was reduced to give an average concentration in parts per million for each run. This average concentration was then corrected for the analyzer zero and span bias and drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

Co = Average of Initial and final system calibration responses for the zero gas, ppm.

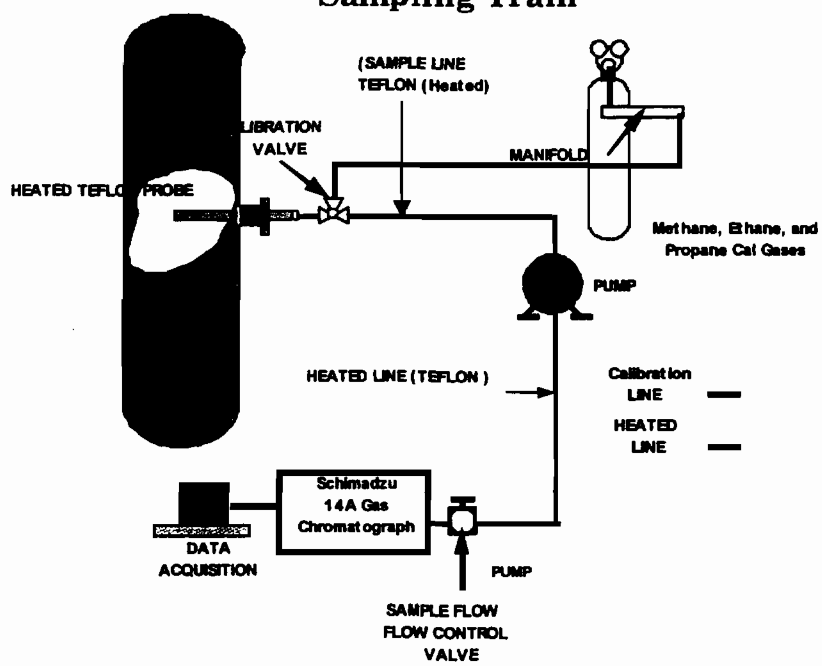
Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

Cma = Actual concentration of the scale calibration gas, ppm.

8. NON-EXEMPT VOLATILE ORGANIC COMPOUND SAMPLING BY GAS CHROMATOGRAPHY (SEAS Method 2518)

Gaseous organic emission sampling (gas chromatography) was performed per **SEAS Method 2518**. Non-exempt volatile organic compounds emissions testing was performed by a system similar to that depicted in the attached figure.

Figure 6. Non-Exempt Volatile Organic Compounds Sampling Train



A heated stainless steel probe and heated teflon sample line was used to draw a sample from the emission source. Stack gases were continuously drawn through the sample lines. The sample lines were leak checked prior to and after all testing.

A small portion of the gas sample was pumped into the on-line gas chromatograph sample loop. The gas chromatograph sample loop was operated at approximately 30 ml/min flow, and was continuously purged with stack gas. Sample was introduced into the gas chromatograph by automatic actuation of the sample valve at a predetermined time. The gas chromatograph was fitted with a column of sufficient physical and chemical characteristics to allow separation of the constituents. The chromatograph was operated in such a manner as to get five separate peaks. The first four were for specific compounds in the following order: methane, acetylene, ethylene, and ethane. The fifth peak was a back flush of the column which contained all organic compounds containing three or more carbon atoms (Propane+). The first four peaks were allowed to elute with the gases flowing through the column in the normal direction. After ethane elutes, the column is backflushed through the operation of a 10-port valve to elute the combined volatile organic compounds to the detector.

In order to ensure only organic compounds were measured, the chromatograph was equipped with a flame ionization detector. Each test run was conducted for at least sixty minutes, with the chromatograph performing as many injections as could be completed given the physical and chemical characteristics of the stack gas.

Calibration of the gas chromatograph was performed using EPA Protocol 1 cylinders of propane in nitrogen. Calibrations were made with a high, mid, and low concentration gas. Using these gas standards, a three-point calibration curve based on area count was generated for combined volatile organic compounds as propane. SEAS used a Shimadzu GC-14A for this testing program. The GC was equipped with an FID and integrator system. Volatile organic compound concentrations were determined by the peak area count of the sample versus the calibration curve. The calibration curve for propane was input to the data acquisition system for the acetylene and ethylene. Therefore, the concentrations generated by the data acquisition system for acetylene, ethylene, and combined volatile organic compounds were each reported on a propane equivalent basis. At the conclusion of testing, the calibration curve of the instrument was verified by injection of a propane calibration standard. If the calibration was maintained within twenty percent, the data was accepted. Otherwise, the data was either corrected for drift or the data was discarded and a new test conducted.

The concentration of non-exempt volatile organic compounds in the stack gas was calculated by summing of the ethylene concentration (propane equivalent) plus the acetylene concentration (propane equivalent) plus the combined volatile organic compound concentration (propane equivalent).

9. QUALITY ASSURANCE

In order to ensure the accuracy of all the data collected in the field and at the laboratory, SEAS has instituted a comprehensive quality assurance and quality control program. New or repaired items which require calibration are calibrated before their initial use in the field. Equipment whose calibration may change with use are calibrated before and after each use. When an item is found to be out of calibration, the unit is either discarded or repaired, and then recalibrated before being returned to service. All equipment is periodically recalibrated in full regardless of the results of the regular inspections or its present calibration status. Calibrations are performed in a manner consistent with the EPA reference methods recommended in the "Quality Assurance Handbook for Air Pollution Measurement Systems" published by the US Environmental Protection Agency. To the maximum degree possible all calibrations are traceable to the National Institute of Standards & Technology (NIST).

In order to ensure that the test will be performed in a timely manner without undue delays, SEAS sampling vans are equipped with duplicate sampling devices for almost every device needed to perform the test. If a particular device is broken or does not pass inspection, a second device is available immediately at the site for use. Any device which appears to be outside calibration, or in need of repair is tagged in the field and repaired, calibrated, or discarded immediately upon return to the laboratory.

9.1. CALIBRATIONS

Certain pieces of equipment need to be calibrated before and after each test. Those items include the pitot tubes, the differential pressure gauges, the dry gas meter, and the nozzles used for the particulate testing. The following is a brief description of the calibration procedures for each of these important devices.

9.1.1. PITOT TUBES

All pitot tubes are the S-type as required by EPA Reference Method 2 (40 CFR, Part 60, Appendix A, Method 2). This method contains certain geometric standards for the construction of S-type pitot tubes. All of SEAS pitot tubes are constructed according to these standards. According to the EPA any pitot tube constructed to these standards will have a coefficient of 0.84 $\pm$ 0.02. To ensure the exact value of SEAS pitot tubes, all pitot tubes are initially calibrated in SEAS wind tunnel to determine the exact pitot coefficient. This coefficient should not change unless the pitot is physically damaged. Each pitot tube is checked before going to the field to make sure it meets the geometry as specified. Any pitot tube which does not meet the specifications is not used in the test.

9.1.2. DIFFERENTIAL PRESSURE GAUGES

SEAS uses several different types of pressure gauges including oil tube manometers, water tube manometers, magnehelics, and current output electronic load cells. Each of these devices are inspected before taken to the field and are inspected for leaks during each test. The magnehelics and load cells are tested against an incline manometer water gauge to ensure accuracy.

9.1.3. TEMPERATURE SENSORS

All temperature sensors used in SEAS sampling program are either mercury in-glass thermometers or type K thermocouples. These thermocouples are a physical device which produce a voltage proportional to the temperature. The thermocouple reading device is calibrated before and after each series of tests to ensure accuracy of $\pm$ 2 percent. The calibration of the thermocouple is accomplished by NIST traceable calibrated reference thermocouple potentiometer system.

9.1.4. NOZZLES

The inside diameter of each nozzle is measured to the nearest 0.001 inches prior to its initial use. Upon arriving in the field each nozzle is again measured with a micrometer on three different points on the diameter to ensure its original measurement and that the nozzle is perfectly round. If the difference between the maximum and minimum diameters measured does not exceed 0.003 inches, the nozzle is acceptable; otherwise, this nozzle is discarded and another is selected. At the end of each test the nozzles are again remeasured on three different points on the diameter to ensure that during the test the nozzle has not become dented or deformed.

9.1.5. DRY GAS METER

The dry gas meter is calibrated every six months against a spirometer transfer standard. It is again calibrated before and after each use in the field. During the semiannual calibration, a five point calibration is made at a minimum of one-half inch water column orifice pressure up to four inches water column orifice pressure. Before and after each test, the dry gas meter is again recalibrated at

three repetitions at a representative flow rate experienced during the test. If the final calibration does not agree with the initial calibration within five percent the calibration which yields the lowest volume of sample pulled is used in the calculations and the dry gas meter is repaired and recalibrated.

9.1.6. ORIFICE

The flow meter orifice is used to establish isokinetic sampling rates during the test. The orifice is calibrated with the dry gas meter at the same time under the same conditions. The orifice is calibrated over a wide range of flow rates and the arithmetic mean of the orifice calibration is used for sampling purposes. The orifice is recalibrated every time the gas meter is recertified.

APPENDIX A QUALITY CONTROL OF PARTICLATE TESTING EQUIPMENT

INITIAL METER BOX CALIBRATION

Calibrated By: RJR **BOX #:** S-103 **Date:** 11/6/02

			Orifice #:	1	Orifice #:	3	Orifice #:	8	
		Unit	RUN 1	RUN 2	RUN 1	RUN 2	RUN 1	RUN 2	
Meter	ΔH	In. H_2O	0.80	0.80	1.30	1.30	1.70	1.70	
Initial Gas Volume		$Ft.^3$	41.800	56.900	72.700	100.100	113.400	138.900	
Final Gas Volume		$Ft.^3$	56.900	66.900	100.100	111.400	138.900	171.200	
	Initial Temp. In	°F	64	76	78	85	86	72	
	Initial Temp. Out	°F	64	70	70	72	74	72	
	Final Temp. In	°F	76	78	85	86	72	72	
	Final Temp. Out	°F	70	70	72	74	72	72	
	Vacuum	In. Hg	23	23	21	21	20	20	
	Ambient Temp.	°F	72	72	72	72	72	72	
Barometric Pressure		In. Hg	30.05	30.05	30.05	30.05	30.05	30.05	
	Time	sec	1899	1257	2681	1101	2252	2858	
	K'		0.3735	0.3735	0.4677	0.4677	0.5200	0.5200	
CALCULATIONS									
Total Meter Gas Volume		Actual $Ft.^3$	15.100	10.000	27.400	11.300	25.500	32.300	
	Time	Minutes	31.650	20.950	44.683	18.350	37.533	47.633	
Volume through the Meter		*SDCF without Y*	15.175	9.955	27.171	11.143	25.323	32.317	
Volume through the Orifice		*SDCF*	15.401	10.194	27.227	11.181	25.428	32.270	
Calculated Y		*Dimensionless*	1.015	1.024	1.002	1.003	1.004	0.999	1.008
		Difference Allowable 0.02	0.007	0.016	-0.006	-0.004	-0.004	-0.009	
Calculated ΔH@			1.875	1.875	1.936	1.928	2.048	2.048	1.951
		Difference Allowable 0.2	-0.077	-0.077	-0.016	-0.023	0.096	0.096	

Magnehelic Calibrations

Device	Calibration	Delta P	
	Standard	Magnehelic	
Units	inches water	inches water	*Percent*
Reading	Reference	Sample	*Error*
1	2.00	2.00	*0.0*
2	1.50	1.50	*0.0*
3	1.00	1.00	*0.0*

Allowed Error = 5% of Reading

Thermocouple Calibrations

Device	Calibration	Thermocouple	
	Standard	Detector	
Units	Degrees F.	Degrees F.	*Percent*
Reading	Reference	Sample	*Error*
1	500	499	*-0.1*
2	300	300	*0.0*
3	100	100	*0.0*

Allowed Error = 1.5% of Absolute Temperature (Degrees Rankin);

Absolute Temperature = Temperature in Degrees Fahrenheit. + 460

Final Meter Box Calibration Check by Critical Orifice

Calibrated By: JBR **Date 12/30/2002** **METER BOX #: S-103**

		Units	RUN 1	RUN 2	RUN 3		
				Orifice #	1		
Meter	ΔH	In. H_2O	0.82	0.82	0.82		
	Initial Gas Volume	Ft.^{3}	621.000	624.200	627.200		
	Final Gas Volume	Ft.^{3}	624.200	627.200	631.400		
	Initial Temp. In	°F	71	71	71		
	Initial Temp. Out	°F	71	71	71		
	Final Temp. In	°F	71	71	71		
	Final Temp. Out	°F	71	71	71		
Vacuum (must be > 16.0)		In. Hg	25	25	25		
	Ambient Temp.	°F	72	72	72		
	Barometric Pressure	In. Hg	30.00	30.00	30.00		
	Time	sec	410	385	541		
	K'		0.3735	0.3735	0.3735		
CALCULATIONS							
Total Meter Gas Volume		Ft.^{3}	3.200	3.000	4.200		
	Time	Minutes	6.833	6.417	9.017		
Vm = Volume through the Meter		*SDCF without Y*	3.196	2.996	4.194	Final	Initial
Vcr = Volume through the Orifice		*SDCF*	3.320	3.117	4.380	Average	Average
	Calculated Y	*Dimensionless*	**1.039**	**1.041**	**1.044**	**1.041**	**1.046**
	Calculated ΔH@		**1.928**	**1.928**	**1.928**	**1.928**	**2.056**

Magnehelic Calibrations

Device	Calibration	Delta P	
	Standard	Magnehelic	
Units	inches water	inches water	*Percent*
Reading	Reference	Sample	*Error*
1	1.75	1.78	*1.7*
2	0.75	0.74	*-1.3*
3	0.25	0.24	*-4.0*

Allowed Error = 5% of Reading

Thermocouple Calibrations

Device	Calibration	Thermocouple	
	Standard	Detector	
Units	Degrees F.	Degrees F.	*Percent*
Reading	Reference	Sample	*Error*
1	100	101	*0.2*
2	250	255	*0.7*
3	500	498	*-0.2*

Allowed Error = 1.5% of Absolute Temperature (Degrees Rankin);
Absolute Temperature = Temperature in Degrees Fahrenheit. + 460

Magnehelic Calibration

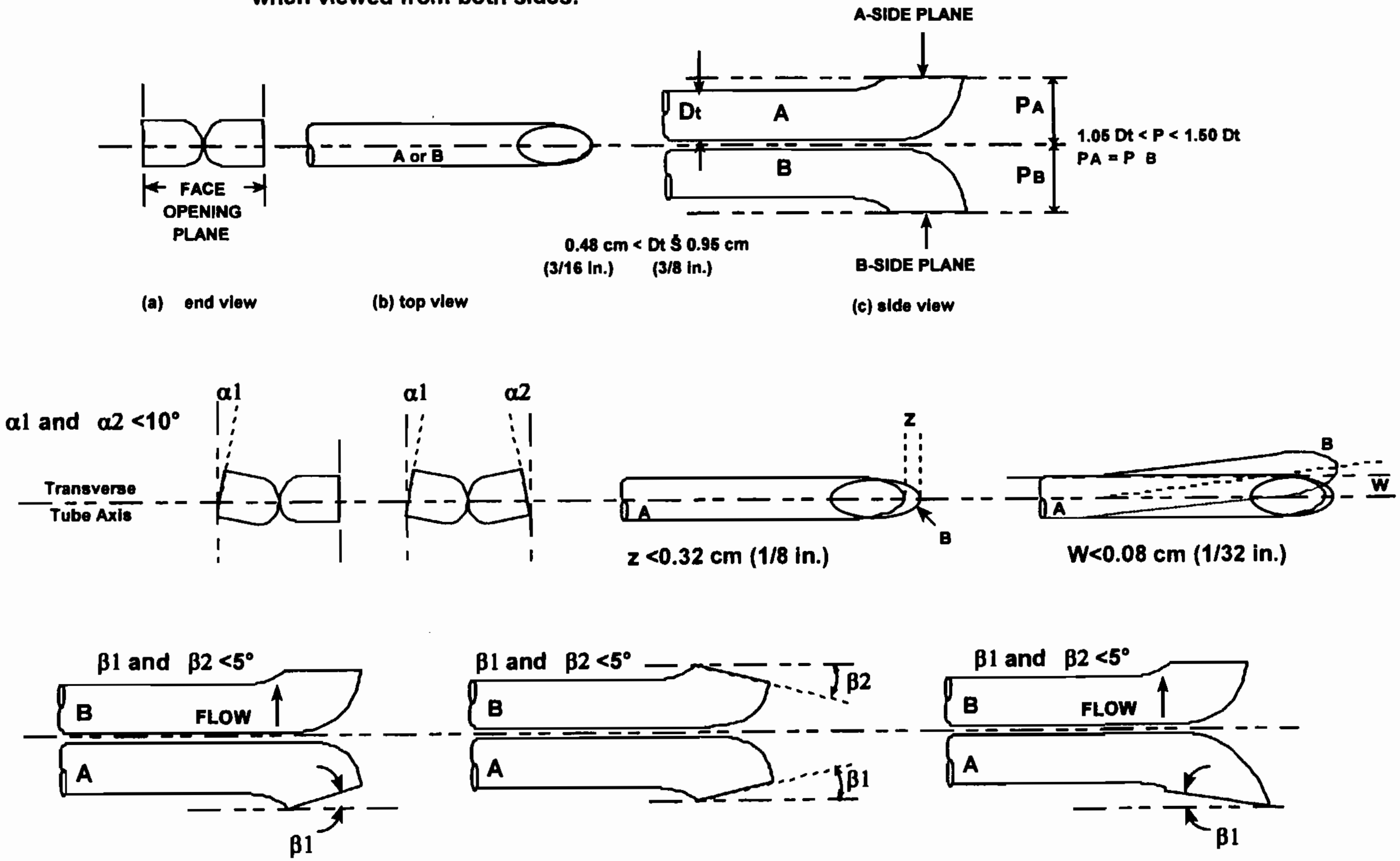
	Box 100						Box 101							Box 100-a				
Ser. No.	W021 JY	R1090 8AG71	R9807 314022	R977110 5290	6AG44 7	R97022 7GJ31	R00630 1YR66	R22D	A980821 7883	R90061 6G721	R98120 2CA55	R90101 5D102		R06F 2	R97020 3	R10628J A62	R10513 MR42	R90124 RI119
Span (in H2O)	0.25	0.5	2	5	10	25	0.25	0.5	2	5	10	25		0.5	2	5	10	25
Reference Reading @ 0% Span (in H2O)	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Device Reading (in H2O)	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00		0.00	0.00	0.00	0.00	0.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Reference Reading @ 50% Span (in H2O)	0.125	0.250	1.00	2.45	5.00	12.50	0.125	0.25	1.00	2.500	4.80	12.50		0.25	1.00	2.50	5.00	13.00
Device Reading (in H2O)	0.125	0.250	1.00	2.50	5.00	12.50	0.125	0.25	0.96	2.500	5.00	12.55		0.25	1.00	2.50	5.00	13.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00		0.00	0.00	0.00	0.00	0.00
Reference Reading @ 90% Span (in H2O)	0.225	0.45	1.80	4.45	9.00	22.50	0.24	0.44	1.80	4.50	9.00	24.00		0.45	1.80	4.50	9.00	24.00
Device Reading (in H2O)	0.225	0.450	1.80	4.45	9.00	22.50	0.240	0.45	1.80	4.500	9.20	24.00		0.45	1.80	4.50	9.00	24.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00		0.00	0.00	0.00	0.00	0.00

	Box 102						Box 103					
Ser. No.	10819 DR2	R1090 2AG18	R5031 5EB93	810629T A87		R10722 MC5	R06E	R96040 2CA34	R20202 CF1	WOB KJM	R360	
Span (in H2O)	0.25	0.5	2	5		25	0.25	0.5	1	2	5	25
Reference Reading @ 0% Span (in H2O)	0.000	0.000	0.00	0.00		0.00	0.000	0.000	0.00	0.00	0.00	0.00
Device Reading (in H2O)	0.000	0.000	0.00	0.00		0.00	0.000	0.000	0.00	0.00	0.00	0.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reference Reading @ 50% Span (in H2O)	0.130	0.250	1.00	2.40		12.80	0.125	0.245	0.50	1.00	2.40	12.50
Device Reading (in H2O)	0.125	0.255	1.02	2.50		12.50	0.121	0.250	0.50	1.03	2.50	13.00
% Difference (Allowed = 0.05)	0.04	0.02	0.02	0.04		0.02	0.03	0.02	0.00	0.03	0.04	0.04
Reference Reading @ 90% Span (in H2O)	0.240	0.490	1.90	4.70		24.20	0.235	0.440	0.90	1.90	4.90	24.00
Device Reading (in H2O)	0.240	0.490	1.90	4.75		24.00	0.230	0.450	0.90	1.90	5.00	24.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.01		0.01	0.02	0.02	0.00	0.00	0.02	0.00

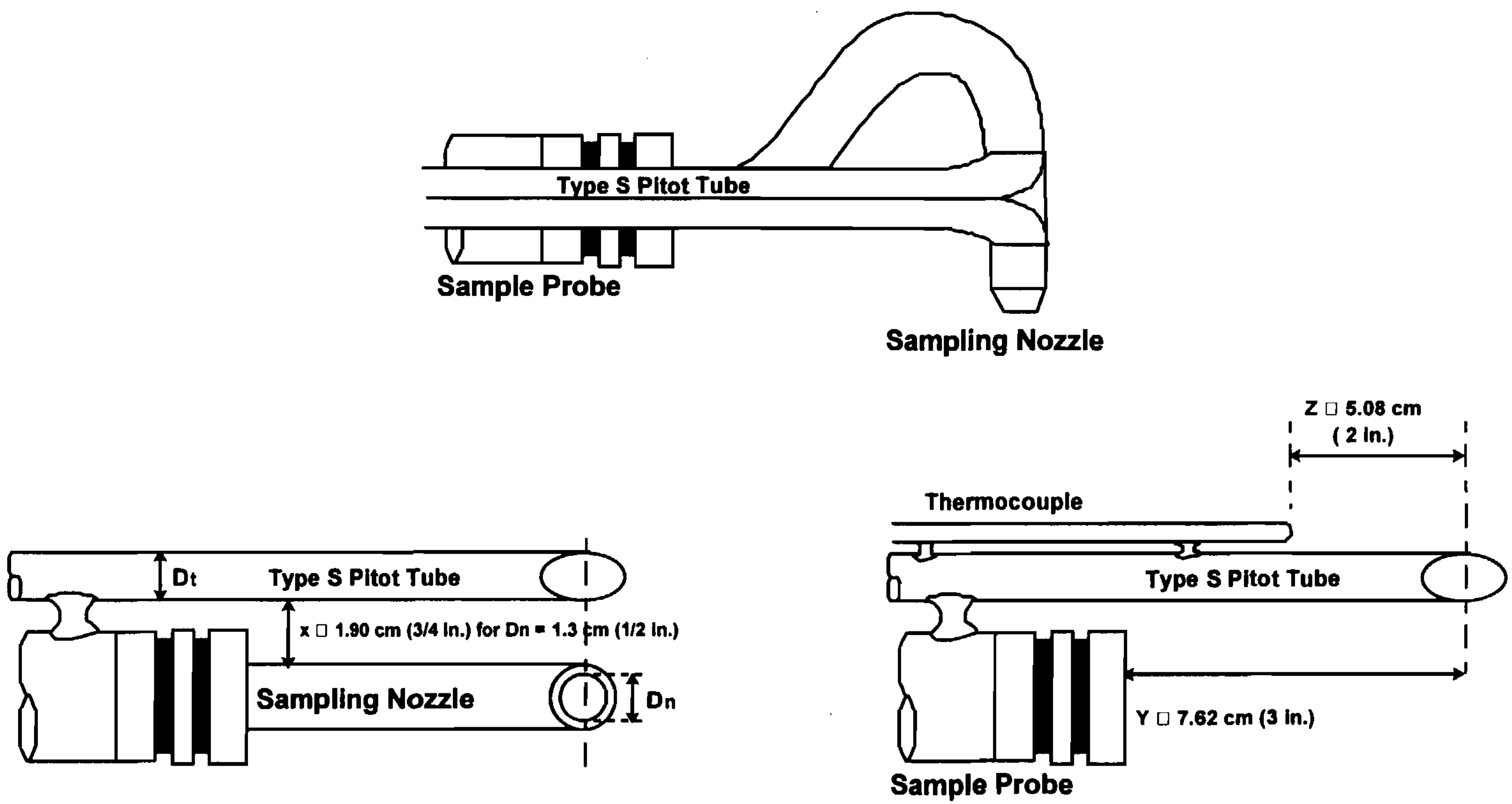
Cailbration Date 06-17-02 By J. RAMPULLA

Type S pitot tube construction details:

a) end view; face opening planes perpendicular to transverse axis.
b) top view; face opening planes parallel to longitudinal axis.
c) side view; both legs of equal length and centerlines coincident, when viewed from both sides.



Sampling Nozzle, Thermocouple, and Probe Configuration



APPENDIX B FIELD DATA SHEETS FOR PARTICULATE TESTING

Sanders Engineering & Analytical Services, Inc.

1568 Leroy Stevens Rd.
Mobile, Al. 36695
Office: (251) 633-4120
Fax: (251) 633-2285

COMPANY Gulf Power Co. DATE 12-19-02 DGM# S-103
PLANT Crist OPERATOR RSR ΔHa ____
UNIT 4 METHOD 17 PROBE (Max Length Allowed) ____

	Run 1	Run 2	Run 3
Nozzle Calibration Pre / Post	.248 / .248	.248 / .248	.248 / .248
	.248 / .248	.248 / .249	.249 / .248
	.248 / .248	.248 / .248	.248 / .248
Average	.248	.248	.248
Filter Number	1047	1048	1049
Meter Reading Final	415.500	457.920	499.010
Meter Reading Initial	372.940	415.935	458.205
Meter Reading Total	42.560	41.985	40.805
Leak Check System Pre	15 in Hg / .000	15 / .000	15 / .000
Leak Check System Post	15 / .000	15 / .000	15 / .001
Volume of Liquid Water Collected Imp 1 (Final / Initial / Net)	172 / 100 / 72	168 / 100 / 68	175 / 100 / 75
Imp 2	100 / 100 / 0	105 / 100 / 5	103 / 100 / 3
Imp 3	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0
Imp 4	1799 / 1786 / 13	1808 / 1799 / 9	1812 / 1808 / 4
Total	85	82	82
Gas Analysis O_2	7.0	7.0	7.25
CO_2	13.5	13.0	12.5
CO	/	/	/
Static (in H_2O)	-.9	-.9	-.9
Barometric (in Hg)	29.75	29.75	29.75

Form Revised 8/24/02 Page 1 of ____

Port # Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Gas Meter	Filter	Imp.	Vac. (In. Hg)
1-1	12:04	372.940	.780	2.29	271	70		36	5
2	:06	374.4	.825	2.42	274	70		36	5
3	:08	376.0	.836	2.45	273	70		36	5
4	:10	377.5	.734	2.15	273	70		36	5
5	:12	378.9	.645	1.89	273	71		36	5
6	:14	380.2	.700	2.05	271	71		36	5
7	:16	381.7	.690	2.02	271	71		36	5
8	:18	383.2	.630	1.85	271	71		36	5
9	:20	384.6	.792	2.30	271	71		36	5
10	:22	386.2	.771	2.26	272	71		36	5
2-1	:24	387.7	.941	2.88	272	72		36	5
2	:26	388.9	.931	2.73	273	72		36	7
3	:28	390.7	.786	2.30	273	72		36	6
4	:30	392.5	.663	1.94	273	72		36	6
5	:32	393.9	.704	2.06	273	72		36	6
6	:34	395.3	.824	2.42	272	72		36	7
7	:36	397.0	.825	2.42	271	72		36	7
8	:38	398.4	.738	2.20	272	72		36	7
9	:40	400.0	.625	1.83	270	72		36	6
10	:42	401.4	.640	1.88	270	72		36	6
3-1	:46	403.2	.650	1.91	272	72		36	6
2	:48	404.4	.525	1.54	272	72		36	5
3	:50	405.4	.493	1.44	272	72		36	5
4	:52	406.6	.566	1.66	272	72		36	5
5	:54	408.1	.401	1.17	272	72		36	5
6	:56	409.2	.447	1.31	272	72		36	5
7	:58	410.5	.473	1.39	272	73		36	5
8	13:00	411.6	.578	1.69	272	73		36	5
9	:02	412.8	.534	1.56	272	73		36	5
10	:04	414.3	.530	1.55	272	73		36	5
	13:06	415.500							
	:								
	:	42.560	.7176						

Form Revised 8/24/02

Company: Gulf Power Co. Date: 12-19-02 Page ____

Site: #4 Run #: 1 Of ____

Port # Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Gas Meter	Filter	Imp.	Vac. (In. Hg)
1-1	13:37	415.935	.948	2.78	274	72		37	7
2	:39	417.6	.897	2.63	274	72		37	7
3	:41	419.1	.842	2.47	273	72		37	6
4	:43	420.8	.700	2.05	273	72		37	6
5	:45	422.4	.552	1.62	272	72		37	5
6	:47	423.6	.607	1.78	272	72		37	5
7	:49	425.2	.724	2.12	271	72		37	6
8	:51	426.4	.685	2.01	271	72		37	6
9	:53	427.7	.738	2.16	272	72		37	6
10	:55	429.5	.679	1.99	272	72		37	6
2-1	:57	431.0	.832	2.44	272	72		37	6
2	:59	432.6	.828	2.43	273	72		37	6
3	14:01	434.1	.781	2.30	274	72		37	7
4	:03	435.4	.661	1.94	274	72		37	6
5	:05	437.0	.563	1.65	273	72		37	6
6	:07	438.4	.551	1.61	273	72		37	6
7	:09	439.7	.643	1.89	273	72		37	6
8	:11	441.1	.623	1.83	272	72		37	6
9	:13	442.5	.603	1.78	272	72		37	6
10	:15	443.8	.653	1.92	272	72		37	6
3-1	:17	445.4	.630	1.85	272	73		37	6
2	:19	447.1	.416	1.22	272	73		37	5
3	:21	447.9	.665	1.95	272	73		37	5
4	:23	449.3	.606	1.78	273	73		37	5
5	:25	450.7	.410	1.20	273	73		37	5
6	:27	451.8	.500	1.46	274	73		37	5
7	:29	453.2	.585	1.64	274	73		37	5
8	:31	454.5	.500	1.40	274	73		37	5
9	:33	455.4	.630	1.78	274	73		37	5
10	:35	456.8	.555	1.56	273	73		37	5
	14:37	457.920							
	:								
	:		.8046						

Form Revised 8/24/02

Company: Gulf Power Date: 12-19-02 Page ____

Site: #4 Run #: 2 Of ____

Port # / Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Gas Meter	Filter	Imp.	Vac. (In. Hg)
1-1	15:25	458.205	.836	2.35	274	70		37	6
2	:27	459.7	.824	2.32	274	70		37	6
3	:29	461.4	.850	2.40	275	71		37	6
4	:31	462.9	.725	2.04	274	71		37	6
5	:33	464.5	.580	1.63	275	71		37	5
6	:35	465.7	.609	1.71	273	71		37	5
7	:37	467.1	.717	2.01	273	71		37	5
8	:39	468.6	.687	1.93	273	71		37	5
9	:41	469.8	.742	2.09	273	71		37	6
10	:43	471.2	.692	1.94	273	71		37	6
2-1	:45	472.8	.705	1.98	273	71		37	6
2	:47	474.2	.978	2.75	274	71		37	7
3	:49	475.6	.898	2.52	274	72		37	7
4	:51	477.4	.669	1.89	274	72		37	6
5	:53	478.9	.639	1.80	292	72		37	6
6	:55	480.3	.602	1.69	273	72		37	6
7	16 33	481.6	.802	2.25	273	72		37	6
8	:35	482.9	.721	2.03	273	72		37	6
9	37	484.7	.609	1.71	273	72		37	6
10	:39	486.0	.622	1.75	273	72		37	6
3-1	:41	487.3	.695	1.95	273	72		37	5
2	:43	488.6	.432	1.21	273	72		37	5
3	:45	489.9	.384	1.08	272	72		37	5
4	:47	490.9	.358	1.00	272	72		37	5
5	:49	492.1	.313	.88	273	72		37	5
6	:51	492.8	.456	1.28	273	72		37	5
7	:53	494.1	.430	1.21	274	72		37	5
8	:55	495.2	.472	1.32	274	72		37	5
9	:57	496.3	.581	1.63	274	72		37	5
10	:59	497.7	.602	1.69	274	72		37	5
	17:02	499.010							
	:								
	:								

Form Revised 8/24/02

Company: Gulf Power Date: 12-19-02 Page ______

Site: #4 Run #: 3 Of ______

LABORATORY ANALYSIS & CHAIN OF CUSTODY

COMPANY/PLANT: Gulf Power

UNIT #: 4- DATE OF TEST: 12-19-02 TYPE OF TEST: ☐ M-5 ☐ M-17 ☐ OTHER

SAMPLE #	RELINQUISHED BY:	RECEIVED BY:	TIME:	DATE:	REASON FOR CHANGE
Run 1					
Run 2					
Run 3					

RUN # 1	FILTER # 1047	BEAKER 99 WASH (ML)	RUN #	FILTER #	BEAKER WASH (ML)
FINAL WEIGHT	121.6	62683.4	FINAL WEIGHT		
INITIAL WEIGHT	117.3	62682.3	INITIAL WEIGHT		
DIFFERENCE	4.3	1.1	DIFFERENCE		
CORRECTED TOTAL WEIGHT		5.4	CORRECTED TOTAL WEIGHT		
RUN # 2	FILTER # 1044	BEAKER 95 WASH (ML)	RUN #	FILTER #	BEAKER WASH (ML)
FINAL WEIGHT	128.0	64420.3	FINAL WEIGHT		
INITIAL WEIGHT	122.6	64420.1	INITIAL WEIGHT		
DIFFERENCE	5.4	.2	DIFFERENCE		
CORRECTED TOTAL WEIGHT		5.6	CORRECTED TOTAL WEIGHT		
RUN # 3	FILTER # 1049	BEAKER 70 WASH (ML)	RUN #	FILTER #	BEAKER WASH (ML)
FINAL WEIGHT	129.1	63567.9	FINAL WEIGHT		
INITIAL WEIGHT	122.8	63566.7	INITIAL WEIGHT		
DIFFERENCE	6.3	1.2	DIFFERENCE		
CORRECTED TOTAL WEIGHT		7.5	CORRECTED TOTAL WEIGHT		

WASH SOLVENT BLANK (ML)		BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		

APPENDIX C SAMPLE CALCULATIONS

Sample Calculations, Run 1
GULF POWER COMPANY
PLANT CRIST
UNIT 4

Absolute Stack Pressure (inches Mercury)

$$P_S = P_{bar} + \frac{\overline{P_g}}{13.6}$$

P_g = Stack Static Pressure (inches Water) =	(0.90)
P_{bar} = Barometric Pressure (inches Mercury) =	29.75
P_s =	29.68

Absolute Pressure at the Dry Gas Meter (inches Mercury)

$$P_m = P_{bar} + \frac{\overline{\Delta H}}{13.6}$$

P_{bar} = Barometric Pressure (inches Mercury) =	29.75
ΔH = Average pressure difference of orifice (inches Water) =	1.99
P_m =	29.90

Average Stack Gas Velocity (feet per second)

$$V_s = K_p C_p \overline{\sqrt{\Delta P}} \sqrt{\frac{\overline{T_s}}{M_s P_s}}$$

Kp = Pitot tube constant $\sqrt{\frac{(\text{lb/lb - mole})\ (\text{inches Hg})}{(°\text{R})\ (\text{inches H2O})}}$ =	85.49
C_p = Pitot tube coefficient (dimensionless) =	0.84
$\overline{\sqrt{\Delta P}}$ = Velocity head of stack gas (inches H2O) =	0.8176
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	732.0
M_s = Molecular weight of stack gas; wet basis (lb/lb mole) =	29.37
P_s = Absolute stack pressure (inches Mercury) =	29.68
V_s =	53.80

Volume of Gas Sampled Measured by Dry Gas Meter

(corrected to standard conditions, SDCF)

$$Vm(Std) = K_1 V_m Y \left[\frac{P_{bar} + \frac{\overline{\Delta H}}{13.6}}{\overline{T_m}} \right]$$

K_1 = Degrees R/inches Mercury =	17.64
V_m = Volume of gas sample as measured by dry gas meter (actual cubic feet) =	42.560
Y = Dry gas meter calibration factor (dimensionless) =	1.008
P_{bar} = Barometric Pressure (inches Mercury) =	29.75
Δ H = Average pressure difference of orifice (inches H2O) =	1.99
T_s = Average absolute temperature of the dry gas, Degrees R (Degrees F+460) =	531.7
$V_{m\,(Std)}$ =	42.553

Volume of Water Vapor in Gas Sample

(corrected to standard conditions, SDCF)

$$V_{w\,(Std)} = 0.04707\ V_{lc}$$

V_{lc} = Total volume of liquid collected in impingers and silica gel (milliliters) =	85.0
$V_{w\,(Std)}$ =	4.001

Water Vapor in the Gas Stream proportion by volume (dimensionless)

$$B_{ws} = \frac{V_{w(Std)}}{V_{m(Std)} + V_{w(Std)}}$$

$V_{w\,(std)}$ = Volume of water in gas sample (corrected to standard conditions) =	4.001
$V_{m(std)}$ = Volume of sample measured by dry gas meter (standard conditions) =	42.553
B_{ws} =	0.086

Molecular Weight of Stack Gas (dry basis, lb/lb mole)

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2 + \%CO)$$

$\%CO_2$ = Number percent by volume (dry basis from gas analysis) =	13.50
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	7.00
$\%N_2+\%CO$ = Number percent by volume (dry basis from gas analysis) =	79.50
M_d =	30.44

Molecular Weight of Stack Gas (wet basis, lb/lb mole)

$$M_s = M_d(1 - B_{ws}) + 18(B_{ws})$$

M_d = Molecular weight of stack gas (dry basis, lb/lb mole) =	30.44
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.086
M_s =	29.37

Volumetric Flow Rate (actual cubic feet per minute)

$$Q_a = (V_s)(A_s)(60)$$

V_s = Average stack gas velocity (feet per second) =	53.80
A_s = Cross sectional area of stack (feet squared) =	92.135
Q_a =	297,411

Volumetric Flow Rate (standard dry cubic feet per minute)

$$Q_s = Q_a(1 - B_{ws}) \frac{(528)}{\overline{T_s}} \frac{(P_s)}{29.92}$$

Q_a = Volumetric flow rate (actual cubic feet per minute) =	297,411
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.086
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	732.0
P_s = Absolute stack pressure (inches Mercury) =	29.68
Q_s =	194,550

Volumetric Flow Rate (standard wet cubic feet per minute)

$$Q_{sw} = Q_a \frac{(528)}{\overline{T_s}} \frac{(P_s)}{29.92}$$

Q_a = Volumetric flow rate (actual cubic feet per minute) =	297,411
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	732.0
P_s = Absolute stack pressure (inches Mercury) =	29.68
Q_{sw} =	212,842

Particulate Mass Rate (pounds per hour)

$$PMR = (Cs)(Qs)\frac{(60)}{7000}$$

Cs =Polutant concentration (grains per standard dry cubic foot) =	0.0020
Q_a = Volumetric flow rate (standard dry cubic feet per minute) =	194,550
PMR =	3.26

Particulate Concentration (grains per standard dry cubic foot)

$$C_s = 0.0154\frac{M_n}{V_{m(Std)}}$$

Mn = Total amount ofPolutant collected (milligrams) =	5.4
$V_{m(Std)}$ = Volume of stack gas sampled (corrected to standard conditions) =	42.553
C_s =	0.0020

Particulate Concentration (grains per actual cubic foot)

$$C_a = 0.0154\frac{M_n}{V_{n\,(actual)}}$$

Mn = Total amount ofPolutant collected (milligrams) =	5.4
$V_{n(actual)}$ = Volume sampled at stack conditions (actual cubic feet) =	65.079
C_a =	0.0013

Percent of Isokinetic Sampling

$$I = \frac{100\ V_n}{(60)\ \varnothing\ V_s\ A_n}$$

V_n = Volume sampled at stack conditions through nozzle (actual cubic feet) =	65.079
V_s = Average stack gas velocity (feet per second) =	53.80
A_n = Cross-sectional area of nozzle (feet squared) =	0.000335
Ø = Sampling Time (minutes) =	60
I =	100.2

Volume of Gas Sampled Through Nozzle (actual cubic feet)

$$V_n = \left[(0.002669)(V_{lc}) + Y \frac{V_m}{T_m} \left(P_{bar} + \frac{\overline{\Delta H}}{13.6} \right) \right] \frac{\overline{T_s}}{P_s}$$

V_{lc} = Total volume of liquid collected in impingers and silica gel (milliliters) =	85.0
Y = Dry gas meter calibration factor (dimensionless) =	1.008
V_m = Volume of gas sample as measured by dry gas meter (actual cubic feet) =	42.560
T_m = Average absolute temperature of dry gas meter, Degrees R (Degrees F+460) =	531.7
P_{bar} = Barometric Pressure (inches Mercury) =	29.75
ΔH = Average pressure difference of orifice (inches Water) =	1.99
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	732.0
P_s = Absolute stack pressure (inches Mercury) =	29.68
V_n =	65.079

Emission Rate in Pounds Per Million Btu (EPA Oxygen F Factor)

$$E_H = \left(\frac{PMR}{HI} \right)$$

$$E = C_d F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

Cd = Pollutant concentration (pounds per standard dry cubic foot) =	0.0000003
F_{O2} = Oxygen based F factor (SDCF/mmBtu for bituminous coal) =	9726
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	7.0
E_{O2} =	0.0041

Unit Operating Rate-Million Btu per Hour

$$UOR = \left(\frac{PMR}{E_{O2}} \right)$$

E_{O2} = Emission Rate in Pounds Per Million Btu (EPA Oxygen F Factor) =	0.0041
PMR = Pollutant Mass Rate (pounds per hour) =	3.258860379
UOR=	798

Carbon Monoxide Emission Rate in Pounds per Hour

$$E_{lb/hour\ x} = \frac{MW_x}{385,000,000} C_{ppm_x} Q_{std} 60$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) = CO
MWx = Molecular weight of compound (dry basis, lb/lb mole) = 28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) = 49.44
Qstd = Volumetric flow rate (standard dry cubic feet per minute) = 194550
$E_{lb/hour}$ = 41.96865

Carbon Monoxide Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws}) C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) = CO
Cppmx = Pollutant Concentration (parts per million, dry basis) = 49.44
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) = 0.09
Cppmwetx 45.19

Carbon Monoxide Emissions Pounds Per Million Btu
(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385,000,000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) = CO
MWx = Molecular weight of compound (dry basis, lb/lb mole) = 28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) = 49.44
F_{O2} = Oxygen based F factor (SDCF/mmBtu) = 9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) = 6.97
E_{O2} = 0.052744

APPENDIX D GAS CERTIFICATIONS

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
8703 BELLINGRATH ROAD

THEODORE, AL 36582
ATTN:

DATE: 02/04/02
P.O. NO. 2844
ORDER NO. 6095288-03-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1965 psig CGA: 590 Analysis Date: 02/04/02
Shelf Life: 36 MONTH Expiration Date: 02/04/05

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC44291	PROPANE	6 ppm	5.9 ppm	1.2 ppm
	AIR	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/951E	150-408	10.5 PPM PROPANE/N2	09/21/02

INSTRUMENTATION

Instrument	Analytical Principle
EC-324 VARIAN MICRO GC	DETECTOR TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska
ANALYST
STEVE ESKA

FROM : INDWELD FAX NO. : 2516540091 Mar. 01 2002 09:37AM P4

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:
INDUSTRIAL WELDING SUPPLY
8703 BELLINGRATH ROAD

THEODORE, AL 36582
ATTN:

DATE:
P.O. NO. 02/04/02
ORDER NO. 2844
6095288-02-01

CYLINDER NO. CONSTITUENTS/CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1960 psig **CGA:** 590 **Analysis Date:** 02/04/02

Shelf Life: 36 MONTH **Expiration Date:** 02/04/05

		Nominal	Actual	Uncertainty
CC43943	PROPANE	10 ppm	9.6 ppm	1.2 ppm
	AIR	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/951E	150-408	10.5 PPM PROPANE/N2	09/21/02

INSTRUMENTATION

Instrument	Analytical Principle
EC-324 VARIAN MICRO GC	DETECTOR TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

ANALYST
STEVE ESKA

FROM : INDWELD FAX NO. : 2516540091 Mar. 01 2002 09:37AM P3

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
8703 BELLINGRATH ROAD

THEODORE, AL 36582
ATTN: LARRY STOKES

DATE: 02/04/02
P.O. NO. 2844
ORDER NO. 6095288-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1960 psig CGA: 590 Analysis Date: 02/04/02

Shelf Life: 36 MONTH Expiration Date: 02/04/05

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC27899	PROPANE	18 ppm	17.4 ppm	1.1 ppm
	AIR	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/952H	CC31625	51.3 PPM PROPANE/N2	09/21/02

INSTRUMENTATION

Instrument	Analytical Principle
KC-324 VARIAN MICRO GC	DETECTOR TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska
STEVE ESKA ANALYST

FROM : INDWELD FAX NO. : 2516540091 Mar. 01 2002 09:36AM P2

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 08/23/02
P.O. NO. 4544
ORDER NO. 6478179-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 2040 psig CGA: 590 Analysis Date: 08/23/02

Shelf Life: 60 MONTH Expiration Date: 08/23/07

		Nominal	Actual	Uncertainty
CC17617	OXYGEN	10.0%	10.00 %	0.025 %
	NITROGEN	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 903E	CC-13342	9.99% O2 IN N2	05/17/04

INSTRUMENTATION

Instrument	Analytical Principle
SERVOMEX	PARAMAGNETIC DETECTION

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 8/23/02

STEVE ESKA ANALYST

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 07/30/02
P.O. NO. 4346
ORDER NO. 5434860-01-01

CYLINDER NO.	CONSTITUENTS CONCENTRATION:	NOMINAL	ACTUAL	

EPA PROTOCOL MIXTURE

Pressure: 2020 psig CGA: 660 Analysis Date: 07/30/02

Shelf Life: 12 MONTHS Expiration Date: 07/30/03

		Nominal	Actual	Uncertainty
CC28069	SULFUR DIOXIDE	185ppm	188 ppm	1.6 ppm
	CARBON MONOXIDE	50 ppm	50 ppm	0.46 ppm
	NITROGEN	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 946E	CC121091	501 PPM SO2/N2	10/12/02
GMIS/ 939E	CC31032	100PPM CO/N2	10/30/02

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 7/30/02
STEVE ESKA ANALYST

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:
INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/22/02
P.O. NO. 4991
ORDER NO. 6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02

Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/ 956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/ 925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/ 914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02

STEVE ESKA ANALYST

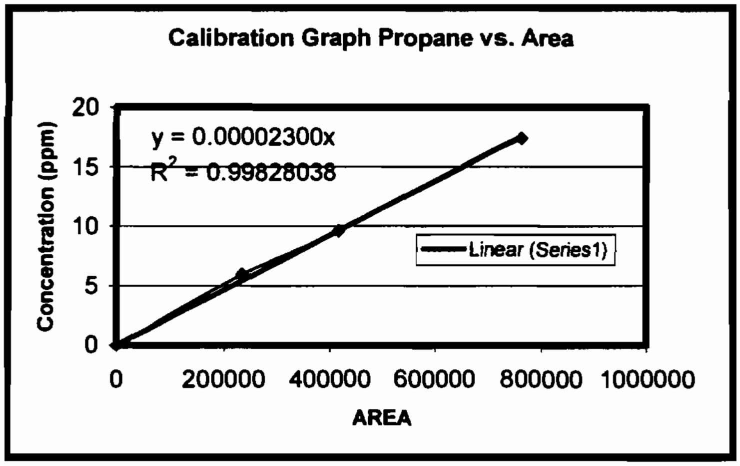
MG 23301/C

VOC Calibration Data

	high 17.4 ppm		mid 9.6 ppm		low 5.9 ppm	
injection #	Area	Percent Difference From Meam	Area	Percent Difference From Meam	Area	Percent Difference From Meam
1	760302	-0.442	415637	-0.257	232746	-0.935
2	767047	0.442	417782	0.257	237139	0.935
Mean	763674.5		416709.5		234943	

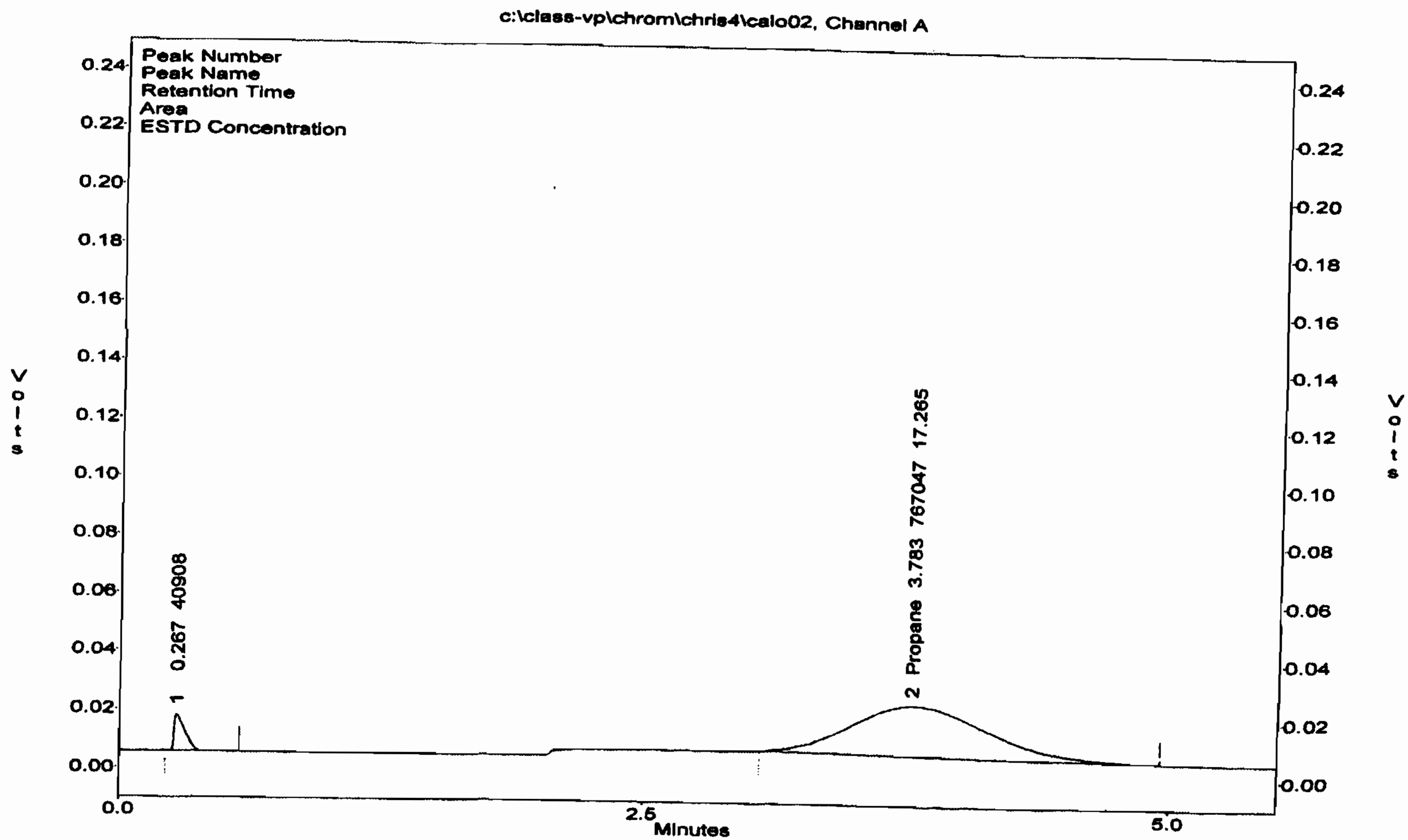
Calibration Data	
area	ppm
763674.5	17.4
416709.5	9.6
234943	5.9
0	0

Initial system check	
area	ppm
234998	5.9
234838	5.9

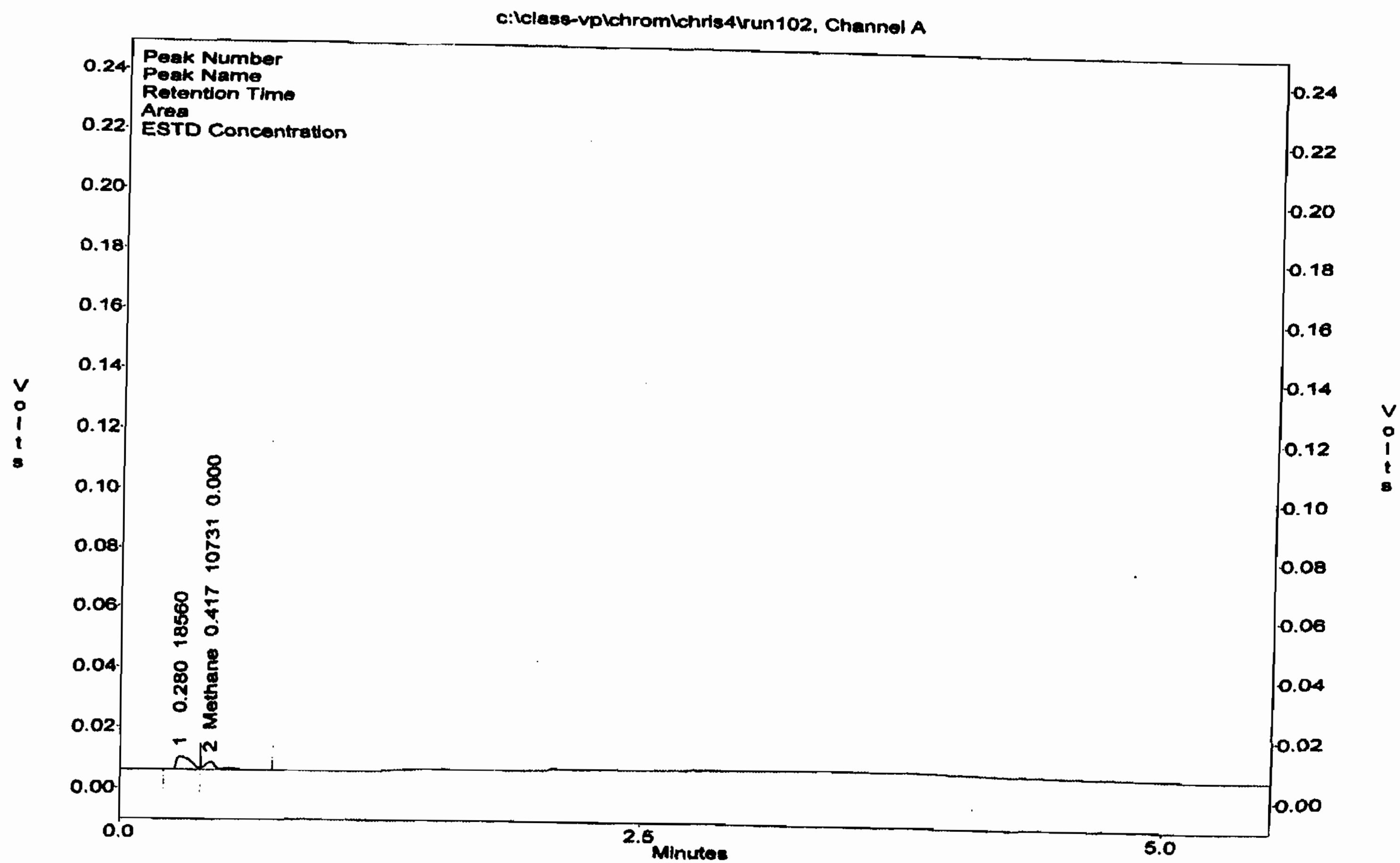


APPENDIX E EXAMPLE CHROMATOGRAMS

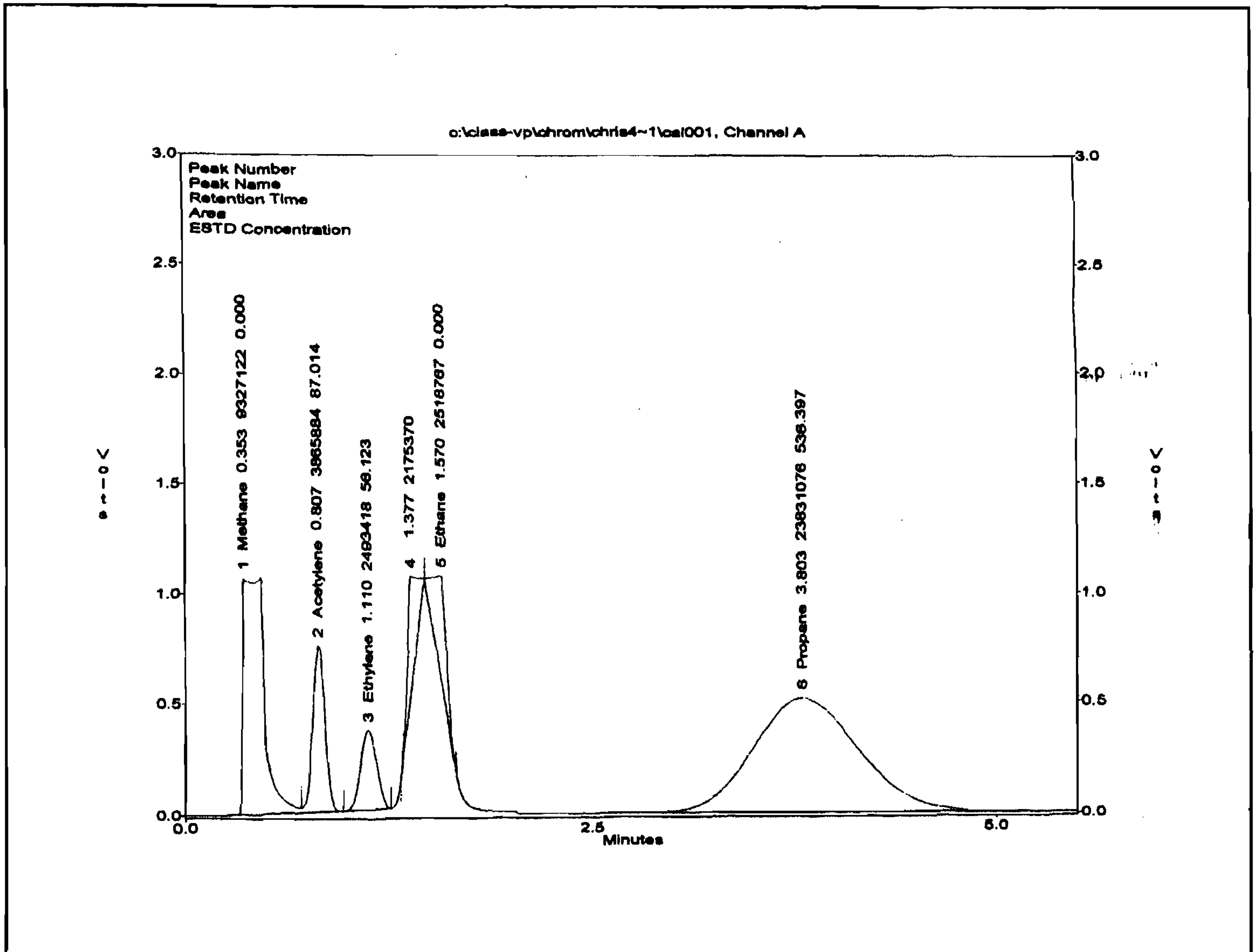
GAS CHROMATOGRAPHIC INJECTION OF 17.4 PARTS PER MILLION CALIBRATION GAS



GAS CHROMATOGRAPHIC INJECTION OF STACK GAS



GAS CHROMATOGRAM DEMONSTRATING COLUMN PERFORMANCE SEPERATING C-1 THROUGH C-3+ COMPOUNDS (METHANE, ACETYLENE, ETHYLENE, ETHANE, AND PROPANE+)



Crist 4

Carbonaceous Material (saw dust) Test

Maximum Allowable Heat Input: 1096.7 mmBtu/hr

Steady State December 19, 2002							
					coal flow	Coal	LDMS
Run #	Load	Start	End	Duration	from LDMS	Analysis	results
	Gross MW	Time	Time	(Hours)	(tons)	Btu / lb	mmBtu's/hr
1	79.4	12:04	13:06	1.03	34.95	11810	798.9
2	79.35	13:37	14:37	1.00	34.95	11751	821.4
3	78.3	15:25	17:02	1.62	33.15	11676	478.8
	79.0					**Average**	699.7
						Percent of Max Allowable	64%
						Load Limit if % < 90%	87

CEMS OPACITY DATA

Crist 4 Carbonaceous Material (saw dust) test Burn

Date	CEM Hour	Minutes									
		00	6	12	18	24	30	36	42	48	54
Steady State Testing											
12/19/02	12		2.8	2.8	2.7	2.8	2.8	2.7	2.7	2.7	2.7
12/19/02	13	2.7	2.8					2.8	2.8	2.9	2.9
12/19/02	14	2.8	2.8	2.8	2.8	2.7	2.7	2.7			
12/19/02	15					2.8	2.8	2.8	2.8	2.9	2.9
12/19/02	16	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.9	2.9	2.9
12/19/02	17	2.9	2.9								

Gulf Power Plant Crist Unit 4
Carbonaceous Material (saw dust) Test Burn Test Notes
Steady State Testing 12/19/02

Run #1

Start Time		Notes
CDT	CEMS	Fuel Mix 90% coal 10% saw dust by weight
12:04	12:04	NOTE: CEMS time, not Central Daylight Time (CDT), is used on Sander's test report.
Stop Time		D mill loaded up causing boiler pressure and megawatts to swing
CDT	CEMS	
13:06	13:06	

Run #2

Start Time		Notes
CDT	CEMS	No operational problems noted.
13:37	13:37	
Stop Time		
CDT	CEMS	
14:37	14:37	

Run #3

Start Time		Notes
CDT	CEMS	D coal feeder quit feeding causing boiler pressure and megawatts to drop. Halted emission test run
15:25	15:25	At 1555 and restarted run at 1633 when MW load and boiler pressure were back to normal.
Stop Time		30 min plus 29 min total run time of 59 min.
CDT	CEMS	
17:02	17:02	

Carbonaceous M[redacted]erial (Sawdust) Test Burn

Crist Plant Particulate Test Control Room Data

Unit 4 Date 12/19/02

Check one: Sootblowing ~~Steady-State~~ (no sootblowing)

Unit Operator: Tidwell

Run	Time	Pulverizer Coal Integrators (x 100 pounds) A	B	C	D	Generation Digital Meter MW	Gross Generation Integrator MWhr	Main Steam Total Flow (x 10e6 lb/hr)	Boiler Air Flow (x 10e6 lb/hr)	Excess O2 Econ Outlet % A	Excess O2 Econ Outlet % B	Opacity 6 min Avg %	ID Fan Amps A	ID Fan Amps B	Gas Temp Air Htr Outlet deg F A	Gas Temp Air Htr Outlet deg F B	Soot Blowing Status	Data taken by (Initials)
#1 Start	1204	830976	090611	697828	484228	78.3	78.5	1671.4	662.90	2.3	2.28	2.8	230		269	272	None	TST
#1 End	1306	831149	090785	697996	484414	80.5	78.8	674.91	657.14	3.1	3.21	2.7	235		268	277	"	TST
#2 Start	1337	831226	090867	698083	484510	79.3	80.9	606.51	661.29	3.05	3.06	2.8	235		268	274	None	TST
#2 End	1437	831397	091058	698245	484708	79.4	82.6	651.03	659.35	2.14	1.78	2.7	235		270	278	"	TST
#3 Start	1525	831520	091169	698368	484849	80.1	81.9	641.45	662.88	2.01	1.79	2.9	235		269	278	None	TST
Restart #3 ~~End~~	1653	831691	091370	698548	485057	80.1	76.8	625.35	652.88	2.22	2.33	2.9	235		269	277	"	'
end	1702	831766	091446	698623	485153	76.8	79.1	617.43	660.21	2.94	3.05	2.8	235		270	278	None	TST

Operational Comments

Run #1	D-mill loaded up
Run #2	
Run #3	D feeder started to fall out. Halted Run 1555 Restart Run 1633

Inside Operator Tidwell

Outside Operator (Coal Samples) D Lee

Laboratoryman (Ash Samples) Jeff McKinney

Electrician (ESP Readings) Tammy Boyd

DATE = 12/19/02

CRIST PLANT LOI WORKSHEET

COMPOSITE LOI

HOPPER	CRUCIBLE	CR. WT.	CR.+SAMP.	FURN. WT.	LOI	MW	TIME
Unit 4 - 2	5	15.4800	16.4510	16.4032	4.92		1300
Unit 4 - 2	20	15.3580	16.6640	16.5981	5.05		
Unit 4 - 6	22	16.8150	17.9920	17.9585	2.85		
Unit 4 - 6	4	15.1860	16.4860	16.4454	3.12		
Unit 4 - 2	3	15.6350	16.8190	16.7143	8.84		1430
Unit 4 - 2	41	15.4530	16.7200	16.6030	9.23		
Unit 4 - 6	1	15.5500	16.7720	16.7391	2.69		
Unit 4 - 6	2	16.8560	17.8810	17.8511	2.92		
Unit 4 - 2	55	14.5660	15.6120	15.4483	15.65		1710
Unit 4 - 2	6	15.4950	16.3750	16.2361	15.78		
Unit 4 - 6	11	14.0620	15.1890	15.0569	11.72		
Unit 4 - 6	14	17.2260	18.6630	18.4946	11.72		

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 10%

Laboratory ID Number : AG39747

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.63	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13293	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.82	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.00	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.61	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.77	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.46	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.91	% By Weight
Fluorine, Dry Basis	ASTM D 5987	PENDING	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.17	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.16	% By Weight
Ash, As Received	ASTM D 5142	5.89	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11810	Btu/lb
Carbon, As Received	ASTM D 5373	66.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.44	% By Weight
Nitrogen, As Received	ASTM D 5373	1.43	% By Weight
Oxygen, As Received	ASTM D 3176	9.57	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.27	% By Weight
Volatiles, As Received	ASTM D 5142	33.68	% By Weight
Fluorine, As Received	ASTM D 5987	PENDING	mg/kg
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 10%

Laboratory ID Number : AG39747

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.49	% By Weight
Barium, Ignited Basis	ASTM D 3683	433.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.62	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.80	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.63	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.97	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.69	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.85	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.30	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.74	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.60	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.27	% By Weight
Iron Oxide, Ignited	ASTM D 3682	14.01	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.04	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.68	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.15	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.25	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14237	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 10%

Laboratory ID Number : AG39747

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.880	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 10%

Laboratory ID Number : AG39748

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.73	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13270	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.82	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.04	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.60	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.64	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.65	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.62	% By Weight
Fluorine, Dry Basis	ASTM D 5987	PENDING	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.17	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.45	% By Weight
Ash, As Received	ASTM D 5142	5.96	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11751	Btu/lb
Carbon, As Received	ASTM D 5373	66.25	% By Weight
Hydrogen, As Received	ASTM D 5373	4.46	% By Weight
Nitrogen, As Received	ASTM D 5373	1.42	% By Weight
Oxygen, As Received	ASTM D 3176	9.42	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.28	% By Weight
Volatiles, As Received	ASTM D 5142	33.31	% By Weight
Fluorine, As Received	ASTM D 5987	PENDING	mg/kg
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 10%

Laboratory ID Number : AG39748

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	421.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.66	% By Weight
Iron, Ignited Basis	ASTM D 3682	8.95	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.10	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.07	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.86	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.23	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.94	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.79	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.53	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.50	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.16	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.08	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.27	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14228	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 10%

Laboratory ID Number : AG39748

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.882	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 10%

Laboratory ID Number : AG39749

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.78	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13262	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.84	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.98	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.60	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.59	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.69	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.53	% By Weight
Fluorine, Dry Basis	ASTM D 5987	PENDING	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.21	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.96	% By Weight
Ash, As Received	ASTM D 5142	5.97	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11676	Btu/lb
Carbon, As Received	ASTM D 5373	65.89	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.41	% By Weight
Oxygen, As Received	ASTM D 3176	9.32	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.03	% By Weight
Volatiles, As Received	ASTM D 5142	33.04	% By Weight
Fluorine, As Received	ASTM D 5987	PENDING	mg/kg
Sulfur, As Received	ASTM D 4239	1.07	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 10%

Laboratory ID Number : AG39749

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.59	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.66	% By Weight
Barium, Ignited Basis	ASTM D 3683	470.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.40	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.63	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.75	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.92	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.28	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.74	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.79	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.44	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.04	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.48	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.81	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.24	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.20	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14227	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ________________________ **Date :** 1/13/03

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 10%

Laboratory ID Number : AG39749

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.912	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ______________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 1

Laboratory ID Number : AG39745

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.22	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13689	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.14	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.89	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.73	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.77	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.10	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.68	% By Weight
Fluorine, Dry Basis	ASTM D 5987	PENDING	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.25	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.38	% By Weight
Ash, As Received	ASTM D 5142	6.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12131	Btu/lb
Carbon, As Received	ASTM D 5373	68.36	% By Weight
Hydrogen, As Received	ASTM D 5373	4.33	% By Weight
Nitrogen, As Received	ASTM D 5373	1.53	% By Weight
Oxygen, As Received	ASTM D 3176	6.89	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.37	% By Weight
Volatiles, As Received	ASTM D 5142	29.85	% By Weight
Fluorine, As Received	ASTM D 5987	PENDING	mg/kg
Sulfur, As Received	ASTM D 4239	1.11	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ **Date :** 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 1

Laboratory ID Number : AG39745

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.81	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.62	% By Weight
Barium, Ignited Basis	ASTM D 3683	500.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.13	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.18	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.86	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.15	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.79	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.13	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.74	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.20	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.27	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.05	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.41	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.24	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.67	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.83	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14754	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 1/13/03

smk/coa

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P.O. Box 2641
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(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 1

Laboratory ID Number : AG39745

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.913	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 2

Laboratory ID Number : AG39746

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.61	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13586	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.33	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.97	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.70	% By Weight
Oxygen, Dry Basis	ASTM D 3176	8.06	% By Weight
Carbon Fixed, Dry	ASTM D 3172	58.21	% By Weight
Volatiles, Dry Basis	ASTM D 5142	34.18	% By Weight
Fluorine, Dry Basis	ASTM D 5987	PENDING	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.33	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.61	% By Weight
Ash, As Received	ASTM D 5142	6.73	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12009	Btu/lb
Carbon, As Received	ASTM D 5373	67.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.39	% By Weight
Nitrogen, As Received	ASTM D 5373	1.50	% By Weight
Oxygen, As Received	ASTM D 3176	7.12	% By Weight
Carbon Fixed, As Received	ASTM D 3172	51.45	% By Weight
Volatiles, As Received	ASTM D 5142	30.21	% By Weight
Fluorine, As Received	ASTM D 5987	PENDING	mg/kg
Sulfur, As Received	ASTM D 4239	1.18	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 2
Laboratory ID Number : AG39746

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.979	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision ___________________________ Date : 1/13/03

smk/coa

HOT SIDE 4 ¢ - PROGRAM 1 9-

8 7 6 5 NUMBER

① GROUP NO.	② FIELD NAME	③ REPEAT TIME	LIFT HEIGHT ④⑤ (LIFT / IMPACTS / FREQUENCY); ON TIME ⑥ (HRS / MIN / SEC); ON TIME ⑦ (ON TIME / INTENSITY)	⑧ REST TIME	⑨ P.O.R. TIME	⑩ RAP DIRECTION	⑪ STARTING RAPPER	⑫ (REST) MODE	⑬ ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACC	DUTY CYCLES INTERCA
1	H4P1	2:05	10	4.0		ASC.	1	MAX	1			
2	H4P2	4:03	10				7		1			
3	H4P3	6:05	10				13		1			
4	H4P4	10:07	10				19		1			
5	H4P5	13:13	10				25		1			
6	H4P6	16:01	10				31		1			
7	H4P7	21:07	10				37		1			
8	H4P8	26:11	10				43		1			
9	H4P9	31:37	10				49		1			
10	H4W	5:01	5 sec/100%				1		2			
11												
12												
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D

C

B

4 COLD

LOC

8	7	6	5	NUMBER

D

GROUP NO.	FIELD NAME	REPEAT TIME	LIFT HEIGHT: LIFT / ON TIME: HRS / ON TIME: ON TIME	LIFT HEIGHT: IMPACTS / ON TIME: MIN / ON TIME: INTENSITY	LIFT HEIGHT: FREQUENCY / ON TIME: SEC	REST TIME	P.O.R. TIME	RAP DIRECTION	STARTING RAPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACC	DUTY CYCLES INTERLEAVE
1	C4LA	1:03 2:03	3.6	1	1	0:10	-	ASC	01	MAX	1	48	179	3
2	C4TA	1:59 3:59	3.6	1	1	0:10	-	ASC	04	MAX	1	25	179	1
3	C4LB	3:01 6:01	3.6	1	1	0:10	-	ASC	07	MAX	1	17	179	1
4	C4TB	3:51 9:51	3.6	1	1	0:10	-	ASC	10	MAX	1	13	179	1
5	C4LC	6:17 15:17	3.6	1	1	0:10	-	ASC	13	MAX	1	8	179	0
6	C4TC	7:03 25:03	3.6	1	1	0:10	-	ASC	16	MAX	1	7	179	0
7	C4EA	2:01	3.4	1	1	0:10	-	ASC	01	MAX	1	33	179	2
8	C4EB	3:59	3.4	1	1	0:10	-	ASC	05	MAX	1	17	179	1
9	C4EC	6:03	3.4	1	1	0:10	-	ASC	09	MAX	1	11	179	1
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22														
23														

C

B

UNIT 5 COLD

8	7	6	5	NUMBER	3

D

GROUP NO. ①	FIELD NAME ②	MIN. REPEAT TIME ③	LIFT HEIGHT ④⑤ / LIFT · IMPACTS · FREQUENCY / ON TIME ⑥ / HRS · MIN · SEC / ON TIME ⑦ / ON TIME · INTENSITY	REST TIME SEC. ⑧	P.O.R. TIME ⑨	RAP DIRECTION ⑩	STARTING RAPPER ⑪	(REST) MODE ⑫	ANTI-COINCIDENCE GROUP ⑬	DUTY CYCLES ⑭ FIELD	DUTY CYCLES ACC	DUTY CYCLES INTERWEAVE
1	CSP1	2:03	5.0 4FT	2.0		ASC.	1	MAX	1	10	17	3
2	CSP2	5:13	5.0	2.0		ASC.	4	MAX	1	4	17	1
3	CSP3	9:19	5.0	2.0		ASC.	7	MAX	1	1	17	0
4	CSP4	13:03	5.0	2.0		ASC.	10	MAX	1	1	17	0
5	CSW	6:00	5.0	2.0		ASC.	13	MAX	1	1	17	0
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24												

C

B

Round Data

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:52:57
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:52:59
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-1 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:53:01
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 00 (Run Start) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:53:03
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** sawdust — 12:04 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:56:10
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:56:29
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:56:36
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 14 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:56:39
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 189 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:56:47
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.07 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:56:52
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:56:56
Note:

A HOT side Cabinent Kilowatts **CompID:**
PointID: CAM009 **Value:** 2 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:00
Note:

A HOT side Cabinent Firing Angle **CompID:**
PointID: CAM010 **Value:** 64 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:04
Note:

B HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM011 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:08
Note:

B HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM012 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:11
Note:

B HOT side Cabinent Primary Amps **CompID:**
PointID: CAM013 **Value:** 44 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:14
Note:

B HOT side Cabinent Primary Volts **CompID:**
PointID: CAM014 **Value:** 217 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:18
Note:

B HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM015 **Value:** 0.68 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:24
Note:

B HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM016 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:28
Note:

B HOT side Cabinent Kilowatts **CompID:**
PointID: CAM017 **Value:** 12 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:30
Note:

B HOT side Cabinent Firing Angle **CompID:**
PointID: CAM018 **Value:** 76 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:34
Note:

C HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM019 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:38
Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:41
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 105 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:47
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 294 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:51
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.9 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:56
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:57:59
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:02
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:06
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:10
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:12
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 118 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:16
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 329 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:21
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:24
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:28
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 36 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:30
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:34
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:38
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:40
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 70 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:43
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 330 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:47
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:51
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 24 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:58:56
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 14 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:01
Note:

E HOT side Cabinent Firing Angle **CompID:**
PointID: CAM042 **Value:** 116 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:08
Note:

F HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM043 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:11
Note:

F HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM044 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:14
Note:

F HOT side Cabinent Primary Amps **CompID:**
PointID: CAM045 **Value:** 100 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:17
Note:

F HOT side Cabinent Primary Volts **CompID:**
PointID: CAM046 **Value:** 359 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:23
Note:

F HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM047 **Value:** 0.97 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:27
Note:

F HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM048 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:31
Note:

F HOT side Cabinent Kilowatts **CompID:**
PointID: CAM049 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:34
Note:

F HOT side Cabinent Firing Angle **CompID:**
PointID: CAM050 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 11:59:37
Note:

A COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM051 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:02:15
Note:

A COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM052 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:02:18
Note:

A COLD side Cabinent Primary Amps **CompID:**

PointID: CAM053 **Value:** 44 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:21

Note:

A COLD side Cabinent Primary Volts **CompID:**

PointID: CAM054 **Value:** 460 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:26

Note:

A COLD side Cabinent Secondary Amps **CompID:**

PointID: CAM055 **Value:** 0.34 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:31

Note:

A COLD side Cabinent Secondary Volts **CompID:**

PointID: CAM056 **Value:** 39 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:35

Note:

A COLD side Cabinent Kilowatts **CompID:**

PointID: CAM057 **Value:** 18 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:38

Note:

A COLD side Cabinent Firing Angle **CompID:**

PointID: CAM058 **Value:** 150 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:41

Note:

B COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM059 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:46

Note:

B COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM060 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:49

Note:

B COLD side Cabinent Primary Amps **CompID:**

PointID: CAM061 **Value:** 71 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:52

Note:

B COLD side Cabinent Primary Volts **CompID:**

PointID: CAM062 **Value:** 344 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:02:56

Note:

B COLD side Cabinent Secondary Amps **CompID:**

PointID: CAM063 **Value:** 0.46 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 12:03:00

Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:04
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:06
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:10
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:13
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:15
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:19
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 320 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:21
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.65 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:27
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:29
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:31
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:03:34
Note:

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:57:35
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:57:37
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-1 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:57:39
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 60 (Run End) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:57:43
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** sawdust — 13:06 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:58:21
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:58:30
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:58:32
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:58:35
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 206 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:58:42
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.17 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:58:51
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:58:57
Note:

A HOT side Cabinent Kilowatts **CompID:**
PointID: CAM009 **Value:** 5 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:00
Note:

A HOT side Cabinent Firing Angle **CompID:**
PointID: CAM010 **Value:** 68 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:04
Note:

B HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM011 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:08
Note:

B HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM012 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:09
Note:

B HOT side Cabinent Primary Amps **CompID:**
PointID: CAM013 **Value:** 69 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:14
Note:

B HOT side Cabinent Primary Volts **CompID:**
PointID: CAM014 **Value:** 300 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:17
Note:

B HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM015 **Value:** 0.67 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:25
Note:

B HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM016 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:28
Note:

B HOT side Cabinent Kilowatts **CompID:**
PointID: CAM017 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:32
Note:

B HOT side Cabinent Firing Angle **CompID:**
PointID: CAM018 **Value:** 76 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:34
Note:

C HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM019 **Value:** 1 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:38
Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:40
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 105 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:42
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 294 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:46
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:51
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:55
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:57
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 12:59:59
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:01
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:01
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 118 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:03
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 326 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:07
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:09
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:11
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:15
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:16
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:18
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:20
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 61 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:24
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 325 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:30
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:35
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:38
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:00:42
Note:

E HOT side Cabinent Firing Angle **CompID:**

PointID: CAM042 **Value:** 88 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:00:45

Note:

F HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM043 **Value:** 1 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:00:50

Note:

F HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM044 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:00:52

Note:

F HOT side Cabinent Primary Amps **CompID:**

PointID: CAM045 **Value:** 100 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:00:54

Note:

F HOT side Cabinent Primary Volts **CompID:**

PointID: CAM046 **Value:** 357 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:00:59

Note:

F HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM047 **Value:** 0.98 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:01:04

Note:

F HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM048 **Value:** 25 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:01:07

Note:

F HOT side Cabinent Kilowatts **CompID:**

PointID: CAM049 **Value:** 32 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:01:12

Note:

F HOT side Cabinent Firing Angle **CompID:**

PointID: CAM050 **Value:** 140 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:01:15

Note:

A COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM051 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:03:46

Note:

A COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM052 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 13:03:50

Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 44 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:03:53
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 459 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:03:58
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:00
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:01
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:03
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:04
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:13
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:14
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 71 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:16
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 344 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:18
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.46 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:20
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:22
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:23
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:25
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:27
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:29
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:31
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 319 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:37
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.66 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:41
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:43
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:45
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:04:47
Note:

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:24:09
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:24:11
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-2 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:24:15
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 00 (Run Start) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:24:19
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** sawdust — 13:37 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:28:39
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:28:46
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:28:48
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 22 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:28:51
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 188 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:28:55
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.17 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:28:57
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:29:08
Note:

A HOT side Cabinent Kilowatts CompID:

PointID: CAM009 Value: 1 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:10

Note:

A HOT side Cabinent Firing Angle CompID:

PointID: CAM010 Value: 64 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:14

Note:

B HOT side Cabinent Sparks per Minute CompID:

PointID: CAM011 Value: 25 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:18

Note:

B HOT side Cabinent Arcs per Minute CompID:

PointID: CAM012 Value: 0 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:19

Note:

B HOT side Cabinent Primary Amps CompID:

PointID: CAM013 Value: 46 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:23

Note:

B HOT side Cabinent Primary Volts CompID:

PointID: CAM014 Value: 255 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:27

Note:

B HOT side Cabinent Secondary Amps CompID:

PointID: CAM015 Value: 0.39 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:32

Note:

B HOT side Cabinent Secondary Volts CompID:

PointID: CAM016 Value: 27 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:37

Note:

B HOT side Cabinent Kilowatts CompID:

PointID: CAM017 Value: 10 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:40

Note:

B HOT side Cabinent Firing Angle CompID:

PointID: CAM018 Value: 103 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:44

Note:

C HOT side Cabinent Sparks per Minute CompID:

PointID: CAM019 Value: 1 InAlarm? :

Gathered By: tsboyd Date: 12/19/2002 13:29:47

Note:

C HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:29:48
Note:

C HOT side Cabinent Primary Amps **CompID:**

PointID: CAM021 **Value:** 88 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:29:52
Note:

C HOT side Cabinent Primary Volts **CompID:**

PointID: CAM022 **Value:** 297 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:29:56
Note:

C HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM023 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:29:59
Note:

C HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM024 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:01
Note:

C HOT side Cabinent Kilowatts **CompID:**

PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:02
Note:

C HOT side Cabinent Firing Angle **CompID:**

PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:04
Note:

D HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:07
Note:

D HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:07
Note:

D HOT side Cabinent Primary Amps **CompID:**

PointID: CAM029 **Value:** 118 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:09
Note:

D HOT side Cabinent Primary Volts **CompID:**

PointID: CAM030 **Value:** 326 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:10
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:12
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:14
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 36 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:18
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:19
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:21
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:23
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 51 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:28
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 339 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:33
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:38
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:41
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:45
Note:

E HOT side Cabinent Firing Angle **CompID:**
PointID: CAM042 **Value:** 96 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:48
Note:

F HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM043 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:52
Note:

F HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM044 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:53
Note:

F HOT side Cabinent Primary Amps **CompID:**
PointID: CAM045 **Value:** 100 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:55
Note:

F HOT side Cabinent Primary Volts **CompID:**
PointID: CAM046 **Value:** 357 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:30:59
Note:

F HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM047 **Value:** 0.97 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:31:03
Note:

F HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM048 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:31:05
Note:

F HOT side Cabinent Kilowatts **CompID:**
PointID: CAM049 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:31:06
Note:

F HOT side Cabinent Firing Angle **CompID:**
PointID: CAM050 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:31:08
Note:

A COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM051 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:33:40
Note:

A COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM052 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:33:41
Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 44 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:33:42
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 460 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:33:50
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:33:55
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:33:57
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:33:59
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:01
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:03
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:05
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 71 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:07
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 343 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:12
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.46 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:14
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:18
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:20
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:21
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:24
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:24
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:26
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 320 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:30
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.66 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:32
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:33
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:35
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 13:34:36
Note:

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:29:43
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:29:44
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-2 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:29:46
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 60 (Run End) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:29:49
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** sawdust --- 14:37 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:29:59
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:30:04
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:30:06
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:30:10
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 167 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:30:15
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.14 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:30:21
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:30:27
Note:

A HOT side Cabinent Kilowatts **CompID:**

PointID: CAM009 **Value:** 1 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:30

Note:

A HOT side Cabinent Firing Angle **CompID:**

PointID: CAM010 **Value:** 47 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:33

Note:

B HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM011 **Value:** 25 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:35

Note:

B HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM012 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:37

Note:

B HOT side Cabinent Primary Amps **CompID:**

PointID: CAM013 **Value:** 38 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:42

Note:

B HOT side Cabinent Primary Volts **CompID:**

PointID: CAM014 **Value:** 230 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:46

Note:

B HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM015 **Value:** 0.37 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:50

Note:

B HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM016 **Value:** 27 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:53

Note:

B HOT side Cabinent Kilowatts **CompID:**

PointID: CAM017 **Value:** 11 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:30:56

Note:

B HOT side Cabinent Firing Angle **CompID:**

PointID: CAM018 **Value:** 72 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:31:00

Note:

C HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM019 **Value:** 2 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 14:31:04

Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:05
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 104 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:10
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 300 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:15
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.87 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:20
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:22
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:23
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:25
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:27
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:28
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 118 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:29
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 327 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:33
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:34
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:36
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:39
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:40
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:42
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:44
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 65 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:47
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 312 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:51
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:31:56
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:00
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:02
Note:

E HOT side Cabinent Firing Angle **CompID:**
PointID: CAM042 **Value:** 113 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:05
Note:

F HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM043 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:08
Note:

F HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM044 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:08
Note:

F HOT side Cabinent Primary Amps **CompID:**
PointID: CAM045 **Value:** 100 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:10
Note:

F HOT side Cabinent Primary Volts **CompID:**
PointID: CAM046 **Value:** 356 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:16
Note:

F HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM047 **Value:** 0.98 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:20
Note:

F HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM048 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:22
Note:

F HOT side Cabinent Kilowatts **CompID:**
PointID: CAM049 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:24
Note:

F HOT side Cabinent Firing Angle **CompID:**
PointID: CAM050 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:32:25
Note:

A COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM051 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:00
Note:

A COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM052 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:00
Note:

A COLD side Cabinent Primary Amps | CompID:
PointID: CAM053 Value: 44 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:02
Note:

A COLD side Cabinent Primary Volts | CompID:
PointID: CAM054 Value: 457 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:07
Note:

A COLD side Cabinent Secondary Amps | CompID:
PointID: CAM055 Value: 0.34 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:12
Note:

A COLD side Cabinent Secondary Volts | CompID:
PointID: CAM056 Value: 39 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:15
Note:

A COLD side Cabinent Kilowatts | CompID:
PointID: CAM057 Value: 18 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:19
Note:

A COLD side Cabinent Firing Angle | CompID:
PointID: CAM058 Value: 150 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:20
Note:

B COLD side Cabinent Sparks per Minute | CompID:
PointID: CAM059 Value: 0 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:23
Note:

B COLD side Cabinent Arcs per Minute | CompID:
PointID: CAM060 Value: 0 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:23
Note:

B COLD side Cabinent Primary Amps | CompID:
PointID: CAM061 Value: 71 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:25
Note:

B COLD side Cabinent Primary Volts | CompID:
PointID: CAM062 Value: 341 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:29
Note:

B COLD side Cabinent Secondary Amps | CompID:
PointID: CAM063 Value: 0.46 | InAlarm? :
Gathered By: tsboyd | Date: 12/19/2002 14:35:32
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:37
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:40
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:41
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:43
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:44
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:46
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 319 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:50
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.65 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:54
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:35:58
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:36:00
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 14:36:01
Note:

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:09:57
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:09:59
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:10:03
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 00 (Run Start) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:10:06
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** sawdust — 15:25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:16:59
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:17:03
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:17:04
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:17:08
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 165 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:17:12
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.09 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:17:18
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:17:26
Note:

A HOT side Cabinent Kilowatts **CompID:**

PointID: CAM009 **Value:** 1 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:27

Note:

A HOT side Cabinent Firing Angle **CompID:**

PointID: CAM010 **Value:** 58 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:30

Note:

B HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM011 **Value:** 27 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:35

Note:

B HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM012 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:38

Note:

B HOT side Cabinent Primary Amps **CompID:**

PointID: CAM013 **Value:** 30 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:42

Note:

B HOT side Cabinent Primary Volts **CompID:**

PointID: CAM014 **Value:** 245 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:46

Note:

B HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM015 **Value:** 0.28 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:52

Note:

B HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM016 **Value:** 25 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:55

Note:

B HOT side Cabinent Kilowatts **CompID:**

PointID: CAM017 **Value:** 4 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:17:58

Note:

B HOT side Cabinent Firing Angle **CompID:**

PointID: CAM018 **Value:** 72 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:18:02

Note:

C HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM019 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 15:18:08

Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:09
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 105 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:13
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 296 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:18
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:22
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:24
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:26
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:29
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:32
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:33
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 118 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:35
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 329 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:38
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:39
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:41
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:43
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:44
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:46
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:49
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 52 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:53
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 288 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:18:58
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:02
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:05
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 14 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:08
Note:

E HOT side Cabinent Firing Angle **CompID:**
PointID: CAM042 **Value:** 94 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:12
Note:

F HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM043 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:15
Note:

F HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM044 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:15
Note:

F HOT side Cabinent Primary Amps **CompID:**
PointID: CAM045 **Value:** 100 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:17
Note:

F HOT side Cabinent Primary Volts **CompID:**
PointID: CAM046 **Value:** 357 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:22
Note:

F HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM047 **Value:** 0.97 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:26
Note:

F HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM048 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:28
Note:

F HOT side Cabinent Kilowatts **CompID:**
PointID: CAM049 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:29
Note:

F HOT side Cabinent Firing Angle **CompID:**
PointID: CAM050 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:19:31
Note:

A COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM051 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:47
Note:

A COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM052 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:48
Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 44 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:49
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 458 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:53
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:55
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:57
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:58
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:22:59
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:01
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:01
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 71 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:03
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 342 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:08
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.46 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:10
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:12
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:13
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:13
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:15
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:16
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:17
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 318 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:21
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.65 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:23
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:24
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:26
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 15:23:27
Note:

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:53:53
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:53:54
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:53:56
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 60 (Run End) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:53:59
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** sawdust — 17:02 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:54:09
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:54:12
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:54:13
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:54:19
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 158 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:54:23
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.19 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:54:30
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 22 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:54:34
Note:

A HOT side Cabinent Kilowatts **CompID:**

PointID: CAM009 **Value:** 1 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:54:36

Note:

A HOT side Cabinent Firing Angle **CompID:**

PointID: CAM010 **Value:** 64 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:54:40

Note:

B HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM011 **Value:** 27 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:54:44

Note:

B HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM012 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:54:46

Note:

B HOT side Cabinent Primary Amps **CompID:**

PointID: CAM013 **Value:** 38 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:54:51

Note:

B HOT side Cabinent Primary Volts **CompID:**

PointID: CAM014 **Value:** 231 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:54:55

Note:

B HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM015 **Value:** 0.21 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:55:00

Note:

B HOT side Cabinent Kilowatts **CompID:**

PointID: CAM017 **Value:** 4 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:55:00

Note:

B HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM016 **Value:** 26 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:55:03

Note:

B HOT side Cabinent Firing Angle **CompID:**

PointID: CAM018 **Value:** 65 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:55:25

Note:

C HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM019 **Value:** 5 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/19/2002 16:55:33

Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:35
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 100 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:39
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 295 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:47
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:49
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:51
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:52
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:56
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:58
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:55:59
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 118 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:03
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 327 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:07
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:09
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:10
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 36 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:13
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:15
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:18
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:20
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 61 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:28
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 306 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:33
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:39
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:42
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:46
Note:

E HOT side Cabinent Firing Angle **CompID:**
PointID: CAM042 **Value:** 106 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:50
Note:

F HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM043 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:53
Note:

F HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM044 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:53
Note:

F HOT side Cabinent Primary Amps **CompID:**
PointID: CAM045 **Value:** 99 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:56:57
Note:

F HOT side Cabinent Primary Volts **CompID:**
PointID: CAM046 **Value:** 356 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:57:01
Note:

F HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM047 **Value:** 0.97 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:57:03
Note:

F HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM048 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:57:05
Note:

F HOT side Cabinent Kilowatts **CompID:**
PointID: CAM049 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:57:06
Note:

F HOT side Cabinent Firing Angle **CompID:**
PointID: CAM050 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 16:57:07
Note:

A COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM051 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:18
Note:

A COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM052 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:19
Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 43 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:23
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 458 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:26
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:27
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:30
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:32
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:33
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:35
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:35
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 71 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:37
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 341 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:42
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.46 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:44
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:45
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:46
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:47
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:50
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:50
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:52
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 317 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:57
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.65 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:00:59
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:01:01
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:01:02
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/19/2002 17:01:04
Note:

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.28	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13666	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.29	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.91	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.71	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.57	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.08	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.64	% By Weight
Fluorine, Dry Basis	ASTM D 5987	36	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.24	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.51	% By Weight
Ash, As Received	ASTM D 5142	6.44	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12093	Btu/lb
Carbon, As Received	ASTM D 5373	68.39	% By Weight
Hydrogen, As Received	ASTM D 5373	4.34	% By Weight
Nitrogen, As Received	ASTM D 5373	1.51	% By Weight
Oxygen, As Received	ASTM D 3176	6.70	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.28	% By Weight
Volatiles, As Received	ASTM D 5142	29.77	% By Weight
Fluorine, As Received	ASTM D 5987	32	mg/kg
Sulfur, As Received	ASTM D 4239	1.10	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.78	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.55	% By Weight
Barium, Ignited Basis	ASTM D 3683	527.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.48	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.68	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.16	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.80	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.91	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.14	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.15	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.17	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.13	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.37	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.30	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.92	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.27	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14739	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6061

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.907	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ Supervision ____________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.42	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8918	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.10	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.20	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.05	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.21	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.72	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.86	% By Weight
Fluorine, Dry Basis	ASTM D 5987	7	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	9.29	% By Weight
Ash, As Received	ASTM D 5142	0.38	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8090	Btu/lb
Carbon, As Received	ASTM D 5373	47.26	% By Weight
Hydrogen, As Received	ASTM D 5373	5.62	% By Weight
Nitrogen, As Received	ASTM D 5373	0.05	% By Weight
Oxygen, As Received	ASTM D 3176	37.38	% By Weight
Carbon Fixed, As Received	ASTM D 3172	16.98	% By Weight
Volatiles, As Received	ASTM D 5142	73.35	% By Weight
Fluorine, As Received	ASTM D 5987	6	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ Supervision ____________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	0.84	% By Weight
Barium, Ignited Basis	ASTM D 3683	1056.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	19.89	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.72	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	5.31	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.93	% By Weight
Potassium, Ignited Basis	ASTM D 3682	13.92	% By Weight
Silicon, Ignited Basis	ASTM D 3682	8.20	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	8.18	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.05	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.59	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	27.83	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	8.81	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	4.42	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	16.77	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	17.54	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	20.45	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8956	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision** ______________________ Date : 1/13/03

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.022	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ Supervision ______________________ Date : 1/13/03

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.45	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8821	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.08	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.23	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.10	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.12	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.76	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.79	% By Weight
Fluorine, Dry Basis	ASTM D 5987	12	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	7.41	% By Weight
Ash, As Received	ASTM D 5142	0.42	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8167	Btu/lb
Carbon, As Received	ASTM D 5373	48.22	% By Weight
Hydrogen, As Received	ASTM D 5373	5.77	% By Weight
Nitrogen, As Received	ASTM D 5373	0.09	% By Weight
Oxygen, As Received	ASTM D 3176	38.07	% By Weight
Carbon Fixed, As Received	ASTM D 3172	17.37	% By Weight
Volatiles, As Received	ASTM D 5142	74.80	% By Weight
Fluorine, As Received	ASTM D 5987	11	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ Supervision ______________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6061

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	0.81	% By Weight
Barium, Ignited Basis	ASTM D 3683	1422.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	30.57	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.40	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	7.40	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.79	% By Weight
Potassium, Ignited Basis	ASTM D 3682	21.61	% By Weight
Silicon, Ignited Basis	ASTM D 3682	1.89	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	3.81	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.00	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.53	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	42.77	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	12.27	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	1.81	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	26.03	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	4.04	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	9.52	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.00	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8861	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision____________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6061

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.023	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.58	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8620	Btu/lb
Carbon, Dry Basis	ASTM D 5373	51.12	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.13	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.08	% By Weight
Oxygen, Dry Basis	ASTM D 3176	42.07	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.78	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.64	% By Weight
Fluorine, Dry Basis	ASTM D 5987	10	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	10.45	% By Weight
Ash, As Received	ASTM D 5142	0.52	% By Weight
Heat of Combustion, As Received	ASTM D 5865	7719	Btu/lb
Carbon, As Received	ASTM D 5373	45.78	% By Weight
Hydrogen, As Received	ASTM D 5373	5.49	% By Weight
Nitrogen, As Received	ASTM D 5373	0.07	% By Weight
Oxygen, As Received	ASTM D 3176	37.67	% By Weight
Carbon Fixed, As Received	ASTM D 3172	16.82	% By Weight
Volatiles, As Received	ASTM D 5142	72.21	% By Weight
Fluorine, As Received	ASTM D 5987	9	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ________________ Supervision____________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	0.91	% By Weight
Calcium, Ignited Basis	ASTM D 3682	30.07	% By Weight
Barium, Ignited Basis	ASTM D 3683	848.	mg/kg
Iron, Ignited Basis	ASTM D 3682	0.40	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	7.97	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	21.80	% By Weight
Silicon, Ignited Basis	ASTM D 3682	2.18	% By Weight
Sodium, Ignited Basis	ASTM D 3682	3.26	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.74	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.02	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.72	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	42.07	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	13.22	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	26.26	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	4.66	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	4.39	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	6.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.03	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8670	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision______________________________ Date : 1/13/03

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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.023	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision ____________________________ Date : 1/13/03

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General Test Laboratory
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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.93	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13343	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.04	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.98	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.61	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.27	% By Weight
Carbon Fixed, Dry	ASTM D 3172	56.54	% By Weight
Volatiles, Dry Basis	ASTM D 5142	36.53	% By Weight
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.17	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.43	% By Weight
Ash, As Received	ASTM D 5142	6.14	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11818	Btu/lb
Carbon, As Received	ASTM D 5373	66.46	% By Weight
Hydrogen, As Received	ASTM D 5373	4.41	% By Weight
Nitrogen, As Received	ASTM D 5373	1.43	% By Weight
Oxygen, As Received	ASTM D 3176	9.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	50.08	% By Weight
Volatiles, As Received	ASTM D 5142	32.35	% By Weight
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision ______________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.87	% By Weight
Barium, Ignited Basis	ASTM D 3683	441.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.58	% By Weight
Iron, Ignited Basis	ASTM D 3682	8.66	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.07	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.20	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.24	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.73	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.32	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.21	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.38	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.77	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.13	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.10	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14337	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision ______________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.877	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ______________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.49	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13220	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.73	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.10	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.55	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.02	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.56	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.95	% By Weight
Fluorine, Dry Basis	ASTM D 5987	24	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.11	% By Weight
As Received			
Moisture, Total	ASTM D 2013	14.30	% By Weight
Ash, As Received	ASTM D 5142	5.56	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11330	Btu/lb
Carbon, As Received	ASTM D 5373	64.04	% By Weight
Hydrogen, As Received	ASTM D 5373	4.37	% By Weight
Nitrogen, As Received	ASTM D 5373	1.33	% By Weight
Oxygen, As Received	ASTM D 3176	9.44	% By Weight
Carbon Fixed, As Received	ASTM D 3172	47.61	% By Weight
Volatiles, As Received	ASTM D 5142	32.52	% By Weight
Fluorine, As Received	ASTM D 5987	21	mg/kg
Sulfur, As Received	ASTM D 4239	0.95	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP

Description : Gulf Power - Plant Crist

Received Date : 26-Dec-02

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.41	% By Weight
Barium, Ignited Basis	ASTM D 3683	532.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.94	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.47	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.70	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.93	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.46	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.95	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.45	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.73	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.45	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.71	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.54	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.16	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.19	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.63	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14138	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.840	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision ____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.62	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13487	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.18	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.89	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.66	% By Weight
Oxygen, Dry Basis	ASTM D 3176	9.46	% By Weight
Carbon Fixed, Dry	ASTM D 3172	57.29	% By Weight
Volatiles, Dry Basis	ASTM D 5142	36.09	% By Weight
Fluorine, Dry Basis	ASTM D 5987	44	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.19	% By Weight
As Received			
Moisture, Total	ASTM D 2013	14.39	% By Weight
Ash, As Received	ASTM D 5142	5.67	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Carbon, As Received	ASTM D 5373	65.22	% By Weight
Hydrogen, As Received	ASTM D 5373	4.19	% By Weight
Nitrogen, As Received	ASTM D 5373	1.42	% By Weight
Oxygen, As Received	ASTM D 3176	8.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.05	% By Weight
Volatiles, As Received	ASTM D 5142	30.90	% By Weight
Fluorine, As Received	ASTM D 5987	38	mg/kg
Sulfur, As Received	ASTM D 4239	1.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision ____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	443.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.64	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.15	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.86	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.27	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.75	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.94	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.29	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.08	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.48	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.05	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.17	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.25	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14443	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6061

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.882	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ *Supervision*____________________________ *Date :* 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.33	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13513	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.04	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.99	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.67	% By Weight
Oxygen, Dry Basis	ASTM D 3176	8.75	% By Weight
Carbon Fixed, Dry	ASTM D 3172	57.48	% By Weight
Volatiles, Dry Basis	ASTM D 5142	35.19	% By Weight
Fluorine, Dry Basis	ASTM D 5987	PENDING	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.22	% By Weight
As Received			
Moisture, Total	ASTM D 2013	12.28	% By Weight
Ash, As Received	ASTM D 5142	6.43	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11854	Btu/lb
Carbon, As Received	ASTM D 5373	66.70	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.46	% By Weight
Oxygen, As Received	ASTM D 3176	7.68	% By Weight
Carbon Fixed, As Received	ASTM D 3172	50.42	% By Weight
Volatiles, As Received	ASTM D 5142	30.87	% By Weight
Fluorine, As Received	ASTM D 5987	PENDING	mg/kg
Sulfur, As Received	ASTM D 4239	1.07	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.56	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	544.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.16	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.67	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.16	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.85	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.10	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.96	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.21	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.71	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.73	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.10	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.11	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.37	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.23	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.56	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.29	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.03	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.18	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14582	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.903	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

smk/coa

One Energy Place
Pensacola, Florida 32520

Tel 850.444.6111

GULF POWER
A SOUTHERN COMPANY

January 13, 2003

Ms. Sandra Veazey
Florida Department of Environmental Protection
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Sandra
Ms. ~~Veazey~~:

PLANT CRIST UNIT 4 – AIR PERMIT NO.: 0330045-004-AC
BASELINE COAL ONLY EMISSION TESTS

Please find attached one copy of the Baseline Coal Only Emission Tests Report for Plant Crist Unit 4 as required under Rule 62-297.310(8), FAC.

The emission testing was conducted by Sanders Engineering and Analytical Services, Inc. and Supervised by Gulf Power's Environmental Affairs Department. This testing was conducted to provide baseline data in preparation of the Initial test burn of Carbonaceous Material (saw dust).

Should you have any questions concerning these reports, please call Dwain Waters at (850) 444-6527.

Sincerely,

Jim Vick

James O. Vick
Manager of Environmental Affairs

Enclosure:
Attachments:

Cc: J. W. Martin, J. M. Dominey, T. L. Wright
G. D. Waters, Charles Howton
file ENG 10-1-15 PCT *CR4* CORR

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

BASELINE COAL ONLY PARTICULATE, CARBON MONOXIDE, OXYGEN, TOTAL VOLATILE ORGANIC COMPOUNDS, AND EXEMPT VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST REPORT

FOR

GULF POWER COMPANY

Plant Crist, Unit 4
Pensacola, Florida

December 17, 2002

1568 LEROY STEVENS ROAD
MOBILE, ALABAMA 36695
(251) 633-4120
FAX: (251) 633-2285
E-MAIL: sanders@sandersengineering.com

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.
An Environmental Engineering Firm Specializing in Air Emissions Measurement and Permitting
www.sandersengineering.com EMAIL: sanders@sandersengineering.com
Phone: 251-633-4120 1568 Leroy Stevens Rd.
Fax: 251-633-2285 Mobile, AL 36695

REPORT CERTIFICATION

I have reviewed the "Baseline Coal Only Particulate, Carbon Monoxide, Oxygen, Total Volatile Organic Compounds, and Exempt Volatile Organic Compounds Emissions Test Report" for the testing performed for Gulf Power Company on Unit 4 located at the Plant Crist facility. I hereby certify that it is authentic and accurate to the best of my knowledge.

Date: 1/7/03

Signature: ____________________
Johnny W. Sanders, P.E. M.P.H.
President

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS) performed a baseline study while burning coal for particulate, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions for Gulf Power Company on Unit 4 located at the Plant Crist facility in Pensacola, Florida. The testing was conducted December 17, 2002. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 1, 2, 3a, 4, 10, 17, and SEAS 2518**. Further discussions of the test methods are included later in the report.

The purpose of the testing was to gain additional information regarding the emission characteristics of the unit while burning coal. The tests were conducted by Mr. Spencer Edwards, Mr. Joseph Sanders, and Mr. Clint Sanders of Sanders Engineering & Analytical Services, Inc., and were coordinated with Mr. Kevin Beaty of Gulf Power Company.

2. DESCRIPTION OF SAMPLING PROGRAM

The sampling program consisted of particulate, carbon monoxide, oxygen, total volatile organic compounds, and exempt volatile organic compounds emissions testing in compliance with US EPA methods. The following is a brief description of these types of tests.

2.1. Particulate Emissions Testing

The particulate sample was extracted from the stack isokinetically through a stainless steel nozzle and probe onto a pre-weighed glass fiber filter. The sample was taken at a series of points across the stack. Each point represented an equal area of stack. The isokinetic sampling rate and volumetric flow rate was monitored by an S-type pitot tube attached to the probe. Calibrations of the particulate testing equipment including pitots, thermocouples, magnehelics, and other measurement devices are included in Appendix A. A detailed description of the testing procedures and schematic of the sampling train is presented in Section 6. The field data is included in Appendix B. Sample calculations of Run 1 are presented in Appendix C.

2.2. Carbon Monoxide and Oxygen Emissions Testing

Gaseous emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe, a moisture removal system, and into instruments specifically designed for the measurement of the particular pollutant of interest. The instruments responded linearly to concentrations of the pollutants. The output of the instruments is a continuous analog voltage which is digitized and input into a PC based data acquisition system. The PC data acquisition system polls the instrument 1000 times per second. The computer averages these readings into one-second averages during calibrations and one minute averages at other times. These one second and one minute averages are written to the hard disk each minute to ensure no data loss due to power failure or other inadvertent occurrence. The computer stores in memory all calibration and stack gas analyses during each run. The average for each calibration and for each independent run were averaged for the time of the runs. A description of the testing procedures is included in Section 7. The Protocol 1 gas certifications are included in Appendix D.

2.3. Volatile Organic Compounds Emissions Testing

Volatile organic compounds emissions testing was accomplished by withdrawing a sample of the stack gas through a stainless steel probe and heated teflon line into a gas chromatograph equipped with a flame ionization detector. The chromatograph divided the compounds into four specific organic compounds and one group of organic compounds. The four specific compounds are methane, acetylene, ethylene, and ethane. The group of compounds are all compounds which contain three or more carbon atoms (Propane+). The chromatograph was injected with a combination of these gases to ensure separation and then calibrated with Protocol 1 gases of propane. The calibration curve for propane was used to convert the area of each peak representing each compound into its equivalent part per million as propane. A description of the testing procedure is included in Section 8. The Protocol 1 gas certifications and calibration graph of propane versus peak area are included in Appendix C. A line loss/system check was performed at the beginning and end of each test by injecting a Protocol 1 propane in nitrogen calibration gas at the probe and measuring the concentration with at least two injections of the chromatograph. Appendix C contains a table which shows the results of these system checks. The raw data is corrected for the line loss/system check if greater than five percent. Example chromatograms are included in Appendix E.

3. SUMMARY AND DISCUSSION OF RESULTS

There were no unusual problems experienced during the performance of the testing. During the performance of the testing the average heat input, as based on F-factor calculations, was 827.43 million Btu per hour. The results of the particulate emissions testing are presented in Table I. The results for the carbon monoxide and volatile organic compounds emissions testing are presented in Table II. The quality assurance calculations for the carbon monoxide and oxygen testing are presented in Tables III and IV, respectively. A graphical representation of the carbon monoxide concentrations are presented in Figure 1. The volatile organic compounds stack gas analysis is presented in Table V.

Example chromatograms of a combination of a gas containing methane, acetylene, ethylene, ethane, and propane are shown in Appendix D. The purpose of these chromatograms is to show the gas chromatograph column performance in separating each of these compounds. Also included in Appendix D is the representative chromatogram of stack gas showing the only non-exempt volatile organic compounds.

The results of the testing for each parameter are as follows:

PARAMETER	Emission Rate
Particulate	0.011 lbs/mmBtu
Carbon Monoxide	7.9 lbs/hr
Volatile Organic Compounds	0.0 lbs/hr

TABLE I. SUMMARY OF PARTICULATE EMISSIONS TEST RESULTS
GULF POWER COMPANY
PLANT CRIST
UNIT 4

Title of Run		RUN 1	RUN 2	RUN 3
Date of Test	Month/Day/Year	12/17/02	12/17/02	12/17/02
Sampling Time -Start	Military	0809	0957	1133
Sampling Time -Stop	Military	0916	1105	1241
Oxygen F Factor	SDCF/MMBTU	9780	9780	9780
Stack Static Pressure	Inches Water	-0.50	-0.50	-0.50
Barometric Pressure	Inches Mercury	30.10	30.10	30.10
Average Orifice Pressure (ΔH)	Inches Water	1.4	1.5	1.4
Meter Correction Factor		1.022	1.022	1.022
Average Meter Temperature	Degrees F	52.5	64.2	69.4
Oxygen Concentration	Percent O2	6.6	6.8	6.7
Carbon Dioxide Concentration	Percent CO2	11.7	11.7	11.5
Volume of Gas Metered	Cubic Feet	42.365	44.700	42.845
Volume of Water Collected	Milliliters	62.0	76.0	51.0
Sampling Time	Minutes	67	68	68
Nozzle Diameter	Inches	0.242	0.248	0.242
Average Stack Temperature	Deg. F	254.4	261.1	264.6
Area of Stack	Square Feet	92.1350	92.1350	92.1350
Weight of Solids Collected	Milligrams	25.5	17.3	4.8
Number of Points Sampled		32	32	32
Avg. Sqr. Root Velocity Press.	Inches Water	0.8028	0.8020	0.7977

RESULTS OF COMPUTATIONS

		RUN 1	RUN 2	RUN 3	Average
Volume of Gas Sampled	Standard Dry Cubic Feet	45.008	46.449	44.067	
Molecular Wt. of Stack Gas	LB/LB-MOLE	29.397	29.276	29.482	29.385
Water vapor in Stack Gas	Percent	6.1	7.2	5.2	6.1
Average Stack Gas Velocity	Feet per second	51.8	52.1	51.8	51.9
Stack Gas Flow Rate	Standard Dry Cubic Feet Per Minute	199,838	196,865	198,802	198,501
Stack Gas Flow Rate	Standard Wet Cubic Feet Per Minute	212,795	212,027	209,632	211,484
Stack Gas Flow Rate	Actual Cubic Feet Per Minute	286,537	288,199	286,314	287,017
Particulate Concentration	Grains per Standard Dry Cubic Foot	0.00873	0.00574	0.00168	0.00538
Particulate Concentration	Grains per Actual Cubic Foot	0.00609	0.00392	0.00116	0.00372
Particulate Emission Rate	Pounds per Hour	14.9	9.7	2.9	9.2
Particulate Emission Rate	Pounds per Million Btu (O2 F Factor)	0.018	0.012	0.003	0.011
Heat Input (O2 F Factor)	Million Btu per Hour	838.84	814.80	828.66	827.43
Isokinetic Rate	Percent	97.0	95.3	94.1	

TABLE II. CARBON MONXOIDE AND VOLATILE ORGANIC COMPOUNDS EMISSIONS TEST RESULTS

GULF POWER COMPANY
PLANT CRIST
UNIT 4

TEST	START TIME Military	STOP TIME Military	STACK GAS FLOWRATE (sdcfm)	WATER VAPOR IN STACK GAS (percent)	F FACTOR Oxygen (Dry) (sdcf/MMbtu)	OXYGEN (Dry) (measured) (Percent)	OXYGEN (Wet) (calculated) (Percent)	Carbon Monoxide Emissions (ppm-dry)	Carbon Monoxide Emissions (ppm-wet)	Carbon Monoxide Emissions (O2 F factor) (lbs/MMbtu)	Carbon Monoxide Emissions (lbs/hour)	Carbon Monoxide Emissions (Tons/Year)
RUN 1	8:07	9:07	199838	6.1	9780	7.0	6.6	9.81	9.21	0.0105	8.6	37.5
RUN 2	9:56	10:56	196865	7.2	9780	6.9	6.4	8.47	7.87	0.0090	7.3	31.9
RUN 3	11:33	12:33	198802	5.2	9780	8.0	7.6	9.17	8.70	0.0106	8.0	34.8
Average			**198501**	**6.1**		**7.3**	**6.9**	**9.15**	**8.59**	**0.0100**	**7.9**	**34.7**

TEST	START TIME Military	STOP TIME Military	Volatile Organic Compounds Emissions (ppm-wet)	Volatile Organic Compounds Emissions (ppm-dry)	Volatile Organic Compounds Emissions (O2 F factor) (lbs/MMbtu)	Volatile Organic Compounds Emissions (lbs/hour)	Volatile Organic Compounds Emissions (Tons/Year)
RUN 1	8:07	9:07	0.00	0.00	0.0000	0.0	0.0
RUN 2	9:56	10:56	0.00	0.00	0.0000	0.0	0.0
RUN 3	11:33	12:33	0.00	0.00	0.0000	0.0	0.0
Average			**0.00**	**0.00**	**0.0000**	**0.0**	**0.0**

TABLE III. CARBON MONOXIDE TESTING QUALITY ASSURANCE

GULF POWER COMPANY
PLANT CRIST
UNIT 4

Analyzer Calibration Data

INITIAL ANALYZER SPAN (PPM) =	1000	ANALYZER ID.	HORIBA 331A	
	CYLINDER VALUE PPM	ANALYZER RESPONSE (PPM)	DIFFERENCE (PPM)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	0	0.0	0.0	0.0
High Range Gas	901	901.0	0.0	0.0
Mid Range Gas	50	52.8	-2.8	-0.3

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	stop time of Run	RUN #	ANALYZER stack gas concentration uncorrected (PPM)	system Zero (PPM)	system upscale (PPM)	CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (PPM)	ANALYZER SPAN (PPM)	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	CARBON MONOXIDE CONCENTRATION (PPM-DRY)
		INITIAL SYSTEM		0.0	48.9									
8:07	9:07	Run 1	9.3	-0.9	49.6	50.0	1000.0	0.0	-0.1	-0.1	-0.4	-0.3	0.1	9.8
9:56	10:56	Run 2	7.4	-1.3	48.5	50.0	1000.0	-0.1	-0.1	0.0	-0.3	-0.4	-0.1	8.5
11:33	12:33	Run 3	7.5	-2.1	48.4	50.0	1000.0	-0.1	-0.2	-0.1	-0.4	-0.4	0.0	9.2

TABLE IV. OXYGEN TESTING QUALITY ASSURANCE

GULF POWER COMPANY

PLANT CRIST

UNIT 4

Analyzer Calibration Data

INITIAL ANALYZER SPAN (%) =	25.0		ANALYZER ID.	HORIBA 331A
	CYLINDER VALUE Percent	ANALYZER RESPONSE (Percent)	DIFFERENCE (Percent)	DIFFERENCE % SPAN (ALLOWED 2%)
Zero Gas	*0*	*0.0*	0.0	0.0
High Range Gas	*20.9*	*20.9*	0.0	0.0
Mid Range Gas	*10.0*	*10.1*	-0.1	-0.4

Test Results & Analyzer Calibration Bias and Drift Data

calculation data entry								system zero bias & drift			system upscale bias & drift			test results
start time of Run	*stop time of Run*	RUN #	*ANALYZER stack gas concentration uncorrected (Percent)*	*system Zero (Percent)*	*system upscale (Percent)*	*CYLINDER CONCENTRATION UPSCALE CALIBRATION GAS (Percent)*	*ANALYZER SPAN (Percent)*	INITIAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM ZERO CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	ZERO DRIFT % SPAN (ALLOWED 3%)	INITIAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	FINAL SYSTEM UPSCALE CAL. BIAS RESPONSE % SPAN (ALLOWED 5%)	UPSCALE DRIFT % SPAN (ALLOWED 3%)	OXYGEN CONCENTRATION (Percent-Dry)
		INITIAL SYSTEM		*-0.4*	*20.9*									
8:07	*9:07*	Run 1	*6.8*	*-0.4*	*21.0*	*20.9*	*25.0*	-1.6	-1.6	0.0	0.0	0.4	0.4	7.0
9:56	*10:56*	Run 2	*6.7*	*-0.4*	*21.0*	*20.9*	*25.0*	-1.6	-1.6	0.0	0.4	0.4	0.0	6.9
11:33	*12:33*	Run 3	*7.8*	*-0.3*	*21.0*	*20.9*	*25.0*	-1.6	-1.2	0.4	0.4	0.4	0.0	8.0

FIGURE 1. CARBON MONOXIDE STACK GAS CONCENTRATIONS

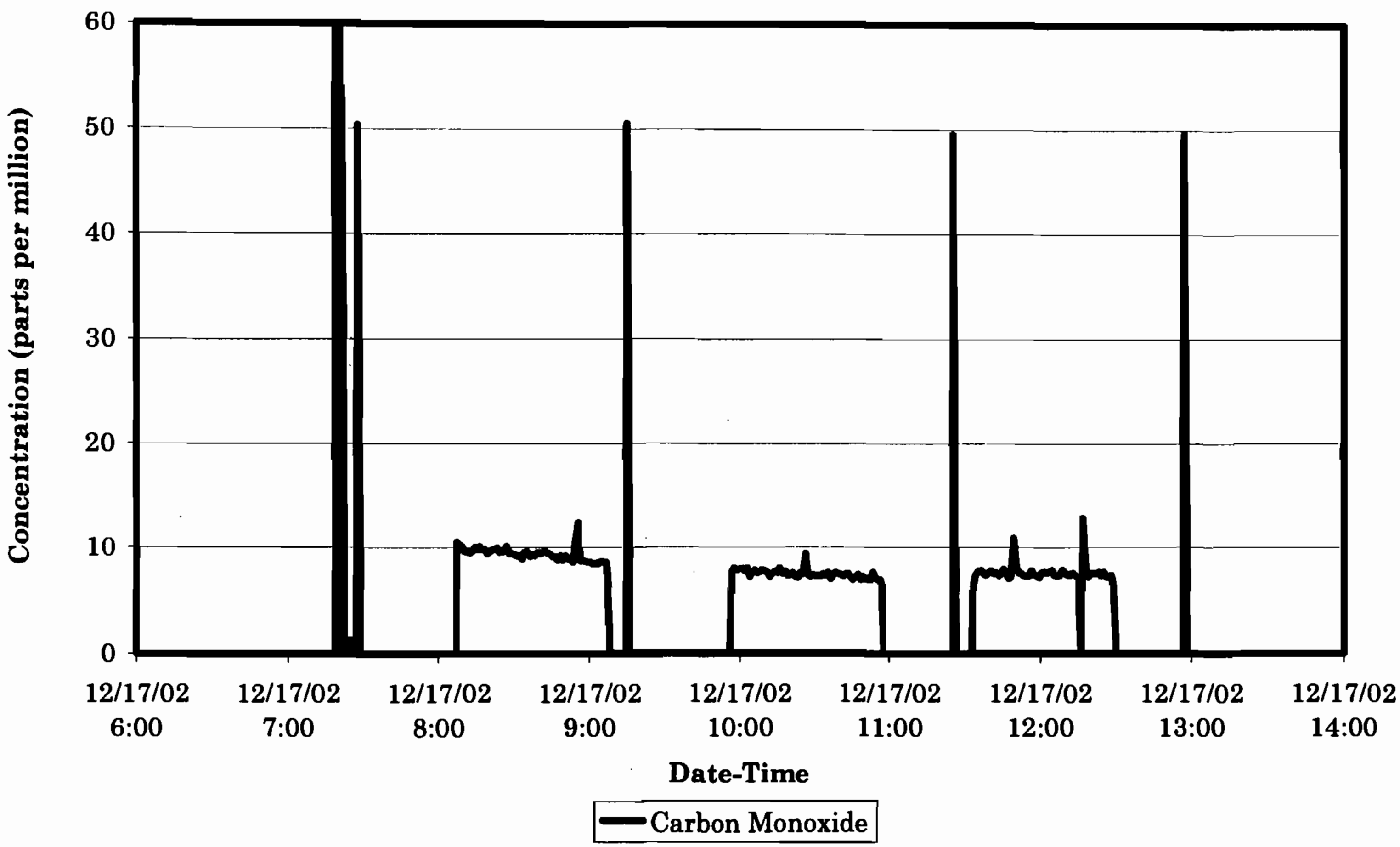


TABLE V. VOLATILE ORGANIC COMPOUNDS STACK GAS ANALYSIS

	Injection Number	Injection Time	Acetylene area	Ethylene area	Propane area	Total area	Total VOC ppm	Corrected ppm Line Loss
system	check 30.4		0	0	271862	271862	6.12	
system	check 30.4		0	0	267150	267150	6.01	
Run 1	Injection 1	11:59:14	0	0	0	0	0.00	
Run 1	Injection 2	12:05:14	0	0	0	0	0.00	
Run 1	Injection 3	12:11:14	0	0	0	0	0.00	
Run 1	Injection 4	12:17:14	0	0	0	0	0.00	
Run 1	Injection 5	12:23:14	0	0	0	0	0.00	
Run 1	Injection 6	12:29:14	0	0	0	0	0.00	
Run 1	Injection 7	12:35:14	0	0	0	0	0.00	
Run 1	Injection 8	12:41:14	0	0	0	0	0.00	
Run 1	Injection 9	12:47:14	0	0	0	0	0.00	
Run 1	Injection 10	12:53:14	0	0	0	0	0.00	
Run 1	**Average**		**0.0**	**0.0**	**0**	**0**	**0.00**	**0.00**
system	check30.4		0	0	258162	258162	5.81	
system	check30.4		0	0	259433	259433	5.84	1.31%
Run 2	Injection 1	13:31:56	0	0	0	0	0.00	
Run 2	Injection 2	13:37:56	0	0	0	0	0.00	
Run 2	Injection 3	13:43:56	0	0	0	0	0.00	
Run 2	Injection 4	13:49:56	0	0	0	0	0.00	
Run 2	Injection 5	13:55:56	0	0	0	0	0.00	
Run 2	Injection 6	14:01:56	0	0	0	0	0.00	
Run 2	Injection 7	14:07:56	0	0	0	0	0.00	
Run 2	Injection 8	14:13:56	0	0	0	0	0.00	
Run 2	Injection 9	14:19:56	0	0	0	0	0.00	
Run 2	Injection 10	14:25:56	0	0	0	0	0.00	
Run 2	**Average**	**14:31**	**0.0**	**0.0**	**0**	**0**	**0.00**	**0.00**
system	check30.4		0	0	253689	253689	5.71	
system	check30.4		0	0	258927	258927	5.83	2.26%
Run 3	Injection 1	15:20:06	0	0	0	0	0.00	
Run 3	Injection 2	15:26:06	0	0	0	0	0.00	
Run 3	Injection 3	15:32:06	0	0	0	0	0.00	
Run 3	Injection 4	15:38:06	0	0	0	0	0.00	
Run 3	Injection 5	15:44:06	0	0	0	0	0.00	
Run 3	Injection 6	15:50:06	0	0	0	0	0.00	
Run 3	Injection 7	16:28:15	0	0	0	0	0.00	
Run 3	Injection 8	16:34:15	0	0	0	0	0.00	
Run 3	Injection 9	16:40:15	0	0	0	0	0.00	
Run 3	Injection 10	16:46:15	0	0	0	0	0.00	
Run 3	**Average**		**0.0**	**0.0**	**0**	**0**	**0.00**	**0.00**
system	check30.4		0	0	258221	258221	5.81	
system	check30.4		0	0	256230	256230	5.77	1.91%

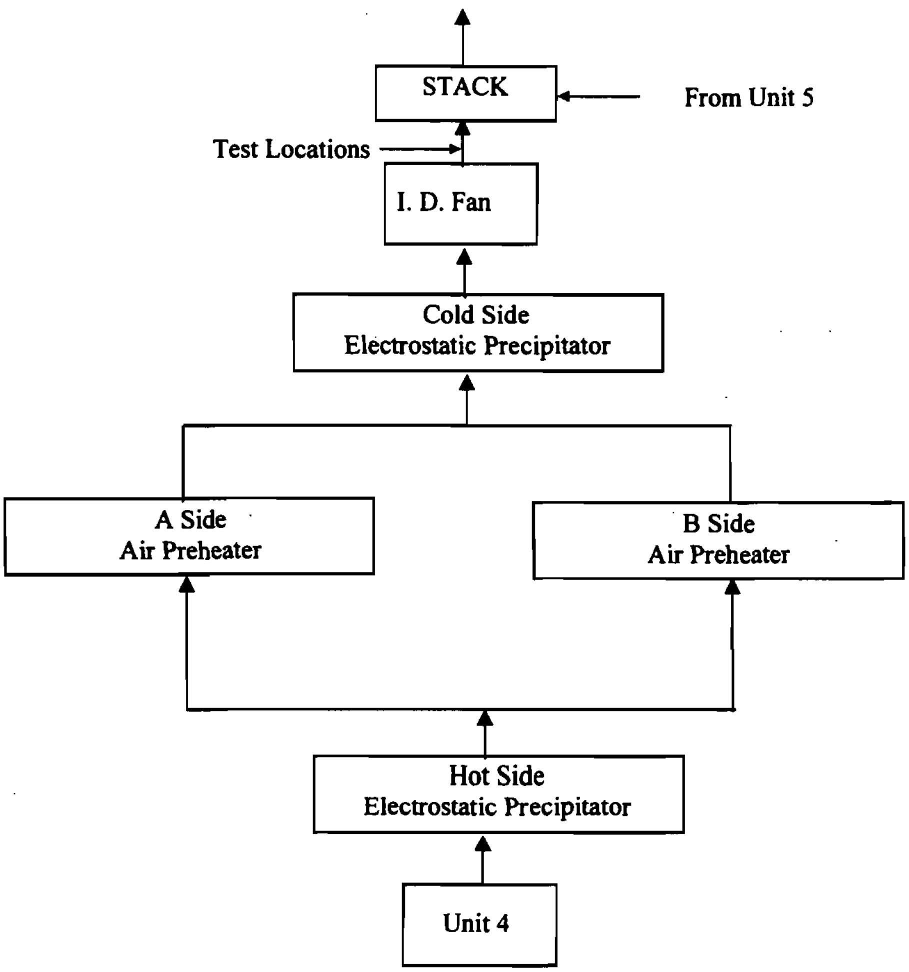
4. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by barge, and loaded directly onto the conveyor feeding the plant or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 36 to 48 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators.

4.1. Source Air Flow

As shown in Figure 2, the flue gases exit the boiler and flow through a hot side precipitator. The exhaust gases are separated into ducts A and B before entering air preheaters. The exhaust gases are combined before entering a cold side ESP. The flue gases exiting the cold side ESP are exhausted through a stack into the atmosphere.

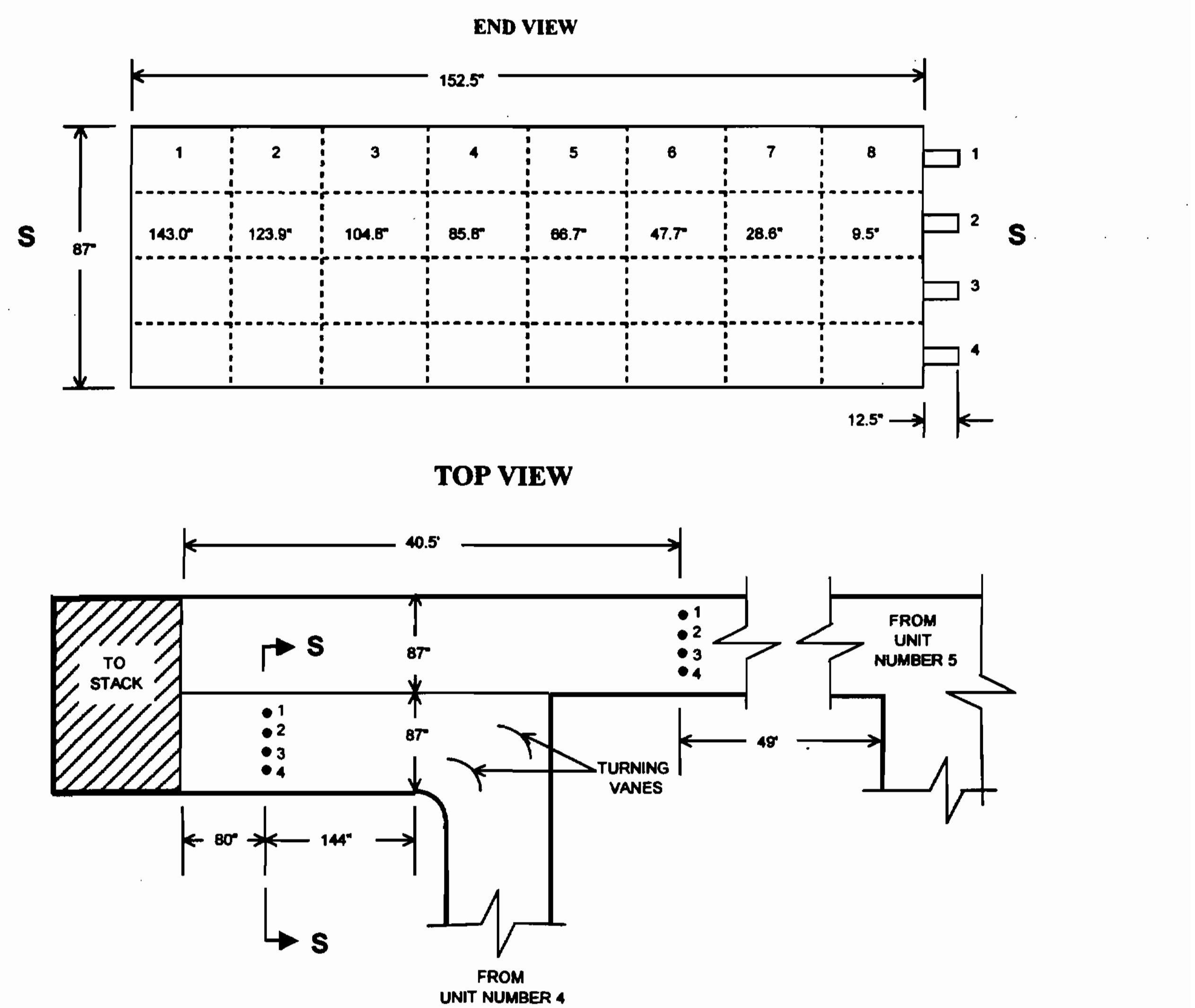
Figure 2. Air Flow Schematic



5. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 3. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 32 points.

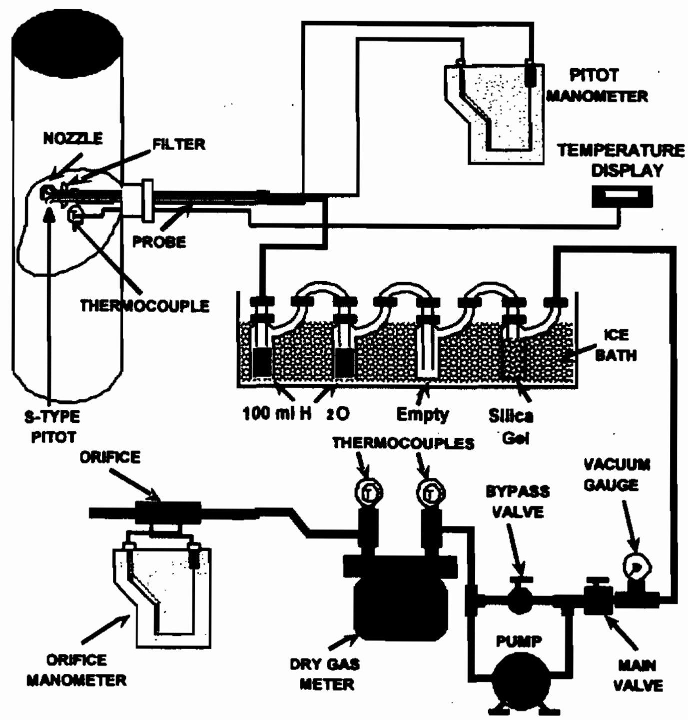
Figure 3. Sample Point Locations



6. PARTICULATE SAMPLING PROCEDURE (EPA Method 17)

The sampling procedure utilized is that specified in **40 CFR, Part 60, Appendix A, Method 17**. A brief description of this procedure is as follows:

Figure 4. Particulate Sampling Train



The first impingers were partially filled with 100 milliliters of deionized water. The next impinger was left empty to act as a moisture trap. Preweighed 6 to 16 mesh indication silica gel was added to the last impinger. The sampling equipment manufactured by Lear Siegler (Model 100) or Sanders Engineering (Model 200) was assembled as shown in the attached drawing. The system was leak checked by plugging the inlet to the nozzle and pulling a 15 inch mercury vacuum. A leakage rate not in excess of 0.02 cubic feet per minute was considered acceptable. The inside dimensions of the stack liner were measured and recorded. The required number of sampling points was marked on the probe for easy visibility. The range of velocity pressure, percent moisture, and temperature of the effluent gases were determined. From this data the correct nozzle size and the nomograph multiplication factor were determined.

Crushed ice was placed around the impingers. The nozzle was placed on the first traverse point with the tip pointing directly into the gas stream. The pump was started immediately and the flow adjusted to isokinetic sampling conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point and isokinetic sampling was re-established. This was performed for each point until the run was completed. Readings were taken at each point and recorded on the field data sheet. At the conclusion of each run, the pump was turned off, final readings recorded, and final system leak checks were performed.

6.1. PARTICULATE SAMPLE RECOVERY

Care was exercised in moving the collection train to the sample recovery area to minimize the loss of collected sample or the gain of extraneous particulate matter. The volume of water in the impingers was measured, the silica gel impinger weighed, and these were recorded on the field data sheet. The nozzle and all sample-exposed surfaces were washed with reagent grade acetone into a clean sample container. A brush was used to loosen any adhering particulate matter and subsequent washings were placed into the container. The filter was carefully removed from the fritted support and placed in a clean separate sample container. A sample of the acetone used in the washing was saved for a blank laboratory analysis.

6.2. PARTICULATE ANALYTICAL PROCEDURES

The filter and any loose particulate matter were transferred from the sample container to a clean, tared weighing dish. The filter was placed in a desiccator for at least 24 hours and then weighed to the nearest 0.1 milligram until a constant weight was obtained. The original weight of the filter was deducted and the weight gain was recorded to the nearest 0.1 milligram.

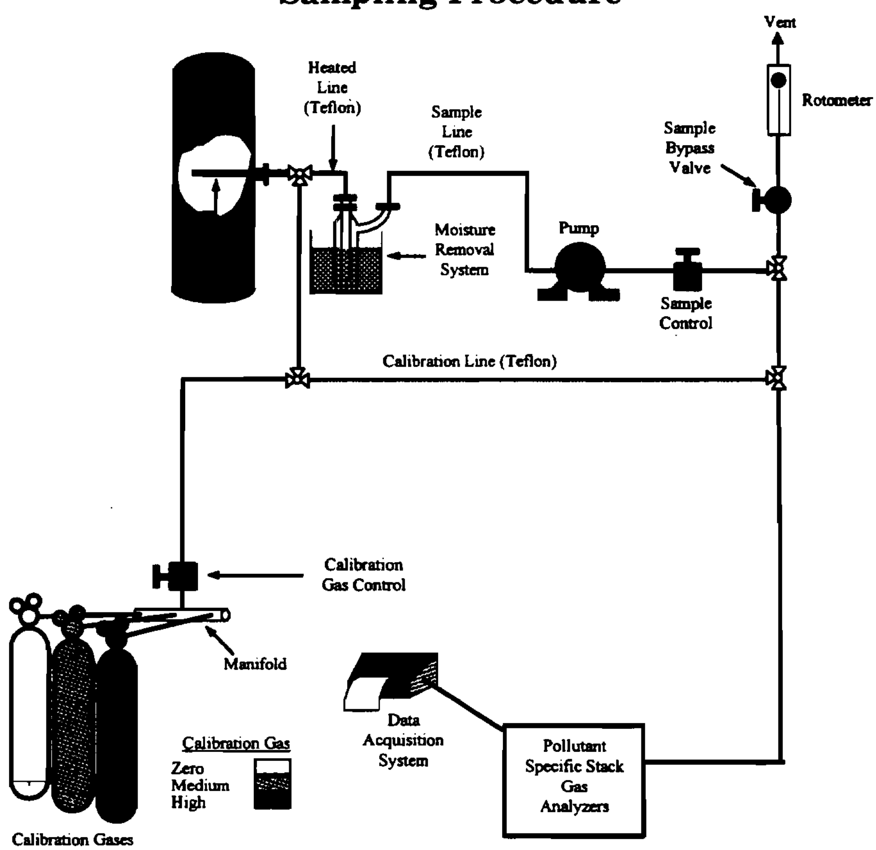
The wash solution was transferred to a clean, tared beaker. The solution was evaporated to dryness, desiccated to a constant weight, and the weight gain was recorded to the nearest 0.1 milligram.

7. CARBON MONOXIDE AND OXYGEN SAMPLING PROCEDURE (EPA METHODS 3A AND 10)

The sampling procedures utilized are those specified in **40 CFR, Part 60, Appendix A, Methods 3a and 10** as modified by the governing regulatory agency. A brief description of these procedures is as follows:

The sample was removed from the stack through a stainless steel probe and passes through a three-way valve and condenser moisture removal system. Teflon® line was used to transport the sample through a transport pump and a flow control valve. From this point the sample was routed into a manifold with a bypass valve, an analyzer sample flow control valve, and to an analyzer specific for the pollutant of interest. Each analyzer produces a voltage analogue output proportional to the concentration of pollutant present in the gas. A schematic of the sampling train is presented in the attached drawing.

Figure 5. Carbon Monoxide and Oxygen Sampling Procedure



Each instrument was allowed to warm up for at least 30 minutes before it was initially calibrated. Zero air is introduced directly to each instrument to establish a baseline and check the zero reading of the instrument. A high range

calibration gas was introduced directly to each instrument. The instrument was allowed to fully respond to the calibration gas. Each analyzer was adjusted, if needed, to the correct value. A linear calibration curve was calculated from this data and stored on computer. Next, a mid-range calibration gas was introduced directly to each instrument. The percent error between each measured value and the corresponding calibration value was calculated. If any of the readings indicated a difference of more than ±2 percent of the span the analyzer was recalibrated.

The high or mid gas and zero gas were then introduced to the system at the three-way valve before the condenser. The response value for each of these gases was recorded. If these measured values differed significantly from the calibration values the sampling system was checked and repaired until the system check met EPA specifications.

To begin sampling, the three-way valve was switched to allow the instrument to sample the stack gas. Twice the system response time was allowed to elapse before the data recorder was marked for the beginning of the run. After the required sampling time, the data recorder was marked for the end of the run. At the end of each run the three-way valve was switched to allow introduction of the zero and calibration gas to the system. From these data the calibration bias and drift were calculated. If the bias values were greater than ±5 percent of the span, or the drift was greater than three percent of the span, the run was invalidated. To begin the next run the three-way valve was switched to allow sampling of the stack gas and the next run was started. This procedure was repeated until all runs were complete.

7.1. Sample Recovery & Analysis

After the tests were completed the data was reduced to give an average concentration in parts per million for each run. This average concentration was then corrected for the analyzer zero and span bias and drift using the equation:

$$C\ gas = \frac{(C - Co)\ \ Cma}{(Cm - Co)}$$

Where:

C gas = Effluent gas Concentration, dry basis, ppm.

C = Average gas concentration indicated by the gas analyzer, dry basis, ppm.

Co = Average of Initial and final system calibration responses for the zero gas, ppm.

Cm = Average of initial and final calibration responses for the upscale calibration gas, ppm.

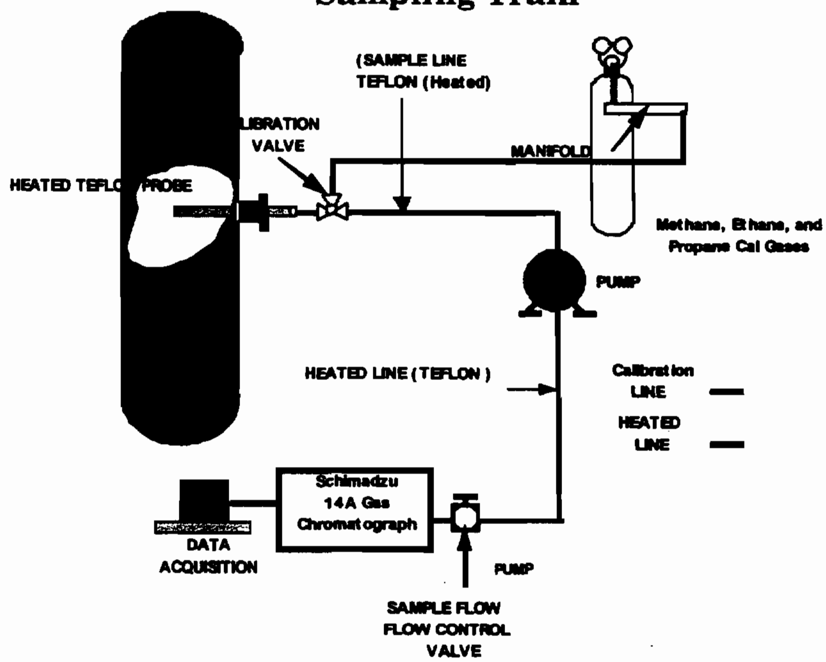
Cma = Actual concentration of the scale calibration gas, ppm.

8. NON-EXEMPT VOLATILE ORGANIC COMPOUND SAMPLING BY GAS CHROMATOGRAPHY (SEAS Method 2518)

Gaseous organic emission sampling (gas chromatography) was performed per **SEAS Method 2518**. Non-exempt volatile organic compounds emissions testing was performed by a system similar to that depicted in the attached figure.

A heated stainless steel probe and heated teflon sample line was used to draw a sample from the emission source. Stack gases were continuously drawn through the sample lines. The sample lines were leak checked prior to and after all testing.

Figure 6. Non-Exempt Volatile Organic Compounds Sampling Train



A small portion of the gas sample was pumped into the on-line gas chromatograph sample loop. The gas chromatograph sample loop was operated at approximately 30 ml/min flow, and was continuously purged with stack gas. Sample was introduced into the gas chromatograph by automatic actuation of the sample valve at a predetermined time. The gas chromatograph was fitted with a column of sufficient physical and chemical characteristics to allow separation of the constituents. The chromatograph was operated in such a manner as to get five separate peaks. The first four were for specific compounds in the following order: methane, acetylene, ethylene, and ethane. The fifth peak was a back flush of the column which contained all organic compounds containing three or more carbon atoms (Propane+). The first four peaks were allowed to elute with the gases flowing through the column in the normal direction. After ethane elutes, the column is backflushed through the operation of a 10-port valve to elute the combined volatile organic compounds to the detector.

In order to ensure only organic compounds were measured, the chromatograph was equipped with a flame ionization detector. Each test run was conducted for at least sixty minutes, with the chromatograph performing as many injections as could be completed given the physical and chemical characteristics of the stack gas.

Calibration of the gas chromatograph was performed using EPA Protocol 1 cylinders of propane in nitrogen. Calibrations were made with a high, mid, and low concentration gas. Using these gas standards, a three-point calibration curve based on area count was generated for combined volatile organic compounds as propane. SEAS used a Shimadzu GC-14A for this testing program. The GC was equipped with an FID and integrator system. Volatile organic compound concentrations were determined by the peak area count of the sample versus the calibration curve. The calibration curve for propane was input to the data acquisition system for the acetylene and ethylene. Therefore, the concentrations generated by the data acquisition system for acetylene, ethylene, and combined volatile organic compounds were each reported on a propane equivalent basis. At the conclusion of testing, the calibration curve of the instrument was verified by injection of a propane calibration standard. If the calibration was maintained within twenty percent, the data was accepted. Otherwise, the data was either corrected for drift or the data was discarded and a new test conducted.

The concentration of non-exempt volatile organic compounds in the stack gas was calculated by summing of the ethylene concentration (propane equivalent) plus the acetylene concentration (propane equivalent) plus the combined volatile organic compound concentration (propane equivalent).

9. QUALITY ASSURANCE

In order to ensure the accuracy of all the data collected in the field and at the laboratory, SEAS has instituted a comprehensive quality assurance and quality control program. New or repaired items which require calibration are calibrated before their initial use in the field. Equipment whose calibration may change with use are calibrated before and after each use. When an item is found to be out of calibration, the unit is either discarded or repaired, and then recalibrated before being returned to service. All equipment is periodically recalibrated in full regardless of the results of the regular inspections or its present calibration status. Calibrations are performed in a manner consistent with the EPA reference methods recommended in the "Quality Assurance Handbook for Air Pollution Measurement Systems" published by the US Environmental Protection Agency. To the maximum degree possible all calibrations are traceable to the National Institute of Standards & Technology (NIST).

In order to ensure that the test will be performed in a timely manner without undue delays, SEAS sampling vans are equipped with duplicate sampling devices for almost every device needed to perform the test. If a particular device is broken or does not pass inspection, a second device is available immediately at the site for use. Any device which appears to be outside calibration, or in need of repair is tagged in the field and repaired, calibrated, or discarded immediately upon return to the laboratory.

9.1. CALIBRATIONS

Certain pieces of equipment need to be calibrated before and after each test. Those items include the pitot tubes, the differential pressure gauges, the dry gas meter, and the nozzles used for the particulate testing. The following is a brief description of the calibration procedures for each of these important devices.

9.1.1. PITOT TUBES

All pitot tubes are the S-type as required by EPA Reference Method 2 (40 CFR, Part 60, Appendix A, Method 2). This method contains certain geometric standards for the construction of S-type pitot tubes. All of SEAS pitot tubes are constructed according to these standards. According to the EPA any pitot tube constructed to these standards will have a coefficient of 0.84 ± 0.02. To ensure the exact value of SEAS pitot tubes, all pitot tubes are initially calibrated in SEAS wind tunnel to determine the exact pitot coefficient. This coefficient should not change unless the pitot is physically damaged. Each pitot tube is checked before going to the field to make sure it meets the geometry as specified. Any pitot tube which does not meet the specifications is not used in the test.

9.1.2. DIFFERENTIAL PRESSURE GAUGES

SEAS uses several different types of pressure gauges including oil tube manometers, water tube manometers, magnehelics, and current output electronic load cells. Each of these devices are inspected before taken to the field and are inspected for leaks during each test. The magnehelics and load cells are tested against an incline manometer water gauge to ensure accuracy.

9.1.3. TEMPERATURE SENSORS

All temperature sensors used in SEAS sampling program are either mercury in-glass thermometers or type K thermocouples. These thermocouples are a physical device which produce a voltage proportional to the temperature. The thermocouple reading device is calibrated before and after each series of tests to ensure accuracy of $\pm$ 2 percent. The calibration of the thermocouple is accomplished by NIST traceable calibrated reference thermocouple potentiometer system.

9.1.4. NOZZLES

The inside diameter of each nozzle is measured to the nearest 0.001 inches prior to its initial use. Upon arriving in the field each nozzle is again measured with a micrometer on three different points on the diameter to ensure its original measurement and that the nozzle is perfectly round. If the difference between the maximum and minimum diameters measured does not exceed 0.003 inches, the nozzle is acceptable; otherwise, this nozzle is discarded and another is selected. At the end of each test the nozzles are again remeasured on three different points on the diameter to ensure that during the test the nozzle has not become dented or deformed.

9.1.5. DRY GAS METER

The dry gas meter is calibrated every six months against a spirometer transfer standard. It is again calibrated before and after each use in the field. During the semiannual calibration, a five point calibration is made at a minimum of one-half inch water column orifice pressure up to four inches water column orifice pressure. Before and after each test, the dry gas meter is again recalibrated at

three repetitions at a representative flow rate experienced during the test. If the final calibration does not agree with the initial calibration within five percent the calibration which yields the lowest volume of sample pulled is used in the calculations and the dry gas meter is repaired and recalibrated.

9.1.6. ORIFICE

The flow meter orifice is used to establish isokinetic sampling rates during the test. The orifice is calibrated with the dry gas meter at the same time under the same conditions. The orifice is calibrated over a wide range of flow rates and the arithmetic mean of the orifice calibration is used for sampling purposes. The orifice is recalibrated every time the gas meter is recertified.

APPENDIX A QUALITY CONTROL OF PARTICLATE TESTING EQUIPMENT

INITIAL METER BOX CALIBRATION

Calibrated By: DMC BOX #: D-762 Date: 6/3/2002

			Orifice #:	1	Orifice #:	3	Orifice #:	8	
		Unit	RUN 1	RUN 2	RUN 1	RUN 2	RUN 1	RUN 2	
Meter	DH	In. H_2O	0.70	0.70	1.07	1.07	1.30	1.30	
	Initial Gas Volume	$Ft.^3$	968.700	986.400	947.900	958.400	2.100	9.500	
	Final Gas Volume	$Ft.^3$	975.300	994.000	957.900	964.100	9.300	17.800	
	Initial Temp. In	°F	70	79	81	80	78	78	
	Initial Temp. Out	°F	69	76	81	77	74	74	
	Final Temp. In	°F	76	78	80	80	78	78	
	Final Temp. Out	°F	72	75	77	77	74	74	
	Vacuum	In. Hg	22	22	21	21	20	20	
	Ambient Temp.	°F	69	71	71	69	67	67	
	Barometric Pressure	In. Hg	29.88	29.88	29.88	29.85	29.85	29.85	
	Time	sec	831	952	989	561	642	740	
	K'		0.3735	0.3735	0.4677	0.4677	0.5200	0.5200	
CALCULATIONS									
	Total Meter Gas Volume	Actual $Ft.^3$	6.600	7.600	10.000	5.700	7.200	8.300	
	Time	Minutes	13.850	15.867	16.483	9.350	10.700	12.333	
	Volume through the Meter	*SDCF without Y*	6.553	7.473	9.791	5.588	7.096	8.180	
	Volume through the Orifice	*SDCF*	6.720	7.684	9.996	5.675	7.235	8.339	
	Calculated Y	*Dimensionless*	1.025	1.028	1.021	1.016	1.020	1.019	1.022
		Difference Allowable 0.02	0.004	0.007	-0.001	-0.006	-0.002	-0.002	
	Calculated DH@		1.653	1.650	1.602	1.601	1.577	1.577	1.610
		Difference Allowable 0.2	0.043	0.040	-0.008	-0.009	-0.033	-0.033	

Magnehelic Calibrations

Device	Calibration	Delta P	
	Standard	Magnehelic	
Units	inches water	inches water	*Percent*
Reading	Reference	Sample	*Error*
1	1.78	1.85	*3.9*
2	1.35	1.32	*-2.2*
3	0.60	0.59	*-1.7*

Allowed Error = 5% of Reading

Thermocouple Calibrations

Device	Calibration	Thermocouple	
	Standard	Detector	
Units	Degrees F.	Degrees F.	*Percent*
Reading	Reference	Sample	*Error*
1	70	65	*-0.9*
2	300	296	*-0.5*
3	700	692	*-0.7*

Allowed Error = 1.5% of Absolute Temperature (Degrees Rankin);
Absolute Temperature = Temperature in Degrees Fahrenheit. + 460

Final Meter Box Calibration Check by Critical Orifice

Calibrated By: JBR | Date 1/3/2003 | METER BOX #: D-762

		Units	RUN 1	RUN 2	RUN 3		
			Orifice # 8				
Meter	ΔH	In. H_2O	1.22	1.22	1.22		
	Initial Gas Volume	Ft.^{3}	10.000	15.600	22.000		
	Final Gas Volume	Ft.^{3}	15.600	22.000	27.000		
	Initial Temp. In	°F	63	66	70		
	Initial Temp. Out	°F	63	66	70		
	Final Temp. In	°F	66	70	72		
	Final Temp. Out	°F	66	70	72		
Vacuum (must be > 16.0)		In. Hg	20	20	20		
	Ambient Temp.	°F	73	73	73		
	Barometric Pressure	In. Hg	30.00	30.00	29.88		
	Time	sec	510	585	450		
	K'		0.5200	0.5200	0.5200		
CALCULATIONS							
Total Meter Gas Volume		Ft.^{3}	5.600	6.400	5.000		
	Time	Minutes	8.500	9.750	7.500		
Vm = Volume through the Meter		*SDCF without Y*	5.667	6.434	4.978	Final	Initial
Vcr = Volume through the Orifice		*SDCF*	5.744	6.588	5.048	Average	Average
	Calculated Y	*Dimensionless*	1.013	1.024	1.014	1.017	1.022
	Calculated $\Delta H@$		1.496	1.485	1.497	1.493	1.610

Magnehelic Calibrations

Device	Calibration	Delta P	
	Standard	Magnehelic	
Units	inches water	inches water	*Percent*
Reading	Reference	Sample	*Error*
1	1.75	1.73	*0.0*
2	0.75	0.74	*-1.3*
3	0.25	0.25	*0.0*

Allowed Error = 5% of Reading

Thermocouple Calibrations

Device	Calibration	Thermocouple	
	Standard	Detector	
Units	Degrees F.	Degrees F.	*Percent*
Reading	Reference	Sample	*Error*
1	100	95	*-0.9*
2	250	246	*-0.6*
3	500	499	*-0.1*

Allowed Error = 1.5% of Absolute Temperature (Degrees Rankin);
Absolute Temperature = Temperature in Degrees Fahrenheit. + 460

Magnehelic Calibration

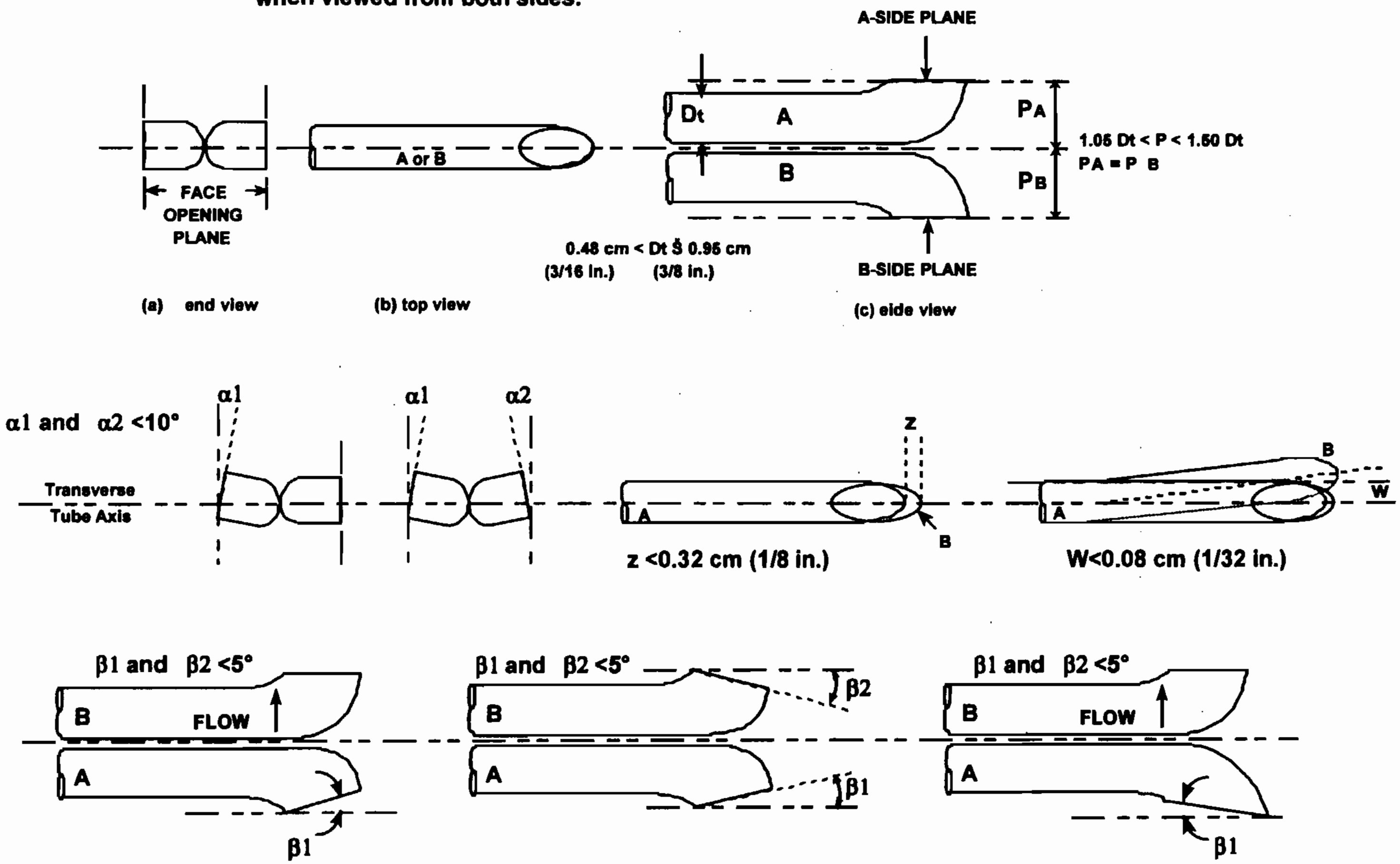
	Box 100						Box 101					
Ser. No.	**W021 JY**	**R1090 9AG71**	**R9807 314022**	**R977110 5290**	**6AG44 7**	**R97022 7GJ31**	**R00630 1YR66**	**R22D**	**A960821 7893**	**R90051 6G721**	**R98120 2CA55**	**R90101 5D102**
Span (in H2O)	**0.25**	**0.5**	**2**	**5**	**10**	**25**	**0.25**	**0.5**	**2**	**5**	**10**	**25**
Reference Reading @ 0% Span (in H2O)	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00
Device Reading (in H2O)	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reference Reading @ 50% Span (in H2O)	0.125	0.250	1.00	2.45	5.00	12.50	0.125	0.25	1.00	2.500	4.80	12.50
Device Reading (in H2O)	0.125	0.250	1.00	2.50	5.00	12.50	0.125	0.25	0.96	2.500	5.00	12.55
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00
Reference Reading @ 90% Span (in H2O)	0.225	0.45	1.80	4.45	9.00	22.50	0.24	0.44	1.80	4.50	9.00	24.00
Device Reading (in H2O)	0.225	0.450	1.80	4.45	9.00	22.50	0.240	0.45	1.80	4.500	9.20	24.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00

	Box 100-a				
Ser. No.	**R08F 2**	**R97020 3**	**R10629J A82**	**R10513 MR42**	**R90124 RI119**
Span (in H2O)	**0.5**	**2**	**5**	**10**	**25**
Reference Reading @ 0% Span (in H2O)	0.00	0.00	0.00	0.00	0.00
Device Reading (in H2O)	0.00	0.00	0.00	0.00	0.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00
Reference Reading @ 50% Span (in H2O)	0.25	1.00	2.50	5.00	13.00
Device Reading (in H2O)	0.25	1.00	2.50	5.00	13.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00
Reference Reading @ 90% Span (in H2O)	0.45	1.80	4.50	9.00	24.00
Device Reading (in H2O)	0.45	1.80	4.50	9.00	24.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00	0.00

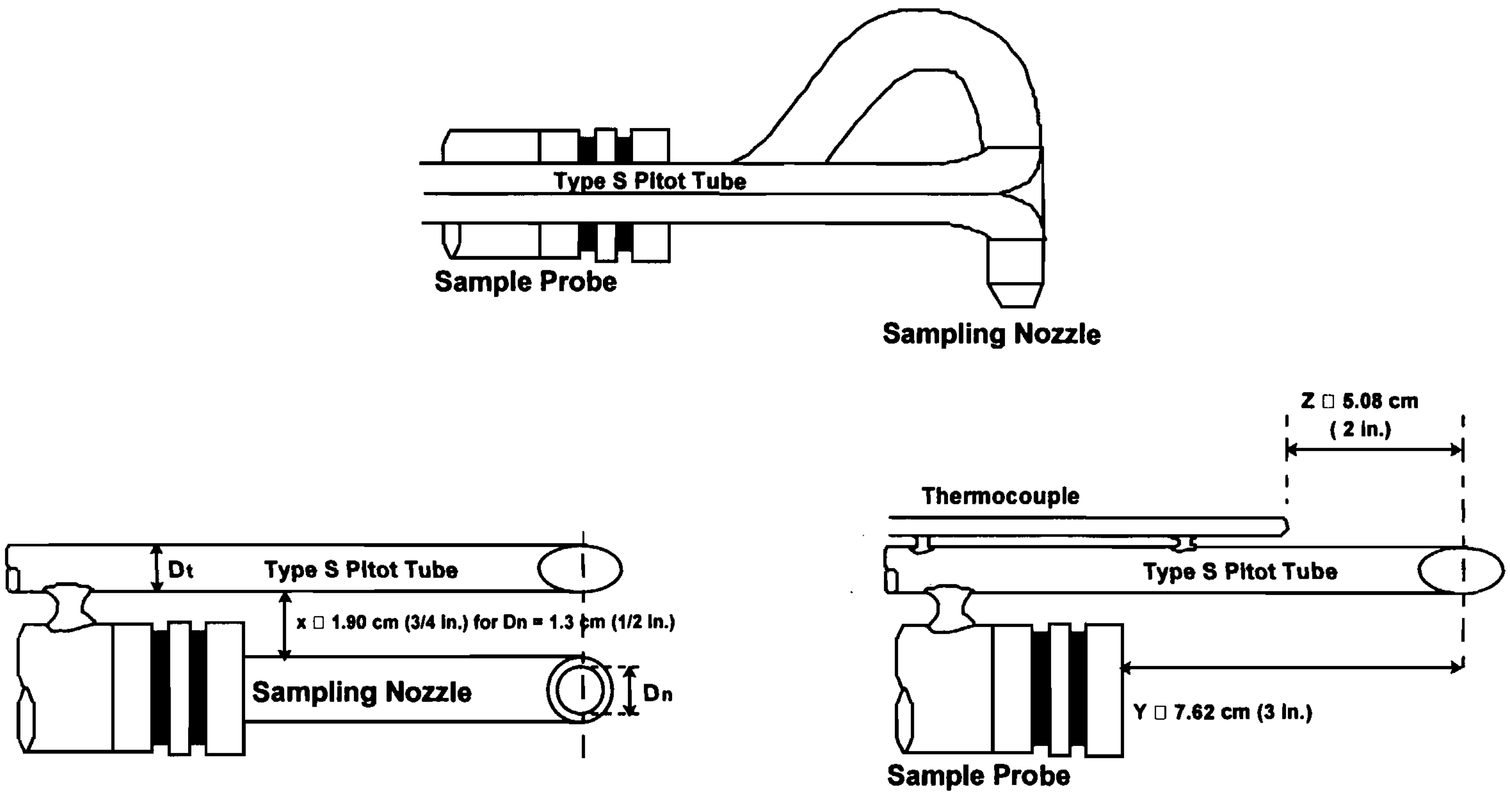
	Box 102						Box 103					
Ser. No.	**10819 DR2**	**R1090 2AG19**	**R5031 5EB93**	**910629T A97**		**R10722 MC5**	**R05E**	**R96040 2CA34**	**R20202 CF1**	**WOB KJM**	**R360**	
Span (in H2O)	**0.25**	**0.5**	**2**	**5**		**25**	**0.25**	**0.5**	**1**	**2**	**5**	**25**
Reference Reading @ 0% Span (in H2O)	0.000	0.000	0.00	0.00		0.00	0.000	0.000	0.00	0.00	0.00	0.00
Device Reading (in H2O)	0.000	0.000	0.00	0.00		0.00	0.000	0.000	0.00	0.00	0.00	0.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reference Reading @ 50% Span (in H2O)	0.130	0.250	1.00	2.40		12.80	0.125	0.245	0.50	1.00	2.40	12.50
Device Reading (in H2O)	0.125	0.255	1.02	2.50		12.50	0.121	0.250	0.50	1.03	2.50	13.00
% Difference (Allowed = 0.05)	0.04	0.02	0.02	0.04		0.02	0.03	0.02	0.00	0.03	0.04	0.04
Reference Reading @ 90% Span (in H2O)	0.240	0.490	1.90	4.70		24.20	0.235	0.440	0.90	1.90	4.90	24.00
Device Reading (in H2O)	0.240	0.490	1.90	4.75		24.00	0.230	0.450	0.90	1.90	5.00	24.00
% Difference (Allowed = 0.05)	0.00	0.00	0.00	0.01		0.01	0.02	0.02	0.00	0.00	0.02	0.00
Cailbration Date 06-17-02 By J. RAMPULLA												

Type S pitot tube construction details:

a) end view; face opening planes perpendicular to transverse axis.
b) top view; face opening planes parallel to longitudinal axis.
c) side view; both legs of equal length and centerlines coincident, when viewed from both sides.



Sampling Nozzle, Thermocouple, and Probe Configuration



APPENDIX B FIELD DATA SHEETS FOR PARTICULATE TESTING

Sanders Engineering & Analytical Services, Inc.
1568 Leroy Stevens Rd.
Mobile, Al. 36695
Office: (334) 633-4120
Fax: (334) 633-2285

COMPANY Gulf Power DATE 12-17-02 DGM# D762
PLANT Crist OPERATOR SL ΔHa .74
UNIT 4 METHOD 17 PROBE NA (Liner) 14' (Length)

	Run 1	Run 2	Run 3
Nozzle Calibration Pre	.242 / .242 / .242	.248 / .248 / .248	.242 / .242 / .242
Nozzle Calibration Post	.242 / .242 / .242	.248 / .248 / .248	.242 / .242 / .242
Average	.242	.248	.242
Filter Number	1044	1045	1046
Meter Reading Final	298.665	344.300	387.445
Meter Reading Initial	256.300	299.600	344.600
Meter Reading Total	42.365	44.700	42.845
Leak Check System Pre	12" / .000	15" / .000	12" / .003
Leak Check System Post	15" / .000	12" / .003	15 / .000
Leak Check Pitot Pre	✓ / ✓	✓ / ✓	✓ / ✓
Leak Check Pitot Post	✓ / ✓	✓ / ✓	✓ / ✓
Imp 1 Final / Initial / Net	140 / 100 / 40	165 / 100 / 65	146 / 100 / 46
Imp 2 Final / Initial / Net	100 / 100 / 0	100 / 100 / 0	100 / 100 / 0
Imp 3 Final / Initial / Net	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0
Imp 4 Final / Initial / Net	1776 / 1754 / 22	1787 / 1776 / 11	1792 / 1787 / 5
Total	62	76	51
Gas Analysis O_2	6.6	6.8	6.7
CO_2	11.7	11.7	11.5
CO	0		
Static (in. H_2O)	-.5	-.5	-.5
Barometric (in. Hg)	30.10	30.10	30.10

Page 1 of

	Port # / Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Gas Meter	Filter	Imp.	Vac. (In. Hg)
~ 2.1236	3-1	08 :09	256.300	.62	1.32	247	44	—	50	4.0
	2	:11	257.700	.75	1.59	252	45	—	48	4.0
	3	:13	259.100	.70	1.49	253	45	—	✓	4.0
	4	:15	260.600	.52	1.10	254	45	—	✓	3.0
	5	:17	261.700	.55	1.17	254	46	—	✓	3.0
	6	:19	262.900	.67	1.42	253	46	—	✓	4.0
	7	:21	264.800	1.00	~~1.48~~ 2.12	253	46	—	✓	5.0
	8	:23	266.300	1.00	2.12	251	46	—	✓	5.0
	3-1	:25	267.500	.75	1.59	255	48	—	✓	4.0
	2	:27	268.800	.75	1.59	254	50	—	✓	4.0
	3	:29	270.200	.45	.96	254	51	—	✓	3.0
	4	:31	271.400	.50	1.06	255	52	—	✓	3.0
± 2.104	5	:33	272.600	.55	1.16	254	52	—	✓	3.0
	6	:35	273.800	.65	1.37	254	53	—	✓	3.0
	7	:37	275.600	.75	1.58	254	53	—	✓	4.0
	8	:39	276.400	1.00	2.10	253	54	—	✓	5.0
	2-1	:43	278.050	.80	1.68	255	55	—	✓	4.0
	2	:45	279.900	.60	1.26	256	55	—	✓	4.0
	3	:47	281.000	.45	.95	256	56	—	✓	4.0
	4	:49	282.000	.35	.74	256	56	—	✓	4.0
	5	:51	283.000	.50	1.05	255	56	—	✓	4.0
	6	:53	284.200	.57	1.20	255	56	—	✓	4.0
	7	:55	285.300	.50	1.05	255	56	—	✓	4.0
	8	:57	286.500	.60	1.26	254	56	—	✓	4.0
	1-1	09:00	287.850	.80	~~1.26~~ 1.64	256	56	—	✓	4.0
	2	:02	289.200	.95	2.00	256	56	—	✓	5.0
	3	:04	290.900	.87	1.83	257	58	—	✓	5.0
	4	:06	292.300	.50	1.05	256	58	—	✓	4.0
	5	:08	293.600	.50	1.05	256	58	—	✓	4.0
	6	:10	294.800	.55	1.15	256	58	—	✓	4.0
	7	:12	295.900	.60	1.26	256	58	—	✓	4.0
	8	:14	297.300	.62	1.30	255	58	—	✓	4.0
	Final	09:16	298.665							

Form Revised

Company: Gulf Power Co Date: 12-17-03 Page ____

Site: Crist 4 Run #: 1 Of ____

	Port # / Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Gas Meter	Filter	Imp.	Vac. (In. Hg)
	3-1	09:57	299.600	~~.39~~ .60	1.39	251	57			
2.3185	2	:59	301.000	.80	1.85	255	57	—	37	4.0
	3	10:01	302.500	.70	1.62	259	57	—	✓	5.0
	4	:03	304.000	.60	1.39	260	57	—	✓	5.0
	5	:05	305.300	.47	1.09	260	58	—	✓	5.0
	6	:07	306.400	.57	1.32	260	58	—	✓	4.0
	7	:09	307.600	.78	~~1.02~~ 1.80	260	60	—	✓	4.0
	8	:11	309.100	.95	2.20	260	60	—	✓	5.0
	3-1	:13	311.100	.65	1.50	259	60	—	✓	6.0
2.3545	2	:15	312.200	.77	1.81	261	60	—	✓	5.0
	3	:17	313.700	.85	2.00	262	61	—	✓	5.0
	4	:19	315.300	.65	1.53	261	62	—	✓	6.0
	5	:21	316.600	.60	1.41	261	62	—	✓	5.0
	6	:23	318.000	.50	1.17	261	63	—	✓	5.0
	7	:25	319.300	.65	1.53	261	63	—	✓	5.0
	8	:27	320.600	.75	1.77	261	65	—	✓	5.0
	2-1	:301	322.130	.75	1.77	261	66	—	✓	5.0
	2	:33	323.400	.70	1.65	262	66	~~55~~	✓	5.0
	3	:35	325.100	.65	1.53	263	66	—	55	5.0
	4	:37	326.500	.50	1.18	263	67	—	✓	5.0
	5	:39	327.900	.50	1.18	263	67	—	✓	5.0
	6	:41	328.900	.52	1.22	262	67	—	✓	5.0
	7	:43	330.300	.52	1.22	262	67	—	✓	5.0
	8	:45	331.600	.60	1.41	262	67	—	✓	5.0
	1-1	:49	330.050	.85	2.00	262	68	—	✓	5.0
	2	:51	334.700	.75	1.77	263	68	—	✓	5.0
	3	:53	336.300	.65	1.53	264	68	—	✓	5.0
	4	:55	337.800	.40	.94	264	69	—	✓	5.0
	5	:57	338.800	.62	1.46	263	69	—	✓	5.0
	6	:59	340.100	.57	1.34	263	69	—	✓	5.0
	7	11:01	341.500	.60	1.41	263	69	—	✓	5.0
	8	:03	342.800	.70	1.65	262	70	—	✓	5.0
	Final	11:05	344.300							

Form Revised 8/24/02

Company: Gulf Power Co. Date: 12-17-02 Page ____

Site: Crist 4 Run #: 2 Of ____

2.1470

Port # / Point#	Time	Gas Meter Volume (Cubic Feet)	Velocity Head ΔP (In. H_2O)	Orifice Head ΔH (In. H_2O)	Temperature °F Stack	Temperature °F Gas Meter	Temperature °F Filter	Temperature °F Imp.	Vac. (In. Hg)
3-1	11:33	344.600	.65	1.40	253	63	—	78	4.0
2	:35	345.900	.77	1.65	262	63	—	✓	5.0
3	:37	347.400	.62	1.33	264	64	—	✓	5.0
4	:39	348.800	.50	1.07	265	64	—	✓	4.0
5	:41	349.950	.50	1.07	265	64	—	✓	4.0
6	:43	35~~0~~.200	.45	.96	265	65	—	✓	4.0
7	:45	352.300	.77	1.65	264	66	—	✓	5.0
8	:47	353.800	1.0 ~~.9~~	2.15	264	66	—	✓	6.0
3-1	:49	355.600	.75	1.61	266	67	—	51	5.0
2	:51	356.800	.75	1.61	266	67	—	✓	5.0
3	:53	358.500	.60	1.29	265	68	—	✓	5.0
4	:55	359.700	.57	1.22	265	69	—	✓	5.0
5	:57	360.900	.50	1.07	266	69	—	✓	4.0
6	:59	362.000	.65	1.40	265	70	—	✓	5.0
7	12:01	363.500	.75	1.61	265	70	—	✓	5.0
8	:03	364.900	.95	2.04	264	71	—	✓	6.0
2-1	:07	366.600	.80	1.72	264	71	—	✓	5.0
2	:09	367.900	.70	1.50	265	72	—	✓	5.0
3	:11	369.400	.55	1.18	265	71	—	✓	5.0
4	:13	370.700	.40	.86	266	71	—	✓	4.0
5	:15	371.800	.50	1.07	265	71	—	✓	5.0
6	:17	372.900	.55	1.18	266	72	—	✓	5.0
7	:19	374.200	.65	1.40	265	72	—	57	5.0
8	:21	375.600	.65	1.40	264	72	—	✓	5.0
1-1	:25	377.000	.85	1.82	263	72	—	✓	5.0
2	:27	378.600	.75	1.61	266	72	—	✓	5.0
3	:29	380.100	.80	1.72	267	73	—	✓	5.0
4	:31	381.500	.40	.86	266	73	—	✓	5.0
5	:33	382.600	.60	1.29	266	73	—	✓	5.0
6	:35	383.800	.50	1.07	265	73	—	✓	5.0
7	:37	385.000	.50	1.07	265	73	—	✓	5.0
8	:39	386.200	.65	1.40	265	73	—	✓	5.0
End	12:41	387.445							

Form Revised [illegible]

Company: Gulf Power Co. Date: 12-17-02 Page ______

Site: Crist 4 Run #: 3 Of ______

LABORATORY ANALYSIS & CHAIN OF CUSTODY

COMPANY/PLANT: Gulf Power - Chris

UNIT #: 9 DATE OF TEST: 12/17/02 TYPE OF TEST: ☐ M-5 ☒ M-17 ☐ OTHER

SAMPLE #	RELINQUISHED BY:	RECEIVED BY:	TIME:	DATE:	REASON FOR CHANGE
No Change					

RUN # 1	FILTER # 1044	BEAKER 67 WASH (ML) 60492.2	RUN #	FILTER #	BEAKER WASH (ML)
FINAL WEIGHT	131.9	60492.2	FINAL WEIGHT		
INITIAL WEIGHT	122.4	60476.2	INITIAL WEIGHT		
DIFFERENCE	9.5	16	DIFFERENCE		
CORRECTED TOTAL WEIGHT		25.5	CORRECTED TOTAL WEIGHT		
RUN # 2	FILTER # 1045	BEAKER 62 WASH (ML)	RUN #	FILTER #	BEAKER WASH (ML)
FINAL WEIGHT	128.1	67194.0	FINAL WEIGHT		
INITIAL WEIGHT	122.6	67182.2	INITIAL WEIGHT		
DIFFERENCE	5.5	11.8	DIFFERENCE		
CORRECTED TOTAL WEIGHT		17.3	CORRECTED TOTAL WEIGHT		
RUN # 3	FILTER # 1046	BEAKER 20 WASH (ML)	RUN #	FILTER #	BEAKER WASH (ML)
FINAL WEIGHT	119.5	64152.8	FINAL WEIGHT		
INITIAL WEIGHT	115.2	64152.3	INITIAL WEIGHT		
DIFFERENCE	4.3	.5	DIFFERENCE		
CORRECTED TOTAL WEIGHT		4.8	CORRECTED TOTAL WEIGHT		

WASH SOLVENT BLANK (ML)		BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		

APPENDIX C SAMPLE CALCULATIONS

Sample Calculations, Run 1
GULF POWER COMPANY
PLANT CRIST
UNIT 4

Absolute Stack Pressure (inches Mercury)

$$P_s = P_{bar} + \frac{\overline{P_g}}{13.6}$$

P_g = Stack Static Pressure (inches Water) =	(0.50)
P_{bar} = Barometric Pressure (inches Mercury) =	30.10
P_s =	30.06

Absolute Pressure at the Dry Gas Meter (inches Mercury)

$$P_m = P_{bar} + \frac{\overline{\Delta H}}{13.6}$$

P_{bar} = Barometric Pressure (inches Mercury) =	30.10
ΔH = Average pressure difference of orifice (inches Water) =	1.38
P_m =	30.20

Average Stack Gas Velocity (feet per second)

$$V_s = K_p C_p \overline{\sqrt{\Delta P}} \sqrt{\frac{\overline{T_s}}{M_s P_s}}$$

Kp = Pitot tube constant $\sqrt{\frac{(\text{lb/lb - mole})\ (\text{inches Hg})}{(°\text{R})\ (\text{inches H2O})}}$ =	85.49
C_p = Pitot tube coefficient (dimensionless) =	0.84
$\overline{\sqrt{\Delta P}}$ = Velocity head of stack gas (inches H2O) =	0.8028
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	714.4
M_s = Molecular weight of stack gas; wet basis (lb/lb mole) =	29.40
P_s = Absolute stack pressure (inches Mercury) =	30.06
V_s =	51.83

Volume of Gas Sampled Measured by Dry Gas Meter

(corrected to standard conditions, SDCF)

$$Vm(Std) = K_1 V_m Y \left[\frac{P_{bar} + \frac{\overline{\Delta H}}{13.6}}{\overline{T_m}} \right]$$

K_1 = Degrees R/inches Mercury =	17.64
V_m = Volume of gas sample as measured by dry gas meter (actual cubic feet) =	42.365
Y = Dry gas meter calibration factor (dimensionless) =	1.022
P_{bar} = Barometric Pressure (inches Mercury) =	30.10
Δ H = Average pressure difference of orifice (inches H2O) =	1.38
T_s = Average absolute temperature of the dry gas, Degrees R (Degrees F+460) =	512.5
$V_{m(Std)}$ =	45.008

Volume of Water Vapor in Gas Sample

(corrected to standard conditions, SDCF)

$$V_{w\,(Std)} = 0.04707\ V_{lc}$$

V_{lc} = Total volume of liquid collected in impingers and silica gel (milliliters) =	62.0
$V_{w(Std)}$ =	2.918

Water Vapor in the Gas Stream proportion by volume (dimensionless)

$$B_{ws} = \frac{V_{w(Std)}}{V_{m(Std)} + V_{w(Std)}}$$

$V_{w(std)}$ = Volume of water in gas sample (corrected to standard conditions) =	2.918
$V_{m(std)}$ = Volume of sample measured by dry gas meter (standard conditions) =	45.008
B_{ws} =	0.061

Molecular Weight of Stack Gas (dry basis, lb/lb mole)

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2 + \%CO)$$

$\%CO_2$ = Number percent by volume (dry basis from gas analysis) =	11.70
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	6.60
$\%N_2+\%CO$ = Number percent by volume (dry basis from gas analysis) =	81.70
M_d =	30.14

Molecular Weight of Stack Gas (wet basis, lb/lb mole)

$$M_s = M_d(1 - B_{ws}) + 18(B_{ws})$$

M_d = Molecular weight of stack gas (dry basis, lb/lb mole) =	30.14
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.061
M_s =	29.40

Volumetric Flow Rate (actual cubic feet per minute)

$$Q_a = (V_s)(A_s)(60)$$

V_s = Average stack gas velocity (feet per second) =	51.83
A_s = Cross sectional area of stack (feet squared) =	92.135
Q_a =	286,537

Volumetric Flow Rate (standard dry cubic feet per minute)

$$Q_s = Q_a(1 - B_{ws}) \frac{(528)}{\overline{T}_s} \frac{(P_s)}{29.92}$$

Q_a = Volumetric flow rate (actual cubic feet per minute) =	286,537
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.061
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	714.4
P_s = Absolute stack pressure (inches Mercury) =	30.06
Q_s =	199,838

Volumetric Flow Rate (standard wet cubic feet per minute)

$$Q_{sw} = Q_a \frac{(528)}{\overline{T}_s} \frac{(P_s)}{29.92}$$

Q_a = Volumetric flow rate (actual cubic feet per minute) =	286,537
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	714.4
P_s = Absolute stack pressure (inches Mercury) =	30.06
Q_{sw} =	212,795

Particulate Mass Rate (pounds per hour)

$$PMR = (Cs)(Qs)\frac{(60)}{7000}$$

Cs =Polutant concentration (grains per standard dry cubic foot) =	0.0087
Q_a = Volumetric flow rate (standard dry cubic feet per minute) =	199,838
PMR =	14.95

Particulate Concentration (grains per standard dry cubic foot)

$$C_s = 0.0154\frac{M_n}{V_{m(Std)}}$$

Mn = Total amount ofPolutant collected (milligrams) =	25.5
$V_{m(Std)}$ = Volume of stack gas sampled (corrected to standard conditions) =	45.008
C_s =	0.0087

Particulate Concentration (grains per actual cubic foot)

$$C_a = 0.0154\frac{M_n}{V_{n\,(actual)}}$$

Mn = Total amount ofPolutant collected (milligrams) =	25.5
$V_{n\,(actual)}$ = Volume sampled at stack conditions (actual cubic feet) =	64.562
C_a =	0.0061

Percent of Isokinetic Sampling

$$I = \frac{100\ V_n}{(60)\ \varnothing\ V_s\ A_n}$$

V_n = Volume sampled at stack conditions through nozzle (actual cubic feet) =	64.562
V_s = Average stack gas velocity (feet per second) =	51.83
A_n = Cross-sectional area of nozzle (feet squared) =	0.000319
$\varnothing$ = Sampling Time (minutes) =	67
I =	97.0

Volume of Gas Sampled Through Nozzle (actual cubic feet)

$$V_n = \left[(0.002669)(V_{lc}) + Y\frac{V_m}{T_m}\left(P_{bar} + \frac{\overline{\Delta H}}{13.6}\right)\right]\frac{\overline{T_s}}{P_s}$$

V_{lc} = Total volume of liquid collected in impingers and silica gel (milliliters) =	62.0
Y = Dry gas meter calibration factor (dimensionless) =	1.022
V_m = Volume of gas sample as measured by dry gas meter (actual cubic feet) =	42.365
T_m = Average absolute temperature of dry gas meter, Degrees R (Degrees F+460) =	512.5
P_{bar} = Barometric Pressure (inches Mercury) =	30.10
ΔH = Average pressure difference of orifice (inches Water) =	1.38
T_s = Average absolute temperature of stack, Degrees R (Degrees F+460) =	714.4
P_s = Absolute stack pressure (inches Mercury) =	30.06
V_n =	64.562

Emission Rate in Pounds Per Million Btu (EPA Oxygen F Factor)

$$E = C_d F_{O2}\left(\frac{20.9}{20.9 - \%O_2}\right)$$

Cd = Pollutant concentration (pounds per standard dry cubic foot) =	0.0000012
F_{O2} = Oxygen based F factor (SDCF/mmBtu for bituminous coal) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	6.6
E_{O2} =	0.0178

Unit Operating Rate-Million Btu per Hour

$$UOR = \left(\frac{PMR}{E_{O2}}\right)$$

E_{O2} = Emission Rate in Pounds Per Million Btu (EPA Oxygen F Factor) =	0.0178
PMR = Pollutant Mass Rate (pounds per hour) =	14.94507282
UOR=	839

Carbon Monoxide Emission Rate in Pounds per Hour

$$E_{\text{lb/hour } x} = \frac{MW_x}{385{,}000{,}000} C_{ppm_x} Q_{std} 60$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	CO
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	9.81
Qstd = Volumetric flow rate (standard dry cubic feet per minute) =	199838
$E_{lb/hour}$ =	8.552659

Carbon Monoxide Concentration (ppm Wet)

$$C_{ppmwetx} = (1 - B_{ws}) C_{ppmx}$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	CO
Cppmx = Pollutant Concentration (parts per million, dry basis) =	9.81
B_{ws} = Water vapor in the gas stream (proportion by volume, dimensionless) =	0.06
Cppmwetx	9.21

Carbon Monoxide Emissions Pounds Per Million Btu
(EPA Oxygen F Factor)

$$E_x = \frac{MW_x}{385{,}000{,}000} C_{ppm_x} F_{O2} \left(\frac{20.9}{20.9 - \%O_2} \right)$$

x = Compound of interest (SO2 NOx CO VOC TRS ect) =	CO
MWx = Molecular weight of compound (dry basis, lb/lb mole) =	28.01
Cppmx = Pollutant Concentration (parts per million, dry basis) =	9.81
F_{O2} = Oxygen based F factor (SDCF/mmBtu) =	9780
$\%O_2$ = Number percent by volume (dry basis from gas analysis) =	7.048244
E_{O2} =	0.010526

APPENDIX D GAS CERTIFICATIONS

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
8703 BELLINGRATH ROAD

THEODORE, AL 36582
ATTN:

DATE: 02/04/02
P.O. NO. 2844
ORDER NO. 6095288-03-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1965 psig CGA: 590 Analysis Date: 02/04/02

Shelf Life: 36 MONTH Expiration Date: 02/04/05

Cylinder No.	Constituents	Nominal	Actual	Uncertainty
CC44291	PROPANE	6 ppm	5.9 ppm	1.2 ppm
	AIR	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/951E	150-408	10.5 PPM PROPANE/N2	09/21/02

INSTRUMENTATION

Instrument	Analytical Principle
EC-324 VARIAN MICRO GC	DETECTOR TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska

STEVE ESKA ANALYST

FROM : INDWELD FAX NO. : 2516540091 Mar. 01 2002 09:37AM P4

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
8703 BELLINGRATH ROAD

THEODORE, AL 36582
ATTN:

DATE: 02/04/02
P.O. NO. 2844
ORDER NO. 6095288-02-01

CYLINDER NO.	CONSTITUENTS CONCENTRATION:	NOMINAL	ACTUAL	

EPA PROTOCOL MIXTURE

Pressure: 1960 psig CGA: 590 Analysis Date: 02/04/02

Shelf Life: 36 MONTH Expiration Date: 02/04/05

		Nominal	Actual	Uncertainty
CC43943	PROPANE	10ppm	9.6 ppm	1.2 ppm
	AIR	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/951E	150-408	10.5 PPM PROPANE/N2	09/21/02

INSTRUMENTATION

Instrument	Analytical Principle
EC-324 VARIAN MICRO GC	DETECTOR TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska
STEVE ESKA ANALYST

FROM : INDWELD FAX NO. : 2516540091 Mar. 01 2002 09:37AM P3

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
8703 BELLINGRATH ROAD

THEODORE, AL 36582
ATTN: LARRY STOKES

DATE: 02/04/02
P.O. NO. 2844
ORDER NO. 6095288-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1960 psig CGA: 590 Analysis Date: 02/04/02

Shelf Life: 36 MONTH Expiration Date: 02/04/05

Cylinder No.	Constituents	Nominal	Actual	Uncertainty
CC27899	PROPANE	18 ppm	17.4 ppm	1.1 ppm
	AIR	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/952H	CC31625	51.3 PPM PROPANE/N2	09/21/02

INSTRUMENTATION

Instrument	Analytical Principle
KC-324 VARIAN MICRO GC	DETECTOR TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska

STEVE ESKA ANALYST

FROM : INDWELD FAX NO. : 2516540091 Mar. 01 2002 09:36AM P2

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER

MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 08/23/02
P.O. NO. 4544
ORDER NO. 6478179-01-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 2040 psig CGA: 590 Analysis Date: 08/23/02

Shelf Life: 60 MONTH Expiration Date: 08/23/07

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC17617	OXYGEN	10.0%	10.00 %	0.025 %
	NITROGEN	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 903E	CC-13342	9.99% O2 IN N2	05/17/04

INSTRUMENTATION

Instrument	Analytical Principle
SERVOMEX	PARAMAGNETIC DETECTION

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 8/23/02

STEVE ESKA ANALYST

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:

INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 07/30/02
P.O. NO. 4346
ORDER NO. 5434860-01-01

CYLINDER NO.	CONSTITUENTS CONCENTRATION:	NOMINAL	ACTUAL	

EPA PROTOCOL MIXTURE

Pressure: 2020 psig CGA: 660 Analysis Date: 07/30/02

Shelf Life: 12 MONTHS Expiration Date: 07/30/03

		Nominal	Actual	Uncertainty
CC28069	SULFUR DIOXIDE	185 ppm	188 ppm	1.6 ppm
	CARBON MONOXIDE	50 ppm	50 ppm	0.46 ppm
	NITROGEN	BALANCE	BALANCE	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/ 946E	CC121091	501 PPM SO2/N2	10/12/02
GMIS/ 939E	CC31032	100PPM CO/N2	10/30/02

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 7/30/02

STEVE ESKA ANALYST

MG 23301/C

8428 MARKET STREET
HOUSTON, TX 77029
(713) 672-1325

MESSER
MG Industries

ANALYTICAL REPORT – PRODUCT CERTIFICATION

TO:
INDUSTRIAL WELDING SUPPLY
5500 EAST RITE RD
PO BOX 568
THEODORE, AL 36590
ATTN:

DATE: 10/22/02
P.O. NO. 4991
ORDER NO. 6561069-02-01

CYLINDER NO. CONSTITUENTS CONCENTRATION: NOMINAL ACTUAL

EPA PROTOCOL MIXTURE

Pressure: 1810 psig CGA: 660 Analysis Date: 10/22/02

Shelf Life: 24 MONTH Expiration Date: 10/22/04

Cylinder No.	Constituent	Nominal	Actual	Uncertainty
CC2054	SULFUR DIOXIDE	900 ppm	891 ppm	2.9 ppm
	NITRIC OXIDE	900 ppm	865.0 ppm	1.7 ppm
	CARBON MONOXIDE	900 ppm	901 ppm	5.1 ppm
	CARBON DIOXIDE	22 %	21.12 %	0.045 %
	NITROGEN	BALANCE	BALANCE	
	NOX		866.0 ppm	

REFERENCE STANDARD

Type/Std No.	Cylinder No.	Concentration	Exp. Date
GMIS/934E	CC-11277	987PPM SO2 IN N2	10/24/02
GMIS/956E	CC28170	1002PPM NO IN N2	01/29/03
GMIS/925E	CC-28549	1000PPM CO IN N2	10/30/02
GMIS/914E	CC111038	14.00% CO2 IN N2	05/14/04

INSTRUMENTATION

Instrument	Analytical Principle
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
SIEMANS ULTRAMAT 23	SPECTROSCOPIC
KC-324 VARIAN MICRO GC	VARIAN TCD

ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-1997:G1/ * DENOTES PROCEDURE G2
ANALYTICAL ACCURACY +/-1%

THIS STANDARD SHOULD NOT BE USED WHEN ITS GAS PRESSURE IS BELOW 1.0 MEGAPASCALS (150psig)

Steve Eska 10/22/02

STEVE ESKA ANALYST

MG 23301/C

VOC Calibration Data

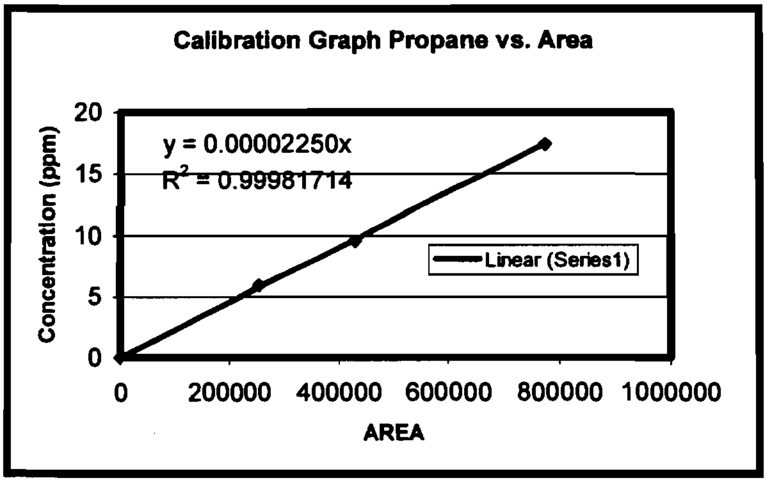
	high 17.4 ppm		mid 9.6 ppm		low 5.9 ppm	
injection #	Area	Percent Difference From Meam	Area	Percent Difference From Meam	Area	Percent Difference From Meam
1	787839	1.818	429299	-0.068	255155	-0.032
2	759708	-1.818	429879	0.068	255320	0.032
Mean	773773.5		429589		255238	

Calibration Data

area	ppm
773773.5	17.4
429589	9.6
255238	5.9
0	0

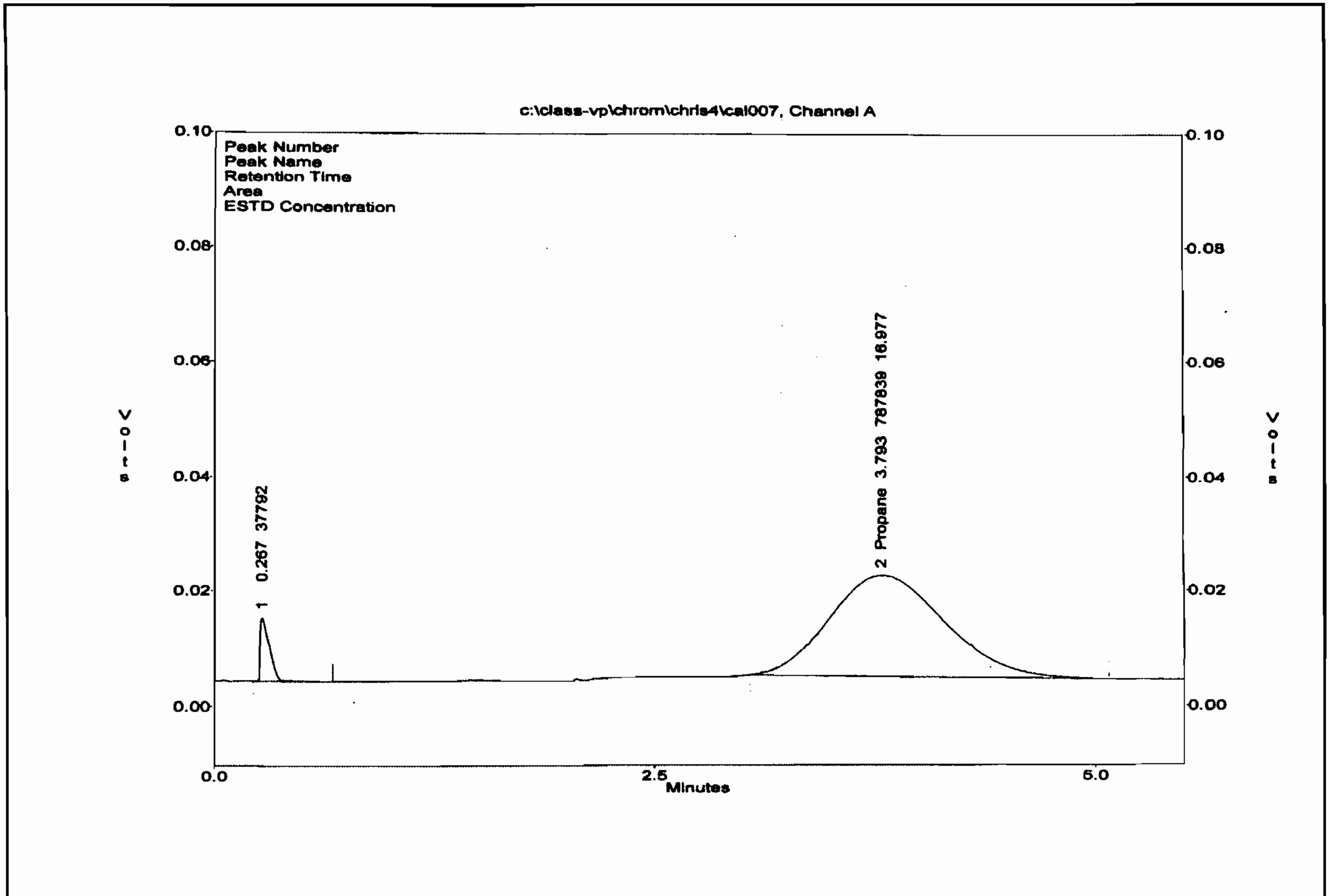
Initial system check

area	ppm
234998	5.9
234838	5.9

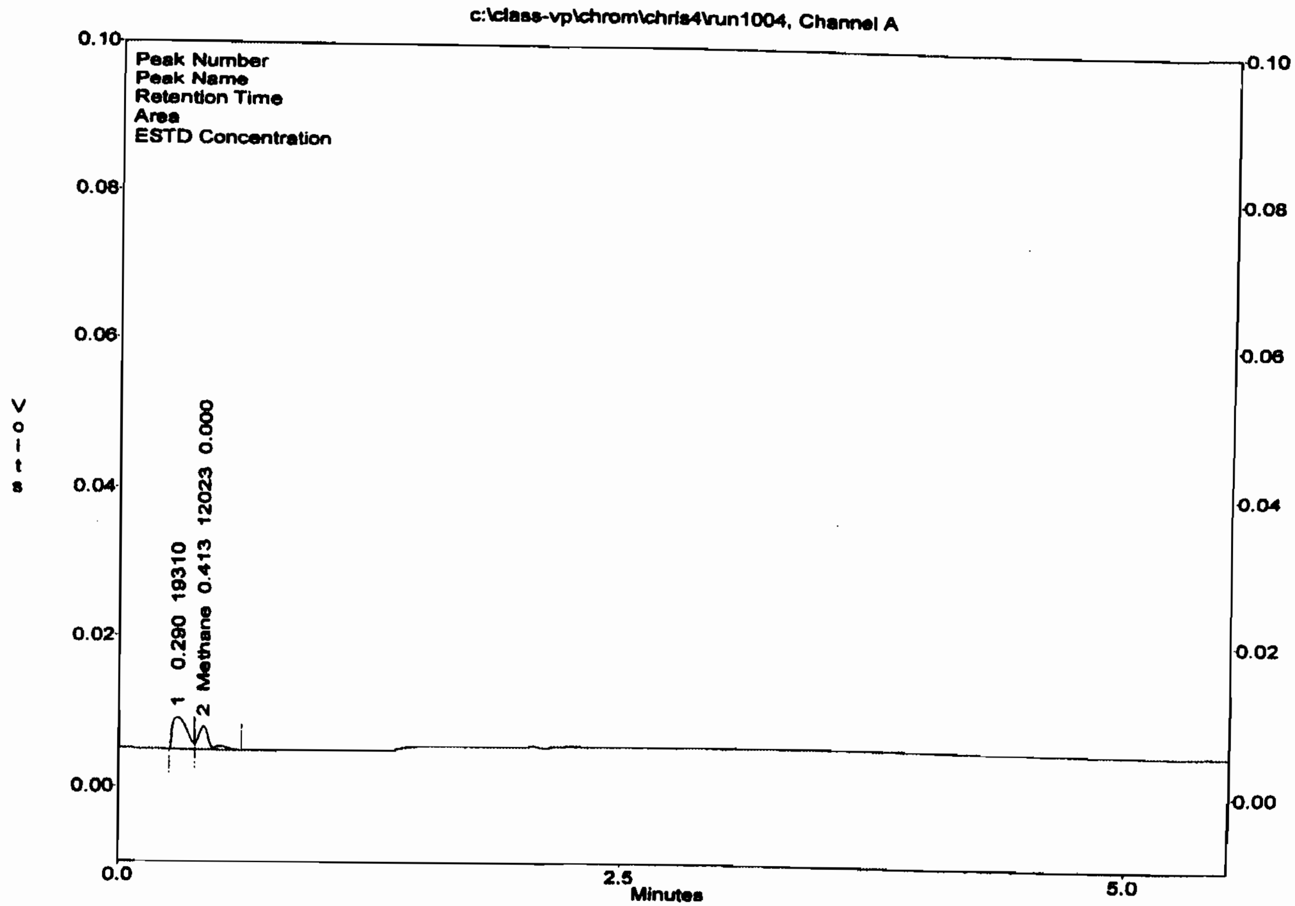


APPENDIX E EXAMPLE CHROMATOGRAMS

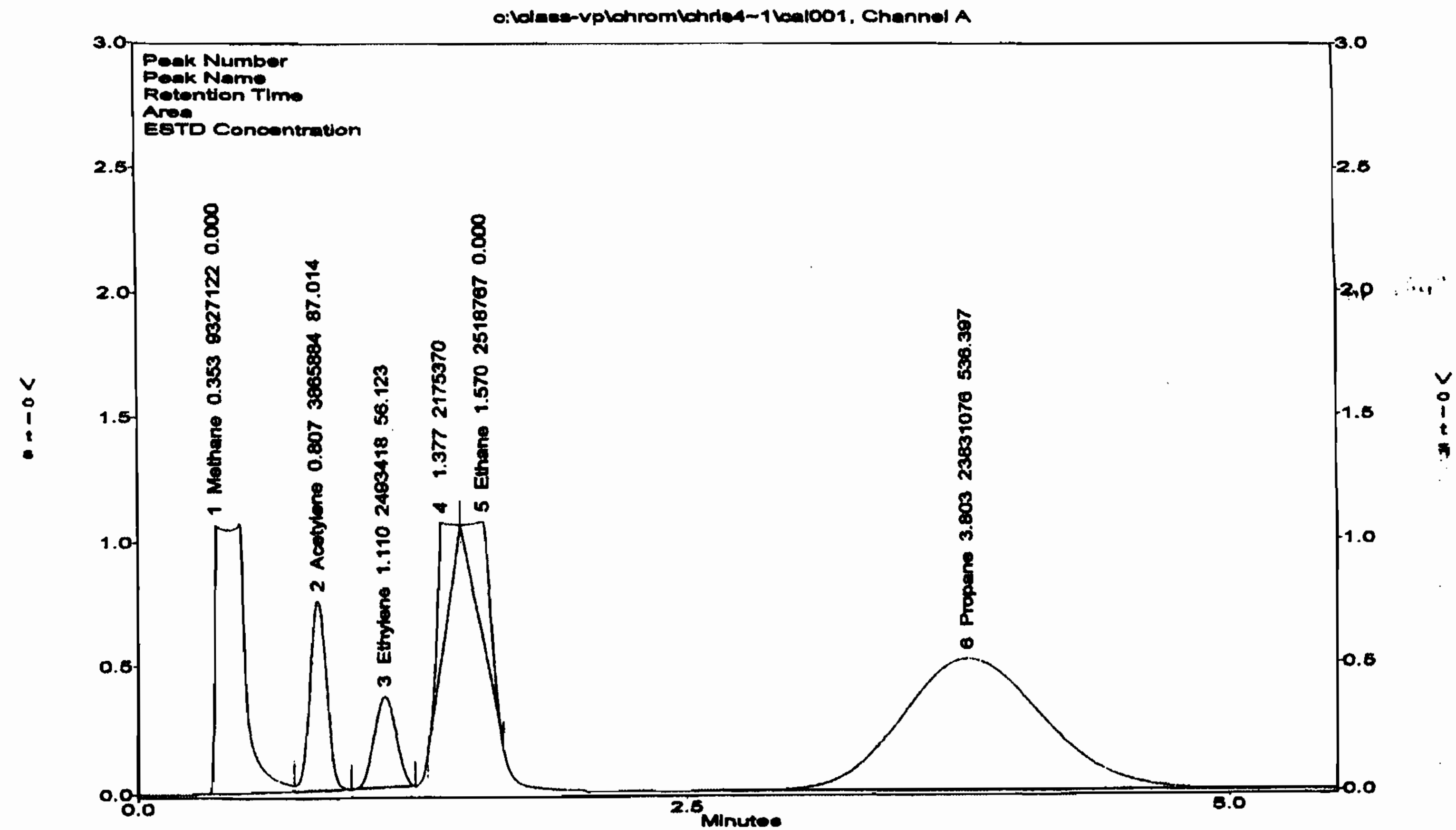
GAS CHROMATOGRAPHIC INJECTION OF 17.4 PARTS PER MILLION CALIBRATION GAS



GAS CHROMATOGRAPHIC INJECTION OF STACK GAS



GAS CHROMATOGRAM DEMONSTRATING COLUMN PERFORMANCE SEPERATING C-1 THROUGH C-3+ COMPOUNDS (METHANE, ACETYLENE, ETHYLENE, ETHANE, AND PROPANE +)



Crist 4 Baseline Coal Only Test							
Maximum Allowable Heat Input: 1096.7 mmBtu/hr							
Steady State December 17, 2002							
					coal flow	Coal	LDMS
Run #	Load	Start	End	Duration	from LDMS	Analysis	results
	Gross MW	Time	Time	(Hours)	(tons)	Btu / lb	mmBtu's/hr
1	81.05	08:09	09:16	1.12	36.45	11974	781.7
2	80.9	09:57	11:05	1.13	41.85	12001	886.3
3	81.45	11:33	12:41	1.13	37.35	11981	789.7
	81.1					**Average**	819.2
						Percent of Max Allowable	75%
						Load Limit if % < 90%	89

Gulf Power Plant Crist Unit 4
Baseline Coal Only Test Notes
Steady State Testing 12/17/02

Run #1

Start Time		Notes
CDT	CEMS	No operational problems noted.
08:09	08:09	NOTE: CEMS time, not Central Daylight Time (CDT), is used on Sander's test report.
Stop Time		Units 1, 2, and 3 were on line at the time of the test.
CDT	CEMS	
09:16	09:16	

Run #2

Start Time		Notes
CDT	CEMS	No operational problems noted.
09:57	09:57	
Stop Time		
CDT	CEMS	
11:05	11:05	

Run #3

Start Time		Notes
CDT	CEMS	No operational problems noted.
11:33	11:33	
Stop Time		
CDT	CEMS	
12:41	12:41	

CEMS OPACITY DATA
Crist 4 Baseline Coal Only

Date	CEM Hour	Minutes									
		00	6	12	18	24	30	36	42	48	54
Steady State Testing											
12/17/02	8			3.0	2.9	3.0	3.1	3.0	2.9	3.0	2.9
12/17/02	9	2.9	2.9	2.9	2.9						3.9
12/17/02	10	3.1	3.0	2.9	2.9	3.1	2.9	2.9	3.0	2.9	3.0
12/17/02	11	2.9	3.0					3.2	3.1	3.1	3.0
12/17/02	12	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
12/17/02											
12/17/02											

Baseline [redacted]st Coal Only

Crist Plant Particulate Test Control Room Data

Unit 4 Date 12/17/02

Check one: Sootblowing / Steady-State (no sootblowing)

Unit Operator: Alsobrook

Run	Time	Pulverizer Coal Integrators (x 100 pounds) A	B	C	D	Generation Digital Meter MW	Gross Generation Integrator MWhr	Main Steam Total Flow (x 10e6 lb/hr)	Boiler Air Flow (x 10e6 lb/hr)	Excess O2 Econ Outlet % A	B	Opacity 6 min Avg %	ID Fan Amps 245 A	B	Gas Temp Air Htr Outlet deg F A	B	Soot Blowing Status	Data taken by (Initials)
#1 Start	0809	825842	084547	690286	476889	81.3	763478	635.28	676.55	2.72	2.40	3.8	[illegible]		266	273	NA	CA
#1 End	0916	825975	084682	690500	477101	80.8	763571	625.51	667.73	2.55	2.49	4.2	245		268	267	NA	CA
#2 Start	0957	826060	084787	690642	477243	80.8	763633	620.39	662.01	2.6	2.60	2.9	235		270	278	NA	CA
#2 End	1105	826175	084959	690832	477431	81.0	763713	620.56	654.02	2.51	2.52	2.9	235		269	277	NA	CA
									653.08									
#3 Start	1133	826226	085037	690926	477518	80.4	763754	616.50	[illegible]	2.50	2.44	3.9	225		270	277	NA	CA
#3 End	1241	826350	085226	691140	477730	80.5	763845	617.00	655.29	2.41	2.31	3.0	225		269	278	NA	CA

Operational Comments

Run #1	
Run #2	
Run #3	

Inside Operator Alsobrook

outside Operator (Coal Samples) Pollitt

Laboratoryman (Ash Samples) Murray

Electrician (ESP Readings) Tommy Boyd

DATE = 12/17/02
unit 4
CRIST PLANT LOI WORKSHEET

COMPOSITE LOI

HOPPER	CRUCIBLE	CR. WT.	CR.+SAMP.	FURN. WT.	LOI	MW	TIME
unit 4 f run1	1	15.553	16.544	16.51	**3.43**		920
unit 4 m run1	3	15.638	16.698	16.67	**2.64**		920
unit 4 f run2	41	15.455	16.724	16.633	**7.17**		1110
unit 4 m run2	20	15.36	16.515	16.473	**3.64**		1110
unit 4 f run 3	5	15.482	16.578	16.509	**6.30**		1235
unit4m run3	2	16.85	17.906	17.858	**4.55**		1235

Domin[redacted]

Baseline (Com) 12/17/02

Analysis
DATE = 12/18/02
unit 4
CRIST PLANT LOI WORKSHEET

COMPOSITE LOI

HOPPER	CRUCIBLE	CR. WT.	CR.+SAMP.	FURN. WT.	LOI	MW	TIME
hopper 2	22	16.816	17.813	17.7539	5.93		1400
hopper 6	4	15.148	16.153	16.13	2.29		1400

@ 1400 HRS

	DATE =		TIME	
CRIST PLANT LOI WORKSHEET				
HOPPER	CRUCIBLE	CRUCIBLE WT.	CRUCIBLE + SAMPLE	FURNICE WEIGHT
2 UNIT 4 F	22	16.816	17.813	17.7539
6 UNIT 4 M	4	15.148	16.153	16.130
UNIT 5 F				
UNIT 5 M				
UNIT 6 AF				
UNIT 6 AM				
UNIT 6 BF				
UNIT 6 BM				
UNIT 7 A F				
UNIT 7 A M				
UNIT 7 B F				
UNIT 7 M F				

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN1
Coal Baseline Run 1

Laboratory ID Number : AG39377

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.94	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13663	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.25	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.84	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.73	% By Weight
Oxygen, Dry Basis	ASTM D 3176	8.10	% By Weight
Carbon Fixed, Dry	ASTM D 3172	53.61	% By Weight
Volatiles, Dry Basis	ASTM D 5142	39.45	% By Weight
Sulfur, Dry Basis	ASTM D 4239	1.14	% By Weight
As Received			
Moisture, Total	ASTM D 2013	12.36	% By Weight
Ash, As Received	ASTM D 5142	6.08	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11974	Btu/lb
Carbon, As Received	ASTM D 5373	67.70	% By Weight
Hydrogen, As Received	ASTM D 5373	4.24	% By Weight
Nitrogen, As Received	ASTM D 5373	1.52	% By Weight
Oxygen, As Received	ASTM D 3176	7.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	46.98	% By Weight
Volatiles, As Received	ASTM D 5142	34.57	% By Weight
Sulfur, As Received	ASTM D 4239	1.00	% By Weight
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.00	% By Weight
Barium, Ignited Basis	ASTM D 3683	575.	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02
Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN1
Coal Baseline Run 1

Laboratory ID Number : AG39377

Test Name	Reference	Result	Units
Calcium, Ignited Basis	ASTM D 3682	1.46	% By Weight
Iron, Ignited Basis	ASTM D 3682	8.55	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.97	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.41	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.77	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.15	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.78	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.56	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.04	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.22	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	52.22	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.04	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.88	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.30	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14682	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.834	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 1/13/03

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN2
Coal Baseline Run 2

Laboratory ID Number : AG39378

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.09	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13670	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.51	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.78	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.53	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.33	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.58	% By Weight
Sulfur, Dry Basis	ASTM D 4239	1.19	% By Weight
As Received			
Moisture, Total	ASTM D 2013	12.21	% By Weight
Ash, As Received	ASTM D 5142	6.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12001	Btu/lb
Carbon, As Received	ASTM D 5373	68.05	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.56	% By Weight
Oxygen, As Received	ASTM D 3176	6.61	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.09	% By Weight
Volatiles, As Received	ASTM D 5142	29.48	% By Weight
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.82	% By Weight
Barium, Ignited Basis	ASTM D 3683	402.	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN2
Coal Baseline Run 2

Laboratory ID Number : AG39378

Test Name	Reference	Result	Units
Calcium, Ignited Basis	ASTM D 3682	1.46	% By Weight
Iron, Ignited Basis	ASTM D 3682	8.75	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.49	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.07	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.77	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.22	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.04	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.51	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	52.39	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.02	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.67	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14713	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.871	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**_________________________ Date : 1/13/03

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN3
Coal Baseline Run 3

Laboratory ID Number : AG39379

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.89	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13665	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.83	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.77	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.40	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.32	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.79	% By Weight
Sulfur, Dry Basis	ASTM D 4239	1.21	% By Weight
As Received			
Moisture, Total	ASTM D 2013	12.32	% By Weight
Ash, As Received	ASTM D 5142	6.04	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11981	Btu/lb
Carbon, As Received	ASTM D 5373	68.24	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.55	% By Weight
Oxygen, As Received	ASTM D 3176	6.49	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.01	% By Weight
Volatiles, As Received	ASTM D 5142	29.63	% By Weight
Sulfur, As Received	ASTM D 4239	1.06	% By Weight
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.19	% By Weight
Barium, Ignited Basis	ASTM D 3683	410.	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02
Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN3
Coal Baseline Run 3

Laboratory ID Number : AG39379

Test Name	Reference	Result	Units
Calcium, Ignited Basis	ASTM D 3682	1.66	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.00	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.83	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.82	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.10	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.92	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.87	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.98	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.11	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.75	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.27	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14676	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.885	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ______________________ **Date :** 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Swift 2:40PM

Laboratory ID Number : AG39611

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.51	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8926	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.10	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.12	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.08	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.17	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.94	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.55	% By Weight
Fluorine, Dry Basis	ASTM D 5987	10	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	8.51	% By Weight
Ash, As Received	ASTM D 5142	0.47	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8166	Btu/lb
Carbon, As Received	ASTM D 5373	47.67	% By Weight
Hydrogen, As Received	ASTM D 5373	5.60	% By Weight
Nitrogen, As Received	ASTM D 5373	0.07	% By Weight
Oxygen, As Received	ASTM D 3176	37.67	% By Weight
Carbon Fixed, As Received	ASTM D 3172	17.33	% By Weight
Volatiles, As Received	ASTM D 5142	73.70	% By Weight
Fluorine, As Received	ASTM D 5987	9	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Swift 2:40PM

Laboratory ID Number : AG39611

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	1.22	% By Weight
Calcium, Ignited Basis	ASTM D 3682	19.55	% By Weight
Barium, Ignited Basis	ASTM D 3683	1290.	mg/kg
Iron, Ignited Basis	ASTM D 3682	1.06	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	5.42	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.90	% By Weight
Potassium, Ignited Basis	ASTM D 3682	14.45	% By Weight
Silicon, Ignited Basis	ASTM D 3682	9.69	% By Weight
Sodium, Ignited Basis	ASTM D 3682	1.06	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	6.27	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.07	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	2.31	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	27.35	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.52	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	8.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	4.35	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	17.41	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	20.73	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.43	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	15.68	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.12	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8972	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Swift 2:40PM

Laboratory ID Number : AG39611

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.022	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ **Date :** 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Gulf 3:00PM

Laboratory ID Number : AG39612

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.43	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8959	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.16	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.27	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.07	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.05	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.89	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.68	% By Weight
Fluorine, Dry Basis	ASTM D 5987	9	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	7.62	% By Weight
Ash, As Received	ASTM D 5142	0.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8276	Btu/lb
Carbon, As Received	ASTM D 5373	48.19	% By Weight
Hydrogen, As Received	ASTM D 5373	5.79	% By Weight
Nitrogen, As Received	ASTM D 5373	0.06	% By Weight
Oxygen, As Received	ASTM D 3176	37.92	% By Weight
Carbon Fixed, As Received	ASTM D 3172	17.45	% By Weight
Volatiles, As Received	ASTM D 5142	74.53	% By Weight
Fluorine, As Received	ASTM D 5987	8	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

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General Test Laboratory
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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Gulf 3:00PM

Laboratory ID Number : AG39612

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	2.91	% By Weight
Calcium, Ignited Basis	ASTM D 3682	23.19	% By Weight
Barium, Ignited Basis	ASTM D 3683	1188.	mg/kg
Iron, Ignited Basis	ASTM D 3682	0.32	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	5.58	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	2.41	% By Weight
Potassium, Ignited Basis	ASTM D 3682	16.97	% By Weight
Silicon, Ignited Basis	ASTM D 3682	1.62	% By Weight
Sodium, Ignited Basis	ASTM D 3682	1.44	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	8.30	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.00	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	5.50	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	32.45	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.46	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	9.25	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	5.52	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	20.44	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	3.47	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.94	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	20.75	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.00	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8998	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Gulf 3:00PM

Laboratory ID Number : AG39612

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.022	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ Supervision ____________________________ Date : 1/13/03

smk/coa

HOT SIDE 4 PROGRAM 1.

GROUP NO.	FIELD NAME	REPEAT TIME	LIFT HEIGHT / LIFT, IMPACTS, FREQUENCY / ON TIME HRS, MIN, SEC / ON TIME, INTENSITY	REST TIME	P.O.R. TIME	RAP DIRECTION	STARTING RAPPER	(REST) MODE	ANTI-COINCIDENCE GROUP	DUTY CYCLES FIELD	DUTY CYCLES ACC	DUTY CYCLES INTERLEAVE
1	H4P1	2:05	10	4:0		ASC.	1	MKV	1			
2	H4P2	4:03	10				7		1			
3	H4P3	6:05	10				13		1			
4	H4P4	10:07	10				19		1			
5	H4P5	13:13	10				25		1			
6	H4P6	16:01	10				31		1			
7	H4P7	21:07	10				37		1			
8	H4P8	26:11	10				43		1			
9	H4P9	31:37	10				49		1			
10	H4W	5:01	5 SEC/100%				1		2			
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												

[redacted]IT 4 COLD

200

8	7	6	5	NUMBER	3

GROUP NO. (1)	FIELD NAME (2)	REPEAT TIME (3)	LIFT HEIGHT (4)(5): LIFT / ON TIME (6): HRS / ON TIME (7): ON TIME	IMPACTS / MIN	FREQUENCY / SEC / INTENSITY	REST TIME (8)	P.O.R. TIME (9)	RIP DIRECTION (10)	STARTING RIPPER (11)	(REST) MODE (12)	ANTI-COINCIDENCE GROUP (13)	DUTY CYCLES (14): FIELD	ACC	INTERLEAVE
1	C4LA	1:03 2:03	3.6	1	1	0:10	-	ASC	01	MAX	1	48	179	3
2	C4TA	1:59 3:59	3.6	1	1	0:10	-	ASC	04	MAX	1	25	179	1
3	C4LB	3:01 6:01	3.6	1	1	0:10	-	ASC	07	MAX	1	17	179	1
4	C4TB	3:51 9:51	3.6	1	1	0:10	-	ASC	10	MAX	1	13	179	1
5	C4LC	6:17 15:17	3.6	1	1	0:10	-	ASC	13	MAX	1	8	179	0
6	C4TC	7:03 25:03	3.6	1	1	0:10	-	ASC	16	MAX	1	7	179	0
7	C4EA	2:01	3.4	1	1	0:10	-	ASC	01	MAX	1	33	179	2
8	C4EB	3:59	3.4	1	1	0:10	-	ASC	05	MAX	1	17	179	1
9	C4EC	6:03	3.4	1	1	0:10	-	ASC	09	MAX	1	11	179	1
10														
11														
12														
13														
14														
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24														

D

C

B

UNIT 5 COLD

8 7 6 5 NUMBER 3

GROUP NO. (1)	FIELD NAME (2)	REPEAT TIME (3)	LIFT HEIGHT (4)(5) / LIFT, IMPACTS, FREQUENCY / ON TIME (6) HRS, MIN, SEC / ON TIME (7) ON TIME, INTENSITY	REST TIME SEC (8)	P.O.R. TIME (9)	RAP DIRECTION (10)	STARTING RAPPER (11)	(REST) MODE (12)	ANTI-COINCIDENCE GROUP (13)	DUTY CYCLES (14) FIELD	ACC	INTERLEAVE
1	CS-1	2:03	5.0 4FT	2.0		ASC.	1	MAX	1	10	17	3
2	CS-2	5:13	5.0	2.0		ASC.	4	MAX	1	4	17	1
3	CS-3	7:19	5.0	2.0		ASC.	7	MAX	1	1	17	0
4	CS-4	13:03	5.0	2.0		ASC.	10	MAX	1	1	17	0
5	CS-5	6:00	5.0	2.0		ASC.	13	MAX	1	1	17	0
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												

D C B

Round Data

12/17/02

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 07:34:13
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 07:34:38
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-1 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 07:34:50
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 00 (Run Start) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 07:34:57
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** hot **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 07:35:21
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:00:58
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:04
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 24 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:08
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 202 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:15
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.12 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:21
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 30 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:29
Note:

A HOT side Cabinent Kilowatts **CompID:**
PointID: CAM009 **Value:** 4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:33
Note:

A HOT side Cabinent Firing Angle **CompID:**
PointID: CAM010 **Value:** 90 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:40
Note:

B HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM011 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:44
Note:

B HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM012 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:47
Note:

B HOT side Cabinent Primary Amps **CompID:**
PointID: CAM013 **Value:** 122 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:51
Note:

B HOT side Cabinent Primary Volts **CompID:**
PointID: CAM014 **Value:** 334 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:01:56
Note:

B HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM015 **Value:** 1.28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:02
Note:

B HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM016 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:08
Note:

B HOT side Cabinent Kilowatts **CompID:**
PointID: CAM017 **Value:** 37 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:12
Note:

B HOT side Cabinent Firing Angle **CompID:**
PointID: CAM018 **Value:** 120 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:16
Note:

C HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM019 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:20
Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:23
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 107 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:27
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 292 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:30
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.91 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:35
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:39
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:43
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:47
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:52
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:54
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:02:59
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 331 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:03
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:07
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:11
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:15
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:19
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 11 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:25
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:28
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 60 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:32
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 332 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:37
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.48 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:41
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:44
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:03:48
Note:

.E HOT side Cabinent Firing Angle CompID:
PointID: CAM042 Value: 125 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:03:52
Note:

F HOT side Cabinent Sparks per Minute CompID:
PointID: CAM043 Value: 0 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:03:57
Note:

F HOT side Cabinent Arcs per Minute CompID:
PointID: CAM044 Value: 0 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:04:00
Note:

F HOT side Cabinent Primary Amps CompID:
PointID: CAM045 Value: 98 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:04:04
Note:

F HOT side Cabinent Primary Volts CompID:
PointID: CAM046 Value: 366 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:04:08
Note:

F HOT side Cabinent Secondary Amps CompID:
PointID: CAM047 Value: 0.94 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:04:12
Note:

F HOT side Cabinent Secondary Volts CompID:
PointID: CAM048 Value: 25 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:04:16
Note:

F HOT side Cabinent Kilowatts CompID:
PointID: CAM049 Value: 32 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:04:19
Note:

F HOT side Cabinent Firing Angle CompID:
PointID: CAM050 Value: 140 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:04:23
Note:

A COLD side Cabinent Sparks per Minute CompID:
PointID: CAM051 Value: 0 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:07:34
Note:

A COLD side Cabinent Arcs per Minute CompID:
PointID: CAM052 Value: 0 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 08:07:38
Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 44 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:07:43
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 463 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:07:48
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:07:52
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:07:57
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:01
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:04
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:12
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:15
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 70 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:19
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 349 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:30
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.45 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:34
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:39
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:42
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:46
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:50
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:53
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 71 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:08:57
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 323 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:09:02
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.64 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:09:06
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:09:09
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:09:11
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:09:15
Note:

Round Data

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:13:27
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:13:29
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-1 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:13:42
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 60 (Run End) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:13:46
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** hot **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 08:13:59
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:10:14
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:10:18
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 24 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:10:21
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 249 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:10:31
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.15 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:10:48
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 30 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:10:55
Note:

A HOT side Cabinent Kilowatts **CompID:**
PointID: CAM009 **Value:** 5 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:01
Note:

A HOT side Cabinent Firing Angle **CompID:**
PointID: CAM010 **Value:** 86 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:07
Note:

B HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM011 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:11
Note:

B HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM012 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:12
Note:

B HOT side Cabinent Primary Amps **CompID:**
PointID: CAM013 **Value:** 122 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:14
Note:

B HOT side Cabinent Primary Volts **CompID:**
PointID: CAM014 **Value:** 334 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:15
Note:

B HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM015 **Value:** 1.28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:17
Note:

B HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM016 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:19
Note:

B HOT side Cabinent Kilowatts **CompID:**
PointID: CAM017 **Value:** 37 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:21
Note:

B HOT side Cabinent Firing Angle **CompID:**
PointID: CAM018 **Value:** 120 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:22
Note:

C HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM019 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:25
Note:

C HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:26
Note:

C HOT side Cabinent Primary Amps **CompID:**

PointID: CAM021 **Value:** 108 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:33
Note:

C HOT side Cabinent Primary Volts **CompID:**

PointID: CAM022 **Value:** 292 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:35
Note:

C HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM023 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:45
Note:

C HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM024 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:51
Note:

C HOT side Cabinent Kilowatts **CompID:**

PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:53
Note:

C HOT side Cabinent Firing Angle **CompID:**

PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:55
Note:

D HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:59
Note:

D HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:11:59
Note:

D HOT side Cabinent Primary Amps **CompID:**

PointID: CAM029 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:01
Note:

D HOT side Cabinent Primary Volts **CompID:**

PointID: CAM030 **Value:** 331 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:03
Note:

D HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM031 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:05
Note:

D HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM032 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:07
Note:

D HOT side Cabinent Kilowatts **CompID:**

PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:09
Note:

D HOT side Cabinent Firing Angle **CompID:**

PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:10
Note:

E HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM035 **Value:** 10 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:19
Note:

E HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:22
Note:

E HOT side Cabinent Primary Amps **CompID:**

PointID: CAM037 **Value:** 60 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:25
Note:

E HOT side Cabinent Primary Volts **CompID:**

PointID: CAM038 **Value:** 307 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:30
Note:

E HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM039 **Value:** 0.46 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:38
Note:

E HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM040 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:40
Note:

E HOT side Cabinent Kilowatts **CompID:**

PointID: CAM041 **Value:** 21 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:12:42
Note:

E HOT side Cabinent Firing Angle **CompID:**

PointID: CAM042 **Value:** 115 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:12:51

Note:

F HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM043 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:12:54

Note:

F HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM044 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:12:55

Note:

F HOT side Cabinent Primary Amps **CompID:**

PointID: CAM045 **Value:** 98 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:12:57

Note:

F HOT side Cabinent Primary Volts **CompID:**

PointID: CAM046 **Value:** 366 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:13:00

Note:

F HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM047 **Value:** 0.94 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:13:01

Note:

F HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM048 **Value:** 25 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:13:03

Note:

F HOT side Cabinent Kilowatts **CompID:**

PointID: CAM049 **Value:** 32 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:13:04

Note:

F HOT side Cabinent Firing Angle **CompID:**

PointID: CAM050 **Value:** 140 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:13:05

Note:

A COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM051 **Value:** 1 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:16:06

Note:

A COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM052 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 09:16:08

Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 44 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:09
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 463 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:12
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:15
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:18
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:19
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:21
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:25
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:26
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 70 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:28
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 349 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:30
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.45 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:32
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:34
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:35
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:36
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:39
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:40
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 71 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:42
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 323 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:44
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.64 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:46
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:48
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:50
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:16:51
Note:

Round Data

12/17/02

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:43:22
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:43:28
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-2 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:43:33
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 00 (Run Start) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:43:39
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** round two **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:44:13
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:23
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:25
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 23 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:33
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 234 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:40
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.15 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:42
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:47
Note:

A HOT side Cabinent Kilowatts **CompID:**
PointID: CAM009 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:51
Note:

A HOT side Cabinent Firing Angle **CompID:**
PointID: CAM010 **Value:** 75 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:50:59
Note:

B HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM011 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:02
Note:

B HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM012 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:02
Note:

B HOT side Cabinent Primary Amps **CompID:**
PointID: CAM013 **Value:** 121 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:09
Note:

B HOT side Cabinent Primary Volts **CompID:**
PointID: CAM014 **Value:** 333 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:14
Note:

B HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM015 **Value:** 1.28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:18
Note:

B HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM016 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:22
Note:

B HOT side Cabinent Kilowatts **CompID:**
PointID: CAM017 **Value:** 36 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:27
Note:

B HOT side Cabinent Firing Angle **CompID:**
PointID: CAM018 **Value:** 120 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:29
Note:

C HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM019 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:32
Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:34
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 108 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:41
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 292 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:47
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:52
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:54
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:51:56
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:01
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:10
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:11
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 116 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:16
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 329 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:21
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.88 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:28
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:30
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:31
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:32
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 10 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:35
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:36
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 69 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:41
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 347 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:46
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:52:56
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:03
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:06
Note:

E HOT side Cabinent Firing Angle **CompID:**
PointID: CAM042 **Value:** 120 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:12
Note:

F HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM043 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:15
Note:

F HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM044 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:17
Note:

F HOT side Cabinent Primary Amps **CompID:**
PointID: CAM045 **Value:** 98 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:20
Note:

F HOT side Cabinent Primary Volts **CompID:**
PointID: CAM046 **Value:** 366 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:23
Note:

F HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM047 **Value:** 0.94 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:24
Note:

F HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM048 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:25
Note:

F HOT side Cabinent Kilowatts **CompID:**
PointID: CAM049 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:27
Note:

F HOT side Cabinent Firing Angle **CompID:**
PointID: CAM050 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:53:28
Note:

A COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM051 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:09
Note:

A COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM052 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:12
Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 44 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:14
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 463 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:16
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:23
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:26
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:27
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:33
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:36
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:37
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 70 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:39
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 349 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:41
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.46 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:47
Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:49
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:51
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:53
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:55
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:56:57
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:57:02
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 323 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:57:05
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.64 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:57:07
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:57:08
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:57:10
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 09:57:11
Note:

Round Data

12/17/02

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:02:05
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:02:07
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-2 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:02:10
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 60 (Run End) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:02:13
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** round two **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:02:16
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:14
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:15
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:19
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 232 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:28
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.15 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:30
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:34
Note:

A HOT side Cabinent Kilowatts **CompID:**
PointID: CAM009 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:35
Note:

A HOT side Cabinent Firing Angle **CompID:**
PointID: CAM010 **Value:** 75 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:39
Note:

B HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM011 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:44
Note:

B HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM012 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:45
Note:

B HOT side Cabinent Primary Amps **CompID:**
PointID: CAM013 **Value:** 121 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:47
Note:

B HOT side Cabinent Primary Volts **CompID:**
PointID: CAM014 **Value:** 333 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:53
Note:

B HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM015 **Value:** 1.28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:56
Note:

B HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM016 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:58
Note:

B HOT side Cabinent Kilowatts **CompID:**
PointID: CAM017 **Value:** 36 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:57:59
Note:

B HOT side Cabinent Firing Angle **CompID:**
PointID: CAM018 **Value:** 120 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:00
Note:

C HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM019 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:03
Note:

C HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:05
Note:

C HOT side Cabinent Primary Amps **CompID:**
PointID: CAM021 **Value:** 108 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:06
Note:

C HOT side Cabinent Primary Volts **CompID:**
PointID: CAM022 **Value:** 290 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:11
Note:

C HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM023 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:14
Note:

C HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM024 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:18
Note:

C HOT side Cabinent Kilowatts **CompID:**
PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:20
Note:

C HOT side Cabinent Firing Angle **CompID:**
PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:21
Note:

D HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:23
Note:

D HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:24
Note:

D HOT side Cabinent Primary Amps **CompID:**
PointID: CAM029 **Value:** 116 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:25
Note:

D HOT side Cabinent Primary Volts **CompID:**
PointID: CAM030 **Value:** 329 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:29
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:35
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:38
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:39
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:40
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 10 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:42
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:43
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 78 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:49
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 375 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:58:54
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.48 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:59:01
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:59:06
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 19 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 10:59:14
Note:

E HOT side Cabinent Firing Angle **CompID:**

PointID: CAM042 **Value:** 115 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:18

Note:

F HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM043 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:21

Note:

F HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM044 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:22

Note:

F HOT side Cabinent Primary Amps **CompID:**

PointID: CAM045 **Value:** 98 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:23

Note:

F HOT side Cabinent Primary Volts **CompID:**

PointID: CAM046 **Value:** 363 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:28

Note:

F HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM047 **Value:** 0.94 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:30

Note:

F HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM048 **Value:** 25 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:31

Note:

F HOT side Cabinent Kilowatts **CompID:**

PointID: CAM049 **Value:** 32 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:32

Note:

F HOT side Cabinent Firing Angle **CompID:**

PointID: CAM050 **Value:** 140 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 10:59:33

Note:

A COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM051 **Value:** 8 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:25

Note:

A COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM052 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:27

Note:

A COLD side Cabinent Primary Amps **CompID:**

PointID: CAM053 **Value:** 44 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:28

Note:

A COLD side Cabinent Primary Volts **CompID:**

PointID: CAM054 **Value:** 460 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:33

Note:

A COLD side Cabinent Secondary Amps **CompID:**

PointID: CAM055 **Value:** 0.35 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:35

Note:

A COLD side Cabinent Secondary Volts **CompID:**

PointID: CAM056 **Value:** 39 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:36

Note:

A COLD side Cabinent Kilowatts **CompID:**

PointID: CAM057 **Value:** 18 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:38

Note:

A COLD side Cabinent Firing Angle **CompID:**

PointID: CAM058 **Value:** 150 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:39

Note:

B COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM059 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:42

Note:

B COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM060 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:44

Note:

B COLD side Cabinent Primary Amps **CompID:**

PointID: CAM061 **Value:** 70 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:45

Note:

B COLD side Cabinent Primary Volts **CompID:**

PointID: CAM062 **Value:** 347 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:50

Note:

B COLD side Cabinent Secondary Amps **CompID:**

PointID: CAM063 **Value:** 0.46 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:02:54

Note:

B COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM064 **Value:** 34 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:02:58
Note:

B COLD side Cabinent Kilowatts **CompID:**
PointID: CAM065 **Value:** 20 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:00
Note:

B COLD side Cabinent Firing Angle **CompID:**
PointID: CAM066 **Value:** 115 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:01
Note:

C COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM067 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:04
Note:

C COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM068 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:05
Note:

C COLD side Cabinent Primary Amps **CompID:**
PointID: CAM069 **Value:** 72 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:07
Note:

C COLD side Cabinent Primary Volts **CompID:**
PointID: CAM070 **Value:** 322 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:13
Note:

C COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM071 **Value:** 0.64 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:15
Note:

C COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM072 **Value:** 33 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:16
Note:

C COLD side Cabinent Kilowatts **CompID:**
PointID: CAM073 **Value:** 3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:18
Note:

C COLD side Cabinent Firing Angle **CompID:**
PointID: CAM074 **Value:** 160 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:03:19
Note:

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:25:50
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:25:53
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:26:07
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 00 (Run Start) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:26:11
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** round **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:26:41
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:01
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:03
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:21
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 247 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:28
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:37
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:39
Note:

A HOT side Cabinent Kilowatts **CompID:**
PointID: CAM009 **Value:** 6 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:43
Note:

A HOT side Cabinent Firing Angle **CompID:**
PointID: CAM010 **Value:** 80 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:47
Note:

B HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM011 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:51
Note:

B HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM012 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:52
Note:

B HOT side Cabinent Primary Amps **CompID:**
PointID: CAM013 **Value:** 121 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:54
Note:

B HOT side Cabinent Primary Volts **CompID:**
PointID: CAM014 **Value:** 332 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:27:58
Note:

B HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM015 **Value:** 1.26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:05
Note:

B HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM016 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:07
Note:

B HOT side Cabinent Kilowatts **CompID:**
PointID: CAM017 **Value:** 36 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:08
Note:

B HOT side Cabinent Firing Angle **CompID:**
PointID: CAM018 **Value:** 120 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:09
Note:

C HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM019 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:12
Note:

C HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM020 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:13

Note:

C HOT side Cabinent Primary Amps **CompID:**

PointID: CAM021 **Value:** 108 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:15

Note:

C HOT side Cabinent Primary Volts **CompID:**

PointID: CAM022 **Value:** 290 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:16

Note:

C HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM023 **Value:** 0.92 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:18

Note:

C HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM024 **Value:** 26 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:20

Note:

C HOT side Cabinent Kilowatts **CompID:**

PointID: CAM025 **Value:** 28 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:21

Note:

C HOT side Cabinent Firing Angle **CompID:**

PointID: CAM026 **Value:** 130 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:22

Note:

D HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM027 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:25

Note:

D HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM028 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:27

Note:

D HOT side Cabinent Primary Amps **CompID:**

PointID: CAM029 **Value:** 116 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:28

Note:

D HOT side Cabinent Primary Volts **CompID:**

PointID: CAM030 **Value:** 328 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:28:33

Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:34
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:36
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:38
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:39
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 10 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:43
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:45
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 60 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:48
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 328 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:53
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.48 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:28:56
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:29:00
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 15 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:29:03
Note:

A COLD side Cabinent Primary Amps CompID:
PointID: CAM053 Value: 44 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:22
Note:

A COLD side Cabinent Primary Volts CompID:
PointID: CAM054 Value: 460 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:23
Note:

A COLD side Cabinent Secondary Amps CompID:
PointID: CAM055 Value: 0.34 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:29
Note:

A COLD side Cabinent Secondary Volts CompID:
PointID: CAM056 Value: 39 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:31
Note:

A COLD side Cabinent Kilowatts CompID:
PointID: CAM057 Value: 18 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:32
Note:

A COLD side Cabinent Firing Angle CompID:
PointID: CAM058 Value: 150 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:34
Note:

B COLD side Cabinent Sparks per Minute CompID:
PointID: CAM059 Value: 0 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:36
Note:

B COLD side Cabinent Arcs per Minute CompID:
PointID: CAM060 Value: 0 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:37
Note:

B COLD side Cabinent Primary Amps CompID:
PointID: CAM061 Value: 70 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:39
Note:

B COLD side Cabinent Primary Volts CompID:
PointID: CAM062 Value: 346 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:43
Note:

B COLD side Cabinent Secondary Amps CompID:
PointID: CAM063 Value: 0.46 InAlarm? :
Gathered By: tsboyd Date: 12/17/2002 11:32:46
Note:

B COLD side Cabinent Secondary Volts **CompID:**

PointID: CAM064 **Value:** 34 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:47

Note:

B COLD side Cabinent Kilowatts **CompID:**

PointID: CAM065 **Value:** 20 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:49

Note:

B COLD side Cabinent Firing Angle **CompID:**

PointID: CAM066 **Value:** 115 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:50

Note:

C COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM067 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:52

Note:

C COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM068 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:53

Note:

C COLD side Cabinent Primary Amps **CompID:**

PointID: CAM069 **Value:** 72 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:56

Note:

C COLD side Cabinent Primary Volts **CompID:**

PointID: CAM070 **Value:** 322 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:58

Note:

C COLD side Cabinent Secondary Amps **CompID:**

PointID: CAM071 **Value:** 0.66 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:32:59

Note:

C COLD side Cabinent Secondary Volts **CompID:**

PointID: CAM072 **Value:** 33 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:33:00

Note:

C COLD side Cabinent Kilowatts **CompID:**

PointID: CAM073 **Value:** 3 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:33:02

Note:

C COLD side Cabinent Firing Angle **CompID:**

PointID: CAM074 **Value:** 160 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 11:33:03

Note:

Round Data

12/17/02

Unit **CompID:**
PointID: CAM002 **Value:** Unit4 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:34:55
Note:

TEST MODE **CompID:**
PointID: CAM076 **Value:** BioMass Coal Baseline **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:34:57
Note:

Run # **CompID:**
PointID: CAM075 **Value:** RUN-3 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:34:59
Note:

Reading **CompID:**
PointID: CAM078 **Value:** 60 (Run End) **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:35:03
Note:

Test Notes **CompID:**
PointID: CAM001 **Value:** round **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 11:35:06
Note:

A HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM003 **Value:** 25 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:33:37
Note:

A HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM004 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:33:38
Note:

A HOT side Cabinent Primary Amps **CompID:**
PointID: CAM005 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:33:44
Note:

A HOT side Cabinent Primary Volts **CompID:**
PointID: CAM006 **Value:** 247 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:33:46
Note:

A HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM007 **Value:** 0.14 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:33:51
Note:

A HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM008 **Value:** 32 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:33:54
Note:

A HOT side Cabinent Kilowatts **CompID:**

PointID: CAM009 **Value:** 6 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:33:56

Note:

A HOT side Cabinent Firing Angle **CompID:**

PointID: CAM010 **Value:** 80 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:33:57

Note:

B HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM011 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:00

Note:

B HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM012 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:02

Note:

B HOT side Cabinent Primary Amps **CompID:**

PointID: CAM013 **Value:** 121 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:03

Note:

B HOT side Cabinent Primary Volts **CompID:**

PointID: CAM014 **Value:** 332 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:05

Note:

B HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM015 **Value:** 128 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:12

Note:

B HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM016 **Value:** 32 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:14

Note:

B HOT side Cabinent Kilowatts **CompID:**

PointID: CAM017 **Value:** 36 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:16

Note:

B HOT side Cabinent Firing Angle **CompID:**

PointID: CAM018 **Value:** 120 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:17

Note:

C HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM019 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:34:20

Note:

C HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM020 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:21
Note:

C HOT side Cabinent Primary Amps **CompID:**

PointID: CAM021 **Value:** 108 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:22
Note:

C HOT side Cabinent Primary Volts **CompID:**

PointID: CAM022 **Value:** 290 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:24
Note:

C HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM023 **Value:** 0.92 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:26
Note:

C HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM024 **Value:** 26 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:27
Note:

C HOT side Cabinent Kilowatts **CompID:**

PointID: CAM025 **Value:** 28 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:30
Note:

C HOT side Cabinent Firing Angle **CompID:**

PointID: CAM026 **Value:** 130 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:31
Note:

D HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM027 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:33
Note:

D HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM028 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:34
Note:

D HOT side Cabinent Primary Amps **CompID:**

PointID: CAM029 **Value:** 116 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:36
Note:

D HOT side Cabinent Primary Volts **CompID:**

PointID: CAM030 **Value:** 328 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:37
Note:

D HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM031 **Value:** 0.89 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:39
Note:

D HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM032 **Value:** 29 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:41
Note:

D HOT side Cabinent Kilowatts **CompID:**
PointID: CAM033 **Value:** 35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:42
Note:

D HOT side Cabinent Firing Angle **CompID:**
PointID: CAM034 **Value:** 140 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:44
Note:

E HOT side Cabinent Sparks per Minute **CompID:**
PointID: CAM035 **Value:** 10 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:47
Note:

E HOT side Cabinent Arcs per Minute **CompID:**
PointID: CAM036 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:48
Note:

E HOT side Cabinent Primary Amps **CompID:**
PointID: CAM037 **Value:** 61 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:54
Note:

E HOT side Cabinent Primary Volts **CompID:**
PointID: CAM038 **Value:** 348 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:34:59
Note:

E HOT side Cabinent Secondary Amps **CompID:**
PointID: CAM039 **Value:** 0.39 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:35:04
Note:

E HOT side Cabinent Secondary Volts **CompID:**
PointID: CAM040 **Value:** 27 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:35:08
Note:

E HOT side Cabinent Kilowatts **CompID:**
PointID: CAM041 **Value:** 19 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:35:15
Note:

E HOT side Cabinent Firing Angle **CompID:**

PointID: CAM042 **Value:** 129 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:18

Note:

F HOT side Cabinent Sparks per Minute **CompID:**

PointID: CAM043 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:21

Note:

F HOT side Cabinent Arcs per Minute **CompID:**

PointID: CAM044 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:22

Note:

F HOT side Cabinent Primary Amps **CompID:**

PointID: CAM045 **Value:** 98 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:24

Note:

F HOT side Cabinent Primary Volts **CompID:**

PointID: CAM046 **Value:** 364 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:27

Note:

F HOT side Cabinent Secondary Amps **CompID:**

PointID: CAM047 **Value:** 0.94 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:30

Note:

F HOT side Cabinent Secondary Volts **CompID:**

PointID: CAM048 **Value:** 25 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:31

Note:

F HOT side Cabinent Kilowatts **CompID:**

PointID: CAM049 **Value:** 32 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:32

Note:

F HOT side Cabinent Firing Angle **CompID:**

PointID: CAM050 **Value:** 140 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:35:35

Note:

A COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM051 **Value:** 5 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:07

Note:

A COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM052 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:09

Note:

A COLD side Cabinent Primary Amps **CompID:**
PointID: CAM053 **Value:** 30 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:12
Note:

A COLD side Cabinent Primary Volts **CompID:**
PointID: CAM054 **Value:** 445 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:17
Note:

A COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM055 **Value:** 0.35 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:22
Note:

A COLD side Cabinent Secondary Volts **CompID:**
PointID: CAM056 **Value:** 38 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:26
Note:

A COLD side Cabinent Kilowatts **CompID:**
PointID: CAM057 **Value:** 18 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:29
Note:

A COLD side Cabinent Firing Angle **CompID:**
PointID: CAM058 **Value:** 150 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:33
Note:

B COLD side Cabinent Sparks per Minute **CompID:**
PointID: CAM059 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:36
Note:

B COLD side Cabinent Arcs per Minute **CompID:**
PointID: CAM060 **Value:** 0 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:37
Note:

B COLD side Cabinent Primary Amps **CompID:**
PointID: CAM061 **Value:** 70 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:38
Note:

B COLD side Cabinent Primary Volts **CompID:**
PointID: CAM062 **Value:** 346 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:40
Note:

B COLD side Cabinent Secondary Amps **CompID:**
PointID: CAM063 **Value:** 0.46 **InAlarm? :**
Gathered By: tsboyd **Date:** 12/17/2002 12:38:42
Note:

B COLD side Cabinent Secondary Volts **CompID:**

PointID: CAM064 **Value:** 34 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:43

Note:

B COLD side Cabinent Kilowatts **CompID:**

PointID: CAM065 **Value:** 20 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:45

Note:

B COLD side Cabinent Firing Angle **CompID:**

PointID: CAM066 **Value:** 115 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:46

Note:

C COLD side Cabinent Sparks per Minute **CompID:**

PointID: CAM067 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:48

Note:

C COLD side Cabinent Arcs per Minute **CompID:**

PointID: CAM068 **Value:** 0 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:49

Note:

C COLD side Cabinent Primary Amps **CompID:**

PointID: CAM069 **Value:** 72 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:51

Note:

C COLD side Cabinent Primary Volts **CompID:**

PointID: CAM070 **Value:** 319 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:38:54

Note:

C COLD side Cabinent Secondary Amps **CompID:**

PointID: CAM071 **Value:** 0.65 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:39:00

Note:

C COLD side Cabinent Secondary Volts **CompID:**

PointID: CAM072 **Value:** 33 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:39:02

Note:

C COLD side Cabinent Kilowatts **CompID:**

PointID: CAM073 **Value:** 3 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:39:03

Note:

C COLD side Cabinent Firing Angle **CompID:**

PointID: CAM074 **Value:** 160 **InAlarm? :**

Gathered By: tsboyd **Date:** 12/17/2002 12:39:04

Note:

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.28	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13666	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.29	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.91	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.71	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.57	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.08	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.64	% By Weight
Fluorine, Dry Basis	ASTM D 5987	36	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.24	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.51	% By Weight
Ash, As Received	ASTM D 5142	6.44	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12093	Btu/lb
Carbon, As Received	ASTM D 5373	68.39	% By Weight
Hydrogen, As Received	ASTM D 5373	4.34	% By Weight
Nitrogen, As Received	ASTM D 5373	1.51	% By Weight
Oxygen, As Received	ASTM D 3176	6.70	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.28	% By Weight
Volatiles, As Received	ASTM D 5142	29.77	% By Weight
Fluorine, As Received	ASTM D 5987	32	mg/kg
Sulfur, As Received	ASTM D 4239	1.10	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ **Date :** 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.78	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.55	% By Weight
Barium, Ignited Basis	ASTM D 3683	527.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.48	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.68	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.16	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.80	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.91	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.14	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.15	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.17	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.13	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.37	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.30	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.92	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.27	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14739	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ **Date :** 1/13/03

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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.907	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ________________________ **Supervision**______________________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP

Description : Gulf Power - Plant Crist

Received Date : 23-Dec-02

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.42	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8918	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.10	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.20	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.05	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.21	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.72	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.86	% By Weight
Fluorine, Dry Basis	ASTM D 5987	7	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	9.29	% By Weight
Ash, As Received	ASTM D 5142	0.38	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8090	Btu/lb
Carbon, As Received	ASTM D 5373	47.26	% By Weight
Hydrogen, As Received	ASTM D 5373	5.62	% By Weight
Nitrogen, As Received	ASTM D 5373	0.05	% By Weight
Oxygen, As Received	ASTM D 3176	37.38	% By Weight
Carbon Fixed, As Received	ASTM D 3172	16.98	% By Weight
Volatiles, As Received	ASTM D 5142	73.35	% By Weight
Fluorine, As Received	ASTM D 5987	6	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ **Date :** 1/13/03

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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	0.84	% By Weight
Barium, Ignited Basis	ASTM D 3683	1056.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	19.89	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.72	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	5.31	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.93	% By Weight
Potassium, Ignited Basis	ASTM D 3682	13.92	% By Weight
Silicon, Ignited Basis	ASTM D 3682	8.20	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	8.18	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.05	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.59	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	27.83	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	8.81	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	4.42	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	16.77	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	17.54	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	20.45	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8956	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ________________ **Supervision**____________________ Date : 1/13/03

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.022	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ____________________________ **Date :** 1/13/03

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General Test Laboratory
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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.45	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8821	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.08	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.23	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.10	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.12	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.76	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.79	% By Weight
Fluorine, Dry Basis	ASTM D 5987	12	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	7.41	% By Weight
Ash, As Received	ASTM D 5142	0.42	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8167	Btu/lb
Carbon, As Received	ASTM D 5373	48.22	% By Weight
Hydrogen, As Received	ASTM D 5373	5.77	% By Weight
Nitrogen, As Received	ASTM D 5373	0.09	% By Weight
Oxygen, As Received	ASTM D 3176	38.07	% By Weight
Carbon Fixed, As Received	ASTM D 3172	17.37	% By Weight
Volatiles, As Received	ASTM D 5142	74.80	% By Weight
Fluorine, As Received	ASTM D 5987	11	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ___________________________ **Date :** 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	0.81	% By Weight
Barium, Ignited Basis	ASTM D 3683	1422.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	30.57	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.40	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	7.40	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.79	% By Weight
Potassium, Ignited Basis	ASTM D 3682	21.61	% By Weight
Silicon, Ignited Basis	ASTM D 3682	1.89	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	3.81	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.00	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.53	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	42.77	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	12.27	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	1.81	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	26.03	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	4.04	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	9.52	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.00	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8861	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ **Date :** 1/13/03

emk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.023	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.58	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8620	Btu/lb
Carbon, Dry Basis	ASTM D 5373	51.12	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.13	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.08	% By Weight
Oxygen, Dry Basis	ASTM D 3176	42.07	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.78	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.64	% By Weight
Fluorine, Dry Basis	ASTM D 5987	10	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
As Received			
Moisture, Total	ASTM D 2013	10.45	% By Weight
Ash, As Received	ASTM D 5142	0.52	% By Weight
Heat of Combustion, As Received	ASTM D 5865	7719	Btu/lb
Carbon, As Received	ASTM D 5373	45.78	% By Weight
Hydrogen, As Received	ASTM D 5373	5.49	% By Weight
Nitrogen, As Received	ASTM D 5373	0.07	% By Weight
Oxygen, As Received	ASTM D 3176	37.67	% By Weight
Carbon Fixed, As Received	ASTM D 3172	16.82	% By Weight
Volatiles, As Received	ASTM D 5142	72.21	% By Weight
Fluorine, As Received	ASTM D 5987	9	mg/kg
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	0.91	% By Weight
Calcium, Ignited Basis	ASTM D 3682	30.07	% By Weight
Barium, Ignited Basis	ASTM D 3683	848.	mg/kg
Iron, Ignited Basis	ASTM D 3682	0.40	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	7.97	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	21.80	% By Weight
Silicon, Ignited Basis	ASTM D 3682	2.18	% By Weight
Sodium, Ignited Basis	ASTM D 3682	3.26	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.74	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.02	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.72	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	42.07	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	13.22	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	26.26	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	4.66	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	4.39	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	6.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.03	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8670	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.023	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ **Date :** 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.93	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13343	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.04	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.98	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.61	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.27	% By Weight
Carbon Fixed, Dry	ASTM D 3172	56.54	% By Weight
Volatiles, Dry Basis	ASTM D 5142	36.53	% By Weight
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.17	% By Weight
As Received			
Moisture, Total	ASTM D 2013	11.43	% By Weight
Ash, As Received	ASTM D 5142	6.14	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11818	Btu/lb
Carbon, As Received	ASTM D 5373	66.46	% By Weight
Hydrogen, As Received	ASTM D 5373	4.41	% By Weight
Nitrogen, As Received	ASTM D 5373	1.43	% By Weight
Oxygen, As Received	ASTM D 3176	9.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	50.08	% By Weight
Volatiles, As Received	ASTM D 5142	32.35	% By Weight
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.87	% By Weight
Barium, Ignited Basis	ASTM D 3683	441.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.58	% By Weight
Iron, Ignited Basis	ASTM D 3682	8.66	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.07	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.20	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.24	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.73	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.32	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.21	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.38	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.77	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.13	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.10	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14337	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision____________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.877	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.49	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13220	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.73	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.10	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.55	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.02	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.56	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.95	% By Weight
Fluorine, Dry Basis	ASTM D 5987	24	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.11	% By Weight
As Received			
Moisture, Total	ASTM D 2013	14.30	% By Weight
Ash, As Received	ASTM D 5142	5.56	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11330	Btu/lb
Carbon, As Received	ASTM D 5373	64.04	% By Weight
Hydrogen, As Received	ASTM D 5373	4.37	% By Weight
Nitrogen, As Received	ASTM D 5373	1.33	% By Weight
Oxygen, As Received	ASTM D 3176	9.44	% By Weight
Carbon Fixed, As Received	ASTM D 3172	47.61	% By Weight
Volatiles, As Received	ASTM D 5142	32.52	% By Weight
Fluorine, As Received	ASTM D 5987	21	mg/kg
Sulfur, As Received	ASTM D 4239	0.95	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : *Gulf Power - Plant Crist*

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.41	% By Weight
Barium, Ignited Basis	ASTM D 3683	532.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.94	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.47	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.70	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.93	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.46	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.95	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.45	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.73	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.45	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.71	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.54	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.16	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.19	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.63	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14138	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.840	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ Supervision ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.62	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13487	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.18	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.89	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.66	% By Weight
Oxygen, Dry Basis	ASTM D 3176	9.46	% By Weight
Carbon Fixed, Dry	ASTM D 3172	57.29	% By Weight
Volatiles, Dry Basis	ASTM D 5142	36.09	% By Weight
Fluorine, Dry Basis	ASTM D 5987	44	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.19	% By Weight
As Received			
Moisture, Total	ASTM D 2013	14.39	% By Weight
Ash, As Received	ASTM D 5142	5.67	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Carbon, As Received	ASTM D 5373	65.22	% By Weight
Hydrogen, As Received	ASTM D 5373	4.19	% By Weight
Nitrogen, As Received	ASTM D 5373	1.42	% By Weight
Oxygen, As Received	ASTM D 3176	8.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.05	% By Weight
Volatiles, As Received	ASTM D 5142	30.90	% By Weight
Fluorine, As Received	ASTM D 5987	38	mg/kg
Sulfur, As Received	ASTM D 4239	1.02	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	443.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.64	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.15	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.86	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.27	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.75	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.94	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.29	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.08	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.48	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.05	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.17	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.25	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14443	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ **Date :** 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.882	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 16-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.33	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13513	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.04	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.99	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.67	% By Weight
Oxygen, Dry Basis	ASTM D 3176	8.75	% By Weight
Carbon Fixed, Dry	ASTM D 3172	57.48	% By Weight
Volatiles, Dry Basis	ASTM D 5142	35.19	% By Weight
Fluorine, Dry Basis	ASTM D 5987	PENDING	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.22	% By Weight
As Received			
Moisture, Total	ASTM D 2013	12.28	% By Weight
Ash, As Received	ASTM D 5142	6.43	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11854	Btu/lb
Carbon, As Received	ASTM D 5373	66.70	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.46	% By Weight
Oxygen, As Received	ASTM D 3176	7.68	% By Weight
Carbon Fixed, As Received	ASTM D 3172	50.42	% By Weight
Volatiles, As Received	ASTM D 5142	30.87	% By Weight
Fluorine, As Received	ASTM D 5987	PENDING	mg/kg
Sulfur, As Received	ASTM D 4239	1.07	% By Weight
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.56	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	544.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.16	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.67	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.16	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.85	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.10	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.96	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.21	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.71	% By Weight
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.73	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.10	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.11	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.37	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.23	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.56	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.29	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.03	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.18	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14582	Btu/lb

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 1/13/03

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Sulfur, lbs/mmBTU	ASTM D 3180	0.903	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ________________________ **Supervision**________________________ Date : 1/13/03

smk/coa

CRIST BIOMASS TESTING - PHASE I & II TEST RESULTS

Parameter	Units	AG39377	AG39378	AG39379	AG39610	AG39611	AG39612	AG39613	AG39614	AG39615	AG39741	AG39742	AG39743	AG39744	AG39745	AG39746	AG39747	AG39748	AG39749
Sample Name		Coal BL R1	Coal BL R2	Coal BL R3	Manual #4 New Side Hopper	Swift 2:40 PM	Referee Gulf 3:00PM	Swift 9:50	Mobile Forr Prod Trk55	Sawdust 4:20	Unit 4 Carb Fuel	Unit 4 Run1 4D Mill	Unit 4 Run2 4D Mill	Unit 3 Run 3 4D Mill	Composite Coal S#1	Composite Coal S#2	Unit 4 Run1-10%	Unit 4 Run 2-10%	Unit 4 Run 3-10%
Date Sampled		12/17/2002	12/17/2002	12/17/2002	12/18/2002	12/17/2002	12/17/2002	12/18/2002	12/18/2002	12/19/2002	12/18/2002	12/18/2002	12/18/2003	12/18/2002	12/19/2003	12/19/2002	12/19/2002	12/19/2003	12/19/2002
As Received																			
Moisture	% by wt	12.36	12.21	12.32	11.51	8.51	7.62	9.29	7.41	10.45	11.43	14.3	14.39	12.28	11.38	11.61	11.16	11.45	11.96
Ash, As Received	% by wt	6.08	6.22	6.04	6.44	0.47	0.4	0.38	0.42	0.52	6.14	5.56	5.67	6.43	6.4	6.73	5.89	5.96	5.97
Heat of Combustion	Btu/lb	11974	12001	11981	12093	8166	8276	8090	8167	7719	11818	11330	11546	11854	12131	12009	11810	11751	11676
Nitrogen	% by wt	1.52	1.56	1.55	1.51	0.07	0.06	0.05	0.09	0.07	1.43	1.33	1.42	1.46	1.53	1.5	1.43	1.42	1.41
Fluorine	% by wt	35	20	25	32	9	8	6	11	9	19	21	38	37	35	31	29	29	32
Sulfur	% by wt	1	1.04	1.06	1.1	0.02	0.02	0.02	0.02	0.02	1.04	0.95	1.02	1.07	1.11	1.18	1.04	1.04	1.07
Lead, As Received	mg/kg	23.7	21.8	21.3	26.7	0.2	0.1	0.1	0.1	0.3	19.8	20.7	19.8	27.2	28.1	28.5	29.3	32.1	27.8
Mercury, As Received	mg/kg	0.083	0.092	0.092	0.102	0.01	0.01	0.01	0.01	0.01	0.103	0.089	0.099	0.111	0.112	0.103	0.112	0.102	0.103

Parameter	Units	AH05116	AH05117	AH05118	AH05249	AH05250	AH05270	AH05721	AH05722	AH05723	AH05724	AH05725	AH05726	AH05727	AH05566	AH13531	AH13532	AH13533
Sample Name		Scale Composite Run 1	Scale Composite Run 2	Scale Composite Run 3	Raw Coal	Raw Coal	Sawdust Mix	Scale Composite Run 1	Scale Composite Run 2	Scale Composite Run 3	Raw Coal Barge Drummond	Scale Composite Run #1	Scale Composite Run #2	Scale Composite Run #3	Sawdust Composite	Drummond Coal Bsline Run 1	Drummond Coal Bsline Run 2	Drummond Coal Bsline Run 3
Date Sampled		2/18/2003	2/18/2003	2/18/2003	2/18/2003	2/19/2003	2/19/2003	2/20/2003	2/20/2003	2/20/2003	2/21/2003	2/21/2003	2/21/2003	2/21/2003	2/24/2003	5/5/2003	5/5/2003	5/5/2003
As Received																		
Moisture	% by wt	13.13	12.74	12.47	9.37	8.79	12.22	12.47	12.56	12.91	13.01	12.9	11.99	12.27	9.74	11.36	10.99	11.5
Ash, As Received	% by wt	5.04	5.22	5.64	3.52	4	4.39	4.46	4.11	4.4	5.18	4.22	4.08	4.75	0.25	4.92	3.93	3.62
Heat of Combustion	Btu/lb	11463	11809	11738	12198	12219	11596	11537	11548	11546	11470	11577	11620	11445	7829	11824	12008	11967
Nitrogen	% by wt	ND	ND	ND	ND	ND	ND	1.29	1.33	1.29	1.3	1.3	1.32	1.26	ND	ND	ND	ND
Fluorine	mg/kg	24	27	30	14	14	18	18	22	19	22	18	18	18	10	43	57	35
Sulfur	% by wt	0.46	0.87	0.88	0.43	0.4	0.42	0.47	0.5	0.48	0.57	0.51	0.48	0.4	0.03	0.54	0.51	0.54
Lead, As Received	mg/kg	3	15.8	16.6	1.5	1.6	1.8	3.2	3.3	3	2	3.8	3.7	1.9	0.1	2.8	1.9	1.9
Mercury, As Received	mg/kg	0.056	0.065	0.102	0.058	0.068	0.056	0.056	0.066	0.057	0.075	0.065	0.048	0.057	0.01	0.094	0.085	0.085

ND = Not Determined

Baselineemissionsdepreport.xls

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN1
Coal Baseline Run 1

Laboratory ID Number : AG39377

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.94	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13663	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.25	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.84	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.73	% By Weight
Oxygen, Dry Basis	ASTM D 3176	8.10	% By Weight
Carbon Fixed, Dry	ASTM D 3172	53.61	% By Weight
Volatiles, Dry Basis	ASTM D 5142	39.45	% By Weight
Fluorine, Dry Basis	ASTM D 5987	40	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.14	% By Weight
Lead, Dry Basis	ASTM D6357	27.0	mg/kg
Mercury, Dry	ASTM D6414	0.095	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.36	% By Weight
Ash, As Received	ASTM D 5142	6.08	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11974	Btu/lb
Carbon, As Received	ASTM D 5373	67.70	% By Weight
Hydrogen, As Received	ASTM D 5373	4.24	% By Weight
Nitrogen, As Received	ASTM D 5373	1.52	% By Weight
Oxygen, As Received	ASTM D 3176	7.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	46.98	% By Weight
Volatiles, As Received	ASTM D 5142	34.57	% By Weight
Fluorine, As Received	ASTM D 5987	35	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN1
Coal Baseline Run 1

Laboratory ID Number : AG39377

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.00	% By Weight
Lead, As Received	ASTM D6357	23.7	mg/kg
Mercury, As Received	ASTM D6414	0.083	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.00	% By Weight
Barium, Ignited Basis	ASTM D 3683	575.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.46	% By Weight
Iron, Ignited Basis	ASTM D 3682	8.55	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.97	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.41	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.77	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.15	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.78	% By Weight
Lead, Ignited Basis	ASTM D 6357	389.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.56	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.04	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.22	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	52.22	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02
Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN1
Coal Baseline Run 1

Laboratory ID Number : AG39377

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.04	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.88	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.30	% By Weight
Lead Oxide, Ignited	ASTM D 6357	447.5	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14682	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.834	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN2
Coal Baseline Run 2

Laboratory ID Number : AG39378

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.09	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13670	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.51	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.78	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.53	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.33	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.58	% By Weight
Fluorine, Dry Basis	ASTM D 5987	23	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.19	% By Weight
Lead, Dry Basis	ASTM D6357	24.8	mg/kg
Mercury, Dry	ASTM D6414	0.105	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.21	% By Weight
Ash, As Received	ASTM D 5142	6.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12001	Btu/lb
Carbon, As Received	ASTM D 5373	68.05	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.56	% By Weight
Oxygen, As Received	ASTM D 3176	6.61	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.09	% By Weight
Volatiles, As Received	ASTM D 5142	29.48	% By Weight
Fluorine, As Received	ASTM D 5987	20	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN2
Coal Baseline Run 2

Laboratory ID Number : AG39378

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Lead, As Received	ASTM D6357	21.8	mg/kg
Mercury, As Received	ASTM D6414	0.092	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.82	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.46	% By Weight
Barium, Ignited Basis	ASTM D 3683	402.	mg/kg
Iron, Ignited Basis	ASTM D 3682	8.75	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.49	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.07	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.77	% By Weight
Lead, Ignited Basis	ASTM D 6357	349.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.22	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.04	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.51	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	52.39	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02
Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN2
Coal Baseline Run 2

Laboratory ID Number : AG39378

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.02	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.67	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Lead Oxide, Ignited	ASTM D 6357	401.6	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14713	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.871	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN3
Coal Baseline Run 3

Laboratory ID Number : AG39379

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.89	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13665	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.83	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.77	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.40	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.32	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.79	% By Weight
Fluorine, Dry Basis	ASTM D 5987	29	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.21	% By Weight
Lead, Dry Basis	ASTM D6357	24.3	mg/kg
Mercury, Dry	ASTM D6414	0.105	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.32	% By Weight
Ash, As Received	ASTM D 5142	6.04	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11981	Btu/lb
Carbon, As Received	ASTM D 5373	68.24	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.55	% By Weight
Oxygen, As Received	ASTM D 3176	6.49	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.01	% By Weight
Volatiles, As Received	ASTM D 5142	29.63	% By Weight
Fluorine, As Received	ASTM D 5987	25	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN3
Coal Baseline Run 3

Laboratory ID Number : AG39379

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.06	% By Weight
Lead, As Received	ASTM D6357	21.3	mg/kg
Mercury, As Received	ASTM D6414	0.092	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.19	% By Weight
Barium, Ignited Basis	ASTM D 3683	410.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.66	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.00	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.83	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.82	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.10	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.76	% By Weight
Lead, Ignited Basis	ASTM D 6357	353.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.92	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.87	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.98	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 17-Dec-02

Laboratory Account : CRI04SP
Received Date : 19-Dec-02

Description : Gulf Power Plant Crist Unit 4
RUN3
Coal Baseline Run 3

Laboratory ID Number : AG39379

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.11	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.75	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.27	% By Weight
Lead Oxide, Ignited	ASTM D 6357	406.1	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14676	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.885	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.28	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13666	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.29	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.91	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.71	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.57	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.08	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.64	% By Weight
Fluorine, Dry Basis	ASTM D 5987	36	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.24	% By Weight
Lead, Dry Basis	ASTM D6357	30.2	mg/kg
Mercury, Dry	ASTM D6414	0.115	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.51	% By Weight
Ash, As Received	ASTM D 5142	6.44	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12093	Btu/lb
Carbon, As Received	ASTM D 5373	68.39	% By Weight
Hydrogen, As Received	ASTM D 5373	4.34	% By Weight
Nitrogen, As Received	ASTM D 5373	1.51	% By Weight
Oxygen, As Received	ASTM D 3176	6.70	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.28	% By Weight
Volatiles, As Received	ASTM D 5142	29.77	% By Weight
Fluorine, As Received	ASTM D 5987	32	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.10	% By Weight
Lead, As Received	ASTM D6357	26.7	mg/kg
Mercury, As Received	ASTM D6414	0.102	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.78	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.55	% By Weight
Barium, Ignited Basis	ASTM D 3683	527.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.48	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.68	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.16	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.80	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.91	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.14	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.76	% By Weight
Lead, Ignited Basis	ASTM D 6357	415.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.15	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.17	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.13	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.37	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.30	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.92	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Manual #4 New Side Hopper

Laboratory ID Number : AG39610

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.27	% By Weight
Lead Oxide, Ignited	ASTM D 6357	477.4	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14739	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.907	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ______________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Swift 2:40PM

Laboratory ID Number : AG39611

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.51	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8926	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.10	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.12	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.08	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.17	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.94	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.55	% By Weight
Fluorine, Dry Basis	ASTM D 5987	10	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
Lead, Dry Basis	ASTM D6357	0.2	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	8.51	% By Weight
Ash, As Received	ASTM D 5142	0.47	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8166	Btu/lb
Carbon, As Received	ASTM D 5373	47.67	% By Weight
Hydrogen, As Received	ASTM D 5373	5.60	% By Weight
Nitrogen, As Received	ASTM D 5373	0.07	% By Weight
Oxygen, As Received	ASTM D 3176	37.67	% By Weight
Carbon Fixed, As Received	ASTM D 3172	17.33	% By Weight
Volatiles, As Received	ASTM D 5142	73.70	% By Weight
Fluorine, As Received	ASTM D 5987	9	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Swift 2:40PM

Laboratory ID Number : AG39611

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Lead, As Received	ASTM D6357	0.2	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	1.22	% By Weight
Calcium, Ignited Basis	ASTM D 3682	19.55	% By Weight
Barium, Ignited Basis	ASTM D 3683	1290.	mg/kg
Iron, Ignited Basis	ASTM D 3682	1.06	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	5.42	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.90	% By Weight
Potassium, Ignited Basis	ASTM D 3682	14.45	% By Weight
Silicon, Ignited Basis	ASTM D 3682	9.69	% By Weight
Sodium, Ignited Basis	ASTM D 3682	1.06	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	6.27	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.07	% By Weight
Lead, Ignited Basis	ASTM D 6357	48.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	2.31	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	27.35	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.52	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	8.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	4.35	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	17.41	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	20.73	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 9/30/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Swift 2:40PM

Laboratory ID Number : AG39611

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.43	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	15.68	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.12	% By Weight
Lead Oxide, Ignited	ASTM D 6357	55.2	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	8972	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.022	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________ Date : 9/30/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Gulf 3:00PM

Laboratory ID Number : AG39612

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.43	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8959	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.16	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.27	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.07	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.05	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.89	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.68	% By Weight
Fluorine, Dry Basis	ASTM D 5987	9	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
Lead, Dry Basis	ASTM D6357	0.1	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	7.62	% By Weight
Ash, As Received	ASTM D 5142	0.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8276	Btu/lb
Carbon, As Received	ASTM D 5373	48.19	% By Weight
Hydrogen, As Received	ASTM D 5373	5.79	% By Weight
Nitrogen, As Received	ASTM D 5373	0.06	% By Weight
Oxygen, As Received	ASTM D 3176	37.92	% By Weight
Carbon Fixed, As Received	ASTM D 3172	17.45	% By Weight
Volatiles, As Received	ASTM D 5142	74.53	% By Weight
Fluorine, As Received	ASTM D 5987	8	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 9/30/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Gulf 3:00PM

Laboratory ID Number : AG39612

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Lead, As Received	ASTM D6357	0.1	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	2.91	% By Weight
Calcium, Ignited Basis	ASTM D 3682	23.19	% By Weight
Barium, Ignited Basis	ASTM D 3683	1188.	mg/kg
Iron, Ignited Basis	ASTM D 3682	0.32	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	5.58	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	2.41	% By Weight
Potassium, Ignited Basis	ASTM D 3682	16.97	% By Weight
Silicon, Ignited Basis	ASTM D 3682	1.62	% By Weight
Sodium, Ignited Basis	ASTM D 3682	1.44	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	8.30	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.00	% By Weight
Lead, Ignited Basis	ASTM D 6357	14.6	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	5.50	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	32.45	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.46	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	9.25	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	5.52	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	20.44	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	3.47	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 17-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Referee - Gulf 3:00PM

Laboratory ID Number : AG39612

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.94	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	20.75	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.00	% By Weight
Lead Oxide, Ignited	ASTM D 6357	16.8	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	8998	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.022	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.42	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8918	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.10	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.20	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.05	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.21	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.72	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.86	% By Weight
Fluorine, Dry Basis	ASTM D 5987	7	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
Lead, Dry Basis	ASTM D6357	0.1	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	9.29	% By Weight
Ash, As Received	ASTM D 5142	0.38	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8090	Btu/lb
Carbon, As Received	ASTM D 5373	47.26	% By Weight
Hydrogen, As Received	ASTM D 5373	5.62	% By Weight
Nitrogen, As Received	ASTM D 5373	0.05	% By Weight
Oxygen, As Received	ASTM D 3176	37.38	% By Weight
Carbon Fixed, As Received	ASTM D 3172	16.98	% By Weight
Volatiles, As Received	ASTM D 5142	73.35	% By Weight
Fluorine, As Received	ASTM D 5987	6	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Lead, As Received	ASTM D6357	0.1	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	0.84	% By Weight
Calcium, Ignited Basis	ASTM D 3682	19.89	% By Weight
Barium, Ignited Basis	ASTM D 3683	1056.	mg/kg
Iron, Ignited Basis	ASTM D 3682	0.72	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	5.31	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.93	% By Weight
Potassium, Ignited Basis	ASTM D 3682	13.92	% By Weight
Silicon, Ignited Basis	ASTM D 3682	8.20	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	8.18	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.05	% By Weight
Lead, Ignited Basis	ASTM D 6357	17.6	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.59	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	27.83	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	8.81	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	4.42	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	16.77	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	17.54	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Swift 9:50

Laboratory ID Number : AG39613

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	20.45	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.08	% By Weight
Lead Oxide, Ignited	ASTM D 6357	20.2	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	8956	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.022	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.45	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8821	Btu/lb
Carbon, Dry Basis	ASTM D 5373	52.08	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.23	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.10	% By Weight
Oxygen, Dry Basis	ASTM D 3176	41.12	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.76	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.79	% By Weight
Fluorine, Dry Basis	ASTM D 5987	12	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
Lead, Dry Basis	ASTM D6357	0.1	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	7.41	% By Weight
Ash, As Received	ASTM D 5142	0.42	% By Weight
Heat of Combustion, As Received	ASTM D 5865	8167	Btu/lb
Carbon, As Received	ASTM D 5373	48.22	% By Weight
Hydrogen, As Received	ASTM D 5373	5.77	% By Weight
Nitrogen, As Received	ASTM D 5373	0.09	% By Weight
Oxygen, As Received	ASTM D 3176	38.07	% By Weight
Carbon Fixed, As Received	ASTM D 3172	17.37	% By Weight
Volatiles, As Received	ASTM D 5142	74.80	% By Weight
Fluorine, As Received	ASTM D 5987	11	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 3/13/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Lead, As Received	ASTM D6357	0.1	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	0.83	% By Weight
Barium, Ignited Basis	ASTM D 3683	1447.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	27.57	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.32	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	6.78	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.49	% By Weight
Potassium, Ignited Basis	ASTM D 3682	17.50	% By Weight
Silicon, Ignited Basis	ASTM D 3682	1.69	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	3.09	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.00	% By Weight
Lead, Ignited Basis	ASTM D 6357	22.3	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.57	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	38.58	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.46	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	11.24	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	1.12	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	21.08	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	3.62	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ________________________ Date : 3/13/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Mobile Forest Prd-BiomassTrk55

Laboratory ID Number : AG39614

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.02	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	7.72	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.00	% By Weight
Barium Oxide, Ignited	ASTM D 3683	1615.6	mg/kg
Lead Oxide, Ignited	ASTM D 6357	25.6	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	8861	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.023	lbs/mmBTU
General			
Chromium Oxide (Cr_2O_3)	APCO 7055	3.34	per cent
Manganese Oxide (MnO)	APCO 7055	6.18	per cent
Copper Oxide (CuO)	APCO 7055	1.84	per cent
Zinc Oxide (ZnO)	APCO 7055	0.43	per cent
Arsenic Trioxide (As_2O_3)		1.37	per cent
Lead Oxide (PbO)		0.58	per cent

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**______________________________ Date : 3/13/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20
Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.58	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8620	Btu/lb
Carbon, Dry Basis	ASTM D 5373	51.12	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	6.13	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	0.08	% By Weight
Oxygen, Dry Basis	ASTM D 3176	42.07	% By Weight
Carbon Fixed, Dry	ASTM D 3172	18.78	% By Weight
Volatiles, Dry Basis	ASTM D 5142	80.64	% By Weight
Fluorine, Dry Basis	ASTM D 5987	10	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.02	% By Weight
Lead, Dry Basis	ASTM D6357	0.3	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	10.45	% By Weight
Ash, As Received	ASTM D 5142	0.52	% By Weight
Heat of Combustion, As Received	ASTM D 5865	7719	Btu/lb
Carbon, As Received	ASTM D 5373	45.78	% By Weight
Hydrogen, As Received	ASTM D 5373	5.49	% By Weight
Nitrogen, As Received	ASTM D 5373	0.07	% By Weight
Oxygen, As Received	ASTM D 3176	37.67	% By Weight
Carbon Fixed, As Received	ASTM D 3172	16.82	% By Weight
Volatiles, As Received	ASTM D 5142	72.21	% By Weight
Fluorine, As Received	ASTM D 5987	9	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**__________________________ Date : 3/13/2003

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	0.02	% By Weight
Lead, As Received	ASTM D6357	0.3	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	0.53	% By Weight
Barium, Ignited Basis	ASTM D 3683	912.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	16.85	% By Weight
Iron, Ignited Basis	ASTM D 3682	0.26	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	4.53	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	12.49	% By Weight
Silicon, Ignited Basis	ASTM D 3682	1.29	% By Weight
Sodium, Ignited Basis	ASTM D 3682	1.81	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.37	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.01	% By Weight
Lead, Ignited Basis	ASTM D 6357	50.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	1.00	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	23.58	% By Weight
Iron Oxide, Ignited	ASTM D 3682	0.37	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	7.51	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	15.05	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	2.76	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision** ____________________ Date : 3/13/2003

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 23-Dec-02

Description : Gulf Power - Plant Crist

Sawdust 4:20

Laboratory ID Number : AG39615

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	*ASTM D 3682*	2.44	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.93	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.02	% By Weight
Barium Oxide, Ignited	ASTM D 3683	1018.2	mg/kg
Lead Oxide, Ignited	ASTM D 6357	57.7	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	8670	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.023	lbs/mmBTU
General			
Chromium Oxide (Cr_2O_3)	APCO 7055	18.21	per cent
Manganese Oxide (MnO)	APCO 7055	3.71	per cent
Copper Oxide (CuO)	APCO 7055	7.63	per cent
Zinc Oxide (ZnO)	APCO 7055	0.35	per cent
Arsenic Trioxide (As_2O_3)		10.36	per cent
Lead Oxide (PbO)		0.14	per cent

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 3/13/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.93	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13343	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.04	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.98	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.61	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.27	% By Weight
Carbon Fixed, Dry	ASTM D 3172	56.54	% By Weight
Volatiles, Dry Basis	ASTM D 5142	36.53	% By Weight
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.17	% By Weight
Lead, Dry Basis	ASTM D6357	22.3	mg/kg
Mercury, Dry	ASTM D6414	0.116	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.43	% By Weight
Ash, As Received	ASTM D 5142	6.14	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11818	Btu/lb
Carbon, As Received	ASTM D 5373	66.46	% By Weight
Hydrogen, As Received	ASTM D 5373	4.41	% By Weight
Nitrogen, As Received	ASTM D 5373	1.43	% By Weight
Oxygen, As Received	ASTM D 3176	9.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	50.08	% By Weight
Volatiles, As Received	ASTM D 5142	32.35	% By Weight
Fluorine, As Received	ASTM D 5987	19	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**____________________________ Date : 3/11/2003

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Lead, As Received	ASTM D6357	19.8	mg/kg
Mercury, As Received	ASTM D6414	0.103	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.87	% By Weight
Barium, Ignited Basis	ASTM D 3683	441.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.58	% By Weight
Iron, Ignited Basis	ASTM D 3682	8.66	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.07	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.20	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.24	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.73	% By Weight
Lead, Ignited Basis	ASTM D 6357	321.7	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.32	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.21	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.38	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.77	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**____________________ Date : 3/11/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP

Description : Gulf Power - Plant Crist

Received Date : 26-Dec-02

Unit 4 Carbonaceous Fuel

Laboratory ID Number : AG39741

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.13	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.10	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
Lead Oxide, Ignited	ASTM D 6357	370.0	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14337	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.877	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**____________________________ Date : 3/11/2003

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.49	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13220	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.73	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.10	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.55	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.02	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.56	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.95	% By Weight
Fluorine, Dry Basis	ASTM D 5987	24	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.11	% By Weight
Lead, Dry Basis	ASTM D6357	24.1	mg/kg
Mercury, Dry	ASTM D6414	0.104	mg/kg
As Received			
Moisture, Total	ASTM D 2013	14.30	% By Weight
Ash, As Received	ASTM D 5142	5.56	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11330	Btu/lb
Carbon, As Received	ASTM D 5373	64.04	% By Weight
Hydrogen, As Received	ASTM D 5373	4.37	% By Weight
Nitrogen, As Received	ASTM D 5373	1.33	% By Weight
Oxygen, As Received	ASTM D 3176	9.44	% By Weight
Carbon Fixed, As Received	ASTM D 3172	47.61	% By Weight
Volatiles, As Received	ASTM D 5142	32.52	% By Weight
Fluorine, As Received	ASTM D 5987	21	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision** ______________________ Date : 3/11/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	0.95	% By Weight
Lead, As Received	ASTM D6357	20.7	mg/kg
Mercury, As Received	ASTM D6414	0.089	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.41	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.94	% By Weight
Barium, Ignited Basis	ASTM D 3683	532.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.47	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.70	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.93	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.46	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.95	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.45	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.73	% By Weight
Lead, Ignited Basis	ASTM D 6357	371.3	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.45	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.71	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.54	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.16	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.19	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

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Quality Control ____________________ **Supervision**________________________ Date : 3/11/2003

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 4D Mill

Laboratory ID Number : AG39742

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.63	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
Lead Oxide, Ignited	ASTM D 6357	427.0	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14138	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.840	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**___________________________ Date : 3/11/2003

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.62	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13487	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.18	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.89	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.66	% By Weight
Oxygen, Dry Basis	ASTM D 3176	9.46	% By Weight
Carbon Fixed, Dry	ASTM D 3172	57.29	% By Weight
Volatiles, Dry Basis	ASTM D 5142	36.09	% By Weight
Fluorine, Dry Basis	ASTM D 5987	44	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.19	% By Weight
Lead, Dry Basis	ASTM D6357	23.1	mg/kg
Mercury, Dry	ASTM D6414	0.116	mg/kg
As Received			
Moisture, Total	ASTM D 2013	14.39	% By Weight
Ash, As Received	ASTM D 5142	5.67	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Carbon, As Received	ASTM D 5373	65.22	% By Weight
Hydrogen, As Received	ASTM D 5373	4.19	% By Weight
Nitrogen, As Received	ASTM D 5373	1.42	% By Weight
Oxygen, As Received	ASTM D 3176	8.10	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.05	% By Weight
Volatiles, As Received	ASTM D 5142	30.90	% By Weight
Fluorine, As Received	ASTM D 5987	38	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**____________________________ Date : 3/11/2003

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P.O. Box 2641
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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.02	% By Weight
Lead, As Received	ASTM D6357	19.8	mg/kg
Mercury, As Received	ASTM D6414	0.099	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	443.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.64	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.15	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.86	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.98	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.27	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.75	% By Weight
Lead, Ignited Basis	ASTM D 6357	349.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.94	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.29	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.08	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.48	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.05	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**____________________ Date : 3/11/2003

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 4D Mill

Laboratory ID Number : AG39743

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.32	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.17	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.25	% By Weight
Lead Oxide, Ignited	ASTM D 6357	401.8	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14443	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.882	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 3/11/2003

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General Test Laboratory
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(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.33	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13513	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.04	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.99	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.67	% By Weight
Oxygen, Dry Basis	ASTM D 3176	8.75	% By Weight
Carbon Fixed, Dry	ASTM D 3172	57.48	% By Weight
Volatiles, Dry Basis	ASTM D 5142	35.19	% By Weight
Fluorine, Dry Basis	ASTM D 5987	42	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.22	% By Weight
Lead, Dry Basis	ASTM D6357	31.0	mg/kg
Mercury, Dry	ASTM D6414	0.126	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.28	% By Weight
Ash, As Received	ASTM D 5142	6.43	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11854	Btu/lb
Carbon, As Received	ASTM D 5373	66.70	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.46	% By Weight
Oxygen, As Received	ASTM D 3176	7.68	% By Weight
Carbon Fixed, As Received	ASTM D 3172	50.42	% By Weight
Volatiles, As Received	ASTM D 5142	30.87	% By Weight
Fluorine, As Received	ASTM D 5987	37	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.07	% By Weight
Lead, As Received	ASTM D6357	27.2	mg/kg
Mercury, As Received	ASTM D6414	0.111	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.56	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	544.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.16	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.67	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.16	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.85	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.10	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.96	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.21	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.71	% By Weight
Lead, Ignited Basis	ASTM D 6357	422.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.73	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.10	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.11	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.37	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.23	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.56	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 18-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 4D Mill

Laboratory ID Number : AG39744

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.29	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.03	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.18	% By Weight
Lead Oxide, Ignited	ASTM D 6357	486.2	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14582	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.903	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**____________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 1

Laboratory ID Number : AG39745

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.22	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13689	Btu/lb
Carbon, Dry Basis	ASTM D 5373	77.14	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.89	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.73	% By Weight
Oxygen, Dry Basis	ASTM D 3176	7.77	% By Weight
Carbon Fixed, Dry	ASTM D 3172	59.10	% By Weight
Volatiles, Dry Basis	ASTM D 5142	33.68	% By Weight
Fluorine, Dry Basis	ASTM D 5987	40	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.25	% By Weight
Lead, Dry Basis	ASTM D6357	31.7	mg/kg
Mercury, Dry	ASTM D6414	0.126	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.38	% By Weight
Ash, As Received	ASTM D 5142	6.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12131	Btu/lb
Carbon, As Received	ASTM D 5373	68.36	% By Weight
Hydrogen, As Received	ASTM D 5373	4.33	% By Weight
Nitrogen, As Received	ASTM D 5373	1.53	% By Weight
Oxygen, As Received	ASTM D 3176	6.89	% By Weight
Carbon Fixed, As Received	ASTM D 3172	52.37	% By Weight
Volatiles, As Received	ASTM D 5142	29.85	% By Weight
Fluorine, As Received	ASTM D 5987	35	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**______________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 1

Laboratory ID Number : AG39745

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.11	% By Weight
Lead, As Received	ASTM D6357	28.1	mg/kg
Mercury, As Received	ASTM D6414	0.112	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.81	% By Weight
Barium, Ignited Basis	ASTM D 3683	500.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.62	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.13	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.18	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.86	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.15	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.79	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.13	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.74	% By Weight
Lead, Ignited Basis	ASTM D 6357	439.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.20	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.27	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.05	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.41	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.24	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.67	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision** ____________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 1

Laboratory ID Number : AG39745

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.83	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Lead Oxide, Ignited	ASTM D 6357	505.0	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14754	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.913	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 2

Laboratory ID Number : AG39746

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	7.61	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13586	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.33	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.97	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.70	% By Weight
Oxygen, Dry Basis	ASTM D 3176	8.06	% By Weight
Carbon Fixed, Dry	ASTM D 3172	58.21	% By Weight
Volatiles, Dry Basis	ASTM D 5142	34.18	% By Weight
Fluorine, Dry Basis	ASTM D 5987	35	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.33	% By Weight
Lead, Dry Basis	ASTM D6357	32.3	mg/kg
Mercury, Dry	ASTM D6414	0.116	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.61	% By Weight
Ash, As Received	ASTM D 5142	6.73	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12009	Btu/lb
Carbon, As Received	ASTM D 5373	67.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.39	% By Weight
Nitrogen, As Received	ASTM D 5373	1.50	% By Weight
Oxygen, As Received	ASTM D 3176	7.12	% By Weight
Carbon Fixed, As Received	ASTM D 3172	51.45	% By Weight
Volatiles, As Received	ASTM D 5142	30.21	% By Weight
Fluorine, As Received	ASTM D 5987	31	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 3/11/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 2

Laboratory ID Number : AG39746

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.18	% By Weight
Lead, As Received	ASTM D6357	28.5	mg/kg
Mercury, As Received	ASTM D6414	0.103	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.63	% By Weight
Barium, Ignited Basis	ASTM D 3683	577.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.78	% By Weight
Iron, Ignited Basis	ASTM D 3682	10.09	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.72	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.74	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.60	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.08	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.73	% By Weight
Lead, Ignited Basis	ASTM D 6357	424.5	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.86	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
Iron Oxide, Ignited	ASTM D 3682	14.42	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.19	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.10	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.49	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision** ________________________ Date : 3/11/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Composite Coal S# 2

Laboratory ID Number : AG39746

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.13	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.70	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
Lead Oxide, Ignited	ASTM D 6357	488.2	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14705	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.979	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision**________________________ Date : 3/11/2003

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General Test Laboratory
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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 10%

Laboratory ID Number : AG39747

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.63	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13293	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.82	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.00	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.61	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.77	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.46	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.91	% By Weight
Fluorine, Dry Basis	ASTM D 5987	33	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.17	% By Weight
Lead, Dry Basis	ASTM D6357	33.0	mg/kg
Mercury, Dry	ASTM D6414	0.126	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.16	% By Weight
Ash, As Received	ASTM D 5142	5.89	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11810	Btu/lb
Carbon, As Received	ASTM D 5373	66.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.44	% By Weight
Nitrogen, As Received	ASTM D 5373	1.43	% By Weight
Oxygen, As Received	ASTM D 3176	9.57	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.27	% By Weight
Volatiles, As Received	ASTM D 5142	33.68	% By Weight
Fluorine, As Received	ASTM D 5987	29	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ____________________ **Supervision** ____________________ Date : 3/11/2003

smk/coa

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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 1 10%

Laboratory ID Number : AG39747

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Lead, As Received	ASTM D6357	29.3	mg/kg
Mercury, As Received	ASTM D6414	0.112	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.49	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.62	% By Weight
Barium, Ignited Basis	ASTM D 3683	433.	mg/kg
Iron, Ignited Basis	ASTM D 3682	9.80	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.63	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.17	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.97	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.69	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.85	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.30	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.74	% By Weight
Lead, Ignited Basis	ASTM D 6357	498.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.60	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.27	% By Weight
Iron Oxide, Ignited	ASTM D 3682	14.01	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.04	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.39	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.68	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ________________________ **Date :** 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory		Customer Account :	CRISTSP
Crist Steam Plant / Gulf Power		Sample Date :	19-Dec-02
		Laboratory Account :	CRISTSP
Description :	Gulf Power - Plant Crist	Received Date :	26-Dec-02

Unit 4 Run 1 10%

Laboratory ID Number : AG39747

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.15	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.25	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Lead Oxide, Ignited	ASTM D 6357	573.2	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14237	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.880	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**___________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 10%

Laboratory ID Number : AG39748

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.73	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13270	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.82	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.04	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.60	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.64	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.65	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.62	% By Weight
Fluorine, Dry Basis	ASTM D 5987	33	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.17	% By Weight
Lead, Dry Basis	ASTM D6357	36.2	mg/kg
Mercury, Dry	ASTM D6414	0.115	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.45	% By Weight
Ash, As Received	ASTM D 5142	5.96	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11751	Btu/lb
Carbon, As Received	ASTM D 5373	66.25	% By Weight
Hydrogen, As Received	ASTM D 5373	4.46	% By Weight
Nitrogen, As Received	ASTM D 5373	1.42	% By Weight
Oxygen, As Received	ASTM D 3176	9.42	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.28	% By Weight
Volatiles, As Received	ASTM D 5142	33.31	% By Weight
Fluorine, As Received	ASTM D 5987	29	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

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Quality Control ______________________ **Supervision**___________________________ Date : 3/11/2003

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CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 10%

Laboratory ID Number : AG39748

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.04	% By Weight
Lead, As Received	ASTM D6357	32.1	mg/kg
Mercury, As Received	ASTM D6414	0.102	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.67	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.66	% By Weight
Barium, Ignited Basis	ASTM D 3683	421.	mg/kg
Iron, Ignited Basis	ASTM D 3682	8.95	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.10	% By Weight
Silicon, Ignited Basis	ASTM D 3682	24.07	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.86	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.23	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.76	% By Weight
Lead, Ignited Basis	ASTM D 6357	538.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.94	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Iron Oxide, Ignited	ASTM D 3682	12.79	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.53	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	51.50	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
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(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 2 10%

Laboratory ID Number : AG39748

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.16	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.08	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.27	% By Weight
Lead Oxide, Ignited	ASTM D 6357	618.7	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14228	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.882	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02
Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 10%

Laboratory ID Number : AG39749

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.78	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13262	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.84	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.98	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.60	% By Weight
Oxygen, Dry Basis	ASTM D 3176	10.59	% By Weight
Carbon Fixed, Dry	ASTM D 3172	55.69	% By Weight
Volatiles, Dry Basis	ASTM D 5142	37.53	% By Weight
Fluorine, Dry Basis	ASTM D 5987	36	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.21	% By Weight
Lead, Dry Basis	ASTM D6357	31.6	mg/kg
Mercury, Dry	ASTM D6414	0.117	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.96	% By Weight
Ash, As Received	ASTM D 5142	5.97	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11676	Btu/lb
Carbon, As Received	ASTM D 5373	65.89	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.41	% By Weight
Oxygen, As Received	ASTM D 3176	9.32	% By Weight
Carbon Fixed, As Received	ASTM D 3172	49.03	% By Weight
Volatiles, As Received	ASTM D 5142	33.04	% By Weight
Fluorine, As Received	ASTM D 5987	32	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision** ____________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP
Received Date : 26-Dec-02

Description : Gulf Power - Plant Crist

Unit 4 Run 3 10%

Laboratory ID Number : AG39749

Test Name	Reference	Result	Units
Sulfur, As Received	ASTM D 4239	1.07	% By Weight
Lead, As Received	ASTM D6357	27.8	mg/kg
Mercury, As Received	ASTM D6414	0.103	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.59	% By Weight
Barium, Ignited Basis	ASTM D 3683	470.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.66	% By Weight
Iron, Ignited Basis	ASTM D 3682	9.40	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.63	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.15	% By Weight
Potassium, Ignited Basis	ASTM D 3682	2.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	23.75	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.92	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.28	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.74	% By Weight
Lead, Ignited Basis	ASTM D 6357	466.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.79	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.32	% By Weight
Iron Oxide, Ignited	ASTM D 3682	13.44	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.04	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.34	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	2.48	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	50.81	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision** ____________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Laboratory
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 19-Dec-02

Laboratory Account : CRISTSP

Description : Gulf Power - Plant Crist

Received Date : 26-Dec-02

Unit 4 Run 3 10%

Laboratory ID Number : AG39749

Test Name	Reference	Result	Units
Sodium Oxide, Ignited	ASTM D 3682	1.24	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.20	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Lead Oxide, Ignited	ASTM D 6357	535.9	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14227	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.912	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 3/11/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03

Laboratory Account : CRI04SP
Received Date : 20-Feb-03

Description : Gulf Power Plant Crist Unit 4

Scale Comp. Run 1

Laboratory ID Number : AH05116

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.80	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13196	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	28	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.53	% By Weight
Lead, Dry Basis	ASTM D6357	3.4	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	13.13	% By Weight
Ash, As Received	ASTM D 5142	5.04	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11463	Btu/lb
Fluorine, As Received	ASTM D 5987	24	mg/kg
Sulfur, As Received	ASTM D 4239	0.46	% By Weight
Lead, As Received	ASTM D6357	3.0	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
Lead, Ignited Basis	ASTM D 6357	58.6	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14008	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.402	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03
Laboratory Account : CRI04SP
Received Date : 20-Feb-03

Description : Gulf Power Plant Crist Unit 4

Scale Comp. Run 2

Laboratory ID Number : AH05117

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.98	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13533	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	31	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.00	% By Weight
Lead, Dry Basis	ASTM D6357	18.1	mg/kg
Mercury, Dry	ASTM D6414	0.074	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.74	% By Weight
Ash, As Received	ASTM D 5142	5.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11809	Btu/lb
Fluorine, As Received	ASTM D 5987	27	mg/kg
Sulfur, As Received	ASTM D 4239	0.87	% By Weight
Lead, As Received	ASTM D6357	15.8	mg/kg
Mercury, As Received	ASTM D6414	0.065	mg/kg
Ignited as Element			
Lead, Ignited Basis	ASTM D 6357	303.4	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14394	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.739	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**________________________ Date : 9/30/2003

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General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03

Laboratory Account : CRI04SP
Received Date : 20-Feb-03

Description : Gulf Power Plant Crist Unit 4

Scale Comp. Run 3

Laboratory ID Number : AH05118

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	6.44	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13410	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	34	mg/kg
Sulfur, Dry Basis	ASTM D 4239	1.00	% By Weight
Lead, Dry Basis	ASTM D6357	19.0	mg/kg
Mercury, Dry	ASTM D6414	0.117	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.47	% By Weight
Ash, As Received	ASTM D 5142	5.64	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11738	Btu/lb
Fluorine, As Received	ASTM D 5987	30	mg/kg
Sulfur, As Received	ASTM D 4239	0.88	% By Weight
Lead, As Received	ASTM D6357	16.6	mg/kg
Mercury, As Received	ASTM D6414	0.102	mg/kg
Ignited as Element			
Lead, Ignited Basis	ASTM D 6357	295.8	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14333	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.746	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**___________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03

Laboratory Account : CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05249

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	3.88	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13459	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	15	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.47	% By Weight
Lead, Dry Basis	ASTM D6357	1.7	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	9.37	% By Weight
Ash, As Received	ASTM D 5142	3.52	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12198	Btu/lb
Fluorine, As Received	ASTM D 5987	14	mg/kg
Sulfur, As Received	ASTM D 4239	0.43	% By Weight
Lead, As Received	ASTM D6357	1.5	mg/kg
Mercury, As Received	ASTM D6414	0.058	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.90	% By Weight
Barium, Ignited Basis	ASTM D 3683	2578.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	2.11	% By Weight
Iron, Ignited Basis	ASTM D 3682	3.79	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.69	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.09	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.04	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.97	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ______________________ **Supervision**__________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 18-Feb-03

Laboratory Account : CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05249

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.41	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.09	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.70	% By Weight
Lead, Ignited Basis	ASTM D 6357	44.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.26	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.95	% By Weight
Iron Oxide, Ignited	ASTM D 3682	5.42	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.14	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.21	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.25	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.56	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.55	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.22	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.17	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14002	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.349	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 19-Feb-03

Laboratory Account : CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05250

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.39	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13397	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	15	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.44	% By Weight
Lead, Dry Basis	ASTM D6357	1.7	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	8.79	% By Weight
Ash, As Received	ASTM D 5142	4.00	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12219	Btu/lb
Fluorine, As Received	ASTM D 5987	14	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.6	mg/kg
Mercury, As Received	ASTM D6414	0.068	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	14.46	% By Weight
Barium, Ignited Basis	ASTM D 3683	2473.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.99	% By Weight
Iron, Ignited Basis	ASTM D 3682	3.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	0.84	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.32	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ______________________ **Supervision**__________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 19-Feb-03

Laboratory Account : CRI04SP
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Raw Coal

Laboratory ID Number : AH05250

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.37	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.05	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	38.3	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	27.32	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.78	% By Weight
Iron Oxide, Ignited	ASTM D 3682	4.57	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.01	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.31	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14012	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.328	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim L. Leroy
Kevin L. Beaty
John M. Dominey

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03

Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05270

Test Name	Reference	Result	Units
Mercury in Coal, NBS 1632c	EPA 3051	0.09673	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.00	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13210	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.48	% By Weight
Lead, Dry Basis	ASTM D6357	2.0	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.22	% By Weight
Ash, As Received	ASTM D 5142	4.39	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11596	Btu/lb
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.42	% By Weight
Lead, As Received	ASTM D6357	1.8	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	12.91	% By Weight
Barium, Ignited Basis	ASTM D 3683	2137.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.78	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.61	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.08	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Plant Crist
Gulf Power Co.

Customer Account : 1CRI04
Sample Date : 19-Feb-03
Laboratory Account : 1CRI04
Received Date : 21-Feb-03

Description : Gulf Power Plant Crist Unit 4

Comp. Sawdust Mix

Laboratory ID Number : AH05270

Test Name	Reference	Result	Units
Potassium, Ignited Basis	ASTM D 3682	1.05	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.75	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.38	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	2.02	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.58	% By Weight
Lead, Ignited Basis	ASTM D 6357	39.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.39	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.49	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.59	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.18	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.26	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	57.23	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.51	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	5.05	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.97	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	13905	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.363	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03
Laboratory Account : CRISTSP
Received Date : 25-Feb-03

Description : Gulf Power - Plant Crist

Sawdust Composite

Laboratory ID Number : AH05566

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	0.28	% By Weight
Heat of Combustion, Dry	ASTM D 5865	8674	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	11	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.03	% By Weight
Lead, Dry Basis	ASTM D6357	0.1	mg/kg
Mercury, Dry	ASTM D6414	0.011	mg/kg
As Received			
Moisture, Total	ASTM D 2013	9.74	% By Weight
Ash, As Received	ASTM D 5142	0.25	% By Weight
Heat of Combustion, As Received	ASTM D 5865	7829	Btu/lb
Fluorine, As Received	ASTM D 5987	10	mg/kg
Sulfur, As Received	ASTM D 4239	0.03	% By Weight
Lead, As Received	ASTM D6357	0.1	mg/kg
Mercury, As Received	ASTM D6414	0.010	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	1.66	% By Weight
Calcium, Ignited Basis	ASTM D 3682	29.36	% By Weight
Barium, Ignited Basis	ASTM D 3683	1402.	mg/kg
Iron, Ignited Basis	ASTM D 3682	0.82	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	7.07	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	1.46	% By Weight
Potassium, Ignited Basis	ASTM D 3682	17.77	% By Weight
Silicon, Ignited Basis	ASTM D 3682	3.09	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: John Dominey
Crist Steam Plant / Gulf Power

Customer Account : CRISTSP
Sample Date : 24-Feb-03

Laboratory Account : CRISTSP
Received Date : 25-Feb-03

Description : Gulf Power - Plant Crist

Sawdust Composite
Laboratory ID Number : AH05566

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	1.11	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	3.88	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.04	% By Weight
Lead, Ignited Basis	ASTM D 6357	25.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	3.14	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	41.08	% By Weight
Iron Oxide, Ignited	ASTM D 3682	1.17	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	11.72	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	3.35	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	21.41	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	6.61	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	1.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	9.70	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.07	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	8698	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.035	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC:

Quality Control ______________________ **Supervision**__________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.10	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13181	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.86	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.02	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.47	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.01	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	3.6	mg/kg
Mercury, Dry	ASTM D6414	0.064	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.47	% By Weight
Ash, As Received	ASTM D 5142	4.46	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11537	Btu/lb
Carbon, As Received	ASTM D 5373	66.40	% By Weight
Hydrogen, As Received	ASTM D 5373	4.39	% By Weight
Nitrogen, As Received	ASTM D 5373	1.29	% By Weight
Oxygen, As Received	ASTM D 3176	10.51	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.47	% By Weight
Lead, As Received	ASTM D6357	3.2	mg/kg
Mercury, As Received	ASTM D6414	0.056	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ______________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.97	% By Weight
Barium, Ignited Basis	ASTM D 3683	1861.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.65	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.83	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.06	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.09	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.39	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.68	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	71.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.40	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.31	% By Weight
Iron Oxide, Ignited	ASTM D 3682	6.90	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.99	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.28	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.82	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.53	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.20	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05721

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13889	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.410	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

smk/coa

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P.O. Box 2641
Birmingham, Alabama 35291
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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.70	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13207	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.20	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	5.01	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.52	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.00	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	3.8	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.56	% By Weight
Ash, As Received	ASTM D 5142	4.11	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11548	Btu/lb
Carbon, As Received	ASTM D 5373	66.63	% By Weight
Hydrogen, As Received	ASTM D 5373	4.38	% By Weight
Nitrogen, As Received	ASTM D 5373	1.33	% By Weight
Oxygen, As Received	ASTM D 3176	10.49	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.50	% By Weight
Lead, As Received	ASTM D6357	3.3	mg/kg
Mercury, As Received	ASTM D6414	0.066	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.54	% By Weight
Barium, Ignited Basis	ASTM D 3683	2115.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.91	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.28	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.18	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.82	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.45	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.71	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Lead, Ignited Basis	ASTM D 6357	81.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.58	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.67	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.55	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.42	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	55.24	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.61	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.28	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.07	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**__________________________ Date : 4/2/2003

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General Test Laboratory
P.O. Box 2641
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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05722

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13858	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.432	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
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Quality Control ____________________ **Supervision**____________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.05	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13258	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.07	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.48	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.92	% By Weight
Fluorine, Dry Basis	ASTM D 5987	22	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.55	% By Weight
Lead, Dry Basis	ASTM D6357	3.5	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.91	% By Weight
Ash, As Received	ASTM D 5142	4.40	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11546	Btu/lb
Carbon, As Received	ASTM D 5373	66.25	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.29	% By Weight
Oxygen, As Received	ASTM D 3176	10.38	% By Weight
Fluorine, As Received	ASTM D 5987	19	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.0	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision** ______________________ Date : 4/2/2003

smk/coa

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P.O. Box 2641
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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.35	% By Weight
Barium, Ignited Basis	ASTM D 3683	1858.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.14	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.10	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.19	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.38	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.65	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.60	% By Weight
Lead, Ignited Basis	ASTM D 6357	68.4	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.22	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.35	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.23	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.43	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.44	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.12	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.00	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**______________________ Date : 4/2/2003

smk/coa

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P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 20-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05723

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13963	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.415	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury in Coal, NBS 1632c	EPA 3051	0.09568	mg/kg
Dry Basis			
Ash, Dry	ASTM D 5142	5.95	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13185	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.26	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.85	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	11.80	% By Weight
Fluorine, Dry Basis	ASTM D 5987	25	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.65	% By Weight
Lead, Dry Basis	ASTM D6357	2.3	mg/kg
Mercury, Dry	ASTM D6414	0.086	mg/kg
As Received			
Moisture, Total	ASTM D 2013	13.01	% By Weight
Ash, As Received	ASTM D 5142	5.18	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11470	Btu/lb
Carbon, As Received	ASTM D 5373	65.47	% By Weight
Hydrogen, As Received	ASTM D 5373	4.22	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.26	% By Weight
Fluorine, As Received	ASTM D 5987	22	mg/kg
Sulfur, As Received	ASTM D 4239	0.57	% By Weight
Lead, As Received	ASTM D6357	2.0	mg/kg

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

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Birmingham, Alabama 35291
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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Mercury, As Received	ASTM D6414	0.075	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.78	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.42	% By Weight
Barium, Ignited Basis	ASTM D 3683	2103.	mg/kg
Iron, Ignited Basis	ASTM D 3682	6.20	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.64	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.31	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.55	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.33	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.49	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.65	% By Weight
Lead, Ignited Basis	ASTM D 6357	37.9	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.99	% By Weight
Iron Oxide, Ignited	ASTM D 3682	8.86	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.06	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.58	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.66	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.44	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.72	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Raw Coal Barge Drummond

Laboratory ID Number : AH05724

Test Name	Reference	Result	Units
Titanium Oxide, Ignited	ASTM D 3682	1.08	% By Weight
General			
Heat of Combustion, MAF	ASTM D 5865	14019	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.493	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ________________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.85	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13292	Btu/lb
Carbon, Dry Basis	ASTM D 5373	75.84	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.93	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.49	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.31	% By Weight
Fluorine, Dry Basis	ASTM D 5987	21	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.58	% By Weight
Lead, Dry Basis	ASTM D6357	4.4	mg/kg
Mercury, Dry	ASTM D6414	0.075	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.90	% By Weight
Ash, As Received	ASTM D 5142	4.22	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11577	Btu/lb
Carbon, As Received	ASTM D 5373	66.06	% By Weight
Hydrogen, As Received	ASTM D 5373	4.29	% By Weight
Nitrogen, As Received	ASTM D 5373	1.30	% By Weight
Oxygen, As Received	ASTM D 3176	10.72	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.51	% By Weight
Lead, As Received	ASTM D6357	3.8	mg/kg
Mercury, As Received	ASTM D6414	0.065	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ____________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.21	% By Weight
Barium, Ignited Basis	ASTM D 3683	1968.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.76	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.41	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.12	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.14	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.23	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.43	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.74	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.59	% By Weight
Lead, Ignited Basis	ASTM D 6357	89.7	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	24.96	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.46	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.27	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.37	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.12	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.58	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.35	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.98	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**____________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #1

Laboratory ID Number : AH05725

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13970	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.436	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.64	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13203	Btu/lb
Carbon, Dry Basis	ASTM D 5373	76.32	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.97	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.50	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.03	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.54	% By Weight
Lead, Dry Basis	ASTM D6357	4.2	mg/kg
Mercury, Dry	ASTM D6414	0.054	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.99	% By Weight
Ash, As Received	ASTM D 5142	4.08	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11620	Btu/lb
Carbon, As Received	ASTM D 5373	67.17	% By Weight
Hydrogen, As Received	ASTM D 5373	4.37	% By Weight
Nitrogen, As Received	ASTM D 5373	1.32	% By Weight
Oxygen, As Received	ASTM D 3176	10.59	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.48	% By Weight
Lead, As Received	ASTM D6357	3.7	mg/kg
Mercury, As Received	ASTM D6414	0.048	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	13.25	% By Weight
Barium, Ignited Basis	ASTM D 3683	1960.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.89	% By Weight
Iron, Ignited Basis	ASTM D 3682	4.94	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.13	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.10	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.58	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.44	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.54	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.62	% By Weight
Lead, Ignited Basis	ASTM D 6357	91.0	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	25.04	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.64	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.06	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.30	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.33	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	56.87	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.59	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	3.85	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.03	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**____________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #2

Laboratory ID Number : AH05726

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13845	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.409	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**______________________________ Date : 4/2/2003

smk/coa

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CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.41	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13046	Btu/lb
Carbon, Dry Basis	ASTM D 5373	74.94	% By Weight
Hydrogen, Dry Basis	ASTM D 5373	4.90	% By Weight
Nitrogen, Dry Basis	ASTM D 5373	1.44	% By Weight
Oxygen, Dry Basis	ASTM D 3176	12.85	% By Weight
Fluorine, Dry Basis	ASTM D 5987	20	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.46	% By Weight
Lead, Dry Basis	ASTM D6357	2.2	mg/kg
Mercury, Dry	ASTM D6414	0.065	mg/kg
As Received			
Moisture, Total	ASTM D 2013	12.27	% By Weight
Ash, As Received	ASTM D 5142	4.75	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11445	Btu/lb
Carbon, As Received	ASTM D 5373	65.74	% By Weight
Hydrogen, As Received	ASTM D 5373	4.30	% By Weight
Nitrogen, As Received	ASTM D 5373	1.26	% By Weight
Oxygen, As Received	ASTM D 3176	11.27	% By Weight
Fluorine, As Received	ASTM D 5987	18	mg/kg
Sulfur, As Received	ASTM D 4239	0.40	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.057	mg/kg
Ignited as Element			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ______________________ **Supervision**____________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03

Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Aluminum, Ignited Basis	ASTM D 3682	12.39	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.67	% By Weight
Barium, Ignited Basis	ASTM D 3683	1952.	mg/kg
Iron, Ignited Basis	ASTM D 3682	4.01	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.66	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	Not Detected	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.02	% By Weight
Silicon, Ignited Basis	ASTM D 3682	27.86	% By Weight
Sodium, Ignited Basis	ASTM D 3682	0.36	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.97	% By Weight
Titanium, Ignited Basis	ASTM D 3682	0.55	% By Weight
Lead, Ignited Basis	ASTM D 6357	40.8	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	23.41	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.34	% By Weight
Iron Oxide, Ignited	ASTM D 3682	5.73	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	1.09	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	Not Detected	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.23	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	59.60	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.49	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	4.93	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	0.92	% By Weight
General			

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision** ________________________ **Date :** 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Kevin Beaty
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 21-Feb-03
Laboratory Account : CRI04SP
Received Date : 26-Feb-03

Description : Gulf Plant Crist Unit #4

Scale Composite Run #3

Laboratory ID Number : AH05727

Test Name	Reference	Result	Units
Heat of Combustion, MAF	ASTM D 5865	13792	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.353	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: John Dominey
Kim Leroy
Bobby Watkins

Quality Control ____________________ **Supervision**________________________ Date : 4/2/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03

Laboratory Account : CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN1
Drummond Coal Baseline Run 1

Laboratory ID Number : AH13531

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	5.55	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13339	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	48	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.61	% By Weight
Lead, Dry Basis	ASTM D6357	3.2	mg/kg
Mercury, Dry	ASTM D6414	0.106	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.36	% By Weight
Ash, As Received	ASTM D 5142	4.92	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11824	Btu/lb
Fluorine, As Received	ASTM D 5987	43	mg/kg
Sulfur, As Received	ASTM D 4239	0.54	% By Weight
Lead, As Received	ASTM D6357	2.8	mg/kg
Mercury, As Received	ASTM D6414	0.094	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	14.37	% By Weight
Barium, Ignited Basis	ASTM D 3683	2089.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.16	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.06	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.45	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.08	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.16	% By Weight
Silicon, Ignited Basis	ASTM D 3682	26.91	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ______________________ **Supervision**___________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03
Laboratory Account : CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN1
Drummond Coal Baseline Run 1

Laboratory ID Number : AH13531

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.36	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	0.90	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.70	% By Weight
Lead, Ignited Basis	ASTM D 6357	57.1	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	27.15	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.62	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.23	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.75	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.18	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.40	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	57.57	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.49	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.25	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.17	% By Weight
Barium Oxide, Ignited	ASTM D 3683	2332.4	mg/kg
Lead Oxide, Ignited	ASTM D 6357	65.7	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14123	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.457	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ______________________ **Supervision**__________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03

Laboratory Account : CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN2
Drummond Coal Baseline Run 2

Laboratory ID Number : AH13532

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.42	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13491	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	64	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.57	% By Weight
Lead, Dry Basis	ASTM D6357	2.1	mg/kg
Mercury, Dry	ASTM D6414	0.096	mg/kg
As Received			
Moisture, Total	ASTM D 2013	10.99	% By Weight
Ash, As Received	ASTM D 5142	3.93	% By Weight
Heat of Combustion, As Received	ASTM D 5865	12008	Btu/lb
Fluorine, As Received	ASTM D 5987	57	mg/kg
Sulfur, As Received	ASTM D 4239	0.51	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.085	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	15.60	% By Weight
Barium, Ignited Basis	ASTM D 3683	2690.	mg/kg
Calcium, Ignited Basis	ASTM D 3682	1.37	% By Weight
Iron, Ignited Basis	ASTM D 3682	5.46	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.48	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.14	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.01	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.14	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ______________________ **Supervision**______________________________ Date : 9/30/2003

smk/coa

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Birmingham, Alabama 35291
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CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03

Laboratory Account : CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN2
Drummond Coal Baseline Run 2

Laboratory ID Number : AH13532

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.37	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.05	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.78	% By Weight
Lead, Ignited Basis	ASTM D 6357	48.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	29.48	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	1.92	% By Weight
Iron Oxide, Ignited	ASTM D 3682	7.81	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.80	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.32	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.22	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	53.78	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.50	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.62	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.30	% By Weight
Barium Oxide, Ignited	ASTM D 3683	3003.4	mg/kg
Lead Oxide, Ignited	ASTM D 6357	55.4	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14115	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.423	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ____________________ **Supervision**____________________ Date : 9/30/2003

smk/coa

General Test Laboratory
P.O. Box 2641
Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03

Laboratory Account : CRI04SP

Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN3
Drummond Coal Baseline Run 3

Laboratory ID Number : AH13533

Test Name	Reference	Result	Units
Dry Basis			
Ash, Dry	ASTM D 5142	4.09	% By Weight
Heat of Combustion, Dry	ASTM D 5865	13522	Btu/lb
Fluorine, Dry Basis	ASTM D 5987	40	mg/kg
Sulfur, Dry Basis	ASTM D 4239	0.61	% By Weight
Lead, Dry Basis	ASTM D6357	2.1	mg/kg
Mercury, Dry	ASTM D6414	0.096	mg/kg
As Received			
Moisture, Total	ASTM D 2013	11.50	% By Weight
Ash, As Received	ASTM D 5142	3.62	% By Weight
Heat of Combustion, As Received	ASTM D 5865	11967	Btu/lb
Fluorine, As Received	ASTM D 5987	35	mg/kg
Sulfur, As Received	ASTM D 4239	0.54	% By Weight
Lead, As Received	ASTM D6357	1.9	mg/kg
Mercury, As Received	ASTM D6414	0.085	mg/kg
Ignited as Element			
Aluminum, Ignited Basis	ASTM D 3682	13.82	% By Weight
Calcium, Ignited Basis	ASTM D 3682	1.51	% By Weight
Barium, Ignited Basis	ASTM D 3683	2910.	mg/kg
Iron, Ignited Basis	ASTM D 3682	6.54	% By Weight
Magnesium, Ignited Basis	ASTM D 3682	0.55	% By Weight
Phosphorus, Ignited Basis	ASTM D 3682	0.14	% By Weight
Potassium, Ignited Basis	ASTM D 3682	1.21	% By Weight
Silicon, Ignited Basis	ASTM D 3682	25.60	% By Weight

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ______________________ **Supervision**____________________________ Date : 9/30/2003

smk/coa

General Test Laboratory
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Birmingham, Alabama 35291
(205) 664 - 6081

CERTIFICATE OF ANALYSIS

TO: Bobby Watkins
Gulf Power Co.

Customer Account : CRI04SP
Sample Date : 05-May-03

Laboratory Account : CRI04SP
Received Date : 06-May-03

Description : Gulf Power Plant Crist Unit 4
RUN3
Drummond Coal Baseline Run 3

Laboratory ID Number : AH13533

Test Name	Reference	Result	Units
Sodium, Ignited Basis	ASTM D 3682	0.42	% By Weight
Sulfur, Ignited Basis	ASTM D 5016	1.17	% By Weight
Titanium Oxide, Ignited Basis	XRF	0.67	% By Weight
Lead, Ignited Basis	ASTM D 6357	52.2	mg/kg
Ignited as Oxide			
Aluminum Oxide, Ignited	ASTM D 3682	26.11	% By Weight
Calcium Oxide, Ignited	ASTM D 3682	2.11	% By Weight
Iron Oxide, Ignited	ASTM D 3682	9.35	% By Weight
Magnesium Oxide, Ignited	ASTM D 3682	0.91	% By Weight
Phosphorus Pentoxide, Ignited	ASTM D 3682	0.32	% By Weight
Potassium Oxide, Ignited	ASTM D 3682	1.46	% By Weight
Silicon Dioxide, Ignited	ASTM D 3682	54.77	% By Weight
Sodium Oxide, Ignited	ASTM D 3682	0.57	% By Weight
Sulfur Trioxide, Ignited	ASTM D 5016	2.92	% By Weight
Titanium Oxide, Ignited	ASTM D 3682	1.12	% By Weight
Barium Oxide, Ignited	ASTM D 3683	3249.0	mg/kg
Lead Oxide, Ignited	ASTM D 6357	60.0	mg/kg
General			
Heat of Combustion, MAF	ASTM D 5865	14099	Btu/lb
Sulfur, lbs/mmBTU	ASTM D 3180	0.451	lbs/mmBTU

This Certificate states the physical and/or chemical characteristics of the sample as submitted.

Comments:

CC: Kim Leroy
Kevin Beaty

Quality Control ______________________ **Supervision**__________________________ Date : 9/30/2003

smk/coa

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

received
12/11/02 GDW

NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by:

Gulf Power Company
One Energy Place
Pensacola, Florida 32520

Authorized Representative:
Mr. Gene L. Ussery, Jr.
Vice President of Power Generation

Crist Electric Generating Plant
Air Permit No. 0330045-004-AC
Project: Units 4 and 5, Field-Testing of Carbonaceous Fuels

Enclosed is Final Air Permit No. 0330045-004-AC, which authorizes a temporary period to conduct field-testing of carbonaceous fuels (wood chips, sawdust, sander dust, and switchgrass) to determine the feasibility of use in a NOx reduction program for Units 4 and 5 at the existing Crist Plant, which is located in Escambia County, Florida. As noted in the Final Determination (attached), only minor changes were made. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes, by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty (30) days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

Trina L. Vielhauer

Trina Vielhauer, Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Final Permit (including the Final permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 12/9/02 to the persons listed:

Mr. Gene L. Ussery, Jr., Gulf Power Co.*
Mr. G. Duane Waters, Gulf Power Co.
Mr. Gregory N. Terry, Gulf Power Co.
Ms. Sandra Veazey, NWD

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Barbara J. Friday 12/9/02
(Clerk) (Date)

PERMITTEE

Gulf Power Company
One Energy Place
Pensacola, Florida 32520

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
New Source Review Section
2600 Blair Stone Road, MS #5505
Tallahassee, Florida, 32399-2400

PROJECT

Crist Electric Generating Plant
Units 4 and 5, Field-Testing of Carbonaceous Fuels
Air Permit No. 0330045-004-AC

This permit authorizes a temporary period to conduct field-testing of carbonaceous fuels (wood chips, sawdust, sander dust, and switchgrass) to determine the feasibility of use in a NOx reduction program for Units 4 and 5 at the existing Crist Plant, which is located in Escambia County, Florida.

NOTICE AND PUBLICATION

The Department distributed an "Intent to Issue Permit" package on November 12, 2002. The applicant published the "Public Notice of Intent to Issue" in the Pensacola News Journal on November 14, 2002. The Department received the proof of publication on November 25, 2002. Gulf Power requested an extension of time in which to file a petition for an administrative hearing. On December 3, 2002, Gulf Power withdrew the request for an extension of time based on the agreed upon changes.

COMMENTS

No comments on the Draft Permit were received from the public or the Department's Northwest District Office. The following summarizes comments received from the applicant and the Department's response.

Condition No. 2: Gulf Power requests clarification regarding the unit heat input rate. The following sentence is added, "The maximum total heat input rate for each unit remains at 1096.7 MMBtu per hour."

Condition No. 6: Gulf Power submitted a brief summary of the field-testing program. The condition is revised to the following, "Before firing any carbonaceous fuel, the permittee shall submit a preliminary schedule detailing the proposed field-testing protocol to the Bureau of Air Regulation and the Compliance Authority. Updates to the field-testing protocol and schedule shall be submitted as necessary."

Condition No. 9: Gulf Power requests the ability to perform baseline CO and VOC testing for coal firing after carbonaceous fuels were fired. The first sentence is revised accordingly. Requirements for ash resistivity and particle size distribution are moved to Condition No. 14. The following note is added, "Baseline VOC testing is only required if VOC testing is required for any carbonaceous fuel." See comments and response for Condition No. 10.

Condition No. 10: Gulf Power requests that only one test be required for particulate matter and that additional CO testing be performed in lieu of VOC testing. The condition is revised to require additional CO testing with VOC testing required only if initial CO tests show that emissions from carbonaceous fuel firing are higher than baseline CO emissions. An initial PM test is required and a second must be performed if the initial test result is greater than 0.025 lb/MMBtu. This rate is based on the most recent PM test (05/01/02) for Unit 4, which is indicated in the ARMS database as 0.022 lb/MMBtu. Requirements for particle size distribution are moved to Condition No. 14.

Condition No. 11: Gulf Power requests clarification that only NOx and opacity need to be reported continuously by CEMS. Units 4 and 5 do not record flue gas oxygen content, but rather CO_2 flue gas content. Gulf Power also requests that the fuel feed rates be monitored as required by the current Title V permit. The condition is revised accordingly.

Condition No. 12: Gulf Power requests that the critical ESP parameters be recorded at the beginning and end of each test run rather than at 15-minute intervals. Gulf Power also requests clarification that the amount of ash generated would be estimated. The condition is revised accordingly. Requirements for ash resistivity and particle size distribution are moved to Condition No. 14.

Condition No. 13: Gulf Power requests that the condition be revised to require fuel samples to be taken and analyzed for the specified properties for each fuel delivery and for each stack test. As this would provide a reasonable number of samples, the condition is revised accordingly.

Condition No. 14: Gulf Power does not believe that particulate matter emissions will increase because of the existing ESP controls and the amounts of carbonaceous fuels being fired. In addition, Gulf Power believes that the ash sampling and particle size distribution tests are complicated and expensive. The Department believes that this information may prove worthwhile if testing shows increased PM emissions. Therefore, the condition is revised to require a second PM test, ash sampling, and particle size distribution testing if PM emissions are higher than the emission rate specified in Condition No. 10.

Condition No. 15: Gulf Power states that it may not be possible to operate at permitted capacity for the tests and that the condition should allow for the possibility of reduced operating rates. The first two sentences are revised to, "The permittee shall attempt to conduct all tests at permitted capacity, which is defined as 90% to 100% of the maximum operating rate allowed by permit (total heat input rate of coal and carbonaceous fuel). If the permittee is unable to operate at this level, then any subsequent request to fire this fuel shall be limited to 110% of the tested rate."

Condition No. 16: Gulf Power requests additional flexibility in the test notification because field testing will be conducted on the basis of actual fuel deliveries and amounts. The condition is revised to, "The permittee shall provide a 5-day advance notice of any scheduled stack tests to afford the Compliance Authority the opportunity to witness the tests. If unavoidable circumstances occur that would delay the stack tests, the permittee shall keep the Compliance Authority informed of the delays and the new schedule."

Condition No. 19: Gulf Power requests that the final report be submitted within 90 days of the permit expiration date rather than completion of the field-testing project. The condition is revised accordingly.

CONCLUSION

The changes to the draft permit are not considered substantial. The final action of the Department is to issue the permit with the changes described above.

Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

PERMITTEE:

Gulf Power Company
One Energy Place
Pensacola, Florida 32520

Authorized Representative:
Mr. Gene L. Ussery, Jr.
Vice President of Power Generation

Crist Electric Generating Plant
Air Permit No. 0330045-004-AC
Facility ID No. 0330045
SIC No. 4911
Permit Expires: October 4, 2003

PROJECT AND LOCATION

This permit authorizes a temporary period to conduct field-testing of carbonaceous fuels (wood chips, sawdust, sander dust, and switchgrass) to determine the feasibility of use in a NOx reduction program for Units 4 and 5 at the Crist Plant. This existing plant is located on Pate Road, off of 10 Mile Road on Governors Bayou in Escambia County, Florida. The map coordinates are: Zone 16, 478.50 km East and 3381.30 km North (Latitude: 30° 33' 58" North and Longitude: 87° 13' 44" West).

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to perform the work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department. This permit supplements all other air construction and operation permits for the affected emissions units and does not alter any requirements from such previously issued air permits.

CONTENTS

Howard L Rhodes   12/09/02

Howard L. Rhodes, Director   (Date)
Division of Air Resources Management

FACILITY AND PROJECT DESCRIPTION

The existing plant consists of seven fossil fuel fired steam generators and two fly ash silos. Natural gas is the primary fuel for Units 1, 2 and 3. Pulverized coal is the primary fuel for Units 4, 5, 6 and 7. Fuel oil is used as supplemental fuel in all seven of the units. Only the following units are affected by this air construction permit.

ID	Emission Unit Description
004	Unit 4 is a utility boiler with a maximum heat input rate of 1096.7 MMBtu/hour.
005	Unit 5 is a utility boiler with a maximum heat input rate of 1096.7 MMBtu/hour.

REGULATORY CLASSIFICATION

Title III: The existing facility is identified as a potential major source of hazardous air pollutants (HAP).

Title IV: The existing facility operates units subject to the acid rain provisions of the Clean Air Act.

Title V: The existing facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.

PSD: The existing facility is a PSD-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

RELEVANT DOCUMENTS

The permit application and additional information received to make it complete are not a part of this permit; however, the information is specifically related to this permitting action and is on file with the Department. In addition, the field-testing of carbonaceous fuels ("biomass") is contemplated as a possible engineering feasibility study for NOx reduction in the "Agreement for the Purpose of Ensuring Compliance with Ozone Ambient Air Quality Standards" that was entered into on August 28, 2002 between the Florida Department of Environmental Protection and the Gulf Power Company.

1. Permitting Authority: All documents related to applications for permits to construct, modify, or operate the emissions units regulated by this permit shall be submitted to the Bureau of Air Regulation of the Florida Department of Environmental Protection (DEP) at 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400. Copies of all such documents shall be submitted to the Compliance Authority.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Department's Northwest District Office at 160 Governmental Center, Pensacola, Florida 32501-5794.

3. Appendices: The following Appendices are attached as part of this permit: Appendix CF (Citation Format); Appendix GC (General Conditions); and Appendix SC (Standard Conditions).

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Title V Permit: The scope of this temporary project is to develop information in support of a permanent project. A future request for permanent authorization to fire carbonaceous fuels would then require a revision to the Title V air operation permit. [Rule 62-213.400, F.A.C.]

This section of the permit addresses the following existing emissions units.

Emissions Unit Nos. 004 and 005
Description: Each unit is a tangentially fired, dry-bottom boiler manufactured by Combustion Engineering. *Capacity and Fuels*: Each unit is rated at a maximum heat input of 1,096.7 MMBtu per hour when firing pulverized coal, natural gas or distillate No. 2 fuel oil (used as back-up fuel). *Controls*: Particulate matter emissions from each unit are controlled by hot side (Buell Model # Bal. 2x34n333-4-3p) and cold side (Buell Model # 1.1x48k33-1p) electrostatic precipitators. *Monitors*: Each unit is continuously monitored for opacity, carbon dioxide, nitrogen oxides, and sulfur dioxide. *Stack Parameters*: Units 4 and 5 share a common stack with Units 1, 2 and 3 having the following characteristics: stack height is 450 feet; exit diameter is 18.0 feet; exit temperature is 290° F; actual volumetric flow rate is approximately 802,500 acfm.

AUTHORIZATION

1. Relation to Other Permits: The conditions of this permit are in addition to those of any other air construction or operation permits. [Rule 62-4.210, F.A.C.]

2. Field-Testing of Carbonaceous Fuels: Subject to the conditions of this permit, the permittee is temporarily authorized to conduct a ten-month field-testing program to determine the feasibility of co-firing carbonaceous fuels with coal in existing Units 4 and 5 as a NOx reduction technique. Carbonaceous fuels shall only include the following untreated materials: wood chips, sawdust, sander dust, and switchgrass. For each unit, these materials may be co-fired with coal at a maximum heat input rate of 97.7 MMBtu per hour. The maximum total heat input rate for each unit remains at 1096.7 MMBtu per hour. The permittee shall implement the field-testing program to determine and report operational and environmental impacts that will result from co-firing carbonaceous fuels. This information may be used to support a future request for permanent authorization of one or more of these fuels. Units 4 and 5 shall remain subject to the conditions of all existing permits related to air pollution and control equipment during the field-testing program. *{Permitting Note: Rule 62-210.200(55), F.A.C. defines "carbonaceous fuel" as, "Solid materials composed primarily of vegetative matter such as tree bark, wood waste, or bagasse." This permit further limits carbonaceous fuels to untreated wood chips, sawdust, sander dust, and switchgrass.}* [Applicant Request]

3. Expiration: Upon the expiration of this permit, the authority to fire carbonaceous fuels is withdrawn.

PERFORMANCE RESTRICTIONS

4. Temporarily Authorized Fuels: Subject to the conditions of this permit, each unit may also fire carbonaceous fuel consisting of the following untreated materials: wood chips, switchgrass, sawdust, and sander dust in addition to currently authorized fuels. These materials shall be substantially free of plastics, metals, paint or other chemicals. [Applicant Request; Rule 62-210.200(PTE), F.A.C.]

5. Permitted Capacity:

   a. For each unit, the maximum hourly firing rates (tons per hour) for the carbonaceous fuels are: 10.9 tons of wood chips per hour, 6.7 tons of switchgrass per hour, 8.7 tons of sawdust per hour, and 8.7 tons of sander dust per hour. The above limits are not cumulative and only one carbonaceous fuel type may be fired at a time. *{Permitting Note: These restrictions are roughly equivalent to a heat input rate of 97.7 MMBtu per hour.}*

b. During the project, no more than the following amounts of carbonaceous fuels shall be fired: 7816 tons of wood chips, 4836 tons of switchgrass, 6288 tons of sawdust, and 6288 tons of sander dust. *{Permitting Note: These restrictions are roughly equivalent to 30 days of firing for each fuel.}*

When firing any carbonaceous fuel, the permittee shall continuously monitor and record the amount of each fuel being fired. [Rule 62-210.200(PTE), F.A.C.]

6. Schedule: Before firing any carbonaceous fuel, the permittee shall submit a preliminary schedule detailing the proposed field-testing protocol to the Bureau of Air Regulation and the Compliance Authority. Updates to the field-testing protocol and schedule shall be submitted as necessary. [Rule 62-4.070(3), F.A.C.]

EMISSIONS STANDARDS

7. Emissions Standards: This permit does not establish any new emissions standards for these units. Units 4 and 5 shall continue to comply with the requirements of all existing, valid Department permits. [Rule 62-4.070(3), F.A.C.]

8. Fugitive Dust Emissions: The permittee shall minimize unconfined particulate matter emissions from the storage and handling of carbonaceous fuels by using dust suppressing techniques such as covering, confining, or applying water to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

TESTING AND MONITORING REQUIREMENTS

9. Baseline Coal Emissions Tests: Initial testing for each boiler when firing only coal shall be performed to determine CO and VOC emissions and establish baseline levels. All CO and VOC tests required by this permit shall be conducted in accordance with the procedures normally used for PM compliance tests. CO_2, NOx, opacity, and SO_2 emissions data collected by the existing continuous monitors shall be reported for each test run. Baseline NOx, opacity, and SO_2 emissions shall be determined from continuous monitor data. Baseline PM emissions shall be determined from recent annual compliance tests. Baseline tests shall be performed at permitted capacity. {Permitting Note: Baseline VOC testing is only required if VOC testing is required for any carbonaceous fuel.} [Rule 62-4.070(3), F.A.C.]

10. Carbonaceous Fuel Emissions Tests: A series of tests shall be conducted to determine emissions of CO, PM and VOC when co-firing each carbonaceous fuel with coal. Within 21 days of first firing a given carbonaceous fuel, the permittee shall conduct an initial CO test. If the initial CO test shows that CO emissions are no greater than baseline emissions from coal firing, then VOC tests are not required. If the initial CO test shows that CO emissions are greater than baseline emissions from coal firing, then at least one VOC test is required. In addition to the preliminary CO tests, the permittee shall conduct two additional CO tests. The permittee shall conduct at least one test to determine particulate matter emissions from each carbonaceous fuel. Each CO, PM, and VOC test shall consist of at least three, 1-hour test runs. CO_2, NOx, opacity, and SO_2 emissions data collected by the existing continuous monitors shall be reported for each test run. Tests shall be performed while co-firing the highest percentage of carbonaceous fuel that will be requested on a permanent basis. All CO, PM, and VOC tests required by this permit shall be conducted in accordance with the procedures normally used for PM compliance tests. Any problems related to storage, handling, pulverizing, charging, boiler or ESP performance shall be reported. [Rule 62-4.070(3), F.A.C.]

11. Monitoring: When co-firing any carbonaceous fuel, the permittee shall continuously monitor and record NOx emissions (lb/MMBtu) and opacity (percent). For each day any carbonaceous fuel is fired, the permittee shall report the following: total tons of each fuel charged; hours of fuel firing; average charging rate of each fuel (tons per hour); and average total heat input rate from each fuel (MMBtu/hour). [Rule 62-4.070(3), F.A.C.]

12. ESP Parameters: At the beginning and end of each required PM test run, the critical ESP parameters (field voltages, rapping intensity, and rapping frequency) shall be monitored and recorded. For each test, estimates of the quantities of ash generated and adjustments made to the ESP shall also be reported. For the baseline tests when firing coal, these parameters shall be monitored and recorded at the beginning and end of each required CO test run. [Rule 62-4.070(3), F.A.C.]

13. Fuel Sampling: During each required test, a representative fuel sample shall be taken and analyzed for the following fuel properties: heating value (Btu/lb), moisture (% by weight), nitrogen (% by weight), sulfur (% by weight), ash (% by weight), fluorides (ppm by weight), lead (ppm by weight), and mercury (ppm by weight). This includes coal samples for the baseline tests. Representative samples of each carbonaceous fuel shall also be taken and analyzed for these properties for each delivery. [Rule 62-4.070(3), F.A.C.]

14. Ash Sampling and Particle Size Testing: If initial tests for a carbonaceous fuel shows PM emissions of 0.025 lb/MMBtu or higher, the permittee shall conduct a second PM test to include particle size distribution. During the second PM test, a representative sample of ESP ash shall be taken and analyzed for resistivity. [Rule 62-4.070(3), F.A.C.]

15. Rate During Testing: The permittee shall attempt to conduct all tests at permitted capacity, which is defined as 90% to 100% of the maximum operating rate allowed by permit (total heat input rate of coal and carbonaceous fuel). If the permittee is unable to operate at this level, then any subsequent request to fire this fuel shall be limited to 110% of the tested rate. If the co-firing of any carbonaceous fuel results in any emissions that are not in accordance with the existing permits, co-firing shall cease as soon as practicable. Co-firing that fuel shall not resume until appropriate actions are taken to correct the problem. The Compliance Authority shall be notified immediately upon such cessation and resumption of co-firing the carbonaceous fuel. [Rules 62-297.310(7)(a)9 and 62-4.070(3), F.A.C.]

16. Test Notification: The permittee shall provide a 5-day advance notice of any scheduled stack tests to afford the Compliance Authority the opportunity to witness the tests. If unavoidable circumstances occur that would delay the stack tests, the permittee shall keep the Compliance Authority informed of the delays and the new schedule. [Rule 62-297.310(7)(a)9, F.A.C.]

17. Test Methods: Required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content *{Permitting Note: Tests performed as necessary to support other methods.}*
5, 5B, 5F or 17	Particulate Matter *{Permitting Note: Testing shall be performed in accordance with the procedures specified in the Title V air operation permit.}*
10	Carbon Monoxide
19	Determination of Mass Emission Rates for Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides *{Permitting Note: Used as necessary to support other methods.}*
18	Organic Compounds *{Permitting Note: As an optional supplement to Method 25A, EPA Method 18 may be performed to determine the fraction of methane and ethane emissions. Otherwise, all compounds measured by Method 25A are assumed to be "volatile organic compounds".}*
25A	Volatile Organic Compounds

The above methods are described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C. Tests shall also be conducted in accordance with the requirements specified in Appendix SC of this permit. Other equivalent methods may be used only if written approval is obtained from the Bureau of Air

Regulation prior to conducting the tests. CO_2, NOx, opacity, and SO_2 emissions shall be determined by data collected with the existing continuous monitoring systems.

[Rules 62-204.800 and 62-297.100, F.A.C.; 40 CFR 60, Appendix A]

RECORDS AND REPORTS

18. Stack Test Reports: The permittee shall prepare and submit reports for all required stack tests in accordance with the requirements specified in Rule 62-297.310(8), F.A.C. All stack test data collected during the field-testing program shall be submitted for review. For each test run, the report shall also indicate the information required by this permit. For each required stack test, the permittee shall submit a written report that summarizes the results within 45 days of completing such test. [Rule 62-297.310(8), F.A.C.]

19. Final Report: Within 90 days of the permit expiration date, the permittee shall submit a report summarizing the following: a description of the entire project; baseline emissions when firing coal; emissions when firing each carbonaceous fuel; ambient conditions during each test; properties of each carbonaceous fuel compared to coal; fuel feed rates; heat input rates; critical ESP parameters (field voltages, rapping intensity, and rapping frequency); and ash resistivity of each carbonaceous fuel compared to coal. The report shall note and discuss any adjustments to the boiler or ESP that were made to accommodate the co-firing of carbonaceous fuels. It shall also detail any operational concerns related to the following items: storage, handling, pulverizing, and charging carbonaceous fuels; co-firing carbonaceous fuels with coal; ash generation; boiler combustion efficiency; and opacity. Finally, the report shall quantify expected NOx reductions and discuss the feasibility of co-firing carbonaceous fuels as a NOx reduction technique. [Rule 62-4.070(3), F.A.C.]

CONTENTS

CITATION FORMATS

The following examples illustrate the format used in the permit to identify applicable permitting actions and regulations.

REFERENCES TO PREVIOUS PERMITTING ACTIONS

Old Permit Numbers

Example: Permit No. AC50-123456 or Air Permit No. AO50-123456

Where: "AC" identifies the permit as an Air Construction Permit
"AO" identifies the permit as an Air Operation Permit
"123456" identifies the specific permit project number

New Permit Numbers

Example: Permit Nos. 099-2222-001-AC, 099-2222-001-AF, 099-2222-001-AO, or 099-2222-001-AV

Where: "099" represents the specific county ID number in which the project is located

"2222" represents the specific facility ID number

"001"identifies the specific permit project

"AC" identifies the permit as an air construction permit

"AF" identifies the permit as a minor federally enforceable state operation permit

"AO" identifies the permit as a minor source air operation permit

"AV" identifies the permit as a Title V Major Source Air Operation Permit

PSD Permit Numbers

Example: Permit No. PSD-FL-317

Where: "PSD" means issued pursuant to the Prevention of Significant Deterioration of Air Quality

"FL" means that the permit was issued by the State of Florida

"317" identifies the specific permit project

RULE CITATION FORMATS

Florida Administrative Code (F.A.C.)

Example: [Rule 62-213.205, F.A.C.]

Means: Title 62, Chapter 213, Rule 205 of the Florida Administrative Code

Code of Federal Regulations (CFR)

Example: [40 CRF 60.7]

Means: Title 40, Part 60, Section 7

SECTION 4. APPENDIX GC

GENERAL CONDITIONS

The permittee shall comply with the following general conditions from Rule 62-4.160, F.A.C.

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

   a. Have access to and copy and records that must be kept under the conditions of the permit;
   b. Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
   c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

   a. A description of and cause of non-compliance; and

   b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

   The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida

Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

    a. Determination of Best Available Control Technology (not applicable to project);
    b. Determination of Prevention of Significant Deterioration (not applicable to project); and
    c. Compliance with New Source Performance Standards (not applicable to project).

14. The permittee shall comply with the following:

    a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

    b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

    c. Records of monitoring information shall include:

        1) The date, exact place, and time of sampling or measurements;
        2) The person responsible for performing the sampling or measurements;
        3) The dates analyses were performed;
        4) The person responsible for performing the analyses;
        5) The analytical techniques or methods used; and
        6) The results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

STANDARD CONDITIONS

{Permitting Note: Unless otherwise specified by permit, the following conditions apply to all emissions units and activities at this facility.}

EMISSIONS AND CONTROLS

1. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify each Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]

2. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]

3. Excess Emissions Allowed: Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. [Rule 62-210.700(1), F.A.C.]

4. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]

5. Excess Emissions - Notification: In case of excess emissions resulting from malfunctions, the permitee shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]

6. VOC or OS Emissions: No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department. [Rule 62-296.320(1), F.A.C.]

7. Objectionable Odor Prohibited: No person shall cause, suffer, allow or permit the discharge of air pollutants, which cause or contribute to an objectionable odor. An "objectionable odor" means any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [Rules 62-296.320(2) and62-210.200(203), F.A.C.]

8. General Visible Emissions: No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20 percent opacity. [Rule 62-296.320(4)(b)1, F.A.C.]

9. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

TESTING REQUIREMENTS

10. Required Number of Test Runs: For mass emission limitations, a compliance test shall consist of three complete and separate determinations of the total air pollutant emission rate through the test section of the stack or duct and three complete and separate determinations of any applicable process variables corresponding to the three distinct time periods during which the stack emission rate was measured; provided, however, that three complete and separate determinations shall not be required if the process variables are not subject to variation during a compliance test, or if three determinations are not necessary in order to calculate the unit's emission rate. The three required test runs shall be completed within one consecutive five-day period. In the event that a sample is lost or one of the three runs must be discontinued because of circumstances beyond the control of the owner or operator, and a valid third run cannot be obtained within the five-day period allowed for the test, the Secretary or his or her designee may accept the results of two complete runs as proof of compliance, provided that the arithmetic mean of the two complete runs is at least 20% below the allowable emission limiting standard. [Rule 62-297.310(1), F.A.C.]

11. Operating Rate During Testing: Testing of emissions shall be conducted with the emissions unit operating at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the maximum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2), F.A.C.]

12. Calculation of Emission Rate: For each emissions performance test, the indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]

13. Test Procedures: Tests shall be conducted in accordance with all applicable requirements of Chapter 62-297, F.A.C.

    a. *Required Sampling Time.* Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes. The minimum observation period for a visible emissions compliance test shall be thirty (30) minutes. The observation period shall include the period during which the highest opacity can reasonably be expected to occur.

    b. *Minimum Sample Volume.* Unless otherwise specified in the applicable rule or test method, the minimum sample volume per run shall be 25 dry standard cubic feet.

    c. *Calibration of Sampling Equipment.* Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C.

    [Rule 62-297.310(4), F.A.C.]

14. Determination of Process Variables

    a. *Required Equipment.* The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

    b. *Accuracy of Equipment.* Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.

    [Rule 62-297.310(5), F.A.C.]

15. Sampling Facilities: The permittee shall install permanent stack sampling ports and provide sampling facilities that meet the requirements of Rule 62-297.310(6), F.A.C.

16. Test Notification: The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator. [Rule 62-297.310(7)(a)9, F.A.C.]

17. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]

18. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide

sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

1. The type, location, and designation of the emissions unit tested.
2. The facility at which the emissions unit is located.
3. The owner or operator of the emissions unit.
4. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
5. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
6. The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.
7. A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
8. The date, starting time and duration of each sampling run.
9. The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
10. The number of points sampled and configuration and location of the sampling plane.
11. For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
12. The type, manufacturer and configuration of the sampling equipment used.
13. Data related to the required calibration of the test equipment.
14. Data on the identification, processing and weights of all filters used.
15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.
19. The detailed calculations for one run that relate the collected data to the calculated emission rate.
20. The applicable emission standard, and the resulting maximum allowable emission rate for the emissions unit, plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rule 62-297.310(8)(c), F.A.C.]

RECORDS AND REPORTS

19. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rules 62-4.160(14) and 62-213.440(1)(b)2, F.A.C.]

20. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

Biomass Testing Phases I & II

Source Testing	Date	Run #	Sanders Time	Generation MW	Sanders CO lb/mmBtu	Sanders NOx lb/mmBtu	CEMS NOx lb/mmBtu	CEMS Opacity %	CEMS CO2 %	CEMS SO2 ppm
Baseline Coal Only	12/17/2003	1	8:07-9:07	78.9	0.01050	ND	0.41	2.94	11.68	618.76
Baseline Coal Only	12/17/2003	2	9:56-10:56	78.4	0.00900	ND	0.40	2.97	11.65	610.60
Baseline Coal Only	12/17/2003	3	11:33-12:33	78.7	0.01060	ND	0.40	3.03	11.41	599.87
Ave of 12/17 Runs 1-3		Ave 1-3		78.7	0.01003	ND	0.40	2.98	11.58	609.74
Carbonaceous	12/19/2003	1	12:04-13:04	78.7	0.05270	ND	0.38	2.74	8.75	493.70
Carbonaceous	12/19/2003	2	13:35-14:36	79.3	0.04520	ND	0.82	2.79	8.91	543.45
Carbonaceous	12/19/2003	3	15:25-17:00	75.9	0.02170	ND	0.58	2.86	8.52	493.02
Ave of 12/19 Runs 1-3		Ave 1-3		78.0	0.03987	ND	0.59	2.80	8.73	510.06
Carbonaceous	2/18/2003	1	9:47-10:47	81.8	0.01262	0.45	0.41	5.37	11.47	343.13
Carbonaceous	2/18/2003	2	12:34-13:34	76.7	0.00855	0.51	0.51	9.49	10.84	451.51
Carbonaceous	2/18/2003	3	13:55-14:55	80.8	0.00776	0.51	0.50	7.82	10.98	465.96
Ave of 2/18 Runs 1-3		Ave 1-3		79.8	0.00964	0.49	0.47	7.56	11.10	420.20
Carbonaceous	2/20/2003	1	15:00-16:00	81.4	0.00498	0.50	0.49	7.19	10.66	287.32
Carbonaceous	2/20/2003	2	16:18-17:18	79.8	0.00693	0.49	0.48	6.11	10.77	286.40
Carbonaceous	2/20/2003	3	17:37-18:37	79.5	0.00619	0.49	0.48	5.99	10.80	295.33
Ave of 2/20 Runs 1-3	2/20/2003	Ave 1-3		80.2	0.00603	0.50	0.48	6.43	10.74	289.68
Carbonaceous	2/21/2003	1	8:14-9:14	81.0	0.00657	0.51	0.48	5.43	10.82	289.22
Carbonaceous	2/21/2003	2	9:27-10:27	80.3	0.00574	0.49	0.47	5.32	10.88	287.44
Carbonaceous	2/21/2003	3	10:41-11:41	80.0	0.00673	0.50	0.48	5.27	10.84	288.03
Ave of 2/21 Runs 1-3	2/21/2003	Ave 1-3		80.4	0.00635	0.50	0.48	5.34	10.85	288.23
Baseline Coal Only	5/2/2003	1	6:34-7:40	80.1	0.00591	0.39	0.38	8.98	12.18	355.94
Baseline Coal Only	5/2/2003	2	8:22-9:28	79.9	0.00594	0.40	0.38	8.33	12.21	349.60
Baseline Coal Only	5/2/2003	3	10:05-11:12	80.3	0.00497	0.40	0.37	8.46	12.26	346.78
Ave of 5/2 Runs 1-3	5/2/2003	Ave 1-3		80.1	0.00561	0.39	0.37	8.59	12.22	350.77

ND = Not Determined

PhaseI&IIbiomass-summary.xls

Run 1 (Baseline Coal) 12/17/03

Record#	DATE	TIME	CO212	GEN13	SO214	NOXRT15	OPAC17
			%	MW	ppm	lb/mmBtu	%
1	12/17/2002	80900	11.78	79.85	631.3	0.408	2.99
2	12/17/2002	81000	11.7	79.81	623.5	0.413	2.97
3	12/17/2002	81100	11.65	79.43	621.5	0.411	2.97
4	12/17/2002	81200	11.65	79.32	618	0.414	2.96
5	12/17/2002	81300	11.56	79.6	615.1	0.418	2.9
6	12/17/2002	81400	11.65	79.81	620.9	0.413	2.96
7	12/17/2002	81500	11.74	80.11	625.5	0.41	2.87
8	12/17/2002	81600	11.75	80.05	627.4	0.407	3.01
9	12/17/2002	81700	11.73	80.4	625.3	0.408	2.96
10	12/17/2002	81800	11.74	80.5	623.5	0.403	3
11	12/17/2002	81900	11.76	80.7	626.9	0.401	3.06
12	12/17/2002	82000	11.79	80.93	625	0.402	2.93
13	12/17/2002	82100	11.8	81.34	629.4	0.399	3
14	12/17/2002	82200	11.81	81.35	632.8	0.396	2.99
15	12/17/2002	82300	11.81	81.43	633.2	0.396	2.93
16	12/17/2002	82400	11.82	81.34	628	0.399	3
17	12/17/2002	82500	11.73	81.51	628.6	0.405	3.04
18	12/17/2002	82600	11.77	81.72	628.4	0.405	2.95
19	12/17/2002	82700	11.79	81.67	631	0.405	3.01
20	12/17/2002	82800	11.85	80.98	632.3	0.397	3.17
21	12/17/2002	82900	11.75	80.62	623.1	0.409	3
22	12/17/2002	83000	11.55	79.93	616.7	0.419	3.16
23	12/17/2002	83100	11.55	79.76	614.9	0.424	2.98
24	12/17/2002	83200	11.46	79.53	613	0.423	2.96
25	12/17/2002	83300	11.48	79.2	615	0.418	2.97
26	12/17/2002	83400	11.54	78.76	617.6	0.415	3
27	12/17/2002	83500	11.59	78.72	619.2	0.415	2.96
28	12/17/2002	83600	11.53	78.67	615.3	0.415	2.97
29	12/17/2002	83700	11.55	78.91	620.9	0.41	2.91
30	12/17/2002	83800	11.6	79.07	621.5	0.406	2.97
31	12/17/2002	83900	11.65	79.29	622.2	0.401	2.93
32	12/17/2002	84000	11.71	79.28	624.5	0.4	2.95
33	12/17/2002	84100	11.64	79.23	622	0.404	2.93
34	12/17/2002	84200	11.65	79.41	621.3	0.404	2.91
35	12/17/2002	84300	11.69	79.33	623.8	0.399	2.94
36	12/17/2002	84400	11.71	79.29	622.6	0.4	2.95
37	12/17/2002	84500	11.65	79.32	622	0.403	3.01
38	12/17/2002	84600	11.72	79.14	622.2	0.397	2.97
39	12/17/2002	84700	11.73	78.97	622	0.4	2.94
40	12/17/2002	84800	11.67	79.44	618	0.406	2.97
41	12/17/2002	84900	11.57	79.39	619	0.406	2.93
42	12/17/2002	85000	11.73	79.09	622.9	0.4	2.86
43	12/17/2002	85100	11.67	78.94	619.1	0.405	2.83
44	12/17/2002	85200	11.61	78.84	615.3	0.406	2.88
45	12/17/2002	85300	11.56	78.87	612.3	0.409	2.93
46	12/17/2002	85400	11.63	79.13	613.9	0.406	2.91
47	12/17/2002	85500	11.68	79.01	616.1	0.402	2.88
48	12/17/2002	85600	11.7	78.77	616.3	0.401	2.86
49	12/17/2002	85700	11.63	78.71	611.6	0.407	2.89
50	12/17/2002	85800	11.63	78.7	610.3	0.406	2.92
51	12/17/2002	85900	11.63	78.65	610	0.403	2.93
52	12/17/2002	90000	11.67	78.59	609.6	0.403	3
53	12/17/2002	90100	11.64	78.68	609.2	0.403	2.95
54	12/17/2002	90200	11.63	78.55	609.8	0.403	2.88
55	12/17/2002	90300	11.69	78.88	612.2	0.398	2.85
56	12/17/2002	90400	11.68	79.18	612.1	0.399	2.84
57	12/17/2002	90500	11.73	79.22	612.8	0.398	2.93
58	12/17/2002	90600	11.73	78.91	613.5	0.398	2.84
59	12/17/2002	90700	11.72	78.82	610.7	0.4	2.88
60	12/17/2002	90800	11.59	79.13	605.3	0.404	2.95
61	12/17/2002	90900	11.67	78.9	610.2	0.4	2.92
62	12/17/2002	91000	11.69	78.89	610.5	0.4	2.9
63	12/17/2002	91100	11.66	78.96	607.8	0.402	2.95
64	12/17/2002	91200	11.66	79.08	608.8	0.4	2.9
65	12/17/2002	91300	11.68	79.15	610	0.398	2.84
66	12/17/2002	91400	11.69	79.22	612.5	0.397	2.78
67	12/17/2002	91500	11.69	79.42	614.2	0.394	2.89
68	12/17/2002	91600	11.76	79.44	614.5	0.393	2.92
69	/ /						
70	/ /	AVE	11.675	79.542	618.763	0.405	2.943

run1coaldbfhist.xls

Run 2 (Coal Baseline) 12/17/03

Record#	DATE	TIME	CO212	GEN13	SO214	NOXRT15	OPAC17
			%	MW	ppm	lb/mmBtu	%
1	12/17/2002	95700	11.52	78.5	602.9	0.404	2.95
2	12/17/2002	95800	11.57	78.57	608.3	0.408	3.1
3	12/17/2002	95900	11.6	78.62	608.2	0.403	3.1
4	12/17/2002	100000	11.62	78.8	611.9	0.401	3.07
5	12/17/2002	100100	11.66	78.79	612.7	0.4	2.96
6	12/17/2002	100200	11.68	78.68	612.5	0.399	3.04
7	12/17/2002	100300	11.67	78.58	608.9	0.403	3.02
8	12/17/2002	100400	11.64	78.63	606.7	0.404	3.02
9	12/17/2002	100500	11.61	78.68	607.3	0.405	2.97
10	12/17/2002	100600	11.61	78.91	608	0.404	2.97
11	12/17/2002	100700	11.64	78.72	611	0.4	3
12	12/17/2002	100800	11.63	78.72	608.4	0.403	2.85
13	12/17/2002	100900	11.61	78.76	606.1	0.401	2.91
14	12/17/2002	101000	11.68	78.8	606.1	0.398	2.97
15	12/17/2002	101100	11.66	78.86	606.9	0.398	2.96
16	12/17/2002	101200	11.67	78.68	609.5	0.398	2.85
17	12/17/2002	101300	11.64	78.69	608.7	0.399	2.85
18	12/17/2002	101400	11.64	78.73	608.4	0.401	2.93
19	12/17/2002	101500	11.67	78.73	609.1	0.396	2.92
20	12/17/2002	101600	11.65	78.95	609.1	0.397	2.92
21	12/17/2002	101700	11.69	79.09	611.3	0.396	2.9
22	12/17/2002	101800	11.7	78.99	614	0.397	2.97
23	12/17/2002	101900	11.73	78.81	613.8	0.398	2.97
24	12/17/2002	102000	11.64	78.91	611.3	0.403	2.95
25	12/17/2002	102100	11.63	78.72	609.7	0.402	3.77
26	12/17/2002	102200	11.61	78.9	610.3	0.402	2.9
27	12/17/2002	102300	11.63	78.97	610.3	0.405	2.87
28	12/17/2002	102400	11.63	78.79	610.2	0.402	2.9
29	12/17/2002	102500	11.64	79	613.3	0.403	2.92
30	12/17/2002	102600	11.69	79	614.1	0.4	2.97
31	12/17/2002	102700	11.7	78.89	611.8	0.396	2.84
32	12/17/2002	102800	11.65	78.86	606.4	0.402	2.96
33	12/17/2002	102900	11.56	78.77	606.8	0.403	2.93
34	12/17/2002	103000	11.62	78.82	609.5	0.402	2.88
35	12/17/2002	103100	11.63	78.87	610.9	0.403	2.96
36	12/17/2002	103200	11.65	78.82	612.1	0.402	2.92
37	12/17/2002	103300	11.63	78.69	613.2	0.401	2.95
38	12/17/2002	103400	11.65	78.66	612.1	0.399	2.9
39	12/17/2002	103500	11.65	78.86	613.2	0.4	2.95
40	12/17/2002	103600	11.67	78.78	613.4	0.397	2.96
41	12/17/2002	103700	11.68	79.07	617.3	0.399	2.91
42	12/17/2002	103800	11.67	79.15	612.2	0.402	2.88
43	12/17/2002	103900	11.62	79.01	611.7	0.4	3.07
44	12/17/2002	104000	11.66	78.96	611.6	0.399	3.07
45	12/17/2002	104100	11.65	79.01	613.5	0.398	2.99
46	12/17/2002	104200	11.66	78.85	612.8	0.395	2.97
47	12/17/2002	104300	11.67	79.12	614.3	0.399	2.97
48	12/17/2002	104400	11.62	79.21	615.6	0.397	2.92
49	12/17/2002	104500	11.69	79.31	613.7	0.395	2.85
50	12/17/2002	104600	11.63	78.97	612.4	0.401	3.02
51	12/17/2002	104700	11.63	78.96	609.4	0.405	3.01
52	12/17/2002	104800	11.63	79	604.8	0.403	2.93
53	12/17/2002	104900	11.63	78.78	608.3	0.399	3.02
54	12/17/2002	105000	11.67	78.88	608.8	0.4	2.91
55	12/17/2002	105100	11.65	78.96	609.3	0.398	2.92
56	12/17/2002	105200	11.64	78.98	609.8	0.398	2.96
57	12/17/2002	105300	11.68	78.98	607.8	0.396	3.02
58	12/17/2002	105400	11.66	79.17	609.4	0.397	2.95
59	12/17/2002	105500	11.68	78.92	609.5	0.393	2.97
60	12/17/2002	105600	11.69	78.91	612.5	0.397	2.89
61	12/17/2002	105700	11.66	79.01	610.4	0.4	2.95
62	12/17/2002	105800	11.66	79.05	610.2	0.4	2.93
63	12/17/2002	105900	11.7	79.18	611.8	0.396	2.99
64	12/17/2002	110000	11.68	78.97	611.7	0.398	2.93
65	12/17/2002	110100	11.63	79.1	611.5	0.4	2.94
66	12/17/2002	110200	11.62	79.37	611.6	0.401	2.95
67	12/17/2002	110300	11.69	79.04	614.7	0.395	2.97
68	12/17/2002	110400	11.68	79	614.7	0.4	3.06
69	12/17/2002	110500	11.6	79.01	611.8	0.405	3.01
70	/ /						
71	/ /	AVE	11.648	78.892	610.601	0.4	2.967

run2coaldbfhist.xls

Run 3 (Baseline Coal) 12/17/02

Record#	DATE	TIME	CO212	GEN13	SO214	NOXRT15	OPAC17
			%	MW	ppm	lb/mmBtu	%
1	12/17/2002	113300	11.68	78.39	619.6	0.404	3.2
2	12/17/2002	113400	11.61	78.43	618.2	0.405	3.11
3	12/17/2002	113500	11.63	78.3	621.8	0.399	3.08
4	12/17/2002	113600	11.71	78.34	625.4	0.394	3.14
5	12/17/2002	113700	11.71	78.41	628	0.394	3.02
6	12/17/2002	113800	11.7	78.33	625.8	0.399	3.08
7	12/17/2002	113900	11.65	78.49	622.2	0.398	3.07
8	12/17/2002	114000	11.63	78.6	619.9	0.4	2.99
9	12/17/2002	114100	11.66	78.61	618.4	0.396	3.04
10	12/17/2002	114200	11.64	78.37	615.4	0.396	3.08
11	12/17/2002	114300	11.66	78.5	620.2	0.397	3.14
12	12/17/2002	114400	11.7	78.5	620.7	0.396	3.11
13	12/17/2002	114500	11.69	78.39	620.3	0.395	3.06
14	12/17/2002	114600	11.7	78.3	619.8	0.397	3.15
15	12/17/2002	114700	11.66	78.33	618.3	0.4	3.06
16	12/17/2002	114800	11.69	78.55	617.4	0.399	2.93
17	12/17/2002	114900	11.65	78.78	621.6	0.395	3.01
18	12/17/2002	115000	11.7	78.61	629.3	0.392	3.02
19	12/17/2002	115100	11.79	78.87	629.9	0.39	3.02
20	12/17/2002	115200	11.67	78.65	621	0.399	3
21	12/17/2002	115300	11.68	78.49	622.5	0.398	3.06
22	12/17/2002	115400	11.65	78.22	619.1	0.401	2.98
23	12/17/2002	115500	11.65	78.22	618.5	0.402	3.09
24	12/17/2002	115600	11.67	77.91	615.1	0.402	3.04
25	12/17/2002	115700	11.6	78.09	614.2	0.403	3.06
26	12/17/2002	115800	11.61	77.84	612.3	0.403	3.07
27	12/17/2002	115900	11.67	78	610.3	0.401	3.06
28	12/17/2002	120000	11.63	77.97	609.2	0.402	2.96
29	12/17/2002	120100	11.67	78.04	592	0.364	2.92
30	12/17/2002	120200	7.85	78	315.1	0.289	3
31	12/17/2002	120300	7.76	77.95	473.3	0.51	2.96
32	12/17/2002	120400	10.12	78.1	548	0.413	2.97
33	12/17/2002	120500	10.71	78.28	564.2	0.395	3.04
34	12/17/2002	120600	10.87	78.31	571.7	0.39	2.94
35	12/17/2002	120700	11.01	78.09	575.3	0.39	3.08
36	12/17/2002	120800	11.05	78.45	575.8	0.397	2.97
37	12/17/2002	120900	11.1	78.34	576.5	0.396	3.04
38	12/17/2002	121000	11.21	78.38	580	0.388	3.14
39	12/17/2002	121100	11.25	78.35	578.3	0.389	2.95
40	12/17/2002	121200	11.26	78.23	584	0.39	3.06
41	12/17/2002	121300	11.32	78.57	587.3	0.391	3.04
42	12/17/2002	121400	11.41	78.29	592.5	0.392	2.97
43	12/17/2002	121500	11.42	78.32	593.6	0.393	3.01
44	12/17/2002	121600	11.32	78.46	590.9	0.397	3.02
45	12/17/2002	121700	11.45	78.28	596.5	0.391	2.97
46	12/17/2002	121800	11.43	78.19	591.6	0.398	3.02
47	12/17/2002	121900	11.39	78.6	594.4	0.401	3.08
48	12/17/2002	122000	11.44	78.64	598.5	0.397	2.99
49	12/17/2002	122100	11.57	78.51	606	0.39	3.05
50	12/17/2002	122200	11.56	78.65	608.2	0.391	3.06
51	12/17/2002	122300	11.51	78.59	602.5	0.398	2.99
52	12/17/2002	122400	11.51	78.39	604.2	0.395	3.04
53	12/17/2002	122500	11.55	78.22	606.1	0.394	2.98
54	12/17/2002	122600	11.56	78.3	608.1	0.395	3.06
55	12/17/2002	122700	11.6	78.4	605.2	0.394	3.01
56	12/17/2002	122800	11.53	78.45	604.5	0.4	3.02
57	12/17/2002	122900	11.52	78.55	606.6	0.4	2.98
58	12/17/2002	123000	11.67	78.32	608.3	0.395	3.03
59	12/17/2002	123100	11.65	78.62	607.3	0.396	3.06
60	12/17/2002	123200	11.63	78.54	605.9	0.398	2.99
61	12/17/2002	123300	11.67	78.39	608.5	0.393	2.95
62	12/17/2002	123400	11.64	78.52	607.7	0.396	2.98
63	12/17/2002	123500	11.63	78.46	607.4	0.397	3.02
64	12/17/2002	123600	11.7	78.52	611.5	0.393	2.96
65	12/17/2002	123700	11.63	78.58	609	0.396	3.03
66	12/17/2002	123800	11.64	78.73	609	0.396	3.06
67	12/17/2002	123900	11.63	78.5	608.6	0.396	3.07
68	12/17/2002	124000	11.66	78.42	611.9	0.395	3.08
69	12/17/2002	124100	11.64	78.37	610.4	0.398	3
70	/ /						
71	/ /	AVE	11.412	78.382	599.867	0.396	3.032

run3coaldbfhist.xls

Run 1 (Saw Dust) 12/19/03

Record#	DATE	TIME	CO212	GEN13	SO214	NOXRT15	OPAC17
			%	MW	ppm	lb/mmBtu	%
1	12/19/2002	120400	7.99	76.56	458.9	0.399	2.78
2	12/19/2002	120500	8.42	76.49	470.8	0.379	2.83
3	12/19/2002	120600	8.49	76.66	470.4	0.38	2.88
4	12/19/2002	120700	8.49	76.52	470.1	0.381	2.81
5	12/19/2002	120800	8.55	76.89	476.8	0.381	2.86
6	12/19/2002	120900	8.6	77.36	480.9	0.379	2.79
7	12/19/2002	121000	8.7	77.51	486.2	0.373	2.73
8	12/19/2002	121100	8.73	77.72	491	0.373	2.79
9	12/19/2002	121200	8.76	78.63	490	0.373	2.7
10	12/19/2002	121300	8.82	79.2	496.3	0.366	2.73
11	12/19/2002	121400	8.92	79.94	503.1	0.358	2.73
12	12/19/2002	121500	9.01	80.59	510.5	0.353	2.73
13	12/19/2002	121600	9.03	80.94	513.1	0.348	2.71
14	12/19/2002	121700	9.04	81.11	512.6	0.352	2.7
15	12/19/2002	121800	9	81.07	513	0.354	2.69
16	12/19/2002	121900	8.94	81.98	508.1	0.357	2.76
17	12/19/2002	122000	9.01	82.57	516.7	0.343	2.63
18	12/19/2002	122100	9.2	83.47	527.9	0.332	2.65
19	12/19/2002	122200	9.24	84.43	531.1	0.329	2.55
20	12/19/2002	122300	9.32	85.28	542.3	0.321	2.73
21	12/19/2002	122400	9.42	86.06	542.6	0.318	3.22
22	12/19/2002	122500	9.42	86.44	550.8	0.31	3.1
23	12/19/2002	122600	9.51	84.47	558.6	0.306	2.67
24	12/19/2002	122700	9.39	80.97	535.6	0.333	2.78
25	12/19/2002	122800	8.89	78.35	491.7	0.382	2.78
26	12/19/2002	122900	8.37	76.48	462.3	0.419	2.83
27	12/19/2002	123000	8.08	75.64	452.5	0.44	2.7
28	12/19/2002	123100	8.04	75.17	456.5	0.439	2.68
29	12/19/2002	123200	8.26	75.11	466.7	0.42	2.64
30	12/19/2002	123300	8.44	75.69	477.4	0.404	2.66
31	12/19/2002	123400	8.61	76.06	488.4	0.392	2.74
32	12/19/2002	123500	8.71	76.53	493.1	0.382	2.79
33	12/19/2002	123600	8.81	77.25	494.8	0.377	2.67
34	12/19/2002	123700	8.8	77.27	498.7	0.375	2.69
35	12/19/2002	123800	8.82	77.27	496.8	0.378	2.68
36	12/19/2002	123900	8.79	77.59	492.3	0.389	2.77
37	12/19/2002	124000	8.73	78.13	492	0.388	2.75
38	12/19/2002	124100	8.76	78.75	496.4	0.383	2.69
39	12/19/2002	124200	8.86	79.17	506.4	0.371	2.66
40	12/19/2002	124300	8.89	79.59	506.2	0.371	2.66
41	12/19/2002	124400	8.93	79.82	502.7	0.373	2.74
42	12/19/2002	124500	8.86	79.9	499.5	0.376	2.76
43	12/19/2002	124600	8.94	79.86	500	0.376	2.66
44	12/19/2002	124700	8.87	79.8	496.4	0.383	2.56
45	12/19/2002	124800	8.87	79.24	493.7	0.383	2.74
46	12/19/2002	124900	8.8	78.58	489	0.393	2.67
47	12/19/2002	125000	8.74	77.92	483.7	0.399	2.69
48	12/19/2002	125100	8.64	77.48	476	0.404	2.74
49	12/19/2002	125200	8.6	77.99	478.2	0.408	2.7
50	12/19/2002	125300	8.63	78.27	484	0.409	2.8
51	12/19/2002	125400	8.79	78.85	499	0.393	2.68
52	12/19/2002	125500	8.81	78.74	497.9	0.392	2.72
53	12/19/2002	125600	8.83	78.46	498.2	0.389	2.73
54	12/19/2002	125700	8.72	77.84	488	0.397	2.68
55	12/19/2002	125800	8.59	77.26	481.4	0.402	2.72
56	12/19/2002	125900	8.54	76.71	475.8	0.408	2.74
57	12/19/2002	130000	8.49	76.36	471.5	0.411	2.72
58	12/19/2002	130100	8.45	75.79	471.7	0.41	2.81
59	12/19/2002	130200	8.48	75.62	472.7	0.408	2.77
60	12/19/2002	130300	8.45	75.65	471.9	0.409	2.68
61	12/19/2002	130400	8.48	76.3	475.3	0.404	2.75
62	12/19/2002	130500	8.5	76.81	478.3	0.396	2.7
63	12/19/2002	130600	8.61	77.22	488.4	0.387	2.7
64	/ /						
65	/ /	AVE	8.754	78.689	493.697	0.38	2.737

Run 2 (Saw Dust) 12-19-02

Record#	DATE	TIME	CO212	GEN13	SO214	NOXRT15	OPAC17
			%	MW	ppm	lb/mmBtu	%
1	12/19/2002	133700	8.73	76.11	519.8	0.849	2.82
2	12/19/2002	133800	8.61	75.61	515.4	0.869	2.93
3	12/19/2002	133900	8.56	75.44	511.7	0.881	2.79
4	12/19/2002	134000	8.52	75.18	516.9	0.879	2.88
5	12/19/2002	134100	8.59	74.83	520.1	0.872	2.85
6	12/19/2002	134200	8.53	74.62	515	0.881	2.85
7	12/19/2002	134300	8.45	74.75	510	0.895	2.88
8	12/19/2002	134400	8.44	74.3	515.7	0.887	2.92
9	12/19/2002	134500	8.52	73.94	518.9	0.885	2.88
10	12/19/2002	134600	8.43	73.42	509.1	0.897	2.84
11	12/19/2002	134700	8.3	72.58	507.7	0.91	2.91
12	12/19/2002	134800	8.27	72.31	499.4	0.919	2.79
13	12/19/2002	134900	8.1	72.75	494.3	0.935	2.81
14	12/19/2002	135000	8.17	73.77	505.3	0.919	2.88
15	12/19/2002	135100	8.42	74.18	520.5	0.881	2.85
16	12/19/2002	135200	8.67	75.05	527.2	0.847	2.82
17	12/19/2002	135300	8.61	75.41	528.2	0.857	2.86
18	12/19/2002	135400	8.74	75.61	532.5	0.846	2.95
19	12/19/2002	135500	8.7	75.12	523.8	0.852	2.84
20	12/19/2002	135600	8.55	75.35	520.9	0.879	2.8
21	12/19/2002	135700	8.51	75.35	517.7	0.884	2.84
22	12/19/2002	135800	8.57	75.52	523.8	0.868	2.88
23	12/19/2002	135900	8.54	75.66	521.9	0.862	2.87
24	12/19/2002	140000	8.54	75.92	522.2	0.857	2.79
25	12/19/2002	140100	8.54	76.82	524.5	0.853	2.86
26	12/19/2002	140200	8.67	77.59	532.6	0.837	2.83
27	12/19/2002	140300	8.87	78.53	542.2	0.813	2.81
28	12/19/2002	140400	8.96	79.35	546.5	0.804	2.77
29	12/19/2002	140500	9.06	80.38	553.1	0.793	2.73
30	12/19/2002	140600	9.06	81.52	555.4	0.789	2.77
31	12/19/2002	140700	9.13	82.17	562.1	0.781	2.84
32	12/19/2002	140800	9.24	82.95	565.5	0.763	2.78
33	12/19/2002	140900	9.25	83.32	568.7	0.764	2.72
34	12/19/2002	141000	9.31	83.82	568.5	0.761	2.75
35	12/19/2002	141100	9.32	84.47	569	0.759	2.79
36	12/19/2002	141200	9.41	84.85	577.7	0.747	2.71
37	12/19/2002	141300	9.4	85.11	575.7	0.75	2.81
38	12/19/2002	141400	9.38	85.48	574.9	0.752	2.78
39	12/19/2002	141500	9.38	85.24	574.7	0.75	2.8
40	12/19/2002	141600	9.4	85.15	573.7	0.753	2.79
41	12/19/2002	141700	9.4	84.83	571.1	0.753	2.74
42	12/19/2002	141800	9.28	84.68	567.3	0.763	2.71
43	12/19/2002	141900	9.3	84.18	571.3	0.761	2.78
44	12/19/2002	142000	9.34	84.04	569.5	0.754	2.67
45	12/19/2002	142100	9.3	83.64	571.1	0.76	2.65
46	12/19/2002	142200	9.32	83.39	567.7	0.762	2.72
47	12/19/2002	142300	9.24	82.5	568.6	0.766	2.81
48	12/19/2002	142400	9.26	82.1	562.3	0.772	2.71
49	12/19/2002	142500	9.12	81.6	553.9	0.794	2.76
50	12/19/2002	142600	9.08	81.25	554.4	0.795	2.64
51	12/19/2002	142700	9.08	80.82	552.3	0.799	2.73
52	12/19/2002	142800	9.12	80.53	556.7	0.793	2.7
53	12/19/2002	142900	9.1	80.33	552.3	0.798	2.76
54	12/19/2002	143000	9.06	80.7	548.7	0.801	2.74
55	12/19/2002	143100	9.04	81.07	555.3	0.799	2.67
56	12/19/2002	143200	9.18	81.1	562.2	0.777	2.73
57	12/19/2002	143300	9.25	81.35	560	0.771	2.71
58	12/19/2002	143400	9.17	81.49	558.4	0.782	2.69
59	12/19/2002	143500	9.19	81.89	560.2	0.779	2.73
60	12/19/2002	143600	9.2	81.8	564.5	0.776	2.74
61	12/19/2002	143700	9.26	81.51	560.1	0.773	2.69
62	/ /						
63	/ /	AVE	8.914	79.251	543.454	0.818	2.789

run2carbdbfhistreport.xls

Run 3 (Saw Dust) 12-19-02

Record#	DATE	TIME	CO212	GEN13	SO214	NOXRT15	OPAC17
			%	MW	PPM	lb/mmBtu	%
1	12/19/2002	152500	8.92	79.41	540.7	0.813	2.73
2	12/19/2002	152600	8.95	79.87	540.4	0.809	2.82
3	12/19/2002	152700	8.87	80.22	537.3	0.818	2.8
4	12/19/2002	152800	8.96	80.14	543.1	0.807	2.8
5	12/19/2002	152900	9	79.93	544.9	0.804	2.74
6	12/19/2002	153000	8.88	80.11	535.2	0.826	2.75
7	12/19/2002	153100	8.88	80.03	537.9	0.822	2.75
8	12/19/2002	153200	8.98	79.73	542.1	0.812	2.71
9	12/19/2002	153300	8.92	79.28	539.3	0.819	2.74
10	12/19/2002	153400	8.9	79.25	535.4	0.821	2.78
11	12/19/2002	153500	8.81	79.15	536.2	0.827	2.82
12	12/19/2002	153600	8.88	79.05	537.5	0.822	2.82
13	12/19/2002	153700	8.88	78.94	539.1	0.822	2.78
14	12/19/2002	153800	8.86	78.84	533.5	0.821	2.7
15	12/19/2002	153900	8.6	78.43	536.4	0.829	2.76
16	12/19/2002	154000	8.89	78.26	537.5	0.827	2.78
17	12/19/2002	154100	8.88	77.88	534.4	0.828	2.87
18	12/19/2002	154200	8.77	77.64	529.2	0.842	2.75
19	12/19/2002	154300	8.76	77.56	530.4	0.843	2.91
20	12/19/2002	154400	8.77	77.74	528.5	0.846	2.84
21	12/19/2002	154500	8.84	77.79	534.4	0.836	2.84
22	12/19/2002	154600	8.84	77.89	533.9	0.837	2.86
23	12/19/2002	154700	8.87	77.96	533.8	0.832	2.81
24	12/19/2002	154800	8.91	77.5	532.9	0.824	2.86
25	12/19/2002	154900	8.83	76.66	532.2	0.831	2.83
26	12/19/2002	155000	8.67	75.29	523.6	0.852	2.92
27	12/19/2002	155100	8.51	73.53	509.4	0.874	2.87
28	12/19/2002	155200	8.29	71.09	494.9	0.901	2.88
29	12/19/2002	155300	7.93	69.93	468.1	0.946	2.85
30	12/19/2002	155400	7.63	69.13	459.6	0.989	2.92
31	12/19/2002	155500	7.71	68.54	471.2	0.986	2.9
32	12/19/2002	155600	7.86	67.82	476.5	0.968	2.95
33	12/19/2002	155700	7.91	68.02	480.8	0.97	2.86
34	12/19/2002	155800	7.86	67.82	478.8	0.981	2.96
35	12/19/2002	155900	8.05	66.59	493.9	0.957	2.9
36	12/19/2002	160000	8	64.03	482.7	0.97	2.91
37	12/19/2002	160100	7.8	63.17	463.8	0.964	2.88
38	12/19/2002	160200	5.09	64.25	231.6	0.55	2.91
39	12/19/2002	160300	5.18	65.96	358	0.619	2.9
40	12/19/2002	160400	7.26	66.84	432.3	0.449	2.93
41	12/19/2002	160500	7.74	68.55	444.6	0.429	3
42	12/19/2002	160600	7.81	67.58	443.2	0.436	2.98
43	12/19/2002	160700	7.86	68.98	444.8	0.441	2.94
44	12/19/2002	160800	7.83	67.58	444.3	0.448	2.89
45	12/19/2002	160900	7.86	69.85	442.5	0.452	2.91
46	12/19/2002	161000	7.91	70.37	453	0.451	2.93
47	12/19/2002	161100	8.2	71.6	472	0.435	2.91
48	12/19/2002	161200	8.1	71.32	460.2	0.441	2.98
49	12/19/2002	161300	8.12	70.33	462.8	0.444	2.96
50	12/19/2002	161400	8.03	70.19	451.8	0.457	2.97
51	12/19/2002	161500	7.94	71.42	451.2	0.461	2.91
52	12/19/2002	161600	8.07	72.99	463.3	0.45	2.92
53	12/19/2002	161700	8.32	74.74	477.8	0.434	2.93
54	12/19/2002	161800	8.44	76.19	483.9	0.423	2.97
55	12/19/2002	161900	8.49	77.1	488.6	0.418	2.82
56	12/19/2002	162000	8.57	77.26	490.1	0.415	2.92
57	12/19/2002	162100	8.56	77.24	494.3	0.414	2.76
58	12/19/2002	162200	8.65	77.41	497.1	0.406	2.96
59	12/19/2002	162300	8.64	77.84	494.7	0.407	2.77
60	12/19/2002	162400	8.66	78.88	497.1	0.397	2.87
61	12/19/2002	162500	8.82	79.76	509.1	0.376	2.8
62	12/19/2002	162600	8.96	80.61	513.8	0.365	2.78
63	12/19/2002	162700	9.04	81.96	519.3	0.359	2.77
64	12/19/2002	162800	9.16	81.85	529.5	0.34	2.79
65	12/19/2002	162900	9.3	79.66	535.5	0.34	2.93
66	12/19/2002	163000	8.96	78.28	494.2	0.377	2.88
67	12/19/2002	163100	8.29	77.93	461.8	0.417	2.79
68	12/19/2002	163200	8.23	78.49	467.5	0.41	2.85
69	12/19/2002	163300	8.59	78.81	490.8	0.384	2.69
70	12/19/2002	163400	8.89	78.51	503.8	0.369	2.9
71	12/19/2002	163500	8.91	78.09	499.7	0.374	2.86
72	12/19/2002	163600	8.78	77.9	493.1	0.386	2.81
73	12/19/2002	163700	8.75	78.4	487.9	0.396	3.03
74	12/19/2002	163800	8.74	78.21	492.3	0.389	2.87
75	12/19/2002	163900	8.84	78.11	497.1	0.381	2.88
76	12/19/2002	164000	8.84	78.68	492.3	0.385	2.93
77	12/19/2002	164100	8.82	79.03	492.5	0.377	2.82
78	12/19/2002	164200	8.93	79.83	497.1	0.363	2.9
79	12/19/2002	164300	9	80.02	502.8	0.353	2.89
80	12/19/2002	164400	9.11	80.72	501.7	0.35	2.82
81	12/19/2002	164500	9.05	80.87	501.3	0.351	2.85
82	12/19/2002	164600	9.07	80.22	504.8	0.348	2.91
83	12/19/2002	164700	9.03	79.6	497.4	0.359	2.86
84	12/19/2002	164800	8.84	78.98	485.2	0.375	2.95
85	12/19/2002	164900	8.73	78.72	484.9	0.384	2.95
86	12/19/2002	165000	8.78	78.3	484.5	0.381	2.91
87	12/19/2002	165100	8.77	78.02	486	0.381	2.86
88	12/19/2002	165200	8.77	78.26	482.3	0.383	2.94
89	12/19/2002	165300	8.75	77.94	483.9	0.381	2.85
90	12/19/2002	165400	8.8	77.6	485.5	0.381	2.9
91	12/19/2002	165500	8.78	77.28	482.8	0.386	2.9
92	12/19/2002	165600	8.74	76.96	481.9	0.388	2.92
93	12/19/2002	165700	8.72	77.04	478.3	0.391	2.76
94	12/19/2002	165800	8.66	76.98	477.9	0.396	2.91
95	12/19/2002	165900	8.74	77.38	481	0.393	2.89
96	12/19/2002	170000	8.73	77.72	481.4	0.392	2.82
97	12/19/2002	170100	8.8	77.98	483.1	0.383	2.89
98	12/19/2002	170200	8.84	77.86	483.6	0.384	2.91
99	/ /						
100	/ /	AVE	8.52	75.931	493.023	0.577	2.864

Carb Test Run 1 - 2/18/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	2/18/2003	94700	3.97	0.417	11.45	444.6
2	2/18/2003	95300	4.99	0.388	11.64	401.6
3	2/18/2003	95900	5.4	0.389	11.74	379.2
4	2/18/2003	100500	5.78	0.408	11.48	357.3
5	2/18/2003	101100	5.47	0.42	11.37	342
6	2/18/2003	101700	5.62	0.413	11.49	331.5
7	2/18/2003	102300	5.79	0.42	11.5	317.6
8	2/18/2003	102900	5.67	0.431	11.46	308
9	2/18/2003	103500	5.31	0.426	11.21	298.8
10	2/18/2003	104100	5.56	0.413	11.38	296.5
11	2/18/2003	104700	5.51	0.399	11.47	297.3
12	/ /					
13	/ /	AVE	5.37	0.411	11.472	343.127

Generation = 81.8 MW

run1carb2-18-03.xls

Carb Test Run 2 - 2/18/03

Record #	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
			%	lb/mmBtu	%	ppm
1	2/18/2003	123400	6.75	0.542	10.58	405.5
2	2/18/2003	124000	6.4	0.533	10.61	422.2
3	2/18/2003	124600	7.05	0.52	10.7	437.4
4	2/18/2003	125200	7.59	0.477	11.06	456.1
5	2/18/2003	125800	10.05	0.488	10.97	455.7
6	2/18/2003	130400	13.51	0.493	10.91	458.3
7	2/18/2003	131000	13.96	0.503	10.87	462.7
8	2/18/2003	131600	12.92	0.504	10.89	463
9	2/18/2003	132200	10.75	0.508	10.85	463.3
10	2/18/2003	132800	8.43	0.503	10.91	468.6
11	2/18/2003	133400	6.94	0.506	10.92	473.8
12	/ /					
13	/ /	AVE	9.486	0.507	10.843	451.509

Generation = 76.7 MW

run2carb2-18-03.xls

Carb Test Run 3 - 2/18/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	2/18/2003	135500	7.92	0.494	11.01	462.5
2	2/18/2003	140100	12.29	0.503	10.9	463.4
3	2/18/2003	140700	14.53	0.498	10.95	476
4	2/18/2003	141300	9.05	0.5	10.95	476.3
5	2/18/2003	141900	6.33	0.494	11.02	469.1
6	2/18/2003	142500	6.16	0.502	10.97	464.1
7	2/18/2003	143100	5.76	0.501	10.9	460.8
8	2/18/2003	143700	5.73	0.496	10.95	464.8
9	2/18/2003	144300	6.05	0.489	11.04	465.2
10	2/18/2003	144900	6.2	0.488	11.06	462.6
11	2/18/2003	145500	6.03	0.489	11.04	460.8
12	/ /					
13	/ /	AVE	7.823	0.496	10.981	465.964

Generation = 80.8

run3carb2-18-03.xls

Carb Test Run 1 - 2/20/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	2/20/2003	150000	7.25	0.462	10.33	274.8
2	2/20/2003	150600	8.05	0.458	10.56	286.3
3	2/20/2003	151200	8.81	0.485	10.68	286.2
4	2/20/2003	151800	8.33	0.52	10.5	284.6
5	2/20/2003	152400	7.82	0.515	10.54	287.5
6	2/20/2003	153000	6.84	0.487	10.6	289
7	2/20/2003	153600	7.17	0.494	10.64	290.4
8	2/20/2003	154200	6.52	0.481	10.78	293.6
9	2/20/2003	154800	6.28	0.482	10.85	292.4
10	2/20/2003	155400	6.13	0.473	10.89	289.4
11	2/20/2003	160000	5.85	0.48	10.86	286.3
12	/ /					
13	/ /	AVE	7.186	0.485	10.657	287.318

Generation = 81.4 MW

run1carb2-20-03.xls

Carb Test Run 2 - 2/20/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	2/20/2003	161800	6.13	0.472	10.56	278
2	2/20/2003	162400	6.38	0.489	10.62	276.8
3	2/20/2003	163000	5.92	0.493	10.63	278.8
4	2/20/2003	163600	6.11	0.479	10.78	284.7
5	2/20/2003	164200	6.12	0.483	10.77	285.5
6	2/20/2003	164800	6.04	0.48	10.8	286.7
7	2/20/2003	165400	6.35	0.461	10.93	289.6
8	2/20/2003	170000	6.35	0.472	10.88	289.4
9	2/20/2003	170600	5.96	0.474	10.84	290.3
10	2/20/2003	171200	5.96	0.483	10.78	292
11	2/20/2003	171800	5.88	0.473	10.87	298.6
12	/ /					
13	/ /	AVE	6.109	0.478	10.769	286.4

Generation = 79.8 MW

run2carb2-20-03.xls

Carb Test Run 3 - 2/20/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	2/20/2003	173700	5.82	0.488	10.77	301.8
2	2/20/2003	174300	5.89	0.49	10.73	300.9
3	2/20/2003	174900	5.9	0.483	10.78	300.3
4	2/20/2003	175500	5.95	0.479	10.81	300.1
5	2/20/2003	180100	5.83	0.477	10.82	298.9
6	2/20/2003	180700	5.95	0.474	10.85	298
7	2/20/2003	181300	6.06	0.471	10.88	296.1
8	2/20/2003	181900	6.07	0.471	10.83	290.4
9	2/20/2003	182500	6.12	0.484	10.77	286.2
10	2/20/2003	183100	6.17	0.487	10.73	286.8
11	2/20/2003	183700	6.08	0.477	10.81	289.1
12	/ /					
13	/ /	AVE	5.985	0.48	10.798	295.327

Generation = 79.5 MW

run3carb2-20-03.xls

Carb Test Run 1 - 2/21/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #						
1	2/21/2003	81400	5.35	0.459	11.03	292.5
2	2/21/2003	82000	5.41	0.454	11.14	298.1
3	2/21/2003	82600	5.36	0.467	11.01	292.7
4	2/21/2003	83200	5.58	0.475	11	295.9
5	2/21/2003	83800	5.46	0.495	10.69	286.5
6	2/21/2003	84400	5.42	0.48	10.73	289.8
7	2/21/2003	85000	5.49	0.491	10.72	288.7
8	2/21/2003	85600	5.57	0.512	10.57	284
9	2/21/2003	90200	5.52	0.506	10.61	283.1
10	2/21/2003	90800	5.3	0.495	10.69	283.2
11	2/21/2003	91400	5.31	0.477	10.85	286.9
12	/ /					
13	/ /	AVE	5.434	0.483	10.822	289.218

Generation = 81 MW

run1carb2-21-03.xls

Carb Test Run 2 - 2/21/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	2/21/2003	92700	5.22	0.463	10.91	289.1
2	2/21/2003	93300	5.23	0.442	11.09	294
3	2/21/2003	93900	5.36	0.463	10.98	289.1
4	2/21/2003	94500	5.56	0.491	10.69	281.5
5	2/21/2003	95100	5.7	0.483	10.68	281.8
6	2/21/2003	95700	5.42	0.473	10.86	286.1
7	2/21/2003	100300	5.21	0.471	10.88	287.4
8	2/21/2003	100900	5.05	0.469	10.91	288.1
9	2/21/2003	101500	5.11	0.46	11	290.3
10	2/21/2003	102100	5.31	0.48	10.86	288.2
11	2/21/2003	102700	5.36	0.486	10.78	286.2
12	/ /					
13	/ /	AVE	5.321	0.471	10.876	287.436

Generation = 80.3 MW

run2carb2-21-03.xls

Carb Test Run 3 - 2/21/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #						
1	2/21/2003	104100	5.23	0.467	10.95	291.3
2	2/21/2003	104700	5.23	0.474	10.89	289.2
3	2/21/2003	105300	5.12	0.488	10.75	286.2
4	2/21/2003	105900	5.15	0.483	10.83	287.7
5	2/21/2003	110500	5.2	0.49	10.77	285.9
6	2/21/2003	111100	5.35	0.488	10.8	286.7
7	2/21/2003	111700	5.26	0.487	10.83	290.9
8	2/21/2003	112300	5.32	0.483	10.87	292
9	2/21/2003	112900	5.23	0.477	10.91	290.6
10	2/21/2003	113500	5.56	0.48	10.9	288.1
11	2/21/2003	114100	5.31	0.491	10.72	279.7
12	/ /					
13	/ /	AVE	5.269	0.483	10.838	288.027

Generation = 80 MW

run3carb2-21-03.xls

Coal Baseline Run 1 - 5/2/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	5/2/2003	63400	11.73	0.373	12.09	350.2
2	5/2/2003	64000	9.13	0.374	12.16	354.7
3	5/2/2003	64600	9.08	0.374	12.17	355.5
4	5/2/2003	65200	8.92	0.379	12.14	357.8
5	5/2/2003	65800	8.81	0.381	12.12	355.1
6	5/2/2003	70400	8.43	0.383	12.11	353.6
7	5/2/2003	71000	8.48	0.372	12.21	357.3
8	5/2/2003	71600	8.66	0.372	12.21	357.3
9	5/2/2003	72200	8.55	0.374	12.16	356.4
10	5/2/2003	72800	8.55	0.373	12.21	356.6
11	5/2/2003	73400	8.44	0.368	12.26	359.2
12	5/2/2003	74000	8.46	0.371	12.26	357.6
13	/ /					
14	/ /	AVE	8.937	0.375	12.175	355.942

Generation = 80.1 MW

coalbaseline5-2-03run1.xls

Coal Baseline Run 2 - 5/2/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	5/2/2003	82200	8.34	0.375	12.17	351.5
2	5/2/2003	82800	8.36	0.377	12.2	349.8
3	5/2/2003	83400	8.21	0.375	12.22	349.8
4	5/2/2003	84000	8.14	0.374	12.22	350.2
5	5/2/2003	84600	8.39	0.377	12.21	349.2
6	5/2/2003	85200	8.12	0.372	12.24	350.9
7	5/2/2003	85800	8.31	0.375	12.23	349.9
8	5/2/2003	90400	8.52	0.377	12.2	349.4
9	5/2/2003	91000	8.56	0.374	12.22	351.3
10	5/2/2003	91600	8.38	0.382	12.19	347.9
11	5/2/2003	92200	8.19	0.378	12.22	347.8
12	5/2/2003	92800	8.49	0.378	12.22	347.5
13	/ /					
14	/ /	AVE	8.334	0.376	12.212	349.6

Generation = 79.9 MW

coalbaseline5-2-03.xls

Coal Baseline Run 3 - 5/2/03

	DATE	TIME	OPAC11	NOXRT13	CO214	SO216
Record #			%	lb/mmBtu	%	ppm
1	5/2/2003	100500	8.71	0.386	12.11	346.8
2	5/2/2003	101100	8.56	0.371	12.27	348.9
3	5/2/2003	101700	8.86	0.369	12.27	347.2
4	5/2/2003	102300	8.53	0.372	12.25	346.1
5	5/2/2003	102900	8.22	0.364	12.33	348.7
6	5/2/2003	103500	8.51	0.369	12.3	347.9
7	5/2/2003	104100	8.33	0.375	12.23	345.6
8	5/2/2003	104700	8.27	0.384	12.14	343.4
9	5/2/2003	105300	8.17	0.366	12.3	347.7
10	5/2/2003	105900	8.37	0.37	12.31	346.2
11	5/2/2003	110500	8.56	0.371	12.28	345.6
12	5/2/2003	111100	8.38	0.364	12.34	347.2
13	/ /					
14	/ /	AVE	8.456	0.372	12.261	346.775

Generation = 80.3 MW

coalbaseline5-2-03run3.xls