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FIXED-BED GASIFICATION RESEARCH USING U.S. COALS, VOLUME 9 GASIFICATION OF ELKHORN BITUMINOUS COAL

Contract H0222001
Black, Sivalls, and Bryson, Incorporated

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FOREWORD

This report was prepared by Black, Sivalls, and Bryson, Inc., Houston, Texas under USBM contract number H0222001. The contract was administered under the technical direction of the Twin Cities Research Center with Mr. Robert Zahl acting as Technical Project Officer. Mr. Frank Pavlich was the contract administrator for the Bureau of Mines. This report is a partial summary of the work recently completed as a part of this contract during the period June 1982 to May 1984. This final report was submitted by the authors on May 1, 1985.

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The University of Minnesota, Particle Technology Laboratory, Minneapolis, Minnesota, a subcontractor to Black, Sivalls, and Bryson, Inc., participated in preparation of this report.

The Elkhorn coal gasified during this test was donated by ANR Technology, Inc., Detroit, Michigan. ANR Technology, Inc. also provided monitoring assistance during this test.

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INTRODUCTION

The United States Department of Interior, Bureau of Mines, Twin Cities Research Center, Minneapolis, Minnesota is the site of a 6.5 foot diameter Wellman-Galusha gasifier, installed in 1977-78. This gasifier, combustor/incinerator, and flue gas scrubber system in the past had been operated jointly by Bureau of Mines personnel, personnel from member companies of the Mining and Industrial Fuel Gas Group (MIFGa), and United States Department of Energy (DOE) personnel-consultants. Numerous tests using a variety of coals have to date been performed.

In May of 1982, Black, Sivalls & Bryson, Incorporated (BS&B) was awarded the contract to plan, execute, and report gasification test performance data from this small industrial fixed-bed gasification test facility. BS&B is responsible for program administration, test planning, test execution, and all documentation of program activities and test reports. The University of Minnesota, Particle Technology Laboratory (UMPTL) is subcontractor to BS&B to monitor process parameters, and provide analysis for material inputs and outputs.

This report is the ninth volume in a series of reports describing the fixed-bed gasification of U.S. coals at the Bureau of Mines, Twin Cities Research Center. This report covers the test period identified as BOM/FGT-008, gasification of Elkhorn Bituminous Coal. The time period covered is September 13 - October 12, 1983.

Section 1 gives a brief summary of test. Section 2 identifies test objectives. Section 3 contains a description of the fuels. Sections 4 and 5 describe the facility and monitoring systems. Sections 6 and 7 describe the conduct and results of the tests. Section 8 presents conclusions. Test data is included in the Appendices.

SECTION 1

TEST SUMMARY

Elkhorn bituminous coal is a moderate-swelling, low-sulfur, high-ash fusion temperature, high-volatile A bituminous coal, mined in large quantities in eastern Kentucky. The coal is a premium single-stage, fixed-bed gasifier fuel due to the refractory nature of the ash.

Testing of this coal involved gasification in a Wellman-Galusha gas producer and combustion of the hot, raw gas in a combustion chamber. The products of combustion were water-quenched, cleaned of sulfur oxides and particles and exhausted.

A slipstream of the coal gas was cooled and cleaned of tar by a water quench and electrostatic precipitator. While severe difficulties were encountered operating this cleanup equipment, enough operating time was logged to characterize the efficiency of tar removal at several gas cleaning rates.

The coal gasified well during the test. Gas quality was fairly steady and high throughputs were achieved. Rather large dust flow rates out of the retort were measured at very high throughputs. Correct operation of the agitator was required to effectively manage coal agglomeration and maintain high gas quality. Table 1-1 gives design point data for gasification of this coal at a throughput of 2.0 tons/hour and a blast saturation temperature of 138 F (58.9 C). Maximum throughput was limited by the ability to remove the large volumes of low density ash resulting from gasification of this coal at the grate settings used.

Due to high throughputs achievable and high gas quality observed during this test, the coal is recommended as a single-stage, fixed-bed gasifier feedstock. Agitation of the top of the fuel bed is required to manage coal agglomeration.

Table 1-1

Design Point Characteristics for Gasification
of Elkhorn Bituminous Coal

Coal Throughput - 2.0 tons/hour (121 lb/hr/sq ft grate)		
Air/Coal	2.162	lb/lb
Steam/Coal	.320	lb/lb
Blast Saturation Temperature	138	deg F
Gas Offtake Temperature	838	deg F
Wet Gas/Coal	52.8	scf/lb
Gas Dewpoint	104	deg F
Tar Yield	14.5	lb/100lb coal
Tar Analysis		
HHV (dry)	16450	Btu/lb
Pourpoint	75	deg F
Viscosity (210 F)	29.5	SUS
Specific Gravity (60/60 F)	1.1095	
Dry Gas Composition (mol%)		
Hydrogen	18.9	
Carbon Monoxide	26.3	
Methane	1.76	
Ethane	.20	
Ethylene	.21	
Propane	.05	
Propylene	.08	
Carbon Dioxide	6.12	
Nitrogen + Argon	46.0	
Water	3.6	lb/1000 dscf
Dry Gas HHV	175	Btu/dscf
Dry Gas LHV	163	Btu/dscf
Thermal Efficiencies		
Hot, Raw	87	%
Cold, with Tar	80	%
Cold, without Tar	62	%

SECTION 2

TEST OBJECTIVES

2.1 Selection of Coal for Testing

Elkhorn bituminous coal is a moderate swelling (FSI = 3 1/2) Eastern Kentucky coal mined in large quantities. Its primary distinguishing feature is its refractory ash, making it a premium fixed-bed gasifier fuel. Preliminary indications were that initial deformation of the ash occurred at temperatures in excess of 2800 F. (This was subsequently confirmed by analysis of the coal gasified during this test.) The very high ash fusion temperatures would allow observation of the limits to throughput with a minimum of ash layer management problems.

A relatively high tar yield and stable operation of the gasifier were anticipated during this test, allowing optimum conditions for operation of the quench/ESP slipstream.

2.2 Test Objectives

- A. Identify maximum gasifier throughput and the limitations to maximum throughput when gasifying this premium coal.
- B. Determine total product composition and conversion efficiency from the gasification of this high volatile A bituminous coal.
- C. Identify operational requirements for gasifying moderately swelling coals.
- D. Investigate the influence of coal bottom size on throughput and conversion efficiency.
- E. Determine tar collection efficiencies of a slip stream, pilot gas quench/ESP.
- F. Evaluate gasifier response to step changes in the blast airflow.

2.3 Test Plan

The proposed test plan is shown in Figure 2-1. Several load levels are shown for 3 different bottom sizings. A transient response investigation is shown 11 days into the test. Agitator rate and vertical travel were left to the facility manager's judgment based on observed operating conditions, as were establishment of maximum throughput and blast saturation temperature. The grate spacings were set at 5 1/2 and 6 inches between the top and middle levels and between the middle and bottom levels respectively.

Figure 2-1

Proposed Test Plan, BOM/FGT 008

SECTION 3

DESCRIPTION OF FUEL TESTED

Elkhorn bituminous coal is a high-volatile A bituminous coal mined in eastern Kentucky and southern West Virginia. The most notable feature of this coal is its very high ash fusion temperature (+2800 F).

The Elkhorn bituminous coal gasified during BOM/FGT-008 was mined by Virginia Iron, Coal, and Coke Company in Pike County, Kentucky. Figure 3-1 shows the location of the mine. The coal was washed and double screened at 2 x 1 inch. 1200 tons were transported by rail to Cerado, West Virginia and loaded on a barge on August 9. The barge arrived in St Paul, on September 11. The coal was on the river 33 days in the uncovered barge. The coal was unloaded from the barge by clamshell, and stored in a pile on the dock. The coal was delivered to the test site at the rate of 60 - 70 tons per day beginning September 13. Very little size degradation was evident. The fraction of coal less than 3/4 inch screened out during the first part of the test was less than 5%.

Table 3-1 gives the average of three coal analyses performed on composite samples collected during BOM/FGT-008. Table 3-2 shows how the coal fits into the coal test objective matrix. Elkhorn coal is a high-ash fusion temperature, moderate-swelling, low-sulfur, high-volatile A bituminous coal.

This coal was donated to the test program by ANR Technology, Inc.

Figure 3-1

Location of the Virginia Coal, Iron, and Coke Mine

Table 3-1
Average Analysis of Elkhorn Bituminous Coal

Proximate Analysis (%)

Volatile Matter	37.18
Fixed Carbon (by difference)	51.54
Ash	6.87
Moisture	4.41
Sulfur	0.76

Heating Value (Btu/lb) 13137

Ultimate Analysis (%)

Carbon	73.73
Hydrogen	5.10
Nitrogen	1.47
Sulfur	0.76
Oxygen (by difference)	7.66
Ash	6.87
Moisture	4.41

Ash Fusion Temperatures +2800 F (Oxidizing and Reducing)

Free Swelling Index 3 1/2

Table 3-2

Characteristics of Elkhorn Bituminous Coal with Regard to
the Coal Test Objective Matrix.

COAL TEST OBJECTIVE MATRIX									
PHYSICAL CHARACTERISTICS		COAL RANK							
TYPE	RANGE	BITUMINOUS	SUB-BITUMINOUS			LIGNITE	PEAT/BIOMASS	PETROLEUM COKE	BRIQUETTES
			A	B	C				
ASH CONTENT	H + 20%								
	M 10 - 20%								
	L - 10%	008							
ASH FUSION	H + 2700 F	008							
	M 2300-2700 F								
	L - 2300 F								
FREE SWELLING INDEX	H 3 +	008							
	M 1 - 3								
	L 0 - 1								
MOISTURE CONTENT	H + 15%								
	M 5 - 15%								
	L - 5%	008							
FRIABILITY (GRINDABILITY)	H								
	M								
	L	008							

SECTION 4

FACILITY DESCRIPTION

The USBM/TCRC gasification facility is described in detail in Volume 1 of this series (Thimsen, Maurer et al, 1984). A brief description of the equipment and monitoring systems is given here.

4.1 Test Facility

The gasification test facility includes a 6.5 foot diameter Wellman-Galusha gas producer, a combustion chamber and a wet caustic scrubber. The site also includes an iron ore pelletizing kiln, and a tar scrubber. The iron ore pelletizing kiln was not used during this test. The entire stream of producer gas was consumed in the combustion chamber. A process flow schematic is shown in Figure 4-1. A bottom size screen removes fine material prior to transport to the overhead storage bin by bucket elevator.

The facility is equipped with standard industrial monitoring equipment for measurement of temperatures, pressures, flows, and process conditions. These are recorded by an automatic data acquisition system for subsequent process analysis.

4.1.1 Gas Producer

The gas producer is a 6.5 foot ID Wellman-Galusha, single-staged, fixed-bed, atmospheric pressure gasifier. The gasifier has a gravity fuel feed system, a water-cooled agitator to manage coal agglomeration, and an eccentric step type grate for ash removal. The retort is water jacketed and has no refractory lining. Steam generated in the water jacket is mixed with blast air. Steam/air ratio in the blast is derived from the temperature of the saturated steam/air mixture.

4.1.2 Gas Combustor

The gas combustor includes a baffle burner and a refractory-lined combustion chamber, and is designed to burn the full gas output of the gasifier at a rated capacity of 30 MMBTU/hour. The combustion products exhaust through an impingement tray-type wet caustic scrubber for sulfur dioxide and particulate removal. An induced draft fan is used to exhaust the scrubbed products of combustion through a flue stack.

4.1.3 Quench/ESP

A slipstream of the gas is sent to a water spray quench tank. In this tank, the gas is brought near its adiabatic saturation temperature and heavy tars and oils are condensed. The tar fog generated is removed in an electrostatic precipitator. The

Figure 4-1

Coal Gasifier Process Flow Schematic,
U.S. Bureau of Mines, Twin Cities Research Center.

detarred gas is returned to the main gas duct. Figure 4-2 shows this cleaning system in schematic. The tar and oil collected by this system is atomized and burned in the coal gas combustion chamber. A steam atomizing nozzle normally used for heavy fuel oil was used to burn the tar/oil.

4.2 Gas Sampling and Conditioning System

Figure 4-3 is a schematic of the gas sampling and conditioning system used during BOM/FGT-008. The sampling port is thermally insulated to prevent condensation. The hot producer gas is quenched rapidly upon entering the surface condenser, which is cooled by cold water or cold, compressed air. The rapid quenching causes tar, oil, and water to condense on the inner surface of the condenser tube. The tar fog generated during cooling is removed in the electrostatic precipitator. The detarred gas is refrigerated and dessicated to remove water remaining in the gas stream. The dry, detarred gas is metered and transported to the instruments. Condensate samples are collected from traps in the condenser, electrostatic precipitator, and refrigerator.

4.3 Gas Analysis Equipment

Carbon dioxide and carbon monoxide concentrations are continuously measured with individual Beckman 864 non-dispersive infrared (NDIR) analyzers. Oxygen is monitored continuously with a Beckman 755 paramagnetic oxygen analyzer. Higher heating value of the sample gas is measured with a SIGMA continuous flow calorimeter. These signals are all recorded by the automatic data acquisition system.

Detailed gas composition is determined every 23 minutes with a Hewlett-Packard model 5880A gas chromatograph. The principal features of the chromatograph are listed in Table 4-1.

Sulfur species concentrations in the gas are determined with a HP 5793 gas chromatograph by manual injection of grab samples. The principle features of the HP 5793 are given in Table 4-2.

Figure 4-2

Schematic Diagram of the Quench/ESP

Figure 4-3

Schematic Diagram of the Gas Sampling and Conditioning System

Table 4-1

Principal Features of HP5880A Gas Chromatograph

1. Columns used:
 - a. 1-10 ft x 1/8 inch SS Porapak Q
 - b. 1-10 ft x 1/8 inch SS Molecular Sieve 5A
 - c. 2-18 ft x 1/8 inch SS 2% OV-101 on WHP
2. Dual detectors - flame ionization detector in series with thermal conductivity detector
3. Set up for analysis of the following species:
Hydrogen, Carbon dioxide, Ethylene, Ethane, Propane, Propylene, Oxygen, Nitrogen, Methane, and Carbon monoxide
4. Argon Carrier Gas - flow rate of 28 ml/min
5. Programmed Temperature from 75 C to 165 C to 135 C
6. 1.0 ml sample
7. 18 minute analysis time

Table 4-2

Principal features of the HP 5793 Gas Chromatograph⁹

1. Flame photometric detector
2. Single column - 1-18" x 1/8" Teflon Supelpak-S (Porapak QS)
3. Ten port valve for sample injection and column backflush
4. Integrator with limited control capabilities
5. Nitrogen carrier gas: Carrier Flowrate = 32 ml/min
6. Sample loop size = 125 ul
7. Temperature program
 - Initial temperature 30 C
 - Initial time 1.5 min
 - Program rate 35 C min
 - Final temperature 170 C
 - Final time 5.0 min
8. Analysis cycle time 25 min.

SECTION 5

TEST PROCEDURES

Test procedures are described in detail in Volume 1 of this series (Thimsen, Maurer et al, 1984). The following is a summary of the procedures including specific procedures used in this test only.

5.1 Test Teams

5.1.1 Gasifier Operation and Overall Coordination

The gasifier operations team was organized by Black, Sivals & Bryson, Incorporated (BS&B) and consisted of three shift lead operators and additional helpers as required. The gasifier was staffed with a lead operator and two helpers, three shifts each day. Backup for lead operators was provided by BS&B supervisory personnel.

The gasifier operations team was responsible for overall operation of the gasifier and associated process equipment and coordination of the three test teams. This includes: gasifier start up, coal gas handling and incineration, exhaust gas cleanup, coal addition and sample collection, fire bed monitoring, process equipment maintenance and repair, operation of the boiler, changes in process conditions, sampling of waste water streams, measurement of retort temperature and pressure profiles, and operation of the quench/ESP tar scrubber.

5.1.2 Gasifier Monitoring

The gas sampling and data retrieval/monitoring team was organized by the University of Minnesota Particle Technology Laboratory, and consisted of persons with individual responsibility for:

- 1) sample gas cleanup
- 2) gas chromatograph
- 3) continuous gas analysis and SIGMA continuous calorimeter
- 4) data acquisition system
- 5) safety evaluation personnel

and such equipment operators as were necessary. The monitoring systems were staffed 24 hours per day.

The monitoring team was responsible for recording continuous process signals, operations of the gas chromatograph and continuous gas analysis equipment, operation of the gas sampling and conditioning system, collection of tar and oil samples,

analysis of coal, ash, and cyclone dust samples, retort exhaust particle sampling, quench/ESP exhaust tar particle sampling, and evaluation of health and safety measures.

5.1.3 Stack Gas Sampling

Interpoll, Incorporated, Circle Pines, Minnesota, a subcontractor to the University of Minnesota, had a two man team on site on September 19. They sampled for exhaust emissions from the gas combustor.

5.1.4 Industrial Cooperators

ANR Technology, Inc. had representatives on site during the test to observe operations and collect data. Some of the transient period data shown in section 7.1.3 were collected by this group.

5.2 Gasifier Sampling and Data Acquisition Procedures

5.2.1 Continuous Data

An Analog Devices, Incorporated MACSYM 350 data acquisition system was used for this test. Process signals are sampled once a minute. Ten-minute signal averages are recorded on floppy disc. Thirty-minute signal averages are printed by line printer. The operations team also logs these signals hourly along with some twenty parameters not sampled by the data acquisition system.

5.2.2 Gas Analysis Data

The continuous gas analyzers are calibrated daily, according to the manufacturer's recommendations. Output signals are recorded by the data acquisition system.

The HP 5880A gas chromatograph is calibrated using a mixture of oxygen, carbon monoxide, carbon dioxide, hydrogen, methane, ethane, ethylene, propane, propylene, and nitrogen at concentrations which nearly duplicate the gasifier offgas. Another calibration mixture with the concentrations of all the species except nitrogen increased by about 50%, and the nitrogen correspondingly reduced, is used to check the linearity of the detectors.

The HP 5793 gas chromatograph is calibrated before and after the test. Calibration gases with 4 different hydrogen sulfide levels ranging from 530 to 2000 ppm in nitrogen are used. The calibrations confirm the square root dependence of the flame photometric detector output on gas sulfur concentrations. The hydrogen sulfide FPD calibration factor is used for determinations of carbonyl sulfide and mercaptan concentrations.

5.2.3 Tar and Oil Data

The condensed tar, oil, and water are removed from the accumulation reservoirs daily. Water collected in the surface condenser and sample electrostatic precipitator is decanted from the tar and combined with the water from the refrigerator. Tar from the surface condenser is combined with tar and oil collected in the sample electrostatic precipitator. Condensate yields are measured by weighing both the tar/oil sample and the water sample. Moisture content of each daily tar sample is determined.

5.2.4 Coal Data

Coal samples are taken by the operations team during coal addition to the lock hopper four times each shift. These four samples are stored in one bucket and submitted as a composite shift sample. Detailed chemical analysis of the coal is performed on a composite of the shift samples.

5.2.5 Ash Data

An ash sample is taken by the operations team each time ash is discharged, and stored in a sealed container. For each ash sample the bulk density, particle size distributions, and carbon, sulfur, and moisture content of the ash are tabulated by the monitoring team. The carbon and sulfur content of each sample is determined from milled samples submitted by the monitoring team. The ash samples, on which detailed analyses are performed, are composited over the same time periods used for compositing the coal samples.

5.2.6 Dust Data

Samples of cyclone dust are grabbed daily from the dust accumulation bin. A single composite of all daily samples is submitted for analysis.

5.2.7 Exhaust Gas Sampling

The gas phase combustion exhaust is analyzed by EPA methods 5 and 6 for sulfur dioxide, nitrogen oxides, and particulates once during the test.

5.2.8 Retort Particle Sampling

Sampling of the offtake for particles is performed periodically as operating conditions permit.

5.2.9 Quench/ESP Particle Penetration Sampling

Sampling of the quench/ESP exhaust for tar particles is performed as operating conditions permit.

5.2.10 Retort Temperature and Pressure Probe Data

Vertical temperature and pressure profiles inside the retort are taken at a single location periodically (usually at the end of a relatively stable period of operation, just before operational changes).

SECTION 6

CONDUCT OF THE TEST

6.1 Gasifier Operation

BOM/FGT-008, gasification of Elkhorn Bituminous Coal began on September 13. The modified start-up procedure developed for BOM/FGT-005 was used (Volumes 1, 6, Thimsen, Maurer et al, 1984). The fire was lit at 8:00 am, and gas was sent to the combustor at 9:00 am. The bituminous coal entered the retort at 7:30 pm, and fully occupied the retort at about 10:30 pm. Figure 6-1 shows the history of the operation of the test.

The blast air flow was maintained at 1000 scfm until the morning of September 16 resulting in a coal consumption averaging 0.91 tn/hr. During this time period the coal consumption, gas quality, and offtake temperature varied periodically in an uncontrolled fashion. As the coal consumption increased the heating value of the gas increased, and the offtake temperature decreased. Conversely, as coal consumption decreased the gas heating value decreased and offtake temperature increased. The coal consumption varied between 0.75 and 1.15 tn/hr and offtake temperature varied between 320 C and 480 C. The period of these variations was about 12 hours. These variations indicate periodic changes in the completeness of the gasification reactions. The variations disappeared upon raising the blast air flow and dropping the agitator further into the coal bed.

Blast saturation temperature was held at 58 C and 59 C during this period. Some crusting was noted at the low blast saturation temperature.

Blast air flows of 1200, 1400, and 1600 scfm were maintained for at least 24 hours each. At a blast air flow of 1600 scfm (coal consumption of 1.5 tn/hr) a test of the agitator was begun at 2:30 pm on September 19. The agitator speed was increased until the coal bed thickness had increased 12 inches. This coal bed thickness was held for about 2 hours, and then allowed to return to the previous condition. As expected, the dry gas heating value increased upon an increase in bed thickness, but this was a transient effect. After about 45 minutes the effect was no longer noticeable. The increase in heating value was due mostly to increases in methane and other hydrocarbon concentrations which are primarily products of devolatilization.

On September 20 efforts to find maximum throughput were started. Initially the blast air flow was increased to 2600 scfm. This air flow had to be subsequently reduced due to problems with import steam delivery to the blast air, and the inability to remove the ash production even at the highest grate speeds. Some burning through was also noted. The blast air flow was reduced to 2200 scfm. At this coal rate (2.1 tn/hr) the grate, at maximum speed, was just able to keep up with ash removal to

Figure 6-1

Test History, BOM/FGT-008

maintain a constant ash thickness on the grate.

During this high throughput period the freeboard set point and agitator height were adjusted several times. These adjustments were made to ensure that the agitator arm was located at the same level in the retort that the agglomeration of the coal was occurring. The effort was successful as noted by a reduction in fire loss pressure from 20 in wc to 12 in wc.

The high throughput conditions were held for 60 hours. During this period coal throughput was steady, as was gas quality. No adverse conditions were noted during the firetests, and there is reason to believe that with increased ash removal capacity higher throughputs could be achieved. (An increased ash removal rate could be accomplished by increasing the spacings between grate levels or increasing the rotational speed of the grate. It was not possible to increase grate spacings without removing the fuel bed from the gasifier. The grate drive was operating at maximum installed speed during these periods.)

On September 23 and 24 a series of load following tests were undertaken. Four swings from high to low and three swings from low to high were investigated. All of these load changes were accomplished successfully with no noticeable change in ash layer conditions. There was a noticeable change in gas quality during these tests. Upon a drop in load the gas heating value rose slightly with a rise in carbon monoxide concentration, and a slight drop in carbon dioxide concentration. Upon a rise in load the heating value dropped slightly with a drop in carbon monoxide concentration, and a rise in carbon dioxide concentration. These transient conditions lasted less than half an hour.

On September 24 the coal feed screen was changed from 3/4 inch to 1/4 inch. Coal passed over the 1/4 inch screen reached the retort early in the morning of September 25. Three blast air flow levels were investigated: 1200, 1400, and 1600 scfm. There was no difference in operation at these air flows in comparison with similar operating conditions with the coal passed over the 3/4 inch screen. This was expected as there is very little material in the 1/4 to 3/4 inch range.

The test was interrupted the evening of September 27 due to excessive vibrations in the induced draft fan. Upon shutting the blast blower off the ashpit pressure did not drop as rapidly as in the past indicating a plug in the vent. The throttling butterfly valve in the blast air line was closed to prevent as much as possible the movement of devolatilization products back through the coal bed into the ashpit with the possibility of an explosion in the ashpit. The gasifier was banked on the bituminous coal pending replacement of the fan impeller and inlet shroud.

The ID fan inlet was removed, and the inlet shroud and impellor

(carbon steel) were removed. A 316 SS shroud and impellor (previously ordered) were delivered to the site and installed on September 30.

During the banking period the blast blower was used to supply 200 cfm of blast to the gasifier for 10 - 20 minutes each shift. Without this airflow the fire was very weak. Total coal dropped from the weigh bin during and just after the bank was 2.15 tons over a 70 hour period.

During the banking period the gas duct downstream of the cyclone was opened and dust and tar that had accumulated was allowed to burn out.

The gasifier was brought back up at 7:00 pm on September 30. The blast air flow was held at 200 cfm for 50 minutes while monitoring systems were tested, and increased to 1800 cfm in a step change at 7:50 pm. There were no adverse effects noted due to the rapid increase in load. The gasifier was brought back to full load in less than one hour during this warm start.

The gas flame immediately after start-up was a bright blue indicating no hydrocarbons in the gas. During the bank the coal was apparently well devolatilized, and only coke was present in the retort at restart. The fire loss pressure climbed rapidly on restart to 25 in wg. After about 20 minutes it came back down to a more reasonable level of 13 in wg. This indicates some settling and compaction of the char in the retort during the bank which was relieved upon operation of the grate and agitator, and the disappearance of solids due to gasification.

The 1800 cfm airflow conditions were held for 60 hours resulting in a coal consumption of about 1.7 tons per hour. During this period the grate was operated at its maximum rate, and was barely able to keep up with ash production. The ash accumulations on top of the grate adversely affected the fire bed. Some ash also accumulated on the underside of the grate on the ash cone and other horizontal surfaces. There is some indication that the under grate accumulations inhibited the ash removal ability of the grate. Otherwise the gasifier performed well at this load level. There was only modest glowing over a small portion of the top of the retort, and gas quality was high and steady.

The gasifier was banked again on the morning of October 3 to allow the quench/ESP operators to drop and clean the hot gas duct leading to the quench tank. (See Section 6.2) When it became obvious that the quench/ESP system would not be operated for the rest of the test, the slip stream was isolated at the spectacle valve and the gasifier was brought up again. During this 3-hour bank the downstream gas duct was again allowed to burn out. Substantial amounts of material had collected and were burning in this duct.

The coal hopper and conveyor belt were moved to feed the coal directly into the bucket elevator. This coal was not screened on site and is referred to as "run of shipment" (ROS) coal. This coal entered the retort at 2:30 am October 4. The blast air flow at this time was set at 1000 cfm, and was raised to 1200 cfm at 10:30 am. Saturation temperature during this period was fluctuating between 138 F and 140 F (59 C and 60 C) due to problems with the steam regulator and steam flow controller. (These problems continued to the end of the test.)

Blast air flow settings of 1200, 1400, 1600, and 1800, cfm were held for 24 hours each. The blast saturation temperature was increased to 140 F (61 C) at 1400 cfm and to 144 F (61 C) at 1600 cfm and higher due to some fusing of ash and hard fire tests. A peak blast air flow of 2100 cfm was held for 38 hours. The coal consumption during this period was about 1.8 tons per hour. As the gas quality had not changed appreciably from previous operation at these load levels it was suspected that the airflow indication was substantially greater than the real air flow.

At the high load levels gasifying the run of shipment coal some gas channeling was detected, as was some ash clinkering. It was noted that the under 1/4 inch fraction of the coal was not evenly distributed throughout the coal inventory. There were pockets of fine material. It is surmized that these pockets caused the uneven gas distribution noted with the accompanying ash fusion.

On October 10 controlled tests of the effect of agitator rate and freeboard of particle carryover from the retort were performed. The agitator was operated at a rate necessary to maintain freeboards of 40, 38, 36, and 34 inches of freeboard for three hours each. During each of these periods particle samples were taken at the offtake duct. Coal consumption during this period was about 1.3 tons per hour.

For the last part of the test beginning 1630 October 10 the coal was again passed over the 1/4 inch screen to search maximum load. Coal consumptions of 1.8 - 1.9 tons per hour were observed. The coal consumption was limited by the ability of the blast blower to deliver air at the high ashpit pressures. The high ashpit pressure was not caused by excessive fire loss pressure, but by excessive offtake pressure due to plugging of the downstream gas duct with dust and tar. On the morning of October 13 the offtake pressure reached 14 in wg, and gas began to escape from the cyclone water seal. There is no way of dealing with this except to reduce load, so the test was terminated at this point.

The ash collected during this test was chalky and substantially less dense than ashes collected during previous tests. This low density caused unexpected problems in the removal of the ash from the gasifier. The grate is an ash volume removal device.

With ashes of lower density the grate must be operated at higher speeds to remove the same amount of ash weight at given grate level spacings. The throughput of this coal was limited by the capacity of the grate to remove the low density ash produced by this coal. At no time was there an excessive load on the grate drive, however. The ash was very "crunchy", and could be easily broken by hand.

Moderate amounts of dust were removed from the cyclone dustleg. Most of this dust sank to the bottom of the water tank. Much of the dust was blown through the cyclone as noted by the high offtake pressures during much of the test, and the ignition and combustion of dust and tar in the gas duct downstream of the cyclone every time the duct was opened to air. This serves to illustrate again the poor dust removal ability of the existing cyclone.

Fire tests were, for the most part, good. Very few double zones were detected, and the fire was very even across the cross section of the retort. Jacket water flow was very low for most of the test. This indicated very low heat loss to the jacket. This is consistent with the presence of a relatively thin incandescent zone noted during the firetests, even at high loads.

Temperature and pressure probings of the retort were performed as noted on Figure 6-1. The temperature profiles indicated that devolatilization and preheating of the coal occurred in the top 9 - 12 inches of the coal bed.

6.2 Quench/ESP Operation

During operation of the quench/ESP as a part of the previous test (Volume 8, Thimsen, Maurer et al, 1985) the major problem encountered was high voltage insulator failure. In order to mitigate this problem the following steps were taken: 1) installation of a steam heated, clean producer gas purge for the insulators and 2) steam tracing and insulation of the high voltage insulator ears.

There were 4 blocks of ESP operation during BOM/FGT-008 as follows:

1. Start-up was at 1000 hours on September 13, 1984, punctuated by insulator failure within 5 minutes and insulator replacement. Restart occurred by 2100 hours. Operation was fairly uneventful for 2 days, including the burning of tar/liquor. Minor mechanical difficulties, such as steam leaks were tended to by the operators. Seemingly periodic reoccurrences of high oxygen content, sufficient to cause shutdown, coincided with gasifier fire tests. This was remedied by switching to a higher range on the oxygen analyzer at the beginning of a fire

test, constant instrument monitoring during a fire test and the switching back to a lower range at the termination of the fire test. This block of testing terminated at 1100 on September 15, 1983 due to a blockage from agglomerated material at the quench tank discharge.

2. Six days were spent building a steam heated surge vessel and close coupling it to the quench tank with three inch pipe and full ported ball valve. Start-up was hampered by low plant air pressure, insufficient to fully open the inlet isolation valve. This was remedied by higher pressure bottled nitrogen until the plant air situation was resolved. The slip stream was on line at 1100 on September 21, 1983. Operation was relatively smooth through September 25, 1983, with the exception of some tar combustion nozzle fouling. It was necessary to purge the tar side of the nozzle any time flow of tar ceased and to maintain atomizing steam pressure at a level of 5-10 psi below the tar pressure. System went down at 1750 due to failure in the high voltage cable between the transformer/rectifier set and the ESP.
3. The ESP system was restarted at 1930 on September 27, 1983 and operated for approximately 4 hours before the gasifier was shut down due to induced draft fan failure.
4. The ESP system was put back on line after repair of the induced draft fan on September 30, 1983 at 2300. The system was run at very low flow due to high vacuum on the ESP vessel. Increased operation at low flow resulted in an unacceptably higher vacuum. Upon shut-down to clean the supply lines, both the pneumatic and hand-operated isolation valves could not be closed due to blockages. The decision was made to bank the gasifier long enough to clean out the gas supply line to the quench tank. Upon banking of the gasifier, tar and dust accumulations in the gas duct began to burn. There was then an explosion in the ESP, rendering it inoperable at 0935 on October 3, 1983. The explosion resulted in bowing of the reinforced sides of the ESP outer housing, bending of the 8-inch pipe leaving the top of the ESP, and loss of several flange connections and cover plates. It is presumed that the explosion was ignited by the fire in the gas duct.

SECTION 7

TEST RESULTS

7.1 Data Summary

7.1.1 Continuous Output Transducer

The data acquisition system encountered only a few operational problems, as listed in Table 7-1. In all, about 36 hours of data were not collected over 30 days. The bulk of the missing data is from the first day of operation. Where necessary, hand logged data collected by the operations team was used to fill in the gaps.

Figure 7-1 shows the offtake temperature, fire loss pressure and dry gas heating value, along with the operating parameters observed during the test period. Offtake temperature varied between 400 C and 500 C, but bore little relationship to blast saturation temperature or air flow. During the first two days of the test, offtake temperature varied between 300 C and 500 C in a cyclical pattern (as described in Section 6.1). Gas quality varied with the same pattern, but 180 degrees out of phase with the offtake temperature. This indicates gas channeling and incomplete gasification during periods of high offtake temperature. The regular cyclical nature of the variations is unexplained.

Dry gas higher heating value was fairly steady throughout the remainder of the test at 165-175 Btu/dscf, and was relatively unaffected by operating conditions. The investigation of maximum throughput on September 20, which resulted in blowing through, as noted in Section 6.1, resulted in correspondingly higher offtake temperatures and lower gas heating value. The general pattern throughout the test was that when the gas heating value increased, offtake temperature decreased and vice versa.

Fire loss pressure depended primarily on the blast air flow, as could be expected. A few anomalies occurred during the last half of the test when finer material entered the retort.

On September 23-24, a series of rapid changes in blast air flow were undertaken to observe the transient response of the gasifier. The results of four of these step changes are shown in Figures 7-2a and 7-2b. The blast saturation temperature changes indicated represent changes in set point of the controller. Offtake temperature tends to drop on a drop in blast air flow and rise on a rise in blast air flow.

The carbon monoxide and carbon dioxide concentrations show a first order response to the step changes in blast air flow. Upon a drop in blast air flow, the carbon monoxide concentration goes up and the carbon dioxide concentration goes down. The

Table 7-1

Data Acquisition Gaps during BOM/FGT-008

Date	Time	Length (min)	Reason
9/13/83	19:50	1087	Memory failure
9/14/83	20:28	113	Software Problems
9/14/83	22:21	99	Software Problems
9/16/83	7:41	108	Unexplained Abort
9/17/83	16:16	182	Hardware memory problems
9/17/83	19:30	125	Hardware memory problems
9/17/83	23:45	143	Hardware memory problems
9/26/83	7:06	114	Unexplained abort
10/06/83	13:07	191	Memory diagnostics

Figure 7-1a

Physical Characteristics of the Gasifier Operation

BOM/FGT-008

Figure 7-1b

Physical Characteristics of the Gasifier Operation

BOM/FGT-008

Figure 7-2a

Gasifier Response to Step Changes in Blast Air Flow

Figure 7-2b

Gasifier Response to Step Changes in Blast Air Flow

opposite is true on a step rise in blast air flow. These transient responses are modest and disappear within 10-15 minutes. The new steady state levels are different from those prior to the step changes, primarily due to the changes in blast saturation temperature setpoint.

7.1.2 Coal, Ash and Dust Data

A complete list of the tests performed on the bulk coal, ash and cyclone dust samples collected during BOM/FGT-008, together with the number of samples analyzed, is given in Table 7-2.

7.1.2.1 Coal Data

The mass fraction of coal less than each of five indicated mesh sizes and the mean coal particle size are presented in Figures 7-3 and 7-4. The bottom size screen changes on September 24 and October 4 and 10 are barely noticeable. The average coal size distribution analysis is shown in Figure 7-5. For almost the entire test, the geometrical average coal particle size was between 1.2 and 1.4 inches, with very little material (under 3%) less than the screen size entering the retort.

The results of the chemical and physical analyses of three composite coal samples is given in Table 7-3. The only significant trend was that as the bottom size screen mesh size went from 3/4 inch to 1/4 inch to 0 inch, the ash content of the coal entering the retort rose from 4.7% to 7.4% to 8.5%. Carbon, fixed carbon and heating value declined correspondingly.

7.1.2.2 Ash Data

The mass fraction of ash, less than each of 5 indicated mesh sizes and the mean ash particle size, is given in Figures 7-6 and 7-7. Geometrical ash particle size generally varied from 0.4 to 0.6 inches, with excursions as high as 0.8 inches and as low as 0.3 inches.

Figure 7-8 shows the physical and chemical characteristics of the ash, along with the operating parameters. There is no obvious, significant relationship between bulk density, mean ash particle size and operational parameters. The dry ash bulk density is only about 2/3 that of other bituminous coals gasified under this program. (Volumes 2, 5, 7, and 8, Thimsen, Maurer et al, 1985).

Table 7-4 gives the chemical analyses of three composite dry ash samples. Analysis variations between samples are relatively minor.

7.1.2.3 Cyclone Dust Data

The chemical analysis of one composite cyclone dust sample is given in Table 7-3. The volatile matter to fixed carbon ratio

Table 7-2

Summary of Coal, Ash and Cyclone Dust Analyses Performed

Material	Type of Analysis	Samples Collected	Composite Samples Analyzed
Coal	Particle size distribution	81	-
	Proximate analysis	-	3
	Ultimate analysis	-	3
	Ash fusion temperature	-	3
	Free swelling index	-	3
Ash	Particle size distribution	222	-
	Bulk density	222	-
	Moisture content	222	-
	Carbon content	222	3
	Sulfur content	222	3
	Chemical analysis	-	3
*Cyclone dust	Proximate analysis	-	1
	Ultimate analysis	-	1

* Composite of 22 cyclone dust samples.

Figure 7-3

Feed Coal Size Distribution Analysis

Figure 7-4
Geometrical Mean Coal Particle Size

Figure 7-5

Average Particle Size Distribution of Feed Coal

Table 7-3

Physical and Chemical Properties of Coal and Dust

Material	Coal				Cyclone Dust (dry basis)
Screen Mesh Size, Inch	+3/4	+1/4	ROS*	Average	---
<u>Type of Analysis</u>					
Proximate Analysis, wt %:					
Moisture	4.63	4.23	4.37	4.41	---
Volatile Matter	36.92	37.18	37.43	37.18	18.14
Ash	4.72	7.37	8.52	6.87	11.60
Fixed Carbon	53.72	51.22	49.68	51.54	70.24
Sulfur	0.81	0.69	0.78	0.76	0.71
Ultimate Analysis, wt %:					
Hydrogen	5.18	5.08	5.04	5.10	3.07
Carbon	74.75	73.72	72.73	73.73	78.03
Nitrogen	1.48	1.46	1.45	1.47	1.57
Sulfur	0.81	0.69	0.78	0.76	0.71
Oxygen	8.42	7.45	7.11	7.66	4.99
Ash	4.72	7.37	8.52	6.87	11.60
Moisture	4.63	4.23	4.37	4.41	---
Heating Value, btu/lb.:					
As Received	13,386	13,134	12,892	13,137	---
Moisture Free	14,036	13,714	13,481	13,744	12,827
Ash Fusion Temp., deg F:					
(Oxidizing Atmosphere)					
Initial Def., IT	2775	+2800	+2800	+2800	-
Softening, ST	+2800	-	-	+2800	-
Softening, HT	-	-	-	-	-
Fluid, FT	-	-	-	-	-
(Reducing Atmosphere)					
Initial Def., IT	2765	+2800	+2800	+2800	-
Softening, ST	+2800	-	-	+2800	-
Softening, HT	-	-	-	-	-
Fluid, FT	-	-	-	-	-
Free Swelling Index	3 1/2	3 1/2	3 1/2	3 1/2	-

All values "as received" unless otherwise noted.

* Run of shipment

Figure 7-6

Ash Size Distribution Analysis

Figure 7-7
Geometrical Mean Ash Particle Size

Figure 7-8a

Ash Characteristics and Operating Conditions

BOM/FGT-008

SEPTEMBER

Figure 7-8b

Ash Characteristics and Operating Conditions

BOM/FGT-008

Table 7-4

Elemental Analysis of Moisture-Free Ash

Mass Fraction, %, for Composited Samples (*)

Element	Ash Sample Numbers			
	1-34	35-53	54-71	Average
Fe	4.1	3.51	4.0	3.87
Fe2+	1.1	0.91	1.0	1.0
Si	18.2	18.4	19.0	18.53
Al	11.5	11.9	11.9	11.8
C	28.0	28.0	24.7	26.9
Ca	1.5	1.2	1.4	1.37
Mg	0.23	0.24	0.26	0.25
K	0.78	0.64	0.54	0.65
P	0.16	0.16	0.10	0.14
Na	0.22	0.17	0.13	0.17
S	0.25	0.21	0.17	0.21
Ti	0.86	0.85	0.84	0.85

(*) Unaccounted for mass is presumed to be oxygen bound onto metals as oxides.

of the dust is only 35% that of the volatile matter to fixed carbon ratio of the feed coal. This is consistent with partial devolatilization of this coal in the high temperatures of the offtake duct. This partial devolatilization is not adequate to explain the dry basis increase in ash content of the cyclone dust compared to the coal. The ash to fixed carbon ratio of the cyclone dust is 24% greater than the ash to fixed carbon ratio of the feed coal. This suggests that higher ash materials are preferentially blown over. These materials may come from the lower region of the retort where the materials have lost some fixed carbon due to gasification.

7.1.3 Gas Analysis Data

The carbon monoxide and carbon dioxide NDIR analyzers performed well during the test. Calibration drift was less than 0.5% between calibrations. The SIGMA calorimeter showed a daily drift of about 1%. The HP 5880A gas chromatograph operated well through most of the test. Valve switching problems resulted in a loss of about 28 hours of data as indicated in Table 7-5.

The concentrations of the various species measured by the HP 5880A are shown in Figures 7-9 and 7-10. The major gas species, along with operating parameters and dry gas HHV are shown in Figure 7-11. The cyclical behavior of the gas composition during the first two days of operation is readily apparent from Figure 7-9. Higher nitrogen and carbon dioxide concentrations correspond to lower hydrogen and carbon monoxide concentrations, indicating incomplete reduction of the gas phase by the coal. This can also be observed on September 20, while searching for maximum load, and sporadically during the last 6 days of the test gasifying "run of shipment" coal.

The minor gas species shown in Figure 7-10 were produced in a curious fashion during the first two days of operation. The concentrations of saturated hydrocarbons (methane, ethane and propane) rose and fell with the carbon monoxide concentration, while the concentrations of unsaturated hydrocarbons (ethylene and propylene) rose and fell with the offtake temperature and carbon dioxide concentrations, 180 degrees out of phase with the saturated hydrocarbon concentrations. It may be that the production of unsaturated hydrocarbons is favored by higher temperatures. The transient testing on September 23-24 affected ethane and propane concentrations. These rose and fell with the blast air flow. The transient testing had no apparent effect on ethylene and propylene concentrations.

The HP 5793 gas chromatograph was used to measure sulfur species from hand-injected, syringe gas samples. Samples were injected during the day only. The results of these analyses are shown in Figure 7-12. As these samples were injected by hand, the total quantity of gas injected varied from sample to sample. Thus, the normalized gas composition is reported here. The compositions were normalized such that:

Table 7-5

Gas Chromatograph Data Gaps

<u>Date</u>	<u>Time Period</u>	<u>Problem</u>
9/26	0700-1400	valve 2 sticking
10/3-10/4	0800-1400	Valve 2 sticking
10/6-10/7	1400-1815	TCD malfunction

Figure 7-9a

Major Gas Species Measured by the Gas Chromatograph.

BOM/FGT-008

Figure 7-9b

Major Gas Species Measured by the Gas Chromatograph.

BOM/FGT-008

Figure 7-10a

Minor Gas Species Measured by the Gas Chromatograph.

BOM/FGT-008

Figure 7-10b

Minor Gas Species Measured by the Gas Chromatograph.

BOM/FGT-008

Figure 7-11a

Dry gas HHV, Major Gas Species and
Gasifier Operational Parameters.

BOM/FGT-008

Figure 7-11b

Dry gas HHV, Major Gas Species and
Gasifier Operational Parameters.

BOM/FGT-008

Figure 7-12a

Sulfur Species Measured by the Gas Chromatograph

BOM/FGT-008

SEPTEMBER

Figure 7-12b

Sulfur Species Measured by the Gas Chromatograph

BOM/FGT-008

hydrogen sulfide + carbonyl sulfide + methyl mercaptan = 100%

Methyl mercaptan measurements were not made before September 21. The sulfur gas concentrations varied randomly, and what variations occurred cannot be tied to operating parameters. Generally speaking, hydrogen sulfide makes up about 85% of the sulfur species, with carbonyl sulfide about 5% and methyl mercaptan about 10%.

7.1.4 Tar and Water Yield Data

The gas sampling and conditioning system was shut down several times during the test. These events typically lasted for 1/2 hour, and were the result of either high voltage insulator problems with the sample ESP or tar/dust accumulations in the pipe leading to the condensor. Table 7-6 lists these events. In all, clean gas was unavailable to the gas analyzers for less than 20 hours.

Two composite condensate samples were prepared for analysis. One composite was prepared from tar collected during relatively high throughput operation, September 19-23. A second composite sample was prepared from relatively low throughput operation, September 14-16. Table 7-7 shows the results of the analyses.

The tar and water yields along with operating parameters are shown in Figure 7-13. There is no obvious relationship between tar and water yields and operating parameters within the resolution of the measurements.

7.2 Material and Energy Balances

The material and energy balance calculation procedures are described in Volume 1 of this series (Thimsen, Maurer et al, 1984). A brief description follows.

The measured data used to calculate balances around the gasifier include process temperatures, pressures, flows, tar/water yields, material ultimate analyses, gas compositions and dust carryover from the retort (Section 7.6).

While relative measurements of gas sulfur species are made, the total sulfur loading in the gas is calculated from the coal sulfur content and coal rate and sulfur flows to ash, tar and dust. (See Section 7.1.3 for discussion of errors in total gas sulfur due to inconsistent sample quantities.) Sulfur species concentrations reported are obtained by normalizing GC data to the total sulfur loading calculated above. In addition, the total gas composition has been normalized to 99.9% accounted for in the material and energy balance calculations.

The balances are calculated over various time periods

Table 7-6

Operation Summary for Gas Sampling System

<u>Date</u>	<u>Time Period</u>	<u>Remarks</u>
9/13	17:15 - 18:00	Gasifier down
	20:03 - 20:30	Gasifier down
9/16	14:30 - 18:45	ESP power supply malfunction
9/17	05:06 - 06:45	ESP power supply problems
9/17	08:02 - 09:20	ESP H.V. power wires replaced
9/17	10:20 - 11:20	ESP electrode replaced
9/18	07:10 - 10:08	ESP electrode changed
9/19	07:00 - 07:50	Rod and steam clean main ball valve
9/20	20:00 - 20:55	Rod and steam main ball valve
9/21	07:00 - 07:30	Steam and rod main ball valve
	10:20 - 11:15	ESP H.V. power supply replaced, back to Hippotronic unit
9/22	09:15 - 09:48	Steam clean sampling system
	15:45 - 16:20	Steam and rod sampling system
9/24	15:00 - 15:18	Steam and rod main ball valve
9/25	14:45 - 16:00	ESP H.V. power supply malfunction, no explanation given
9/26	07:00 - 07:30	Steam and rod main ball valve
	03:15 - 03:30	Steam and rod main ball valve
	12:15 - 12:50	Steam and rod main ball valve
10/1	13:40 - 13:50	Steam and rod main ball valve
10/3	09:30 - 12:51	Large ESP explosion, gasifier down
10/6	01:10 - 01:15	Rod main ball valve
10/7	02:05 - 02:35	Steam and rod main ball valve
10/7	14:15 - 14:17	Steam and rod main ball valve
10/8	19:05 - 19:09	Steam and rod main ball valve
10/9	13:20 - 13:45	Steam and rod main ball valve
10/9	14:00 - 14:30	Clean sampling system, problem due to operator error

Table 7-7

Condensed Material Analysis

	9/14 - 9/16		9/19-9/23	
	Low Load		High Load	
<u>Water</u>				
Total organics, %	0.28		0.22	
	As	Dry	As	Dry
	Received	Basis	Received	Basis
<u>Tar</u>				
Heating value, Btu/lb	14,383	16204	13,822	16450
Flash point, F	212		218	
Water by distillation, %	11.24		15.98	
Specific gravity, 60/60 F	1.0885		1.1095	
Pour point, F	90		75	
Cold (solid) point, F	85		70	
Viscosity at:				
122 F Saybolt Furol, s	160		526.8	
122 F Kinematic, centistokes	338.9		1117	
210 F Saybolt Universal, s	85.2		29.53	
210 F Kinematic, centistokes	16.83		29.32	
Ultimate Analysis, WT%				
Hydrogen	7.18	8.09	6.42	7.64
Carbon	73.42	82.72	71.83	85.49
Nitrogen	1.25	1.41	1.30	1.56
Oxygen (by difference)	6.26	7.05	3.87	4.61
Sulfur	0.62	0.70	0.56	0.67
Moisture, Total	11.24		15.98	
Ash	0.03	0.03	0.04	0.05

Figure 7-13a

Tar/Oil Yield and Water Yield with Operating Conditions

BOM/FGT-008

Figure 7-13b

Tar/Oil Yield and Water Yield with Operating Conditions

BOM/FGT-008

representing relatively stable operation. Each time period is characterized by a coal rate, blast saturation temperature, and coal screen size. Tables 7-8 to 7-29 show the results of the calculations. Table 7-30 shows the result of the calculation over the entire test period.

7.3 Grate Performance Model

A geometrical grate performance model was prepared and is described in Volume 1 of this series (Thimsen, Maurer et al, 1984). The model calculates the void volume swept by the grate and compares it to the volume of ash rejected by the grate. Figure 7-14 shows the experimental data and the theoretical prediction. The model tends to over predict actual ash removal. Ash flow may have been influenced adversely by the very low bulk density of the ash.

7.4 Tar Yield Correlations

The overall tar yield measured during gasification of the Elkhorn bituminous coal was 15.3 lb/100 pound coal. This value varied from 13.2 to 17.4. This tar/oil yield can be compared with Fischer-Schrader Assays of similar coals (Selvig and Ode, 1958). Fischer-Schrader Assay tar/oil yield correlations described by Ode and Selvig (1944) and Gomez et al (1958) have predicted tar/oil yields from past gasification tests within acceptable error bands.

There is no Fischer-Schrader Assay available for this coal. As can be seen from Figures 7-15 and 7-16, the correlations of tar/oil yields of similar coals predict a tar/oil yield of 13.6 to 15.4 lb/100 lb coal (as received). The tar/oil yield measured during this test is well within the scatter of the correlations.

7.5 Combustion Emissions Monitoring

Emissions from the gas combustion chamber were monitored on September 19. The full report is included in Appendix M. The information presented here is abstracted from the full report.

Particulate loadings averaging 0.024 gr/dscf were observed. These correspond to mass rates averaging 3.9 lb/hr and a particulate emission factor of 0.086 lb/million Btu input. Assuming the particulate is ash, it corresponds to 0.13% of the ash flow entering the gasifier. Corresponding dust flow rates leaving the cyclone would be 1.2% of the coal feed rate. This is about 40% of the dust calculated to be leaving the retort at the time (see Section 7.6), and suggests a cyclone dust removal efficiency of about 60%.

Sulfur dioxide concentrations averaging 290 ppm (dry) were

Table 7-8

Material Balance and Thermal Efficiency Calculation
0.91 tn/hr, 140 F, +3/4 inch

Input Data

Time period: 9/14/83 00:00 - 9/15/83 14:00 (38.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 0.91
Blast air flow (dry) , Scfm = 1000.
Saturated air temperature, F = 140.
Steam/Air Ratio (lb./lb.) = 0.15
Ambient air temperature, F = 56.
Off-take temperature, F = 748.

Coal Data:

Type = Elkhorn , +3/4 inch
Mass Fraction Carbon % = 74.8
Mass Fraction Fixed Carbon = 53.72
Mass Fraction Moisture % = 4.63
Mass Fraction nitrogen % = 1.48
Mass Percent sulfur = 0.81
Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.53
Tar yield, lb./1000 SCF = 2.52
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 143.
Ash carbon ,percent = 25.0
Ash sulfur ,percent = 0.00
Ash moisture (wet),percent = 16.5
Cyclone dust,lb/hour(est.) = 5.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 16.6	CH4 % = 1.56	H2S (est ppm) = 1332
CO % = 24.8	C2H4 % = 0.104	COS (est ppm) = 138
CO2 % = 6.68	C2H6 % = 0.182	CH3SH (est ppm) = 0
N2 % = 49.1	C3H6 % = 0.058	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.053	HHV, Btu/SCF = 158
Molec. Weight = 24.43	Argon(est. %) = 0.584	LHV, Btu/SCF = 147

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: 0.11)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 1813.	24.2	Dry gas	= 6646.	88.7
Steam (total)	= 758.	10.1	Water in gas	= 467.	6.2
Air(calc,dry)	= 4929.	65.7	Oil and tar	= 260.	3.5
			Ash(calc,dry)	= 113.	1.5
			Dust	= 5.	0.1
Total	= 7500.		Total	= 7492.	

Energy Balance (Percent unaccounted for: 3.12)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 24.3	Dry coal gas	= 16.3	66.7
Air	= -0.005	Oil and tar	= 4.21	17.3
Steam(import)	= 0.783	Sensible	= 1.62	6.6
Cooling water	= 0.147	Latent	= 0.517	2.1
		Ash	= 0.401	1.6
		Dust	= 0.070	0.3
		Cooling water	= 1.310	5.4
Total	= 25.2	Total	= 24.4	

Performance Data

Cold gas efficiency, percent = 64.6
Cold gas with tar efficiency, percent = 81.3
Hot gas without tar efficiency percent = 72.3
Hot gas with tar efficiency, percent = 89.7
Air/Coal (lb./lb.) = 2.719
Steam/Coal (lb./lb.) = 0.418
Air/Fixed Carbon (lb./lb.) = 5.062
Coal/Gasifier Area (lb./hr./sqft) = 54.6
Fixed Carbon/Area (lb./hr./sqft) = 29.3
Producer Gas/Coal (SCF/lb.) = 62.6
Producer Gas/Fixed Carbon (SCF/lb.) = 116.5
Tar Yield (lb./lb. coal) = 0.143

Table 7-9

Material Balance and Thermal Efficiency Calculation
 0.92 tn/hr, 138 F, +3/4 inch

Input Data

Time period: 9/15/83 14:00 - 9/16/83 8:00 (18.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 0.92
 Blast air flow (dry) , Scfm = 994.
 Saturated air temperature, F = 138.
 Steam/Air Ratio (lb./lb.) = 0.15
 Ambient air temperature, F = 54.
 Off-take temperature, F = 794.

Coal Data:

Type = Elkhorn , +3/4 inch
 Mass Fraction Carbon % = 74.8
 Mass Fraction Fixed Carbon = 53.72
 Mass Fraction Moisture % = 4.63
 Mass Fraction nitrogen % = 1.48
 Mass Percent sulfur = 0.81
 Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.68
 Tar yield, lb/1000 SCF = 2.66
 Carbon in Tar (percent) = 82.7
 Sulfur in Tar (percent) = 0.70
 Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 131.
 Ash carbon ,percent = 24.0
 Ash sulfur ,percent = 0.10
 Ash moisture (wet),percent = 19.3
 Cyclone dust,lb/hour(est.) = 7.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.2	CH4 % = 1.57	H2S (est ppm) = 1302
CO % = 26.2	C2H4 % = 0.121	COS (est ppm) = 184
CO2 % = 5.81	C2H6 % = 0.181	CH3SH (est ppm) = 0
N2 % = 48.0	C3H6 % = 0.064	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.051	HHV, Btu/SCF = 164
Molec. Weight= 24.16	Argon(est. %) = 0.571	LHV, Btu/SCF = 154

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.98)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 1838.	25.2	Dry gas	= 6506.	88.2
Steam (total)	= 698.	9.6	Water in gas	= 478.	6.5
Air(calc,dry)	= 4769.	65.3	Oil and tar	= 272.	3.7
			Ash(calc,dry)	= 113.	1.5
			Dust	= 7.	0.1
Total	= 7304.		Total	= 7376.	

Energy Balance (Percent unaccounted for: 1.67)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 24.6	Dry coal gas	= 16.8	57.1
Air	= -0.007	Oil and tar	= 4.40	17.6
Steam(import)	= 0.742	Sensible	= 1.73	6.9
Cooling water	= 0.135	Latent	= 0.530	2.1
		Ash	= 0.385	1.5
		Dust	= 0.086	0.3
		Cooling water	= 1.109	4.4
Total	= 25.5	Total	= 25.0	

Performance Data

Cold gas efficiency, percent = 65.9
 Cold gas with tar efficiency, percent = 83.2
 Hot gas without tar efficiency percent = 73.9
 Hot gas with tar efficiency, percent = 92.0
 Air/Coal (lb./lb.) = 2.595
 Steam/Coal (lb./lb.) = 0.380
 Air/Fixed Carbon (lb./lb.) = 4.830
 Coal/Gasifier Area (lb./hr./sqft) = 55.4
 Fixed Carbon/Area (lb./hr./sqft) = 29.8
 Producer Gas/Coal (SCF/lb.) = 61.3
 Producer Gas/Fixed Carbon (SCF/lb.) = 114.1
 Tar Yield (lb./lb. coal) = 0.148

Table 7-10

Material Balance and Thermal Efficiency Calculation
 1.18 tn/hr, 136 F, +3/4 inch

Input Data

Time period: 9/16/83 10:30 - 9/17/83 7:30 (21.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.18
 Blast air flow (dry) , Scfm =1156.
 Saturated air temperature, F= 136.
 Steam/Air Ratio (lb./lb.) = 0.14
 Ambient air temperature, F = 55.
 Off-take temperature, F = 848.

Coal Data:

Type = Elkhorn , +3/4 inch
 Mass Fraction Carbon % = 74.8
 Mass Fraction Fixed Carbon = 53.72
 Mass Fraction Moisture % = 4.63
 Mass Fraction nitrogen % = 1.48
 Mass Percent sulfur = 0.81
 Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 3.56
 Tar yield, lb/1000 SCF = 2.94
 Carbon in Tar (percent) = 82.7
 Sulfur in Tar (percent) = 0.70
 Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 168.
 Ash carbon ,percent = 27.8
 Ash sulfur ,percent = 0.11
 Ash moisture (wet),percent = 21.7
 Cyclone dust,lb/hour(est.) = 22.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.5	CH4 % = 1.63	H2S (est ppm)= 1362
CO % = 27.5	C2H4 % = 0.175	COS (est ppm)= 171
CO2 % = 5.06	C2H6 % = 0.194	CH3SH (est ppm)= 0
N2 % = 47.0	C3H6 % = 0.074	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.051	HHV, Btu/SCF = 172
Molec. Weight= 23.97	Argon(est. %)= 0.559	LHV, Btu/SCF = 161

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.19)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2355.	26.6	Dry gas	= 7893.	88.9
Steam (total)	= 797.	9.0	Water in gas	= 444.	5.0
Air(calc,dry)	= 5708.	64.4	Oil and tar	= 367.	4.1
			Ash(calc,dry)	= 151.	1.7
			Dust	= 22.	0.2
Total	= 8860.		Total	= 8877.	

Energy Balance (Percent unaccounted for: 1.45)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 31.5	Dry coal gas	= 21.4	67.1
Air	= -0.006	Oil and tar	= 5.95	18.6
Steam(import)	= 0.820	Sensible	= 2.27	7.1
Cooling water	= 0.109	Latent	= 0.502	1.6
		Ash	= 0.593	1.9
		Dust	= 0.279	0.9
		Cooling water	= 0.938	2.9
Total	= 32.4	Total	= 32.0	

Performance Data

Cold gas efficiency, percent = 66.1
 Cold gas with tar efficiency, percent = 84.4
 Hot gas without tar efficiency percent = 73.5
 Hot gas with tar efficiency, percent = 92.8
 Air/Coal (lb./lb.) = 2.424
 Steam/Coal (lb./lb.) = 0.338
 Air/Fixed Carbon (lb./lb.) = 4.512
 Coal/Gasifier Area (lb./hr./sqft) = 71.0
 Fixed Carbon/Area (lb./hr./sqft) = 38.1
 Producer Gas/Coal (SCF/lb.) = 57.2
 Producer Gas/Fixed Carbon (SCF/lb.) = 106.6
 Tar Yield (lb./lb. coal) = 0.156

Table 7-11

Material Balance and Thermal Efficiency Calculation
1.29 tn/hr, 137 F, +3/4 inch

Input Data

Time period: 9/17/83 10:30 - 9/18/83 10:30 (24.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.29
Blast air flow (dry) , Scfm = 1298.
Saturated air temperature, F = 137.
Steam/Air Ratio (lb./lb.) = 0.14
Ambient air temperature, F = 62.
Off-take temperature, F = 821.

Coal Data:

Type = Elkhorn , +3/4 inch
Mass Fraction Carbon % = 74.8
Mass Fraction Fixed Carbon = 53.72
Mass Fraction Moisture % = 4.63
Mass Fraction nitrogen % = 1.48
Mass Percent sulfur = 0.81
Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 3.71
Tar yield, lb/1000 SCF = 2.65
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 227.
Ash carbon ,percent = 24.1
Ash sulfur ,percent = 0.11
Ash moisture (wet),percent = 25.0
Cyclone dust,lb/hour(est.) = 36.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.9	CH4 % = 1.63	H2S (est ppm) = 1332
CO % = 27.6	C2H4 % = 0.163	COS (est ppm) = 191
CO2 % = 5.07	C2H6 % = 0.193	CH3SH (est ppm) = 0
N2 % = 46.5	C3H6 % = 0.072	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.051	HHV, Btu/SCF = 173
Molec. Weight = 23.85	Argon(est. %) = 0.552	LHV, Btu/SCF = 162

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.62)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2574.	26.5	Dry gas	= 8718.	89.0
Steam (total)	= 895.	9.2	Water in gas	= 515.	5.3
Air (calc,dry)	= 6261.	64.3	Oil and tar	= 367.	3.8
			Ash(calc,dry)	= 155.	1.6
			Dust	= 36.	0.4
Total	= 9730.		Total	= 9790.	

Energy Balance (Percent unaccounted for: 1.80)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 34.5	Dry coal gas	= 24.0	68.9
Air	= 0.003	Oil and tar	= 5.95	17.1
Steam(import)	= 0.930	Sensible	= 2.40	6.9
Cooling water	= 0.107	Latent	= 0.577	1.7
		Ash	= 0.529	1.5
		Dust	= 0.461	1.3
		Cooling water	= 0.922	2.6
Total	= 35.5	Total	= 34.9	

Performance Data

Cold gas efficiency, percent = 67.6
Cold gas with tar efficiency, percent = 84.4
Hot gas without tar efficiency percent = 75.1
Hot gas with tar efficiency, percent = 92.7
Air/Coal (lb./lb.) = 2.432
Steam/Coal (lb./lb.) = 0.348
Air/Fixed Carbon (lb./lb.) = 4.528
Coal/Gasifier Area (lb./hr./sqft) = 77.6
Fixed Carbon/Area (lb./hr./sqft) = 41.7
Producer Gas/Coal (SCF/lb.) = 58.3
Producer Gas/Fixed Carbon (SCF/lb.) = 108.5
Tar Yield (lb./lb. coal) = 0.143

Table 7-12

Material Balance and Thermal Efficiency Calculation
1.44 tn/hr, 139 F, +3/4 inch

Input Data

Time period: 9/18/83 13:30 - 9/19/83 13:30 (24.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.44
Blast air flow (dry) , Scfm = 1448.
Saturated air temperature, F = 139.
Steam/Air Ratio (lb./lb.) = 0.15
Ambient air temperature, F = 53.
Off-take temperature, F = 867.

Coal Data:

Type = Elkmorn , +3/4 inch
Mass Fraction Carbon % = 74.8
Mass Fraction Fixed Carbon = 53.72
Mass Fraction Moisture % = 4.63
Mass Fraction nitrogen % = 1.48
Mass Percent sulfur = 0.81
Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.13
Tar yield, lb./1000 SCF = 3.21
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 192.
Ash carbon ,percent = 23.9
Ash sulfur ,percent = 0.08
Ash moisture (wet),percent = 14.2
Cyclone dust,lb/hour(est.) = 62.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.5	CH4 % = 1.67	H2S (est ppm) = 1326
CO % = 26.9	C2H4 % = 0.189	COS (est ppm) = 219
CO2 % = 5.66	C2H6 % = 0.188	CH3SH (est ppm) = 0
N2 % = 46.0	C3H6 % = 0.073	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.047	HHV, Btu/SCF = 173
Molec. Weight = 23.79	Argon(est. %) = 0.547	LHV, Btu/SCF = 162

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -1.27)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2872.	27.3	Dry gas	= 9281.	87.3
Steam (total)	= 1018.	9.7	Water in gas	= 611.	5.7
Air(calc,dry)	= 6613.	63.0	Oil and tar	= 475.	4.5
			Ash(calc,dry)	= 207.	2.0
			Dust	= 62.	0.6
Total	= 10503.		Total	= 10636.	

Energy Balance (Percent unaccounted for: 1.61)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 38.4	Dry coal gas	= 25.7	65.9
Air	= -0.010	Oil and tar	= 7.70	19.8
Steam(import)	= 1.138	Sensible	= 2.84	7.3
Cooling water	= 0.038	Latent	= 0.688	1.8
		Ash	= 0.704	1.8
		Dust	= 0.789	2.0
		Cooling water	= 0.574	1.5
Total	= 39.6	Total	= 39.0	

Performance Data

Cold gas efficiency, percent = 64.8
Cold gas with tar efficiency, percent = 84.2
Hot gas without tar efficiency percent = 72.5
Hot gas with tar efficiency, percent = 93.0
Air/Coal (lb./lb.) = 2.303
Steam/Coal (lb./lb.) = 0.354
Air/Fixed Carbon (lb./lb.) = 4.287
Coal/Gasifier Area (lb./hr./sqft) = 86.5
Fixed Carbon/Area (lb./hr./sqft) = 46.5
Producer Gas/Coal (SCF/lb.) = 56.3
Producer Gas/Fixed Carbon (SCF/lb.) = 104.7
Tar Yield (lb./lb. coal) = 0.165

Table 7-13

Material Balance and Thermal Efficiency Calculation
1.50 tn/hr, 141 F, +3/4 inch

Input Data

Time period: 9/19/83 14:30 - 9/20/83 4:30 (14.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.50
Blast air flow (dry) , Scfm = 1450.
Saturated air temperature, F = 141.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 47.
Off-take temperature, F = 820.

Coal Data:

Type = Elkhorn , +3/4 inch
Mass Fraction Carbon % = 74.8
Mass Fraction Fixed Carbon = 53.72
Mass Fraction Moisture % = 4.63
Mass Fraction nitrogen % = 1.48
Mass Percent sulfur = 0.81
Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 3.62
Tar yield, lb/1000 SCF = 2.96
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 219.
Ash carbon ,percent = 23.8
Ash sulfur ,percent = 0.24
Ash moisture (wet), percent = 15.6
Cyclone dust,lb/hour(est.) = 68.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.9	CH4 % = 1.70	H2S (est ppm) = 1503
CO % = 26.4	C2H4 % = 0.173	COS (est ppm) = 0
CO2 % = 5.99	C2H6 % = 0.190	CH3SH (est ppm) = 0
N2 % = 45.8	C3H6 % = 0.071	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.049	HHV, Btu/SCF = 173
Molec. Weight = 23.73	Argon(est. %) = 0.544	LHV, Btu/SCF = 161

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.29)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2990.	26.9	Dry gas	= 9828.	88.2
Steam (total)	= 1132.	10.2	Water in gas	= 568.	5.1
Air(calc,dry)	= 6993.	62.9	Oil and tar	= 465.	4.2
			Ash(calc,dry)	= 217.	1.9
			Dust	= 68.	0.6
Total	= 11114.		Total	= 11146.	

Energy Balance (Percent unaccounted for: 2.34)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 40.0	Dry coal gas	= 27.2	67.4
Air	= -0.021	Oil and tar	= 7.53	18.7
Steam(import)	= 1.213	Sensible	= 2.76	6.9
Cooling water	= 0.043	Latent	= 0.642	1.6
		Ash	= 0.733	1.8
		Dust	= 0.870	2.2
		Cooling water	= 0.566	1.4
Total	= 41.2	Total	= 40.3	

Performance Data

Cold gas efficiency, percent = 65.8
Cold gas with tar efficiency, percent = 84.1
Hot gas without tar efficiency percent = 73.1
Hot gas with tar efficiency, percent = 92.2
Air/Coal (lb./lb.) = 2.339
Steam/Coal (lb./lb.) = 0.379
Air/Fixed Carbon (lb./lb.) = 4.353
Coal/Gasifier Area (lb./hr./sqft) = 90.1
Fixed Carbon/Area (lb./hr./sqft) = 48.4
Producer Gas/Coal (SCF/lb.) = 56.8
Producer Gas/Fixed Carbon (SCF/lb.) = 105.7
Tar Yield (lb./lb. coal) = 0.156

Table 7-14

Material Balance and Thermal Efficiency Calculation
2.13 tn/hr, 138 F, +3/4 inch

Input Data

Time period: 9/21/83 2:30 - 9/23/83 7:30 (53.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 2.13
Blast air flow (dry) , Scfm = 1884.
Saturated air temperature, F = 138.
Steam/Air Ratio (lb./lb.) = 0.15
Ambient air temperature, F = 40.
Off-take temperature, F = 838.

Coal Data:

Type = Elkhorn , +3/4 inch
Mass Fraction Carbon % = 74.8
Mass Fraction Fixed Carbon = 53.72
Mass Fraction Moisture % = 4.63
Mass Fraction nitrogen % = 1.48
Mass Percent sulfur = 0.81
Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 3.60
Tar yield, lb/1000 SCF = 2.97
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 332.
Ash carbon ,percent = 27.8
Ash sulfur ,percent = 0.32
Ash moisture (wet),percent = 25.7
Cyclone dust,lb/hour (est.) = 330.

Gas Composition (Dry): (normalized to 99.90)

H2	%	= 18.9	CH4	%	= 1.76	H2S	(est ppm)=	1367
CO	%	= 26.3	C2H4	%	= 0.213	COS	(est ppm)=	90
CO2	%	= 6.12	C2H6	%	= 0.200	CH3SH	(est ppm)=	93
N2	%	= 45.5	C3H6	%	= 0.082	C2H5SH	(est ppm)=	0
O2	%	= 0.00	C3H8	%	= 0.050	HHV,	Btu/SCF =	175
Molec. Weight=		23.75	Argon(est. %)=		0.541	LHV,	Btu/SCF =	163

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.80)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 4257.	28.7	Dry gas	= 13021.	87.1
Steam (total)	= 1364.	9.2	Water in gas	= 749.	5.0
Air(calc,dry)	= 9203.	62.1	Oil and tar	= 618.	4.1
			Ash(calc,dry)	= 226.	1.5
			Dust	= 330.	2.2
Total	= 14825.		Total	= 14944.	

Energy Balance (Percent unaccounted for: 2.50)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 57.0	Dry coal gas	= 36.4	63.9
Air	= -0.041	Oil and tar	= 10.16	17.9
Steam(import)	= 1.455	Sensible	= 3.82	6.7
Cooling water	= 0.017	Latent	= 0.846	1.5
		Ash	= 0.890	1.6
		Dust	= 4.237	7.4
		Cooling water	= 0.536	0.9
Total	= 58.4	Total	= 56.9	

Performance Data

Cold gas efficiency, percent = 62.3
Cold gas with tar efficiency, percent = 79.7
Hot gas without tar efficiency percent = 69.1
Hot gas with tar efficiency, percent = 87.4
Air/Coal (lb./lb.) = 2.162
Steam/Coal (lb./lb.) = 0.320
Air/Fixed Carbon (lb./lb.) = 4.024
Coal/Gasifier Area (lb./hr./sqft) = 128.3
Fixed Carbon/Area (lb./hr./sqft) = 68.9
Producer Gas/Coal (SCF/lb.) = 52.8
Producer Gas/Fixed Carbon (SCF/lb.) = 98.2
Tar Yield (lb./lb. coal) = 0.145

Table 7-15

Material Balance and Thermal Efficiency Calculation
0.92 tn/hr, 139 F, +3/4 inch

Input Data

Time period: 9/24/83 16:30 - 9/25/83 8:30 (16.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 0.92
Blast air flow (dry) , Scfm = 994.
Saturated air temperature, F= 139.
Steam/Air Ratio (lb./lb.) = 0.15
Ambient air temperature, F = 57.
Off-take temperature, F = 757.

Coal Data:

Type = Elkhorn , +3/4 inch
Mass Fraction Carbon % = 74.8
Mass Fraction Fixed Carbon = 53.72
Mass Fraction Moisture % = 4.63
Mass Fraction nitrogen % = 1.48
Mass Percent sulfur = 0.81
Heating value, Btu/lb = 13386

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.03
Tar yield, lb/1000 SCF = 2.84
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 98.
Ash carbon ,percent = 21.7
Ash sulfur ,percent = 0.16
Ash moisture (wet),percent = 26.6
Cyclone dust,lb/hour(est.) = 5.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.3	CH4 % = 1.67	H2S (est ppm)= 1236
CO % = 26.6	C2H4 % = 0.111	COS (est ppm)= 99
CO2 % = 6.09	C2H6 % = 0.181	CH3SH (est ppm)= 172
N2 % = 46.2	C3H6 % = 0.056	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.052	HHV, Btu/SCF = 170
Molec. Weight= 23.92	Argon(est. %)= 0.549	LHV, Btu/SCF = 159

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -1.39)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 1844.	26.3	Dry gas	= 6301.	88.7
Steam (total)	= 674.	9.6	Water in gas	= 402.	5.7
Air(calc,dry)	= 4487.	64.1	Oil and tar	= 284.	4.0
			Ash(calc,dry)	= 111.	1.6
			Dust	= 5.	0.1
Total	= 7005.		Total	= 7102.	

Energy Balance (Percent unaccounted for: 2.56)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 24.7	Dry coal gas	= 17.0	68.5
Air	= -0.003	Oil and tar	= 4.60	18.5
Steam(import)	= 0.757	Sensible	= 1.59	6.4
Cooling water	= 0.015	Latent	= 0.450	1.8
		Ash	= 0.341	1.4
		Dust	= 0.063	0.3
		Cooling water	= 0.761	3.1
Total	= 25.4	Total	= 24.8	

Performance Data

Cold gas efficiency, percent = 66.8
Cold gas with tar efficiency, percent = 84.8
Hot gas without tar efficiency percent = 73.9
Hot gas with tar efficiency, percent = 92.8
Air/Coal (lb./lb.) = 2.433
Steam/Coal (lb./lb.) = 0.366
Air/Fixed Carbon (lb./lb.) = 4.530
Coal/Gasifier Area (lb./hr./sqft) = 55.6
Fixed Carbon/Area (lb./hr./sqft) = 29.8
Producer Gas/Coal (SCF/lb.) = 59.0
Producer Gas/Fixed Carbon (SCF/lb.) = 109.9
Tar Yield (lb./lb. coal) = 0.154

Table 7-16

Material Balance and Thermal Efficiency Calculation
1.16 tn/hr, 141 F, +1/4 inch

Input Data

Time period: 9/25/83 9:30 - 9/26/83 7:30 (22.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.16
Blast air flow (dry) , Scfm = 1140.
Saturated air temperature, F = 141.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 64.
Off-take temperature, F = 771.

Coal Data:

Type = Elkhorn , +1/4 inch
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 3.93
Tar yield, lb/1000 SCF = 3.03
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 134.
Ash carbon ,percent = 21.7
Ash sulfur ,percent = 0.16
Ash moisture (wet),percent = 26.6
Cyclone dust,lb/hour(est.) = 14.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.5	CH4 % = 1.77	H2S (est ppm) = 1091
CO % = 26.9	C2H4 % = 0.130	COS (est ppm) = 82
CO2 % = 6.00	C2H6 % = 0.202	CH3SH (est ppm) = 114
N2 % = 45.6	C3H6 % = 0.069	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.059	HHV, Btu/SCF = 174
Molec. Weight = 23.82	Argon(est. %) = 0.542	LHV, Btu/SCF = 162

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -1.20)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2315.	27.4	Dry gas	= 7501.	87.6
Steam (total)	= 854.	10.1	Water in gas	= 470.	5.5
Air(calc,dry)	= 5293.	62.6	Oil and tar	= 362.	4.2
			Ash(calc,dry)	= 216.	2.5
			Dust	= 14.	0.2
Total	= 8461.		Total	= 8562.	

Energy Balance (Percent unaccounted for: 2.15)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 30.4	Dry coal gas	= 20.8	67.7
Air	= 0.005	Oil and tar	= 5.87	19.1
Steam(import)	= 0.930	Sensible	= 1.96	6.4
Cooling water	= 0.013	Latent	= 0.529	1.7
		Ash	= 0.666	2.2
		Dust	= 0.176	0.6
		Cooling water	= 0.709	2.3
Total	= 31.3	Total	= 30.7	

Performance Data

Cold gas efficiency, percent = 66.2
Cold gas with tar efficiency, percent = 84.9
Hot gas without tar efficiency percent = 73.2
Hot gas with tar efficiency, percent = 92.8
Air/Coal (lb./lb.) = 2.287
Steam/Coal (lb./lb.) = 0.369
Air/Fixed Carbon (lb./lb.) = 4.464
Coal/Gasifier Area (lb./hr./sqft) = 69.8
Fixed Carbon/Area (lb./hr./sqft) = 35.7
Producer Gas/Coal (SCF/lb.) = 56.1
Producer Gas/Fixed Carbon (SCF/lb.) = 109.6
Tar Yield (lb./lb. coal) = 0.156

Table 7-17

Material Balance and Thermal Efficiency Calculation
1.28 tn/hr, 141 F, +1/4 inch

Input Data

Time period: 9/26/83 8:30 - 9/27/83 6:30 (22.0 hours)

Gasifier Operation:	Coal Data:
Coal feed, Ton/hour = 1.28	Type = Elkhorn, +1/4 inch
Blast air flow (dry), Scfm = 1284.	Mass Fraction Carbon % = 73.7
Saturated air temperature, F = 141.	Mass Fraction Fixed Carbon = 51.22
Steam/Air Ratio (lb./lb.) = 0.16	Mass Fraction Moisture % = 4.23
Ambient air temperature, F = 68.	Mass Fraction nitrogen % = 1.46
Off-take temperature, F = 805.	Mass Percent sulfur = 0.69
	Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):	Ash and Dust Data:(dry basis)
Water yield, lb./1000 SCF = 4.06	Ash discharge, lb/hour = 198.
Tar yield, lb/1000 SCF = 2.75	Ash carbon, percent = 17.4
Carbon in Tar (percent) = 82.7	Ash sulfur, percent = 0.12
Sulfur in Tar (percent) = 0.70	Ash moisture (wet), percent = 14.6
Tar HHV, thou. Btu/lb = 16.20	Cyclone dust, lb/hour (est.) = 30.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.5	CH4 % = 1.58	H2S (est ppm) = 1041
CO % = 27.0	C2H4 % = 0.132	COS (est ppm) = 83
CO2 % = 5.63	C2H6 % = 0.186	CH3SH (est ppm) = 144
N2 % = 46.0	C3H6 % = 0.055	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.050	HHV, Btu/SCF = 172
Molec. Weight = 23.78	Argon (est. %) = 0.547	LHV, Btu/SCF = 160

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.79)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2554.	26.6	Dry gas	= 8505.	87.8
Steam (total)	= 984.	10.2	Water in gas	= 551.	5.7
Air (calc, dry)	= 6069.	63.2	Oil and tar	= 373.	3.9
			Ash (calc, dry)	= 224.	2.3
			Dust	= 30.	0.3
Total	= 9606.		Total	= 9682.	

Energy Balance (Percent unaccounted for: 2.11)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 33.5	Dry coal gas	= 23.3	68.7
Air	= 0.011	Oil and tar	= 6.04	17.8
Steam (import)	= 1.043	Sensible	= 2.32	6.8
Cooling water	= 0.018	Latent	= 0.615	1.8
		Ash	= 0.554	1.6
		Dust	= 0.381	1.1
		Cooling water	= 0.686	2.0
Total	= 34.6	Total	= 33.9	

Performance Data

Cold gas efficiency,	percent = 67.2
Cold gas with tar efficiency,	percent = 84.7
Hot gas without tar efficiency	percent = 74.8
Hot gas with tar efficiency,	percent = 93.1
Air/Coal	(lb./lb.) = 2.376
Steam/Coal	(lb./lb.) = 0.385
Air/Fixed Carbon	(lb./lb.) = 4.640
Coal/Gasifier Area	(lb./hr./sqft) = 77.0
Fixed Carbon/Area	(lb./hr./sqft) = 39.4
Producer Gas/Coal	(SCF/lb.) = 57.9
Producer Gas/Fixed Carbon	(SCF/lb.) = 113.0
Tar Yield	(lb./lb. coal) = 0.146

Table 7-18

Material Balance and Thermal Efficiency Calculation
1.45 tn/hr, 141 F, +1/4 inch

Input Data

Time period: 9/27/83 7:30 - 9/27/83 21:30 (14.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.45
Blast air flow (dry) , Scfm =1391.
Saturated air temperature, F= 141.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 62.
Off-take temperature, F = 793.

Coal Data:

Type = Elkhorn , +1/4
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.20
Tar yield, lb/1000 SCF = 2.75
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 241.
Ash carbon ,percent = 17.8
Ash sulfur ,percent = 0.13
Ash moisture (wet),percent = 11.1
Cyclone dust,lb/hour(est.) = 55.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.5	CH4 % = 1.57	H2S (est ppm)= 1068
CO % = 27.0	C2H4 % = 0.144	COS (est ppm)= 73
CO2 % = 5.61	C2H6 % = 0.185	CH3SH (est ppm)= 123
N2 % = 46.2	C3H6 % = 0.066	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.051	HHV, Btu/SCF = 172
Molec. Weight= 23.80	Argon(est. %) = 0.549	LHV, Btu/SCF = 160

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.72)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2900.	26.6	Dry gas	= 9596.	87.5
Steam (total)	= 1123.	10.3	Water in gas	= 643.	5.9
Air (calc,dry)	= 6865.	63.1	Oil and tar	= 421.	3.8
			Ash(calc,dry)	= 252.	2.3
			Dust	= 55.	0.5
Total	= 10888.		Total	= 10967.	

Energy Balance (Percent unaccounted for: 2.21)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 38.1	Dry coal gas	= 26.2	68.3
Air	= 0.004	Oil and tar	= 6.82	17.8
Steam(import)	= 1.154	Sensible	= 2.58	6.7
Cooling water	= 0.019	Latent	= 0.717	1.9
		Ash	= 0.640	1.7
		Dust	= 0.707	1.8
		Cooling water	= 0.689	1.8
Total	= 39.3	Total	= 38.4	

Performance Data

Cold gas efficiency, percent = 66.8
Cold gas with tar efficiency, percent = 84.2
Hot gas without tar efficiency percent = 74.3
Hot gas with tar efficiency, percent = 92.4
Air/Coal (lb./lb.) = 2.367
Steam/Coal (lb./lb.) = 0.387
Air/Fixed Carbon (lb./lb.) = 4.622
Coal/Gasifier Area (lb./hr./sqft) = 87.4
Fixed Carbon/Area (lb./hr./sqft) = 44.8
Producer Gas/Coal (SCF/lb.) = 57.6
Producer Gas/Fixed Carbon (SCF/lb.) = 112.5
Tar Yield (lb./lb. coal) = 0.145

Table 7-19

Material Balance and Thermal Efficiency Calculation
1.66 tn/hr, 142 F, +1/4 inch

Input Data

Time period: 10/1/83 00:30 - 10/2/83 6:30 (30.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.66
Blast air flow (dry) , Scfm =1580.
Saturated air temperature, F= 142.
Steam/Air Ratio (lb./lb.) = 0.17
Ambient air temperature, F = 69.
Off-take temperature, F = 833.

Coal Data:

Type = Elkhorn , +1/4 inch
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.23
Tar yield, lb/1000 SCF = 3.02
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 193.
Ash carbon ,percent = 25.1
Ash sulfur ,percent = 0.23
Ash moisture (wet),percent = 26.6
Cyclone dust,lb/hour(est.) = 107.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.9	CH4 % = 1.47	H2S (est ppm)= 1057
CO % = 26.9	C2H4 % = 0.167	COS (est ppm)= 77
CO2 % = 5.73	C2H6 % = 0.179	CH3SH (est ppm)= 148
N2 % = 45.7	C3H6 % = 0.073	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.041	HHV, Btu/SCF = 172
Molec. Weight= 23.72	Argon(est. %) = 0.544	LHV, Btu/SCF = 160

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.71)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 3323.	27.8	Dry gas	= 10430.	86.5
Steam (total)	= 1235.	10.3	Water in gas	= 706.	5.9
Air(calc,dry)	= 7416.	61.9	Oil and tar	= 504.	4.2
			Ash(calc,dry)	= 311.	2.6
			Dust	= 107.	0.9
Total	= 11973.		Total	= 12057.	

Energy Balance (Percent unaccounted for: 1.86)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 43.6	Dry coal gas	= 28.7	65.0
Air	= 0.016	Oil and tar	= 8.29	18.8
Steam(import)	= 1.312	Sensible	= 3.03	6.9
Cooling water	= 0.014	Latent	= 0.791	1.8
		Ash	= 1.108	2.5
		Dust	= 1.371	3.1
		Cooling water	= 0.859	1.9
Total	= 45.0	Total	= 44.2	

Performance Data

Cold gas efficiency, percent = 63.8
Cold gas with tar efficiency, percent = 82.2
Hot gas without tar efficiency percent = 71.2
Hot gas with tar efficiency, percent = 90.5
Air/Coal (lb./lb.) = 2.232
Steam/Coal (lb./lb.) = 0.372
Air/Fixed Carbon (lb./lb.) = 4.357
Coal/Gasifier Area (lb./hr./sqft) = 100.1
Fixed Carbon/Area (lb./hr./sqft) = 51.3
Producer Gas/Coal (SCF/lb.) = 54.9
Producer Gas/Fixed Carbon (SCF/lb.) = 107.2
Tar Yield (lb./lb. coal) = 0.152

Table 7-20

Material Balance and Thermal Efficiency Calculation
1.70 tn/hr, 140 F, +1/4 inch

Input Data

Time period: 10/2/83 8:30 - 10/3/83 8:30 (24.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.70
Blast air flow (dry) , Scfm =1584.
Saturated air temperature, F= 140.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 65.
Off-take temperature, F = 818.

Coal Data:

Type = Eikhorn , +1/4 inch
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 3.79
Tar yield, lb/1000 SCF = 3.27
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 269.
Ash carbon ,percent = 39.9
Ash sulfur ,percent = 0.28
Ash moisture (wet),percent = 24.1
Cyclone dust,lb/hour(est.) = 93.

Gas Composition (Dry): (normalized to 99.90)

H2	%	= 18.4	CH4	%	= 1.49	H2S	(est ppm)= 1114
CO	%	= 27.5	C2H4	%	= 0.168	COS	(est ppm)= 71
CO2	%	= 5.28	C2H6	%	= 0.175	CH3SH	(est ppm)= 133
N2	%	= 46.1	C3H6	%	= 0.076	C2H5SH	(est ppm)= 0
O2	%	= 0.00	C3H8	%	= 0.048	HHV,	Btu/SCF = 173
Molec. Weight=		23.78	Argon(est. %)=		0.547	LHV,	Btu/SCF = 161

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: 0.08)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 3398.	28.7	Dry gas	= 10183.	86.1
Steam (total)	= 1163.	9.8	Water in gas	= 615.	5.2
Air(calc,dry)	= 7271.	61.5	Oil and tar	= 531.	4.5
			Ash(calc,dry)	= 400.	3.4
			Dust	= 93.	0.8
Total	= 11832.		Total	= 11823.	

Energy Balance (Percent unaccounted for: 2.98)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 44.6	Dry coal gas	= 28.0	62.9
Air	= 0.008	Oil and tar	= 8.74	19.6
Steam(import)	= 1.275	Sensible	= 2.90	6.5
Cooling water	= 0.011	Latent	= 0.697	1.6
		Ash	= 2.260	5.1
		Dust	= 1.189	2.7
		Cooling water	= 0.711	1.6
Total	= 45.9	Total	= 44.6	

Performance Data

Cold gas efficiency, percent = 61.1
Cold gas with tar efficiency, percent = 80.1
Hot gas without tar efficiency percent = 67.8
Hot gas with tar efficiency, percent = 87.8
Air/Coal (lb./lb.) = 2.140
Steam/Coal (lb./lb.) = 0.342
Air/Fixed Carbon (lb./lb.) = 4.177
Coal/Gasifier Area (lb./hr./sqft) = 102.4
Fixed Carbon/Area (lb./hr./sqft) = 52.5
Producer Gas/Coal (SCF/lb.) = 51.8
Producer Gas/Fixed Carbon (SCF/lb.) = 101.2
Tar Yield (lb./lb. coal) = 0.156

Table 7-21

Material Balance and Thermal Efficiency Calculation
0.98 tn/hr, 140 F, +1/4 inch

Input Data

Time period: 10/ 3/83 18:30 - 10/ 4/83 9:30 (14.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 0.98
Blast air flow (dry) , Scfm = 998.
Saturated air temperature, F= 140.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 49.
Off-take temperature, F = 711.

Coal Data:

Type = Elcorn , +1/4 inch
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 5.29
Tar yield, lb/1000 SCF = 2.51
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 219.
Ash carbon ,percent = 25.1
Ash sulfur ,percent = 0.19
Ash moisture (wet),percent = 24.7
Cyclone dust,lb/hour(est.) = 7.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.9	CH4 % = 1.55	H2S (est ppm)= 1050
CO % = 26.3	C2H4 % = 0.154	COS (est ppm)= 80
CO2 % = 5.93	C2H6 % = 0.166	CH3SH (est ppm)= 120
N2 % = 47.1	C3H6 % = 0.066	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.048	HHV, Btu/SCF = 167
Molec. Weight= 24.00	Argon(est. %)= 0.560	LHV, Btu/SCF = 156

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -2.04)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 1956.	25.8	Dry gas	= 6716.	86.7
Steam (total)	= 769.	10.1	Water in gas	= 562.	7.3
Air(calc,dry)	= 4864.	64.1	Oil and tar	= 267.	3.4
			Ash(calc,dry)	= 192.	2.5
			Dust	= 7.	0.1
Total	= 7588.		Total	= 7743.	

Energy Balance (Percent unaccounted for: 2.55)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 25.7	Dry coal gas	= 17.7	68.7
Air	= -0.012	Oil and tar	= 4.32	16.7
Steam(import)	= 0.811	Sensible	= 1.59	6.2
Cooling water	= -0.008	Latent	= 0.618	2.4
		Ash	= 0.683	2.6
		Dust	= 0.084	0.3
		Cooling water	= 0.771	3.0
Total	= 26.5	Total	= 25.8	

Performance Data

Cold gas efficiency, percent = 67.0
Cold gas with tar efficiency, percent = 83.3
Hot gas without tar efficiency percent = 74.6
Hot gas with tar efficiency, percent = 91.5
Air/Coal (lb./lb.) = 2.487
Steam/Coal (lb./lb.) = 0.393
Air/Fixed Carbon (lb./lb.) = 4.855
Coal/Gasifier Area (lb./hr./sqft) = 58.9
Fixed Carbon/Area (lb./hr./sqft) = 30.2
Producer Gas/Coal (SCF/lb.) = 60.5
Producer Gas/Fixed Carbon (SCF/lb.) = 118.2
Tar Yield (lb./lb. coal) = 0.136

Table 7-22

Material Balance and Thermal Efficiency Calculation
1.02 tn/hr, 140 F, R.O.S.

Input Data

Time period: 10/ 4/83 10:30 - 10/ 5/83 8:30 (22.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.02
Blast air flow (dry) , Scfm = 1155.
Saturated air temperature, F = 140.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 52.
Off-take temperature, F = 835.

Coal Data:

Type = Elkhorn , R. O. S.
Mass Fraction Carbon % = 72.7
Mass Fraction Fixed Carbon = 49.68
Mass Fraction Moisture % = 4.37
Mass Fraction nitrogen % = 1.45
Mass Percent sulfur = 0.78
Heating value, Btu/lb = 12892

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.58
Tar yield, lb/1000 SCF = 2.63
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 144.
Ash carbon ,percent = 28.6
Ash sulfur ,percent = 0.21
Ash moisture (wet), percent = 16.6
Cyclone dust, lb/hour (est.) = 9.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.5	CH4 % = 1.60	H2S (est ppm) = 1243
CO % = 25.4	C2H4 % = 0.154	COS (est ppm) = 99
CO2 % = 6.68	C2H6 % = 0.172	CH3SH (est ppm) = 145
N2 % = 47.6	C3H6 % = 0.062	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.047	HHV, Btu/SCF = 163
Molec. Weight = 24.23	Argon (est. %) = 0.566	LHV, Btu/SCF = 153

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -1.84)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2034.	26.6	Dry gas	= 6706.	86.1
Steam (total)	= 756.	9.9	Water in gas	= 481.	6.2
Air (calc, dry)	= 4857.	63.5	Oil and tar	= 276.	3.5
			Ash (calc, dry)	= 315.	4.0
			Dust	= 9.	0.1
Total	= 7647.		Total	= 7788.	

Energy Balance (Percent unaccounted for: 2.69)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 26.2	Dry coal gas	= 17.2	65.2
Air	= -0.009	Oil and tar	= 4.47	17.0
Steam (import)	= 0.848	Sensible	= 1.89	7.2
Cooling water	= 0.008	Latent	= 0.533	2.0
		Ash	= 1.278	4.9
		Dust	= 0.121	0.5
		Cooling water	= 0.868	3.3
Total	= 27.1	Total	= 26.3	

Performance Data

Cold gas efficiency, percent = 63.4
Cold gas with tar efficiency, percent = 80.0
Hot gas without tar efficiency percent = 71.5
Hot gas with tar efficiency, percent = 88.8
Air/Coal (lb./lb.) = 2.389
Steam/Coal (lb./lb.) = 0.372
Air/Fixed Carbon (lb./lb.) = 4.808
Coal/Gasifier Area (lb./hr./sqft) = 61.3
Fixed Carbon/Area (lb./hr./sqft) = 30.4
Producer Gas/Coal (SCF/lb.) = 56.8
Producer Gas/Fixed Carbon (SCF/lb.) = 114.4
Tar Yield (lb./lb. coal) = 0.136

Table 7-23

Material Balance and Thermal Efficiency Calculation
1.16 tn/hr, 141 F, R.O.S.

Input Data

Time period: 10/5/83 15:30 - 10/6/83 8:30 (17.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.16
Blast air flow (dry) , Scfm =1298.
Saturated air temperature, F= 141.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 46.
Off-take temperature, F = 905.

Coal Data:

Type = Elkhorn , R.O.S.
Mass Fraction Carbon % = 72.7
Mass Fraction Fixed Carbon = 49.68
Mass Fraction Moisture % = 4.37
Mass Fraction nitrogen % = 1.45
Mass Percent sulfur = 0.78
Heating value, Btu/lb = 12892

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.52
Tar yield, lb/1000 SCF = 2.39
Carbon in Tar (percent) = 82.7
Sulfur in Tar (percent) = 0.70
Tar HHV, thou. Btu/lb = 16.20

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 91.
Ash carbon ,percent = 15.9
Ash sulfur ,percent = 0.15
Ash moisture (wet),percent = 28.3
Cyclone dust,lb/hour(est.) = 30.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.6	CH4 % = 1.50	H2S (est ppm)= 1171
CO % = 24.8	C2H4 % = 0.176	COS (est ppm)= 75
CO2 % = 6.68	C2H6 % = 0.160	CH3SH (est ppm)= 180
N2 % = 48.2	C3H6 % = 0.069	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.044	HHV, Btu/SCF = 161
Molec. weight= 24.19	Argon(est. %)= 0.573	LHV, Btu/SCF = 150

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.24)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2320.	25.0	Dry gas	= 3146.	87.7
Steam (total)	= 968.	10.4	Water in gas	= 578.	6.2
Air(calc,dry)	= 5980.	64.5	Oil and tar	= 305.	3.3
			Ash(calc,dry)	= 231.	2.5
			Dust	= 30.	0.3
Total	= 9268.		Total	= 9290.	

Energy Balance (Percent unaccounted for: 1.56)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 29.9	Dry coal gas	= 20.6	67.5
Air	= -0.018	Oil and tar	= 4.95	16.2
Steam(import)	= 1.085	Sensible	= 2.50	8.2
Cooling water	= 0.010	Latent	= 0.638	2.1
		Ash	= 0.524	1.7
		Dust	= 0.386	1.3
		Cooling water	= 0.909	3.0
Total	= 31.0	Total	= 30.5	

Performance Data

Cold gas efficiency, percent = 66.5
Cold gas with tar efficiency, percent = 82.4
Hot gas without tar efficiency percent = 75.6
Hot gas with tar efficiency, percent = 92.4
Air/Coal (lb./lb.) = 2.578
Steam/Coal (lb./lb.) = 0.417
Air/Fixed Carbon (lb./lb.) = 5.189
Coal/Gasifier Area (lb./hr./sqft) = 69.9
Fixed Carbon/Area (lb./hr./sqft) = 34.7
Producer Gas/Coal (SCF/lb.) = 60.5
Producer Gas/Fixed Carbon (SCF/lb.) = 121.8
Tar Yield (lb./lb. coal) = 0.132

Table 7-24

Material Balance and Thermal Efficiency Calculation
1.50 tn/hr, 143 F, R.O.S.

Input Data

Time period: 10/6/83 10:30 - 10/7/83 7:30 (21.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.50
Blast air flow (dry) , Scfm = 145.
Saturated air temperature, F= 143.
Steam/Air Ratio (lb./lb.) = 0.17
Ambient air temperature, F = 54.
Off-take temperature, F = 844.

Coal Data:

Type = Elkhorn , R.O.S.
Mass Fraction Carbon % = 72.7
Mass Fraction Fixed Carbon = 49.68
Mass Fraction Moisture % = 4.37
Mass Fraction nitrogen % = 1.45
Mass Percent sulfur = 0.78
Heating value, Btu/lb = 12892

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.72
Tar yield, lb/1000 SCF = 2.96
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 288.
Ash carbon ,percent = 22.8
Ash sulfur ,percent = 0.17
Ash moisture (wet),percent = 21.3
Cyclone dust,lb/hour(est.) = 67.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.6	CH4 % = 1.62	H2S (est ppm)= 1235
CO % = 26.7	C2H4 % = 0.189	COS (est ppm)= 91
CO2 % = 5.63	C2H6 % = 0.189	CH3SH (est ppm)= 197
N2 % = 47.1	C3H6 % = 0.081	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.053	HHV, Btu/SCF = 170
Molec. Weight= 24.01	Argon(est. %)= 0.560	LHV, Btu/SCF = 159

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.10)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 3008.	27.1	Dry gas	= 9562.	86.1
Steam (total)	= 1181.	10.6	Water in gas	= 713.	6.4
Air(calc,dry)	= 6911.	62.3	Oil and tar	= 447.	4.0
			Ash(calc,dry)	= 322.	2.9
			Dust	= 67.	0.6
Total	= 11100.		Total	= 11111.	

Energy Balance (Percent unaccounted for: -0.64)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 38.8	Dry coal gas	= 25.7	65.5
Air	= -0.009	Oil and tar	= 7.36	18.8
Steam(import)	= 0.150	Sensible	= 2.80	7.2
Cooling water	= 0.030	Latent	= 0.793	2.0
		Ash	= 1.044	2.7
		Dust	= 0.856	2.2
		Cooling water	= 0.657	1.7
Total	= 38.9	Total	= 39.2	

Performance Data

Cold gas efficiency, percent = 65.9
Cold gas with tar efficiency, percent = 84.8
Hot gas without tar efficiency percent = 74.0
Hot gas with tar efficiency, percent = 93.9
Air/Coal (lb./lb.) = 2.298
Steam/Coal (lb./lb.) = 0.393
Air/Fixed Carbon (lb./lb.) = 4.626
Coal/Gasifier Area (lb./hr./sqft) = 90.6
Fixed Carbon/Area (lb./hr./sqft) = 45.0
Producer Gas/Coal (SCF/lb.) = 55.4
Producer Gas/Fixed Carbon (SCF/lb.) = 111.6
Tar Yield (lb./lb. coal) = 0.149

Table 7-25

Material Balance and Thermal Efficiency Calculation
1.50 tn/hr, 143 F, R.O.S.

Input Data

Time period: 10/7/83 9:30 - 10/8/83 5:30 (20.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.50
Blast air flow (dry) , Scfm = 1605.
Saturated air temperature, F = 143.
Steam/Air Ratio (lb./lb.) = 0.17
Ambient air temperature, F = 49.
Off-take temperature, F = 869.

Coal Data:

Type = Elkhorn , R.O.S.
Mass Fraction Carbon % = 72.7
Mass Fraction Fixed Carbon = 49.68
Mass Fraction Moisture % = 4.37
Mass Fraction nitrogen % = 1.45
Mass Percent sulfur = 0.78
Heating value, Btu/lb = 12892

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 5.01
Tar yield, lb/1000 SCF = 2.70
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 173.
Ash carbon ,percent = 25.4
Ash sulfur ,percent = 0.20
Ash moisture (wet),percent = 32.1
Cyclone dust,lb/hour(est.) = 76.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.6	CH4 % = 1.70	H2S (est ppm)= 1281
CO % = 25.9	C2H4 % = 0.171	COS (est ppm)= 87
CO2 % = 6.20	C2H6 % = 0.187	CH3SH (est ppm)= 139
N2 % = 46.3	C3H6 % = 0.094	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.026	HHV, Btu/SCF = 171
Molec. Weight= 23.84	Argon(est. %)= 0.550	LHV, Btu/SCF = 159

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -1.26)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2992.	27.2	Dry gas	= 9563.	85.8
Steam (total)	= 1166.	10.6	Water in gas	= 762.	6.8
Air(calc,dry)	= 6847.	62.2	Oil and tar	= 411.	3.7
			Ash(calc,dry)	= 330.	3.0
			Dust	= 76.	0.7
Total	= 11005.		Total	= 11143.	

Energy Balance (Percent unaccounted for: 0.56)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 38.6	Dry coal gas	= 26.0	65.5
Air	= -0.018	Oil and tar	= 6.76	17.0
Steam(import)	= 1.322	Sensible	= 2.91	7.3
Cooling water	= 0.012	Latent	= 0.842	2.1
		Ash	= 1.191	3.0
		Dust	= 0.978	2.5
		Cooling water	= 0.991	2.5
Total	= 39.9	Total	= 39.7	

Performance Data

Cold gas efficiency, percent = 65.1
Cold gas with tar efficiency, percent = 82.1
Hot gas without tar efficiency percent = 73.5
Hot gas with tar efficiency, percent = 91.3
Air/Coal (lb./lb.) = 2.289
Steam/Coal (lb./lb.) = 0.390
Air/Fixed Carbon (lb./lb.) = 4.607
Coal/Gasifier Area (lb./hr./sqft) = 90.2
Fixed Carbon/Area (lb./hr./sqft) = 44.8
Producer Gas/Coal (SCF/lb.) = 56.4
Producer Gas/Fixed Carbon (SCF/lb.) = 113.6
Tar Yield (lb./lb. coal) = 0.137

Table 7-26

Material Balance and Thermal Efficiency Calculation
1.72 tn/hr, 143 F, R.O.S.

Input Data

Time period: 10/8/83 11:30 - 10/9/83 23:30 (36.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.72
Blast air flow (dry) , Scfm = 1813.
Saturated air temperature, F = 143.
Steam/Air Ratio (lb./lb.) = 0.17
Ambient air temperature, F = 49.
Off-take temperature, F = 913.

Coal Data:

Type = Elkhorn , R.O.S.
Mass Fraction Carbon % = 72.7
Mass Fraction Fixed Carbon = 49.68
Mass Fraction Moisture % = 4.37
Mass Fraction nitrogen % = 1.45
Mass Percent sulfur = 0.78
Heating value, Btu/lb = 12892

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.61
Tar yield, lb/1000 SCF = 3.13
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 296.
Ash carbon ,percent = 28.0
Ash sulfur ,percent = 0.20
Ash moisture (wet),percent = 24.3
Cyclone dust,lb/hour(est.) = 141.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 17.9	CH4 % = 1.65	H2S (est ppm) = 1306
CO % = 24.7	C2H4 % = 0.206	COS (est ppm) = 88
CO2 % = 6.78	C2H6 % = 0.173	CH3SH (est ppm) = 122
N2 % = 47.6	C3H6 % = 0.083	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.104	HHV, Btu/SCF = 166
Molec. Weight = 24.14	Argon(est. %) = 0.566	LHV, Btu/SCF = 154

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: 0.03)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 3438.	27.5	Dry gas	= 10688.	85.4
Steam (total)	= 1310.	10.5	water in gas	= 775.	6.2
Air(calc,dry)	= 7771.	62.1	Oil and tar	= 526.	4.2
			Ash(calc,dry)	= 385.	3.1
			Dust	= 141.	1.1
Total	= 12519.		Total	= 12515.	

Energy Balance (Percent unaccounted for: 1.11)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 44.3	Dry coal gas	= 27.9	61.5
Air	= -0.020	Oil and tar	= 8.65	19.1
Steam(import)	= 1.489	Sensible	= 3.48	7.7
Cooling water	= 0.012	Latent	= 0.866	1.9
		Ash	= 1.528	3.4
		Dust	= 1.806	4.0
		Cooling water	= 1.057	2.3
Total	= 45.3	Total	= 45.3	

Performance Data

Cold gas efficiency, percent = 60.9
Cold gas with tar efficiency, percent = 79.7
Hot gas without tar efficiency percent = 69.1
Hot gas with tar efficiency, percent = 89.0
Air/Coal (lb./lb.) = 2.260
Steam/Coal (lb./lb.) = 0.381
Air/Fixed Carbon (lb./lb.) = 4.549
Coal/Gasifier Area (lb./hr./sqft) = 103.6
Fixed Carbon/Area (lb./hr./sqft) = 51.5
Producer Gas/Coal (SCF/lb.) = 53.8
Producer Gas/Fixed Carbon (SCF/lb.) = 108.3
Tar Yield (lb./lb. coal) = 0.153

Table 7-27

Material Balance and Thermal Efficiency Calculation
1.29 tn/hr, 143 F, +1/4 inch

Input Data

Time period: 10/10/83 00:30 - 10/10/83 23:30 (23.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.29
Blast air flow (dry) , Scfm =1446.
Saturated air temperature, F= 143.
Steam/Air Ratio (lb./lb.) = 0.17
Ambient air temperature, F = 51.
Off-take temperature, F = 791.

Coal Data:

Type = Elkhorn +1/4
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.15
Tar yield, lb/1000 SCF = 2.89
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 180.
Ash carbon ,percent = 23.2
Ash sulfur ,percent = 0.16
Ash moisture (wet),percent = 21.9
Cyclone dust,lb/hour(est.) = 29.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.5	CH4 % = 1.59	H2S (est ppm) = 1094
CO % = 25.8	C2H4 % = 0.149	COS (est ppm) = 69
CO2 % = 6.37	C2H6 % = 0.178	CH3SH (est ppm) = 112
N2 % = 46.5	C3H6 % = 0.067	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.050	HHV, Btu/SCF = 168
Molec. Weight= 23.91	Argon(est. %) = 0.553	LHV, Btu/SCF = 157

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.04)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2580.	26.5	Dry gas	= 8526.	87.4
Steam (total)	= 1049.	10.8	Water in gas	= 562.	5.8
Air(calc,dry)	= 6118.	62.8	Oil and tar	= 391.	4.0
			Ash(calc,dry)	= 244.	2.5
			Dust	= 29.	0.3
Total	= 9747.		Total	= 9751.	

Energy Balance (Percent unaccounted for: 2.10)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 33.9	Dry coal gas	= 22.7	66.2
Air	= -0.013	Oil and tar	= 6.43	18.7
Steam(import)	= 1.191	Sensible	= 2.29	6.7
Cooling water	= -0.006	Latent	= 0.629	1.8
		Ash	= 0.802	2.3
		Dust	= 0.367	1.1
		Cooling water	= 1.054	3.1
Total	= 35.0	Total	= 34.3	

Performance Data

Cold gas efficiency, percent = 64.9
Cold gas with tar efficiency, percent = 83.2
Hot gas without tar efficiency percent = 72.2
Hot gas with tar efficiency, percent = 91.4
Air/Coal (lb./lb.) = 2.371
Steam/Coal (lb./lb.) = 0.407
Air/Fixed Carbon (lb./lb.) = 4.630
Coal/Gasifier Area (lb./hr./sqft) = 77.8
Fixed Carbon/Area (lb./hr./sqft) = 39.8
Producer Gas/Coal (SCF/lb.) = 57.2
Producer Gas/Fixed Carbon (SCF/lb.) = 111.8
Tar Yield (lb./lb. coal) = 0.152

Table 7-28

Material Balance and Thermal Efficiency Calculation
1.77 tn/hr, 144 F, +1/4 inch

Input Data

Time period: 10/11/83 9:30 - 10/11/83 21:30 (12.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.77
Blast air flow (dry) , Scfm = 1725.
Saturated air temperature, F = 144.
Steam/Air Ratio (lb./lb.) = 0.18
Ambient air temperature, F = 49.
Off-take temperature, F = 752.

Coal Data:

Type = Elkhorn +1/4
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.19
Tar yield, lb./1000 SCF = 3.60
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data: (dry basis)

Ash discharge ,lb/hour = 355.
Ash carbon ,percent = 31.7
Ash sulfur ,percent = 0.19
Ash moisture (wet), percent = 17.5
Cyclone dust, lb/hour (est.) = 92.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.9	CH4 % = 1.62	H2S (est ppm) = 1141
CO % = 26.7	C2H4 % = 0.142	COS (est ppm) = 58
CO2 % = 5.96	C2H6 % = 0.192	CH3SH (est ppm) = 124
N2 % = 45.5	C3H6 % = 0.071	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.054	HHV, Btu/SCF = 173
Molec. Weight = 23.73	Argon (est. %) = 0.541	LHV, Btu/SCF = 161

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.07)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 3533.	28.6	Dry gas	= 10597.	85.6
Steam (total)	= 1337.	10.8	Water in gas	= 709.	5.7
Air (calc, dry)	= 7495.	60.6	Oil and tar	= 610.	4.9
			Ash (calc, dry)	= 366.	3.0
			Dust	= 92.	0.7
Total	= 12366.		Total	= 12374.	

Energy Balance (Percent unaccounted for: 2.33)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 46.4	Dry coal gas	= 29.3	62.7
Air	= -0.019	Oil and tar	= 10.03	21.5
Steam (import)	= 1.519	Sensible	= 2.80	6.0
Cooling water	= -0.009	Latent	= 0.803	1.7
		Ash	= 1.646	3.5
		Dust	= 1.174	2.5
		Cooling water	= 0.968	2.1
Total	= 47.9	Total	= 46.8	

Performance Data

Cold gas efficiency, percent = 61.2
Cold gas with tar efficiency, percent = 82.2
Hot gas without tar efficiency percent = 67.7
Hot gas with tar efficiency, percent = 89.6
Air/Coal (lb./lb.) = 2.121
Steam/Coal (lb./lb.) = 0.379
Air/Fixed Carbon (lb./lb.) = 4.142
Coal/Gasifier Area (lb./hr./sqft) = 106.5
Fixed Carbon/Area (lb./hr./sqft) = 54.5
Producer Gas/Coal (SCF/lb.) = 52.4
Producer Gas/Fixed Carbon (SCF/lb.) = 102.4
Tar Yield (lb./lb. coal) = 0.173

Table 7-29

Material Balance and Thermal Efficiency Calculation
1.73 tn/hr, 144 F, +1/4 inch

Input Data

Time period: 10/11/83 23:30 - 10/13/83 6:30 (31.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.73
Blast air flow (dry) , Scfm = 1725.
Saturated air temperature, F = 144.
Steam/Air Ratio (lb./lb.) = 0.18
Ambient air temperature, F = 49.
Off-take temperature, F = 752.

Coal Data:

Type = Elkhorn +1/4
Mass Fraction Carbon % = 73.7
Mass Fraction Fixed Carbon = 51.22
Mass Fraction Moisture % = 4.23
Mass Fraction nitrogen % = 1.46
Mass Percent sulfur = 0.69
Heating value, Btu/lb = 13134

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.45
Tar yield, lb/1000 SCF = 3.56
Carbon in Tar (percent) = 85.5
Sulfur in Tar (percent) = 0.67
Tar HHV, thou. Btu/lb = 16.45

Ash and Dust Data:(dry basis)

Ash discharge ,lb/hour = 21.
Ash carbon ,percent = 20.5
Ash sulfur ,percent = 0.14
Ash moisture (wet),percent = 30.3
Cyclone dust,lb/hour(est.) = 92.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.2	CH4 % = 1.59	H2S (est ppm)= 1136
CO % = 27.6	C2H4 % = 0.139	COS (est ppm)= 68
CO2 % = 5.17	C2H6 % = 0.182	CH3SH (est ppm)= 104
N2 % = 46.2	C3H6 % = 0.070	C2H5SH (est ppm)= 0
O2 % = 0.00	C3H8 % = 0.052	HHV, Btu/SCF = 173
Molec. Weight= 23.79	Argon(est. %)= 0.549	LHV, Btu/SCF = 162

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: 0.25)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 3467.	27.9	Dry gas	= 10652.	85.8
Steam (total)	= 1358.	10.9	Water in gas	= 757.	6.1
Air(calc,dry)	= 7621.	61.2	Oil and tar	= 605.	4.9
			Ash(calc,dry)	= 308.	2.5
			Dust	= 92.	0.7
Total	= 12446.		Total	= 12414.	

Energy Balance (Percent unaccounted for: 2.29)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 45.5	Dry coal gas	= 29.4	63.9
Air	= -0.020	Oil and tar	= 9.95	21.6
Steam(import)	= 1.543	Sensible	= 2.81	6.1
Cooling water	= -0.009	Latent	= 0.853	1.9
		Ash	= 0.898	2.0
		Dust	= 1.185	2.6
		Cooling water	= 0.861	1.9
Total	= 47.0	Total	= 46.0	

Performance Data

Cold gas efficiency, percent = 62.5
Cold gas with tar efficiency, percent = 83.6
Hot gas without tar efficiency percent = 69.2
Hot gas with tar efficiency, percent = 91.3
Air/Coal (lb./lb.) = 2.198
Steam/Coal (lb./lb.) = 0.392
Air/Fixed Carbon (lb./lb.) = 4.291
Coal/Gasifier Area (lb./hr./sqft) = 104.5
Fixed Carbon/Area (lb./hr./sqft) = 53.5
Producer Gas/Coal (SCF/lb.) = 53.8
Producer Gas/Fixed Carbon (SCF/lb.) = 105.1
Tar Yield (lb./lb. coal) = 0.174

Table 7-30

Material Balance and Thermal Efficiency Calculation
Elkhorn Overall AVERAGE

Input Data

Time period: Overall Average (516.0 hours)

Gasifier Operation:

Coal feed, Ton/hour = 1.43
Blast air flow (dry) , Scfm = 1375.
Saturated air temperature, F = 141.
Steam/Air Ratio (lb./lb.) = 0.16
Ambient air temperature, F = 53.
Off-take temperature, F = 821.

Coal Data:

Type = Elkhorn
Mass Fraction Carbon % = 73.9
Mass Fraction Fixed Carbon = 51.86
Mass Fraction Moisture % = 4.42
Mass Fraction nitrogen % = 1.47
Mass Percent sulfur = 0.76
Heating value, Btu/lb = 13179

Tar and Water Yield (dry basis):

Water yield, lb./1000 SCF = 4.18
Tar yield, lb/1000 SCF = 2.96
Carbon in Tar (percent) = 84.7
Sulfur in Tar (percent) = 0.68
Tar HHV, thou. Btu/lb = 16.38

Ash and Dust Data: (dry basis)

Ash discharge ,lb/hour = 200.
Ash carbon ,percent = 26.1
Ash sulfur ,percent = 0.19
Ash moisture (wet),percent = 22.8
Cyclone dust, lb/hour (est.) = 51.

Gas Composition (Dry): (normalized to 99.90)

H2 % = 18.2	CH4 % = 1.62	H2S (est ppm) = 1230
CO % = 26.4	C2H4 % = 0.166	COS (est ppm) = 105
CO2 % = 5.96	C2H6 % = 0.185	CH3SH (est ppm) = 96
N2 % = 46.5	C3H6 % = 0.073	C2H5SH (est ppm) = 0
O2 % = 0.00	C3H8 % = 0.054	HHV, Btu/SCF = 170
Molec. Weight = 23.90	Argon (est. %) = 0.553	LHV, Btu/SCF = 159

Calculation Results (based on nitrogen and carbon balance)

Material Balance (Percent unaccounted for: -0.57)

Input,	lb/hr	% Total	Output,	lb/hr	% Total
Coal	= 2860.	27.0	Dry gas	= 9300.	87.3
Steam (total)	= 1065.	10.1	Water in gas	= 617.	5.8
Air (calc, dry)	= 6673.	63.0	Oil and tar	= 437.	4.1
			Ash (calc, dry)	= 252.	2.4
			Dust	= 51.	0.5
Total	= 10597.		Total	= 10658.	

Energy Balance (Percent unaccounted for: 2.06)

Input,	MM BTU/hr	Output,	MM Btu/hr	% Total
Coal	= 37.7	Dry coal gas	= 25.1	66.0
Air	= -0.010	Oil and tar	= 7.16	18.8
Steam (import)	= 1.130	Sensible	= 2.62	6.9
Cooling water	= 0.035	Latent	= 0.691	1.8
		Ash	= 0.932	2.5
		Dust	= 0.659	1.7
		Cooling water	= 0.848	2.2
Total	= 38.8	Total	= 38.0	

Performance Data

Cold gas efficiency, percent = 64.7
Cold gas with tar efficiency, percent = 83.1
Hot gas without tar efficiency percent = 72.2
Hot gas with tar efficiency, percent = 91.5
Air/Coal (lb./lb.) = 2.333
Steam/Coal (lb./lb.) = 0.372
Air/Fixed Carbon (lb./lb.) = 4.500
Coal/Gasifier Area (lb./hr./sqft) = 86.2
Fixed Carbon/Area (lb./hr./sqft) = 44.7
Producer Gas/Coal (SCF/lb.) = 56.4
Producer Gas/Fixed Carbon (SCF/lb.) = 108.7
Tar Yield (lb./lb. coal) = 0.153

Figure 7-14

Comparison of the Geometrical Grate Performance Model
with Average Ash Removal Rates.

Figure 7-15

Tar/oil Yield Comparison with
Volatile Matter-Oxygen Correlation

Reference: Ode and Selvig, 1944

Figure 7-16

Tar/oil Yield Comparison with Volatile BTU Correlation

Reference: Gomez et al, 1958

measured. This corresponds to a mass flow averaging 55 lb/hr and a sulfur dioxide emission factor of 1.21 lb/million Btu input. If all coal sulfur were ultimately converted to sulfur dioxide in the combustor exhaust, the sulfur dioxide mass flow rate would be 46.5 lb/hr. This indicates essentially complete conversion of coal sulfur to overhead product sulfur and is confirmed by the low sulfur flows out the ashpit.

Nitric oxide concentrations averaged 144 ppm (dry).

7.6 Retort Particle Sampling

Developmental efforts continued in regard to measurement of total particle mass loadings leaving the retort and particle size distributions. The procedures are described in Volume 1 of this series (Thimsen, Maurer et al, 1984).

A total of 36 sampling runs were made resulting in 28 sets of valid data. The particle loading data was found to correlate best with product gas flow rate (acfm) and coal rate (which are directly related) and no correlation was found between dust loading and agitator sweep rate or position. This could be expected as elutriation of particles from the retort is a function of gas flow rate. Figure 7-17 shows the dust yield data as a function of coal bed top face velocity of the gas. A fair amount of scatter is present. The power law regression equation was used to calculate dust carry over for the material and energy balances (Section 7.2). Data for each loading determination is included in Appendix H.

Dust particle size distributions were measured for three of the samples taken during the test at three coal throughputs. The data for these measurements are presented in Appendix H. The mass median diameter of the dust particles increased from 150 μm to 270 μm to 500 μm as the coal throughput increased from approximately 54 to 102 to 127 lb/hr/sq ft grate. The size distribution data are best fitted with a bimodal size distribution. The fittings are included in Appendix H. Under the high throughput conditions the mass (volume) modes were approximately 21 and 1090 μm . The smaller mode was less affected by throughput level than the larger mode.

7.7 Quench/ESP Tar Removal Data

The quench/ESP tar scrubber was not operated long enough under steady-state conditions to calculate material and energy balances around the slipstream, or to confirm the gas sampling and conditioning system tar/oil yields. It was operated long enough to make some tar removal efficiency measurements. The technique is described in Volume 1 of this series (Thimsen, Maurer et al, 1984).

Figure 7-17

Dust Carryover vs. Gas Face Velocity

Figure 7-18 shows the efficiency data plotted as tar particle penetration vs. specific collection area. These data show that the design point of the electrostatic precipitator is far from the performance. This may be due to the different electrical characteristics of coal gas compared to air and is discussed in detail by Liu et al (1984).

Briefly, the corona current under negative electrode discharge in producer gas is substantially higher than when air is the gaseous medium. This is thought to be due to a greater free electron component in the corona current. The sparkover voltage is also reduced in producer gas compared to air. This is consistent with the excessive sparking noticed by the ESP operators. This sparking effectively reduces the average voltage on the electrode, and hence the removal efficiency.

Figure 7-18

Particle Penetration Through the Quench/ESP

SECTION 8

CONCLUSIONS

1. The maximum throughput observed was 2.1 ton/hour for 60 hours. Throughput was limited by ability to remove ash with the grate spacings used.
2. A coal throughput of 2.0 ton/hour (121 lb/hour/square foot grate) is recommended for design purposes. Based on this throughput and a blast saturation temperature of 144 F (62.2 C) the following material and energy flows can be expected:

Material in (lb/lb coal)		Energy In (million Btu/hr)	
Air	2.162	Coal	53.5
Steam	.320	Steam (import)	.8
Material out (lb/lb coal)		Energy Out (million Btu/hr)	
Dry Gas	3.059	Dry Coal Gas	34.2
Tar/Oil	.145	Tar/Oil	9.5
Water	.176	Sensible, Latent Heat	4.4
Dust	.078	Dust	4.0
Ash	.053	Ash	0.8
		Cooling Water	0.5
		Unaccounted for	0.9

3. The mass weighted average tar/oil yield was 15.3 lb/100 lb coal. This represents 19% of the energy in the coal.
4. The ash resulting from gasification of this coal has a very low density which resulted in capacity restrictions due to ability to remove ash as the grate is a volume removal device. Appropriate modifications to grate spacings could possibly increase maximum throughput.
5. Blast saturation temperatures between 138 F and 144 F (59 C and 62 C) were used. Control of blast saturation temperature at high throughputs was poor.
6. Agglomerations were detected, but correct location and operation of the agitator was adequate to keep large agglomerations of char from forming in the upper zone of the retort.
7. Gasification of the run of shipment coal resulted in slight operational instabilities compared to gasification of the +3/4 inch coal. The distribution of fine material in the coal was uneven, and this may have contributed to the instabilities. Maximum throughput of 1.8 ton/hour was achieved with the smaller bottom size coal size distributions used during this test.

8. Particle emissions from the coal gas flame were 0.08 lb/million Btu input. Sulfur dioxide emissions were 1.2 lb/million Btu input; essentially all of the sulfur in the coal.
9. Particle loss as a fraction of coal throughput could be characterized as a power function of the produced gas flow rate. Mass mean particle sizes averaged from 150 um to 500 um. Dust losses measured were somewhat higher than those measured in past tests.
10. The process quench/ESP tar scrubber removed tar according to simple theory, but performance was well below design specification.
11. Based on this test, the Elkhorn bituminous coal is recommended as a fixed-bed gasifier fuel with agitation. High throughputs are possible and gas quality is good.

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APPENDIX A

Gasifier Operator's Log

These are the comments recorded by the gasifier operators during the course of the test.

TEST LOG

BOM/FGT 008

SEPTEMBER 13, 1983

- 0700 530 pounds of charcoal is loaded into the gasifier.
Flooded the cyclone.
- 0712 Soaked the wicks and charcoal with fuel oil.
- 0730 Dropped metallurgical coke into the retort (10.18 tons start weight).
- 0742 Cycled the valves until they choked at 0.92 tons.
- 0800 Lit the gasifier.
- 0810 Restocked the weigh bin with additional available metallurgical coke. Start weight was 0.90 tons.
- 0814 Have quality, combustable gas. Lit the flare.
- 0824 Stopped coaling up. The weigh bin is now at 1.96 tons.
- 0828 Must light the flare manually.
- 0840 The combustor pilot has been lit.
- 0850 Scrubber system is on.
- 0855 Caustic pump is on at 30/30.
- 0902 Gas is going down stream.
- 0910 The agitator is on at low speed (3.5 sweeps/hour).
- 0930 Starting normal readings and operational procedure.
Cycled the valves to keep the feed legs choked.
- 0940 Adjusted the jacket water flow and turned on the steam to achieve a 58-59 degree C saturation temperature. Also increased the furnace pressure from 50 to 77 inches wg to reduce the back pressure exhaust through the combustor viewing port.
- 0955 Pressures are falling. We are getting negative readings on the ashpit, fire loss and top gas pressures. The sensing line is plugged.
- 1007 The top gas pressure line is unplugged.
- 1010 Fire test results show a 7 inch ash average. The bars had to be left in for 4 minutes to read the ash

level accurately. The number 5 bar hit crust near the grate.

1030 Freeboard average is 41 inches. Leaving the agitator at 3.6 sweeps/hour until the 1100 reading. We are having pressure readout problems. Again the ashpit, fire loss and top gas pressures are reading negative.

1033 Trying to locate where the sensor line is plugged.

1055 Discovered the induced draft fan to be 100% open. Reduced the furnace pressure at .50 inches wg with the valve at 13% open.

1100 The freeboard average was 40.5 inches. Increasing the agitator to speed to 3.8 sweeps/hour. Goal is a 40 inch freeboard.

1110 Top gas and gas supply pressures are both at 4.5 inches wg. The furnace pressure indicator is not responding to automatic control. We are manually increasing the furnace pressure to reduce the top gas and gas supply pressures to 2.5 inches wg. The indicator only operates at atmosphere. The transmitter line is not sending a signal.

1115 Reattached the sending line.

1120 Top gas and gas supply pressures are each at 5.5 inches wg. Increased the furnace pressure and the secondary fan to aid in the reduction of the top gas and gas supply pressures. Increasing the saturation air flow to 1000 cfm.

1130 Furnace pressure is at 150 inches wg and we are still unable to reduce the top gas and gas supply pressures below 4.5 inches wg. The first truckload of Elkhorn coal has just arrived and has been offloaded.

1140 The offtake temperature is 400 degrees C.

1145 The furnace pressure is on automatic and reading 150 inches wg. The valve is only open 30%. Cannot reduce the offtake pressure below 5 inches. Must open the valve manually to 65% open to reach 2.5 inches wg on the top gas and gas supply pressures.

1200 The fire test ash average is 9.7 inches.

1225 The offtake temperature has stabilized at 420 degrees C.

1300 The weigh bin is empty and the weigh cell is reading 0.33 tons. Closed off the slide gate valves and started loading the Elkhorn 3/4" X 2" into the weigh

bin.

- 1330 Cycled only the disc valves. We are choke feeding the retort with coke from the lower bin.
- 1400 The fire test showed an even bed with an ash average of 11.4 inches.
- 1420 Stopped loading coal into the weigh bin at 11.34 tons.
- 1430 Made a slight adjustment to the agitator speed as the freeboard average is 41.25 inches. The agitator speed is now 4.2 sweeps/hour.
- 1500 Freeboard average is now 41.75 inches. Increasing the agitator speed to 4.5 sweeps per minute.
- 1530 Increased the jacket water flow to 20 gpm for the saturation steam to operate on automatic.
- 1545 Saturation steam is controlling the saturation temperature at 59 degrees C.
- 1600 The freeboard average is 44 inches. Increasing the agitator to 5.0 sweeps/hour. Still trying to maintain a 40 inch freeboard average. The fire test ash average was 14.1 inches.
- 1625 The safety valve was closed. Opened the valve and decreased the furnace pressure to 40 inches wg. Closed the supply valve to 5% open. Combustor primary fan is down to 3000 cfm and the combustor secondary fan is down to 7000 cfm. Lowered the setting for this load to maintain gas offtake pressure and a good flow into the combustor.
- 1715 Working on the safety limit switch and lost power. System is down.
- 1750 Back up. Gas is going down stream. Installed a new limit switch for the gas safety valve while we were down.
- 1800 The freeboard average is 39.5 inches and the fire test ash average is 15.7 inches.
- 1820 Reduced the grate drive speed to 2/1.40 to lower the ash average to 14 inches.
- 1840 The freeboard average is 42 inches. Increased the agitator to 6.0 sweeps/hour in attempt to maintain a 40 inch freeboard.
- 1900 The freeboard average is 42 inches.

1935 Elkhorn is entering the retort (4.64 tons net weight). The offtake temperature is 537 degrees C. The coal leg temperature is 32 degrees C and the pipes are empty.

1940 The offtake temperature is 370 degrees C.

2000 Lost power and all fans went down. Opened the vent valve and flooded the cyclone.

2020 Restarted the fans and the gas is going downstream to the combustor again.

2130 Freeboard average is 40.5 inches and the fire test ash average is 18 inches. Increased the grate to 2/2.80. Still trying to lower the ash average to 14 inches.

2135 Started filling the upper bin at a weight of 5.91 tons.

2200 The freeboard average is 40.5 inches. Stopped filling the upper bin at a weight of 11.71 tons. Increased the grate to 3/2.80.

2215 Dumped 5.75 tons of ash and water (110 lbs of water).

2235 The pH is 5.7. Increased the caustic pump to 35/55. We are attempting to keep the pH in the range of 7-7.5. Increased the agitator to 7.0 sweeps/hour. Freeboard average was 42 inches.

2245 Drained 500 pounds of water from the ash cone.

2320 Drained water from the ash cone.

2335 No particulate is available at this cyclone dump.

September 14, 1983

0005 Fire test ash average is 15.4 inches. Freeboard average is 41 inches. The bed is very even with no clinkering.

0100 Dumped 636 pounds of ash. Freeboard average is 40.5 inches.

0130 Coal feed to the gasifier was down this hour (.76 ton). Checked the coal legs and found both to be full. No blockage is apparent in the weigh bins. Freeboard average is 41 inches.

0200 Fire test ash average is 12.1. Freeboard average is 41 inches. The bed is still in good condition with

no burning through and no clinkers.

- 0215 Discovered that we will have to notify the people on the Quench/ESP system know when we are going to take a fire test as the amount of O₂ entrained during this test will shut down their system.
- 0400 Fire test ash average is 12.1 inches. The bars went in easily and the bed still appears to be in good condition. The freeboard average is 40 inches. Slowed the agitator to 6.5 sweeps/hour. Trying to maintain a 40 inch freeboard.
- 0415 Slowed the grate speed to 3/2.50.
- 0445 Changed the caustic barrels.
- 0500 Dumped 764 pounds of ash. The freeboard average is 40.5 inches. The pH is 7.0.
- 0600 Fire test ash average is 16.3 inches. The bed is still in good condition.
- 0610 Increased the grate speed to 3/2.80. Increased the agitator to 7.0 sweeps/hour.
- 0615 Started loading coal into the upper bin; starting weight is 4.54 tons.
- 0628 Finished loading the last of the first load of the Elkhorn into the upper bin; final weight is 5.78 tons.
- 0635 Increased the agitator speed to 8.0 sweeps/hour.
- 0730 The pH is 7.5 or better. Dumped the cyclone and found only a light foaming dust on top of the water. Freeboard average is 40.75 inches.
- 0800 Fire test ash average is 17.3 inches. Noticed no clinkering at the 59 degree C. saturation temperature.
- 0810 Increased the grate speed to 4/3.00 in attempt to lower the ash level. As no clinkering was noticed at the 59 degrees C saturation temperature, we will attempt to drop it to 58 degrees C or lower after the next fire test. We are trying to determine the optimum operating temperature. Gas quality remains very good at 146.8 Btu/ft³, lower heating value. The CO is running 25.2%, the CO₂ is 5.6% and the H₂ is 16.3%.
- 0830 Coal feed exceeded 1 ton per hour (1.05 tons).

- 0853 Increased the induced draft fan draw to -0.6 inch wg to eliminate the back pressure visible through the combustor port.
- 0905 Dumped 824 pounds of ash. Found mostly dry 4 inch chunks.
- 0940 Increased the agitator speed slightly to 8.5 sweeps/hour to keep the freeboard down. The offtake temperature has dropped 50 degrees since the initial increase in agitator and grate speeds after the 0800 fire test.
- 1000 Fire test ash average shows only a slight decline to 16.0 inches. A thick crust approximately 2 feet thick has developed across the entire bed. The bars are going in with some difficulty. Will not reduce the saturation temperature below 58 degrees C. Increasing the grate speed to 4/3.15.
- 1030 The weigh bin is down to 0.86 tons and the next load of Elkhorn has just been unloaded.
- 1040 Started loading coal into the weigh bin.
- 1050 Increased the saturation temperature to 60 degrees C. Still searching for the optimum operating temperature. The CO₂ has gone up to 8%.
- 1110 Dumped 550 pounds of ash. Used the upper nozzles to flush the underside of the grate to remove the finer ash accumulation.
- 1120 After 1/2 hour at the higher saturation temperature, the CO₂ has made the turn around. The offtake temperature is 330 degrees C. It is still lower than we would like. Saturation temperature is now swinging between 59 and 61 degrees C.
- 1200 Fire test ash average is 13.3 inches. The bed is tightly and uniformly packed due to the prior lower saturation temperature. Had to hammer the bars in as the crust is thick and heavy all the way down. The grate speed is 4/3.00.
- 1215 Steam valve is not controlling the saturation temperature. We are getting wider fluctuations now (between 58 and 64 degrees C). Increased the jacket water to 23 gpm hoping this will allow the steam valve to open to a point where it will control the saturation temperature automatically.
- 1230 Freeboard average is 40 inches.
- 1300 Reduced the saturation temperature to 59 degrees C.

as we found that at the 100 cfm load 58 degrees C caused clinkering and gas quality continued to be poor at 60 degrees C.

- 1340 Started refilling the weigh bin at 6.40 tons.
- 1355 Gas quality has improved considerably since going back to the 59 degree saturation temperature. The offtake temperature has started to rise. It is now 350 degrees C.
- 1400 Fire test ash average is 11.4 inches. The bed is fairly even. The rods are still going in with much difficulty. Lowered the grate speed to 4/2.80 in attempt to bring the ash level between 12 and 14 inches.
- 1415 Stopped filling the weigh bin at 11.58 tons.
- 1430 Dumped 675 pounds of ash. Slowed the agitator to 8.0 sweeps/hour. Freeboard average is 39.5 inches.
- 1500 Slowed the agitator speed to 7.8 sweeps/hour as the freeboard is still at 39.5 inches and we want 40 inches.
- 1530 Reduced the induced draft fan pressure to 55 inches wg to increase the gas supply pressure. Dumped the cyclone and found it to be clean with just a small amount of fine ash floating on the water.
- 1600 Freeboard average is 38.5 inches. Slowed the agitator to 7.5 sweeps/hour trying to achieve a 40 inch freeboard. Slowed the grate to 4/1.75 to increase the ash level.
- 1630 Freeboard average is 38 inches. Slowed the agitator to 7.0 sweeps/hour. The offtake temperature has been climbing since 1615. The offtake temperature then was 430 degrees C and now it is 476 degrees C.
- 1645 The induced draft fan was squeeling so we greased each bearing. Changed the combustion inlet thermometer.
- 1730 Freeboard average is 38.5 inches.
- 1800 Freeboard average is 39 inches. Fire test ash average is 14.4 inches. Increased the grate speed to 4/2.20.
- 1900 Dumped 651 pounds of ash. The ash was dry and between 1 and 1.5 inches in size and tan in color. The freeboard average is 39.5 inches. The higher heating value is 158 Btu/ft³. The CO is 30% and the CO₂ is

5.6%. Repaired the leak in the number 7 retort steam line.

- 1930 Freeboard average is 40.5 inches. Increased the agitator to 7.5 sweeps/hour.
- 2000 Freeboard average is 40.5 inches. The fire test ash average is 10.9 inches. The bars are going in more easily. Slowed the grate down to 4/2.00 to increase the ash depth.
- 2030 The freeboard average is 40 inches, finally. Started filling the upper bin at a weight of 6.16 tons. Flushed the cyclone and found 1 inch of floating particulate. The CO is 28% and CO2 is 5.9%. The higher heating value is 159 Btu/ft3 and the lower heating value is 148 Btu/ft3.
- 2100 Stopped filling the upper bin at 11.18 tons. The freeboard average remains at 40 inches.
- 2130 The freeboard average is 39.5 inches. The fire loss pressure has been steadily dropping from 6.6 down to the current 3.5 inches wg.
- 2200 Freeboard average is 40.5 inches. The fire test ash average is 14.0 inches. The offtake temperature is down to 373 degrees C.
- 2230 Freeboard average is 39.5 inches.
- 2345 Increased the agitator speed to 8.0 sweeps/hour. The freeboard average is 42.5 inches.

September 15, 1983

- 0005 Fire test ash average is 16.6 inches. Had to pound in bars #2, 5 & 6. The bed is tight, but no clinkers are evident. The freeboard average is 42 inches.
- 0015 Increased the grate speed to 2.25.
- 0100 Dumped 756 pounds of ash.
- 0200 The fire test ash average is 15.0 inches. The bed is still tight and we had to pound in bars number 3, 4 & 6. No clinkering is evident. The freeboard average is 40.5 inches.
- 0215 Slowed the agitator to 7.5 sweeps/hour.
- 0300 The freeboard average is 40.5 inches.
- 0400 Fire test ash average is 14.3 inches. The bed condi-

tion is improving.

- 0415 Changed caustic barrels.
- 0500 Dumped 595 pounds of ash.
- 0505 Started loading coal into the upper bin.
- 0551 Finished loading coal into the upper bin.
- 0600 Fire test ash average is 16.0 inches. The freeboard average is 40 inches.
- 0615 Increased the caustic feed to 50 as the pH is 6.5. We are trying to maintain a 7.0 pH.
- 0620 The lower heating value is 143 Btu/ft³. The gasifier is running consistantly well now.
- 0635 Flushed the cyclone and got 1.5 scoopsful.
- 0658 Increased the agitator speed to 7.5 sweeps/hour. The freeboard average is 42 inches.
- 0730 It is raining outside. The cyclone dump showed little dust on top or bottom, however there was some scale from the inside of the cone. The pH is 7.5. The freeboard average is 40.5 inches. The saturation air flow is 1000 cfm and the saturation temperature is 59 degrees C.
- 0800 Fire test ash average is 20.1 inches. The bed seems hotter around holes number 3 and 7. Increased the grate speed to 4/3.50 to reduce the ash level.
- 0900 Dumped 685 pounds of ash. Found the ash to be very dry and only one large klinker (boot size). Most of the chunks were 2-3 inches. Much fine ash was evident in this dump. Incresed the agitator speed to 8.4 sweeps/hour as the increased grate speed had pulled the bed down somewhat. The freeboard average is 41.5 inches.
- 0930 Increased the agitator speed to 8.6 sweeps/hour. Freeboard average is 41.25 inches.
- 0945 Offtake temperature has fallen 60-70 degrees C in the last 3 hours. It is now 390 degrees C. The CO vs CO₂ ratio has steadily improved. CO₂ is 5.5%, CO is 25.7%, and H₂ is 16.4%. The higher heating value is 158 Btu/ft³.
- 0950 Checked the downcomer trap and found dry dust and some tar buildup. The combustor port on the lip of the combustor was free of buildup.

0955 Reduced the caustic pump stroke to 45 as the pH was 8.5.

1000 Fire test ash average is 14.4 inches. Slowed the grate speed slightly to 4/3.20 to keep the low side from falling into the critical range.

1030 Slowed the agitator to 8.2 sweeps/hour.

1100 Dumped 540 pounds of ash. Flushed with the upper nozzles. The ash was grayish-tan in color. The coal seems to be burning fully. It was made up of fine ash from the undergrate and some small chunks. Slowed the agitator to 8.0 sweeps/hour.

1200 Fire test ash average is 12.7 inches. Leaving the grate at 4/3.00.

1230 Agitator speed is 7.8 sweeps/hour. Still trying to maintain a 40 inch freeboard.

1330 Started the bed probe. Shut the agitator down for 2 minutes during the probe. Raised the offtake temperature only 20 degrees C. The fire loss pressure is up to 2.5 inches wg.

1340 Started feeding coal to the weigh bin. Starting weight is 3.50 tons. It is still raining and the coal is drenched.

1400 Fire test ash average is 11.4 inches. The grate speed is now 4/2.60. There is a thick crust on top to 3 feet down. Will lower the saturation temperature to 58 degrees C in attempt to loosen up the crust layer on top of the bed. The bottom two feet above the grate is free of clinkers.

1420 Stopped filling the upper bin at a weight of 11.32 tons.

1430 Freeboard average is 38.75 inches. Slowed the agitator to 7.5 sweeps/hour. Dropped the jacket water flow slightly to bring the saturation temperature from 57 degrees C to 58 degrees C.

1450 The offtake temperature is 360 degrees C.

1500 Freeboard average is 39.0 inches. Slowed the agitator to 7.2 sweeps/hour.

1530 The freeboard average is 40.5 inches. the pH is 6.9. Flushed the cyclone and only 1 inch of particulate was found floating on top.

1600 The freeboard average is 40.0 inches. The fire test

ash average is 11.0 inches.

1630 The freeboard average is 40.0 inches. Opened the downcomer and only a small amount of tar came out.

1700 Freeboard average is 39.0 inches.

1745 Changed the agitator depth from 35-37 to 38-40 inches.

1800 Freeboard average is 39.0 inches. The fire test average is 11.4 inches. The top of the bed is still all little crusty, but improving.

1830 Freeboard average is 38.5 inches. Slowed the agitator down to 6.6 sweeps/hour.

1900 Dumped 847 pounds of ash. Ash was dry and sandy in color. The size of the ash particles was 1-2 inches. The gas quality has been steadily improving for the last three hours. CO is 26% and CO₂ is 5.9%. Freeboard average is 37.0 inches. Slowed the agitator down to 6.0 sweeps/hour.

2000 Freeboard average is 37.5 inches. The fire test ash average is 18.3 inches. Increased the grate speed to 4/2.90 to lower the ash depth.

2030 Freeboard average is 40.0 inches. Increased the agitator to 6.5 sweeps/hour.

2100 Freeboard average is 40 inches. The upper bin is full at 11.48 tons.

2115 Slowed the grate down to 4/2.75 to maintain a 14 inch ash average.

2200 Freeboard average is 40.0 inches. The fire test ash average is 12.7 inches.

2210 Dumped 555 pounds of ash. CO₂ has dropped sharply from 6.0 to 5.8%. The CO is at 27%. The offtake temperature is 420 degrees C.

2230 Freeboard average is 40 inches. Filled the upper bin with coal (11.20 tons).

2338 Increased the agitator speed to 7.5 from 6.5. The freeboard average is 42 inches.

September 16, 1983

0005 Fire test ash average is 15.7 inches. The bed is loose and the bars are going in easily. No clinkers

- are present. Freeboard average is 41.0 inches.
- 0100 Dumped 555 pounds of ash. Freeboard average is 40.5 inches.
- 0200 The fire test ash average is 15.0 inches. Freeboard average is 40.5 inches.
- 0300 Freeboard average is 41.0 inches.
- 0400 Fire test ash average is 14.6. Freeboard average is 40.5 inches.
- 0730 The pH is 6.5 so we are increasing the caustic speed to 40. The cyclone still appears to be clean with very little particulate. The strip chart indicators show a straight line, stable condition. Gas quality is very good. Freeboard average is 40.5 inches.
- 0800 Fire test ash average is 13.9 inches. The bed is even and the bars are going in with ease. There is a slight bottom crust forming in the area of holes number 5 & 6. The freeboard average is 39.5 inches. The grate speed is now 4/2.90.
- 0810 Will gradually increase the load to 1200 cfm in 50 cfm increments. The saturation air flow is now at 1050 cfm and the saturation temperature is 58 degrees C. We will leave the saturation temperature at 58 degrees C unless clinkering is noticed.
- 0840 Saturation air flow is 1100 cfm. The offtake temperature is 490 degrees C. The jacket water flow is now at 22 gpm to bring the saturation temperature to 60 degrees C.
- 0900 Gas quality is superb! Higher heating value is 167 Btu/ft³.
- 0910 The saturation air flow is now 1150 cfm. The offtake temperature is 440 degrees C.
- 0940 Increased the saturation air flow is 1200 cfm and the saturation temperature is 58 degrees C. The offtake temperature is 450 degrees C. The ash pit pressure is 8 inches wg. Combustor air flow valves are 83% open to handle the increased saturation air flow. Jacket water flow is at 20 gpm.
- 1000 Fire test ash average is 13.1 inches. The bars are going in easily. Grate speed is 4/2.95. Freeboard average is 40.0 inches. Increased the agitator speed to 7.4 sweeps/hour. We are increasing this to accommodate the increased grate speed and increased coal consumption.

- 1015 The offtake temperature is 475 degrees C.
- 1040 Increased the furnace pressure to 0.75 inches wg to reduce the combustor back pressure. Increased load and back pressure have caused the cyclone elbow on the outlet to leak slightly.
- 1045 The pH level is up to 8.5. Reduced the caustic being supplied to bring the pH back in line at 7.0-7.5.
- 1130 The offtake continues to run around 470-475 degrees C. The gas quality is excellent. Higher heating value is 163 Btu/ft³. Continuing to make slight adjustments to the jacket water, allowing the steam to control the saturation temperature at 58 degrees C.
- 1200 The fire test ash average is 13.0 inches. Moving the grate speed up slightly to 4/3.00 and the agitator speed to 7.5 sweeps/hour. Freeboard average is 41.0 inches.
- 1210 Caustic lines are plugged up. The pH had gone to 4.5. Cleaned the line by flushing it with water.
- 1300 Dumped 370 pounds of ash. Used the upper nozzles and flushed the grate underside three times and this loosened a large amount of fine ash. Recommend the use of the upper nozzles each dump or a triple flush once each day.
- 1330 Start coaling up at 2.30 tons.
- 1400 Stopped coaling up at 10.63 tons. Fire test ash average is 12.9 inches. The bars are still going in with ease. The fire zone seems to have compacted 8-10 inches thick. Moved the grate speed to 4/3.15 and the agitator speed to 8.1 sweeps/hour.
- 1445 Topped off the weigh bin at 11.14 tons.
- 1530 Freeboard average is 39.5 inches. Flushed the cyclone and found 2 inches of floating black silt and two rakesful on the bottom. The pH is 7.0.
- 1600 Freeboard average is 40.5 inches. Fire test ash average is 16.4 inches. Increased the grate speed to 4/3.45 trying to lower the ash level to 14 inches. Increased the agitator speed to 8.5 sweeps/hour.
- 1700 Dump 815 pounds of dry ash (size: 1/4-2 inches). The ash was 50-50 in color from black to sandy.
- 1715 Checked all the equipment outside. All fans are running well. The induced draft bearing is cool.

Cleaned the combustor and downcomer. About a gallon of tar came out.

- 1800 Freeboard average is 41.5 inches and the fire test ash average is 15.6 inches.
- 1830 Dropped in 1.32 tons of coal. The freeboard average is 40.0 inches.
- 1840 University of Minnesota got the chromatograph working.
- 1915 Higher heating value is 169 Btu/ft³. The CO is 26% and the CO₂ is 6.0%. The lower heating value is 158 Btu/ft³. Flushed the cyclone and found 2 inches of floating silt and 3 rakesful on the bottom.
- 2000 Freeboard average is 40.0 inches and the fire test ash average is 14.4 inches.
- 2020 Dumped 1495 pounds of ash (approx 850 pounds ash and the balance water).
- 2035 Started filling the upper bin at 3.98 tons. The freeboard average is 40.0 inches.
- 2100 Finished filling the upper bin at 11.89 tons. The freeboard average is 40.5 inches. Higher heating value is 170 Btu/ft³.
- 2200 Freeboard average is 40.0 inches. Fire test ash average is 14.9 inches. Increased the grate speed to 4/3.5 to lower the ash level to 12-14 inches.
- 2235 Dumped 501 pounds of ash. The ash was dry with no evidence of clinkering. Flushed the cyclone and found 3 inches of floating particulate and only a trace in the bottom.

September 17, 1983

- 0005 Fire test ash average is 16.1 inches. Freeboard average is 41.5 inches.
- 0030 Dumped 1.34 tons of coal. Freeboard average is 41.5 inches.
- 0045 Decreased the agitator speed to 9.0 to lower the freeboard.
- 0100 Freeboard average is 41.0 inches. Dumped ash.
- 0130 Coal drop is 1.08 tons. Freeboard average is 41.0 inches.

0200 Fire test ash average is 41.0 inches. Freeboard average is 41.0 inches.

0230 Dropped 1.23 tons of coal.

0300 Checked the ash weight (385 pounds).

0400 Fire test ash average is 14.3 inches and the freeboard average is 40.5 inches.

0430 Freeboard average is 40.0 inches. Dropped 1.19 tons of coal.

0500 Dumped ash. Freeboard average is 40.5 inches.

0515 Started loading coal into the upper bin.

0530 Dumped 1.20 tons of coal. Freeboard average is 40.5 inches.

0545 Finished loading coal into the upper bin (12.14 tons).

0600 Fire test ash average is 14.6 inches. Freeboard average is 40.5 inches.

0700 Bed probe is in progress. The agitator has been shut off, turned wide open to move it past the probe hole, etc.

0730 Freeboard average is 39.5 inches. Will leave the agitator speed at 9.1 sweeps/hour until after the 0800 fire test and freeboard.

0800 Freeboard average is 39.5 inches and the fire test ash average is 16.7 inches. The fire zone appears to be somewhat deeper than yesterday. The plan is to increase the load gradually so we are increasing the grate speed to 5/2.75.

0810 Increased the saturation air flow to 1250 cfm. We anticipate bumping the load 50 cfm every 1/2 hour until we reach 1400 cfm at a saturation temperature of 58 degrees C.

0830 Freeboard average is 39.5 inches.

0840 Increased the saturation air flow to 1300 cfm.

0900 Dumped 980 pounds of ash. Used the upper nozzles to flush out the fine ash accumulation. Blew down the boiler.

0910 Raised the saturation air flow up to 1350 cfm. Increased the grate speed to 5/2.85 and the agitator

speed to 9.4 sweeps/hour.

- 0930 Checked the downcomer and combustor port. Found 3-4 inches of packed tar and 1 gallon of liquid tar. We also noticed a large build up of tar on the lip to the combustor, which we poked into the fire.
- 0940 The saturation air flow is now 1400 cfm. Increased the furnace pressure to -0.7 inches wg. The valve opened to 50%. Adjusted the jacket water to allow the steam to control the saturation temperature at 58 degrees C.
- 0945 The ash weight is already at 530 pounds.
- 0955 Combustor terminus temperature is over 1000 degrees C. The burner inlet thermocouple is not functioning. It reads 268 degrees C vs. the Venturi discharge reading of 408 degrees C.
- 1000 Fire test ash average is 16.0 inches. Increasing the grate speed to 5/3.15 to reduce the ash level. The bars continue to slide in easily.
- 1130 Having difficulty holding the saturation temperature at 58 degrees C on steam. The upper ash valve was closed. Opened it and now getting 700 pounds of ash.
- 1150 Cut the jacket water flow to 15 gpm. Now the saturation temperature seems to be static at 58 degrees C. Flushed the underside of the grate with 90 gallons of water.
- 1200 Fire test ash average is 17.7 inches. Adjusted the grate speed to 6/3.50 to reduce the ash level to 12-14 inches. Freeboard average is 39.5 inches.
- 1300 The jacket water valve is 100% open and the saturation temperature is flip-flopping between 57-58 and 58-59 degrees C. On the smaller bypass, we are pushing 15 gpm through the jacket. The steam control valve is controlling at 50-55% open.
- 1330 Started coaling up at 2.15 tons. The higher heating value is 168 Btu/ft³.
- 1400 Fire test ash average is 16.4 inches. Leaving the grate at 7/3.50.
- 1415 Stopped coaling up at 11.45 tons. The two hour flip-flop of saturation temperature has settled down.
- 1430 The cyclone particulate concentration is getting heavier and we are noticing much more floating debris.

- 1440 Dumped 1425 pounds of ash. It was half water and half silt.
- 1500 Agitator speed is 9.2 sweeps/hour. The grate speed is 7/3.25.
- 1530 Freeboard average is 39.5 inches. Closed on upper spray nozzle as water was going in the ash. The pH is 7.0. Flushed the cyclone and found there to be only three rakesful of particulate.
- 1600 Freeboard average is 40.0 inches. The fire test ash average is 16.0 inches. Leaving the grate speed at 7/3.25.
- 1615 Drained 400 pounds of water from the ash cone.
- 1730 Freeboard average is 39.0 inches. Increased the agitator to 9.5 sweeps/hour.
- 1800 Freeboard average is 40.0 inches. Fire test ash average is 11.3 inches. Slowed the grate speed to 7/3.00 in attempt to keep the ash level between 12 and 14 inches.
- 1815 Dumped 865 pounds of ash. This ash was dry and from 1/4 to 2 inches in size. The coloring of the ash was a mixture of black and off yellow.
- 2000 Freeboard average is 41 inches. Fire test ash average is 9.0 inches. Slowed the grate to 7/2.50 to build up the ash. Fire loss pressure has leveled off at 7.8 inches wg.
- 2035 Filling the upper weigh bin with a starting weight of 2.34 tons.
- 2100 Freeboard average is 39.5 inches. Slowed the agitator down to 9.0 sweeps/hour. Stopped loading coal at 11.51 tons.
- 2135 Dumped 767 pounds of dry ash. No evidence of clinkers.
- 2200 Freeboard average is 40.5 inches. Fire test ash average is 11.6 inches. The bars are still going in easily.

September 18, 1983

- 0005 Fire test ash average is 10.1 inches.
- 0100 Dumped ash. Freeboard average is 40.0 inches.

0130 Dropped 1.24 tons of coal. Freeboard average is 40.0 inches.

0200 Fire test ash average is 11.4 inches. Freeboard average is 40.5 inches. The bed is fairly even with no clinkers. The bars are going in easily.

0230 Dropped 1.28 tons of coal. Freeboard average is 40.0 inches.

0300 Dumped ash. Freeboard average is 39.5 inches.

0400 Fire test ash average is 12.6 inches. Freeboard average is 40.0 inches.

0500 Dump ash.

0515 Started loading coal into the upper bin.

0545 Finished loading coal into the upper bin.

0730 The pH is 7.0. Freeboard average is 39.5 inches.

0740 Taking the fire test early to allow time for the pressure and temperature probe of the bed. The ash average is 14.6 inches. Speeded up the grate to 7/2.60.

0750-0830 Probe time. Offtake temperature was fluctuating during this time period. It appears to be related to the agitator speed.

0900 Dumped 1400 pounds of ash.

0930 Cyclone deposit is heavier at the current saturation air flow. There was 1 inch of floating particulate and 5-6 rakesful on the bottom.

1000 Fire test ash average is 13.4 inches. Leaving the grate speed at 7/2.60.

1015 Reduced the jacket water to 15 gpm as the saturation temperature is falling toward 57 degrees C. The steam valve position opens from 57-64% open to control the saturation temperature at 58 degrees C.

1100 Dumped 590 pounds of ash. Used the upper nozzles again to flush the fine ash from the bottom of the grate. The ash is made up of fist size and smaller chunks of grayish white matter. Downcomer contained 3-4 inches of packed tar and 1/2 gallon of liquid tar with dust suspended on top. Again there was buildup on the lip of the combustor.

1115 Increasing the saturation air flow by increments of

50 cfm each half hour until 1600 cfm is reached. Leaving the saturation air flow at 58 degrees C. The saturation air flow is now 1450 cfm.

- 1145 Increased the saturation air flow to 1500 cfm.
- 1200 Fire test ash average is 12.6 inches. There are some clinkers developing along the incandescent zone. Increased the saturation temperature to 59 degrees C. Lost the bottom 12-13 inches of a rod after having it in for 2.5 minutes! Increased the grate speed to 7/2.50 and the agitator to 8.8 sweeps/hour.
- 1215 Increased the saturation air flow to 1550 cfm. Saturation temperature is 61 degrees C.
- 1230 Saturation temperature is starting to drift somewhat. Cut the jacket water back to 13 gpm. Steam valve is 65% open.
- 1245 Saturation air flow is now 1600 cfm with a saturation temperature of 59 degrees C. There is still some drift to the saturation temperature. Cut the jacket water to 10 gpm.
- 1300 Saturation temperature is still drifting. We are still controlling it with steam and the valve is 85% open. Reduced the jacket water to 8 gpm. Offtake temperature is 497 degrees C. Jacket outlet temperature is 80 degrees C.
- 1330 Started coaling up at 1.40 tons.
- 1400 Fire test ash average is 17.0 inches. The grate speed is 7/2.85. Freeboard average is 39.75 inches.
- 1415 Stopped coaling up at 11.42 tons. Rear bearing on the induced draft fan is hot to the touch. The bearing nearest the fan is O.K. Put 10 pumps of grease on each side.
- 1430 Dumped 780 pounds of ash.
- 1530 Freeboard average is 40.5 inches. Flushed the cyclone and found 2 inches of floating silt and 7 rakesful on the bottom.
- 1600 Rear bearing on the induced draft fan is still hot to the touch. Freeboard average is 40.0 inches. Fire test ash average is 20.0 inches. Increasing the grate to 7/3.20 to lower the ash average to 12-14 inches.
- 1630 Freeboard average is 42.0 inches. Increased the agitator to 9.4 sweeps.

- 1735 Cleaned out the downcomer and got 1/2 gallon of dry material.
- 1800 Freeboard average is 40.5 inches. Fire test ash average is 40.5 inches. Fire test ash average is 18.6 inches.
- 1830 Freeboard average is 39.5 inches.
- 1845 Dumped 1065 pounds of off yellow ash. No clinkers were evident. Ash ranged in size from fine to 2.5 inches.
- 1930 Freeboard average is 39.5 inches.
- 2000 Freeboard average is 39 inches. Fire test ash average is 16.4 inches.
- 2030 Freeboard average is 40.0 inches. The bed has a slight glow on top. The higher heating value is 171 Btu/ft³. Lower heating value is 159 Btu/ft³. CO is 26% and CO₂ is 6.0%.
- 2035 Loading coal into the upper bin at a weight of 1.53 tons.
- 2115 Stopped coaling up at 11.66 tons.
- 2200 Freeboard average is 40.0 inches. Fire test ash average is 17.7 inches. Increased the grate speed to 7/3.40 to keep the ash average at 1214 inches.
- 2210 Dumped 896 pounds of dry ash. The ash was an off yellow color and between 1/4" and 2 1/2 inches in size. The outside bearing on the induced draft fan has cooled off.
- 2230 Freeboard average is 40.0 inches.

September 19, 1983

- 0005 Fire test ash average is 12.6 inches. Reduced the grate speed to 7/2.25. Freeboard average is 42.0 inches.
- 0100 Increased the agitator speed to 11.0 sweeps/hour. Freeboard average is 43.0 inches.
- 0105 Dumped 809 pounds of ash.
- 0200 Freeboard average is 40.5 inches. Fire test ash average is 16.1 inches. Increased the grate speed to 7/3.50.

0300 Dumped ash. Freeboard average is 41 inches. Increased the agitator speed to 12.0 sweeps/hour.

0400 Fire test ash average is 15.7 inches. Bars are going in easily with no evidence of clinkering.

0500 Dumped 685 pounds of ash. Started loading coal into the upper bin at 1.94 tons.

0600 Fire test ash average is 15.4 inches. Freeboard average is 40.5 inches.

0700 Dumped 522 pounds of ash.

0730 Maintaining a 1600 cfm saturation air flow and a 59 degree C. saturation temperature. Offtake temperature is 45 degrees C. Higher heating value is 170 Btu/ft³.

0800 Fire test ash average is 16.4 inches. Starting to notice a slight bottom crust. Increasing the grate speed to 8/3.00.

0815 Started the bed probe test. Agitator speed will be adjusted to accomodate the bed probe.

0845 Dumped 615 pounds of ash. The ash is still fairly dry. The size ranges from fist size down.

0900 Bed probe continues. The offtake temperature is up to 500 degrees C with the agitator running slowly. As the test ended the offtake went down to 380 degrees C. The jacket water is at 8 gpm with the steam valve 40% open. We are trying to maintain a 59 degree saturation temperature.

0930 Coal useage tops 1.5 tons. The offtake temperature is back up to 480 degrees C. Agitator speed is 10.3 sweeps/hour.

1000 Fire test ash average is 15.1 inches. Slowed the grate slightly to 8/2.85 as the number 4 hole showed the ash level to be close to the grate. Slowed the agitator to 10.0 sweeps/hour. Freeboard average is 39.75.

1100 Slowed the agitator again slightly to 9.8 sweeps/hour. Dumped 697 pounds of ash. There were still many fist sized chunks.

1200 Fire test ash average is 14.4 inches. There are, however, two low holes (4 & 5). Grate speed is 8/2.75. Freeboard average is 40.0 inches. Agitator speed is 9.0 sweeps/hour. The offtake temperature is 485 degrees C.

- 1240 Checked the downcomer and combustor. Found no liquid in the downcomer, only dust. The combustor was clean.
- 1300 Dumped ash and flushed with the upper nozzles. Found 20-30 large clinkers in the 5-6 inch range. The color of the ash is white to tan.
- 1310 Rechecked number 5 hole and found large clinkers on the bottom. Hammered the bar through to the grate to free up this section of grate.
- 1315 Jacket water is 7 gpm and the steam is controlling the saturation temperature at 59 degrees C.
- 1330 Started filling the weigh bin at 1.23 tons.
- 1350 Increased the saturation temperature to 60 degrees C. We are finding too many large clinkers.
- 1400 Fire test ash average is 16.7 inches. Hot spots and clinkering are still evident.
- 1410 Stopped coaling up at 11.61 tons.
- 1415 Started the agitator speed test. We will increase the agitator speed to maximum until we reach a 30 inch freeboard. At that time we will shut the agitator down until 40 inches is attained.
- 1420 Offtake temperature is down to 335 degrees C. Agitator speed is 31+ sweeps/hour.
- 1430 Freeboard average is 33 inches. (A seven inch change in 18 minutes!!!) Dropped 1.79 tons of coal.
- 1440 Offtake temperature has started to recover. It is now over 400 degrees C.
- 1445 Dumped 524 pounds of ash. Freeboard average is 28.5 inches. Offtake temperature is 408 degrees C. Fire loss pressure is 10.0 inches wg. Keeping the agitator at full speed a while longer.
- 1500 Freeboard average is 26.83 inches. Offtake temperature is staying in the range of 410-412 degrees C.
- 1503 Slowed the agitator to the slowest setting (1.7 sweeps/hour.)
- 1510 Offtake temperature is just a little over 500 degrees C.
- 1515 Freeboard average is 32.0 inches. Offtake temperature is 594 degrees C.

- 1530 Freeboard average is 38.5 inches. Increased the agitator to 9.4 sweeps/hour. Trying to hold the freeboard at 40 inches.
- 1600 Freeboard average is 39.5 inches. The agitator speed is 9.8 sweeps/hour. This is the same as before the agitator test. Fire test ash average is 16.7 inches. The offtake temperature is 455 degrees C.
- 1735 Cleaned the downcomer and all that came out was a small amount of dry material. Combustor inlet is clean and the fire is coming in and around the elbow. Noticed the fire burning material in mid air.
- 1800 Freeboard average is 39.5 inches. Fire test ash average is 16.1 inches. The gasifier seems to be divided in half, with one side low ash and the other high. Going to poke the holes and see if this will remedy the situation.
- 1900 Freeboard average is 39.0 inches. The steam valve is 100% open. Slowed the jacket water flow to 6 gpm. Trying to get better control of saturation temperature.
- 1915 Dumped 1002 pounds of dry ash mostly 1.5 inches in size. Chunks were soft and a sandy color with a few black chunks here and there.
- 1930 Put the saturation steam control on manual to better control the saturation temperature. Increased the jacket water flow to 7 gpm,
- 1935 Saturation temperature is 62 degrees C. Steam valve is 49% open. Increased the jacket water flow to 10 gpm.
- 1940 Started loading the upper bin at 2.59 tons.
- 1945 Steam valve is open 40% and the saturation temperature is 60 degrees C.
- 2000 Freeboard average is 40.5 inches. Fire test ash average is 19.7 inches. Increased the grate speed to 7/3.15.
- 2010 Stopped loading coal into the upper bin at 12.47 tons.
- 2200 Freeboard average is 41.0 inches. Fire test ash average is 15.0 inches.
- 2210 Dumped 1072 pounds of ash. The color was sandy and the size range was 1/4" to 2" with a couple softball size. The ash chunks break up fairly easily. Slowed

the grate to 7/3.05.

2330 Increased the agitator speed to 10.5 sweeps/hour.
Freeboard average is 41.5 inches.

September 20, 1983

0005 Fire test ash average is 13.7 inches. Freeboard
average is 40.5 inches.

0100 Dumped ash.

0130 Decreased the jacket water flow to 10 gpm. The steam
is at 100%.

0215 Increased the agitator speed to 11.5 sweeps/hour.
Freeboard average is 41.0 inches.

0216 Fire test ash average is 12.6 inches.

0300 Dump ash.

0400 Fire test ash average is 14.9 inches. The bars went
in easily with no clinkers.

0435 Started loading coal into the upper bin.

0500 Per the test plan, we will raise the saturation air
flow in increments of 50 cfm every 30 minutes until
we reach maximum load. Saturation air flow is now
1650 cfm.

0530 Increased saturation air flow to 1700 cfm.

0600 Increased the saturation air flow to 1750 cfm. In-
creased the saturation temperature to 61 degrees C.
Fire test ash average is 13.7 inches.

0630 Increased the saturation air flow to 1800 cfm.

0700 Increased the saturation air flow to 1850 cfm.

0715 Dumped ash.

0730 Increased the saturation air flow to 1900 cfm. The
steam valve is 100% open. Have cut the jacket water
back to 3-4 gpm and we dare not go any lower. Satu-
ration temperature is holding at 60 degrees C. Can-
not achieve the 61 degrees C target saturation temp-
erature. Increased the agitator speed to 12.2
sweeps/hour.

0750 Have reached the end of the jacket water at 3 gpm.

- 0755 Jacket water outlet temperature is 82 degrees C. Saturation temperature swings above 61 degrees C. Increasing the jacket water flow to 5-6 gpm.
- 0800 Fire test ash average is 28.0 inches. Grate speed is 10/3.50. Agitator is working at top speed.
- 0815 Increased the saturation air flow to 1950 cfm. Saturation temperature is heading to 60 degrees C from 61 degrees C.
- 0820 Jacket water flow is 4 gpm, but must raise it to 5.5 gpm due to the saturation temperature climbing to 62 degrees C. This move brings the saturation temperature down to 61 degrees C.
- 0830 Coal feed is 1.8 tons. The grate has pushed out 500 lbs of ash over the last hour.
- 0845 Increased the saturation air flow to 2000 cfm. Saturation temperature is holding at 61 degrees C with the jacket water flow at 5.5 gpm. Steam valve is 100% open. Fire loss pressure is 12.4 inches wg. Offtake temperature is 480 degrees C. Increased the agitator speed to 12.8 sweeps/hour. Trying to maintain a 40 inch freeboard.
- 0854 Steam regulator valve opened from 12 pounds to 28 pounds. We have plenty steam now. Put the jacket water flow back to 10 gpm with the steam control valve at 30% open.
- 0900 The decision was made to back off the steam regulator valve to the 16-17 pound plateau. Opened the steam control valve to 70% open. Jacket water flow is at 5gpm to maintain the 61 degree C. saturation temperature.
- 0910 Both the top gas and the gas supply pressures are approaching 4 inches wg. Opened the gas control valve to 75% open from 20% open.
- 0915 Dumped 800 pounds of ash. Increased the saturation air flow to 2050 cfm. We are still searching for high load. Increased the agitator speed to 13.2 sweeps/hour.
- 0945 Increased the saturation air flow to 2100 cfm. Increased the agitator speed to 13.1 sweeps/hour.
- 1000 Fire test ash average is 15.3 inches. Grate speed is 10/3.30. Freeboard average is 39.752 inches.
- 1015 Increased the saturation air flow to 2150 cfm. Saturation temperature is 61 degrees C. Adjusted the

agitator speed to 13.2 sweeps/hour.

- 1030 Dropped 1.94 tons of coal. This is the same as the 0930 drop. Steam control valve is 86% open and controlling the saturation temperature at 61 degrees C. Jacket water flow is 5 gpm. CO is 28% and CO₂ is 6%.
- 1045 Increased the saturation air flow to 2200 cfm. Saturation temperature is still at 61 degrees C.
- 1051 Offtake temperature is 500 degrees C.
- 1100 Dumped 900 pounds of ash.
- 1115 Increased the saturation air flow to 2250 cfm. Saturation steam valve is 100% open. Jacket water flow is 5 gpm. Opened the regulator to allow 19-20 pounds of steam. Now we can control the saturation temperature with a jacket water flow of 10 gpm and the steam valve 45% open.
- 1130 Coal feed hits 2.01 tons at a saturation air flow of 2250 cfm.
- 1145 Steam valve is 100% open. Jacket water flow is at 5 gpm. Having difficulty maintaining the desired 61 degrees C saturation temperature. We need more steam!! Again we changed the regulator adjustment to 20 pounds.
- 1155 Now we are back to a saturation temperature of 61 degrees C with the steam valve 65% open.
- 1200 Fire test ash average is 22 inches. Increased the grate speed to 10/3.45. Freeboard average is 40.0 inches.
- 1210 Started filling the upper bin at 2.13 tons.
- 1220 Now both the burner inlet and the combustor end thermocouples are gone. The combustor end is not even giving any reading and the burner inlet thermocouple is giving a reading of 1420+ degrees C. For a short period of time the latter gave a reading of 1562 degrees C and then it started darting up and down.
- 1300 Still at a saturation air flow of 2250 cfm. The saturation temperature is remaining at 61 degrees C. The jacket water is at 5 gpm with the steam valve 32% open. The offtake temperature is 490 degrees C. Fire loss pressure is 13 inches wg. The combustor is not able to handle all the gas being produced!! Dumped 1000 pounds of dry ash. The grate has been

churning out over 500 pounds of ash per hour since the 0900 dump. Coal is being completely consumed. The dust and particles in the cyclone are not building up as much as was expected.

- 1345 Increased the saturation air flow to 2300 cfm. Started filling the upper bin at 3.24 tons.
- 1400 Fire test ash average is 20.0 inches. Noticed some clinkering. Increased the grate speed to 10/3.70 to reduce the ash level. Increased the saturation temperature to 62 degrees C.
- 1415 Increased the saturation air flow to 2350 cfm.
- 1430 Coal feed hit 2.14 tons.
- 1445 Increased the saturation air flow to 2400 cfm at a saturation temperature of 62 degrees C. Dumped 900 pounds of ash. The lower water counter is out.
- 1455 Having difficulty holding the saturation temperature at 62 degrees C. Increased the jacket water to allow the steam control valve to do its' job.
- 1515 Saturation air flow is now at 2450 cfm. Still having trouble holding the saturation temperature at 62 degrees C. Opened the steam regulator to 23 pounds. The steam control valve is 100% open. Jacket water flow is 5 gpm.
- 1530 Changed the agitator depth to 34-36 from 38-40 inches.
- 1545 Increased the saturation air flow to 2500 cfm.
- 1600 Increased the agitator speed to 21.8 sweeps/hour. Freeboard average is 41.5 inches. Fire test ash average is 24.3 inches. Increased the grate drive to 10/4.50. Increased the jacket water flow to 10 gpm.
- 1610 Increased the agitator to 31.0 sweeps/hour. We are trying to bring the freeboard to 34 inches.
- 1615 Saturation steam valve diaphragm is leaking. Closed the main valve and blocked the steam control line. Opened the main steam valve slightly.
- 1730 We are having trouble with the boiler failure light.
- 1745 Reduced the saturation air flow to 2000 cfm. The grate speed is 10/3.50. Agitator speed is 15.8 sweeps/hour in attempt to maintain a 38 inch average freeboard.
- 1800 Freeboard average is 38.5 inches. Fire test ash

average is 14.0 inches.

1815 Started loading the upper bin at 2.04 tons. Dumped 950 pounds of ash and water. The water meter is not working well. Will have to use the upper spray nozzles and leave them on for one minute. Agitator depth is back to 38-40 inches. Trying to hold the freeboard average at 38 inches.

1900 Freeboard average is 37.5 inches. Slowed the grate down to 10/2.50. Opened the steam valve to the stack and eliminated boiler failure light.

1915 Saturation steam is back to automatic. Replaced the leaking diaphragm. Inlet pressure is 19 psi. Increased the jacket water flow to 26 gpm to operate the steam valve.

1930 Freeboard average is 37.5 inches.

2000 Freeboard average is 38.0 inches. Fire test ash average is 12.6 inches. Slowed the grate down to 10/2.20.

2030 Increased the saturation air flow to 2050 cfm.

2100 Increased the saturation air flow to 2100 cfm.

2115 Repaired the ash flush water meter. Slowed the jacket water to 16 gpm. The steam valve is 80% open.

2130 Secondary combustor fan is down to 6000 cfm from 13500 cfm. Slowed the jacket water flow down to 13 gpm to allow the saturation steam better control.

2200 Freeboard average is 40.5 inches. Fire test ash average is 13.7 inches. Will hold the grate speed at 10/2.20 to maintain a 12-14 inch ash average. Slowed the agitator down to 2.20 sweeps/hour to allow a 38 inch freeboard.

2230 Freeboard average is 40.5 inches. Increased the agitator speed to 13.5 sweeps/hour.

2300 Freeboard average is 40.5 inches. Reduced the agitator to 11.0 sweeps/hour.

September 21, 1983

0005 Freeboard average is 39.0 inches. Fire test ash average is 18.2 inches. Bars are going in easily with no evidence of clinkering.

0100 Dumped ash.

0130 Increased the saturation air flow to 2100 cfm.

0135 Increased the saturation air flow to 2150 cfm.

0200 Fire test ash average is 21.1 inches. Increased the grate speed to 10/2.50.

0205 Increased the saturation air flow to 2200 cfm.

0225 Steam is now at 100%. Can only maintain a 60 degrees C saturation temperature.

0315 Loaded coal into the upper bin.

0345 Stopped loading coal.

0400 Fire test ash average is 18.1 inches. The bars went in easily with no evidence of clinkering.

0445 Started loading coal into the upper bin.

0500 Dumped 1300 pounds of ash.

0515 Increased the jacketr water flow to 10 gpm.

0530 Increased the agitator speed to 14.0 sweeps/hour.

0600 Fire test ash average is 13.1 inches.

0730 Increased the agitator speed to bring the freeboard average to 36-38 range from 39.0 inches. Cut back the jacket water to 8 gpm. The steam valve is open 90%. Trying to maintain a 61 degree C saturation temperature.

0800 Fire test ash average is 14.6 inches. The ash level is very even. Changing the height of the agitator to 34-36 from 38-40 inches. Grate speed is 10/2.50.

0845 Increased the agitator to maximum speed (31.0 sweeps/hour). The freeboard average is 36.5 inches and we want to keep it in the 34-36 inch range.

0945 Readjusted the height of the agitator arm to reach further into the top of the bed. The agitator is now running at a depth of 38-40 inches.

1000 Fire test ash average is 20.7 inches. No multiple zones. Grate speed is 10/3.15. Still adjusting the agitator speed to keep up with the changes in the agitator depth changes over the last hour.

1040 Reduced the pressure build up by rodding the offtake sensor tube.

- 1100 Dumped 1100 pounds of ash. Started to fill weigh bin at 1.67 tons. Plate and eye hook shored up above the scrubber tank. It was in danger of breaking off and going through the induced draft fan. Freeboard average is 34.75 inches. Agitator speed is at 23.9 sweeps/hour.
- 1115 Reduced the agitator speed to 22.5 sweeps/hour. Re-tighten packing around the agitator shaft.
- 1200 Fire test ash average is 24.9 inches. Running the grate full out at 10/4.50 in attempt to reduce the ash. Fire loss pressure is extremely high at 20 inches wg. Freeboard average is 36.0 inches.
- 1215 Reducing the saturation temperature to 61 degrees C. We are attempting to dry out the bed and allow the ash to be churned out faster. Jacket water flow is now 11 gpm.
- 1315 The grate has churned out 750 pounds of ash.
- 1330 The downcomer contains only granular dust and powder. There was no tar in liquid form.
- 1340 Fire test ash average is 22.6 inches. Increasing the grate to 10/5.00.
- 1400 The decision was made to drop the freeboard to 40 inches. Changed the agitator speed to 10.0 sweeps/hour. Will try to determine if fire loss pressure is proportional to change in the freeboard. Fire loss pressure is now at 22 inches wg. Freeboard average is currently 35 inches.
- 1430 Agitator speed is 15-16 sweeps/hour. Fire loss pressure is now 18.2 inches wg. Freeboard average is 40.5 inches.
- 1440 Dumped 140 pounds of ash and flushed the cyclone.
- 1530 Saturation temperature is 61 degrees C. Freeboard average is 39.5 inches.
- 1600 Saturation temperature is dropping. Opened the ball valve. The valve was 3/4 closed. Increased the inlet pressure. Freeboard average is 39.0 inches. Fire test ash average is 24.3 inches.
- 1610 Lowered the agitator from 38-40 inches to 40-42 inches. This should help decrease the fire loss pressure drop of 19 to 20 inches. There may be an agglomeration several inches below the vertical travel of the agitator which may be opened with the 2 inch lower travel.

- 1700 Freeboard average is 39.0 inches. Fire loss pressure is down to 17 inches wg. Increased the agitator to 16.4 sweeps/hour. Trying to hold the freeboard at 40 inches.
- 1800 Lowered the saturataion temperature to 60 degrees C. Trying to grind out more ash. Freeboard average is 40.0 inches. Fire test ash average is 21.7 inches. Dumped 1400 pounds of dry ash.
- 1830 Filling the upper bin at a weight of 1.74 tons. Boiler flame failure light is on. Opened the steam valve to the stack and restarted the boiler. Freeboard average is 40.0 inches. Poked numbers 2 & 7 holes to bring down the ash. CO2 has come down from 5.5% to 4.5% when we lowered the saturation temperature from 61 degrees C to 60 degrees C.
- 1845 Secondary air is down to 8500 cfm from 10500 cfm. Fire loss pressure is holding at 17.4 inches wg.
- 1915 Having trouble burning tar from the ESP. The combustor is at capacity burning gas from the gasifier at a rate of 50,000,000 Btu/hour.
- 1930 Freeboard average is 39.5 inches. Finished coaling up at 12.24 tons.
- 2000 Freeboard average is 40.5 inches. Fire test ash average is 15.3 inches. Will slow the grate down to 10/4.50.
- 2100 Freeboard ash average is 39.5 inches.
- 2145 Dumped 1400 pounds of ash. Flushed the underside of the grate and got 1145 pounds more. In total we got two hoppersful of ash. Started filling the upper bin at 5.72 tons.
- 2200 Stopped filling the upper bin at 1220 pounds. Freeboard average is 40.5 inches. Fire test ash average is 12.6 inches. Slowed the grate speed to 10/4.00 to hold the ash average to 12-14 inches.
- 2300 Dumpeed 1045 pounds of ash. Freeboard average is 39.0 inches.

September 22, 1983

- 0005 Fire test ash average is 11.7 inches. The bars went in easlily with no clinkers present.
- 0100 Dumped ash.
- 0130 Having trouble maintaining the saturation tempera-

ture. Steam pressure is jumping around from 12-30 psi. The steam regulator is not controlling the steam.

0200 Fire test ash average is 12.3 inches.

0215 Still trying to get the steam under control.

0245 Finally got the steam regulator to partially control the steam flow to the valve at 15 psi. Hopefully this will stop the wide swings in saturation temperature.

0300 Dumped ash.

0330 The steam is still wandering, but not as badly as before.

0400 Fire test ash average is 13.9 inches.

0415 Will have to control the steam manually as the automatic mode is still too wild.

0500 Dumped ash.

0515 Boiler failed. High steam. Adjusted the boiler high limit to 100 psi. Set the load demand at 95 psi. This should stop the overshoot.

0600 Fire test ash average is 13.3 inches.

0610 Still running on manual steam to control saturation temperature. This is the only way it will stay even close to the saturation temperature.

0740 Agitator speed is 15-16 sweeps/hour. Trying to maintain a 40 inch freeboard. Freeboard average is currently 38.0 inches. Dumped 1300 pounds of ash. No large clinkers. Saturation temperature is 60-61 degrees C.

0800 Fire test ash average is 20.7 inches. Increased the grate speed to 10/4.40 to remove the ash. Freeboard average is 39.5 inches.

0810-0900 Pressure and temperature bed probe test. Varied the agitator speed to accomodate this test.

0900 Unplugged the offtake pressure sensor, as there was no drop across the cyclone 5.6 vs 5.3 inches wg. Previous six hours was 6 inches wg. After unplugging it, we obtained 7 inches wg. Top gas pressure is 6.3 inches wg vs the gas supply pressure of 5.5 inches. Dumped 670 pounds of ash. Ash seems much more dense and not as brittle. Higher heating value is 170

Btu/ft³.

- 1000 Fire test ash average is 15.0 inches. Slowed the grate to 10/4.10.
- 1015 Upon entering the control room after taking the fire test, we noticed that the saturation temperature had fallen 6-8 degrees C. Steam valve is 10% open with the jacket water at 4-5 gpm. Cannot raise the saturation temperature above 56 degrees C. Increased the available pressure from 15 to 20 pounds, allowing the valve to be controlling the saturation temperature at 35% open with 9 gpm jacket water flow.
- 1100 Grate speed is 10/4.60. Dumped 1300 pounds of ash. Trying to control the saturation temperature with the steam on automatic.
- 1120 The automatic control is keeping the saturation temperature at 61 degrees C. Started filling the weigh bin at 2.20 tons.
- 1200 Fire test ash average is 23.9 inches. Increasing the grate speed to 10/5.00 (almost 2 revolutions per hour). Increased the agitator speed to 15.2 sweeps/hour. Freeboard average is 40.0 inches.
- 1400 Fire test ash average is 15.9 inches. Leaving the grate wide open at 10/5.00.
- 1410 Boiler alarm sounded as we had flame failure. Our inlet gauges peaked at 30+ pounds. Blew down and relit the boiler.
- 1430 Freeboard average is 39.5 inches. The agitator speed is 16.5 sweeps/hour.
- 1450 Stopped filling the weigh bin at 10.51 tons.
- 1500 Freeboard average is 38.5 inches. Reduced the agitator speed to 15.5 sweeps/hour. Reduced the grate speed to 10/4.75.
- 1545 The grate stopped. Restarted it at the remote station.
- 1600 Freeboard average is 40.0 inches. Fire test ash average is 21.9 inches. Increased the grate speed to 10/5.00 to lower the ash level.
- 1635 The retort steam valve was left open. Turned it off. Boiler failure alarm came on.
- 1800 Freeboard average is 39.5 inches. Fire test ash average is 17.6 inches. Leaving the grate at

10/5.00.

1815 Dumped 1319 pounds of ash.

1900 Freeboard average is 39.5 inches. Started loading the upper bin at a weight of 2.43.

1930 Upper bin is full at 10.89 tons.

2000 Freeboard average is 40.0 inches. Fire test ash average is 15.4 inches. Holding the grate speed at 10/5.00. Fire loss pressure is holding at 13.5 inches wg. Gas supply pressure is 5.8 inches wg.

2030 Freeboard average is 39.0 inches. Increased the agitator speed to 16.5 sweeps/hour.

2130 Slowed the agitator down to 16.0 sweeps/hour. Filled the upper bin at 12.45 tons.

2200 Fire test ash average is 13.4 inches. Slowed the grate down to 10/4.75.

2215 Dumped 1365 pounds of ash. The ash was sandy in color and 1/4" to 2" in size.

September 23, 1983

0005 Fire test ash average is 15.1 inches.

0015 Boiler kicked out. Set the high pressure modulator.

0100 Dumped ash.

0112 Slowed down the agitator.

0200 Fire test ash average is 16.0 inches.

0230 Started loading coal into the upper bin. Dumped the cyclone. Getting quite a bit of particulate now.

0245 Reset the boiler and adjusted the modulator for high pressure.

0300 Dumped ash.

0315 Stopped loading coal.

0400 Fire test ash average is 12.3 inches.

0500 Dumped ash.

0515 Started loading coal into the upper bin.

0545 Finished loading coal.

0600 Fire test ash average is 14.8 inches.

0700 Dumped 1045 pounds of ash.

0715 Agitator speed is being changed to accomodate the pressure and temperature bed probe.

0730 Freeboard average is 38.5 inches. Reducing the agitator speed to 14.2 sweeps/hour. Back pressure is building throughout. P-707 is 3.0 inches wg.

0800 Fire test average is 18.1 inches.

0815 Starting the step drop as part of the load swing test. Reducing the saturation air flow to 1000 cfm. Reducing the grate to 10/2.00 and the agitator to 8.1 sweeps/hour. Cut the saturation temperature to 60 degrees C. Increasing the jacket water flow to 13 gpm. Closed the steam valve to 19% open. Back pressure went from 3.0 to 0. Furnace pressure went to -1.8 inches wg.

0830 Freeboard average is 40.0 inches Offtake temperature is between 415 & 420 degrees C. Saturation temperature is being maintained at 60 degrees C.

0845 Freeboard average is 41.5 inches. Increased the agitator speed to 8.3 sweeps/hour.

0850 Reduced the furnace pressure to -1.2 inches wg with the valve 45% open. Cut the gas supply valve to 50% open in attempt to maintain at least 1.0 inch wg in the cyclone outlet pressure.

0900 Dumped 1000 pounds of ash. Changed caustic barrels as the pH had dropped to 5.5.

0920 Offtake temperature is now 397 degrees C. Higher heating value is 172 Btu/ft³.

0940 Offtake temperature is 380 degrees C.

1000 Fire test ash average is 15.1 inches. Saturation air flow is still 1000 cfm. Noticing a slight bottom crust about 2-4 inches thick at th is low load and saturation temperature of 60 degrees C. Leaving the grate at 10/2.00. Freeboard average is 39.5 inches. Agitator speed is 8.2-8.3 sweeps/hour.

1020 Checking the boiler as the alarm was sounding for "boiler off". Panel lights flash and then are off in 3-4 seconds. Found that it is not modulating correctly and that we must reset the upper limit on the demand side.

- 1030 Offtake seems to be staying in the 380-400 degree C level. Coal consumption seems to be ranging from 1-1.75 tons/hour.
- 1100 Dumped 850 pounds of ash. Making new poke rods. Higher heating value is 170 Btu/ft³. CO is 26.8%, CO₂ is 5.9% and H₂ is 18.8%.
- 1200 Fire test ash average is 11.3 inches. Leaving the grate at 10/2.00.
- 1215 Per test plan, boosting the saturation air flow to 1800 cfm. Increased the agitator speed to 11.5 sweeps/hour. Increased the induced draft fan draw and opened the gas control valve to 70% open. Trying to keep the gas supply pressure below 5 inches wg. With the valve 100% open the furnace pressure is 110 inches wg.
- 1300 Saturation temperature is 60 degrees C. It is being maintained with the steam control valve 18% open and the jacket water is at 11 gallons/hour. Offtake temperature is 425 degrees C.
- 1315 Increased the saturation temperature to 61 degrees C.
- 1330 Dumped 680 pounds of ash and water (100 pounds of water). Offtake temperature is 440 degrees C. Started filling the weigh bin at 1.59 tons.
- 1400 Fire test ash average is 16.4 inches. The bars are going in easily with only a slight crust. Fire zone is very compact with no high areas. Increasing the grate to 10/3.00. Increased the agitator speed to 12.8 sweeps/hour to compensate for the faster removal of ash.
- 1430 At a saturation air flow of 1800 cfm we are using 1.66 tons of coal per hour.
- 1445 Stopped coaling up at 11.55 tons.
- 1450 Offtake temperature is 403 degrees C. Dumped ash. Fire loss pressure is climbing steadily since we increased the grate speed to 10/3.00. It is now 10.0 inches wg.
- 1500 Reinserted the grate drive stroke limiter bar as we will be dropping the saturation air flow to 600 cfm.
- 1515 Saturation temperature is 59 degrees C. Saturation air flow is now at 600 cfm. Grate speed has been reduced to 4/3.00 and the agitator to 9.0 sweeps/hour.

- 1530 Slowed the jacket water flow to 7 gpm for better control of saturation steam. Freeboard average is 34.0 inches. Slowed the agitator to 6.5 sweeps/hour. Slowed the caustic pump to 30-30.
- 1600 Freeboard average is 34.0 inches. Slowed the agitator down to 3.0 sweeps/hour. Fire test ash average is 12.7 inches. Slowed the grate down to 4/2.50 to maintain a 12-14 inch ash level. Closed the gas supply valve to 15% open to increase the outlet pressure.
- 1630 Freeboard average is 37.5 inches. Starting to load the upper bin at .56 tons. Offtake temperature is rising now that the agitator has slowed down. It is now 427 degrees C.
- 1700 Freeboard average is 39.0 inches. Increasing the agitator to 4.2 sweep/hour.
- 1730 Leaving the grate at 4/2.50. Higher heating value is 163 Btu/ft³ and the lower heating value is 153 Btu/ft³.
- 1800 Fire test ash average is 9.4 inches. Slowed the grate to 4/1.50 and the agitator to 3.5 sweeps/hour.
- 1900 Freeboard average is 37.5 inches. Higher heating value is 171 Btu/ft³ and the lower heating value is 162 Btu/hour.
- 1915 Increased the saturation air flow to 1800 cfm from 600 cfm. Increased the saturation temperature to 61 degrees C. Increased the jacket water flow to 10 gpm. Increased the agitator to 7.5 sweeps/hour. Dumped 1392 pounds of ash and water (700 pounds of water). Induced draft fan is at 110 inches wg. Primary and secondary fan are at 100%. Opened the gas supply valve to 70%. Increased the caustic pump to 50-45.
- 1930 Freeboard average is 42.0 inches. Increased the agitator to 10.0 sweeps/hour. Increased the grate to 4/2.50 to keep the ash level at 12-14 inches.
- 2000 Freeboard average is 40.0 inches. Fire test ash average is 17.0 sweeps/hour.
- 2015 Increased the grate speed to 4/4.90 and the agitator to 11.5 sweeps/hour. Scrubber inlet is starting to turn cherry red! The gas quality did not change as much going to the higher load as it did when dropping the load.
- 2030 Freeboard average is 38.5 inches. Increased the

grate speed to 10/1.25. The pH is 6.5. Started loading the upper bin at 5.69 tons. Drained 150 pounds of water from the ash cone.

2100 Freeboard average is 39.0 inches. Increasing the grate speed to 10/1.50. Stopped loading the upper bin at 12.58 tons.

2130 Increased the grate speed to 10/2.00 and the agitator to 12.0 sweeps/hour.

2200 Freeboard average is 40.0 inches. Fire test ash average is 20.6 inches. Increasing the grate speed to 10/2.50 to grind more ash out.

2210 Loading the upper bin at 11.05 tons. Fire loss pressure is starting to climb. It is now 11.2 inches wg.

2220 Dumped 750 pounds of ash.

2245 Increased the grate speed to 10/3.00.

2315 Dropped the saturation air flow to 1000 cfm per test plan. Reset the saturation temperature at 60 degrees C. Lowered the induced draft fan to 100 inches wg. Increased the jacket water flow to 13 gpm. Reduced the agitator speed to 10.0 sweeps/hour. Reduced the grate speed to 10/2.25.

2345 Freeboard average is 39.0 inches. Reduced the agitator to 9.0 sweeps/hour.

September 24, 1983

0005 Fire test ash average is 14.6 inches. Freeboard average is 40.0 inches.

0010 Slowed the grate speed to 10/2.00.

0100 Dumped ash.

0130 Freeboard average is 39.0 inches.

0200 Fire test ash average is 39.5 inches. Noticed a slight crust in the area of hole number 5.

0210 Slowed the grate speed to 10/1.75.

0235 Slowed the agitator speed to 5.0 sweeps/hour.

0300 Dumped ash. Freeboard average is 40.5 inches. Increased the agitator speed to 6.5 sweeps/hour.

0400 Fire test ash average is 10.9 inches. Slowed the grate to 10/1.25. Had a bar get hung up in hole number 4, but we got it out. Freeboard average is 40.5 inches.

0445 Started loading coal into the upper bin.

0500 Dumped ash. Freeboard average is 40.0 inches.

0515 Finished loading coal into the upper bin.

0600 Fire test ash average is 1.1 inches. Slowed the grate to 10/1.10. Bars went in easily with no clinkers. Freeboard average is 40.5 inches.

0630 Freeboard average is 39.0 inches. Slowed the agitator to 6.5 sweeps/hour.

0700 Dumped ash.

0800 Fire test ash average at this 1000 cfm saturation air flow is 9.6 inches. Noticed a slight crust at the midpoint in the bed. Freeboard average is 39.0 inches.

0815 Increased the saturation air flow to 2000 cfm. Increased the saturation temperature to 61 degrees C. Grate speed is 10/2.20. Increased the agitator to 13.0 sweeps/hour. All fans are 100% open.

0825 Jacket water has been increased to 17 gpm.

0900 Increasing the grate speed. Dumped 1000 pounds of ash and water (500+ pounds of water).

1000 Fire test ash average is 15.3 inches. Ash level is fairly even. Bars are going in easily with no evidence of clinkering. Increased the grate speed to 10/3.30 and the agitator to 13.7 sweeps/hour.

1015 Increased the grate speed to help reduce the ashpit pressure somewhat.

1030 After 2 hours at a saturation air flow of 2000 cfm, we are now using 1.875 tons of coal per hour.

1100 Offtake temperature is 465 degrees C. Dumped 1032 pounds of damp ash. Much less water than we have been seeing.

1200 Fire test ash average is 13.1 inches. Grate speed is 10/3.25. Freeboard average is 39.5 inches.

1240 Started filling the upper bin with the last of the 3/4 inch by 2 inch sized coal. Going to change the

screen soon.

- 1320 Finished loading the last of the 3/4" x 2" sized coal into the weigh bin. Final weight is 9.90 tons. The plan is to leave 4-4.5 tons in the upper bin after the 1530 feed to the lower bin.
- 1330 Dumped ash. Very little water is present. If the jacket water is kept under 15 gpm, there is no blow over. Dropped 1.88 tons of coal. Freeboard average is 39.5 inches. Agitator speed is 13.0 sweeps/hour.
- 1355 Top gas and gas supply pressures are running 8.6 and 9.0 inches wg respectively. Unplugging the offtake sensor.
- 1400 Fire test ash average is 12.7 inches. Bars are going in easily with no clinkers or crust. Slowed the grate slightly to 10/3.27.
- 1410 Cut the jacket water to 11 gpm. Trying to maintain a 61 degree C saturation temperature.
- 1430 Changing the screens from 3/4" to 1/4". Slowed the agitator speed to 12.7 sweeps/hour.
- 1600 Freeboard average is 39.5 inches. Fire test ash average is 12.5 inches.
- 1610 Dumped 1239 pounds of ash.
- 1615 Dropped the saturation air flow to 1000 cfm per plan. Saturation temperature is now 60 degrees C. Slowed the gratae down to 10/1.75 and the jacket water flow to 6 gpm. Closed the gas supply valve to 15% open to hold the 2 inch wg outlet pressure.
- 1630 Freeboard average is 37 inches. Slowed the agitator down to 7.5 sweeps/hour. At 1615 we had some trouble with the saturation temperature which was on manual. When the jacket water flow was lowered, the saturation temperature increased. This was corrected by putting the controller on automatic.
- 1700 Freeboard average is 39 inches.
- 1800 Freeboard average is 39 inches and the fire test ash average is 10.4 inches. Slowing the grate down to 10/1.10 to bring the ash level to 12-14 inches. Slowed the agitator to 6.5 to maintain a 40 inch ash average.
- 2000 Freeboard average is 40.5 inches. Fire test ash average is 11.5 inches.

2015 Installed the grate drive stroke limiter and adjusted it to 3/2.50. Higher heating value is 170 Btu/ft³.

2030 Upper bin is empty at .20 tons. Put in .15 tons at coal up.

2035 Started loading the upper bin.

2045 Increased the jacket water to 12 gpm to allow for better steam control. Slowed the grate to 3/2.40. At 3/2.50 we were getting the same speed as 10/1.10!

2110 Dumped 883 pounds of ash. Stopped loading the upper bin at 11.15 tons.

2130 Cycled the coal valves. Freeboard average is 39.5 inches.

2200 Fire test ash average is 12.6 inches. The bed had a slight crust halfway down, but the bars went in easily.

2230 Freeboard average is 40.0 inches.

2245 Cycled the coal valves and we can hear the coal falling in the pipes.

2330 Cycled the coal valves. Coal is still dropping from the lower bin. Coal leg temperature is 28 degrees C.

September 25, 1983

0005 Fire test ash average is 13.9 inches. Freeboard average is 42.0 inches.

0010 Coal leg is now warm. Dropping the 1/4" x 2" coal into the gasifier (3.77 tons).

0030 Dropped 1.19 tons of coal into the retort.

0100 Dumped ash.

0200 Fire test ash average is 16.6 inches. The bed feels a little stiff, but no clinkering is evident.

0210 Increased the grate speed to 3/2.75.

0330 Dropped .90 ton of coal.

0400 Fire test ash average is 15.4 inches. The bed is still stiff, but no crust or clinkers are present. Freeboard average is 40.0 inches.

0500 Dumped ash. Started loading coal into the upper bin.

- 0545 Finished loading coal into the upper bin at 11.36 tons.
- 0600 Fire test ash average is 14.8 inches. The bed feel s better, however, there is a slight crust forming.
- 0610 Freeboard average is 39.0 inches. Slowed the agitator speed to 6.5 sweeps/hour to maintain a 40 inch freeboard average.
- 0730 Slowed the agitator to 6.3 sweeps/hour to aid in maintaining a 40 inch freeboard.
- 0800 Fire test ash average is 21.0 inches. Increase the grate speed to 6/3.40 and the agitator speed to 7.2 sweeps/hour.
- 0840 Increased the saturation air flow to 1200 cfm. The saturation temperature is 60 degrees C.
- 0850 Opened the gas control valve to 60% open and increased the furnace pressure to 120 inches wg with the vane valve 100% open. Reducing the cyclone outlet pressure to under 2 inches wg.
- 0900 Dumped 1000 pounds of ash.
- 1000 Fire test ash average is 18.3 inches. Bars were very sticky going in and a crust has developed on top. Will hold the saturation temperature at 59 degrees C to remedy this situation.
- 1010 Increased the grate speed to 8/3.20. Increased the agitator to 8.4 sweeps/hour. Cut the jacket water to 11 gpm to help maintain the 59 degree saturation temperature.
- 1030 The higher heating value is 174 Btu/ft³. CO is 26%, CO₂ is 5% and H₂ is 17.6%.
- 1100 Dumped 1000 pounds of ash. It continues to be exceptionally dry, but more incompletely burned coal was evident.
- 1200 Fire test ash average is 11.4 inches. The bars are very stiff going in. We must jump on them. The bed seems to be packed tightly all the way down. Slowed the grate to 8/2.85. Slowed the agitator to 7.6 sweeps/hour.
- 1210 Cut the jacket water to 10 gpm and increased the saturation temperature to 60 degrees C.
- 1300 Dumped 800 pounds of ash.

1330 Started filling the weigh bin at 2.01 tons.

1400 Fire test ash average is 10.4 inches. The bed has loosened up. Reduced the grate to 7/2.50. Agitator speed is 7.2 sweeps/hour.

1410 Stopped filling the upper bin at 11.60 tons.

1450 Dumped 700 pounds of ash.

1530 Freeboard average is 40.0 inches.

1600 Fire test ash average is 11.3 inches.

1615 The induced draft fan is starting to vibrate. The scrubber pH is 7.0. Stack pH is 3.0. The induced draft fan bearings are hot enough that you cannot leave your hand on them. Flushed the cyclone and found very little particulate (only one rakeful).

1800 Fire test ash average is 11.3 inches.

1830 Fire loss pressure is steadily going down. It is 4.9 inches wg now.

1900 The ESP is down due to a short.

2000 Fire test ash average is 12.3 inches.

2045 Started loading the upper bin at 3.83 tons. Dumped 1150 pounds of ash. The ash is mostly 1.5 to 2 inch chunks, but there are some softball size. Flushing the upper cone produced 440 pounds of silt.

2100 Freeboard average is 40.0 inches.

2115 Stopped loading the upper bin at 12.43 tons.

2200 Fire test ash average is 11.3 inches.

September 26, 1983

0005 Fire test ash average is 12.8 inches. Freeboard average is 40.5 inches.

0100 Dumped ash. Freeboard average is 39.5 inches.

0200 Fire test ash average is 12.2 inches.

0300 Dumped ash.

0400 Fire test ash average is 12.9 inches.

0500 Dumped ash.

0505 Started loading coal into the upper bin.

0530 Finished loading coal into the upper bin.

0600 Fire test ash average is 12.9 inches.

0645 Changed the caustic barrel.

0700 Freeboard average is 40.5 inches.

0730 Saturation air flow is 1200 cfm and the saturation temperature is 60 degrees C. Beginning the pressure and temperature bed probe testing.

0810 Probe testing is completed.

0820 Fire test ash average is 14.1 inches. Increasing the saturation air flow to 1400 cfm and leaving the saturation temperature at 60 degrees C. Increased the grate speed to 7/2.60. Increased the agitator speed to 8.0 sweeps/hour. The furnace pressure is 130 inches wg.

0830 All blowers are on at maximum peak and valve positions are at 100% open. We are still getting a cyclone outlet pressure of 4.5 inches.

0900 Dumped 1175 pounds of ash and water (150-200 pounds of water). There were many chunks 4-6 inches in size. Tightened the agitator shaft packing as the gas had started leaking out at the increased load.

1000 Fire test ash average is 13.3 inches. Increased the grate speed to 7/2.85 and the agitator to 8.0 sweeps/hour.

1030 The burner inlet thermocouple started functioning again. It is now reading 633 degrees C.

1100 Dumped 870 pounds of ash.

1200 Fire test ash average is 11.0 inches. Hit clinkeers 4 inches above the grate on number 4 hole. Slowing the grate slightly to 7/2.80 and the agitator to 7.9 sweeps/hour. Freeboard ash average is 39.0 inches.

1215 For the past two days we have sampled the stack condensate for pH. It has varied between 3.0 & 3.5.

1300 Dumped ash.

1330 Started filling the weigh bin at 1.25 tons. Cyclone outlet pressure is now at 5 inches wg. Cannot seem to reduce it.

1400 Fire test ash average is 11.9 inches. Freeboard average is 40.0 inches. Leaving the grate at 7/2.80.

1410 Stopped filling the upper bin at 11.82 tons.

1445 The boiler off alarm continues to go off periodically. This time we got "boiler off" at 97 psi. Upper and lower limits are tightly set at 50 & 75 psi.

1450 Dumped 680 pounds of ash.

1500 Slowed the agitator to 7.3 sweeps/hour. Freeboard average is 39.5 inches. Jacket water flow is 10 gpm to maintain the 60 degrees C saturation temperature.

1600 Freeboard average is 41.0 inches. Increased the agitator speed to 8.0 sweeps/hour. Fire test ash average is 15.0 inches. Increasing the grate speed to 7/2.90.

1800 Freeboard average is 41.0 inches. Fire test ash average is 14.3 inches.

1830 Freeboard average is 41.5 inches. Increasing the agitator speed to 8.5 sweeps/hour.

1900 Checked the induced draft fan bearings and found them to be hot. It does not seem to be vibrating as much as yesterday. Started loading coal into the upper bin at 5.65 tons.

1925 Stopped loading coal at 12.31 tons. Dumped 1197 pounds of ash. Used 45 gallons of water to flush the upper cone. Freeboard average is 41.5 inches. Increased the agitator to 9.0 sweeps/hour. Changed the caustic barrel.

2000 Fire test ash average is 13.6 inches. Slowed the grate to 7/2.85.

2020 Boiler alarm is sounding, but upon checking, we found the boiler to still be running.

2115 Boiler alarm is sounding again. The low water float is sticking.

2135 Loading coal into the upper bin at 8.40 tons. Freeboard average is 39.0 inches. Increased the agitator speed to 9.0 sweeps/hour.

2150 Stopped loading coal into the upper bin at 11.23 tons.

2200 Freeboard average is 40.0 inches. Fire test ash average is 12.4 inches.

2215 Dumped 760 pounds of ash.

2230 Freeboard average is 40.5 inches.

September 27, 1983

0005 Fire test ash average is 14.1 inches. Freeboard average is 41.0 inches.

0100 Dumped ash.

0200 Fire test ash average is 14.1 inches. Freeboard average is 40.5 inches.

0400 Fire test ash average is 15.7 inches.

0500 Dumped ash.

0730 Started pressure and temperature probe test at 1400 cfm saturation air flow. Agitator speed will be varied to facilitate this test.

0750 Cleared the plug in the top gas port. It went from 4.3 inches wg to 5.9 inches wg. The north coal bin slide gate is malfunctioning.

0800 Probe test is completed. Now we are increasing the saturation air flow to 1600 cfm. Fire test ash average is 13.9 inches. The fire zone is even and narrow.

0810 Increased the grate speed to 7/2.95 and the agitator speed to 9.5 sweeps/hour. Freeboard average is 40.0 inches.

0810-0830 Continued to troubleshoot the north coal bin discharge slide gate problem. The limit switch seems to be inoperative. The gate shaft seems sticky.

0830 Coal drop was accomplished manually through the breaker box.

0900 Dumped 1150 pounds of ash. Reduced the agitator speed to 9.2 sweeps/hour.

0930 Again we fed coal manually. Still working on the switches.

1000 Fire test ash average is 13.0 inches. Leaving the grate speed at 7/2.95.

1100 Dumped 750 pounds of ash. Coal is burning well. The pH is 7.0 at the holding tanks and 3.5 for the stack condensate.

1200 Firetest ash average is 13.1 inches. Leaving the grate speed at 7/2.95.

1240 Top gas pressure is plugged again. Unclogged the offtake sensor.

1250 Troubleshooting the northside slide gate problem. We are down to the motor, the limit switches or the valve itself. The cam that trips the limit switch is not in proper alignment when it should be in neutral. The motor itself is very hot.

1300 Dumped 823 pounds of ash.

1355 Started filling the weigh bin at 1.22 tons. Checked the downcomer tee. All the particulate was a dry, granular dust.

1400 Gas supply pressure is 9.5 inches wg. Fire test ash average is 14.9 inches. Increased the grate speed to 7/3.10 to reduce the ash level slightly. Increased the agitator speed to 9.6 sweeps/hour.

1430 Coal feed gates are operating normally again.

1440 Stopped filling the upper bin at 11.13 tons.

1450 Dumped 600 pounds of ash.

1600 Freeboard average is 39.5 inches. Fire test ash average is 14.0 inches. Increased the agitator speed to 10.2 sweeps/hour. Both slide gates worked at the last coalup.

1615 Changed the agitator depth setting to 41-43 inches from 40-42 inches. Trying to have better control of the offtake temperature.

1645 The ground around the induced draft fan is starting to vibrate and the outside bearing is warmer than the inside bearing. The grate drive was functioning on one dog, we readjusted it to drive on two.

1700 Slowed the agitator down to 10.0 sweeps/hour.

1715 Cleaned the plugged fire loss pressure line.

1800 Freeboard average is 40.0 inches. The offtake temperature cycle has narrowed to a cycle of 25 degrees C instead of a 50 degrees C cycle.

1845 Dumped 1284 pounds of ash. The ash was sandy-white in color and from 1.5 to 3 inches in size. Used 45 gallons of water to flush the upper cone. The upper cone weight is 542 pounds. Flushing the cyclone only resulted in 3 rakesful of particulate.

1915 ESP has started up.

2000 Freeboard average is 41.0 inches. Increased the agitator speed to 10.5 sweeps/hour. Fire test ash average is 14.0 inches. Greased the induced draft fan bearing for the second time.

2040 Started loading coal into the upper bin at 2.66 tons.

2130 Reducing the saturation air flow to 1000 cfm. The induced draft fan was vibrating up to the control room. The induced draft fan is at -0.4 inches wg. Grate speed is down to 2.0 sweeps/hour. Agitator speed has been reduced to 4.5 sweeps/hour. Have lit the vent burner and found that the gas was shut off by the kiln.

2200 Dropped the saturation air flow to 800 cfm. The induced draft fan pressure is 50 inches wg. Grate speed is down to 7/1.50 and the agitator speed is at 3.5 sweeps/hour. Saturation steam temperature is 59 degrees C. Increased the jacket water flow to 14 gpm.

2245 Saturation air flow is down to 600 cfm. Induced draft fan is at 0.1 inch wg. Notified the ESP personnel.

2315 SHUTDOWN! Removed the induced draft fan inlet transition. Opened the downcomer tee poke hole unit in the cyclone outlet and all combustor ports to allow excess air for the lines to burn out. Left the scrubber water on. At 0200 will open the banking disc 1 inch.

2340 Will dump ash about 0300. Checked the bearings on the induced draft fan. Will coal up about 0400.

September 28, 1983

0800 Started working on the new caustic pump and frame. Will mount both pumps side by side and use the old pump as a back up.

0900 No coal drop.

1000 Opened the upper manhole to inspect the demister pads. Noticed 4 holes in a geometric pattern. They appeared to each be 8-12 inches in diameter. The center and outer portions seemed to be intact. LPW, Incorporated is on hand and removing the induced draft fan and impellor in preparation for the replacement.

- 1200 Again the gasifier took no coal.
- 1210 Checked the ash level on holes number 1 & 4. You could lay your hands on the bars after 15 minutes. Decided to run the grate wide open. Pulled the bars, closed the banking disc, started the saturation blower and shut off the roof flare. Ran the blower at 200 cfm saturation air flow.
- 1225 Reinserted the bars.
- 1235 The bars are still cold, but get a 64 inch ash depth on hole number 4 and an 84 inch ash depth on hole number 1. There is very little fire. Phelps fan has the induced draft fan parts and they are due in by air this evening.
- 1250
Blast air inlet temperature:	28 degrees C
Saturation air inlet temperature:	30 degrees C
Jacket air exhaust temperature:	40 degrees C
Ash pit air inlet temperature:	36 degrees C
Jacket water inlet temperature:	19 degrees C
Jacket water outlet temperature:	44 degrees C
Agitator water inlet temperature:	19 degrees C
Agitator water outlet temperature:	24 degrees C
Coal leg temperature:	34 degrees C
Saturation steam temperature:	75 degrees C
Offtake temperature:	100 degrees C
Cyclone gas outlet temperature:	194 degrees C
Venturi gas discharge temperature:	300 degrees C
Burner inlet temperature:	290 degrees C
Combustor terminus temperature:	399 degrees C
Combustor discharge temperature:	184 degrees C
Scrubber inlet temperature:	75 degrees C
Scrubber sieve discharge:	33 degrees C
Scrubber discharge temperature:	28 degrees C
Blast air flow:	0
Retort ash pit pressuer:	1.0 inches wg
Retort fire loss pressure:	1.0 inches wg
Retort top gas pressure:	0.1 inches wg
Gas supply pressure:	0.1 inches wg
- 1530 Checked the cyclone waste overflow and found everything to be o.k.
- 1600 Put in number 3 and number 6 bars to check the ash levels. The bars came out with no reading. Cycled the coal valves and used no coal. Started the saturation blower to 200 cfm. Grate drive speed is 7/5.00. Offtake temperature is 90 degrees C.
- 1615 Stopped the saturation blower and grate. Put numbers 3 & 6 bars in again for 5 minutes.

Blast air inlet temperature:	29 degrees C
Saturation air inlet temperature:	39 degrees C
Jacket air exhaust temperature:	36 degrees C
Ash pit air inlet temperature:	33 degrees C
Jacket water inlet temperature:	19 degrees C
Jacket water outlet temperature:	43 degrees C
Agitator water inlet temperature:	19 degrees C
Agitator water outlet temperature:	23 degrees C
Coal leg temperature:	33 degrees C
Saturation steam temperature:	104 degrees C
Offtake temperature:	258 degrees C
Cyclone gas outlet temperature:	184 degrees C
Venturi gas discharge temperature:	234 degrees C
Burner inlet temperature:	206 degrees C
Combustor terminus temperature:	408 degrees C
Combustor discharge temperature:	173 degrees C
Scrubber inlet temperature:	87 degrees C
Scrubber sieve discharge:	40 degrees C
Scrubber discharge temperature:	37 degrees C

1620 Cycled the coal valves at a weight of 8.78 tons.
Dropped 0.70 ton of coal into the gasifier.

1900 Repaired the vent burner control on the roof.

2000 Started the saturation air flow at 300 cfm and the
grate speed at 7/5.00. The offtake temperature is 89
degrees C. Cyclone water overflow looks good.

2015 Stopped the saturation blower and grate drive.

Blast air inlet temperature:	26 degrees C
Saturation air inlet temperature:	34 degrees C
Jacket air exhaust temperature:	38 degrees C
Ash pit air inlet temperature:	36 degrees C
Jacket water inlet temperature:	19 degrees C
Jacket water outlet temperature:	48 degrees C
Agitator water inlet temperature:	19 degrees C
Agitator water outlet temperature:	21 degrees C
Coal leg temperature:	36 degrees C
Saturation steam temperature:	81 degrees C
Offtake temperature:	133 degrees C
Cyclone gas outlet temperature:	156 degrees C
Venturi gas discharge temperature:	173 degrees C
Burner inlet temperature:	130 degrees C
Combustor terminus temperature:	470 degrees C
Combustor discharge temperature:	148 degrees C
Scrubber inlet temperature:	78 degrees C
Scrubber sieve discharge:	38 degrees C
Scrubber discharge temperature:	33 degrees C

Cycle the coal valves.

2025 Put in bars number 1 & 4 to check the ash level.
Number one burned rubber at 14 inches, but number 4

was hot 3 feet up and yet not hot enough to give a reading. The bars were left in for 15 minutes.

2200 Installed a new caustic line from the crusher building to the scrubber tanks.

September 29, 1983

0005 Blast air inlet temperature: 24 degrees C
Saturation air inlet temperature: 28 degrees C
Jacket air exhaust temperature: 40 degrees C
Ash pit air inlet temperature: 38 degrees C
Jacket water inlet temperature: 19 degrees C
Jacket water outlet temperature: 50 degrees C
Agitator water inlet temperature: 19 degrees C
Agitator water outlet temperature: 21 degrees C
Coal leg temperature: 30 degrees C
Saturation steam temperature: 82 degrees C
Offtake temperature: 80 degrees C
Cyclone gas outlet temperature: 120 degrees C
Venturi gas discharge temperature: 98 degrees C
Burner inlet temperature: 110 degrees C
Combustor terminus temperature: 500 degrees C
Combustor discharge temperature: 137 degrees C
Scrubber inlet temperature: 76 degrees C
Scrubber sieve discharge: 38 degrees C
Scrubber discharge temperature: 33 degrees C

0400 Blast air inlet temperature: 21 degrees C
Saturation air inlet temperature: 24 degrees C
Jacket air exhaust temperature: 42 degrees C
Ash pit air inlet temperature: 40 degrees C
Jacket water inlet temperature: 19 degrees C
Jacket water outlet temperature: 52 degrees C
Agitator water inlet temperature: 19 degrees C
Agitator water outlet temperature: 21 degrees C
Coal leg temperature: 31 degrees C
Saturation steam temperature: 83 degrees C
Offtake temperature: 71 degrees C
Cyclone gas outlet temperature: 116 degrees C
Venturi gas discharge temperature: 91 degrees C
Burner inlet temperature: 53 degrees C
Combustor terminus temperature: 589 degrees C
Combustor discharge temperature: 113 degrees C
Scrubber inlet temperature: 67 degrees C
Scrubber sieve discharge: 34 degrees C
Scrubber discharge temperature: 30 degrees C
Blast air flow: 0
Retort ash pit pressure: 0.8 inches wg
Retort fire loss pressure: 0.8 inches wg
Retort top gas pressure: 0.1 inches wg
Gas supply pressure: 0

Ash weight is 324 pounds. Coal weight is 7.96 tons.

Fire test ash average is 8.6 inches. Ran the saturation blower for 10 minutes.

1100 Finished the installation of the new caustic pumping system. Started to install conduit for the University of Minnesota. Pulled out the spray tree and found that the front two 4 foot sections need complete replacement. We will attempt to salvage the nozzles from the old pipe.

1500 Ran the saturation blower for 15 minutes at 200 cfm.

1745 Cycled the coal valves. Weight is 7.91 tons of coal. Started the saturation blower and the grate drive. Checked the cyclone overflow and found it to be in good shape. Offtake temperature is 69 degrees C.

1755 Blast air inlet temperature: 21 degrees C
Saturation air inlet temperature: 26 degrees C
Jacket air exhaust temperature: 47 degrees C
Ash pit air inlet temperature: 42 degrees C
Jacket water inlet temperature: 19 degrees C
Jacket water outlet temperature: 59 degrees C
Agitator water inlet temperature: 19 degrees C
Agitator water outlet temperature: 13 degrees C
Coal leg temperature: 31 degrees C
Saturation steam temperature: 48 degrees C
Offtake temperature: 58 degrees C
Cyclone gas outlet temperature: 174 degrees C
Venturi gas discharge temperature: 34 degrees C
Burner inlet temperature: 41 degrees C
Combustor terminus temperature: 1 degrees C
Combustor discharge temperature: 53 degrees C
Scrubber inlet temperature: 48 degrees C
Scrubber sieve discharge: 49 degrees C
Scrubber discharge temperature: 27 degrees C

The retort access ports showed blue fire on top when the bars were removed after the fire test. Make some new poke rods.

2045 Started the saturation blower at 300 cfm and grate drive at 7/2.25. Cycled the coal valves with a starting weight of 7.61 tons. Dropped in .22 ton of coal.

2100 Blast air inlet temperature: 21 degrees C
Saturation air inlet temperature: 27 degrees C
Jacket air exhaust temperature: 48 degrees C
Ash pit air inlet temperature: 39 degrees C
Jacket water inlet temperature: 19 degrees C
Jacket water outlet temperature: 59 degrees C
Agitator water inlet temperature: 19 degrees C
Agitator water outlet temperature: 20 degrees C
Coal leg temperature: 30 degrees C

Saturation steam temperature:	39 degrees C
Offtake temperature:	59 degrees C
Cyclone gas outlet temperature:	185 degrees C
Venturi gas discharge temperature:	30 degrees C
Burner inlet temperature:	38 degrees C
Combustor terminus temperature:	1 degrees C
Combustor discharge temperature:	48 degrees C
Scrubber inlet temperature:	43 degrees C
Scrubber sieve discharge:	45 degrees C
Scrubber discharge temperature:	32 degrees C

2115 Cyclone over flow is o.k.

September 30, 1983

0800-1100 Finished the fabrication and installation of the spray tree.

1200 Ran the saturation blower at 200 cfm for 20 minutes. The grate is running at a speed of 7/2.25. Gas ignites when the bars are pulled out after checking the ash level.

1400 Closed up the scrubber manhole covers. LPW, Incorporated continues to work on the induced draft fan impellor shaft and housing. They also patched the stack.

1500 Blast air inlet temperature:	27 degrees C
Saturation air inlet temperature:	28 degrees C
Jacket air exhaust temperature:	50 degrees C
Ash pit air inlet temperature:	48 degrees C
Jacket water inlet temperature:	20 degrees C
Jacket water outlet temperature:	61 degrees C
Agitator water inlet temperature:	19 degrees C
Agitator water outlet temperature:	20 degrees C
Coal leg temperature:	35 degrees C
Saturation steam temperature:	105 degrees C
Offtake temperature:	53 degrees C
Cyclone gas outlet temperature:	246 degrees C
Venturi gas discharge temperature:	29 degrees C
Burner inlet temperature:	34 degrees C
Combustor terminus temperature:	1 degrees C
Combustor discharge temperature:	33 degrees C
Scrubber inlet temperature:	35 degrees C
Scrubber sieve discharge:	40 degrees C
Scrubber discharge temperature:	31 degrees C

1510 Dropped .48 ton of coal.

1900 Started the saturation blower at 200 cfm. Started the agitator at 25.3 sweeps/hour to loosen up the bed. Started the number 1 scrubber pump. Started caustic pump at 30-30.

1920 Stopped the agitator. Offtake temperature dropped down to 48 degrees C.

1940 Combustor pilot is on. Scrubber water is on. Gas safety valve is on and ready for gas.

1943 Draining the cyclone water seal.

1950 Combustor has been lit. Turned the saturation steam on. Saturation air flow is 1800 cfm. Closed the gas supply valve to get the offtake pressure.

1955 Started the agitator drive at 6.9 sweeps/hour.

2000 Fire test ash average is 7.3 inches. Freeboard average is 30.5 inches.

2010 Started the grate at 7/1.08. Jacket water flow is 14 gpm for the steam valve to operate as the steam valve is closed at 10 gpm.

2015 All previous gas readings were in error due to plugged valve.

2020 Opened the primary and secondary air to 100%.

2030 Freeboard average is 44.5 inches. Increased the agitator speed to 14.5 sweeps to get a 40 inch freeboard average. We went from 0 to 1800 cfm in 55 minutes. Dropped 1.27 tons for the first coal up since back on line.

2035 Started loading coal into the upper bin at 7.27 tons.

2050 Upper bin is full at 12.23 tons.

2100 Freeboard average is 39.0 inches. Slowed the agitator down to 12.0 sweeps/hour to maintain the target freeboard. Fire test ash average is 9.7 inches. Increasing the grate speed to 7/1.20.

2115 Higher heating value is 169 Btu/ft³ and the lower heating value is 157 Btu/ft³. We are burning tar from the ESP in the combustor.

2130 Offtake temperature is 515 degrees C and climbing.

2135 Increased the jacket water flow to 17 gpm. Steam valve is closed. Freeboard average is 38.0 inches. Slowed the agitator down to 10.0 sweeps/hour. Holes number 1 & 5 have a slight glow. It looks like the bed is hot on one side and cold on the other. Loaded the upper bin again to 12.25 tons.

2145 With the high offtake temperature, the jacket water

flow is increased to 20 gpm in attempt to gain control of the saturation steam valve. Offtake temperature is 527 degrees C. Drained 200 pounds of water from the ash.

2200 Freeboard average is 39.0 inches. Fire test ash average is 13.7 inches. Increased the grate speed to 7/2.00. The offtake temperature has started to come down. It is now 486 degrees C. After flushing the cyclone only one rakeful resulted.

2235 Cleaned the offtake pressure line. Cleaned the ash pit pressure line.

October 1, 1983

0005 Fire test ash average is 21.7 inches. The bed is loose with no clinkers.

0012 Increased the grate speed to 7/2.25. Freeboard average is 40.5 inches.

0100 Dumped ash.

0200 Fire test ash average is 22.0 inches. Bars are going in easily with no clinkers. The bed is loose.

0210 Increased the grate speed to 7/2.50.

0211 Freeboard average is 41.5 inches. Increased the agitator speed to 11.0 sweeps/hour.

0300 Dumped ash.

0320 Decreased the jacket water flow to 17 gpm.

0400 Fire test ash average is 21.4 inches. Bars went in easily with no clinkers.

0415 Increased the grate speed to 10/2.00.

0500 Dumped ash.

0510 Started loading coal to the upper bin at 2.00 tons.

0545 Finishd loading coal at 11.97 tons.

0600 Fire test ash average is 20.7 inches. The bed is loose with no evidence of clinkering. Freeboard average is 40.5 inches.

0610 Increased the grate speed to 10/2.50.

0615 Increased the agitator speed to 12.5 sweeps/hour.

- 0700 Dumped ash. Freeboard average is 40.5 inches.
- 0720 Changed caustic barrels.
- 0800 Fire test ash average is 25.7 inches. The bed is even and loose. Increased the grate speed to 10/3.50 and the agitator to 13.0 sweeps/hour.
- 0810 Fire loss pressure has continued its gradual increase since 0600 at 9.0 inches wg to 12.4 at 0730.
- 0820 Fire loss pressure is 15.4 inches.
- 0835 Fire loss pressure has started to turn around. It is 14.3 inches wg now. Freeboard average is 40.5 inches.
- 0855 Fire loss pressure is now at 16.5 inches wg. The possible cause for this rise again is the high level of ash. Reduced the jacket water flow to 14 gpm in attempt to maintain the saturation temperature at 60 degrees C.
- 0900 Dumped 1070 pounds of ash. This ash dump was damper than the dumps prior to shutdown. Size distribution ranges from fine to a few chunks the size of a double fist.
- 0915 Since the ash dump, the fire loss pressure is evened off to 16.3 inches wg. There must still be a restriction in the bed.
- 0920 Top gas and gas supply pressures are running 4.5 inches wg and 3.3 inches wg respectively. Opened the gas control valve from 45% open to 70% open. This dropped the top gas pressure to 3.9 inches wg and the gas supply pressure to 3.2 inches wg. The furnace pressure increased from 70 to 110 inches wg. The vane valve opens from 55% to 80% maintaining a 2.5 inch wg or less cyclone outlet pressure.
- 0930 Noticed a slight orange glow around the number 3 hole. Higher heating value is 168-169 Btu/ft³. CO is 27.2%, CO₂ is 4.6%, H₂ is 18.3% and nitrogen is 44.7%. Fire loss pressure is holding near 17 inches wg.
- 0955 Fire loss pressure is starting down. It is now at 15.4 inches wg.
- 1000 Fire test ash average is 25.3 inches. Cranking the grate wide open (10/5.00) to reduce the high ash level. The ash cone weight had only climbed 200 pounds over the last hour. Should have been closer to 500 pounds since the grate was 10/3.50. The agitator speed is now at 13.7 sweeps/hour.

- 1020 Fire loss pressure is at 17.5 inches wg. Cut the jacket water flow to 12 gpm as steam control valve is near 50% open and we are not maintaining a 60 degree C saturation temperature. The saturation temperature is running 58-59 degrees C.
- 1030 Slowed the agitator to 13.5 sweeps/hour.
- 1050 The restriction through the bed continues as the fire loss pressure is now up to 18.5 inches wg. The grate continues to put out less ash than expected. Over a 2 hour period, the ash weight has increased less than 500 pounds. Regreased the cog and all the fittings on the grate drive.
- 1100 Automatic steam control is fluctuating. Saturation temperature is not holding. Dumped 780 pounds of ash. Flushed the grate underside thoroughly with upper nozzles.
- 1130 Slowed the agitator to 13.3 sweeps/hour.
- 1200 Fire test ash average is 25.3 inches. The bed is getting somewhat upset. Leaving the grate wide open at 10/5.00.
- 1210 Started filling the upper bin at 1.66 tons.
- 1235 Stopped the conveyor as the belt lacings have ripped through the conveyor belting. There is only 4.16 tons of coal up on top after the 1230 feed. Will temporarily wire the belt together to allow the finish of the coal up. Then we will resplice the belt as the tear is 2/5 of the distance across the belt.
- 1330 Fire loss pressure is 17.3 inches and the ash cone weight is reading 1020 pounds. This indicates that there is still a restriction through the bed. The pH reading is 7.0 at the drain, 6.7 at the tank, 4.0 at the fan transition and 4.0 from the stack drain.
- 1345 Stopped coaling up at 11.64 tons. Dumped 1010 pounds of ash.
- 1400 Fire test ash average is 25.3 inches. Leaving the grate at 10/5.00. Freeboard average is 40.0 inches.
- 1430 Started removing the conveyor belt for repair. The agitator is slowed to 13.2 sweeps/hour.
- 1500 The fire loss pressure is 17.4 inches wg.
- 1530 Repairing the conveyor belt. Cleaned the offtake pressure line.

1600 Freeboard average is 39.0 inches. Fire test average is 23.9 inches. Dumped ash.

1630 South coal slide gate would not operate on automatic, problem with the energized coil. Had to operate them manually.

1730 Coal up weight is 2.07 tons.

1800 Freeboard average is 39.0 inches. Fire test ash average is 24.1 inches. Fire loss pressure has been very erratic.

1830 Grate rpm is 150. Found that the grate had stopped but we had not noticed as the bulb had burned out.

1900 Started coaling up at 3.31 tons.

1950 Unplugged the offtake pressure line. Stopped filling the upper bin at 12.40 tons.

2000 Fire test ash average is 23.3 inches.

2035 Dumped 1487 tons of ash. There appeared to be a large amount of carbon in the ash. The ash was fine to 1.5 inches in size. Flushed the ash cone with 30 gallons of water and an additional 45 gallons of water from the upper nozzles.

2200 Fire test ash average is 23.0 inches.

2210 Loading coal into the upper bin.

2215 Starting to realize more particulate in the cyclone dumps. This time there were six rakesful. The off-take pressure has stopped cycling. Dumped 763 pounds of ash.

October 2, 1983

0005 Fire test ash average is 23.2 inches. Freeboard average is 41.0 inches.

0100 Dumped ash. Freeboard average is 40.0 inches.

0200 Fire test ash average is 23.3 inches. Freeboard average is 40.0 inches.

0300 Dumped ash. Freeboard average is 40.5 inches.

0400 Fire test ash average is 22.1 inches. Freeboard average is 40.5 inches.

0500 Dumped ash. Freeboard average is 41.0 inches.

0515 Started loading coal into the upper bin.

0530 Freeboard average is 40.5 inches.

0600 Fire test ash average is 22.4 inches. Freeboard average is 40.0 inches.

0715 Started the pressure and temperature bed probe test. Fire loss pressure is running 16 inches wg. Cyclone outlet pressure is 4 inches wg.

0757 End of the probe test. Agitator speed had been changed to accomodate the probe. Slowed it to 5.0 sweeps/hour while the probe was inserted and full out to bring the agitator arm past the number 5 hole. Checked the freeboard average and found it to be maintaining at 40 inches.

0800 Fire test ash average is 19.6 inches. leaving the grate full out at 10/5.00.

0820 Noticed that the ash weight total (257 pounds) had not changed since the shift started a little over an hour ago. Found that the upper valve in the ash cone was closed. As the ashpit pressure had been at 22 inches wg, perhaps there was a packing of ash up under the grate. Opened the valve and the counter readout went from 257 pounds to 570 pounds. Dumped the ash and flushed the underside of the grate with the upper nozzles. The ash particles were all 1/4" to 1/2 inch and smaller in size. Noticed no immediate effect on the ash pit pressure. It still reads 21-22 inches. Lowered the saturation temperature to 59 degrees C to loosen the bed and reduce any possible restrictions.

0845 Twenty-five minutes after flushing the cone and reducing the saturation temperature, both the ash pit and fire loss pressures remain basically the same. The fire loss pressure actually went up slightly to 18.0 inches wg. Top gas and gas supply pressures have remained steady also. The vane vave is 100% open with the furnace pressure at 110 inches wg.

0900 Dumped ash again. The weight had climbed from 220 pounds to 675 pounds in 40 minutes. Flushing the underside of the grate did improve the ash removal. Used the upper nozzles on this and the last dump at 0820.

0945 Noticed the vane valve had closed to 85% open from 100%. This alowed the furnace pressure to increase from -1.2 to -1.6 inches wg. Top gas and gas supply pressure each dropped only 0.3 inch wg.

- 0955 Both the ash pit and the fire loss pressures have dropped 4 inches wg and remained this way for 20 minutes, then increased by 3 and 4 inches wg respectively.
- 1000 Fire test ash average is 20.1 inches. The bed is loose and the bars are going in with ease.
- 1100 The pH is 7 at the drain and the tank. It is 4.0 on the fan and stack.
- 1200 Fire test ash average is 22.0 inches. The fire zones have narrowed. Leaving the grate at 10/5.00. The freeboard average is 40.5 inches. Agitator speed is 13.3 sweeps/hour.
- 1215 Dumped 1092 pounds of ash. Flushed the grate with the upper nozzles. Again only fine ash particles dropped. The induced draft fan bearing is vibrating. The drive belt is flopping. Think that there is too much play in the belt, but it is not making any noise.
- 1240 Started filling the weigh bin at 0.77 ton.
- 1318 Stopped initial coal up at 8.06 tons.
- 1333 Opened the downcomer and found very little build up. Hardly any dust and only a small amount of scale.
- 1400 Fire test ash average is 20.4 inches. Leaving the grate speed at 10/5.00.
- 1415 Started refilling the weigh bin a second time at 6.40 tons.
- 1430 Dumped 1020 pounds of ash.
- 1452 Stopped filling the upper bin at 11.81 tons.
- 1500 Freeboard average is 40.0 inches. Scrubber seive discharge is running between 94 & 96 degrees C. There is a large volume of water coming out just above the spray tree inlet.
- 1530 Cleaned the offtake pressure line. The line was plugged, however, unplugging it produced no change.
- 1600 Fire test ash average is 20.4 inches. Freeboard average is 39.5 inches. Flushed the cyclone and found very little particulate on the bottom of the tank (one rakeful) and only 2 inches of floating silt on top of the water.
- 1800 Fire test ash average is 18.3 inches.

1900 Dumped 1237 pounds of ash. It was mostly fine with a few chunks 1.5 inches in size. Still appears to be a large amount of carbon in the ash.

2000 Fire test ash average is 21.0 inches. Freeboard average is 40.5 inches.

2015 Closed the gas supply valve to 42% open to increase the pressure to 5 inches wg. Dumped 1000 pounds of water from the ash cone. The spray nozzle was open slightly.

2035 Loading coal into the upper bin at 1.86 tons.

2115 Finished loading coal at 12.37 tons.

2120 Loaded coal into the upper bin again at 12.15 tons.

2200 Fire test ash average is 20.4 inches.

2220 Dumped 737 pounds of dry ash with a large amount of carbon evident. The ash was mostly fine particles with a few 1.5 inch chunks. ESP is down.

2245 Opened the gas control valve to 72% to lower the cyclone outlet pressure.

October 3, 1983

0005 Fire test ash average is 20.6 inches. The freeboard average is 40.5 inches.

0100 Dumped ash. Freeboard average is 40.5 inches.

0130 Dumped the cyclone and a large amount of particulate resulted.

0200 Fire test ash average is 19.1 inches. The bed is in good shape with no clinkering or burning through. Freeboard average is 40.5 inches.

0300 Dumped ash.

0400 Fire test ash average is 19.7 inches.

0500 Dumped ash.

0505 Started loading coal into the upper bin.

0515 Coal conveyor keeps hanging up. Adjusted the slack. It seems to be running alright temporarily, but it appears that the front lacing is coming loose.

0545 Finished loading coal into the upper bin.

- 0600 Fire test ash average is 15.0 inches. Freeboard average is 40.5 inches.
- 0730 Noticed that both the ashpit pressure and the fire loss pressure had dropped 4 inches wg, indicating a decrease in restriction through the bed.
- 0800 Fire test ash average is 10.7 inches. The bed has changed drastically in the last 24 hours at 1800 cfm saturation air flow and 59 degrees C saturation temperature. Reducing the grate speed to 10/4.50 and the agitator to 12.6 sweeps per hour. Pressure and temperature bed probe test is starting.
- 0900 Started shutdown procedure to allow the quench/ESP crew to clean out their gas offtake line which is thoroughly plugged. Reduced combustor air and furnace pressure to atmosphere. Dropped the saturation air flow to 300 cfm. Reduced the grate speed to 10/1.10 and shut off the agitator. Flooded the cyclone and turned off the steam valve.
- 0915 Ash pit pressure is rising. Shut off the saturation blower. The flare is automatically lighting.
- 0920 The gasifier crew is assisting in the removal of piping.
- 0935 Quench/ESP explosion!!
- 1030 Turned off the grate entirely.
- 1210 Succeeded in banking the offtake to the quench process. It took over 1 hour. The pipes are red hot.
- 1225 Start up procedure is complete. All fans are running and the combustor is lit. The saturation blower is on and the cyclone is drained. The vent valve is closed and gas is going downstream. Will gradually build the saturation air flow back to 1800 cfm.
- 1245 Saturation air flow is 1400 cfm. Saturation temperature is 59 degrees C. Set the grate speed at 10/2.40 and the agitator speed at 9.0 sweeps/hour.
- 1250 The concussion of the explosion had loosened a circuit panel and the ash weight was not registering. The counter showed 240 pounds of ash. Dumped ash using the upper nozzles and loosened 1018 pounds of ash which had been stuck under the grate.
- 1300 Fire test ash average is 6.3 inches. Slowed the grate to 10/1.80 and the agitator to 8.5 sweeps/hour to build up the ash level. Increased the saturation air flow to 1500 cfm.

- 1315 Increased the saturation air flow to 1600 cfm.
- 1330 Increased the saturation air flow to 1700 cfm. Leaving the grate speed at 10/1.80 as the ash level is low. Adjusting the agitator to try maintaining a 40 inch freeboard.
- 1340 Started filling the upper weigh bin at 4.52 tons.
- 1345 Saturation air flow is 1800 cfm. Saturation temperature is 59 degrees C. Grate speed is 10/1.80 and the agitator is running at 8.7 sweeps/hour.
- 1400 Fire test shows an ash average of 11.1 inches. The bars are very stiff going in. Grate speed is 10/2.00 and the agitator is 8.9 sweeps/hour.
- 1405 Stopped filling the upper weigh bin at 10.20 tons. The plan calls for running "run of shipment" now. We are moving the hopper and the conveyor to the side chute, and will bypass the shaker.
- 1450 Finished moving the conveyor.
- 1500 The scrubber exhaust thermocouple is not functioning.
- 1600 Fire test ash average is 13.7 inches. Freeboard average is 42.0 inches. Increased the agitator speed to 9.5 sweeps/hour.
- 1700 Freeboard average is 42.5 inches. Saturation air flow is 1000 cfm. The grate is slowed to 10/1.10. Cut the steam pressure in half from 30+ to 15 pounds. The induced draft fan is at 0.8 inches wg. Primary and secondary fans are 70% open. The agitator speed is down to 8.5 sweeps/hour. Slowed the caustic pump to 40/30.
- 1800 Fire test ash average is 14.4 inches. Freeboard average is 40.0 inches.
- 1830 The pH is 6.5. Caustic pump setting is 40/50.
- 1900 Freeboard average is 40.0 inches. Increased the grate speed to 10/1.50.
- 2000 Fire test ash average is 14.1 inches. Freeboard average is 39.5 inches.
- 2010 Dumped 1170 pounds. Ash looks similar to that before we banked the combustor. The ash is sandy in color, mostly 2-4 inches in size. Changed the caustic barrel.
- 2045 Higher heating value is running 188 Btu/ft³ and the

lower heating value is 176 Btu/ft³. Increased the caustic pump speed to 50/50 with the last pH reading was 6.5.

2200 Fire test ash average is 12.9 inches. Slowed the grate speed to 10/1.20.

2215 Dumped ash and found it to be mostly water.

2230 Used the last of the 1/4 inch screened coal (bin weight is .44).

October 4, 1983

0005 Fire test ash average 13.4 inches. Freeboard average is 39.5 inches.

0010 Start loading coal into the upper bin.

0040 The coal is jamming up in the chute. We stuck the bar between the shaker and the chute to vibrate the coal down the chute. This seemed to work alright.

0200 Fire test ash average is 10.3 inches.

0230 North coal leg is empty. Dropping the "run of shipment" coal into the gasifier. Coal drop is 3.77 tons.

0300 Dump ash. Freeboard average 40.5 inches.

0330 Coal drop is 1.29 tons. Freeboard average is 40.0 inches.

0400 Fire test ash average is 14.4 inches. Noticed a slight crust on hole number 3. The bed is feeling a bit sticky. No clinkers. Freeboard average is 40.0 inches.

0500 Loading coal into the upper bin. Freeboard average is 40.0 inches.

0530 Finished loading coal. Freeboard average is 40.0 inches.

0600 Fire test ash average is 15.6 inches. The bed is still sticky.

0710 Dumped ash.

0730 Freeboard average is 38.0 inches. Slowed the agitator to 8.2 sweeps/hour. Jacket outlet temperature is 96 degrees C. Increased the jacket water flow to 12 gpm. Trying to bring down the outlet temperature and

lower the saturation temperature from 60 to 59 degrees C.

- 0800 Fire test ash average is 11.1 inches. The bed is tight and uneven. The fines appear to be concentrated on the south coal leg side. Slowed the grate to 10/1.08. We will increase the saturation air flow later this morning after the pressure and temperature bed probe test. If the 1000 fire test ash average shows no gain, we will reinsert the grate drive stroke limiter. Freeboard average is 38.0 inches. Reduced the agitator speed to 8.0 sweeps/hour.
- 0830 Freeboard average is 36.5 inches. Reducing the agitator to 7.0 sweeps/hour.
- 0900 Freeboard average is 37.0 inches. Slowed the agitator to 6.5 sweeps/hour.
- 0905 Started the pressure and temperature probe test for the "run of shipment" at a saturation air flow of 1000 cfm.
- 0930 Freeboard average is 37.5 inches. Slowed the agitator to 5.7 sweeps/hour. Dumped 2300 pounds of ash and water. It was mostly water.
- 0935 Finished the bed probe test.
- 0945 Starting the gradual increase in load from 100 to 1200 cfm. Saturation air flow is currently 1050 cfm at a saturation temperature of 59 degrees C.
- 1000 Increased the saturation air flow of 1100 cfm. Freeboard average is 38.5 inches. Slowed the agitator to 5.5 sweeps/hour. Inserted the grate drive stroke limiter and set the grate at 6/1.08.
- 1015 Saturation air flow is 1150 cfm.
- 1030 Freeboard average is 39.0 inches. Leaving the agitator at 5.5 sweeps/hour. Saturation air flow is 1200 cfm.
- 1100 Dumped 1000 pounds of ash and water (approximately 2/3 water).
- 1130 Freeboard average is 40.0 inches. Unplugging the offtake port as the top gas pressure was 1.7 inches wg. Gas supply pressure was 2.3 inches wg.
- 1200 Freeboard average is 39.5 inches. Fire test ash average is 10.9 inches. The bars seem to be less sticky. Fire appears to be mainly located on the south side. The grate is set at 6/1.20 and the

agitator speed is 5.5 sweeps/hour.

1215 Tried to unclog the build up of dust from the offtake pipe and in the vicinity of the 10 inch vent valve.

1300 Did not dump ash as the weight is only 300 pounds.

1350 Started filling the weigh bin at 3.97 tons. The conveyor had to be repositioned.

1400 Fire test ash average is 11.1 inches. The bed is still fairly tight with 2-3 layers of crust. Leaving the grate speed at 6/1.20.

1445 Stopped coaling up at 10.37 tons.

1500 Freeboard average is 40.0 inches. Gas quality is not quite up to par.

1530 Freeboard average is 39.5 inches. The combustor exhaust thermocouple is not working properly.

1600 Freeboard average is 41.0 inches. Fire test ash average is 14.4 inches.

1615 Noticed the induced draft fan is starting to vibrate again.

1630 Freeboard average is 41.5 inches. Increased the agitator speed to 6.0 sweeps/hour.

1730 Freeboard average is 41.5 inches. Increased the agitator speed to 7.0 sweeps/hour. Still trying for a 40.0 inch freeboard average.

1800 Fire test ash average is 16.6 inches. The ash bed changed drastically from test to test. Increased the grate speed to 6/1.50.

2000 Fire test ash average is 20.0 inches. Increased the grate speed to 6/3.00 to reduce the ash level. Increased the agitator speed to 8.0 inches.

2035 Loading coal into the upper bin at 4.33 tons.

2100 Dumped 1290 pounds of dry ash. There appeared to be a large amount of carbon in the ash and the size range was 1-1.5 inches. There were a couple softball sized chunks. The ash was sandy in color.

2115 There has been very little particulate this shift.

2120 Stopped loading the upper weigh bin at 12.62 tons. Slowed the grate to 6/2.25 and the agitator to 7.0

2200 Fire test ash average is 12.9 inches.

2220 Higher heating value is 154 Btu/ft³ and the lower heating value is 144 Btu/ft³.

October 5, 1983

0005 Fire test ash average is 13.3 inches.

0100 Dumped ash. Freeboard average is 40.5 inches.

0200 Fire test ash average is 10.3 inches.

0245 Decreased the grate speed to 6/2.00.

0300 Dumped ash. Freeboard average is 40.5 inches.

0400 Fire test ash average is 10.6 inches.

0440 Increased the jacket water flow to 14 gpm.

0510 Started loading coal into the upper bin.

0600 Fire test ash average is 9.4 inches. Freeboard average is 40.5 inches.

0750 Fire test ash average is 6.3 inches. Slowed the grate to 6/1.08. We will be increasing the saturation air flow after the completion of the bed probe test.

0800 Started the bed probe test.

0850 Finished the bed probe test.

0900 Dumped 1150 pounds of ash. There was very little moisture in this dump. Size distribution was 2-3 inches in size. Saturation air flow is 1250 cfm.

0915 Increased the saturation air flow to 1300 cfm. Reduced the agitator speed to 6.5 sweeps/hour.

0930 Increased the saturation air flow to 1350 cfm. Saturation temperature is 59 degrees C. Leaving the grate at 6/1.08 as the ash level is low. Reduced the agitator speed to 6.0 sweeps/hour. Freeboard average is 41.0 inches.

0945 Increased the saturation air flow to 1400 cfm. Furnace pressure increased to 90 inches wg. The valve opens from 40-52% open. Leaving the saturation temperature at 59 degrees C unless a heavy crust develops. Fire loss pressure continues to oscillate with increased frequency. This seemed to start with the first increase in saturation air flow at 0900.

- 1000 Fire test shows that the ash level has increased. Fire test ash average is 17.6 inches. We are getting multiple zones. Increased the grate to 6/2.40.
- 1130 Strip chart and digital readout show wider fluctuations in ash pit and fire loss pressure. Increased the agitator speed to 6.9 sweeps/hour. Freeboard average is 41.0 inches.
- 1200 Fire test ash average is 16.1 inches. Noticed a crust on the bottom in the area of number 4 hole. Increased the grate speed to 6/3.10 with the agitator increased to 7.3 sweeps/hour.
- 1215 Unclogged the offtake sensor. It makes no appreciable difference with the fire loss readout.
- 1229 Discovered that the ash pit pressure indicator knife valve has been left open since the probe test. All pressure data appears to be in error since that time.
- 1230 Reread the temperature and pressure readings. The results are as follows:

Blast air inlet temperature:	22 degrees C
Saturation air inlet temperature:	31 degrees C
Jacket air exhaust temperature:	55 degrees C
Ash pit air inlet temperature:	61 degrees C
Jacket water inlet temperature:	19 degrees C
Jacket water outlet temperature:	88 degrees C
Agitator water inlet temperature:	19 degrees C
Agitator water outlet temperature:	27 degrees C
Coal leg temperature:	31 degrees C
Saturation steam temperature:	153 degrees C
Offtake temperature:	448 degrees C
Cyclone gas outlet temperature:	424 degrees C
Venturi gas discharge temperature:	408 degrees C
Burner inlet temperature:	294 degrees C
Combustor terminus temperature:	1354 degrees C
Combustor discharge temperature:	614 degrees C
Scrubber inlet temperature:	72 degrees C
Scrubber sieve discharge:	88 degrees C
Scrubber discharge temperature:	0 degrees C
Saturation temperature (steam)	59 degrees C
Saturation temperature (water)	59 degrees C
Saturation air flow	1400 cfm
Retort ash pit pressure	10.2 inches wg
Retort fire loss pressure	7.4 inches wg
Retort top gas pressure	2.8 inches wg
Gas supply pressure	2.4 inches wg

- 1300 Increased the agitator speed to 7.4 sweeps/hour. Freeboard average is 42.0 inches. Dumped 840 pounds of ash.

- 1330 Started filling the upper bins at 1.46 tons.
- 1400 Fire test ash average is 10.7 inches. Slowed the grate to 6/3.00.
- 1440 Stopped coaling up at 11.37 tons. Dumped 515 pounds of ash.
- 1450 Increased the saturation temperature to 60 degrees C to loosen the crust developing on the bottom of the bed.
- 1530 The pH is 7.0. Flushed the cyclone and very little particulate resulted (mostly slight amount of floating silt).
- 1600 Fire test ash average is 4.0 inches. Slowed the grate to 6/1.25 to allow the ash level to rise. Freeboard average is 40.0 inches. The bed is glowing. Slowed the agitator.
- 1715 Unplugged P-707 line and the reading went from 0 to 1.5 inches wg. The fire loss pressure has been dropping steadily to the current 6.4 inches about the time that the grate was slowed down.
- 1730 Freeboard average is 41.0 inches. Increased the agitator speed to 6.0 sweeps/hour.
- 1800 Fire test ash average is 9.4 sweeps/hour. The center of the bed is spongy.
- 1830 Freeboard average is 40.5 inches. Slowed the agitator to 5.0 inches.
- 1930 Increased the agitator speed to 6.0 sweeps/hour.
- 2000 Freeboard average is 42.0 inches. Increased the agitator to 7.0 sweeps/hour. Fire test ash average is 12.0 inches. The bed is very uneven. Higher heating value is 152 Btu/ft³. Lower heating value is 142 Btu/ft³.
- 2035 Dumped 1070 pounds of ash. Started loading coal into the upper bin at 4.68 tons.
- 2125 Finished loading coal into the upper bin at 12.64 tons.
- 2140 Offtake temperature is 532 degrees C. There is some evidence of channeling in the region of holes number 3 & 6.
- 2200 Fire test ash average is 13.3 inches. The bars are hitting crust 2 feet from the bottom. Increased the

grate speed to 6/1.50.

October 6, 1983

0005 Fire test ash average is 12.4 inches. The bars are slipping in with ease. The bed is in good shape.

0100 Dumped ash.

0200 Fire test ash average is 15.1 inches.

0300 No ash dump this time.

0400 Fire test ash average is 13.4 inches.

0500 Dumped ash. Freeboard average is 40.5 inches.

0510 The main breaker on the bucket elevator is not functioning properly. We rewired it from another breaker on the panel and this will work until we can fix it permanently.

0545 Loading coal into the upper bin.

0600 Fire test ash average is 13.3 inches.

0620 Stil loading coal.

0630 Freeboard average is 40.0 inches.

0637 Stopped loading coal into the upper bin.

0727 Agitator speed is 9.0 sweeps/hour. Freeboard average is 40.0 inches.

0730 Dropped 1.40 tons of coal into the gasifier.

0800 Fire test ash average is 23.9 inches. Grate speed is 6/2.00.

0810-0850 Pressure and temperature bed probe test.

0900 Per test plan we are starting a gradual increase of the saturation air flow from 1400 cfm to 1600 cfm. We will increase the load 50 cfm every 15 minutes. Now we are increasing the saturation air flow to 1450 cfm. Dumped 750 pounds of dry ash. Flushed with the upper nozzles. There were some clinkers 5 inches in diameter in this ash dump.

0915 Saturation air flow is 1500 cfm. Increased the grate to 6/2.20 and the agitator to 6.7 sweeps/hour.

0930 Increased the saturation air flow to 1550 cfm. Free-

board average is 40.0 inches. Reran the wire for the elevator trip lever and marked the panel. The disconnect and reset will remain in the original box.

- 0945 Saturation air flow is 1600 cfm. Grate speed is 6/2.40. Agitator speed is 6.9 sweeps/hour. Increased the furnace pressure to 110 inches wg so the valve opens from 55 to 65% open. Gas supply pressure is 3.5 inches wg.
- 0950 Replaced the number one retort access port cover as the packing would not stay in place.
- 1000 Fire test ash average is 29.3 inches. Saturation temperature is 60 degrees C. Fire zones are very narrow. Changing the grate speed to 8/4.65. Increased the agitator speed to 8.4 sweeps/hour.
- 1045 Ash weight is 545 pounds.
- 1050 Unclog the plugged west side scrubber tank drain line. It had completely closed off with a green gel. Discovered bare wires on the scrubber discharge thermocouple.
- 1100 Dumped 561 pounds of ash. Getting some large chunks. There has been a continued drastic increase in the ash pit and fire loss pressures.
- 1115 Both the ash pit and fire loss pressures have stabilized at 22.5 and 18.5 inches wg respectively. It appears that using the upper nozzles has definitely improved the ash removal process.
- 1150 The grate has ground out 400 pounds of ash in 40 minutes.
- 1200 Fire test ash average is 29.6 inches. Increased the saturation temperature to 61 degrees C and increase the grate speed to 10/5.00.
- 1210 Removed the stroke limiter from the grate drive. Decreased the jacket water flow to 10 gpm. Increased the furnace pressure to 140 inches wg with the valve wide open. Top gas and gas supply pressure have each dropped 0.3 inches wg.
- 1230 Cyclone dump produced one large monolith 20 inches long and 10 inches in diameter. It broke into three pieces and is floating on top of the tank. This powdered cylinder must be the result of the huge "burp" from the 1130 cyclone dump. The whole tank shook violently upon opening the slide valve. The entire 10 inch pipe was plugged. Coal feed was only 1.06 tons. Climbed up to the weigh bin and found that the coal had accumulated on the south end only.

Perhaps we are letting the weigh bin get too empty before refilling it. A low of 3 tons should probably be the limit.

- 1235 Started loading coal into the upper bin at 1.78 tons. Noticed that the conveyor belt is getting a little bit ragged. The spline on the west side is loose again.
- 1300 Dumped 900 pounds of ash. There were many 5-6 inch clinkers in this dump. Rechecked holes number 3, 4 & 5 and found that the burning through had ceased. Fire loss pressure is 14 inches wg.
- 1345 Stopped loading coal into the upper bin at 11.78 tons.
- 1350 Decreased the jacket water flow to 9 gpm. Saturation temperature is 61 degrees C.
- 1400 Fire test ash average is 14.6 inches. The bed has been upset and is very uneven. There is no burning through.
- 1410 Slowed the grate speed to 10/4.00 so we do not overshoot our target of 12-14 inches ash. Slowed the agitator to 8.5 sweeps/hour.
- 1500 Freeboard average is 41.5 inches. Increased the agitator speed to 8.9 sweeps/hour. Ash pit pressure is 16 inches wg and the fire loss pressure is 12 inches wg.
- 1530 Freeboard ash average is 42.0 inches. Increased the agitator to 9.5 sweeps/hour.
- 1600 Fire test ash average is 10.7 inches. Slowed the grate to 10/3.50.
- 1630 Freeboard average is 40.0 inches. Slowed the agitator to 9.0 sweeps/hour.
- 1700 Dumped 1227 pounds of ash. The ash was mostly .25 to .50 inches in size. Some carbon was also evident. Flushed with the upper nozzles and the ash appears to have absorbed all the water.
- 1800 Fire test ash average is 7.1 inches. Slowed the grate speed to 10/2.50.
- 1815 Leaving the valve open to keep the 10 inch line open.
- 1835 Loading coal into the upper bin at 3.82 tons.
- 1915 Stopped loading coal into the upper bin at 12.18

tons.

- 1930 Increased the agitator speed to 9.5 sweeps/hour.
- 2000 Fire test ash average is 11.7 inches. Increased the grate speed to 10/2.75.
- 2010 Dumped 132 pounds of ash. Flushed the cyclone and found 6 rakesful on the bottom.
- 2035 Freeboard average is 39.5 inches. Increased the agitator to 10.0 sweeps/hour. The weigh bin shows a weight of 7.78 tons.
- 2200 Fire test ash average is 9.7 inches. Slowed the grate to 10/2.50. Slowed the agitator to 9.0.
- 2215 Dumped 870 pounds of ash.

October 7, 1983

- 0005 Fire test ash average is 11.1 inches.
- 0100 Dumped ash.
- 0200 Fire test ash average is 11.3 inches.
- 0300 Dump ash.
- 0400 Fire test ash average is 10.3 inches.
- 0500 Dumped ash.
- 0510 Started loading coal into the upper bin.
- 0700 Freeboard average is 39.0 inches. Noticed burning through on holes number 2,3,4 & 5. CO₂ is approaching 9%.
- 0730 Still burning through. Offtake temperature is 460 degrees C. Gas quality is worse at 21% CO and 9% CO₂.
- 0750 Either the ash is hanging up under the grate and dropping suddenly, or there is an excessive amount of water blowing over into the ashcone. The ash weight jumped from 863 pounds to 1027 pounds in 15 minutes.
- 0800 Fire test ash average is 5.4 inches. The bed is still burning through.
- 0810 Slowed the grate speed to 10/2.00. Agitator speed is 6.8 sweeps/hour.

- 0815 Started the gradual saturation air flow increased per test plan. Saturation air flow is now 1650 cfm and the saturation temperature is 61 degrees C.
- 0830 Saturation air flow is 1700 cfm. Also noted that, for the first time, we have gas leaking from the coal valves. The south coal leg is most obvious.
- 0845 Saturation air flow is 1750 cfm.
- 0850 Increased the furnace pressure and the combustion air flow to reduce the cyclone outlet pressure. Gas supply pressure is at 4.5 inches wg. These increases in draw have no effect. The gas control valve is also unable to control the outlet pressure.
- 0900 Dumped 1600 pounds of ash and water (mostly water). The sizes of the ash particles were 2 inches and under. Replaced the number 3 retort access port cover as the packing was gone. Saturation air flow is 1800 cfm. Saturation temperature is 61 degrees C.
- 0930 The bed is still glowing but we can see some improvement. The CO is 22% and the CO₂ is 7%. Decreasing the jacket water flow to 16 gpm. Increased the agitator speed to 7.1 sweeps/hour.
- 1000 Fire test ash average is 4.0 inches. The bed is glowing all around! Slowed the grate to 10/1.18 and the agitator to 6.5 sweeps/hour.
- 1015 Unclogged the top gas pressure sensor tube.
- 1120 Dumped 1800 pounds of water and ash (mostly water). Used the upper nozzles to flush and discovered the excessive water is coming from the ball valves which are not closing properly. Also the 1.5 inch line off the saturation pipe into the trap was plugged.
- 1200 Noticed a pressure drop of one inch of water or more across the ash pit, fire loss, top gas and gas supply sensors. The 1130 cyclone dump produced a considerable amount of particulate. Fire test ash average is 8.6 inches.
- 1210 Leaving the grate speed alone at 10/1.18. The agitator speed is 7.0 sweeps/hour.
- 1230 Started filling the upper bin at 2.82 tons.
- 1320 Stopped loading coal into the upper bin at 11.12 tons.
- 1400 Fire test ash average is 6.0 inches. Glowing is evident all around. Put the stroke limiter bar back on

- the grate and set it to run at 6/1.18.
- 1450 Stopped loading coal into the upper bin at 11.24 tons. Dumped 825 pounds of ash. There was very little water.
- 1500 Slowed the agitator to 6.7 sweeps/hour. Freeboard average is 39.0 inches.
- 1530 Freeboard average is 40.5 inches. The top of the bed is glowing cherry red. Flushed the cyclone and got 12 rakesful off the bottom. Leaving the valve open 1/4 turn.
- 1600 Freeboard average is 39.0 inches. Fire test ash average is 10.9 inches. Increased the grate speed to 6/1.30.
- 1700 Offtake temperature is at 545 degrees C. The bed is glowing in the areas of holes number 1,2,3,4,5 & 6. Freeboard average is 41.5 inches. Increased the agitator to 7.0 sweeps/hour.
- 1745 Unplugged P-707 and the line reading changed from .4 to 2.3 inches wg.
- 1800 Fire test ash average is 14.9 inches. Increased the grate speed to 6/2.00+ and the agitator to 7.5 sweeps/hour.
- 1815 Slowed the jacket water flow down to 14 gpm. The steam valve is 70% open. Increased the agitator to 8.0 sweeps/hour. Freeboard average is 41.0 inches.
- 1935 Steam valve is 100% open. Increased the steam pressure to 24 psi. Had a blip on the saturation temperature strip chart showing from 61 degrees C to 63 degrees C. Put the controller on manual and closed the valve to 30% open. Increased the agitator to 9.0 sweeps/hour. Freeboard average is 41.5 inches.
- 2000 Fire test ash average is 16.6 inches. Higher heating value is 167 Btu/ft³ and the lower heating value is 155 Btu/ft³.
- 2020 Dumped 1072 pounds of ash.
- 2035 Freeboard average is 41.5 inches. Increased the agitator speed to 11.0 sweeps/hour. Loading coal into the upper bin at 3.33 tons.
- 2120 Stopped loading coal into the upper bin at 12.44 tons.
- 2135 Started loading coal into the weigh bin again at

12.05 tons.

2200 Fire test ash average is 21.9 inches. Increased the grate speed to 10/4.75. Agitator speed is 16.0 sweeps/hour.

2220 Dumped 751 pounds of ash.

2245 Higher heating value is 171 Btu/ft³ and the lower heating value is 159 Btu/ft³.

October 8, 1983

0005 Fire test ash average is 13.9 inches

0030 Freeboard average is 40.5 inches.

0100 Fire loss pressure is starting to climb. It is now 13.2 inches wg. Ash pit pressure is 17.1 inches wg.

0130 Ash pit pressure is now 17.4 inches wg. Fire loss pressure is 13.8 inches.

0200 Fire test ash average is 6.0 inches. Slowed the grate to 10/1.20 and reduced the agitator speed to 4.0 sweeps/hour.

0215 Freeboard average is 39.5 inches.

0230 Ash pit pressure is 18.2 inches wg and fire loss pressure is 14.6 inches wg.

0300 Dumped ash. Ash pit pressure is 17.8 inches wg. Fire loss pressure is 14.1 inches wg.

0330 Ash pit pressure is 17.4 inches wg. Fire loss pressure is 13.2 inches. Increased the grate speed to 10/2.00.

0400 Fire test ash average is 9.3 inches. Freeboard average is 40.0 inches.

0430 Ash pit pressure is 17.8 inches wg. Fire loss pressure is 13.6 inches wg.

0445 Ash pit pressure is 16.8 inches wg. Fire loss pressure is 13.1 inches wg.

0450 Started loading coal into the upper bin.

0500 Freeboard average is 41.5 inches. Increased the agitator speed to 8.0 sweeps/hour. Dump ash.

0535 Finished loading coal into the upper bin at 12.03 tons.

0545 The bed is glowing in the area of the number 3 hole.

0555 Fire loss pressure is 12.8 inches wg. Ash pit pressure is 16.7 inches wg.

0600 Fire test ash average is 7.9 inches.

0615 Increased the saturation air flow to 1900 cfm. We are now searching for the maximum load.

0800 Fire test ash average is 4.4 inches. Reduced the grate speed to 10/2.00 and slowed the agitator slightly to maintain a 40 inch freeboard average.

0815 Increased the saturation air flow to 1950 cfm.

0830 Saturation air flow is now 2000 cfm. Increased the grate speed to 10/2.10 and the agitator to 7.8 sweeps/hour.

0845 Increased the saturation air flow to 2050 cfm. Increased the grate speed to 10/2.20 and the agitator to 7.9 sweeps/hour. Dumped 1050 pounds of damp ash. Flushed with the upper nozzles. The ash was mostly very fine. Started the temperature and pressure bed probe test.

0900 The pressure across the bed is quite high. Back pressure is starting to build. Ash pit pressure = 24 inches wg. Fire loss pressure = 16 inches wg. Top gas pressure = 7.5 inches wg. Gas supply pressure = 6.7 inches wg.

1000 Fire test ash average is 6.7 inches. Leaving the grate speed at 10/2.20. Agitator speed is 8.1 sweeps/hour. No burning through is noticed at a saturation air flow of 2050 cfm.

1030 Feeding 1.8 tons per hour for two hours running now. The saturation air flow is 2050 cfm. We are now increasing it to 2100 cfm.

1050 No burning through is apparent. The pressure across the bed is still high and the CO is climbing.

1130 Ash pit pressure = 25.3 inches wg. Fire loss pressure = 18.3 inches wg. Top gas pressure = 7.0 inches wg. Gas supply pressure = 6.0 inches wg.

1200 Fire test ash average is 3.7 inches. Slowing the grate to 8/1.08.

- 1210 CO₂ is 9% and CO is 21%. The offtake temperature is 552 degrees C. Ash pit pressure = 26.2 inches wg. Fire loss pressure = 19.0 inches wg. Top gas pressure = 7.1 inches wg. Gas supply pressure = 6.3 inches wg.
- 1225 The pressures have taken a turn around. The off take temperature is heading down also.
- 1230 Dumped 1500 pounds of ash. This ash dump was very damp. Started filling the upper bin.
- 1315 Ash pit pressure = 23.3 inches wg. Fire loss pressure = 16.1 inches wg. Top gas pressure = 7.2 inches wg. Gas supply pressure = 6.5 inches wg. Offtake temperature is 535 degrees C. The top of the bed has shown a dark red for the last three hours.
- 1330 Noticed a bright glow on top of hole number 4.
- 1400 Fire test ash average is 6.1 inches. Leaving the grate speed at 8/1.08. Freeboard average is 39.5 inches. Agitator speed is 7.8 sweeps/hour.
- 1430 Coal useage has deteriorated to 1.4 tons/hour.
- 1445 Dumped 630 pounds of ash. This time the ash dump was approximately 50% water.
- 1450 Ash pit pressure = 23.0 inches wg. Fire loss pressure = 15.6 inches wg. Top gas pressure = 7.4 inches wg. Gas supply pressure = 6.7 inches wg. Still burning through on holes number 3 & 4. Leakage from the upper levels of the gasifier is more evident today at this higher saturation air flow.
- 1600 Fire test ash average is 11.6 inches. Increasing the grate speed to 8/1.25 and the agitator to 8.5 sweeps/hour.
- 1700 Freeboard average is 40.0 inches. Increased the grate speed to 8/2.00 and the agitator to remain at 8.5 sweeps/hour.
- 1735 Slowed the jacket water flow to 16 gpm with the steam valve at 55% open.
- 1800 Freeboard average is 42.0 inches. Fire test ash average is 14.6 inches. Increased the agitator speed to 10.0 sweeps/hour. The bars are hitting crust above the fire zones. Leaving the grate speed as is.
- 1845 Cleaned the combustion burner and knocked loose a large amount of carbon which was starting to burn around the elbow. The induced draft fan seems to be running more smoothly. Very little vibration can be detected.

1855 Started loading coal into the upper weigh bin at 4.37 tons.

1900 Dumped 1100 pounds of ash. The ash was mostly 2 inches in size with a few chunks in the area of 6 inches. Still noticing a large amount of carbon in the ash. Flushed with the upper nozzles. Closed the 2 inch drain line 50%, but the fire loss pressure jumped, so we opened it back up. The valve is off on the saturation air line on the second floor. Freeboard average is 41.5 inches. Agitator speed is 10 sweeps/hour.

1930 Freeboard average is 42 inches. Increased the agitator speed to 11.0 sweeps/hour. Stopped loading coal into the upper bin at 12.05 tons.

2000 Fire test ash average is 17.6 inches. Increased the grate speed to 8/3.25 and the agitator to 12.5 sweeps/hour. The delta p has been fairly level for the last 4 hours. Ash pit pressure = 22.4 inches wg. Fire loss pressure = 14.5 inches wg. Top gas pressure = 8.1 inches. The offtake temperature is cycling as is the CO₂ every hour. The CO₂ goes from 6 to 7% and the offtake temperature goes from 450 degrees C to 500 degrees C.

2045 Higher heating value is 172 Btu/ft³ and the lower heating value is 160 Btu/ft³.

2145 Dumped 1377 pounds of dry ash. The ash was mostly fist sized with a few larger chunks.

2155 Stopped loading coal into the upper bin at 12.04

2200 Fire test ash average is 12.3 inches. Freeboard average is 39.5 inches. CO is 28% and the CO₂ is 6%. Higher heating value is 175 Btu/ft³ and the lower heating value is 163 Btu/ft³.

2230 Dropped 2.08 tons of coal.

2245 Opened the gas control valve to 70% open. The pressure dropped from 7.8 to 7.6 inches wg.

October 9, 1983

0005 Fire test ash average is 24.1 inches. Freeboard average is 42.5 inches.

0010 Increased the agitator speed to 14.5 sweeps/hour and the grate to 10/3.75.

0100 Dumped ash.

- 0200 Fire test ash average is 22.6 inches. Freeboard average is 40.0 inches.
- 0210 Increased the grate speed to 10/4.25 and the agitator speed to 15.5 sweeps/hour.
- 0211 Ash pit pressure is 27.2 inches wg. Fire loss pressure is 20.3 inches wg. The saturation blower is maxed out at 2050 cfm.
- 0300 Dumped ash. Started loading coal into the upper bin.
- 0400 Fire test ash average is 7.7 inches. Freeboard average is 40.0 inches.
- 0410 Slowed the grate to 10/2.00 and the agitator to 7.0 sweeps/hour. Ash pit pressure is 26.8 inches wg. Fire loss pressure is 19.1 inches wg.
- 0415 The saturation air flow is 2100 cfm.
- 0500 Dumped ash. Freeboard average is 40.0 inches.
- 0506 Started loading coal into the upper bin.
- 0600 Fire test ash average is 8.4 inches. Slowed the grate to 10/1.50.
- 0730 The bed continues to glow on holes number 2,3,4 & 5. Freeboard average is 41.5 inches. Increased the agitator speed to 7.2 sweeps/hour. The cyclone outlet pressure is 7.5 inches wg.
- 0800 Fire test ash average is 10.3 inches. Put the grate speed at 10/1.70.
- 0830 Cyclone valve sticks in both the open and closed positions. Took 10 minutes to complete the dump cycle. Heavy amounts of particulate were washed into level 1. Gas supply pressure is 7.5 inches wg.
- 0850 Dumped 1800 pounds of ash. This was 85% water.
- 0900 Saturation air flow has been wavering for one hour now. It is moving back and forth between 2060 and 2110 cfm.
- 1000 Fire test ash average is 12.3 inches. There is a little crust on the bottom. Leaving the grate speed at 10/1.70 and increasing the agitator speed to 7.8 sweeps/hour.
- 1130 Increasing the agitator speed to 8.0 sweeps/hour.
- 1200 Fire test ash average is 12.7 inches. Increased the grate speed to 10/2.00.

- 1215 Started loading coal into the upper bin at 3.18 tons.
- 1230 Increased the agitator speed to 8.4 sweeps/hour. The last coal up includes 1/3 fines.
- 1300 Dumped 1700 pounds of ash. This time it contained very little water. The size distribution averaged smaller.
- 1345 Higher heating value is 162 Btu/ft³ and the lower heating value is 153 Btu/ft³. CO is 30.9%, CO₂ is 6.0% and H₂ is 12.8%.
- 1400 Fire test ash average is 11.0 inches. Slowed the grate speed to 10/1.90. Freeboard average is 41.0 inches. Decreased the jacket water to 17 gpm to maintain a saturation temperature of 61 degrees C.
- 1410 Continued topping off the weigh bin. Dumped 700 pounds of ash. Very little water this dump.
- 1440 Changed the caustic barrels. The pH is 6.5.
- 1500 Started the pressure and temperature bed probe test for 2100 cfm saturation air flow.
- 1530 Freeboard average is 42.5 inches. Increased the agitator to 9.5 sweeps/hour. Flushed the cyclone. 25 rakesful resulted on the bottom and about 3 inches of floating silt.
- 1600 Fire test ash average is 20.9 inches. Increased the grate speed to 10/2.50 and the agitator to 12.0 sweeps/hour.
- 1700 Dumped 1325 pounds of dry ash, Saturataion air flow is 2120 cfm. Started the number 2 scrubber pump.
- 1800 Fire test ash average is 18.4 inches. Increased the grate to 10/2.65 and slowed the agitator to 11.0 sweeps/hour. Freeboard average is 39.0 inches.
- 1815 Induced draft fan sounds good. Opened the port on the elbow before the combustor and the gas ignited and is burning around the elbow.
- 1845 Started loading coal into the upper bin at 2.07 tons.
- 2000 Fire test ash average is 16.0 inches. Increased the grate speed to 10/3.00 and the agitator to 12.5 sweeps/hour.
- 2015 Dumped ash. The size range of the ash was 1/4 to 2". Higher heating value is 172 Btu/ft³ and the lower heating value is 160 Btu/ft³.

2200 Fire test ash average is 20.7 inches.

2210 Dumped 1255 pounds of ash. Increased the grate speed to 10/4.00 and the agitator to 13.5 sweeps/hour.

October 10, 1983

0005 Fire test ash average is 17.9 inches. Freeboard average is 42.0 inches.

0015 Reducing the saturation air flow to 1600 cfm. We are attempting to maintain a 40 inch freeboard average until 0600. Slowed the grate speed to 8/2.00 and the agitator speed to 7.0 sweeps/hour.

0030 Dropped 1.68 tons of coal. Freeboard average is 40.0 inches.

0100 Dumped ash.

0130 Dropped 1.25 tons of coal. Freeboard average is 42.5 inches.

0135 Increased the agitator speed to 11.0 sweeps/hour.

0200 Fire test ash average is 19.4 inches. Freeboard average is 40.5 inches.

0210 Increased the grate speed to 8/2.25.

0330 Coal drop is 1.57 tons. Freeboard average is 40.0 inches.

0400 Fire test ash average is 24.3. Freeboard average is 40.0 inches.

0430 Coal drop was 1.39 tons. Freeboard average is 40.5 inches.

0445 Started loading coal into the upper bin.

0500 Dumped ash. Freeboard average is 40.0 inches.

0530 Coal drop was 1.62 tons. Freeboard average is 40.0 inches.

0545 The coal conveyor belt lacing is torn about halfway through.

0600 Freeboard average is 39 inches. Increased the agitator speed to 15.0 sweeps/hour.

0610 Fire test ash average is 20.1 inches.

- 0630 Freeboard is 38.0 inches. Coal drop is 1.32 tons.
- 0632 Slowed the agitator to 14.5 sweeps/hour.
- 0730 In the midst of the agitator/praticle sampling test. Freeboard average is 37.5 inches. Saturation air flow is 1600 cfm with a saturation temperature of 61 degrees C.
- 0800 Fire test ash average is 18.0 inches.
- 0810 Slowed the grate speed to 8/1.90.
- 0820 Slowed the agitator to 13.9 sweeps/hour.
- 0845 Increased the agitator speed to 14.1 sweeps/hour.
- 0850 Dumped 1280 pounds of damp ash. There was very little standing water. The size varied from fines to 2 inch particles.
- 0900 Per test plan, we will lower the freeboard average to 36 inches. Increased the agitator speed to 14.6 sweeps/hour. Crew is starting to put the coal conveyor back in shape. The conveyor belt is still ripped halfway across and jammed tight against the cross walk and diagonally off track. The front end loader is out of fuel and had to be primed to restart it. Cleaned the fines out of the pick up area. This process takes 1.5 hours in this rain. (The crew is not happy!!) Started loading coal into the upper weigh bin with the "run of shipment" left in the hopper prior to the repair of the belt and moving of the conveyor back to normal placement in front of the shaker. This afternoon we will start loading 1/4" X 2" coal.
- 0915 Increased the agitator speed to 16.0 sweeps/hour.
- 0930 Increased the agitator to 18.0 sweeps/hour. It seems that the grate has not dropped the bed and that the agitator increases have not kept up.
- 0945 Another increase in agitator speed to 19.0 sweeps/hour will hopefully aid in maintaining a 36 inch freeboard. Higher heating value is 168 Btu/ft³. The CO is 26.8%, CO₂ is 5.3% and H₂ is 17.9%.
- 1000 Freeboard average is 36.0 inches. Fire test ash average is 11.0 inches.
- 1010 Increased the grate speed to 8/2.00.
- 1130 Freeboard average is 35.0 inches. Slowed the agitator speed to 19.0 sweeps/hour.

- 1200 Started the final phase of the agitator/particle sample test at the 34 inch freeboard. Fire test ash average is 8.0 inches. Slowed the grate to 8/2.00.
- 1230 Freeboard average is 33.5 inches. Agitator speed is 23.5 sweeps/hour.
- 1300 Freeboard average is 32.5 inches. Reduced the agitator speed to 19.5 sweeps/hour. Dumped 1100 pounds of ash. Started work on splicing the belt.
- 1330 Increased the agitator speed to 21.5 sweeps/hour.
- 1400 Fire test ash average is 11.0 inches.
- 1410 Increased the grate speed to 8/2.70 and the agitator to 24.0 sweeps/hour.
- 1415 Changed caustic barrels. The pH at the drain and tanks is 7.0+, at the fan is 4.0 and at the stack is 3.0. Work continues on the conveyor belt in the cold pouring rain. We are trying a new three part alligator lacing configuration this time.
- 1430 Probe test is completed. Freeboard average is 33.5 inches. We want to stabilize the system before going to the 1/4" X 2" coal later tonight. Slowed the agitator to 10.5 sweeps/hour.
- 1445 Conveyor belt repair is completed.
- 1455 Cyclone particulate is heavy. It took 15 minutes to rake it clean.
- 1500 Freeboard average is 37.5 inches. Slowed the agitator to 10.0 sweeps/hour. During 9 hours of particle sampling, the agitator sweeps averaged 10.3 sweeps/hour at freeboard of 38 inches, 13.7 sweeps/hour at a 36 inch freeboard and 15.2 sweeps/hour at 34 inch freeboard. Weigh bin is running empty of the "run of shipment" coal. Current weight reading is 0.94 tons.
- 1530 Weigh bin shows 0.16 tons and is empty. Freeboard average is 40.0 inches.
- 1600 Fire test ash average is 18.8 inches. Increased the grate speed to 8/3.00 and the agitator to 11.0 sweeps/hour.
- 1615 Started loading coal with the 1/4" screen in place.
- 1650 Weigh bin is loaded at 12.22 tons. Dumped 1199 pounds of fine ash.

1715 Gas quality went down after dumping and the CO₂ is increasing.

1730 North coal leg is hot. Ran the vibrator. The off-take temperature is 485 degrees C. Increased the jacket water flow to 19 gpm.

1800 Fire test ash average is 11.2 inches.

1810 Offtake temperature peaks when we cycle the coal valves. Dropped 4.38 tons of 1/4" X 2" coal into the coal leg and upper bin. The north coal leg is very hot.

1900 Slowed the agitator to 10.0 sweeps/hour. Freeboard average is 39.0 inches. The coal valves are leaking badly. The south gate is the worst.

2000 Fire test ash average is 38.5 inches. Slowed the grate to 8/1.40 and the agitator to 8.0 sweeps/hour.

2015 Gas quality is improving and the fire loss pressure has gone down to 12.5 inches wg.

2100 Loading coal into the upper bin at 5.45 tons. Dumped 1217 pounds of ash. Increased the grate speed to 8/1.80. The bed is tight. Increased the agitator speed to 9.0 sweeps/hour.

2200 Fire test ash average is 11.3 inches. Freeboard average is 41.0 inches. Increased the agitator to 9.5 sweeps/hour to maintain a 40 inch freeboard. The delta p has dropped 5" since the starting of the shift. The ash pit pressure is 12.8 inches wg and the fire loss pressure is 9.8 inches. CO is 25% and the CO₂ is 5%.

October 11, 1983

0005 Fire test ash average is 17.8 inches.

0035 Increased the saturation air flow to 1700 cfm.

0100 Dumped ash.

0105 Increased the saturation air flow to 1800 cfm.

0200 Fire test ash average is 19.4 inches. Freeboard average is 42.0 inches.

0215 Increased the agitator speed to 13.0 sweeps/hour and the grate speed to 8/2.50.

0400 Fire test ash average is 24.3 inches. Increased the

grate speed to 8/3.25. Freeboard average is 40.5 inches. Increased the agitator speed to 14.0 sweeps/hour.

0500 Dump ash. Freeboard average is 40.0 inches.

0600 Fire test ash average is 24.3 inches. Freeboard average is 40.0 inches. The bars are going in easily with no evidence of clinkering.

0730 Cleaned out the control room.

0800 Fire test ash average is 18.0 inches. The bed is loose and even. Freeboard average is 40.0 inches. Pulling the stroke limiting bar from the grate and allowing it to push 10 teeth. We will start the gradual increase in saturation air flow to 2000 cfm per plan.

0810 Increasing the grate speed to 10/4.00 and the agitator to 16.0 sweeps/hour. Unplugged the gas supply pressure sensor.

0815 Increased the saturation air flow to 1850 cfm.

0830 Increased the saturation air flow to 1900 cfm. Increasing the grate speed to 10/4.15 and the agitator to 16.3 sweeps/hour.

0845 Increased the saturation air flow to 1950 cfm.

0855 Fire loss pressure is at 16.0 inches wg. Cyclone outlet pressure is 6.8 inches wg. Combustor fans and valves are wide open and the gas supply valve is at the most efficient setting. The butterfly valve is 73% open.

0900 Saturation air flow is 2000 cfm. Increasing the grate speed to 10/4.25 and the agitator to 16.7 sweeps/hour. Dumped 850 pounds of fine ash. There were a few chunks 2 inches in size.

0915 Fifteen minutes after reaching 2000 cfm, the fire loss pressure is 17.4 inches wg and the gas supply pressure is 7.4 inches wg. The cyclone bottom tank had 2 feet of packed dust in the bottom and a large amount of floating particulate.

0930 Reduced the agitator speed to 16.5 sweeps/hour. Freeboard average is 39.0 inches.

0940 Fire loss pressure is 18.1 inches wg. The south coal leg leakage is worse as the load and pressures increase. Gas on the 3rd level is getting noxious.

- 1000 Freeboard average is 39.5 inches. Fire test ash average is 11.0 inches. There was 4 inches of crust on the bottom of the number 4 hole. Slowed the grate speed to 10/4.20 and the agitator is at 16.5 sweeps/hour.
- 1010 Ash pit pressure is 27.0 inches wg and the fire loss pressure is 19.3 inches wg. The offtake temperature is staying in the range of 370-395 degrees C.
- 1030 Slowed the agitator to 16.2 sweeps/hour. Freeboard average is 38.5 inches. Changed the caustic barrels.
- 1100 Dumped 1350 pounds of ash. The cyclone particulate continues to be very heavy. Slowed the agitator again to 16.0 sweeps/hour. Freeboard average is 38.5 inches.
- 1130 Freeboard average is 39.0 inches. Decreased the agitator speed to 15.7 sweeps/hour. The grate counter indicates that the grate cog is slipping as the counter reading had decreased 52% while the grate speed only decreased 2% over the last 2 hours. Looking at the empty cone weight of over 330 pounds. Think that the underside of the grate is clogged.
- 1200 Fire test ash average is 8.0 inches. Saturation temperature is 61 degrees C. No clinkering is evident. Ash pit pressure is 27 inches wg. Do not have enough steam to hold back the gas. Slowed the grate to 10/3.50 and the agitator speed is 15.0 sweeps/hour.
- 1215 As we have maintained a 2000 cfm saturation air flow for 3 hours, we will start searching for the upper limit. We have very little blower left. The valve is 90% open. Increased the saturation air flow to 2050 cfm.
- 1220 Have reached the top load at somewhere between 2000-2020 cfm. We are limited by our blower, which is now 100% open.
- 1250 Ash pit pressure = 27.2 inches wg. Fire loss pressure = 19.20 inches wg. Gas supply pressure = 7.5 inches wg. Offtake temperature is 420 degrees C.
- 1300 Dumped 1000 pounds of ash. Using the upper nozzles with each dump. Much fine ash. Slowed the agitator to 14.7 sweeps/hour.
- 1330 Coal feed has averaged 1.75 tons for the last 3 hours at 2000 cfm saturation air flow. Slowed the agitator slightly to 14.5 sweeps/hour. Delta p and the offtake temperature are holding steady. All is well outside. The inside induced draft fan bearing is

getting hot.

- 1340 Topped off the weigh bin at 11.30 tons.
- 1400 Fire test ash average is 11.0 inches. Leaving the grate and agitator settings as is. Freeboard average is 40.0 inches.
- 1410 Decreased the saturation temperature to 60 degrees C. Hoping that this will produce less restriction in the bed as well as lowering the ash pit and fire loss pressures. Since attempting to go over 2000 cfm saturation air flow, the gas supply pressure has lost 0.3 inch wg. The offtake temperature has also decreased from 420 degrees C to the neighborhood of 380 degrees C. Lowered the jacket water flow to 16 gpm.
- 1430 Dumped 900 pounds of dry ash. The ash has developed a strange odor.
- 1445 Have noticed no change in pressures 1/2 hour after decreasing the saturation temperature. Jacket water flow is at 17.5 gpm.
- 1520 Increased the saturation temperature to 62 degrees C. to lower fire loss pressure. Fire loss pressure is 19.7 inches wg.
- 1550 With the increase in saturation temperature, the CO₂ increased to 7% and the CO dropped slightly.
- 1600 Freeboard average is 40.0 inches. Fire test ash average is 10.7 inches. Slowed the grate to 10/3.25. Tightened the main seal as it was leaking gas.
- 1635 Cleaned the offtake pressure line.
- 1700 Dumped 110 pounds of ash. The ash was mostly 1/4" to 2" in size with a few soft 4 inch chunks. The stack pH is 4.0. Induced draft fan is running well. Good fire burning in the 24 inch gas line before the combustor. Freeboard average is 38.5 inches. Slowed the jacket water flow to 15 gpm. The steam valve is 54% open.
- 1800 Fire test ash average is 11.2 inches.
- 1815 Started loading coal into the upper bin at 4.23 tons.
- 1845 Stopped loading coal at 12.18 tons.
- 1855 Dumped 900 pounds of ash.
- 2000 Fire test ash average is 13.7 inches. Increased the grate speed to 10/3.50. Gas quality has not in-

creased since it dropped off after the increase to 62 degrees C of the saturation temperature.

2100 CO₂ is 6% and CO is 25%. Lower heating value is 157 Btu/ft³.

2145 Dumped 1333 pounds of ash.

2150 Saturation air flow is 1875 cfm. Lowered the saturation temperature to 60 degrees C.

2200 Fire test ash average is 11.3 inches. Slowed the grate to 10/3.35.

2210 Loaded the upper bin at 12.18 tons. CO is 26% and CO₂ is 5.5%.

2305 We had an accidental shut down. The switch on the control circuit for the primary combustion fan was bumped.

2310 Combustor was relit.

2311 Gas is going back downstream.

2312 The vent is closed.

October 12, 1983

0005 Fire test ash average is 9.9 inches. Freeboard average is 40.5 inches.

0100 Dumped ash.

0200 Fire test ash average is 12.9 inches. Freeboard average is 40.0 inches.

0300 Dumped ash.

0400 Fire test ash average is 10.3 inches. Freeboard average is 40.5 inches. Slowed the grate to 10/2.75.

0600 Fire test ash average is 11.3 inches. Freeboard average is 40.0 inches.

0715 Changed to the last caustic barrel.

0800 Fire test ash average is 12.7 inches. Do not have enough steam to keep the gas down in the retort.

0835 Reduced the agitator speed to 13.7 sweeps/hour.

0840 Start setting up for the pressure and temperature probe. Slowing the agitator to 5.5 sweeps/hour. Ash

pit pressure is 29.5 inches wg and the fire loss pressure is 23.0 inches.

0935 Cleaned out and chopped free the build up at the offtake pipe as it exists in the retort. The result was an immediate increase of 4 inches on the offtake pressure to 11.0 inches wg. Fire loss pressure dropped 4 inches to 16.0 inches wg. Saturation air flow is now 2050 cfm. This trade off has given us 10.5 inches wg cyclone outlet pressure.

0950 Now we have some blower left. The valve has closed to 93% open. We will try to go to 2100 cfm saturation air flow after the 1000 fire test.

1000 Fire test ash average is 10.9 inches. Gas is still spewing out of holes number 2,3 & 4. Slowed the grate speed to 10/2.50 to increase the ash level. Slowed the agitator speed to 14.7 sweeps/hour.

1015 Saturation blower is 100% open again. Trying for 2100 cfm saturation air flow, but we are out of blower. We are getting momentary peaks of 2070 cfm.

1030 Decreased the jacket water flow to 13 gpm to attempt to maintain a 60 degree C saturation temperature.

1100 Dumped ash again and the ash was damper than at 0900 due to increased air and blowover.

1130 Slowed the agitator to 14.5 sweeps/hour.

1200 Fire test ash average is 12.0 inches. Leaving the grate at 10/2.50. Freeboard average is 40.5 inches.

1310 Saturation air flow hits a momentary peak at 2100 cfm and then backs off.

1400 Fire test ash average is 16.0 inches. Increased the grate to 10/2.75.

1415 Just unloaded a new load of caustic.

1445 Dumped 860 pounds of ash.

1530 Freeboard average is 40.0 inches. CO is 26.5% and CO2 is 5.3%. Higher heating value is 167 Btu/ft3 and the lower heating value is 155 Btu/ft3.

1600 Fire test ash average is 12.9 inches. Slowed the grate to 10/2.65. Flushed the cyclone. 30 rakesful on the bottom and a little more than 3 inches of particulate resulted on top.

1720 Dumped 1290 pounds of ash.

1730 Coal up weight is 2.84 tons. Readjusted the steam for the poke hole units.

1800 Fire test ash average is 14.7 inches. Increased the grate speed to 10/2.75.

1815 Checked the induced draft fan and it is running o.k. Cleaned the combustor. It was not burning at the elbow.

1915 Loaded coal into the upper bin at 12.23 tons.

1935 Dumped 1139 pounds of ash.

2000 Freeboard average is 40.0 inches. Fire test ash average is 13.4 inches.

2025 Saturation air flow is 1975 cfm with the valve 100% open. Fire loss pressure is 18.1 inches wc. Opened the offtake retort and cleaned the line out from the gasifier which had a restricted opening in it (should have been 24 inch). While cleaning it out gas was escaping. Lowered the saturation air flow to 600 cfm to allow the building to clear (3 minutes). Then increased the saturation air flow to 2100 cfm. The valve is 45% open. Before opening up the offtake line it was 100% open. Fire loss pressure is down to 8.2 inches wg from 18.1 inches wg. Gas supply pressure is 13.1 inches wg (up from 10.6 inches wg). Ash pit pressure is down to 22.3 inches wg from 29.1 inches wg.

2200 Fire test ash average is 16.0 inches

2210 Dumped 1428 pounds of ash. Flushed a large amount of particulate from the cyclone. Increased the grate to 10/2.85 and the agitator to 15.0 sweeps/hour. Lowered the saturation air flow to 2000 cm and the valve is 41% open. Increased the jacket water flow to 15 gpm. The steam valve is 16% open.

2220 Loaded coal into the weigh bin at 12.17 tons.

October 13, 1983

0005 Fire test ash average is 14.6 inches.

0100 Dumped ash.

0200 Fire test ash average is 14.1 inches.

0300 Dumped ash.

0400 Fire test ash average is 15.9 inches.

0500 Dumped ash.

0515 Started loading coal.

0600 Fire test ash average is 15.3 inches. Freeboard is 40.0 inches.

0630 Dumped the cyclone. Freeboard average is 40.5 inches.

0700 Freeboard average is 40.0 inches.

0705 Gas is escaping through the water seal on the cyclone. The water from the cyclone is splashing violently. This shorted the frostex heating cable around the water piping of the cyclone causing arcing to the water pipe. This ignited the gas in the cyclone dump. Tried to close the cyclone drain, but the flames melted the plastic cup on the water separator. Opened the vent, flared off and shut down the gasifier.

END OF BOM/FGT 008 ELKHORN BITUMINOUS COAL

APPENDIX B

Quench/ESP Operator's Log

These are the comments recorded by the quench/ESP operators during the course of the test.

PREFACE

QUENCH/ESP OPERATOR'S LOG

August 1983

Prior to BOM/FGT 008, the Quench/ESP system was on line twice, both instances of short duration. Due to the brevity of on line time and difficulties experienced, the following log entries will serve as a preface to the system operation in BOM/FGT 008.

August 3, 1983

- 1205 Turned the blower on. The delta p across the annubar is 0.08 inches wg. KV = 35 and snapping.
- 1235 The quench outlet temperature is at 127 degrees F. Everything except the high voltage control board is working fine. A resistor on the control board is shot and arcs to the board every time the electrodes arc. Water is accumulating in the quench tank. Must increase the gas load to evaporate all of the water supplied by the fogging nozzles.
- 1240 The delta p across the annubar is 0.66 inches wg after decreasing the blower bypass.
- 1245 Lost pressure on the recycle pump and the oxygen went way up. Manually shut down the high voltage. The oxygen went down by itself, indicating a leak in the sampling system.
- 1250 Recycle pump lost its prime and is not working properly.
- 1251 Starting the gas through again.
- 1252 Restarted blower.
- 1300 Secured the blower.
- 1600 Steam line leak is noticed on the opposite side of the tee from the copper steam trace.
- 1800 Tar pumps are running too fast.
- 2200 System shutdown, O₂ has reached 3% on the cal scale. After checking with the gasifier control room, we discovered this is a normal course of events during the poke test. O₂ returned to 1000 ppm by itself after the completion this poke test.
- 2215 Restarted the system.

2300 The quench tank inlet gauge pressure line melted off.
Made the necessary repairs and it is again functioning.

August 4, 1983

0005 Because of the inaccuracy of the O2 analyzer, the system was shut down until the O2 device could be properly recalibrated and tested.

Installed a new AVC board.

Subsequent testing indicated a dead short in the ESP. Investigation revealed a broken high voltage insulator on the East side of the ESP. Replaced the damaged insulator. A new one needs to be ordered.

Subsequent testing indicated a faulty transformer/rectifier resistor. Will probably need to be rebuilt.

Replumbed the isolation gate valves on the tar combustion pumps to eliminate an area for possible vapor lock problems.

Installed individual outlet pressure gauges on the tar pumps.

August 15, 1983

Wired in the new transformer/rectifier. Tested the high voltage and all seems o.k.

August 16, 1983

0800 Started purging the line with N2. The O2 went down to 6000 ppm; 4,000ppm; and decreasing . Tried to start the gas blower; it was too tight! Apparently tar had gummed up the lobe/vane.

0900 Heated the compressor with steam injection to loosen the mechanism.

1000 Pushing gas flow through the quench/ESP.

1030 The delta p is 0.20 inches wg. gas flow. Everything seems to be performing correctly. The tar pump has been running over night non-stop. Cooled gas temperature hovers around 150 degrees F. Fresh water is approximately 86 degrees F.

1035 Number 1 fog nozzle has been turned down to 20 psi. Still unable to read the inlet temperature gauge due to the water spray. Number 2 is still closed. Will try

to run at a lower temperature later this afternoon.

1115 Pumped the quench tank down.

1215 Pumped the quench tank down.

1340 Automatic shut down due to undervoltage.

1350 Sparking seems to be continuous, instead of intermittent.

1415 Under voltage occurred several times. The HV was reading 20-25 kv.

QUENCH/ESP OPERATOR LOG

BOM/FGT 008

September 13, 1983

1000 Attempted start up. The system shut down after approximately 5 minutes due to a broken insulator on the west side.

1900 Replaced the insulator. Started the pressure test.

2026 Pressure is O.K. Started the N2 purge.

2120 We are on line.

September 14, 1983

0215 High O2, again, due to a fire test being performed by the gasifier operators.

0830 Started burning tar.

1200 Changed the filter on the O2 indicator.

1800 Shutdown due to undervoltage.

September 15, 1983

0415 Steam hose broke to the combustor.

0600 Tar hose to the combustor is leaking.

1100 Shut down due to plugging in the quench tank discharge.

September 20, 1983

0830 Started the N2 purge. Ambient temperature is approximately 45 degrees F.

1030 The Keystone butterfly valve is partly open. Began the gas flow to heat up. No Good!

1100 Low plant air pressure is a problem. Resolved this problem temporarily by using N2 from the l2-pack. We are back on line.

1730 System has been shut down to work on the Keystone valve. Back on compressed air from N2. Sump tank steam trap is sticking and needs to be replaced.

September 21, 1983

- 0400 Put the system in standby mode. Combustion nozzle is not functional. Installed thermostatic control on the surge tank. Repaired the tar combustor nozzle.
- 1100 Burning tar at a rate of 1 gallon/minute (small nozzle). Steamed the frozen air pump and returned the entire system to operation at low cfm.
- 2000 Replaced the malfunctioning small combustion nozzle with a larger one.

September 22, 1983

- 0830 Gasifier load was reduced from 2000 cfm to 1000 cfm.
- 0900 Closed the bypass on the positive displacement blower 2 turns to increase the flow through the system.
- 1000 Replaced the small pulley on the number 1 tar pump.
- 1100 Replaced the small pulley on the number 2 tar pump.
- 1135 Increased the flow to approximately 90%.
- 1700 Tar pump number 2 starter and motor have burned up.
- 1730 Shut down to replace the transfer pump. Blew a gasket while steam tracing the line. Gas valve froze up during the change. Steamed it to free up the mechanism.
- 1800 Tar pump number 2 is back on line.
- 2100 Gas valve cleared and we are back on line.

September 23, 1983

- 0005 Increased the gas flow. Tried burning tar and the nozzle plugged. Removed the wand and found the steam supply side to be plugged with tar. Removed the head, cleaned and replaced it. Solution to this problem may be to not open the transverse steam line full, rather to throttle back so the steam flows in the tar and steam side of the burning wand.
- 0105 Back on line and burning tar.

September 24, 1983

- 0750 Surge tank contains 230 gallons. Started burning tar

prior to the gasifier load increase.

0805 Stopped burning tar due to pressure loss. Surge tank level is 180 gallons.

0820 System shutdown due to blower failure. The blower was plugged with condensate and tar.

1125 Back on line.

September 25, 1983

0610 System shutdown due to high O2.

0612 O2 has come down and we were able to restart.

1030 Tar nozzle is plugged.

1215 Removed and cleaned the tar burning nozzle.

1250 Started to burn tar again (large nozzle). Surge tank level is at 200 gallons.

1315 Stopped burning tar. Surge tank level is at 110 gallons.

1750 Shutdown due to undervoltage. Restarted the system, but found the voltage to be extremely low.

1845 Shut down completely. Automatic shutdown on undervoltage. Investigation revealed a faulty high voltage cable.

1900 Drained the quench tank completely to eliminate the hardening of the tar on the bottom. Shut down the transfer pump. Closed the Vanessa valve. Closed the return valve. Burned the tar out of the tar tank to a level of approximately 200 gallons. Shut down tar pumps and tar heaters. Removed the burner head from the combustor.

1930 Shut down the fresh water and recycle pumps. Turned off the high voltage insulator electric heaters.

September 27, 1983

1930 Start up.

2130 Lowered the cfm through the gasifier to 1000.

2200 Opened the bypass on the positive displacement blower to approximately 50%. The O2 level was too high (over 1%).

2330 Shut down the gasifier due to induced draft fan and shut down of the ESP followed.

September 30, 1983

2300 System is back on line. Very high (9-10 inches wg) vacuum on the quench tank and ESP vessels. Evidently due to blockage in the supply line, various remedial efforts were fruitless.

October 1, 1983

1530 Opened the bypass on the positive displacement blower to catch up on the tar burning. A large amount of fresh water is being used to lower the temperature of the gas.

1630 Used tar pump number 2 only for burning tar. This increased pressure to supply to 65 psi. Tar pump number 1 is in circulation mode.

1815 Drained the lower section of gas pipe near the positive displacement blower. Annubar delta p leveled off at 0.20 inches wg. It was fluctuating badly.

1825 Closed the blower bypass 2 turns.

1840 The delta p across the annubar is 0.22 inches wg. The quench inlet temperature is 680 degrees F. The fresh water inlet is at 100% capacity. Number 3 nozzle is at 14 psi. The quench outlet temperature is 14 degrees F.

October 2, 1983

0230 Stopped burning tar due to low levels in the surge tank. Drained the discharge pipe from the positive displacement blower. Number 1 fresh water line is partly plugged with tar. It needs to be steam cleaned. Could not figure out a way to do it with the system on line.

0410 Opened the bypass on the positive displacement blower 2 turns due to negative pressures showing on the gauges.

0415 Started burning tar again. The surge tank is at 400 gallons.

0550 Stopped burning tar due to low level in the surge tank (110 gallons).

0730 Started burning tar again as the surge tank now is at 375 gallons.

1810 Opened bypass on the blower 100% due to high vacuum on the system. The delta p across the annubar is now at 0.13 inches wg. The vacuum has dropped from .53 psi to .48 psi.

2105 Noticed that the primary voltage has decreased to 290 volts. Spark rate has increased from 15 to 40 sparks per minute.

2000 Vacuum has increased to .62 psi. Shut the positive displacement blower off. Flushed out the quench tank.

2230 Turned off the insulator heaters.

APPENDIX C

Weather Data for Testing Days

These data were taken from NOAA weather station 72658
approximately 3 miles from the test site.

Note: Barometric pressure has been adiabatically normalized to
sea level from 840 feet elevation and ambient temperature.

Temperature in degrees Fahrenheit

Relative Humidity in %

Barometric Pressure in inches mercury

Precipitation in inches

BOM/FGT 008 ELKHORN

WEATHER DATA

DATE: September 13, 1983

HOURL	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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1000	62	65	29.475	
1100	64	56	29.465	
1200	63	56	29.455	
1300	64	56	29.445	
1400	65	52	29.435	
1500	63	56	29.415	
1600	65	54	29.415	
1700	63	56	29.405	
1800	61	56	29.405	
1900	57	62	29.415	
2000	57	62	29.425	
2100	56	66	29.425	
2200	56	66	29.425	
2300	52	74	29.425	
2354	51	77	29.420	

General Conditions: Cloudy sunrise and cloudy sunset. 652 minutes of sunshine (86%). Maximum wind speed is 12 mph.

DATE: September 14, 1983

HOURL	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	49	83	29.430	
0200	50	77	29.430	
0300	48	80	29.430	
0400	47	83	29.430	
0500	48	77	29.430	
0600	47	80	29.445	
0700	50	80	29.445	
0800	53	77	29.445	
0900	57	64	29.435	
1000	60	60	29.425	
1100	63	56	29.415	
1200	63	52	29.395	
1300	63	48	29.365	
1400	62	50	29.345	
1500	62	54	29.320	
1600	62	54	29.300	
1700	62	54	29.290	
1800	61	58	29.280	
1900	60	58	29.270	T
2000	58	64	29.270	T
2100	56	69	29.280	.01
2200	55	74	29.270	.02
2300	54	77	29.270	.01
2340	54	74	29.250	.01

General Conditions: Clear sunrise and cloudy sunset. 471 minutes of sunshine (62%). Maximum wind is 15 mph.

DATE: September 15, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	54	74	29.220	T
0200	54	77	29.190	.01
0300	54	77	29.170	.02
0400	54	77	29.150	.02
0500	53	80	28.140	.03
0600	53	80	29.125	.13
0700	53	74	29.115	.10
0800	53	71	29.095	.15
0900	53	77	29.065	.18
1000	53	77	29.045	.18
1100	53	74	29.015	.19
1200	54	77	28.985	.19
1300	54	80	28.965	.07
1400	54	80	28.935	.05
1500	55	77	28.920	.03
1600	55	80	28.910	T
1700	55	77	28.900	.01
1800	54	83	28.905	.01
1900	55	80	28.910	T
2000	54	86	28.910	.01
2100	55	83	28.920	.01
2200	55	83	28.910	T
2300	55	83	28.910	T
2350	55	83	28.900	T

General Condidtions: Cloudy sunrise and cloudy sunset. There was 0% sunshine today. Maximum wind speed is 20 mph.

DATE: September 16, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	55	83	28.910	T
0200	55	83	28.910	T
0300	54	83	28.920	T
0400	54	83	28.935	.01
0500	54	83	28.945	T
0600	54	83	28.965	T
0700	54	80	28.985	T
0800	54	80	28.995	.01
0900	56	77	28.995	
1000	57	74	29.025	
1100	58	72	29.035	
1200	58	72	29.045	
1300	58	72	29.045	
1400	60	67	29.035	
1500	59	69	29.045	
1600	59	67	29.045	
1700	58	69	29.045	
1800	58	72	29.045	
1900	57	75	29.050	
2000	57	75	29.060	
2100	56	77	29.075	
2200	56	77	29.070	
2300	56	77	29.075	
2353	54	80	29.065	

General Conditions: Cloudy sunrise and sunset. 126 Minutes of sunshine (17%). Maximum wind speed is 14 mph.

DATE: September 17, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	52	83	29.065	
0200	51	83	29.065	
0300	49	83	29.045	
0400	48	83	29.035	
0500	49	80	29.035	
0600	50	83	29.015	
0700	51	80	28.985	
0800	52	83	28.970	
0900	56	74	28.945	
1000	60	64	28.920	
1100	62	50	28.885	
1200	65	60	28.845	
1300	67	56	28.790	
1400	66	58	28.760	
1500	65	61	28.730	
1600	67	63	28.705	
1700	67	70	28.705	
1800	67	73	28.795	
1900	70	61	29.730	
2000	67	70	28.725	
2100	66	73	28.715	
2200	65	78	28.715	
2300	64	78	28.715	
2353	62	83	28.685	

General Conditions: Cloudy sunrise and sunset. 468 minutes of sunshine (63%). Maximum wind speed is 26 mph.

DATE: September 18, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	59	84	28.705	
0200	61	83	28.730	
0300	62	75	28.735	
0400	61	75	28.760	
0500	61	62	28.790	
0600	56	71	28.850	
0700	57	72	28.890	
0800	60	62	28.905	
0900	61	46	28.925	
1000	62	44	28.935	
1100	62	48	28.945	
1200	63	46	28.955	
1300	65	45	28.965	
1400	66	43	28.970	
1500	66	43	28.980	
1600	66	43	28.995	
1700	63	44	29.005	
1800	62	48	29.025	
1900	60	51	29.025	
2000	56	59	29.055	
2100	56	59	29.065	
2200	54	64	29.055	
2300	52	71	29.055	
2354	51	74	29.035	

General Conditions: Cloudy sunrise and clear sunset. 717 minutes of sunshine (96%). Maximum wind speed is 21 mph.

DATE: September 19, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
------	------	-------------------	---------------	-----------

0100	52	74	29.025	
0200	52	71	29.045	
0300	52	77	29.035	
0400	51	77	29.075	
0500	51	74	29.065	
0600	51	77	29.065	T
0700	53	71	29.075	T
0800	54	74	29.055	.01
0900	53	71	29.065	.01
1000	53	71	29.025	T
1100	53	71	29.035	T
1200	51	74	29.005	.05
1300	51	74	28.975	.02
1400	51	77	28.945	.01
1500	51	71	28.925	.04
1600	51	71	28.935	.04
1700	50	74	28.935	.01
1800	50	68	28.935	.01
1900	50	68	28.955	T
2000	50	68	28.975	
2100	50	68	29.015	
2200	50	74	29.015	
2300	50	71	29.035	T
2355	50	68	29.055	.01

General Conditions: Cloudy sunrise and sunset. 13 minutes of sunshine (2%). Maximum wind speed is 21 mph.

DATE: September 20, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	49	66	29.075	T
0200	47	71	29.100	.01
0300	46	71	29.065	T
0400	46	68	29.105	T
0500	46	68	29.115	
0600	46	68	29.125	
0700	46	68	29.150	
0800	47	63	29.140	
0900	48	63	29.140	
1000	50	61	29.160	
1100	51	59	29.150	
1200	51	56	29.150	
1300	48	68	29.150	T
1400	49	56	29.140	
1500	49	56	29.140	
1600	47	58	29.140	.01
1700	47	68	29.145	T
1800	48	58	29.145	
1900	48	61	29.150	
2000	46	60	29.160	
2100	46	60	29.160	
2200	46	63	29.160	
2300	45	65	29.160	
2353	45	65	29.155	

General Conditions: Cloudy sunrise and sunset. 369 minutes of sunshine (50%). Maximum wind speed is 25 mph.

DATE: September 21, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	45	58	29.150	
0200	44	60	29.135	
0300	43	58	29.130	
0400	43	62	29.120	
0500	43	62	29.120	
0600	43	62	29.130	
0700	42	65	29.130	
0800	43	65	29.130	T
0900	44	65	29.135	
1000	44	68	29.145	T
1100	45	65	29.140	T
1200	46	65	29.150	.01
1300	49	56	29.130	T
1400	49	54	29.130	T
1500	49	52	29.140	
1600	49	52	29.140	
1700	50	52	29.140	T
1800	47	51	29.140	
1900	47	56	29.150	
2000	46	60	29.160	
2100	46	60	29.160	
2200	46	60	29.170	
2300	45	65	29.170	
2350	45	63	29.170	

General Conditions: Cloudy sunrise and sunset. 243 minutes sunshine (33%). Maximum wind speed is 20 mph.

DATE: September 22, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	45	60	29.170	
0200	44	60	29.170	
0300	43	62	29.175	
0400	43	62	29.185	
0500	43	62	29.210	
0600	43	62	29.215	
0700	43	62	29.240	
0800	44	60	29.250	
0900	45	60	29.265	
1000	46	57	29.285	
1100	48	51	29.285	
1200	45	57	29.295	
1300	47	57	29.305	
1400	46	61	29.315	
1500	47	58	29.310	
1600	48	56	29.310	
1700	48	56	29.305	
1800	47	56	29.310	
1900	46	58	29.330	
2000	45	58	29.340	
2100	42	65	29.360	
2200	41	62	29.375	
2300	37	70	29.375	
2351	38	70	29.385	

General Conditions: Cloudy sunrise and sunset. 209 minutes of sunshine (29%). Maximum wind speed is 21 mph.

DATE: September 23, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	36	73	29.395	
0200	35	73	29.395	
0300	34	73	29.405	
0400	31	81	29.405	
0500	32	75	29.415	
0600	30	81	29.415	
0700	31	81	29.415	
0800	40	70	29.440	
0900	46	58	29.440	
1000	50	54	29.435	
1100	54	47	29.420	
1200	56	42	29.395	
1300	57	39	29.375	
1400	59	39	29.350	
1500	59	37	29.330	
1600	59	37	29.330	
1700	58	40	29.290	
1800	55	43	29.270	
1900	51	50	29.275	
2000	50	50	29.280	
2100	48	56	29.285	
2200	45	60	29.300	
2300	46	58	29.300	
2355	46	58	29.300	

General Conditions: Clear sunrise and sunset. 728 minutes of sunshine (100%). Maximum wind speed is 17 mph.

DATE: September 24, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	47	56	29.290	
0200	47	53	29.270	
0300	47	53	29.250	
0400	45	60	29.250	
0500	45	60	29.230	
0600	46	58	29.210	
0700	48	56	29.200	
0800	52	52	29.185	
0900	57	47	29.170	
1000	61	46	29.155	
1100	64	45	29.140	
1200	66	43	29.130	
1300	68	44	29.110	
1400	70	42	29.075	
1500	71	42	29.095	
1600	69	49	29.085	
1700	68	51	29.095	
1800	65	52	29.100	
1900	63	58	29.095	
2000	61	62	29.110	
2100	59	67	29.115	
2200	58	69	29.120	
2300	55	74	29.125	
2354	56	72	29.115	

General Conditions: Clear sunrise cloudy sunset. 688 minutes of sunshine (95%). Maximum wind speed is 22 mph.

DATE: September 25, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	56	72	29.125	
0200	55	74	29.125	
0300	53	77	29.125	
0400	52	77	29.130	
0500	51	77	29.130	
0600	49	80	29.150	
0700	47	82	29.170	
0800	55	77	29.180	
0900	59	75	29.190	
1000	63	67	29.210	
1100	67	63	29.200	
1200	71	59	29.200	
1300	74	52	29.190	
1400	76	47	29.180	
1500	77	45	29.175	
1600	77	45	29.170	
1700	74	56	29.180	
1800	69	55	29.190	
1900	66	59	29.190	
2000	63	65	29.200	
2100	62	67	29.200	
2200	62	70	29.205	
2300	61	67	29.190	
2350	60	72	29.190	

General Conditions: Cloudy sunrise and clear sunset. 665 Minutes of sunshine (92%). Maximum wind speed is 10 mph.

DATE: September 26, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	56	77	29.190	
0200	57	77	29.190	
0300	55	80	29.190	
0400	55	80	29.180	
0500	55	80	29.190	
0600	54	83	29.195	
0700	56	80	29.200	
0800	60	78	29.205	
0900	65	70	29.210	
1000	68	66	29.215	
1100	72	59	29.205	
1200	76	58	29.200	
1300	78	54	29.190	
1400	80	51	29.170	
1500	81	44	29.160	
1600	81	46	29.160	
1700	77	56	29.160	
1800	74	54	29.160	
1900	73	55	29.160	
2000	68	66	29.180	
2100	65	70	29.160	
2200	64	70	29.160	
2300	64	73	29.170	
2355	61	78	29.170	

General Conditions: Clear sunrise and sunset. 719 minutes of sunshine (100%). Maximum wind speed is 10 mph.

DATE: September 27, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	59	81	29.170	
0200	58	83	29.160	
0300	58	81	29.160	
0400	57	83	29.160	
0500	56	83	29.160	
0600	56	83	29.160	
0700	58	84	29.160	
0800	64	73	29.160	
0900	67	70	29.160	
1000	73.6	54	29.160	
1100	77	54	29.160	
1200	80	49	29.135	
1300	83	46	29.115	
1400	83	44	29.105	
1500	85	37	29.095	
1600	84	40	29.095	
1700	81	46	29.095	
1800	75	56	29.095	
1900	71	59	29.105	
2000	69	66	29.125	
2100	68	65	29.130	
2200	67	68	29.140	
2300	65	75	29.140	
2355	64	78	29.130	

General Conditions: Clear sun-
rise and cloudy sunset. 658
minutes of sunshine (92%). Max-
imum wind speed is 21 mph.

DATE: September 28, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	63	84	29.130	
0200	63	84	29.130	
0300	63	84	29.125	
0400	62	87	29.125	
0500	62	90	29.130	
0600	61	93	29.130	
0700	63	87	29.125	
0800	65	84	29.145	
0900	69	76	29.165	
1000	74	66	29.160	
1100	73	69	29.145	
1200	75	63	29.145	
1300	78	60	29.130	
1400	79	58	29.130	
1500	81	54	29.125	
1600	80	56	29.130	
1700	78	64	29.130	
1800	76	60	29.150	
1900	72	71	29.160	
2000	72	68	29.160	
2100	70	71	29.180	
2200	71	71	29.200	
2300	70	76	29.210	
2350	69	78	29.230	

General Conditions: Cloudy sun-
rise and sunset. 628 minutes of
sunshine (88%). Maximum wind
speed is 18 mph.

DATE: September 29, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
0100	68	87	29.230	T
0200	67	90	29.230	
0300	66	93	29.250	
0400	64	100	29.270	
0500	61	100	29.300	T
0600	61	100	29.300	T
0700	60	100	29.310	.01
0800	61	97	29.315	.01
0900	62	97	29.320	.01
1000	62	97	29.325	.01
1100	63	100	29.500	.01
1200	63	100	29.310	.05
1300	64	97	29.290	T
1400	65	97	29.280	T
1500	67	97	29.260	T
1600	67	100	29.260	
1700	68	100	29.260	
1800	66	100	29.260	
1900	66	100	29.250	
2000	65	100	29.250	
2100	66	100	29.250	
2200	67	90	29.270	T
2300	65	94	29.260	T
2355	64	93	29.270	.08

General Conditions: Cloudy sunrise and sunset. 73 minutes of sunshine (10%). Maximum wind speed is 17 mph.

DATE: September 30, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
0100	63	96	29.260	.03
0200	64	93	29.255	.02
0300	63	93	29.250	T
0400	63	96	29.245	
0500	63	93	29.250	
0600	63	90	29.250	
0700	64	87	29.270	
0800	64	87	29.280	
0900	64	87	29.290	
1000	66	81	29.280	
1100	70	73	29.260	
1200	73	64	29.240	
1300	78	54	29.210	
1400	79	52	29.180	
1500	78	54	29.180	
1600	76	56	29.160	
1700	74	57	29.155	
1800	71	64	29.155	
1900	68	68	29.155	
2000	68	68	29.155	
2100	67	70	29.155	
2200	66	73	29.150	
2300	64	78	29.140	
2355	64	78	29.130	

General Conditions: Cloudy sunrise and sunset. 430 minutes of sunshine (61%). Maximum wind speed is 20 mph

DATE: October 1, 1983

HOURL	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	63	78	29.125	
0200	63	81	29.115	
0300	64	75	29.105	
0400	62	81	29.095	
0500	61	84	29.085	
0600	60	87	29.075	
0700	63	78	29.065	
0800	64	75	29.050	
0900	65	75	29.040	
1000	70	68	29.035	
1100	74	60	29.005	
1200	77	62	28.995	
1300	78	56	28.985	
1400	78	54	28.955	
1500	77	58	28.950	
1600	75	67	28.945	
1700	74	71	28.945	
1800	73	71	28.935	
1900	67	94	28.945	
2000	69	84	28.965	
2100	68	84	28.965	
2200	68	87	28.965	
2300	65	90	28.955	
2355	64	97	28.940	

General Conditions: Cloudy sunrise and sunset. 430 minutes of sunshine (61%). Maximum wind speed is 16 mph.

DATE: October 2, 1983

HOURL	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	61	100	28.945	
0200	62	100	28.945	
0300	62	100	28.930	
0400	61	100	28.925	
0500	62	100	28.930	
0600	62	100	28.925	
0700	61	100	28.925	
0800	61	100	28.900	
0900	61	100	28.890	
1000	62	100	28.870	
1100	65	96	28.850	
1200	68	90	28.810	
1300	72	76	28.760	
1400	77	67	28.795	
1500	75	67	28.925	
1600	77	69	28.695	
1700	75	76	28.695	
1800	71	87	28.695	
1900	69	87	28.715	
2000	66	94	28.750	
2100	64	94	28.760	
2200	62	94	28.760	
2300	60	100	28.770	
2355	60	97	28.760	

General Conditions: Cloudy sunrise and sunset. 335 minutes of sunshine (48%). Maximum wind speed is 17 mph.

DATE: October 3, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	59	93	28.740	
0200	58	93	28.780	
0300	58	90	28.790	
0400	56	90	28.790	
0500	55	97	28.790	
0600	54	100	28.820	
0700	54	97	28.810	
0800	54	97	28.855	
0900	53	97	28.870	
1000	54	93	28.860	
1100	54	93	28.870	
1200	55	89	28.880	
1300	56	89	28.885	
1400	56	89	28.880	
1500	56	87	28.890	
1600	56	86	28.900	
1700	55	90	28.925	
1800	55	83	28.945	
1900	55	86	28.965	
2000	54	90	28.965	
2100	54	86	28.965	
2200	53	93	28.975	T
2300	53	83	28.975	
2355	53	93	28.965	

General Conditions: Cloudy sunrise and sunset. 57 minutes of sunshine (8%). Maximum wind speed is 18 mph.

DATE: October 4, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	53	93	28.975	
0200	52	96	28.965	
0300	51	100	28.965	
0400	51	100	28.975	T
0500	51	100	28.975	T
0600	51	100	28.985	T
0700	51	100	28.995	
0800	51	100	29.005	
0900	51	100	29.005	
1000	52	96	28.995	
1100	54	96	28.985	
1200	55	86	28.985	
1300	57	83	28.965	
1400	58	77	28.955	
1500	58	72	28.955	
1600	58	80	28.945	
1700	58	80	28.955	
1800	56	83	28.965	
1900	54	93	28.960	
2000	53	93	28.965	
2100	52	96	28.975	
2200	51	100	28.965	
2300	51	100	28.955	
2355	51	100	28.945	

General Conditions: Cloudy sunrise and sunset. 292 minutes of sunshine (42%). Maximum wind speed is 13 mph.

DATE: October 5, 1983

HOUR TEMP RELATIVE BAROMET RAIN
HUMIDITY PRESS SNOW

0100	47	100	28.945	
0200	49	100	28.935	
0300	45	100	28.935	
0400	46	100	28.935	
0500	45	100	28.935	
0600	45	100	28.925	
0700	46	100	28.935	
0800	51	96	28.940	
0900	54	90	28.945	
1000	58	83	28.955	
1100	62	67	28.965	
1200	65	58	28.965	
1300	64	63	28.965	
1400	64	56	28.980	
1500	63	56	29.005	
1600	58	67	29.045	
1700	57	67	29.065	
1800	55	72	29.085	
1900	54	77	29.115	
2000	52	83	29.132	
2100	49	89	29.160	
2200	49	89	29.170	
2300	47	96	29.185	
2355	47	93	29.210	

General Conditions: Clear sunrise and sunset. 625 minutes of sunshine (90%). Maximum wind speed is 26 mph.

DATE: October 6, 1983

HOUR TEMP RELATIVE BAROMET RAIN
HUMIDITY PRESS SNOW

0100	46	79	29.230	
0200	44	86	29.250	
0300	43	89	29.260	
0400	41	96	29.280	
0500	40	100	29.290	
0600	37	100	29.310	
0700	38	100	29.320	
0800	43	100	29.320	
0900	49	82	29.330	
1000	52	69	29.330	
1100	54	69	29.310	
1200	56	64	29.300	
1300	57	57	29.280	
1400	57	57	29.270	
1500	54	66	29.270	
1600	54	66	29.270	
1700	52	74	29.240	
1800	51	77	29.330	
1900	51	83	29.330	
2000	51	83	29.200	
2100	50	86	29.205	
2200	49	89	29.210	
2300	50	86	29.190	
2350	51	83	29.175	

General Conditions: Clear sunrise and cloudy sunset. 506 minutes of sunshine (74%). Maximum wind speed is 17 mph.

DATE: October 7, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
0100	49	96	29.150	T
0200	49	93	29.110	
0300	51	86	29.070	
0400	51	86	29.060	
0500	51	86	29.035	T
0600	51	86	29.030	
0700	51	89	29.015	
0800	51	93	29.005	
0900	51	100	29.015	T
1000	51	100	29.015	.05
1100	51	100	29.025	.02
1200	52	100	29.025	
1300	54	96	28.985	
1400	57	96	29.005	
1500	59	90	29.025	
1600	57	87	29.055	
1700	56	90	29.075	
1800	55	93	29.115	
1900	53	96	29.150	
2000	50	96	29.190	
2100	49	96	29.240	
2200	48	97	29.280	
2300	47	100	29.310	
2355	46	100	29.335	

General Conditions: Cloudy sunrise and sunset. 89 minutes of sunshine (13%). Maximum wind speed is 25 mph.

DATE: October 8, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
0100	45	96	29.375	
0200	44	96	29.405	
0300	43	96	29.435	
0400	42	100	29.465	
0500	40	100	29.485	
0600	38	100	29.495	
0700	38	100	29.515	
0800	42	96	29.535	
0900	45	96	29.555	
1000	47	93	29.595	
1100	50	77	29.575	
1200	52	66	29.585	
1300	53	66	29.560	
1400	54	64	29.555	
1500	55	57	29.550	
1600	55	59	29.550	
1700	53	59	29.550	
1800	51	61	29.550	
1900	47	73	29.560	
2000	45	79	29.570	
2100	43	89	29.580	
2200	41	96	29.590	
2300	42	92	29.590	
2355	41	96	29.590	

General Conditions: Cloudy sunrise and clear sunset. 659 minutes of sunshine (97%). Maximum wind speed is 18 mph.

DATE: October 9, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	40	100	29.590	
0200	39	100	29.590	
0300	38	100	29.590	
0400	39	100	29.600	
0500	36	100	29.600	
0600	36	100	29.600	
0700	37	100	29.610	
0800	41	100	29.615	
0900	46	89	29.620	
1000	51	63	29.610	
1100	53	61	29.590	
1200	54	57	29.570	
1300	55	62	29.535	
1400	55	62	29.505	
1500	56	59	29.485	
1600	55	62	29.475	
1700	54	66	29.465	
1800	53	69	29.455	
1900	52	74	29.455	
2000	51	77	29.445	T
2100	51	77	29.425	T
2200	50	77	29.415	
2300	49	80	29.395	
2355	49	80	29.375	

General Conditions: Clear sunrise and cloudy sunset. 581 minutes of sunshine (86%). Maximum wind speed is 20 mph.

DATE: October 10, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
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0100	47	86	29.360	
0200	48	83	29.340	
0300	49	80	29.335	
0400	48	86	29.330	
0500	47	86	29.305	
0600	47	93	29.290	T
0700	46	100	29.270	.01
0800	47	96	29.250	.01
0900	47	96	29.230	.01
1000	48	96	29.200	
1100	49	96	29.180	T
1200	51	96	29.130	
1300	53	93	29.095	
1400	52	96	29.055	.13
1500	54	93	29.050	.01
1600	53	100	29.025	.01
1700	52	100	29.015	.04
1800	53	100	29.005	.03
1900	52	100	28.995	.22
2000	52	100	28.955	.23
2100	52	100	28.945	.25
2200	53	100	28.935	.18
2300	54	100	28.920	.07
2355	54	100	28.895	.25

General Conditions: Cloudy sunrise and sunset. No sunshine. Maximum wind speed is 23 mph.

DATE: October 11, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
0100	55	100	28.895	.17
0200	55	100	28.870	.22
0300	55	100	28.855	.04
0400	55	96	28.865	T
0500	56	100	28.870	.01
0600	56	100	28.870	T
0700	56	100	28.880	T
0800	55	100	28.920	
0900	51	100	28.945	
1000	50	96	28.965	
1100	51	93	28.975	
1200	52	83	29.005	
1300	52	83	29.015	
1400	52	74	29.015	
1500	51	71	29.020	
1600	50	68	29.035	
1700	49	58	29.045	
1800	48	63	29.065	
1900	45	73	29.075	
2000	44	79	29.085	
2100	44	79	29.095	
2200	43	79	29.095	
2300	41	79	29.095	
2353	38	89	29.075	

General Conditions: Cloudy sunrise and sunset. 54 minutes of sunshine (8%). Maximum wind speed is 20 mph.

DATE: October 12, 1983

HOUR	TEMP	RELATIVE HUMIDITY	BAROMET PRESS	RAIN SNOW
0100	38	92	29.075	
0200	36	100	29.075	
0300	36	100	29.065	
0400	37.9	74	29.055	
0500	35.2	78	29.055	
0600	33.1	94	29.055	
0700	33.8	88	29.055	
0800	34.2	80	29.055	
0900	35.8	72	29.055	
1000	40	82	29.045	
1100	41	76	29.035	
1200	41	73	29.035	
1300	40	73	29.045	
1400	43	65	29.045	
1500	42	73	29.055	
1600	40	79	29.065	
1700	38	89	29.075	
1800	36	100	29.085	
1900	34	100	29.095	
2000	32	100	29.085	
2100	31	100	29.075	
2200	30	100	29.065	
2300	32	100	29.045	
2355	31.1	85	29.035	

General Conditions: Cloudy sunrise and sunset. 373 minutes of sunshine (56%). Maximum wind speed is 16 mph.

APPENDIX D
Coal Sizing Data

Feed Coal Size Distribution for BOM/FGT-008

Sample Number	Date	Shift Start Time	Screen Mesh Size inch	Cumulative Mass Fraction, % <u>less than stated mesh size, inch</u>				
				1/4	1/2	3/4	1	1 1/2
1	9/13/84	16:00	+3/4	0.4	0.5	1.0	5.0	67.6
2	9/14/84	0:00	+3/4	0.7	1.2	2.1	8.1	75.1
3	9/14/84	8:00	+3/4	0.7	1.1	1.9	7.6	72.0
4	9/14/84	16:00	+3/4	0.5	0.6	0.9	6.8	73.4
5	9/15/84	0:00	+3/4	0.5	1.4	9.9	15.1	79.9
6	9/15/84	8:00	+3/4	0.1	0.6	1.5	8.8	79.7
7	9/15/84	16:00	+3/4	0.4	0.6	1.2	8.7	76.3
8	9/16/84	0:00	+3/4	0.2	0.3	1.0	8.6	74.5
9	9/16/84	8:00	+3/4	0.6	0.6	1.4	11.1	85.7
10	9/16/84	16:00	+3/4	1.0	1.3	2.4	12.9	79.0
11	9/17/84	0:00	+3/4	0.9	1.0	1.6	9.5	65.6
12	9/17/84	8:00	+3/4	0.8	0.9	1.5	10.9	77.7
13	9/17/84	16:00	+3/4	1.2	1.4	1.5	9.2	26.5
14	9/18/84	0:00	+3/4	1.4	1.6	2.1	10.2	70.2
15	9/18/84	8:00	+3/4	1.3	2.0	3.8	17.5	86.0
16	9/18/84	16:00	+3/4	1.0	1.2	2.3	9.4	73.3
17	9/19/84	0:00	+3/4	1.1	1.3	2.5	10.3	72.1
18	9/19/84	8:00	+3/4	1.0	1.0	2.2	9.7	72.8
19	9/19/84	16:00	+3/4	0.6	1.1	1.9	11.4	72.8
20	9/20/84	0:00	+3/4	1.1	1.2	1.9	9.8	73.7
21	9/20/84	8:00	+3/4	1.5	1.8	3.3	15.3	81.1
22	9/20/84	16:00	+3/4	0.7	0.9	1.8	8.1	67.9
23	9/21/84	0:00	+3/4	0.6	0.8	1.7	6.5	74.9
24	9/21/84	8:00	+3/4	0.9	1.0	1.2	6.5	70.6
25	9/21/84	16:00	+3/4	0.7	0.9	2.0	10.7	78.3
26	9/22/84	0:00	+3/4	0.8	0.9	1.6	10.3	79.1
27	9/22/84	8:00	+3/4	0.9	1.3	2.8	12.9	83.3
28	9/22/84	16:00	+3/4	0.4	0.6	1.0	11.1	75.8
29	9/23/84	0:00	+3/4	1.2	1.7	3.3	14.4	76.7
30	9/23/84	8:00	+3/4	0.9	1.2	2.5	10.8	75.8
31	9/23/84	16:00	+3/4	0.5	0.7	1.1	9.1	72.6
32	9/24/84	0:00	+3/4	0.7	1.0	2.7	13.1	81.2
33	9/24/84	8:00	+3/4	0.7	1.4	3.3	14.4	78.8
34	9/24/84	16:00	+3/4	0.3	0.5	0.6	7.2	74.5
35	9/25/84	0:00	+1/4	0.3	1.0	3.2	11.6	72.6
36	9/25/84	8:00	+1/4	0.8	1.2	3.0	11.8	66.1
37	9/25/84	16:00	+1/4	0.5	1.8	4.1	11.1	74.2
38	9/26/84	0:00	+1/4	0.4	1.4	3.3	12.2	73.1
39	9/26/84	8:00	+1/4	0.8	2.8	5.9	13.5	75.7
40	9/26/84	16:00	+1/4	0.4	1.0	2.6	9.0	71.1
41	9/27/84	0:00	+1/4	0.9	3.0	7.2	16.9	82.4
42	9/27/84	8:00	+1/4	1.0	3.4	4.9	17.2	75.9
43	9/27/84	16:00	+1/4	0.4	1.8	4.0	12.5	80.1
44	9/30/84	16:00	+1/4	0.4	1.2	3.3	12.1	78.4

Sample Number	Date	Shift Start Time	Screen Mesh Size inch	Cumulative Mass Fraction, % less than stated mesh size, inch				
				1/4	1/2	3/4	1	1 1/2
45	10/ 1/84	0:00	+1/4	1.2	3.6	6.7	17.8	82.2
46	10/ 1/84	8:00	+1/4	0.2	0.3	1.3	6.0	75.1
47	10/ 1/84	16:00	+1/4	1.0	3.1	6.1	16.8	79.3
48	10/ 2/84	0:00	+1/4	1.0	3.0	6.0	14.5	78.7
49	10/ 2/84	8:00	+1/4	1.5	6.9	11.9	21.8	76.4
50	10/ 2/84	16:00	+1/4	0.8	3.3	6.5	14.4	79.3
51	10/ 3/84	0:00	+1/4	1.3	3.5	6.2	14.1	79.7
52	10/ 3/84	8:00	+1/4	0.6	1.8	3.9	12.1	68.0
53	10/ 3/84	16:00	+1/4	1.0	3.1	6.2	22.4	80.8
54	10/ 4/84	0:00	ROS	0.9	2.1	4.6	10.8	75.2
55	10/ 4/84	8:00	ROS	2.9	5.7	8.9	19.5	76.9
56	10/ 4/84	16:00	ROS	1.3	2.8	4.9	11.3	73.4
57	10/ 5/84	0:00	ROS	1.9	4.6	7.9	19.3	82.6
58	10/ 5/84	8:00	ROS	1.5	3.9	7.8	18.8	88.3
59	10/ 5/84	16:00	ROS	4.5	8.5	11.8	21.3	84.2
60	10/ 6/84	0:00	ROS	2.8	6.0	9.4	16.7	86.8
61	10/ 6/84	8:00	ROS	3.3	6.5	9.9	22.3	80.7
62	10/ 6/84	16:00	ROS	8.3	13.8	20.0	30.9	88.1
63	10/ 7/84	0:00	ROS	0.6	1.6	4.1	11.7	67.6
64	10/ 7/84	8:00	ROS	2.2	5.1	9.0	19.6	80.3
65	10/ 7/84	16:00	ROS	6.6	11.3	15.5	24.9	84.7
66	10/ 8/84	0:00	ROS	2.0	4.8	8.4	20.0	86.1
67	10/ 8/84	8:00	ROS	7.7	12.8	18.5	32.2	88.5
68	10/ 8/84	16:00	ROS	3.8	7.3	12.1	21.8	83.2
69	10/ 9/84	0:00	ROS	3.7	7.5	11.7	23.9	82.4
70	10/ 9/84	8:00	ROS	4.2	8.5	14.1	25.8	90.4
71	10/ 9/84	16:00	ROS	1.7	3.8	5.6	13.8	73.0
72	10/10/84	0:00	+1/4	2.1	5.6	10.2	18.2	85.5
73	10/10/84	8:00	+1/4	2.2	5.2	9.2	16.9	71.4
74	10/10/84	16:00	+1/4	3.7	7.1	10.2	21.2	78.8
75	10/10/84	0:00	+1/4	1.0	2.4	4.1	11.8	72.3
76	10/11/84	8:00	+1/4	1.1	2.4	3.8	10.7	83.3
77	10/11/84	16:00	+1/4	0.6	2.6	5.4	14.0	73.1
78	10/12/84	0:00	+1/4	5.0	8.3	12.1	21.9	79.3
79	10/12/84	8:00	+1/4	3.9	7.2	10.9	20.4	82.1
80	10/12/84	16:00	+1/4	3.9	7.2	10.9	20.4	82.1
81	10/13/84	0:00	+1/4	0.8	2.5	5.5	13.8	76.0
AVERAGES				+3/4	0.8	1.0	2.3	10.2
				+1/4	1.3	3.4	6.3	15.4
				ROS	3.5	6.8	10.6	20.6

APPENDIX E

Coal Addition Log

Coal Weights are given in short tons.

BOM/FGT 008 ELKHORN BITUMINOUS

COAL FEED

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-13	0730	COKE	.75	NO	10.18	0.92	9.26
09-13	0930	COKE	.75	NO	1.95	1.42	.53
09-13	1030	COKE	.75	NO	1.42	.96	.46
09-13	1130	COKE	.75	NO	.96	.68	.28
09-13	1230	COKE	.75	NO	.68	.45	.23
09-13	1300	COKE	.75	NO	.45	.33	.12
09-13	1330	COKE	.75	NO	CHOKE FED FROM LOWER BIN		
09-13	1935	008-C1	.75	NO	11.34	6.70	4.64
09-13	2030	008-C1	.75	NO	6.70	5.91	.79
09-13	2130	008-C1	.75	NO	11.71	10.83	.88
09-13	2230	008-C1	.75	NO	10.83	10.02	.81
09-13	2330	008-C2	.75	NO	10.02	9.10	.92
09-14	0030	008-C2	.75	NO	9.10	8.18	.92
09-14	0130	008-C2	.75	NO	8.17	7.41	.76
09-14	0230	008-C2	.75	NO	7.41	6.68	.73
09-14	0330	008-C2	.75	NO	6.66	5.95	.70
09-14	0430	008-C2	.75	NO	5.94	5.24	.70
09-14	0530	008-C2	.75	NO	5.24	4.54	.70
09-14	0630	008-C2	.75	NO	5.78	5.00	.78
09-14	0730	008-C3	.75	NO	5.00	4.07	.93
09-14	0830	008-C3	.75	NO	4.07	3.02	1.05
09-14	0930	008-C3	.75	NO	3.02	1.90	1.12
09-14	1030	008-C3	.75	NO	1.90	.86	1.04
09-14	1130	008-C3	.75	NO	9.75	8.45	1.30
09-14	1230	008-C3	.75	NO	8.44	7.40	1.04
09-14	1330	008-C3	.75	NO	7.39	6.42	0.97
09-14	1430	008-C3	.75	NO	11.59	10.72	.87
09-14	1530	008-C4	.75	NO	10.72	9.98	.74
09-14	1630	008-C4	.75	NO	9.98	9.26	.72
09-14	1730	008-C4	.75	NO	9.26	8.62	.64
09-14	1830	008-C4	.75	NO	8.61	7.88	.73
09-14	1930	008-C4	.75	NO	7.88	7.11	.77
09-14	2030	008-C4	.75	NO	7.11	6.16	.95
09-14	2130	008-C4	.75	NO	11.17	10.26	.91
09-14	2230	008-C4	.75	NO	11.45	10.37	1.08
09-14	2330	008-C5	.75	NO	10.37	9.28	1.09
09-15	0030	008-C5	.75	NO	9.28	8.24	1.04
09-15	0130	008-C5	.75	NO	8.24	7.33	.91
09-15	0230	008-C5	.75	NO	7.33	6.53	.80
09-15	0330	008-C5	.75	NO	6.53	5.68	.85
09-15	0430	008-C5	.75	NO	5.67	4.96	.71
09-15	0530	008-C5	.75	NO	11.75	11.14	.61
09-15	0630	008-C5	.75	NO	11.68	10.96	.72
09-15	0730	008-C6	.75	NO	10.96	10.09	.87
09-15	0830	008-C6	.75	NO	10.09	9.10	.99
09-15	0930	008-C6	.75	NO	9.10	8.00	1.10
09-15	1030	008-C6	.75	NO	8.00	6.78	1.22
09-15	1130	008-C6	.75	NO	6.77	5.62	1.15

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-15	1230	008-C6	.75	NO	5.62	4.52	1.10
09-15	1330	008-C6	.75	NO	4.50	3.49	1.01
09-15	1430	008-C6	.75	NO	11.32	10.40	.92
09-15	1530	008-C7	.75	NO	10.40	9.60	.80
09-15	1630	008-C7	.75	NO	9.60	8.76	.84
09-15	1730	008-C7	.75	NO	8.76	7.94	.82
09-15	1830	008-C7	.75	NO	7.94	7.15	.79
09-15	1930	008-C7	.75	NO	7.15	6.42	.73
09-15	2030	008-C7	.75	NO	6.42	5.61	.81
09-15	2130	008-C7	.75	NO	11.49	10.57	.92
09-15	2230	008-C7	.75	NO	10.57	9.66	.91
09-15	2330	008-C8	.75	NO	11.20	10.20	1.00
09-16	0030	008-C8	.75	NO	10.20	9.16	1.04
09-16	0130	008-C8	.75	NO	9.16	8.15	1.01
09-16	0230	008-C8	.75	NO	8.15	7.21	.94
09-16	0330	008-C8	.75	NO	7.21	6.26	.95
09-16	0430	008-C8	.75	NO	6.26	5.27	.99
09-16	0530	008-C8	.75	NO	12.19	11.19	1.00
09-16	0630	008-C8	.75	NO	11.19	10.25	.94
09-16	0730	008-C9	.75	NO	10.23	9.12	1.11
09-16	0830	008-C9	.75	NO	9.12	8.07	1.05
09-16	0930	008-C9	.75	NO	8.07	6.96	1.11
09-16	1030	008-C9	.75	NO	6.94	5.87	1.07
09-16	1130	008-C9	.75	NO	5.84	4.67	1.17
09-16	1230	008-C9	.75	NO	4.67	3.54	1.13
09-16	1330	008-C9	.75	NO	3.54	2.30	1.24
09-16	1430	008-C9	.75	NO	10.64	9.50	1.14
09-16	1530	008-C10	.75	NO	11.14	10.03	1.11
09-16	1630	008-C10	.75	NO	10.03	8.89	1.14
09-16	1730	008-C10	.75	NO	8.89	7.75	1.14
09-16	1830	008-C10	.75	NO	7.75	6.43	1.32
09-16	1930	008-C10	.75	NO	6.43	5.24	1.19
09-16	2030	008-C10	.75	NO	5.24	3.98	1.26
09-16	2130	008-C10	.75	NO	11.89	10.76	1.13
09-16	2230	008-C10	.75	NO	10.76	9.64	1.12
09-16	2330	008-C11	.75	NO	11.13	9.95	1.18
09-17	0030	008-C11	.75	NO	9.95	8.61	1.34
09-17	0130	008-C11	.75	NO	8.60	7.52	1.08
09-17	0230	008-C11	.75	NO	7.52	6.29	1.23
09-17	0330	008-C11	.75	NO	6.29	5.13	1.16
09-17	0430	008-C11	.75	NO	5.12	3.93	1.19
09-17	0530	008-C11	.75	NO	11.38	10.18	1.20
09-17	0630	008-C11	.75	NO	12.14	11.08	1.06
09-17	0730	008-C12	.75	NO	11.07	9.90	1.17
09-17	0830	008-C12	.75	NO	9.90	8.59	1.31
09-17	0930	008-C12	.75	NO	8.59	7.33	1.26
09-17	1030	008-C12	.75	NO	7.33	5.98	1.35
09-17	1130	008-C12	.75	NO	5.98	4.69	1.29
09-17	1230	008-C12	.75	NO	4.69	3.45	1.24
09-17	1330	008-C12	.75	NO	3.45	2.15	1.30
09-17	1430	008-C12	.75	NO	1.45	10.13	1.32

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-17	1530	008-C13	.75	NO	10.13	8.83	1.30
09-17	1630	008-C13	.75	NO	8.83	7.49	1.34
09-17	1730	008-C13	.75	NO	7.49	6.18	1.31
09-17	1830	008-C13	.75	NO	6.18	4.85	1.33
09-17	1930	008-C13	.75	NO	4.85	3.65	1.20
09-17	2030	008-C13	.75	NO	3.65	2.34	1.31
09-17	2130	008-C13	.75	NO	11.51	10.22	1.29
09-17	2230	008-C13	.75	NO	11.87	10.57	1.30
09-17	2330	008-C14	.75	NO	10.57	9.30	1.27
09-18	0030	008-C14	.75	NO	9.30	8.04	1.26
09-18	0130	008-C14	.75	NO	8.04	6.80	1.24
09-18	0230	008-C14	.75	NO	6.80	5.52	1.28
09-18	0330	008-C14	.75	NO	5.52	4.23	1.29
09-18	0430	008-C14	.75	NO	4.27	3.00	1.21
09-18	0530	008-C14	.75	NO	13.17	11.92	1.25
09-18	0630	008-C14	.75	NO	11.92	10.65	1.27
09-18	0730	008-C15	.75	NO	10.65	9.35	1.30
09-18	0830	008-C15	.75	NO	9.35	8.10	1.25
09-18	0930	008-C15	.75	NO	8.10	6.72	1.38
09-18	1030	008-C15	.75	NO	6.72	5.38	1.34
09-18	1130	008-C15	.75	NO	5.38	4.08	1.30
09-18	1230	008-C15	.75	NO	4.08	2.82	1.26
09-18	1330	008-C15	.75	NO	2.82	1.40	1.42
09-18	1430	008-C15	.75	NO	11.42	10.03	1.39
09-18	1530	008-C16	.75	NO	10.03	8.73	1.30
09-18	1630	008-C16	.75	NO	8.73	7.27	1.46
09-18	1730	008-C16	.75	NO	7.25	5.77	1.48
09-18	1830	008-C16	.75	NO	5.77	4.37	1.40
09-18	1930	008-C16	.75	NO	4.37	2.99	1.38
09-18	2030	008-C16	.75	NO	2.99	1.53	1.46
09-18	2130	008-C16	.75	NO	11.66	10.25	1.41
09-18	2230	008-C16	.75	NO	12.05	10.66	1.39
09-18	2330	008-C17	.75	NO	10.66	9.24	1.42
09-19	0030	008-C17	.75	NO	9.24	7.83	1.41
09-19	0130	008-C17	.75	NO	7.82	6.36	1.46
09-19	0230	008-C17	.75	NO	6.36	4.87	1.49
09-19	0330	008-C17	.75	NO	4.87	3.40	1.47
09-19	0430	008-C17	.75	NO	3.39	1.95	1.44
09-19	0530	008-C17	.75	NO	8.30	6.87	1.43
09-19	0630	008-C17	.75	NO	12.86	11.44	1.42
09-19	0730	008-C18	.75	NO	11.44	9.99	1.45
09-19	0830	008-C18	.75	NO	9.99	8.51	1.48
09-19	0930	008-C18	.75	NO	8.51	6.97	1.54
09-19	1030	008-C18	.75	NO	6.97	5.55	1.42
09-19	1130	008-C18	.75	NO	5.55	4.12	1.43
09-19	1230	008-C18	.75	NO	4.12	2.70	1.42
09-19	1330	008-C18	.75	NO	2.70	1.23	1.47
09-19	1430	008-C18	.75	NO	11.62	9.83	1.79
09-19	1530	008-C19	.75	NO	9.83	8.68	1.15
09-19	1630	008-C19	.75	NO	8.68	7.21	1.47
09-19	1730	008-C19	.75	NO	7.21	5.76	1.45

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-19	1830	008-C19	.75	NO	5.76	4.19	1.57
09-19	1930	008-C19	.75	NO	4.19	2.59	1.60
09-19	2030	008-C19	.75	NO	12.47	11.04	1.43
09-19	2130	008-C19	.75	NO	11.04	9.58	1.46
09-19	2230	008-C19	.75	NO	12.21	10.73	1.48
09-19	2330	008-C20	.75	NO	10.73	9.22	1.51
09-20	0030	008-C20	.75	NO	9.21	7.81	1.40
09-20	0130	008-C20	.75	NO	7.81	6.38	1.43
09-20	0230	008-C20	.75	NO	6.38	4.96	1.42
09-20	0330	008-C20	.75	NO	4.96	3.55	1.41
09-20	0430	008-C20	.75	NO	3.53	2.01	1.52
09-20	0530	008-C20	.75	NO	13.41	12.81	.60
09-20	0630	008-C20	.75	NO	12.81	11.54	1.27
09-20	0730	008-C21	.75	NO	11.50	9.84	1.66
09-20	0830	008-C21	.75	NO	9.84	8.02	1.82
09-20	0930	008-C21	.75	NO	8.02	6.08	1.94
09-20	1030	008-C21	.75	NO	6.08	4.14	1.94
09-20	1130	008-C21	.75	NO	4.14	2.13	2.01
09-20	1230	008-C21	.75	NO	7.04	4.97	2.07
09-20	1330	008-C21	.75	NO	4.96	3.00	1.96
09-20	1430	008-C21	.75	NO	11.46	9.32	2.14
09-20	1530	008-C22	.75	NO	9.32	7.16	2.16
09-20	1630	008-C22	.75	NO	7.16	4.76	2.40
09-20	1730	008-C22	.75	NO	4.76	2.04	2.72
09-20	1830	008-C22	.75	NO	8.43	6.66	1.77
09-20	1930	008-C22	.75	NO	12.39	10.79	1.60
09-20	2030	008-C22	.75	NO	10.78	9.40	4.38
09-20	2130	008-C22	.75	NO	9.40	7.60	1.80
09-20	2230	008-C22	.75	NO	12.24	10.22	2.02
09-20	2330	008-C23	.75	NO	10.22	8.11	2.11
09-21	0030	008-C23	.75	NO	8.11	6.23	1.88
09-21	0130	008-C23	.75	NO	6.23	4.23	2.00
09-21	0230	008-C23	.75	NO	4.23	2.13	2.10
09-21	0330	008-C23	.75	NO	7.35	5.23	2.12
09-21	0430	008-C23	.75	NO	5.23	3.09	2.14
09-21	0530	008-C23	.75	NO	11.64	9.52	2.12
09-21	0630	008-C23	.75	NO	12.60	10.60	2.00
09-21	0730	008-C24	.75	NO	10.60	8.57	2.03
09-21	0830	008-C24	.75	NO	8.57	6.37	2.20
09-21	0930	008-C24	.75	NO	6.37	4.01	2.36
09-21	1030	008-C24	.75	NO	4.01	1.67	2.34
09-21	1130	008-C24	.75	NO	5.25	3.11	2.14
09-21	1230	008-C24	.75	NO	3.11	1.06	2.05
09-21	1330	008-C24	.75	NO	12.83	10.46	2.37
09-21	1430	008-C24	.75	NO	12.28	10.39	1.89
09-21	1530	008-C25	.75	NO	10.39	8.19	2.20
09-21	1630	008-C25	.75	NO	8.19	6.09	2.10
09-21	1730	008-C25	.75	NO	6.09	3.95	2.14
09-21	1830	008-C25	.75	NO	3.95	1.74	2.21
09-21	1930	008-C25	.75	NO	12.24	10.06	2.18
09-21	2030	008-C25	.75	NO	10.06	7.88	2.18

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-21	2130	008-C25	.75	NO	7.88	5.72	2.16
09-21	2230	008-C25	.75	NO	12.19	10.00	2.19
09-21	2330	008-C26	.75	NO	10.00	7.86	2.14
09-22	0030	008-C26	.75	NO	7.86	5.76	2.10
09-22	0130	008-C26	.75	NO	5.76	3.49	2.27
09-22	0230	008-C26	.75	NO	3.49	1.23	2.26
09-22	0330	008-C26	.75	NO	7.70	5.87	1.83
09-22	0430	008-C26	.75	NO	5.87	3.84	2.03
09-22	0530	008-C26	.75	NO	10.69	8.56	2.13
09-22	0630	008-C26	.75	NO	13.28	11.28	2.00
09-22	0730	008-C27	.75	NO	11.29	9.25	2.04
09-22	0830	008-C27	.75	NO	9.25	7.29	1.96
09-22	0930	008-C27	.75	NO	7.29	5.19	2.10
09-22	1030	008-C27	.75	NO	5.19	2.99	2.20
09-22	1130	008-C27	.75	NO	6.67	4.65	2.02
09-22	1230	008-C27	.75	NO	8.47	6.43	2.04
09-22	1330	008-C27	.75	NO	6.43	4.30	2.13
09-22	1430	008-C27	.75	NO	10.70	8.63	2.07
09-22	1530	008-C28	.75	MO	10.50	8.53	1.97
09-22	1630	008-C28	.75	NO	8.53	6.48	2.05
09-22	1730	008-C28	.75	NO	6.48	2.43	2.05
09-22	1830	008-C28	.75	NO	4.48	4.48	2.00
09-22	1930	008-C28	.75	NO	10.89	8.89	2.00
09-22	2030	008-C28	.75	NO	12.21	10.19	2.02
09-22	2130	008-C28	.75	NO	10.19	8.15	2.04
09-22	2230	008-C28	.75	NO	12.45	10.45	2.00
09-22	2330	008-C29	.75	NO	10.45	8.42	2.03
09-23	0030	008-C29	.75	NO	8.42	6.42	2.00
09-23	0130	008-C29	.75	NO	6.42	4.37	2.05
09-23	0230	008-C29	.75	NO	4.37	2.34	2.03
09-23	0330	008-C29	.75	NO	6.38	4.36	2.02
09-23	0430	008-C29	.75	NO	6.23	4.22	2.01
09-23	0530	008-C29	.75	NO	9.91	7.89	2.02
09-23	0630	008-C29	.75	NO	13.39	11.08	2.31
09-23	0730	008-C30	.75	NO	11.08	9.29	1.79
09-23	0830	008-C30	.75	NO	9.29	7.52	1.77
09-23	0930	008-C30	.75	NO	7.52	6.44	1.08
09-23	1030	008-C30	.75	NO	6.44	5.38	1.06
09-23	1130	008-C30	.75	NO	5.38	4.36	1.02
09-23	1230	008-C30	.75	NO	4.36	3.25	1.11
09-23	1330	008-C30	.75	NO	3.25	1.59	1.66
09-23	1430	008-C30	.75	NO	10.89	9.23	1.66
09-23	1530	008-C31	.75	NO	11.56	10.02	1.54
09-23	1630	008-C31	.75	NO	10.02	9.46	.56
09-23	1730	008-C31	.75	NO	9.46	8.87	.59
09-23	1830	008-C31	.75	NO	8.87	8.10	.77
09-23	1930	008-C31	.75	NO	8.10	7.42	.68
09-23	2030	008-C31	.75	NO	7.42	5.69	1.73
09-23	2130	008-C31	.75	NO	12.57	11.05	1.52
09-23	2230	008-C31	.75	NO	12.52	10.80	1.72
09-23	2330	008-C32	.75	NO	10.79	9.13	1.66

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-24	0030	008-C32	.75	NO	9.13	7.87	1.26
09-24	0130	008-C32	.75	NO	7.85	6.89	.96
09-24	0230	008-C32	.75	NO	6.88	5.78	1.10
09-24	0330	008-C32	.75	NO	5.78	4.86	.92
09-24	0430	008-C32	.75	NO	4.85	3.85	1.00
09-24	0530	008-C32	.75	NO	12.65	11.71	.94
09-24	0630	008-C32	.75	NO	11.72	10.75	.97
09-24	0730	008-C33	.75	NO	10.75	9.89	.86
09-24	0830	008-C33	.75	NO	9.89	8.76	1.13
09-24	0930	008-C33	.75	NO	8.76	6.95	1.81
09-24	1030	008-C33	.75	NO	6.95	5.01	1.94
09-24	1130	008-C33	.75	NO	5.01	3.09	1.92
09-24	1230	008-C33	.75	NO	3.09	1.24	1.85
09-24	1330	008-C33	.75	NO	9.90	8.02	1.88
09-24	1430	008-C33	.75	NO	8.02	6.17	1.85
09-24	1530	008-C34	.75	NO	6.17	4.29	1.88
09-24	1630	008-C34	.75	NO	4.29	2.55	1.74
09-24	1730	008-C34	.75	NO	2.55	1.61	.94
09-24	1830	008-C34	.75	NO	1.61	.92	.69
09-24	1930	008-C34	.75	NO	.92	.35	.57
09-24	2030	008-C34	.75	NO	.35	.20	.15
09-24	2130	008-C34	.75	NO			
09-24	2230	008-C34	.75	NO			
09-25	0010	008-C35	.25	NO	11.15	7.38	3.77
09-25	0030	008-C35	.25	NO	7.38	6.19	1.19
09-25	0130	008-C35	.25	NO	6.19	5.05	1.19
09-25	0230	008-C35	.25	NO	5.05	3.97	1.08
09-25	0330	008-C35	.25	NO	3.96	3.06	.90
09-25	0430	008-C35	.25	NO	3.06	2.24	.82
09-25	0530	008-C35	.25	NO	7.68	6.75	.93
09-25	0630	008-C35	.25	NO	11.36	10.56	.80
09-25	0730	008-C36	.25	NO	10.55	9.74	.81
09-25	0830	008-C36	.25	NO	9.74	8.80	.94
09-25	0930	008-C36	.25	NO	8.80	7.36	1.17
09-25	1030	008-C36	.25	NO	7.36	6.17	1.19
09-25	1130	008-C36	.25	NO	6.17	4.61	1.56
09-25	1230	008-C36	.25	NO	4.61	3.41	1.20
09-25	1330	008-C36	.25	NO	3.41	2.01	1.40
09-25	1430	008-C36	.25	NO	11.60	10.42	1.18
09-25	1530	008-C37	.25	NO	10.41	9.36	1.05
09-25	1630	008-C37	.25	NO	9.36	8.26	1.10
09-25	1730	008-C37	.25	NO	8.26	7.22	1.04
09-25	1830	008-C37	.25	NO	7.22	6.06	1.16
09-25	1930	008-C37	.25	NO	6.06	4.96	1.10
09-25	2030	008-C37	.25	NO	4.96	3.80	1.16
09-25	2130	008-C37	.25	NO	12.42	11.31	1.11
09-25	2230	008-C37	.25	NO	11.31	10.21	1.10
09-25	2330	008-C38	.25	NO	10.21	9.11	1.10
09-26	0030	008-C38	.25	NO	9.11	7.99	1.12
09-26	0130	008-C38	.25	NO	7.98	6.80	1.18
09-26	0230	008-C38	.25	NO	6.80	5.67	1.13

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-26	0330	008-C38	.25	NO	5.67	4.55	1.12
09-26	0430	008-C38	.25	NO	4.54	3.44	1.10
09-26	0530	008-C38	.25	NO	12.26	11.09	1.17
09-26	0630	008-C38	.25	NO	11.09	10.09	1.00
09-26	0730	008-C39	.25	NO	10.09	8.93	1.16
09-26	0830	008-C39	.25	NO	8.93	7.72	1.21
09-26	0930	008-C39	.25	NO	7.72	6.50	1.22
09-26	1030	008-C39	.25	NO	6.50	5.16	1.34
09-26	1130	008-C39	.25	NO	5.16	3.84	1.32
09-26	1230	008-C39	.25	NO	3.84	2.58	1.26
09-26	1330	008-C39	.25	NO	2.58	1.25	1.33
09-26	1430	008-C39	.25	NO	11.82	10.64	1.18
09-26	1530	008-C40	.25	NO	10.64	9.48	1.16
09-26	1630	008-C40	.25	NO	9.48	8.21	1.27
09-26	1730	008-C40	.25	NO	8.21	6.95	1.26
09-26	1830	008-C40	.25	NO	6.95	5.65	1.30
09-26	1930	008-C40	.25	NO	12.30	10.95	1.35
09-26	2030	008-C40	.25	NO	10.95	9.67	1.28
09-26	2130	008-C40	.25	NO	9.67	8.40	1.27
09-26	2230	008-C40	.25	NO	11.24	9.99	1.25
09-26	2330	008-C41	.25	NO	9.99	8.73	1.26
09-27	0030	008-C41	.25	NO	8.73	7.37	1.36
09-27	0130	008-C41	.25	NO	7.37	6.07	1.30
09-27	0230	008-C41	.25	NO	6.07	5.84	1.22
09-27	0330	008-C41	.25	NO	4.84	3.54	1.30
09-27	0430	008-C41	.25	NO	3.54	2.20	1.34
09-27	0530	008-C41	.25	NO	9.85	8.56	1.29
09-27	0630	008-C41	.25	NO	12.38	11.16	1.22
09-27	0730	008-C42	.25	NO	11.16	10.22	.94
09-27	0745	008-C42	.25	NO	10.22	9.62	.60
09-27	0820	008-C42	.25	NO	9.62	9.58	.04
09-27	0825	008-C42	.25	NO	9.58	9.47	.11
09-27	0835	008-C42	.25	NO	9.47	8.39	1.08
09-27	0930	008-C42	.25	NO	8.39	7.15	1.24
09-27	1030	008-C42	.25	NO	7.15	5.73	1.42
09-27	1130	008-C42	.25	NO	5.70	4.22	1.48
09-27	1230	008-C42	.25	NO	4.22	2.76	1.46
09-27	1330	008-C42	.25	NO	2.70	1.24	1.46
09-27	1430	008-C42	.25	NO	10.08	8.68	1.40
09-27	1530	008-C43	.25	NO	11.13	9.83	1.30
09-27	1630	008-C43	.25	NO	9.83	8.44	1.39
09-27	1730	008-C43	.25	NO	8.44	7.01	1.43
09-27	1830	008-C43	.25	NO	7.01	5.55	1.46
09-27	1930	008-C43	.25	NO	5.55	4.13	1.42
09-27	2030	008-C43	.25	NO	4.13	2.66	1.47
09-27	2130	008-C43	.25	NO	11.79	10.34	1.45
09-27	2230	008-C43	.25	NO	10.34	9.55	.79
09-27	2330	008-C44	.25	NO	9.55	8.75	.80
09-28	0300	008-C44	.25	NO	8.75	8.25	.50
SHUT DOWN			INDUCED DRAFT FAN				

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
09-30	2030	008-C44	.25	NO	7.40	6.13	1.27
09-30	2130	008-C44	.25	NO	12.23	10.81	1.42
09-30	2230	008-C44	.25	NO	12.25	11.06	1.19
09-30	2330	008-C45	.25	NO	11.05	9.81	1.24
10-01	0030	008-C45	.25	NO	9.80	8.37	1.43
10-01	0130	008-C45	.25	NO	8.37	6.76	1.61
10-01	0230	008-C45	.25	NO	6.75	5.25	1.50
10-01	0330	008-C45	.25	NO	5.25	3.63	1.62
10-01	0430	008-C45	.25	NO	3.63	2.00	1.63
10-01	0530	008-C45	.25	NO	9.51	7.89	1.62
10-01	0630	008-C45	.25	NO	11.97	10.30	1.67
10-01	0730	008-C46	.25	NO	10.29	8.51	1.78
10-01	0830	008-C46	.25	NO	8.51	6.84	1.67
10-01	0930	008-C46	.25	NO	6.84	5.10	1.74
10-01	1030	008-C46	.25	NO	5.09	3.37	1.72
10-01	1130	008-C46	.25	NO	3.35	1.66	1.69
10-01	1230	008-C46	.25	NO	5.81	4.12	1.69
10-01	1330	008-C46	.25	NO	11.67	10.01	1.66
10-01	1430	008-C46	.25	NO	11.63	9.94	1.69
10-01	1530	008-C47	.25	NO	9.94	8.27	1.67
10-01	1630	008-C47	.25	NO	8.27	6.98	1.29
10-01	1730	008-C47	.25	NO	6.98	4.91	2.07
10-01	1830	008-C47	.25	NO	4.91	3.31	1.60
10-01	1930	008-C47	.25	NO	8.96	7.32	1.64
10-01	2030	008-C47	.25	NO	12.40	10.72	1.68
10-01	2130	008-C47	.25	NO	10.72	9.06	1.66
10-01	2230	008-C47	.25	NO	12.46	10.73	1.73
10-01	2330	008-C48	.25	NO	10.74	9.05	1.69
10-02	0030	008-C48	.25	NO	9.03	7.32	1.71
10-02	0130	008-C48	.25	NO	7.32	5.66	1.66
10-02	0230	008-C48	.25	NO	5.66	3.88	1.78
10-02	0330	008-C48	.25	NO	3.88	2.27	1.61
10-02	0430	008-C48	.25	NO	2.27	.82	1.45
10-02	0530	008-C48	.25	NO	6.81	5.16	1.65
10-02	0630	008-C48	.25	NO	12.60	11.00	1.60
10-02	0730	008-C49	.25	NO	11.00	9.30	1.70
10-02	0830	008-C49	.25	NO	9.29	7.57	1.72
10-02	0930	008-C49	.25	NO	7.57	5.86	1.71
10-02	1030	008-C49	.25	NO	5.86	4.19	1.67
10-02	1130	008-C49	.25	NO	4.18	2.47	1.71
10-02	1230	008-C49	.25	NO	2.47	0.77	1.70
10-02	1330	008-C49	.25	NO	8.06	6.40	1.66
10-02	1430	008-C49	.25	NO	9.00	7.47	1.53
10-02	1530	008-C50	.25	NO	11.81	10.13	1.68
10-02	1630	008-C50	.25	NO	10.13	8.45	1.68
10-02	1730	008-C50	.25	NO	8.45	6.83	1.62
10-02	1830	008-C50	.25	NO	6.83	5.19	1.64
10-02	1930	008-C50	.25	NO	5.19	3.55	1.64
10-02	2030	008-C50	.25	NO	3.55	1.86	1.69
10-02	2130	008-C50	.25	NO	12.37	10.74	1.63
10-02	2230	008-C50	.25	NO	12.15	10.44	1.71

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
10-02	2330	008-C51	.25	NO	10.44	8.80	1.64
10-03	0030	008-C51	.25	NO	8.80	7.06	1.74
10-03	0130	008-C51	.25	NO	7.06	5.33	1.73
10-03	0230	008-C51	.25	NO	5.33	3.56	1.77
10-03	0330	008-C51	.25	NO	3.56	1.84	1.72
10-03	0430	008-C51	.25	NO	4.84	3.11	1.73
10-03	0530	008-C51	.25	NO	9.56	7.79	1.77
10-03	0630	008-C51	.25	NO	12.67	10.94	1.73
10-03	0730	008-C52	.25	NO	10.92	9.00	1.92
10-03	0830	008-C52	.25	NO	9.00	7.27	1.73
10-03	0930	008-C52	.25	NO	7.27	6.22	1.05
10-03		SHUT DOWN		QUENCH	EXPLOSION		
10-03	1230	008-C52	.25	NO	6.22	6.12	0.10
10-03	1330	008-C52	.25	NO	6.12	4.51	1.61
10-03	1430	008-C52	.25	NO	10.20	8.78	1.42
10-03	1530	008-C53	.25	NO	8.78	7.48	1.30
10-03	1630	008-C53	.25	NO	7.48	6.04	1.44
10-03	1730	008-C53	.25	NO	6.04	5.35	.69
10-03	1830	008-C53	.25	NO	5.35	3.66	1.69
10-03	1930	008-C53	.25	NO	3.66	2.71	.95
10-03	2030	008-C53	.25	NO	2.71	1.71	1.00
10-03	2130	008-C53	.25	NO	1.71	.99	.72
10-03	2230	008-C53	.25	NO	.99	.43	.56
10-03	2330	008-C54	.25	NO	.43	.18	.25
10-04	0030	008-C54	.25	NO		CYCLE VALVES	
10-04	0230	008-C54	R.O.S	NO	12.43	8.57	3.77
10-04	0330	008-C54	R.O.S.	NO	8.57	7.28	1.29
10-04	0430	008-C54	R.O.S.	NO	8.39	7.19	1.20
10-04	0530	008-C54	R.O.S.	NO	12.58	11.42	1.16
10-04	0630	008-C54	R.O.S.	NO	11.42	10.32	1.10
10-04	0730	008-C55	R.O.S.	NO	10.32	9.21	1.11
10-04	0830	008-C55	R.O.S.	NO	9.21	8.38	0.83
10-04	0930	008-C55	R.O.S.	NO	8.38	7.61	0.77
10-04	1030	008-C55	R.O.S.	NO	7.61	6.87	0.74
10-04	1130	008-C55	R.O.S.	NO	6.87	5.94	0.93
10-04	1230	008-C55	R.O.S.	NO	5.94	4.91	1.03
10-04	1330	008-C55	R.O.S.	NO	4.91	3.97	0.94
10-04	1430	008-C55	R.O.S.	NO	8.82	7.89	0.93
10-04	1530	008-C56	R.O.S.	NO	10.37	9.49	0.88
10-04	1630	008-C56	R.O.S.	NO	9.49	8.62	0.87
10-04	1730	008-C56	R.O.S.	NO	8.62	7.52	1.10
10-04	1830	008-C56	R.O.S.	NO	7.52	6.49	1.03
10-04	1930	008-C56	R.O.S.	NO	6.49	5.45	1.04
10-04	2030	008-C56	R.O.S.	NO	5.45	4.33	1.12
10-04	2130	008-C56	R.O.S.	NO	12.63	11.33	1.30
10-04	2230	008-C56	R.O.S.	NO	11.33	10.25	1.08
10-04	2330	008-C57	R.O.S.	NO	10.25	9.31	.94
10-05	0030	008-C57	R.O.S.	NO	9.31	8.43	.88
10-05	0130	008-C57	R.O.S.	NO	8.43	7.35	1.08
10-05	0230	008-C57	R.O.S.	NO	7.35	6.16	1.19
10-05	0330	008-C57	R.O.S.	NO	6.16	5.04	1.12

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
10-05	0430	008-C57	R.O.S.	NO	5.03	3.91	1.12
10-05	0530	008-C57	R.O.S.	NO	7.23	6.10	1.13
10-05	0630	008-C57	R.O.S.	NO	12.56	11.68	0.88
10-05	0730	008-C58	R.O.S.	NO	11.67	10.80	0.87
10-05	0830	008-C58	R.O.S.	NO	10.80	9.91	0.89
10-05	0930	008-C58	R.O.S.	NO	9.91	8.84	1.07
10-05	1030	008-C58	R.O.S.	NO	8.83	7.72	1.11
10-05	1130	008-C58	R.O.S.	NO	7.72	6.43	1.29
10-05	1230	008-C58	R.O.S.	NO	6.43	5.07	1.36
10-05	1330	008-C58	R.O.S.	NO	5.06	3.60	1.46
10-05	1430	008-C58	R.O.S.	NO	11.43	10.17	1.26
10-05	1530	008-C59	R.O.S.	NO	11.37	10.31	1.06
10-05	1630	008-C59	R.O.S.	NO	10.31	9.34	.97
10-05	1730	008-C59	R.O.S.	NO	9.34	8.39	.95
10-05	1830	008-C59	R.O.S.	NO	8.39	7.28	1.11
10-05	1930	008-C59	R.O.S.	NO	7.28	6.12	1.16
10-05	2030	008-C59	R.O.S.	NO	6.12	4.68	1.44
10-05	2130	008-C59	R.O.S.	NO	12.65	11.55	1.10
10-05	2230	008-C59	R.O.S.	NO	11.55	10.53	1.02
10-05	2330	008-C60	R.O.S.	NO	10.53	9.55	.98
10-06	0030	008-C60	R.O.S.	NO	9.55	8.60	.95
10-06	0130	008-C60	R.O.S.	NO	8.60	7.61	.99
10-06	0230	008-C60	R.O.S.	NO	7.59	6.51	1.08
10-06	0330	008-C60	R.O.S.	NO	6.51	5.27	1.24
10-06	0430	008-C60	R.O.S.	NO	5.27	3.94	1.33
10-06	0530	008-C60	R.O.S.	NO	3.94	2.60	1.34
10-06	0630	008-C60	R.O.S.	NO	11.12	9.79	1.33
10-06	0730	008-C61	R.O.S.	NO	10.24	8.84	1.40
10-06	0830	008-C61	R.O.S.	NO	8.84	7.53	1.31
10-06	0930	008-C61	R.O.S.	NO	7.53	6.41	1.12
10-06	1030	008-C61	R.O.S.	NO	6.40	4.64	1.76
10-06	1130	008-C61	R.O.S.	NO	4.63	2.85	1.78
10-06	1230	008-C61	R.O.S.	NO	2.84	1.78	1.06
10-06	1330	008-C61	R.O.S.	NO	10.98	9.15	1.83
10-06	1430	008-C61	R.O.S.	NO	11.78	10.14	1.64
10-06	1530	008-C62	R.O.S.	NO	10.14	8.30	1.84
10-06	1630	008-C62	R.O.S.	NO	8.30	6.74	1.56
10-06	1730	008-C62	R.O.S.	NO	6.74	5.10	1.64
10-06	1830	008-C62	R.O.S.	NO	5.30	3.82	1.48
10-06	1930	008-C62	R.O.S.	NO	12.18	10.63	1.55
10-06	2030	008-C62	R.O.S.	NO	10.63	9.31	1.32
10-06	2130	008-C62	R.O.S.	NO	9.31	7.78	1.53
10-06	2230	008-C62	R.O.S.	NO	11.53	9.90	1.63
10-06	2330	008-C63	R.O.S.	NO	9.90	8.44	1.46
10-07	0030	008-C63	R.O.S.	NO	8.44	7.03	1.41
10-07	0130	008-C63	R.O.S.	NO	7.03	5.49	1.54
10-07	0230	008-C63	R.O.S.	NO	5.49	3.74	1.75
10-07	0330	008-C63	R.O.S.	NO	3.74	2.11	1.63
10-07	0430	008-C63	R.O.S.	NO	2.11	1.23	.88
10-07	0530	008-C63	R.O.S.	NO	10.91	9.38	1.53
10-07	0630	008-C63	R.O.S.	NO	12.32	10.96	1.36

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
10-07	0730	008-C64	R.O.S.	NO	10.95	9.61	1.34
10-07	0830	008-C64	R.O.S.	NO	9.61	8.49	1.12
10-07	0930	008-C64	R.O.S.	NO	8.49	7.29	1.20
10-07	1030	008-C64	R.O.S.	NO	7.29	5.65	1.64
10-07	1130	008-C64	R.O.S.	NO	5.64	4.17	1.47
10-07	1230	008-C64	R.O.S.	NO	4.17	2.82	1.35
10-07	1330	008-C64	R.O.S.	NO	11.13	9.91	1.22
10-07	1430	008-C64	R.O.S.	NO	9.86	8.49	1.37
10-07	1530	008-C65	R.O.S.	NO	11.27	10.15	1.12
10-07	1630	008-C65	R.O.S.	NO	10.15	9.00	1.15
10-07	1730	008-C65	R.O.S.	NO	9.00	7.79	1.21
10-07	1830	008-C65	R.O.S.	NO	7.79	6.54	1.25
10-07	1930	008-C65	R.O.S.	NO	6.54	5.03	1.51
10-07	2030	008-C65	R.O.S.	NO	5.03	3.33	1.70
10-07	2130	008-C65	R.O.S.	NO	12.43	10.66	1.77
10-07	2230	008-C65	R.O.S.	NO	12.05	10.32	1.73
10-07	2330	008-C66	R.O.S.	NO	10.32	8.34	1.98
10-08	0030	008-C66	R.O.S.	NO	8.34	6.37	1.97
10-08	0130	008-C66	R.O.S.	NO	6.37	4.37	2.00
10-08	0230	008-C66	R.O.S.	NO	4.35	2.80	1.55
10-08	0330	008-C66	R.O.S.	NO	4.42	3.25	1.17
10-08	0430	008-C66	R.O.S.	NO	5.92	4.60	1.32
10-08	0530	008-C66	R.O.S.	NO	11.94	10.58	1.36
10-08	0630	008-C66	R.O.S.	NO	12.03	10.56	1.47
10-08	0730	008-C67	R.O.S.	NO	10.56	9.16	1.40
10-08	0830	008-C67	R.O.S.	NO	9.15	7.67	1.48
10-08	0930	008-C67	R.O.S.	NO	7.67	5.86	1.81
10-08	1030	008-C67	R.O.S.	NO	5.86	4.05	1.81
10-08	1130	008-C67	R.O.S.	NO	4.03	2.32	1.71
10-08	1230	008-C67	R.O.S.	NO	2.32	1.47	0.85
10-08	1330	008-C67	R.O.S.	NO	9.25	7.39	1.86
10-08	1430	008-C67	R.O.S.	NO	7.39	6.10	1.29
10-08	1530	008-C68	R.O.S.	NO	10.25	9.15	1.10
10-08	1630	008-C68	R.O.S.	NO	9.15	7.73	1.42
10-08	1730	008-C68	R.O.S.	NO	7.73	6.30	1.43
10-08	1830	008-C68	R.O.S.	NO	6.30	4.37	1.93
10-08	1930	008-C68	R.O.S.	NO	10.13	8.32	1.81
10-08	2030	008-C68	R.O.S.	NO	12.04	10.24	1.80
10-08	2130	008-C68	R.O.S.	NO	10.24	8.45	1.79
10-08	2230	008-C68	R.O.S.	NO	12.04	9.96	2.08
10-08	2330	008-C69	R.O.S.	NO	10.72	8.77	1.95
10-09	0030	008-C69	R.O.S.	NO	8.77	6.53	2.24
10-09	0130	008-C69	R.O.S.	NO	6.53	4.53	2.00
10-09	0230	008-C69	R.O.S.	NO	4.53	2.74	1.75
10-09	0330	008-C69	R.O.S.	NO	7.45	5.77	1.68
10-09	0430	008-C69	R.O.S.	NO	6.23	4.97	1.26
10-09	0530	008-C69	R.O.S.	NO	9.29	8.00	1.29
10-09	0630	008-C69	R.O.S.	NO	12.96	11.52	1.44
10-09	0730	008-C70	R.O.S.	NO	11.50	9.91	1.59
10-09	0830	008-C70	R.O.S.	NO	9.91	8.31	1.60
10-09	0930	008-C70	R.O.S.	NO	8.29	6.63	1.66

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
10-09	1030	008-C70	R.O.S.	NO	6.63	4.90	1.73
10-09	1130	008-C70	R.O.S.	NO	4.88	3.18	1.70
10-09	1230	008-C70	R.O.S.	NO	5.23	3.68	1.55
10-09	1330	008-C70	R.O.S.	NO	4.53	3.02	1.51
10-09	1430	008-C70	R.O.S.	NO	8.97	7.06	1.91
10-09	1530	008-C71	R.O.S.	NO	9.64	8.00	1.64
10-09	1630	008-C71	R.O.S.	NO	8.00	5.95	2.05
10-09	1730	008-C71	R.O.S.	NO	5.95	3.94	2.01
10-09	1830	008-C71	R.O.S.	NO	3.94	2.10	1.84
10-09	1930	008-C71	R.O.S.	NO	5.44	3.87	1.57
10-09	2030	008-C71	R.O.S.	NO	12.81	11.00	1.81
10-09	2130	008-C71	R.O.S.	NO	11.12	9.31	1.81
10-09	2230	008-C71	R.O.S.	NO	12.61	10.70	1.91
10-09	2330	008-C72	R.O.S.	NO	10.70	8.58	2.12
10-10	0030	008-C72	R.O.S.	NO	8.57	6.89	1.68
10-10	0130	008-C72	R.O.S.	NO	6.88	5.63	1.25
10-10	0230	008-C72	R.O.S.	NO	5.62	4.17	1.45
10-10	0330	008-C72	R.O.S.	NO	4.17	2.60	1.57
10-10	0430	008-C72	R.O.S.	NO	2.60	1.21	1.39
10-10	0530	008-C72	R.O.S.	NO	7.62	6.00	1.62
10-10	0630	008-C72	R.O.S.	NO	11.84	10.50	1.34
10-10	0730	008-C73	R.O.S.	NO	10.51	9.40	1.11
10-10	0830	008-C73	R.O.S.	NO	9.40	8.12	1.28
10-10	0930	008-C73	R.O.S.	NO	8.25	6.79	1.46
10-10	1030	008-C73	R.O.S.	NO	8.08	6.46	1.62
10-10	1130	008-C73	R.O.S.	NO	6.45	4.95	1.50
10-10	1230	008-C73	R.O.S.	NO	4.94	3.51	1.43
10-10	1330	008-C73	R.O.S.	NO	3.49	2.04	1.45
10-10	1430	008-C73	R.O.S.	NO	2.04	0.94	1.10
10-10	1530	008-C74	R.O.S.	NO	0.94	.15	.79
10-10	1630	008-C74	.25	NO	CYCLE VALVES		
10-10	1810	008-C74	.25	NO	12.23	7.85	4.38
10-10	1830	008-C74	.25	NO	7.85	7.49	.36
10-10	1930	008-C74	.25	NO	7.49	6.38	1.11
10-10	2030	008-C74	.25	NO	6.38	5.44	.94
10-10	2130	008-C74	.25	NO	12.53	11.33	1.20
10-10	2230	008-C74	.25	NO	11.33	10.05	1.28
10-10	2330	008-C75	.25	NO	10.05	8.73	1.32
10-11	0030	008-C75	.25	NO	8.73	7.44	1.29
10-11	0130	008-C75	.25	NO	7.44	5.95	1.49
10-11	0230	008-C75	.25	NO	5.93	4.20	1.73
10-11	0330	008-C75	.25	NO	4.19	2.74	1.45
10-11	0430	008-C75	.25	NO	4.67	2.97	1.70
10-11	0530	008-C75	.25	NO	8.34	7.02	1.32
10-11	0630	008-C75	.25	NO	12.15	10.57	1.58
10-11	0730	008-C76	.25	NO	10.58	8.93	1.65
10-11	0830	008-C76	.25	NO	8.93	7.12	1.81
10-11	0930	008-C76	.25	NO	7.11	5.11	2.00
10-11	1030	008-C76	.25	NO	5.11	3.13	1.98
10-11	1130	008-C76	.25	NO	3.12	1.34	1.78
10-11	1230	008-C76	.25	NO	5.77	4.03	1.74

DATE	TIME	SAMPLE NUMBER	SCREEN IN	WASH?	START WT.	STOP WT.	NET WT.
10-11	1330	008-C76	.25	NO	10.56	8.83	1.73
10-11	1430	008-C76	.25	NO	11.30	9.53	1.77
10-11	1530	008-C77	.25	NO	9.53	7.76	1.77
10-11	1630	008-C77	.25	NO	7.76	6.04	1.72
10-11	1730	008-C77	.25	NO	6.04	4.23	1.81
10-11	1830	008-C77	.25	NO	9.71	8.07	1.64
10-11	1930	008-C77	.25	NO	12.18	10.44	1.74
10-11	2030	008-C77	.25	NO	10.44	8.65	1.79
10-11	2130	008-C77	.25	NO	8.65	6.93	1.72
10-11	2230	008-C77	.25	NO	12.17	10.46	1.71
10-11	2330	008-C78	.25	NO	10.46	8.99	1.47
10-12	0030	008-C78	.25	NO	8.98	7.43	1.55
10-12	0130	008-C78	.25	NO	7.41	5.81	1.60
10-12	0230	008-C78	.25	NO	5.80	4.10	1.70
10-12	0330	008-C78	.25	NO	4.10	2.44	1.66
10-12	0430	008-C78	.25	NO	5.24	3.70	1.54
10-12	0530	008-C78	.25	NO	12.06	10.78	1.28
10-12	0630	008-C78	.25	NO	12.12	10.48	1.64
10-12	0730	008-C79	.25	NO	10.46	8.81	1.65
10-12	0830	008-C79	.25	NO	8.81	7.18	1.63
10-12	0930	008-C79	.25	NO	7.18	5.67	1.51
10-12	1030	008-C79	.25	NO	5.67	3.87	1.80
10-12	1130	008-C79	.25	NO	3.87	2.13	1.74
10-12	1230	008-C79	.25	NO	7.35	5.56	1.79
10-12	1330	008-C79	.25	NO	11.25	9.48	1.77
10-12	1430	008-C79	.25	NO	11.98	10.21	1.77
10-12	1530	008-C80	.25	NO	10.21	8.47	1.74
10-12	1630	008-C80	.25	NO	8.47	7.70	.77
10-12	1730	008-C80	.25	NO	7.70	4.86	2.84
10-12	1830	008-C80	.25	NO	4.86	3.00	1.86
10-12	1930	008-C80	.25	NO	12.23	10.57	1.66
10-12	2030	008-C80	.25	NO	10.57	8.82	1.75
10-12	2130	008-C80	.25	NO	8.82	6.98	1.84
10-12	2230	008-C80	.25	NO	12.18	10.22	1.96
10-12	2330	008-C81	.25	NO	10.22	8.40	1.82
10-13	0030	008-C81	.25	NO	8.40	6.58	1.82
10-13	0130	008-C81	.25	NO	6.58	4.72	1.86
10-13	0230	008-C81	.25	NO	4.72	2.88	1.84
10-13	0330	008-C81	.25	NO	4.91	3.24	1.67
10-13	0430	008-C81	.25	NO	3.24	1.41	1.83
10-13	0530	008-C81	.25	NO	9.27	7.41	1.86
10-13	0630	008-C81	.25	NO	13.03	11.19	1.84
10-13	0730	008-C82	.25	NO	SHUT DOWN		

END OF BOM/FGT 008 ELKHORN BITUMINOUS

APPENDIX F
Ash Analysis Data

ASH ANALYSIS FOR BOM/FGT-008

Sample Number	Date	Time	Cumulative Mass Fraction, % less than stated size, inch					Bulk Density gm/cc	Moisture content %	Carbon content %	Sulfur content %
			1/4	1/2	3/4	1	2				
1	9/13/84	0:00	11.4	30.7	49.2	64.6	82.7	—	15	17.8	0.56
2	9/14/84	1:00	20.9	47.1	63.9	72.2	92.9	—	23	21.3	1.30
3	9/14/84	5:00	20.7	50.4	69.9	78.5	93.1	—	17	20.2	0.41
4	9/14/84	9:00	23.4	47.5	62.6	79.1	100.0	0.49	16	25.1	0.28
5	9/14/84	11:05	5.0	12.8	22.6	35.7	54.6	0.48	8	27.6	0.20
6	9/14/84	14:30	12.8	29.7	42.2	52.4	95.2	0.45	8	32.4	0.21
7	9/14/84	19:00	18.8	32.4	49.4	67.1	92.3	0.42	12	30.2	0.24
8	9/15/84	1:00	26.9	48.7	65.9	75.6	99.4	0.48	23	24.7	0.18
9	9/15/84	5:00	18.6	42.8	60.8	70.4	100.0	0.47	27	26.1	0.16
10	9/15/84	9:00	18.0	35.8	52.3	69.5	92.8	0.52	8	22.3	0.16
11	9/15/84	11:00	24.9	39.8	54.5	70.2	99.6	0.50	16	34.1	0.19
12	9/15/84	14:30	30.1	51.4	64.3	73.2	89.7	0.44	13	17.5	0.13
13	9/15/84	19:00	36.6	52.5	62.6	69.3	95.3	0.48	26	18.9	0.16
14	9/15/84	22:10	26.7	46.5	61.2	72.1	100.0	0.50	13	20.0	0.15
15	9/16/84	1:00	31.2	48.7	63.6	78.5	100.0	0.51	23	29.2	0.07
16	9/16/84	5:00	23.6	44.3	61.0	72.9	93.9	0.46	24	23.1	0.07
17	9/16/84	9:00	28.1	49.2	64.1	73.7	96.1	0.48	10	25.6	0.07
18	9/16/84	13:00	15.0	32.1	48.2	59.9	100.0	0.53	10	30.3	0.11
19	9/16/84	16:35	19.2	46.8	63.8	74.5	100.0	0.49	23	29.0	0.12
20	9/16/84	20:29	11.1	24.8	44.0	65.2	100.0	0.46	34	27.0	0.12
21	9/16/84	22:29	38.4	67.2	81.4	91.6	100.0	0.48	17	29.0	0.10
22	9/17/84	1:00	28.0	56.9	73.0	84.1	100.0	0.47	23	23.5	0.11
23	9/17/84	5:00	24.0	49.7	63.4	75.9	100.0	0.48	31	29.3	0.11
24	9/17/84	9:00	20.0	40.3	55.6	67.8	93.8	0.50	15	26.8	0.11
25	9/17/84	12:00	21.6	49.8	67.9	87.3	100.0	0.47	37	27.9	0.17
26	9/17/84	15:35	17.9	48.9	67.7	77.7	100.0	0.41	32	28.3	0.20
27	9/17/84	18:05	19.9	42.4	55.6	67.5	100.0	0.53	7	26.4	0.13
28	9/17/84	20:35	24.7	53.7	76.2	87.2	100.0	0.36	13	0.0	0.00
29	9/18/84	1:00	35.8	60.3	72.8	82.0	100.0	0.49	38	26.4	0.10
30	9/18/84	3:00	25.6	51.5	65.3	76.5	100.0	0.48	33	26.4	0.10
31	9/18/84	5:00	39.9	62.6	71.9	81.1	94.3	0.53	35	24.6	0.08
32	9/18/84	9:00	23.6	36.2	45.5	52.9	88.1	0.47	11	13.0	0.04
33	9/18/84	11:00	31.5	49.9	58.5	64.2	86.8	0.53	19	22.1	0.06
34	9/18/84	15:00	15.2	35.8	48.2	60.5	88.5	0.42	8	21.4	0.06
35	9/18/84	19:00	29.0	44.3	55.0	64.8	89.8	0.50	8	26.6	0.09
36	9/18/84	22:10	11.9	26.5	40.0	48.6	80.7	0.43	3	24.6	0.09
37	9/19/84	1:00	22.4	46.3	62.8	73.6	96.3	0.40	32	26.3	0.09
38	9/19/84	3:00	23.8	46.4	60.1	74.1	100.0	0.48	13	23.1	0.07
39	9/19/84	5:00	34.3	57.6	70.4	80.1	96.6	0.47	21	26.8	0.08
40	9/19/84	7:00	18.8	40.3	54.0	61.4	97.4	0.48	28	23.9	0.07
41	9/19/84	9:00	27.8	48.9	59.8	68.2	85.9	0.48	8	23.8	0.07
42	9/19/84	11:00	32.5	50.8	60.9	65.7	88.3	0.42	8	24.3	0.07
43	9/19/84	13:00	42.8	62.7	68.2	72.6	88.8	0.48	13	16.1	0.09
44	9/19/84	14:30	14.2	31.7	43.2	51.4	96.5	0.50	15	25.8	0.07
45	9/19/84	19:09	20.2	30.9	35.2	45.9	93.3	0.50	—	9.1	0.12
46	9/19/84	22:10	10.0	23.1	37.8	56.3	92.9	0.44	4	21.7	0.17
47	9/20/84	1:00	31.6	51.1	63.0	73.4	100.0	0.48	32	25.6	0.17

Sample Number	Date	Time	Cumulative Mass Fraction, % less than stated size, inch					Bulk Density gm/cc	Moisture content %	Carbon content %	Sulfur content %
			1/4	1/2	3/4	1	2				
48	9/20/84	3:00	23.0	40.1	54.2	68.2	99.5	0.47	11	24.1	0.18
49	9/20/84	5:00	25.7	46.0	58.3	67.6	87.8	0.46	—	36.6	0.72
50	9/20/84	7:15	20.8	38.0	46.8	53.4	73.7	0.52	—	16.8	0.17
51	9/20/84	9:00	16.6	32.7	46.1	52.9	82.5	0.48	—	29.3	0.18
52	9/20/84	11:00	9.3	18.2	24.4	28.0	55.2	0.51	3	10.6	0.11
53	9/20/84	13:00	18.8	32.2	39.5	45.7	75.0	0.47	9	24.4	0.17
54	9/20/84	15:00									
55	9/20/84	18:29	18.7	32.4	42.8	51.4	90.1	0.53	28	22.5	0.16
56	9/20/84	20:04									
57	9/21/84	1:00	28.7	54.3	65.4	73.3	100.0	0.51	34	22.8	0.16
58	9/21/84	3:00									
59	9/21/84	5:40	19.2	39.9	50.4	60.0	95.6	0.49	22	28.5	0.22
60	9/21/84	7:30									
61	9/21/84	9:00	11.4	19.3	27.1	36.7	77.1	0.51	17	33.9	0.24
62	9/21/84	11:00									
63	9/21/84	13:00	10.0	29.1	45.5	58.2	100.0	0.53	11	40.3	0.32
64	9/21/84	15:00									
65	9/21/84	17:45	35.7	62.7	71.1	78.6	100.0	0.50	30	21.5	0.16
66	9/21/84	21:50									
67	9/21/84	23:00	21.0	55.6	77.9	83.2	100.0	0.51	37	46.7	0.41
68	9/22/84	1:00									
69	9/22/84	3:00	21.3	45.8	58.8	65.4	96.1	0.53	27	24.9	0.18
70	9/22/84	5:00									
71	9/22/84	7:30	26.5	52.3	65.6	74.9	95.1	0.50	25	19.6	1.20
72	9/22/84	9:10									
73	9/22/84	11:00	25.9	54.3	65.8	70.9	93.7	0.51	21	24.2	0.20
74	9/22/84	13:00									
75	9/22/84	15:00	20.2	47.1	59.2	66.4	82.9	0.48	31	35.5	0.23
76	9/22/84	18:10									
77	9/22/84	22:03	18.3	41.4	53.8	62.4	90.6	0.45	28	16.2	0.15
78	9/23/84	1:00									
79	9/23/84	2:00	28.4	60.5	73.9	81.1	99.5	0.43	25	12.3	0.17
80	9/23/84	3:00									
81	9/23/84	7:00	17.7	49.9	64.0	70.0	86.6	0.49	34	29.8	0.00
82	9/23/84	9:00									

Sample Number	Date	Time	Cumulative Mass Fraction, % less than stated size, inch					Bulk Density gm/cc	Moisture content %	Carbon content %	Sulfur content %
			1/4	1/2	3/4	1	2				
83	9/23/84	11:00	19.7	33.9	45.0	53.3	90.1	0.51	29	10.7	0.16
84	9/23/84	13:00									
85	9/23/84	16:00	36.4	57.0	66.5	73.8	95.3	0.51	25	13.4	0.16
86	9/23/84	19:20									
87	9/23/84	22:20	23.5	48.0	59.6	67.4	92.0	0.48	34	34.8	0.20
88	9/24/84	1:00									
89	9/24/84	3:00	20.9	51.9	68.6	78.7	100.0	0.47	36	24.0	0.28
90	9/24/84	5:00									
91	9/24/84	7:00	24.3	46.8	59.0	71.0	92.7	0.42	38	27.1	0.20
92	9/24/84	9:00									
93	9/24/84	11:00	21.3	46.0	57.0	62.0	85.7	0.50	3	34.1	0.20
94	9/24/84	13:05									
95	9/24/84	16:00	36.2	64.0	74.3	83.9	96.0	0.45	11	21.6	0.15
96	9/24/84	21:07	20.5	40.0	54.4	64.5	87.3	0.43	10	10.2	0.01
97	9/25/84	1:00	20.0	37.9	49.1	56.7	88.7	0.39	18	15.5	0.12
98	9/25/84	5:00	10.4	28.8	46.0	61.9	100.0	0.49	68	29.6	0.22
99	9/25/84	9:00	12.9	31.9	49.8	65.8	90.7	0.48	11	31.3	0.27
100	9/25/84	11:00	20.3	42.8	61.5	76.1	100.0	0.46	16	32.1	0.21
101	9/25/84	13:00	19.2	25.7	39.3	53.3	100.0	0.44	6	24.5	0.22
102	9/25/84	15:00	36.8	60.5	75.9	84.8	100.0	0.44	25	23.0	0.16
103	9/25/84	21:00	37.9	62.5	74.6	81.7	100.0	0.47	25	24.4	0.21
104	9/26/84	1:00	31.7	51.4	60.6	66.7	89.6	0.48	32	23.8	0.14
105	9/26/84	3:00									
106	9/26/84	5:00	23.1	48.4	60.9	70.5	91.0	0.46	42	21.4	0.16
107	9/26/84	9:00	14.9	26.5	40.9	38.6	62.6	0.47	7	14.5	0.00
108	9/26/84	11:00	24.3	50.2	61.0	68.5	89.9	0.55	13	18.1	0.13
109	9/26/84	13:00									
110	9/26/84	14:50	35.8	46.5	54.8	61.9	87.9	0.67	16	15.6	0.10
111	9/26/84	19:50	12.1	25.3	38.3	49.8	100.0	0.52	7	17.2	0.11
112	9/26/84	22:10	24.4	53.8	65.3	76.9	98.5	0.47	22	23.4	0.14
113	9/27/84	1:00									
114	9/27/84	5:00	27.2	46.7	58.1	65.4	95.7	0.54	23	15.4	0.10
115	9/27/84	9:00	26.0	44.5	52.7	59.6	83.9	0.52	12	24.4	0.14
116	9/27/84	11:00									
117	9/27/84	13:00	31.1	54.4	63.5	70.1	93.4	0.52	13	13.8	0.12
118	9/27/84	15:00									
119	9/27/84	19:00	8.9	21.5	36.1	47.1	82.4	0.48	5	11.2	0.09
120	9/27/84	22:00	15.5	42.4	58.3	68.4	95.6	0.46	14	21.9	0.16
121	9/30/84	16:00	19.3	45.5	61.4	73.6	93.9	0.49	30	16.2	0.15

Sample Number	Date	Time	Cumulative Mass Fraction, % less than stated size, inch					Bulk Density gm/cc	Moisture content %	Carbon content %	Sulfur content %
			1/4	1/2	3/4	1	2				
122	10/ 1/84	1:00	16.2	32.2	48.5	61.7	92.4	0.46	28	25.2	0.18
123	10/ 1/84	3:00	25.8	56.8	75.3	85.0	100.0	0.50	40	26.3	0.24
124	10/ 1/84	5:00	16.2	33.4	48.1	59.5	90.7	0.52	26	25.0	0.14
125	10/ 1/84	7:00	22.0	45.5	60.6	71.1	96.0	0.48	26	17.8	0.11
126	10/ 1/84	9:00	20.1	50.8	62.4	69.0	86.5	0.56	16	22.2	0.17
127	10/ 1/84	11:00									
128	10/ 1/84	13:30	32.8	61.7	72.8	78.7	100.0	0.46	27	34.3	0.22
129	10/ 1/84	16:04									
130	10/ 1/84	20:29	33.1	74.7	83.4	88.3	97.2	0.56	21	33.6	0.65
131	10/ 1/84	22:00									
132	10/ 2/84	1:00	45.9	80.5	91.9	94.8	100.0	0.51	20	35.5	0.23
133	10/ 2/84	3:00	21.2	64.3	79.6	85.0	100.0	0.53	24	39.4	0.26
134	10/ 2/84	5:00									
135	10/ 2/84	7:00	37.8	77.8	86.0	89.8	100.0	0.54	24	32.0	0.23
136	10/ 2/84	8:00									
137	10/ 2/84	9:00	34.4	77.1	86.4	90.0	100.0	0.50	19	47.2	0.29
138	10/ 2/84	12:00									
139	10/ 2/84	14:35	18.9	53.6	64.0	68.3	88.4	—	38	43.8	0.26
140	10/ 2/84	19:00	21.2	57.2	71.4	77.8	96.8	0.48	11	36.5	0.22
141	10/ 2/84	20:00									
142	10/ 3/84	1:00	25.2	69.1	81.1	86.4	100.0	0.51	27	45.2	0.26
143	10/ 3/84	3:00									
144	10/ 3/84	5:00	18.3	53.4	70.5	80.1	99.0	0.50	30	39.7	0.46
145	10/ 3/84	7:00									
146	10/ 3/84	13:14	13.2	29.6	40.7	47.2	78.4	0.48	14	27.8	0.21
147	10/ 3/84	20:15									
148	10/ 4/84	3:00	31.9	59.8	74.0	84.6	100.0	0.50	32	18.3	0.15
149	10/ 4/84	7:00	18.1	35.7	47.3	55.4	94.8	0.57	28	21.7	0.16
150	10/ 4/84	9:39	25.5	50.4	65.4	75.6	100.0	0.52	38	24.9	0.19
151	10/ 4/84	11:00									
153	10/ 4/84	21:00	10.8	27.2	42.5	57.8	89.8	0.48	9	42.0	0.28
154	10/ 5/84	1:00	22.4	44.5	59.8	70.5	97.2	0.52	24	27.1	0.19
155	10/ 5/84	3:00									
156	10/ 5/84	9:00	26.0	40.0	51.6	62.3	95.0	0.56	16	16.6	0.15
157	10/ 5/84	13:00	9.0	24.2	38.1	54.1	77.9	0.53	6	29.3	0.19
158	10/ 5/84	20:29	22.8	43.5	53.1	59.6	74.8	0.55	22	17.3	0.13
159	10/ 6/84	1:00	47.4	67.6	76.9	84.8	95.4	0.52	30	12.1	0.14
160	10/ 6/84	5:00	32.7	59.5	75.8	88.7	100.0	0.54	33	18.4	0.18

Sample Number	Date	Time	Cumulative Mass Fraction, % less than stated size, inch					Bulk Density gm/cc	Moisture content %	Carbon content %	Sulfur content %
			1/4	1/2	3/4	1	2				
161	10/ 6/84	7:00	30.2	48.5	56.9	61.8	77.6	0.64	18	16.3	0.12
162	10/ 6/84	9:00									
163	10/ 6/84	13:00	54.6	77.3	81.8	84.8	89.7	0.56	16	14.5	0.11
164	10/ 6/84	15:00	30.0	57.1	67.7	75.4	93.8	0.55	10	26.3	0.17
165	10/ 6/84	17:00									
166	10/ 6/84	20:00	19.3	32.8	42.6	49.9	81.8	0.58	10	15.3	0.12
167	10/ 6/84	22:14									
168	10/ 7/84	1:00	49.9	66.8	77.6	85.2	100.0	0.57	29	15.6	0.12
169	10/ 7/84	3:00	18.5	38.2	48.9	57.9	88.1	0.43	27	16.9	0.15
170	10/ 7/84	5:00	21.0	44.3	58.5	69.8	94.9	0.58	24	19.0	0.14
171	10/ 7/84	7:00									
172	10/ 7/84	9:00	6.3	22.3	39.0	54.6	92.9	0.42	34	51.7	0.37
173	10/ 7/84	11:39	78.0	88.2	92.1	95.5	100.0	—	62	16.0	0.16
174	10/ 7/84	14:00	33.9	64.8	79.1	86.4	94.1	0.51	26	34.2	0.24
175	10/ 7/84	20:29	33.1	65.3	74.8	79.9	91.7	0.54	19	31.4	0.22
176	10/ 7/84	21:29									
177	10/ 8/84	1:00	21.1	49.1	68.9	80.6	100.0	0.49	26	21.1	0.16
178	10/ 8/84	4:00									
179	10/ 8/84	5:00	27.0	62.6	78.1	86.7	100.0	0.53	28	24.3	0.20
180	10/ 8/84	7:00									
181	10/ 8/84	8:44	13.2	33.0	54.4	72.3	92.7	0.45	20	39.1	0.25
182	10/ 8/84	13:00									
183	10/ 8/84	15:00	15.0	27.5	39.8	50.7	100.0	0.59	22	50.5	0.30
184	10/ 8/84	19:00	5.4	14.2	27.5	43.4	94.0	0.58	13	29.6	0.22
185	10/ 8/84	22:00	13.3	35.2	44.4	51.0	70.2	0.64	11	19.6	0.15
186	10/ 9/84	1:00	24.8	50.4	61.8	74.1	97.2	0.44	27	20.2	0.23
187	10/ 9/84	3:00									
188	10/ 9/84	5:00	19.8	45.3	62.2	74.5	96.1	0.52	33	31.2	0.21
189	10/ 9/84	7:00									
190	10/ 9/84	12:00	18.8	38.0	54.6	69.9	93.8	0.59	39	25.7	0.19
191	10/ 9/84	14:10	14.8	28.2	39.9	50.1	82.3	0.51	27	32.2	0.21
192	10/ 9/84	17:00	31.0	57.4	66.7	74.2	92.9	0.56	21	18.1	0.13
194	10/ 9/84	20:29	23.0	48.7	62.6	71.6	92.7	0.58	22	29.9	0.17
195	10/ 9/84	22:00									
196	10/10/84	1:00	28.6	51.9	64.7	73.3	95.9	0.50	27	23.5	0.16
197	10/10/84	5:00	61.1	77.5	84.4	88.0	96.9	0.53	28	11.8	0.10
198	10/10/84	9:00	27.0	45.2	57.1	64.8	82.8	0.62	17	21.8	0.16
199	10/10/84	13:00	31.4	47.3	58.4	65.7	85.0	0.54	20	25.0	0.17
200	10/10/84	16:00	42.9	64.4	75.2	82.5	100.0	0.62	18	27.3	0.16

Sample Number	Date	Time	Cumulative Mass Fraction, % less than stated size, inch					Bulk Density gm/cc	Moisture content %	Carbon content %	Sulfur content %
			1/4	1/2	3/4	1	2				
201	10/10/84	21:00	24.4	53.5	65.5	87.9	100.0	0.57	13	25.5	0.17
202	10/11/84	1:00	25.1	52.1	70.1	78.9	93.5	0.49	29	27.7	0.21
203	10/11/84	5:00	23.4	43.8	64.6	80.5	100.0	0.49	23	47.8	0.31
204	10/11/84	7:00	35.9	67.7	76.5	82.2	100.0	0.49	20	23.5	0.16
205	10/11/84	9:00									
206	10/11/84	11:30	10.6	24.1	37.1	46.9	90.3	0.53	10	37.4	0.22
207	10/11/84	13:00	18.2	40.9	55.5	64.7	89.9	0.49	23	30.4	0.18
208	10/11/84	15:00									
209	10/11/84	17:00	20.6	44.8	58.0	69.4	96.4	0.45	20	27.2	0.18
210	10/11/84	19:00									
211	10/11/84	21:45	31.9	56.1	65.6	72.6	95.1	0.47	18	18.7	0.14
212	10/12/84	1:00									
213	10/12/84	3:00	27.6	54.9	64.9	72.1	94.9	0.46	30	20.5	0.14
214	10/12/84	5:00									
215	10/12/84	9:00	21.3	46.2	55.8	61.5	92.2	0.51	21	26.5	0.16
216	10/12/84	11:00									
217	10/12/84	13:00	23.8	54.8	68.8	76.4	97.4	0.52	19	29.1	0.18
218	10/12/84	15:00									
219	10/12/84	17:29	25.3	44.5	55.4	65.3	90.4	0.48	18	21.3	0.13
220	10/12/84	19:29									
221	10/12/84	22:00	34.1	64.6	76.1	80.0	100.0	—	28	19.4	0.14
222	10/13/84	1:00									
223	10/13/84	5:00	36.9	76.0	86.6	91.6	97.1	—	35	19.6	0.15
224	10/13/84	7:00									
<hr/>											
Averages											
Samples 5- 99			22.9	43.8	56.9	67.0	92.8	0.48	21	24.8	0.17
100-147											
+ 189-224			26.1	51.0	63.4	71.8	93.8	0.51	22	26.0	0.19
148-188			26.2	47.4	60.0	69.9	92.4	0.53	24	24.8	0.19
<hr/>											
Grand Average			24.6	47.0	59.8	69.2	93.1	0.50	22	25.3	0.18
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APPENDIX G

Ash Removal Log

Ash weights are given in pounds.

Flush water is given in gallons.

BOM/FGT 008 ELKHORN BITUMINOUS GASIFIER ASH

DATE	TIME	SAMPLE NUMBER	INITIAL DRY	FINAL DRY	NET DRY	INITIAL WET	FINAL WET	NET WET	NET DRY +NET WET	FLUSH WATER
09-13	2207	A-1	440	28	412	330	29	301	713	30U
09-14	0100	A-2	636	31	605	475	31	444	1049	30U
09-14	0500	A-3	768	31	737	485	31	454	1191	30L
09-14	0900	A-4	815	39	776	459	33	426	1202	30L
09-14	1100	A-5	549	38	511	446	34	412	923	30U
09-14	1430	A-6	657	39	618	360	31	329	947	30L
09-14	1900	A-7	651	37	614	383	35	348	962	30U
09-15	0100	A-8	726	36	690	445	31	414	1104	30U
09-15	0500	A-9	585	42	543	480	29	451	994	30L
09-15	0901	A-10	689	43	646	342	29	313	959	30L
09-15	1100	A-11	528	36	492	389	32	357	849	30U
09-15	1430	A-12	715	40	675	362	29	333	1008	30L
09-15	1900	A-13	847	39	808	482	33	449	1257	30U
09-15	2210	A-14	540	38	502	359	30	329	831	30L
09-16	0100	A-15	546	43	503	509	35	474	97	30U
09-16	0500	A-16	632	39	593	337	29	308	901	30L
09-16	0900	A-17	741	42	699	306	28	278	977	30L
09-16	1300	A-18	855	37	818	352	35	317	1135	30U
09-16	1700	A-19	781	38	743	482	33	449	1192	30U
09-16	2030	A-20	1492	37	1455	420	29	391	1846	30L
09-16	2230	A-21	501	36	465	350	30	320	785	30L
09-17	0100	A-22	588	45	543	361	32	329	872	30U
09-17	0500	A-23	837	51	786	608	32	576	1362	30L
09-17	0900	A-24	963	46	917	435	33	402	1319	30U
09-17	1200	A-25	2000	39	1961	442	40	402	2363	30U&L
09-17	1430	A-26	1346	41	1305	401	37	364	1669	30L
09-17	1830	A-27	865	37	828	450	35	415	1243	30U
09-17	2035	A-28	767	54	713	367	33	334	1047	30L
09-18	0100	A-29	1229	37	1192	820	33	787	1979	30U
09-18	0300	A-30	60	53	607	760	32	728	1335	30L
09-18	0500	A-31	535	41	494	425	32	393	887	30U
09-18	0900	A-32	1075	40	1035	346	29	317	1352	30L
09-18	1100	A-33	596	39	557	515	36	479	1036	30U
09-18	1500	A-34	741	58	683	356	28	328	1011	30L
09-18	1900	A-35	1068	32	1036	278	30	248	1284	30U
09-18	2210	A-36	870	44	826	293	27	266	1092	30L
09-19	0100	A-37	804	42	762	220	27	193	955	30U
09-19	0300	A-38	575	31	544	276	26	250	794	30L
09-19	0500	A-39	696	37	659	280	26	254	913	30U
09-19	0700	A-40	511	37	474	304	26	278	752	30L
09-19	0900	A-41	608	36	572	216	28	188	760	30U
09-19	1100	A-42	621	35	586	281	27	254	840	30L
09-19	1300	A-43	532	85	447	216	30	186	633	30U
09-19	1430	A-44	524	60	464	305	27	278	822	30L
09-19	1907	A-45	1098	32	1066	290	28	262	1328	30U
09-19	2210	A-46	1071	53	1018	340	24	316	1334	30L
09-20	0100	A-47	1042	28	1014	324	27	297	1311	30L
09-20	0300	A-48	617	45	572	214	30	184	756	30U

DATE	TIME	SAMPLE NUMBER	INITIAL DRY	FINAL DRY	NET DRY	INITIAL WET	FINAL WET	NET WET	NET DRY +NET WET	FLUSH WATER
09-20	0500	A-49	763	30	733	297	25	272	1005	30L
09-20	0900	A-51	835	80	755	328	31	297	1052	30U
09-20	1100	A-52	975	73	902	327	23	304	1206	30L
09-20	1300	A-53	901	95	806	327	28	299	1105	30U
09-20	1500	A-54	862	61	801	552	14	538	1339	30L
09-20	1735	A-55	1970	15	1955					
09-20	2010	A-56	1320	30	1290	370	16	354	1644	30U
09-21	0100	A-57	1350	38	1312	485	19	466	1778	30L
09-21	0300	A-58	1195	20	1175	209	13	196	1371	30U
09-21	0530	A-59	1370	33	1337	270	15	255	1592	30L
09-21	0730	A-60	1023	29	994	340	21	319	1313	30U
09-21	0900	A-61	1007	10	897	384	126	258	1155	30U
09-21	1100	A-62	1212	133	1079	350	19	331	1410	30U
09-21	1300	A-63	1313	17	1296	341	14	327	1623	30U
09-21	1500	A-64	1449	162	1287	487	157	330	1617	30U
09-21	1745	A-65	1400	20	1380	350	14	336	1716	30L
09-21		A-65	435	150	285	440	22	418	703	30U
09-21	2130	A-66	1404	31	1373	2360	883	1477	2850	30U
09-21	2300	A-67	923	19	904	270	12	258	1162	30L
09-22	0100	A-68	1712	45	1667	816	47	769	2436	30U
09-22	0300	A-69	1114	18	1096	369	22	347	1453	30U
09-22	0500	A-70	1224	108	1116	391	106	285	1401	30U
09-22	0730	A-71	1332	330	1002	55	320	235	1237	30U
09-22	0745	ASH HANGING UP FROM THE 0730 DUMP							500	
09-22	0910	A-72	722	120	602	300	15	285	887	30L
09-22	1100	A-73	1241	90	1151	347	47	300	1451	30U
09-22	1300	A-74	1143	128	1015	318	9	309	1324	30L
09-22	1500	A-75	1380	78	1302	300	2	298	1600	30L
09-22	1810	A-76	1319	33	1286	571	18	553	1804	30U
09-22	2203	A-77	1306	15	1291	640	22	618	1899	30U
09-23	0100	A-78	1348	12	1336	258	13	245	1582	30U
09-23	0300	A-79	1326	26	1300	532	12	520	1820	30U
09-23	0500	A-80	1150	41	1109	407	5	402	1511	30U
09-23	0700	A-81	1050	10	1040	312	5	307	1347	30U
09-23	0900	A-82	1038	39	999	188	5	183	1182	30L
09-23	1100	A-83	911	42	869	292	10	282	1151	30U
09-23	1300	A-84	660	78	582	202	13	189	771	30U
09-23	1500	A-85	712	21	691	279	10	269	960	32L
09-23	1920	A-86	1391	13	1378	280	25	255	1633	33.5U
09-23	2220	A-87	725	21	704	296	25	271	975	30U
09-24	0100	A-88	1340	56	1284	381	61	320	1604	30L
09-24	0300	A-89	745	52	693	344	85	259	952	30U
09-24	0500	A-90	760	55	705	318	69	249	954	30U
09-24	0700	A-91	555	54	501	184	22	162	663	30L
09-24	0905	A-92	1032	26	1006	323	18	305	1311	30U
09-24	1100	A-93	1034	103	931	275	17	258	1189	30L
09-24	1305	A-94	1135	128	1007	270	16	254	1261	30L&U
09-24	1600	A-95	1238	23	1215	409	21	388	1603	30U
09-24	2100	A-96	883	31	852	350	28	322	1174	30L
09-25	0100	A-97	690	63	627	324	68	256	883	30U

DATE	TIME	SAMPLE NUMBER	INITIAL DRY	FINAL DRY	NET DRY	INITIAL WET	FINAL WET	NET WET	NET DRY +NET WET	FLUSH WATER
09-25	0500	A-98	742	63	679	340	62	278	957	30U
09-25	0900	A-99	969	68	901	210	27	183	1084	30L
09-25	1300	A-100	1026	67	959	375	33	342	1301	30U
09-25	1500	A-102	610	86	524	253	26	227	751	30L
09-25	2100	A-103	1150	57	1093	439	58	381	1474	30U
09-26	0100	A-104	1081	65	1016	193	29	164	1180	30L
09-26	0300	A-105	711	78	633	352	32	320	953	30U
09-26	0500	A-106	543	75	468	330	30	300	768	30U
09-26	0900	A-107	1160	34	1126	220	30	190	1316	30L
09-26	1100	A-108	811	85	726	230	26	204	930	30L
09-26	1300	A-109	716	79	637	290	32	258	895	30U
09-26	1500	A-110	605	75	530	292	27	265	795	40L
09-26	1730	A-111	1191	32	1159	467	32	435	1594	45U
09-26	2210	A-112	741	30	711	284	24	260	971	40L
09-27	0100	A-113	906	83	823	344	31	313	1136	30U
09-27	0500	A-114	1091	140	951	236	27	209	1160	30L
09-27	0900	A-115	1150	87	1063	286	39	247	1310	30U
09-27	1100	A-116	707	97	610	216	22	194	804	30L
09-27	1300	A-117	923	100	823	314	25	289	1112	30U
09-27	1500	A-118	580	99	481	213	25	188	669	30L
09-27	1700	A-119	1283	95	1188	540	130	510	1698	45U
09-27	2200	A-120	895	29	866	192	22	170	1036	30L
10-02	2330	A-141	724	20	704	415	9	406	1110	30L
10-03	0100	A-142	1048	92	956	416	9	407	1363	30L
10-03	0300	A-143	820	111	709	722	12	710	1419	30U
10-03	0500	A-144	2669	118	2551	908	24	884	3435	30U
10-03	0900	A-145	1122	29	1093	508	21	487	1580	30U
10-03	1315	A-146	237	86	151	1087	23	1064	1215	40L 30U
10-03	2006	A-147	1174	20	1154	414	21	393	1547	30U
10-03	2206	A-148	1390	25	1365	330	25	305	1670	30L
10-04	0300	A-148	836	54	782	307	17	290	1072	30L
10-04	0700	A-149	676	49	627	326	16	310	937	30U
10-04	0940	A-140	2282	62	2220	409	46	363	2583	30L
10-04	1100	A-151	1020	20	1000	560	69	491	1491	30U
10-04	2100	A-153	1290	17	1273	452	17	435	1708	30U
10-05	0100	A-154	965	60	905	350	13	337	1242	30L
10-05	0300	A-154	581	66	515	300	10	290	805	30L
10-05	0900	A-155	1168	60	1108	380	62	318	1426	30U
10-05	1300	A-156	895	80	815	330	73	257	1072	30U
10-05	1500	A-157	511	71	440	429	25	404	844	30L
10-05	2030	A-158	1070	70	1000	240	10	230	1230	40U
10-06	0100	A-159	767	67	700	389	21	368	1068	30L
10-06	0500	A-160	722	74	648	335	5	330	978	30L
10-06	0900	A-161	750	6	684	389	72	317	1001	30U
10-06	1100	A-162	680	138	542	481	33	448	990	30L
10-06	1300	A-163	900	130	770	684	125	559	1329	30U 30U
10-06	1500	A-164	1000	113	87	454	33	421	1308	30L
10-06	1700	A-165	1230	42	1188	670	30	640	1828	30U
10-06	2000	A-166	1128	26	1102	350	23	327	1429	30L
10-06	2215	A-167	875	28	847	494	28	466	1313	30U

DATE	TIME	SAMPLE NUMBER	INITIAL DRY	FINAL DRY	NET DRY	INITIAL WET	FINAL WET	NET WET	NET DRY +NET WET	FLUSH WATER
10-07	0100	A-168	1000	98	902	333	21	312	1214	30L
10-07	0300	A-169	722	104	618	341	21	320	938	30L
10-07	0500	A-170	800	126	674	350	20	330	1004	30U
10-07	0700	A-171	690	24	666	686	26	660	1326	40U
10-07	0900	A-172	1630	55	1575	638	24	614	2189	30L
10-07	1100	A-173	1725	148	1577	498	121	377	1954	30L
10-07	1450	A-174	823	115	708	475	123	352	1060	30U
10-07	2030	A-175	1070	19	1051	377	20	357	1408	30U
10-07	2130	A-176	760	108	652	450	20	430	1082	30L
10-08	0100	A-177	1196	54	1142	485	26	459	1601	30L
10-08	0300	A-178	1111	105	1006	419	19	400	1406	30U
10-08	0500	A-179	790	19	771	240	14	226	997	30U
10-08	0700	A-180	645	111	534	457	25	432	966	30L
10-08	0845	A-181	1082	119	963	356	159	197	1160	60U
10-08	1300	A-182	1563	150	1413	450	22	428	1841	30L
10-08	1500	A-183	630	147	483	360	148	212	695	30U
10-08	1900	A-184	1000	112	988	413	13	400	1388	30U
10-08	2200	A-185	1377	12	1365	450	14	436	1801	30U
10-09	0100	A-186	1439	15	1424	472	13	459	1883	30L
10-09	0300	A-187	1183	11	1172	462	10	452	1624	30L
10-09	0500	A-188	1383	10	1373	397	10	387	1760	30L
10-09	0700	A-189	737	137	600	510	17	493	1093	30U
10-09	0900	A-000	1916	170	1746	401	25	376	2122	30L
10-09	1300	A-190	1710	153	1557	447	23	424	1981	30U
10-09	1410	A-191	722	148	574	403	19	384	958	30L
10-09	1700	A-192	1304	12	1292	477	17	460	1752	30U
10-09	2030	A-194	1578	15	1563	380	10	370	1933	30L
10-09	2200	A-195	1255	20	1235	404	19	385	1620	30U
10-10	0100	A-196	1322	48	1274	379	16	363	1637	30L
10-10	0500	A-197	1169	90	1079	308	10	298	1377	
10-10	0900	A-198	1287	89	1198	470	94	376	1574	30U
10-10	1300	A-199	1108	90	1018	364	16	348	1366	30L
10-10	1600	A-200	1190	21	1169	286	17	269	1438	30U
10-10	2100	A-201	1208	22	1186	290	24	266	1452	30I
10-11	0100	A-202	982	74	908	327	18	309	1217	30L
10-11	0500	A-203	1354	55	1299	402	20	382	1681	
10-11	0700	A-204	817	16	801	484	16	468	1269	
10-11	0900	A-205	1017	116	901	413	174	239	1140	60U
10-11	1100	A-206	1338	47	1291	425	18	407	1698	30L
10-11	1300	A-207	942	164	778	838	200	638	1416	30U
10-11	1440	A-208	928	164	778	453	187	266	1044	30U
10-11	1700	A-209	1100	165	935	409	8	401	1336	30U
10-11	1900	A-210	896	13	883	344	14	330	1213	30U
10-11	2145	A-211	1328	178	1150	402	14	388	1538	30U
10-12	0100	A-212	1262	22	1240	306	14	292	1532	30U
10-12	0300	A-213	978	176	802	518	12	506	1308	30U
10-12	0500	A-214	845	188	657	518	18	500	1157	30U
10-12	0915	A-215	1242	49	1193	432	14	418	1611	30L
10-12	1100	A-216	929	167	762	405	183	222	984	60U
10-12	1300	A-217	1036	180	856	385	12	373	1229	30L
10-12	1500	A-218	875	181	694	377	180	197	891	30U
10-12	1730	A-219	1293	180	1113	404	11	393	1506	30U

DATE	TIME	SAMPLE NUMBER	INITIAL DRY	FINAL DRY	NET DRY	INITIAL WET	FINAL WET	NET WET	NET DRY +NET WET	FLUSH WATER
10-12	1930	A-220	1034	14	1020	416	14	402	1422	30L
10-12	2200	A-221	1428	13	1415	390	9	381	1796	30L
10-13	0100	A-222	1452	49	1403	613	17	596	1999	30L
10-13	0500	A-223	1364	51	1313	488	18	470	1783	30L30U
10-13	0700	A-224	928	16	912	455	26	429	1341	30U

END OF BOM/FGT ELKHORN BITUMINOUS

APPENDIX H

Retort Particle Sampling Data

Reference: Volume 1, Thimsen, Maurer et al, 1984

H-1. Dust Loading Data

H-2. Cumulative Dust Data

H-3. Cumulative Dust Size Distributions (3 included)

H-4. Dust Size Distribution Modal Analysis (3 included)

H-5. Explanation of Modal Fitting Parameters

DUST DATA for BOM/FGT-008

Grand Average Gas/Air Ratio
1.84Estimated Offtake Elbow Area/ Sampler Inlet Area
7585Retort Area Less Draft Shroud Area
28.75 square feet

Equation of Fitted Curve: Dust (#/hr)/ Coal Feed (#/hr) (%) = 5.24e-3*Face Velocity **4.28 R Squared = 0.691

RUN #	DATE	TEST LENGTH (min)	MASS PARTICLES (milligram)	COAL FEED RATE (lb/hr)	T- 705 (deg. K)	P-705 ("hg abs)	F-701 (scfm)	GAS FLOW RATE (acfm)	DUST RT/ COAL RT (%)	PROBE DEPTH (inch)	AGITATOR ANGLE (deg)	AGITATOR RATE (sw/hr)	FREE-BOARD (inch)
1	15-SEP-83 14:37	5	38.0	2330	663	29.17	1000	4218	0.301	34	--	8	39
2	16-SEP-83 15:14	6	58.3	2320	634	29.16	1000	4035	0.385	34	--	7.2	39
3	15-SEP-83 16:03	5	Five minutes of backflow, no particles were collected										
4	15-SEP-83 16:33	2	33.4	2260	685	29.12	1000	4358	0.680	34	--	7.2	40
5	15-SEP-83 17:18	7	32.5	2400	703	29.12	1000	4471	0.178	34	--	7.3	39
6	19-SEP-83 01:36	5	287.0	2420	740	29.23	1450	6820	2.09	34	105	11	41
7	Sample too small to weight												
8	Sample destroyed in lab												
9	Never sampled; labeling mix-up												
10	19-SEP-83 04:57	1.73	211.0	2480	736	29.33	1450	6775	4.52	34	270	11.5	40.5
11	19-SEP-83 05:36	1.73	131.6	2480	736	29.31	1450	6775	2.82	34	320	11.5	40
12	19-SEP-83 06:26	5	202.2	2540	737	29.31	1450	6784	0.731	34	--	11.5	40
13	Filters in sampler melted												
14	22-SEP-83 09:22	5	Five minutes of backflow, no particle swere collected										
15	22-SEP-83 09:47	1.23	488.8	4600	703	29.75	1890	8344	7.94	34	90	15.6	40
16	Sample lost												
17	22-SEP-83 11:09	1.45	328.6	4360	749	29.78	1880	8834	4.78	34	--	13.8	40
18	22-SEP-83 11:56	5	731.0	4380	736	29.87	1890	8729	3.07	34	--	14.8	40
19	22-SEP-83 13:43	1.23	533.4	4200	742	29.90	1880	8746	9.49	34	325	16.8	40
20	22-SEP-83 14:38	1.2	329.8	4300	733	29.94	1880	8642	5.88	34	270	16.5	39.5
21	22-SEP-83 15:24	1.283	434.3	4120	714	29.90	1890	8469	7.56	34	210	15.5	37.5
22	03-OCT-83 01:33	1.5	28.0	3500	715	29.19	1585	7154	0.490	34	325	13.3	41
23	03-OCT-83	Unknown time											
24	03-OCT-83 03:05	1.5	54.7	3480	718	29.27	1585	7166	0.963	28	325	13.3	41
25	03-OCT-83 04:52	1.5	37.6	3480	728	29.24	1590	7274	0.662	22	325	13.3	40.5
26	03-OCT-83 05:37	1.5	23.2	3480	732	29.31	1440	7326	0.408	34	325	13.3	40

TABLE H-1

DUST DATA for BOM/FGT-008

Grand Average Gas/Air Ratio
1.84

Estimated Offtake Elbow Area/ Sampler Inlet Area
7585

Retort Area Less Draft Shroud Area
28.75 square feet

Equation of Fitted Curve: Dust (\$/hr)/ Coal Feed (\$/hr) (%) = $5.24e-3 \times \text{Face Velocity}^{**4.28}$ R Squared = 0.691

RUN #	DATE TIME	TEST LENGTH (min)	MASS PARTICLES (milligram)	COAL FEED RATE (lb/hr)	T- 705 (deg. K)	P-705 ("hg abs)	F-701 (scfm)	GAS FLOW RATE (acfm)	DUST RT/ COAL RT (%)	PROBE DEPTH (inch)	AGITATOR ANGLE (deg)	AGITATOR RATE (sw/hr)	FREE-BOARD (inch)
37	10-OCT-83 06:38	1.383	22.8	2720	658	29.68	1440	5990	0.579	34	270	14.5	38
38	10-OCT-83 07:06	1.383	31.9	2480	738	29.68	1440	6714	0.855	34	210	14.5	38
27	10-OCT-83 07:42	1.383	44.6	2480	702	29.65	1440	6392	1.24	34	270	14.5	37
28	10-OCT-83 08:36	1.433	32.2	2560	598	29.65	1430	5406	0.807	34	325	13.9	37.5
29	10-OCT-83 10:26	1.05	62.2	3060	643	29.64	1450	5898	1.78	34	270	19.5	36.5
30	10-OCT-83 11:00	1.05	63.2	3040	653	29.67	1440	5943	1.82	34	325	19.5	36
31	10-OCT-83 11:40	1.05	55.5	3040	630	29.57	1440	5736	1.60	34	210	19.1	35.5
32	10-OCT-83 12:55	0.95	8.9	2640	698	29.55	1440	6348	0.326	34	325	20.9	32.5
33	10-OCT-83 13:43	0.933	65.0	2220	656	29.45	1450	6013	2.88	34	270	21.5	34
34	10-OCT-83 14:22	0.833	73.3	2220	664	29.45	1445	6067	3.64	34	210	24	33.5
35	10-OCT-83 15:47	2.0	21.2	2700	701	29.43	1450	6427	0.361	34	270	10	40
36	10-OCT-83 16:24	1.817	27.7	2700	686	29.37	1450	6297	0.519	34	325	11	40

TABLE H-1 (Concluded)

Table H-2

BOM/FGT-008 CUMULATIVE DUST DATA

SIEVING ASTM SIEVE NUM.	SIEVE SIZE (μm)	SHIFT SIZE (μm)	sample #		
			008-02 Percent (%)	008-11 Less Than (%)	008-24 Stated Size (%)
8	2360	3189.2	--	100.0	100.0
14	1400	1891.9	--	99.5	97.4
20	841	1136.5	100.0	90.9	70.6
30	595	804.1	97.6	81.5	56.9
40	420	567.5	93.1	68.0	41.7
60	250	337.8	72.1	45.0	24.2
100	149	201.4	42.4	27.3	14.4
200	74	100.0	11.0	9.05	4.9
270	53	71.6	7.93	--	--

MICROSCOPY

PARTICLE DIAMETER (μm)	Percent Less Than Stated Size (%)		
100.0	7.93	9.05	4.90
56.0	4.30	3.98	1.894
32.0	1.18	1.31	0.514
17.8	0.397	0.385	0.147
10.0	0.160	0.108	0.0426
5.60	0.0419	0.0116	--
3.20	0.0094	0.0098	--
1.78	--	--	--

Figure H-3a

Figure H-3b

Figure H-3c

Figure H-4a

Figure H-4b

GASIFIER 008-11:VOLUME

CHN= .069 CHS= .054 CHV= .019

F1= 0 DG1= 1 SG1= 2

F2= 1.31E+10 DG2= 48.42 SG2= 2.2

F3= 2.89E+11 DG3= 390 SG3= 2.7

GASIFIER 008-11:SURFACE

CHN= .069 CHS= .054 CHV= .019

F1= 0 DG1= 1 SG1= 2

F2= 2.22E+09 DG2= 26 SG2= 2.2

F3= 7.29E+09 DG3= 145 SG3= 2.7

GASIFIER 008-11:NUMBER

CHN= .069 CHS= .054 CHV= .019

F1= 0 DG1= 1 SG1= 2

F2= 3.62E+06 DG2= 7.5 SG2= 2.2

F3= 789000 DG3= 20.2 SG3= 2.7

Figure H-4c

008-24 VOLUME DISTRIBUTION

CHN= .024 CHS= .027 CHV= .019
 F1= 0 DG1= 1 SG1= 2
 F2= 2.96E+08 DG2= 21.13 SG2= 2
 F3= 1.73E+11 DG3= 1090 SG3= 3.3

008-24 SURFACE DISTRIBUTION

CHN= .024 CHS= .027 CHV= .019
 F1= 0 DG1= 1 SG1= 2
 F2= 1.07E+08 DG2= 13.07 SG2= 2
 F3= 1.94E+09 DG3= 262.04 SG3= 3.3

008-24 NUMBER DISTRIBUTION

CHN= .024 CHS= .027 CHV= .019
 F1= 0 DG1= 1 SG1= 2
 F2= 521000 DG2= 5 SG2= 2
 F3= 155000 DG3= 15.14 SG3= 3.3

Table H-5

Description of Modal Fitting Parameters
(Associated with Figures H-4(a-c))

CHN: CHI square for the number distribution
CHS: CHI square for the surface distribution
CHV: CHI square for the volume distribution

If CHI square is less than 0.04 the fit is good.
If CHI square is less than 0.15 the fit is fair.

F1: Total number, surface, or volume of Mode 1 for the
 respective weighting. (*)
F2: Total number, surface, or volume of Mode 2 for the
 respective weighting.
F3: Total number, surface, or volume in Mode 3 for the
 respective weighting.

DG1: Geometrical mean diameter of Mode 1 for the given
 weighting (*)
DG2: Geometrical mean diameter of Mode 2 for the given
 weighting
DG3: Geometrical mean diameter of Mode 3 for the given
 weighting

SG1: Geometric Standard Deviation of Mode 1 (*)
SG2: Geometric Standard Deviation of Mode 2
SG3: Geometric Standard Deviation of Mode 3

(*) Unused modes are set to F1 = 0, DG1 = 1, and SG1 = 2, etc.

APPENDIX I

Gasifier Operator Logged Data

Included are three tables of data:

I-1. Freeboard Data

I-2. Firetest Data

I - Relatively hot incandescent zone

D - Multiple incandescent zones

C - Relatively cold incandescent zone

I-3. Operator Logged Data I

Water flows in gpm.

Water totals in gallons.

Steam flows in lb/min.

I-4. Operator Logged Data II

Agitator counter in (total revolutions * 2)

Grate Gear counter in (total grate revolutions * 116)

Further description of these data are given in Volume 1 of this series (Thimsen, Maurer et al, 1984).

TABLE I-1

FREEBOARD DATA

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-13	1030			40.5			41.5	41.0
09-13	1100	40			41			40.5
09-13	1130		40			41		40.5
09-13	1200			39			41	40.0
09-13	1230	39			41			40.0
09-13	1300		39.5			41		40.25
09-13	1330			40			41	40.5
09-13	1400	40.5			41			40.75
09-13	1430		40.5			42		41.25
09-13	1500			41.5			42	41.75
09-13	1530	40			42			41.0
09-13	1600		44			44		44.0
09-13	1630			42			44	43.0
09-13	1700	39			39			39.0
09-13	1800		40			39		39.5
09-13	1830			42			42	42.0
09-13	1900	44			40			42.0
09-13	1930		43			46		44.5
09-13	2030			42			41	41.5
09-13	2100	40			41			40.5
09-13	2130		40			41		40.5
09-13	2200			40			41	40.5
09-13	2230	42			42			42.0
09-13	2300		41			41		41.0
09-13	2330			42			42	42.0
09-14	0000	41			41			41.0
09-14	0030		42			42		42.0
09-14	0100			40			41	40.5
09-14	0130	41			41			41.0
09-14	0200		41			41		41.0
09-14	0230			40			40	40.0
09-14	0300	40			40			40.0
09-14	0330		40			40		40.0
09-14	0400			40			40	40.0
09-14	0430	40			41			40.5
09-14	0500		40			41		40.5
09-14	0530			40			40	40.0
09-14	0600	41			40			40.5
09-14	0630		42			42		42.0
09-14	0700			41			40	40.5
09-14	0730	40.5			41.0			40.75
09-14	0800		40			41		40.5
09-14	0830			41			41	41.0
09-14	0900	40.5			41.5			41.0
09-14	0930		41.75			41.75		41.75
09-14	1000			40.5			40.5	40.5
09-14	1030	40			40			40.0
09-14	1100		41			41		41.0
09-14	1130			41			41	41.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-14	1200	40			41			40.5
09-14	1230		40			40		40.0
09-14	1300			41			40.5	40.75
09-14	1330	40			40			40.0
09-14	1400		39.5			40.5		40.0
09-14	1430			39.5			39.5	39.5
09-14	1500	39.5			39.5			39.5
09-14	1530		39			39		39.0
09-14	1600			39			38	38.5
09-14	1630	38			38			38.0
09-14	1700		37			39		38.0
09-14	1730			39			38	38.5
09-14	1800	38			40			39.0
09-14	1830		39			41		40.0
09-14	1900			41			38	39.5
09-14	1930	41			40			40.5
09-14	2000		40			41		40.5
09-14	2030			40			40	40.0
09-14	2100	40			40			40.0
09-04	2130		40			39		39.5
09-04	2200			40			41	40.5
09-04	2230	39			40			39.5
09-14	2300		40			41		40.5
09-14	2330		43			42		42.5
09-15	0000			42			42	42.0
09-15	0030	41			42			41.5
09-15	0100		40			41		40.5
09-15	0130			38			40	39.0
09-15	0200	40			41			40.5
09-15	0230		40			40		40.0
09-15	0300			41			40	40.5
09-15	0330	40			40			40.0
09-15	0400		40			40		40.0
09-15	0430			40			39	39.5
09-15	0500	40			40			40.0
09-15	0530		41			39		40.0
09-15	0600			40			40	40.0
09-15	0630	40			40			40.0
09-15	0700		42			42		42.0
09-15	0730			41			40	40.5
09-15	0800	40			41.5			40.75
09-15	0830		40.5			39.5		40.0
09-15	0900			41.5			41.5	41.5
09-15	0930	41			41.5			41.25
09-15	1000		40			41		40.5
09-15	1030			43			43	43.0
09-15	1100	40			42			41.0
09-15	1130		41			40		40.5
09-15	1200			40.5			40.5	40.5
09-15	1230	39.5			41.0			40.25
09-15	1300		40			40		40.0
09-15	1330			40			42	41.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-15	1400	39			41			40.0
09-15	1430		38.5		39			38.75
09-15	1500			38			40	39.0
09-15	1530	40			41			40.5
09-15	1600		40			40		40.0
09-15	1630			39			41	40.0
09-15	1700	39			39			39.0
09-15	1730		40			39		39.5
09-15	1800			40			38	39.0
09-15	1830	39			38			38.5
09-15	1900		38			36		37.0
09-15	1930			38			36	37.0
09-15	2000	37			38			37.5
09-15	2030		40			40		40.0
09-15	2100			40			40	40.0
09-15	2130	39			39			39.0
09-15	2200		40			40		40.0
09-15	2230			40			40	40.0
09-15	2300	40			40			40.0
09-15	2330		42			42		42.0
09-16	0000			41			41	41.0
09-16	0030	41			41			41.0
09-16	0100		41			40		40.5
09-16	0130			39			39	39.0
09-16	0200	40			41			40.5
09-16	0230		40			40		40.0
09-16	0300			41			41	41.0
09-16	0330	40			41			40.5
09-16	0400		41			40		40.5
09-16	0430			40			40	40.0
09-16	0500	41			40			40.5
09-16	0530		40			41		40.5
09-16	0600			41			40	40.5
09-16	0630	41			40			40.5
09-16	0700		40			41		40.5
09-16	0730			40			41	40.5
09-16	0800	40			39			39.5
09-16	0830		41			41		41.0
09-16	0900			39			40	39.5
09-16	0930	40			40.5			40.25
09-16	1000		40			40		40.0
09-16	1030			40			40	40.0
09-16	1100	39.5			40.5			40.0
09-16	1130		39.5			41.5		40.5
09-16	1200			40.5			41.5	41.0
09-16	1230	40			40.5			40.25
09-16	1300		.5			40.0		40.75
09-16	1330			41			42	41.5
09-16	1400	41			42			41.5
09-16	1430		41			40		40.5
09-16	1500			39.5			40.5	40.0
09-16	1530	39			40			39.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-16	1600		40			41		40.5
09-16	1630			41			41	41.0
09-16	1700	40			40			40.0
09-16	1730		39			39		39.0
09-16	1800			41			42	41.5
09-16	1830	40			40			40.0
09-16	1900		40			41		40.5
09-16	1930			41			41	41.0
09-16	2000	40			40			40.0
09-16	2030		40			40		40.0
09-16	2100			40			41	40.5
09-16	2130	39			40			39.5
09-16	2200		40			40		40.0
09-16	2230			40			41	40.5
09-16	2300	40			40			40.0
09-16	2330		41		40			40.5
09-17	0000			41		42		41.5
09-17	0030	41					42	41.5
09-17	0100		40		42			41.0
09-17	0130			41		41		41.0
09-17	0200	41					41	41.0
09-17	0230		41		40			40.5
09-17	0300			41			40	40.5
09-17	0330	40			41			40.5
09-17	0400		40			41		40.5
09-17	0430			40			40	40.0
09-17	0500	40			41			40.5
09-17	0530		40			41		40.5
09-17	0600			40			40	40.5
09-17	0630	40				40		40.0
09-17	0700		43				42	42.5
09-17	0730			39.5			39.5	39.5
09-17	0800	41			38			39.5
09-17	0830		40			39		39.5
09-17	0900			41			41	41.0
09-17	0930	40			40			40.0
09-17	1000		40			40		40.0
09-17	1030			40			40	40.0
09-17	1100	40			40			40.0
09-17	1130		41			41		41.0
09-17	1200			39			40	39.5
09-17	1230	41			40			40.5
09-17	1300		40			40		40.0
09-17	1330			41			41	41.0
09-17	1400	40.5			39.5			40.0
09-17	1430		40			41		40.5
09-17	1500			39.5			39.5	39.5
09-17	1530	39			40			39.5
09-17	1600		40			40		40.0
09-17	1630			39			39.5	39.25
09-17	1700	39			40			39.5
09-17	1730		39			39		39.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-17	1800			40			40	40.0
09-17	1830	40			40			40.0
09-17	1900		39			40		39.5
09-17	1930			40			40	40.0
09-17	2000	41			41			41.0
09-17	2030		39			39		39.0
09-17	2100			39			40	39.5
09-17	2130	39			39			39.0
09-17	2200		40			41		40.5
09-17	2230			41			39	40.0
09-17	2300	39			40			39.5
09-17	2330		42			41		41.5
09-18	0000			40			40	40.0
09-18	0030	40			41			40.5
09-18	0100		40			40		40.0
09-18	0130			40			40	40.0
09-18	0200	40			41			40.5
09-18	0230		40			40		40.0
09-18	0300			39			40	39.5
09-18	0330	41			41			41.0
09-18	0400		40			40		40.0
09-18	0430			39			40	39.5
09-18	0500	40			40			40.0
09-18	0530		40			41		40.5
09-18	0600			40			40	40.0
09-18	0630	40			40			40.0
09-18	0700		40			40		40.0
09-18	0730			40			39.0	39.5
09-18	0800	41			41			41.0
09-18	0830		40.5			40.5		40.5
09-18	0900			40			40	40.0
09-18	0930	39			39.5			39.25
09-18	1000		39			40		39.5
09-18	1030			40			41	40.5
09-18	1100	39.5			39.5			39.5
09-18	1130		39			39		39.0
09-18	1200			39			39	39.0
09-18	1230	39.5			40			39.75
09-18	1300		40			40		40.0
09-18	1330			40			40	40.0
09-18	1400	40			39.5			39.75
09-18	1430		40			41		40.5
09-18	1500			40.5			40.5	40.5
09-18	1530	41			40			40.5
09-18	1600		40			40		40.0
09-18	1630			42			42	42.0
09-18	1700	40			40			40.0
09-18	1730		40			39		39.5
09-18	1800			40			41	40.5
09-18	1830	40			39			39.5
09-18	1900		40			40		40.0
09-18	1930			41			39	39.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-18	2000	39			39			39.0
09-18	2030		40			40		40.0
09-18	2100			40			41	40.5
09-18	2130	40			40			40.0
09-18	2200		40			40		40.0
09-18	2230			40			40	40.0
09-18	2300	40			40			40.0
09-18	2330		41			40		40.5
09-19	0000			42			42	42.0
09-19	0030	42			42			42.0
09-19	0100		43			43		43.0
09-19	0130			41			41	41.0
09-19	0200	41			40			40.5
09-19	0230		41			40		40.5
09-19	0300			41			41	41.0
09-19	0330	40			39			39.5
09-19	0400		40			40		40.0
09-19	0430			40			40	40.0
09-19	0500	40			41			40.5
09-19	0530		40			40		40.0
09-19	0600			40			41	40.5
09-19	0630	40			40			40.0
09-19	0700		39			40		39.5
09-19	0730			40			39	39.5
09-19	0800	39			39			39.0
09-19	0830		38			40		39.0
09-19	0900			42			40.5	41.25
09-19	0930	39			39			39.0
09-19	1000		39			40.5		39.75
09-19	1030			40			39.5	39.75
09-19	1100	39.5			39.5			39.5
09-19	1130		40.5			40.5		40.5
09-19	1200			40			40	40.0
09-19	1230	39.5			40			39.75
09-19	1300		39.5			39.5		39.5
09-19	1330			40.5			39.5	40.0
09-19	1400		41			40		40.5
BEGIN THE AGITATOR TEST								
09-19	1415	39.5			41			40.25
09-19	1430		32			34		33.0
09-19	1445			29			28	28.5
09-19	1500	28	26	26	27	28	26	26.83
END OF THE AGITATOR TEST								
09-19	1515			33			31	32.0
09-19	1530	38			39			38.5
09-19	1600		39			40		39.5
09-19	1630			40			40	40.0
09-19	1700	40			39			39.5
09-19	1730		39			40		39.5
09-19	1800			39			40	39.5
09-19	1830	40			40			40.0
09-19	1900		39			39		39.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-19	1930			40			40	40.0
09-19	2000	40			41			40.5
09-19	2030		40			40		40.0
09-19	2100			39			39	39.0
09-19	2130	40			40			40.0
09-19	2200		41			41		41.0
09-19	2230			40			41	40.5
09-19	2300	40			40			40.0
09-19	2330		41			42		41.5
09-20	0000			41			40	40.5
09-20	0030	42			42			42.0
09-20	0100		40			40		40.0
09-20	0130			40			40	40.0
09-20	0200	41			41			41.0
09-20	0230		40			40		40.0
09-20	0300			39			40	39.5
09-20	0330	41			41			41.0
09-20	0400		40			41		40.5
09-20	0430			40			41	40.5
09-20	0500	40			40			40.0
09-20	0530		41			40		40.5
09-20	0600			40			41	40.5
09-20	0630	39			40			39.5
09-20	0700		41			42		41.5
09-20	0730			41			42	41.5
09-20	0800	40			41			40.5
09-20	0830		40			40		40.0
09-20	0900			40			39	39.5
09-20	0930	39			39			39.0
09-20	1000		40			39.5		39.75
09-20	1030			41			39	40.0
09-20	1100	39			41			40.0
09-20	1130		40			39		39.5
09-20	1200			40			40	40.0
09-20	1230		40			40		40.0
09-20	1300	40			41			40.5
09-20	1330			40			39	39.5
09-20	1400		40.5			40.5		40.5
09-20	1430	40			40			40.0
09-20	1500			40			41	40.5
09-20	1530	40			41			40.5
09-20	1600		41			42		41.5
09-20	1630			40			40	40.0
09-20	1700	39			40			39.5
09-20	1730		39			38		38.5
09-20	1800			38			39	38.5
09-20	1830	38			40			39.0
09-20	1900		38			37		37.5
09-20	1930			38			37	37.5
09-20	2000	38			38			38.0
09-20	2030		39			38		38.5
09-20	2100			39			41	40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-20	2230	41			40			40.5
09-20	2300		40			41		40.5
09-20	2330	40			38			39.0
09-21	0000		39			39		39.0
09-21	0030			40			39	39.5
09-21	0100	39			41			40.0
09-21	0130		40			41		40.5
09-21	0200			38			40	39.0
09-21	0230	39			39			39.0
09-21	0300		39			39		39.0
09-21	0330			39			40	39.5
09-21	0400	39			38			38.5
09-21	0430		38			40		39.0
09-21	0500			39			38	38.5
09-21	0530		39			40		39.5
09-21	0600		39			39		39.0
09-21	0630			38			39	38.5
09-21	0700	38			38			38.0
09-21	0730		39			39		39.0
09-21	0800			39			40	39.5
09-21	0830	38.5			39			38.75
09-21	0845		36.5			36.5		36.5
09-21	0900			37.5			37.5	37.5
09-21	0915	39			38			38.5
09-21	0930		37.5			36.5		37.0
09-21	0945			38			38	38.0
09-21	1000	34			36			35.0
09-21	1015		35			34		34.5
09-21	1030			36			36	36.0
09-21	1045	36			35			35.5
09-21	1100		35			34.5		34.75
09-21	1115			36			34	35.0
09-21	1130	36			34.5			35.25
09-21	1200		36			36		36.0
09-21	1215			34			34	34.0
09-21	1230	34.5			35.5			35.0
09-21	1300		34			35.5		34.75
09-21	1315			34			33	33.5
09-21	1330	34			35			34.5
09-21	1345		36			35		35.5
09-21	1400			34			36	35.0
09-21	1415	38			38.5			38.25
09-21	1430		40			41		40.5
09-21	1445			40			41	40.5
09-21	1500	40			39			39.5
09-21	1530		39			40		39.5
09-21	1600			38			40	39.0
09-21	1630	39			40			39.5
09-21	1700		38			40		39.0
09-21	1730			40			40	40.0
09-21	1800	40			40			40.0
09-21	1830		40			40		40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-21	1900			40			40	40.0
09-21	1930	39			40			39.5
09-21	2000		40			41		40.5
09-21	2030			40			40	40.0
09-21	2100	40			39			39.5
09-21	2130		40			41		40.5
09-21	2200			40			41	40.5
09-21	2230	40			40			40.0
09-21	2300		39			39		39.0
09-21	2330			41			39	40.0
09-22	0000	39			41			40.0
09-22	0030		40			40		40.0
09-22	0100			40			40	40.0
09-22	0200	40			39			39.5
09-22	0230			41.5		43.0		42.25
09-22	0400	39			39			39.0
09-22	0500			39			40	39.5
09-22	0600		40			40		40.0
09-22	0700			40			40	40.0
09-22	0730	38			38			38.0
09-22	0800		39			40		39.5
09-22	0840			39			41	40.0
09-22	0900	40			40			40.0
09-22	0930		39.5			40.5		40.0
09-22	1000			39			40	39.5
09-22	1030	41			41			41.0
09-22	1100		40			40		40.0
09-22	1130			40			40	40.0
09-22	1200	40			40			40.0
09-22	1230		41			41		41.0
09-22	1300			41			40	40.5
09-22	1330	40			40			40.0
09-22	1400		39			39		39.0
09-22	1430			39			40	39.5
09-22	1500	38			39			38.5
09-22	1530	38			37			37.5
09-22	1600		40			40		40.0
09-22	1630			40			39	39.5
09-22	1700	39			40			39.5
09-22	1730		40			40		40.0
09-22	1800			40			39	39.5
09-22	1830	39			39			39.0
09-22	1900		39			40		39.5
09-22	1930			39			40	39.5
09-22	2000	40			40			40.0
09-22	2030		38			40		39.0
09-22	2100			40			40	40.0
09-22	2130	39			39			39.0
09-22	2200		39			40		39.5
09-22	2230			40			39	39.5
09-22	2300	40			40			40.0
09-23	0000	37			40			38.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-23	0030		40			40		40.0
09-23	0100			40			40	40.0
09-23	0130	38			40			39.0
09-23	0200		39			40		39.5
09-23	0230			40			40	40.0
09-23	0300	40				40		40.0
09-23	0330		39				40	39.5
09-23	0400			41			39	40.0
09-23	0430	39			40			39.5
09-23	0500		40			41		40.5
09-23	0530			40			40	40.0
09-23	0600	40			40			40.0
09-23	0630			39			40	39.5
09-23	0700	40			39			39.5
09-23	0730		39			38		38.5
09-23	0800			40			40	40.0
09-23	0830	39			41			40.0
09-23	0845		41			42		41.5
09-23	0900			40			39	39.5
09-23	0915	40			40			40.0
09-23	0930		40			40		40.0
09-23	0945			41			40	40.5
09-23	1000	40			40			40.0
09-23	1015		40			40		40.0
09-23	1030			40			41	40.5
09-23	1045	40			39			39.5
09-23	1100		39.5			38.5		39.0
09-23	1115			39			39	39.0
09-23	1130	40			40			40.0
09-23	1145		40			40		40.0
09-23	1200			40			39	39.5
09-23	1215	40			40			40.0
09-23	1230		40			39		39.5
09-23	1245			41			40	40.5
09-23	1300	40			40			40.0
09-23	1315		40			39		39.5
09-23	1330			40			38	39.0
09-23	1345	39			40			39.5
09-23	1400		39			40		39.5
09-23	1415			40			40	40.0
09-23	1430	40			40			40.0
09-23	1445		40.5			39.5		40.0
09-23	1500			39			39	39.0
09-23	1530	38			36			37.0
09-23	1600		32			36		34.0
09-23	1630			35			40	37.5
09-23	1700	38			40			39.0
09-23	1730		41			40		40.5
09-23	1800			40			41	40.5
09-23	1830	40			40			40.0
09-23	1900		39			36		37.5
09-23	1930			42			42	42.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-23	2000	40			40			40.0
09-23	2030		38			39		38.5
09-23	2100			40			38	39.0
09-23	2130	39			40			39.5
09-23	2200		40			40		40.0
09-23	2230			40			40	40.0
09-23	2300	40			40			40.0
09-23	2330		38			40		39.0
09-24	0000			40			40	40.0
09-24	0030	37			38			37.5
09-24	0100		38			39		38.5
09-24	0130			39			39	39.0
09-24	0200	39			40			39.5
09-24	0230		40			40		40.0
09-24	0300			41			40	40.5
09-24	0330	41			40			40.5
09-24	0400		40			41		40.5
09-24	0430			40			40	40.0
09-24	0500	40			40			40.0
09-24	0530		40			40		40.0
09-24	0600			40			41	40.5
09-24	0630	39			39			39.0
09-24	0700		40			40		40.0
09-24	0730			40			39	39.5
09-24	0800	39			39			39.0
09-24	0830		39			40		39.5
09-24	0900			39			40	39.5
09-24	0930	40			40			40.0
09-24	1000		39			39		39.5
09-24	1030			40			40	40.0
09-24	1100	40			40			40.0
09-24	1130		39			39		39.0
09-24	1200			39			40	39.5
09-24	1230	39			39			39.0
09-24	1300		39			40		39.5
09-24	1400			40			40	40.0
09-24	1430	39			40			39.5
09-24	1500		40			40		40.0
09-24	1530			38			40	39.0
09-24	1600	39			40			39.5
09-24	1630		37			37		37.0
09-24	1700			39			39	39.0
09-24	1730	40			40			40.0
09-24	1800		39			39		39.0
09-24	1830			40			40	40.0
09-24	1900	40			40			40.0
09-24	1930		40			42		41.0
09-24	2000			40			41	40.5
09-24	2030	38			40			39.0
09-24	2100		39			39		39.0
09-24	2130			39			40	39.5
09-24	2200	40			40			40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-24	2230		40			40		40.0
09-24	2300			40			39	39.5
09-24	2330	40			40			40.0
09-25	0000		42			42		42.0
09-25	0030			40			39	39.5
09-25	0100		40			41		40.5
09-25	0130			40			40	40.0
09-25	0200	39			41			40.0
09-25	0230	40			40			40.0
09-25	0330		40			40		40.0
09-25	0400			40			40	40.0
09-25	0430	40			40			40.0
09-25	0500		40			41		40.5
09-25	0530			40			40	40.0
09-25	0600	39			39			39.0
09-25	0630		40			40		40.0
09-25	0700			40			41	40.5
09-25	0730			39			39	39.0
09-25	0800	40			41			40.5
09-25	0830		40			40		40.0
09-25	0900			42			42	42.0
09-25	0930		39			40		39.5
09-25	1000		40			41		40.5
09-25	1030			41			42	41.5
09-25	1100	39			41			39.5
09-25	1130		38			40		39.0
09-25	1200			40			39	39.5
09-25	1230	39			40			39.5
09-25	1300		40			40		40.0
09-25	1330			40			40	40.0
09-25	1400	40			41			40.5
09-25	1430		39			40		39.5
09-25	1500			39			40	39.5
09-25	1530	39			41			40.0
09-25	1600		40			40		40.0
09-25	1630			41			40	40.5
09-25	1700	40			40			40.0
09-25	1730		39			40		39.5
09-25	1800			42			41	41.5
09-25	1830	40			40			40.0
09-25	1900		41			41		41.0
09-25	1930			40			40	40.0
09-25	2000	40			40			40.0
09-25	2030		40			40		40.0
09-25	2100			40			40	40.0
09-25	2130	39			40			39.5
09-25	2200		39			41		40.0
09-25	2230			41			39	40.0
09-25	2300	40			41			40.5
09-25	2330		41			40		40.5
09-26	0000		41			40		40.5
09-26	0030			39			40	39.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-26	0100	40			39			39.5
09-26	0130		41			40		40.5
09-26	0200			41			41	41.0
09-26	0230			41			40	40.5
09-26	0300	40			40			40.0
09-26	0330		41			39		40.0
09-26	0400			42			41	41.5
09-26	0430	40			41			40.5
09-26	0500		40			40		40.0
09-26	0530			41			40	40.5
09-26	0600		41			41		41.0
09-26	0630			40			41	40.5
09-26	0700	40			41			40.5
09-26	0730		39.5			40.5		40.0
09-26	0800			40			40	40.0
09-26	0830	40			41			40.5
09-26	0900		40			41		40.5
09-26	0930			40			40	40.0
09-26	1000	40			41			40.5
09-26	1030		40			41		40.5
09-26	1100			40			40	40.0
09-26	1130	41			40			40.5
09-26	1200		39			39		39.0
09-26	1230		39			41		40.0
09-26	1300	39.5			40.5			40.0
09-26	1330		39.5			40.5		40.0
09-26	1400			40			40	40.0
09-26	1430	40			38			39.0
09-26	1500		40			39		39.5
09-26	1530			42			41	41.5
09-26	1600	41			41			41.0
09-26	1630		41			41		41.0
09-26	1700			40			39	39.5
09-26	1730	40			41			40.5
09-26	1800		41			41		41.0
09-26	1830			42			41	41.5
09-26	1900	39			41			40.5
09-26	1930		41			42		41.5
09-26	2000			38			40	39.0
09-26	2030	40			41			40.5
09-26	2100		40			40		40.0
09-26	2130			39			39	39.0
09-26	2200	40			40			40.0
09-26	2230		40			41		40.5
09-26	2300			39			40	39.5
09-26	2330			40			41	40.5
09-27	0000	41			41			41.0
09-27	0100	40			40			40.0
09-27	0130		40			40		40.0
09-27	0200	40			41			40.5
09-27	0230		40			41		40.5
09-27	0300			40			40	40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
09-27	0330			40			40	40.0
09-27	0400		40			41		40.5
09-27	0430		40			40		40.0
09-27	0500			40			40	40.0
09-27	0530	40			40			40.0
09-27	0600		40			40		40.0
09-27	0630			40			40	40.0
09-27	0730		40			40		40.0
09-27	0800			40			40	40.0
09-27	0830	41			39			40.0
09-27	0900		39			39		39.0
09-27	0930			40.5			39.5	40.0
09-27	1000	40			40			40.0
09-27	1030		39.5			40.5		40.0
09-27	1100			40.5			40.5	40.5
09-27	1130	41			40			40.5
09-27	1200		41			41		41.0
09-27	1230			40			39	39.5
09-27	1300	40			41			40.5
09-27	1330		40			40		40.0
09-27	1400			40			39	39.5
09-27	1430	40			39			39.5
09-27	1500		41			39		39.5
09-27	1530			39			39	39.0
09-27	1600	39			40			39.5
09-27	1630		40			40		40.0
09-27	1700			39			40	39.5
09-27	1730	41			41			41.0
09-27	1800		40			40		40.0
09-27	1830			40			40	40.0
09-27	1900	40			41			40.5
09-27	1930		41			41		41.0
09-27	2000			41			41	41.0
09-27	2030	40			41			40.5
09-27	2100		41			41		41.0
09-27	2130			40			40	40.0
09-27	2200	41			41			41.0
09-27	2230		40			42		41.0
09-30	2000	31			30			30.5
09-30	2020		45			44		44.5
09-30	2100			38			40	39.0
09-30	2130	38			38			38.0
09-30	2200		40			38		39.0
09-30	2230			40			39	39.5
09-30	2300	40			41			40.5
10-01	0000	40			41			40.5
10-01	0030		40			41		40.5
10-01	0100			41			41	41.0
10-01	0130	40			41			40.5
10-01	0200		42			41		41.5
10-01	0230			40			41	40.5
10-01	0300	41			41			41.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-01	0330		41			41		41.0
10-01	0400			42			40	41.0
10-01	0430	41			40			40.5
10-01	0500		40			41		40.5
10-01	0530			41			40	40.5
10-01	0600	42			41			41.5
10-01	0630		40			41		40.5
10-01	0700			41			40	40.5
10-01	0730	40			39			39.5
10-01	0800		41			40		40.5
10-01	0830			41			40	40.5
10-01	0900	40			40			40.0
10-01	0930		40			39		39.5
10-01	1000			40			40	40.0
10-01	1030	39			39			39.0
10-01	1100		40			39		39.5
10-01	1130			39			39	39.0
10-01	1200	40			40			40.0
10-01	1230		40			40		40.0
10-01	1300			41			40	40.5
10-01	1330	40			40			40.0
10-01	1400		40			40		40.0
10-01	1430			39			40	39.5
10-01	1500	39.5			40.5			40.0
10-01	1530		40			41		40.5
10-01	1600			38			40	39.0
10-01	1630	40			40			40.0
10-01	1700		40			40		40.0
10-01	1730			40			40	40.0
10-01	1800	40			38			39.0
10-01	1830		38			38		38.0
10-01	1900			41			40	40.5
10-01	1930	38			40			39.0
10-01	2000		41			41		41.0
10-01	2030			40			40	40.0
10-01	2100	39			40			39.5
10-01	2130		40			40		40.0
10-01	2200			40			40	40.0
10-01	2230	39			40			39.5
10-01	2300		39			41		40.0
10-01	2330			40			40	40.0
10-02	0000	41			41			41.0
10-02	0030	41			40			40.5
10-02	0100		40			40		40.0
10-02	0130		40			40		40.0
10-02	0200			40			40	40.0
10-02	0230	40			40			40.0
10-02	0300			41			40	40.5
10-02	0330	41			41			41.0
10-02	0400		40			41		40.5
10-02	0430			41			40	40.5
10-02	0500	41			41			41.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
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10-02	0600			40			40	40.0
10-02	0630	40			40			40.0
10-02	0700		41			40		40.5
10-02	0730			41			40	40.5
10-02	0800	39.5			40.5			40.0
10-02	0830		42			40		41.0
10-02	0900			40			40	40.0
10-02	0930	40.5			38.5			39.5
10-02	1000		41			41		41.0
10-02	1030			40			39	39.5
10-02	1100	40			40			40.0
10-02	1130		40			40		40.0
10-02	1200			40			41	40.5
10-02	1230	39			40			39.5
10-02	1300		39			41		40.0
10-02	1330			41			39	40.0
10-02	1400	39			41			40.0
10-02	1430		39			40		39.5
10-02	1500			40			40	40.0
10-02	1530	39			40			39.5
10-02	1600		40			39		39.5
10-02	1630			39			40	39.5
10-02	1700	40			41			40.5
10-02	1730		38			39		38.5
10-02	1800			41			40	40.5
10-02	1830	40			40			40.0
10-02	1900		40			41		40.5
10-02	1930			39			41	40.0
10-02	2000	40			41			40.5
10-02	2030		39			40		39.5
10-02	2100			40			41	40.5
10-02	2130	40			41			40.5
10-02	2200		40			41		40.5
10-02	2230			40			41	40.5
10-02	2300	40			40			40.0
10-02	2330	40			40			40.0
10-03	0000		40			41		40.5
10-03	0030			41			40	40.5
10-03	0100	40			41			40.5
10-03	0130		41			41		41.0
10-03	0200			40			41	40.5
10-03	0230	40			40			40.0
10-03	0300		41			41		41.0
10-03	0330			41			40	40.5
10-03	0400	41			41			41.0
10-03	0430		40			41		40.5
10-03	0500			41			40	40.5
10-03	0530	40			40			40.0
10-03	0600		41			40		40.5
10-03	0630			40			41	40.5
10-03	0700	40			40			40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
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10-03	0800			40			40	40.0
10-03	0830	40			41			40.5
				SHUT DOWN				
10-03	1300			40.5			41.5	41.0
10-03	1330	40			41			40.5
10-03	1400		39			40		39.5
10-03	1430			39			41	40.0
10-03	1500	39			40			39.5
10-03	1530		41			41		41.0
10-03	1600			42			42	42.0
10-03	1630	40			42			41.0
10-03	1700		43			42		42.5
10-03	1730			41			40	40.5
10-03	1800	40			40			40.0
10-03	1830		38			40		39.0
10-03	1900			40			40	40.0
10-03	1930	40		41				40.5
10-03	2000		39		40			39.5
10-03	2030			41			40	40.5
10-03	2100	40			40			40.0
10-03	2130		40			39		39.5
10-03	2200			40			40	40.0
10-03	2230	40			40			40.0
10-03	2300		39			39		39.0
10-03	2330			40			40	40.0
10-04	0000	40			39			39.5
10-04	0030		40			40		40.0
10-04	0100			41			40	40.5
10-04	0130	40			40			40.0
10-04	0200		41			40		40.5
10-04	0230			40			41	40.5
10-04	0300	40			41			40.5
10-04	0330		40			40		40.0
10-04	0400			40			40	40.0
10-04	0430	40			40			40.0
10-04	0530			40			40	40.0
10-04	0600		41			40		40.5
10-04	0630			40			41	40.5
10-04	0700	40			40			40.0
10-04	0730		38			38		38.0
10-04	0800			38			38	38.0
10-04	0830	37			36			36.5
10-04	0900		37			37		37.0
10-04	0930			37.5			37.5	37.5
10-04	1000	38			39			38.5
10-04	1030		40			38		39.0
10-04	1100			40			40	40.0
10-04	1130	41			39			40.0
10-04	1200		40			39		39.5
10-04	1230			40			39	39.5
10-04	1300	40			40			40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
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10-04	1430	40.5			39.5			40.0
10-04	1500		41			39		40.0
10-04	1530			39			40	39.5
10-04	1600	40			42			41.0
10-04	1630		41			42		41.5
10-04	1700			40			41	40.5
10-04	1730	41			42			41.5
10-04	1800		40			40		40.0
10-04	1830			41			40	40.5
10-04	1900	40			41			40.5
10-04	1930		40			40		40.0
10-04	2015			40			39	39.5
10-04	2030	41			40			40.5
10-04	2100		41			40		40.5
10-04	2130			40			40	40.0
10-04	2200	40			41			40.5
10-04	2230		40			41		40.5
10-04	2300			40			40	40.0
10-04	2330	40			41			40.5
10-05	0000		40			40		40.0
10-05	0100			41			40	40.5
10-05	0130		40			40		40.0
10-05	0200			40			40	40.0
10-05	0230	40			41			40.5
10-05	0300		40			41		40.5
10-05	0330			40			40	40.0
10-05	0400	40			40			40.0
10-05	0430		41			40		40.5
10-05	0500			41			40	40.5
10-05	0530	40			40			40.0
10-05	0600		41			40		40.5
10-05	0630			41			40	40.5
10-05	0700	40			40			40.0
10-05	0730		39.5			39.5		39.5
10-05	0800			40			40	40.0
10-05	0830	41.5			41.5			41.5
10-05	0900		41			41		41.0
10-05	0930			41			41	41.0
10-05	1000	40			39			39.5
10-05	1030		40			41		40.5
10-05	1100			41			41	41.0
10-05	1130	40			42			41.0
10-05	1200		41			39		40.0
10-05	1230			41			40	40.5
10-05	1300	42			42			42.0
10-05	1330		40			40		40.0
10-05	1400			40			38	39.0
10-05	1430	40			40			40.0
10-05	1500		40			39		39.5
10-05	1530			39			40	39.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
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10-05	1630		40			41		40.5
10-05	1700			41			41	41.0
10-05	1730	41			41			41.0
10-05	1800		41			41		41.0
10-05	1830			41			40	40.5
10-05	1900	40			40			40.0
10-05	1930		41			41		41.0
10-05	2000			42			42	42.0
10-05	2030	40			39			39.5
10-05	2100		40			41		40.5
10-05	2130			40			40	40.0
10-05	2200	40			40			40.0
10-05	2230		40			40		40.0
10-05	2300			40				40.0
10-05	2330			40			40	40.0
10-06	0000	41			40			40.5
10-06	0030		40			41		40.5
10-06	0100		40			40		40.0
10-06	0130	40			40			40.0
10-06	0200		40			40		40.0
10-06	0230		40			40		40.0
10-06	0300			40			40	40.0
10-06	0330	40			41			40.5
10-06	0400		40			40		40.0
10-06	0430	40			40			40.0
10-06	0500			41			40	40.5
10-06	0530	40			41			40.5
10-06	0600		41			41		41.0
10-06	0630			40			40	40.0
10-06	0700	40			40			40.0
10-06	0730		40			40		40.0
10-06	0800			40			40	40.0
10-06	0830	39			40			39.5
10-06	0900		40			39		39.5
10-06	0930			40			40	40.0
10-06	1000	40			42			41.0
10-06	1030		41			40		40.5
10-06	1100			41			40	40.5
10-06	1130	41			40			40.5
10-06	1200		40			40		40.0
10-06	1230			39.5			39.5	39.5
10-06	1300	40.5			40.5			40.5
10-06	1330		41.5			41.5		41.5
10-06	1400			40			40	40.0
10-06	1430	40			40			40.0
10-06	1500		41.5			41.5		41.5
10-06	1530			42			42	42.0
10-06	1600	41			40			40.5
10-06	1630		40			40		40.0
10-06	1700			40			41	40.5
10-06	1730	40			41			40.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-06	1800		41			42		41.5
10-06	1830			40			40	40.0
10-06	1900	40			40			40.0
10-06	1930		41			42		41.5
10-06	2000			41			41	41.0
10-06	2030	40			39			39.5
10-06	2100		41			41		41.0
10-06	2130			41			41	41.0
10-06	2200	40			39			39.5
10-06	2230		40			40		40.0
10-06	2300			40			39	39.5
10-06	2330			41			41	41.0
10-07	0000		41			40		40.5
10-07	0030			40			40	40.0
10-07	0100	40			41			40.5
10-07	0130			40			40	40.0
10-07	0200	41			41			41.0
10-07	0230			40			41	40.5
10-07	0300		41			41		41.0
10-07	0330	41			41			41.0
10-07	0400	40			40			40.0
10-07	0430		40			40		40.0
10-07	0500			40			40	40.0
10-07	0530	40			40			40.0
10-07	0600		41			40		40.5
10-07	0630			40			40.0	40.0
10-07	0700	39			39			39.0
10-07	0730		40.5			39.5		40.0
10-07	0800			40			39	39.5
10-07	0830	39			40			39.5
10-07	0900		40			40		40.0
10-07	0930			42			41	41.5
10-07	1000	39.5			39.5			39.5
10-07	1030		40			40		40.0
10-07	1100			40.5			39.5	40.0
10-07	1130	41			41			41.0
10-07	1200		41			41		41.0
10-07	1230			39			40	39.5
10-07	1300	40			40			40.0
10-07	1330		40			41		40.5
10-07	1400			41			41	41.0
10-07	1430	39			40			39.5
10-07	1500		40			38		39.0
10-07	1530			40			41	40.5
10-07	1600	39			39			39.0
10-07	1630		40			40		40.0
10-07	1700			41			42	41.5
10-07	1730	39			40			39.5
10-07	1800		41			41		41.0
10-07	1830			41			42	41.5
10-07	1900	40			38			39.0
10-07	1930		42			41		41.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-07	2000			42			42	42.0
10-07	2030	41			42			41.5
10-07	2100		41			42		41.5
10-07	2130			41			40	40.5
10-07	2200	40			40			40.0
10-07	2230		41			40		40.5
10-07	2300			40			41	40.5
10-07	2330	40			40			40.0
10-08	0000		40			40		40.0
10-08	0030			41			40	40.5
10-08	0100	40			40			40.0
10-08	0130		40			41		40.5
10-08	0200			40			40	40.0
10-08	0230	39			40			39.5
10-08	0300		38				38	38.0
10-08	0330			39		40		39.5
10-08	0400	40			40			40.0
10-08	0430		41			40		40.5
10-08	0500			41			42	41.5
10-08	0530	40			42			41.0
10-08	0600		40			41		40.5
10-08	0630			40			40	40.0
10-08	0700	41			40			40.5
10-08	0715		40			41		40.5
10-08	0730			41			39	40.0
10-08	0800	38			40			39.0
10-08	0830		41			41		41.0
10-08	0900			42			42	42.0
10-08	0930	41			41			41.0
10-08	1000		42			41		41.5
10-08	1030			41			40	40.5
10-08	1100	41			40			40.5
10-08	1130		41			41		41.0
10-08	1200			41			40	40.5
10-08	1230	41			40			40.5
10-08	1300		40			41		40.5
10-08	1330			41			39	40.0
10-08	1400	40			39			39.5
10-08	1430		40			40		40.0
10-08	1500			40			41	40.5
10-08	1530	40			40			40.0
10-08	1600		41			40		40.5
10-08	1630			40			39	39.5
10-08	1700	40			40			40.0
10-08	1730		40			40		40.0
10-08	1800			42			42	42.0
10-08	1830	41			41			41.0
10-08	1900		41			42		41.5
10-08	1930			42			42	42.0
10-08	2000	39			40			39.5
10-08	2030		41			41		41.0
10-08	2100			41			40	40.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-08	2130	41			41			41.0
10-08	2200		40			39		39.5
10-08	2230			41			41	41.0
10-08	2300	41			40			40.5
10-08	2330		40			41		40.5
10-09	0000			43			42	42.5
10-09	0030	40			41			40.5
10-09	0100			41			40	40.5
10-09	0130		40				40	40.0
10-09	0200		40			40		40.0
10-09	0230			40			41	40.5
10-09	0300	40			40			40.0
10-09	0330		39			39		39.0
10-09	0400			40			40	40.0
10-09	0430		39			39		39.0
10-09	0500			40			40	40.0
10-09	0530	40			41			40.5
10-09	0600		40			40		40.0
10-09	0630			40			40	40.0
10-09	0700	40			41			40.5
10-09	0730		41.5			41.5		41.5
10-09	0800			40.5			40.5	40.5
10-09	0830	40.5			40.5			40.5
10-09	0900		42			41		41.5
10-09	0930			41			41	41.0
10-09	1000	41			42			41.5
10-09	1030		42			41		41.5
10-09	1100			40			40	40.0
10-09	1130	41			42			41.5
10-09	1200		40			40		40.0
10-09	1230			42			43	42.5
10-09	1300	42			41			41.5
10-09	1330		41			41		41.0
10-09	1400			41			41	41.0
10-09	1430	41			39			40.0
10-09	1500		41			40		40.5
10-09	1530			42			43	42.5
10-09	1600	40			41			40.5
10-09	1630		41			41		41.0
10-09	1700			40			41	40.5
10-09	1730	39			40			39.5
10-09	1800		39			39		39.0
10-09	1830			41			42	41.5
10-09	1900	40			40			40.0
10-09	1930		40			41		41.0
10-09	2000			42			41	41.5
10-09	2030	40			39			39.5
10-09	2100		41			41		41.0
10-09	2130			40			41	40.5
10-09	2200	40			40			40.0
10-09	2230		40			40		40.0
10-09	2300			40			40	40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-09	2330	41			41			41.0
10-10	0000		42			42		42.0
10-10	0030			40			40	40.0
10-10	0100	41			41			41.0
10-10	0130			42			43	42.5
10-10	0200			41			40	40.5
10-10	0230			41			40	40.5
10-10	0300			41			41	41.0
10-10	0330	40			40			40.0
10-10	0400	40			40			40.0
10-10	0430			41			40	40.5
10-10	0500		40			40		40.0
10-10	0530			40			40	40.0
10-10	0600			40			38	39.0
10-10	0630			38			38	38.0
10-10	0700		38			38		38.0
10-10	0730			38			37	37.5
10-10	0800			36			36	36.0
10-10	0820			37			36	36.5
10-10	0830			37.5			37.5	37.5
10-10	0845		37.5			38.5		38.0
10-10	0900			37			36	36.5
10-10	0915	38	37	38	38	37	37	37.5
10-10	0930	37			38			37.5
10-10	0945	38	37	36.5	35	36.5	37	36.66
10-10	1000			36			36	36.0
10-10	1015		36			36		36.0
10-10	1030			36			37	36.5
10-10	1045	36			36			36.0
10-10	1100			36			36	36.0
10-10	1115			36			36	36.0
10-10	1130	35	34	35.5	36	34	35.5	35.0
10-10	1145			35			36	35.5
10-10	1200		33			34		33.5
10-10	1230	33			34			33.5
10-10	1300	32.5			32.5			32.5
10-10	1330		34			35		34.5
10-10	1400	34		34			34	34.0
10-10	1430		33.5			33.5		33.5
10-10	1445		36			35		35.5
10-10	1500		37			38		37.5
10-10	1530	40			40			40.0
10-10	1600		41			40		40.5
10-10	1630			40			40	40.0
10-10	1700	40			41			40.5
10-10	1730		41			41		41.0
10-10	1800			42			42	42.0
10-10	1830	39			40			39.5
10-10	1900		39			39		39.0
10-10	1930			39			38	38.5
10-10	2000	38			39			38.5
10-10	2030		40			40		40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-10	2100			39			40	39.5
10-10	2130	40			41			40.5
10-10	2200		41			41		41.0
10-10	2230			41			40	40.5
10-10	2300	39			40			39.5
10-10	2330		41			41		41.0
10-11	0000	41			42			41.5
10-11	0030	41			41			41.0
10-11	0100		41			41		41.0
10-11	0130		41			40		40.5
10-11	0200		42			42		42.0
10-11	0230			41			41	41.0
10-11	0300	40			40			40.0
10-11	0330		40			40		40.0
10-11	0400	40			41			40.5
10-11	0430		40			40		40.0
10-11	0500	40			40			40.0
10-11	0530			40			40	40.0
10-11	0600	40			40			40.0
10-11	0630		41			40		40.5
10-11	0700			40			40	40.0
10-11	0730	38			41			39.5
10-11	0800		39			41		40.0
10-11	0830			40			39	39.5
10-11	0900	40			40			40.0
10-11	0930		39			39		39.0
10-11	1000			40			39	39.5
10-11	1030	38			39			38.5
10-11	1100		38			39		38.5
10-11	1130			39			39	39.0
10-11	1200	39			39			39.0
10-11	1230		40			38		39.0
10-11	1300			40			39	39.5
10-11	1330	40			39			39.5
10-11	1400		41			39		40.0
10-11	1430			40			40	40.0
10-11	1500	41			39			40.0
10-11	1530		40			39		39.5
10-11	1600			40			40	40.0
10-11	1630	38			40			39.0
10-11	1700		39			38		38.5
10-11	1730			40			38	39.0
10-11	1800	39			40			39.5
10-11	1830		39			39		39.0
10-11	1900			39			39	39.0
10-11	1930	39			39			39.0
10-11	2000		39			40		39.5
10-11	2030			40			39	39.5
10-11	2100	40			39			39.5
10-11	2130		39			40		39.5
10-11	2200			39			40	39.5
10-11	2230	40			40			40.0

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-11	2300		40			40		40.0
10-11	2330	40			40			40.0
10-12	0000		41			40		40.5
10-12	0030			40			41	40.5
10-12	0100	40			40			40.0
10-12	0130		40			40		40.0
10-12	0200			40			40	40.0
10-12	0230	40			39			39.5
10-12	0300		40			40		40.0
10-12	0330			40			40	40.0
10-12	0400	40			41			40.5
10-12	0430		41			40		40.5
10-12	0500			40			40	40.0
10-12	0530	39			40			39.5
10-12	0600		40			40		40.0
10-12	0630			40			40	40.0
10-12	0730	40			40			40.0
10-12	0800		40			38		39.0
10-12	0830			39			39	39.0
10-12	0900	40			40			40.0
10-12	0930		40			40		40.0
10-12	1000			41			39	40.0
10-12	1030	40			39			39.5
10-12	1100		40			40		40.0
10-12	1130			39			39	39.0
10-12	1200	40			41			40.5
10-12	1230		41			40		40.5
10-12	1300			40			40	40.0
10-12	1330	39			38			38.5
10-12	1400		40			41		40.5
10-12	1430			40			40	40.0
10-12	1500	40			39			39.5
10-12	1530		40			40		40.0
10-12	1600			40			39	39.5
10-12	1630	40			40			40.0
10-12	1700		39			41		40.0
10-12	1730			40			40	40.0
10-12	1800	41			40			40.5
10-12	1830		40			40		40.0
10-12	1900			39			39	39.0
10-12	1930	40			40			40.0
10-12	2000		40			40		40.0
10-12	2030			40			40	40.0
10-12	2100	40			40			40.0
10-12	2130		40			39		39.5
10-12	2200			39			39	39.0
10-12	2230	39			40			39.5
10-12	2300		39			40		39.5
10-12	2330	40			40			40.0
10-13	0000		40			40		40.0
10-13	0030			40			40	40.0
10-13	0100	41			40			40.5

DATE	TIME	#1	#2	#3	#4	#5	#6	AVE
10-13	0130			40			40	40.0
10-13	0200	40			40			40.0
10-13	0230		40			39		39.5
10-13	0300			41			40	40.5
10-13	0330	40			40			40.0
10-13	0400		40			40		40.0
10-13	0430			41			40	40.5
10-13	0500	42			38			40.0
10-13	0530		41			40		40.5
10-13	0600			40			40	40.0
10-13	0630	41			40			40.5
10-13	0700			39			41	40.0

END OF BOM/FGT 008 ELKHORN

TABLE I-2

FIRETEST DATA

Date	Time	Insertion Time (min)	#1	#2	#3	#4	#5	#6	#7	Average
09-13	1010	4	10	7	6	5	7	11	3	7.0
09-13	1200	4	9	11	11	9	7	6	15	9.7
09-13	1400	3	13	13	11	12	12	14	5	11.4
09-13	1600	2.5	13	15	14	16	17	16	8	14.1
09-13	1800	2.5	16	16	16	17	17	18	10	15.7
09-13	2000	2.5	17	18	21	17	18	20	15	18.0
09-13	2200	2.5	18	20	20	14	17	20	17	18.0
09-14	0000	2.5	14	18	21	15	17	15	8	15.4
09-14	0200	2.5	10	18	23	10	12	12	0	12.1
09-14	0400	2.5	6	15	5	10	15	29	5	12.1
09-14	0600	2.5	21	15	26	10	13	11	18	16.3
09-14	0800	2.5	23	22	26	18	8	22	2	17.3
09-14	1000	2.5	13	22	11	10	23	28	5	16.0
09-14	1200	2.5	16	5	10	14	17	18	13	13.3
09-14	1400	2.5	13	11	9	13	10	16	10	11.7
09-14	1600	2.5	10	9	16	7	6	17	1	9.4
09-14	1800	2.0	7	12	14	17	9	22	20	14.4
09-14	2000	2.0	7	5	4	15	24	16	5	10.9
09-14	2200	2.0	15	13	6	11	17	18	18C	14.0
09-15	0000	2.0	13	19	28	11	14	15	16	16.6
09-15	0200	2.0	12	16	24	15	10	20	8	15.0
09-15	0400	2.0	12	10	26	12	12	18	10	14.3
09-15	0600	2.0	28	12	14	10	13	22	13	16.0
09-15	0800	2.0	24	26	27	15	10	26	13	20.1
09-15	1000	2.0	21	16C	11C	10	11	24	8	14.4
09-15	1200	2.0	12	14	8	6	17	24	8	12.7
09-15	1400	2.0	6	13	8	14	17	21	1	11.4
09-15	1600	2.0	10	10	13	13	15	15	1	11.0
09-15	1800	2.0	13	14	11	8	11	11	12C	11.4
09-15	2000	2.0	18	25	20	14	17	22	12	18.3
09-15	2200	2.0	15	19	5	14	13	10	13	12.7
09-16	0000	2.0	11	16	15	14	18	16	20	15.7
09-16	0200	2.0	16	16	12	12	17	14	18	15.0
09-16	0400	2.0	18	15	11	14	18	14	12	14.6
09-16	0600	2.0	14	15	12	12	3	15	12	11.9
09-16	0800	2.0	12	12	17	16	15	12	13	13.9
09-16	1000	2.0	15	11	19	8	14	15	10	13.1
09-16	1200	2.0	17	15	13	12	12	17	5	13.0
09-16	1400	2.0	14	15	14	14	14	16	3	12.9
09-16	1600	2.0	18	14	17	17	16	17	16	16.4
09-16	1800	2.0	15	13	17	15	15	17	17	15.6
09-16	2000	2.0	11	14	13	15	13	12	18	14.4
09-16	2200	2.0	16	14	17	14	14	12	17	14.9
09-17	0000	2.0	14	15	20	14	15	17	18	16.1
09-17	0200	2.0	13	12	20	13	14	16	18	15.1
09-17	0400	2.0	11	12	15	15	12	17	18	14.3
09-17	0600	2.0	12	13	14	15	13	17	18	14.6

Date	Time	Insertion								Average
		Time (min)	#1	#2	#3	#4	#5	#6	#7	
09-17	0800	2.0	19	18	16	15	17	14	18	16.7
09-17	1000	2.0	13	15	18	13	17	16	20	16.0
09-17	1200	2.0	18	13	16	18	16	17	26	17.7
09-17	1400	2.0	15	12	19	16	13	15	25	16.4
09-17	1600	2.0	14	22	17	15	12	16	16	16.0
09-17	1800	2.0	10	12	13	10	7	11	16	11.3
09-17	2000	2.0	6	11	12	13	6	4	11	9.0
09-17	2200	2.0	8	14	12	12	14	9	12	11.6
09-18	0000	2.0	13	0	15	13	6	11	13	10.1
09-18	0200	2.0	10	12	14	12	13	6	13	11.4
09-18	0400	2.0	12	12	15	13	11	12	13	12.6
09-18	0600	2.0	12	14	16	10	11	13	16	13.1
09-18	0740	2.0	15	13	12	117	11	15	19	14.6
09-18	1000	2.0	17	15	16	12	10	8	16	13.4
09-18	1200	2.0	10	13	9	15	19C	8	14	12.6
09-18	1400	2.0	23	15	24	18	9	12C	18	17.0
09-18	1600	2.0	21	13	22	9	22	27	26	20.0
09-18	1800	2.0	21	22	13	12	20	22	20	18.6
09-18	2000	2.0	15	21	12	19	30	8	10	16.4
09-18	2200	2.0	22	8	19	24	15	13	23	17.7
09-19	0000	2.0	24	6	7	10	7	12	22	12.6
09-19	0200	2.0	23	14	0	15	15	18	28	16.1
09-19	0400	2.0	18	12	20	12	10	10	28	15.7
09-19	0600	2.0	19	13	18	13	12	12	21	15.4
09-19	0800	2.0	25	16	7	21	21	6	19	16.4
09-19	1000	2.0	18	17	15	2	14	27	13	15.1
09-19	1130	2.0				10				10.0
09-19	1200	2.0	22	19	13	5	2	19	21	14.4
09-19	1310	2.0					17			17.0
09-19	1400	2.0	9	19	25	4	25	15	20	16.7
09-19	1600	2.0	21D	22	13	4	8	24	25	16.7
09-19	1800	2.0	29	24	5D	5	5	17	28	16.1
09-19	2000	2.0	21	24	21	9	15	19	29	19.7
09-19	2200	2.0	19	25	10	17	3	15	16	15.0
09-20	0000	2.0	9	17	12	10	10	26	12	13.7
09-20	0200	2.0	17	15	12	2	12	7	23	12.6
09-20	0400	2.0	20	16	4	12	26	14	12	14.9
09-20	0600	1.75	18	14	10	12	14	18	10	13.7
09-20	0800	1.75	25	27	30	31	16	35	32	28.0
09-20	1000	2.0	19	23	18	13	11	17	6	15.3
09-20	1200	2.0	27	26	17	23	15	18	28	22.0
09-20	1400	2.0	22	19	20	21	19	16	23	20.0
09-20	1600	2.0	33	29	23	20	22	22	21	24.3
09-20	1800	2.0	14	17	9	13	13	21	11	14.0
09-20	2000	2.0	13	12	9	10	13	23	8	12.6
09-20	2200	2.0	2	13	12	18	18	15	18	13.7
09-21	0000	2.0	13	12	21	22	21	19	20	18.2
09-21	0200	2.0	15	18	24	23	23	24	21	21.1
09-21	0400	2.0	14	16	20	19	21	18	19	18.1
09-21	0600	2.0	12	12	12	16	12	14	14	13.1
09-21	0800	2.0	18	11D	13	14	15	18	13	14.6

Date	Time	Insertion Time (min)	#1	#2	#3	#4	#5	#6	#7	Average
09-21	1000	2.0	23	23	19	20	23	37	22	20.7
09-21	1200	2.0	36	15	25	26	26	28	18	24.9
09-21	1340	2.0	37	17	17	22	20	23	22	22.6
09-21	1600	2.0	39	31	21	18	15	22	24	24.3
09-21	1700	2.0	19			18				18.5
09-21	1800	2.0	28	38	22	13	14	22	15	21.7
09-21	1900	2.0	20	28		15	14			19.25
09-21	2100	2.0	14	14	17	14	15	19	14	15.3
09-21	2200	2.0	9	13	15	13	12	10	16	12.6
09-22	0000	2.0	12	13	13	14	12	10	8	11.7
09-22	0200	2.0	12	15	12	15	10	10	12	12.3
09-22	0400	2.0	12	14	16	14	15	12	14	13.9
09-22	0600	2.0	12	13	14	12	14	12	16	13.3
09-22	0800	2.0	13	17	16D	23	15	31D	30	20.7
09-22	1000	2.0	6	26	16	17	8	10	22	15.0
09-22	1100	2.0	26	22						24.0
09-22	1200	2.0	24	21	18	24	23	27	30	23.9
09-22	1400	2.0	26	23	2	12	9	14	25	15.9
09-22	1500	2.0	15	6	2	29	17	4	27	14.3
09-22	1600	2.0	23	22	20	27	7	18	36	21.9
09-22	1800	2.0	25	15	18	13	10	10	32	17.6
09-22	2000	2.0	16	19	21	18	16	11	7	15.4
09-22	2200	2.0	0	20	5	12	16	16	25	13.4
09-22	2230	2.0	12		14					13.0
09-23	0000	2.0	21	19	7	12	5	8	34	15.1
09-23	0200	2.0	7	23	7	24	12	17	22	16.0
09-23	0400	2.0	19	22	2	6	19	2	16	12.3
09-23	0600	2.0	15	21	10	24	12	23	22	14.8
09-23	0800	2.0	18	20	19	2	14	16	22	18.1
09-23	1000	2.0	22	17	9	12	8	19	19	15.1
09-23	1200	2.0	20	2	6	8	18	12	13	11.3
09-23	1400	2.0	20	17	17	11	14	15	21	16.4
09-23	1600	2.0	10	14	13	15	15	7	15	12.7
09-23	1730	2.0			7			15		11.0
09-23	1800	2.0	3	7	12	10	10	10	14	9.4
09-23	2000	2.0	16	18	13	17	20	21	14	17.0
09-23	2100	2.0		20	17		17	14		17.0
09-23	2200	2.0	25	22	18	21	22	18	18	20.6
09-24	0000	2.0	15	14	14	16	16	10	17	14.6
09-24	0200	2.0	8	10	16	13	14	13	15	12.7
09-24	0400	2.0	12	10	10	8	14	12	10	10.9
09-24	0600	2.0	3	14	13	13	13	8	14	1.1
09-24	0800	2.0	0	10	3	10	15	19	10	9.6
09-24	0900	2.0	14		20					17.0
09-24	1000	2.0	12	16	17	16	17	12	17	15.3
09-24	1200	2.0	8	12	14	13	14	16	15	13.1
09-24	1400	2.0	10	10	11	10	19	16	13	12.7
09-24	1600	2.0	13	14	21	14	11	0	15	12.5
09-24	1700	2.0			13			13		13.0
09-24	1800	2.0	12	10	17	7	8	5	14	10.4
09-24	1900	2.0		11	9		11	11		10.5

Date	Time	Insertion	#1	#2	#3	#4	#5	#6	#7	Average
		Time (min)								
09-24	2000	1.5	6	18	17	10	85	11	11	11.5
09-24	2200	1.5	11	12	17	18	9	5	16	12.6
09-25	0000	1.5	15	13	12	17	17	18	5	13.9
09-25	0200	1.5	13	12	14	22	22	18	15	16.6
09-25	0400	1.5	12	14	15	17	19	16	15	15.4
09-25	0600	1.5	9.5	17	15	13	18	18	13	14.8
09-25	0800	1.5	25	28	34	9	15	22	14	21.0
09-25	1000	1.5	18	19	22	21	14	11	23	18.3
09-25	1200	1.5	11	6	15	8	13	14	13	11.4
09-25	1400	1.5	9	11	13	14	1	5	10	10.4
09-25	1600	1.5	13	9	12	9	13	12	11	11.3
09-25	1800	1.5	13	14	15	14	4	5	14	11.3
09-25	1900	1.5					14	8		11.0
09-25	2000	1.5	16	9	9	12	14	15	11	12.3
09-25	2200	1.5	9	13	13	10	10	10	14	11.3
09-26	0000	1.5	16.5	11	1	8.5	10	18.5	14	12.8
09-26	0200	1.5	16	12	5	11	11	16	15	12.2
09-26	0400	1.5	14	9	12	19	12	16	8	12.9
09-26	0600	1.5	12	12	10	13	15	14	14	12.9
09-26	0800	1.5	16	14	15	14	16	9	15	14.1
09-26	1000	1.5	18	12	14.5	5	15	16	12.5	13.3
09-26	1200	1.5	15	10	9	11	10	13	9	11.0
09-26	1400	1.5	11	14	15	9	5	14	15	11.9
09-26	1600	1.5	13	13	15c	17	12	18	17	15.0
09-26	1800	1.5	19	15	14	11	12	17	12	14.3
09-26	2000	1.5	18	9	11	13	13	16	15	13.6
09-26	2200	1.5	16	13	15	7	11	13	12	12.4
09-30	2000	1.5	12	33	13D	1C	6C	4D	12	7.3
09-30	2100	1.5	11	10	8	10	9	11	9D	9.7
09-30	2200	1.5	8	10D	17	20	13	12	16	13.7
10-01	0000	1.5	17	37	26	32	11	8	21	21.7
10-01	0200	1.5	18	30	30	10	16	18	32	22.0
10-01	0400	1.5	25	24	16	24	20	28	13	21.4
10-01	0600	1.5	19	21	18	26	24	21	16	20.7
10-01	0800	1.5	27	29	23	24	21	29	27	25.7
10-01	1000	1.5	32	19	25	22	22	30	27	25.3
10-01	1200	1.5	32	28	31	16	21	23D	26	25.3
10-01	1400	1.5	29	25	29	29	17	21	27	25.3
10-01	1600	1.5	25	25	29	23	19	22	24	23.9
10-01	1800	1.5	24	28	35	20	18	20	24	24.1
10-01	2000	1.5	23	31	28	20	18	18	25	23.3
10-01	2200	1.5	24	36	29	16	18	18	20	23.0
10-02	0000	1.5	25	26	30	25	17	16	24	23.2
10-02	0200	1.5	23	31	28	20	18	18	25	23.3
10-02	0400	1.5	33	31	27	13	15	18	18	22.1
10-02	0600	1.5	27	27	27	15	13	27	25	22.4
10-02	0800	1.5	26	24	18	12	11	26	20	19.6
10-02	1000	1.5	24	25	22	13	20	17	20	20.1
10-02	1200	1.5	24	24	27	19	23	16	21	22.0
10-02	1400	1.5	21	28	22	16	19	15	22	20.4
10-02	1600	1.5	25	21	18	17	18	21	23	20.4

Date	Time	Insertion	#1	#2	#3	#4	#5	#6	#7	Average
		Time (min)								
10-02	1800	1.5	20	15D	21	16	18D	18	20	18.3
10-02	2000	1.5	20	30	27	16	14	17	23	21.0
10-02	2200	1.5	16	31	23	17	14	21	21	20.4
10-03	0000	1.5	20	29	22	16	16	20	21	20.6
10-03	0200	1.5	13	27	20	16	15	15	28	19.1
10-03	0400	1.5	16	28	21	17	14	16	26	19.7
10-03	0600	1.5	12	15	15	14	15	12	22	15.0
10-03	0800	1.5	5	5D	8	17D	9	14	17	10.7
10-03	1300	1.5	4D	6D	3	2	12	5	12	6.3
10-03	1400	1.5	10	7	8	16	8	14D	15	11.1
10-03	1600	1.5	16	15	18	5	15	8	19	13.7
10-03	1800	1.5	15	15	14	3	17	16	21	14.4
10-03	2000	1.5	15	15	13	15	17	15	9	14.1
10-03	2200	1.5	12	12	16	11	16	12D	11	12.9
10-04	0000	1.5	13	13	16	14	13	9	16	13.4
10-04	0200	1.5	14	14	15	13	15	12	11	13.4
10-04	0400	1.5	16	16	10	16	13	15	15	14.4
10-04	0600	1.5	16	25	19	11	13	13	12	15.6
10-04	0800	1.5	13D	19D	19	5	5	8	9	11.1
10-04	1000	1.5	12	5	4	4	11	3	13	7.4
10-04	1200	1.5	9	8D	11	15	10	3	20	10.9
10-04	1400	1.5	11	10	3	13D	10	20	11	11.1
10-04	1600	1.5	13	9D	32	9	10	18	10	14.4
10-04	1800	1.5	6	4	15	23	28	17	23	16.6
10-04	2000	1.5	14	26	41	14	21	14	10	20.0
10-04	2200	1.5	6	11	19	22	9	10	13	12.9
10-05	0000	1.5	10	14	24	11	9	10	15	13.3
10-05	0200	1.5	13	10	5	5	13	15	11	10.3
10-05	0400	1.5	13	14	8	10	11	16	2	10.6
10-05	0600	1.5	7	7	0	10	18	16	8	9.4
10-05	0800	1.5	16	3	2	8	9	3	3	6.3
10-05	1000	1.5	13	36	28	8	11D	16	11	17.6
10-05	1200	1.5	18	20	17	9	18	24	7	16.1
10-05	1400	1.5	15	20	21	6	4	8D	1	10.7
10-05	1600	1.5	2	3	0	11D	6	6	0	4.0
10-05	1800	1.5	2D	2D	10	10	15	21	6D	9.4
10-05	2000	1.5	6	1	17	29	7D	4	20	12.0
10-05	2200	1.5	3D	7	11	15	17	33	7	13.3
10-06	0000	1.5	6	8	12	14	16	21	10	12.4
10-06	0200	1.5	10	22	12	26	7	15	14	15.1
10-06	0400	1.5	15	20	11	7	10	18	13	13.4
10-06	0600	1.5	12	19	15	20	12	6	9	13.3
10-06	0800	1.5	26D	20	24	23	21	28	25	23.9
10-06	1000	1.5	27	25	29	31	31	31	31	29.3
10-06	1200	1.5	23	20	27	29	26	22	30	29.6
10-06	1400	1.5	23	7D	26D	17	8	8	13	14.6
10-06	1600	1.5	7	11	9	20	5	8D	15	10.7
10-06	1800	1.5	11	5	1	11	1	8D	3	7.1
10-06	2000	1.5	10	9	9	3D	11	16	24D	11.7
10-06	2200	1.5	13	14	9	0	5	13	14	9.7
10-07	0000	1.5	12	13	10	11	7	12	13	11.1
10-07	0200	1.5	11	9	10	12	12	14	11	11.3

Date	Time	Insertion Time (min)	#1	#2	#3	#4	#5	#6	#7	Average
10-07	0400	1.5	11	4	9	7	11	16	14	10.3
10-07	0600	1.5	12	13	12	12	8	10	12	11.3
10-07	0800	1.5	2	1	19D	11D	1	0	4	5.4
10-07	1000	1.5	4.5D	3	3	2.5D	3	5	7	4.0
10-07	1200	1.5	12	9	7D	3D	12	12D	5	8.6
10-07	1400	1.5	3	3	1	2	13D	16	4	6.0
10-07	1600	1.5	14	9	9	7	22	7	8	10.9
10-07	1800	1.5	11	13	18	19	12	14	17	14.9
10-07	2000	1.5	12	11C	16	25	29	11	12D	16.6
10-07	2200	1.5	25	26	27	24	10	25	16	21.9
10-08	0000	1.5	15	16	7	13	18	13	15	13.9
10-08	0200	1.5	8	3	3	7	3	10	8	6.0
10-08	0400	1.5	5	11	13	15	6	3	12	9.3
10-08	0600	1.5	6	8	9	5	10	9	8	7.9
10-08	0800	1.5	8	7	6D	3	2.5	3	1.5	4.4
10-08	1000	1.5	15	7D	5	6	7	3	4	6.7
10-08	1200	1.5	2D	12	6D	2D	2D	1D	1D	3.7
10-08	1400	1.5	6	3	9	8D	3D	4D	10	6.1
10-08	1600	1.5	5	8	8D	26	15	8	11	11.6
10-08	1800	1.5	3	19	37	15	3	3	22	14.6
10-08	2000	1.5	9D	9D	20	15	21	31	18	17.6
10-08	2200	1.5	7D	11	6	14	16	17	15	12.3
10-09	0000	1.5	30	28	29	21	15	18	28	24.1
10-09	0200	1.5	23	21	26	26	22	19	21	22.6
10-09	0400	1.5	6	5D	0	13	11	19	0	7.7
10-09	0600	1.5	8	8	13	12	6	5	7	8.4
10-09	0800	1.5	11	7	7	16	11	16	4	10.3
10-09	1000	1.5	9	6	8	13	25	13	12	12.3
10-09	1200	1.5	21	20	5D	11	12	14	6D	12.7
10-09	1400	1.5	8	17	7	8	8	13	16	11.0
10-09	1600	1.5	23	24	27	11	23	15	23	20.9
10-09	1800	1.5	10	13	13	26	19	19	29	18.4
10-09	2000	1.5	18	19	24	10	17	7	17	16.0
10-09	2200	1.5	22	13	19	23	25	18	25	20.7
10-10	0000	1.5	17	23	28	12	13	25	7	17.9
10-10	0200	1.5	9	21	22	23	13	17	31	19.4
10-10	0400	1.5	25	23	30	26	15	21	30	24.3
10-10	0600	1.5	12	18	29	19	14	14	35	20.1
10-10	0800	1.5	20	19	27	14	15	17	14	18.0
10-10	1000	1.5	13	12	13	6	7D	10	16	11.0
10-10	1200	1.5	10D	7	3	7	10	10	9	8.0
10-10	1400	1.5	15	11	13	12	11	5	10	11.0
10-10	1600	1.5	9	9	11	12	12	9	13	10.7
10-10	1800	1.5	10	11	10	15	14	9	10	11.2
10-10	2000	1.5	14	14	13	12	14	15	14	13.7
10-10	2200	1.5	5	11	12	15	12	11	13	11.3
10-11	0000	1.5	17	23	28	12	13	25	7	17.9
10-11	0200	1.5	9	21	22	23	13	17	31	19.4
10-11	0400	1.5	25	23	30	26	15	21	30	24.3
10-11	0600	1.5	12	18	29	19	14	14	35	24.3
10-11	0800	1.5	20	19	27	14	15	17	14	18.0
10-11	1000	1.5	13	12	13	6	7D	10	16	11.0

Date	Time	Insertion Time (min)	#1	#2	#3	#4	#5	#6	#7	Average
10-11	1200	1.5	10D	7	3	7	10	10	9	8.0
10-11	1400	1.5	15	11	13	12	11	5	10	11.0
10-11	1600	1.5	9	9	11	12	12	9	13	10.7
10-11	1800	1.5	10	11	10	15	14	9	10	11.2
10-11	2000	1.5	14	14	13	12	14	15	14	13.7
10-11	2200	1.5	5	11	12	15	12	11	13	11.3
10-12	0000	1.5	4	11	12	6	9	15	12	9.9
10-12	0200	1.5	14	15	13	14	11	10	13	12.9
10-12	0400	1.5	11	7	11	11	12	10	10	10.3
10-12	0600	1.5	16	6	14	8	9	15	11	11.3
10-12	0800	1.5	10	13	16	11	13D	11D	15	12.7
10-12	1000	1.5	8	13	8	12	9	14	12	10.9
10-12	1200	1.5	11	11	4D	14	15	15	14	12.0
10-12	1400	1.5	17	14	17	13	15	16	20	16.0
10-12	1600	1.5	12	15	17	13	13	8	12	12.9
10-12	1800	1.5	18	9	13	16	12	15	15	14.7
10-12	2000	1.5	18	18	22	9	3	8	16	13.4
10-12	2200	1.5	12	14	20	16	17	20	13	16.0
10-13	0000	1.5	17	16	16	15	10	13	15	14.6
10-13	0200	1.5	15	16	19	15	11	12	11	14.1
10-13	0400	1.5	14	17	14	16	14	16	20	15.9
10-13	0600	1.5	15	16	15	14	15	13	19	15.3

END OF BOM/FGT 008 ELKHORN BITUMINOUS

TABLE I-3

OPERATOR LOGGED DATA I

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0913	0930	6.0	7.5	20176		-2.42	6.5	30+	5.1	03
0913	1030	6.0	16.0	20185	900	-2.42	6.5	12.5	1.7	18
0913	1130	6.0	16.0	20194	900	-2.42	6.5	13.5	1.0	10
0913	1230	6.0	16.0	20203	900	-2.42	6.8	13.9		10
0913	1330	6.0	16.0	20213	1000	-2.42	7.5			01
0913	1430	6.0	16.0	20222	900	-2.42	7.5			
0913	1530	6.0	20.0	20232	1000	-2.42	7.5	13.0		12
0913	1630	6.0	20.0	20243	1100	-2.42	7.0	13.0	1.0	18
0913	1730	LOST POWER WORKING ON LIMIT SWITCH.								
0913	1830	6.0	20.0	20266	2300	4.0	7.5	12.0	1.0	20
0913	1930	6.0	20.0	20277	1100	2.42	7.0	13.0		16
0913	2030	6.0	20.0	20289	1200	2.42	7.0	12.0	3.0	24
0913	2130	6.0	20.0	20301	1200	2.42	7.0	12.5	1.0	20
0913	2230	6.0	20.0	20312	1100	2.42	7.0	13.0	0	14
0913	2330	6.0	20.0	20322	1000	2.42	12.0	12.0		6
0914	0030	6.0	20.0	20336	1400	2.42	12.0	12.0		15
0914	0130	6.0	20.0	20346	1000	2.42	12.0	12.0	1.0	15
0914	0230	6.0	20.0	20356	1000	2.42	12.0	12.0	3.0	20
0914	0330	6.0	20.0	20369	1300	2.42	12.0	12.0	3.0	22
0914	0430	6.0	20.0	20379	1000	2.42	12.0	12.0	3.0	22
0914	0530	6.0	20.0	20390	1100	2.42	12.0	12.0	3.0	22
0914	0630	6.0	20.0	20405	1500	2.42	12.0	12.0	3.0	22
0914	0730	6.0	20.0	20417	1200	5.2	12.5	12.1	7.0	32
0914	0830	6.0	20.0	20428	1100	5.1	12.5	12.5	5.4	28
0914	0930	6.0	20.0	20440	1200	-2.42	12.7	12.7	2.7	22
0914	1030	6.0	20.0	20452	1200	-2.42	12.4	13.1	1.4	18
0914	1130	6.0	20.0	20464	1200	-2.42	21.2	21.0	1.0	02
0914	1230	6.0	23.0	20476	1200	-2.42	12.0	13.0		15
0914	1330	6.0	23.0	20489	1300	-2.42	12.8	12.6	1.5	18
0914	1430	6.0	23.0	20503	1400	3.0	13.0	12.7	2.6	22
0914	1530	6.0	22.0	20515	1200	3.0	12.5	12.0	3.0	20
0914	1630	6.0	22.0	20528	1300	3.0	12.5	12.0	4.0	24
0914	1730	6.0	22.0	20541	1300	4.0	13.0	12.0	6.0	30
0914	1830	6.0	22.0	20554	1300	5.0	13.0	12.0	7.0	32
0914	1930	6.0	22.0	20566	1200	5.0	12.5	12.0	6.0	30
0914	2030	6.0	22.0	20579	1300	5.0	12.5	12.0	6.0	30
0914	2130	6.0	22.0	20591	1200	5.0	13.0	12.5	5.0	26
0914	2230	6.0	22.0	20604	1300	5.0	12.5	12.0	4.0	26
0914	2330	6.0	22.0	20617	1300	2.42	12.0	12.0		10
0915	0030	6.0	22.0	20630	1300	2.42	12.0	12.0		10
0915	0130	6.0	22.0	20644	1400	2.42	12.0	12.0	1.0	15
0915	0230	6.0	22.0	20655	1100	2.42	12.0	12.0	2.0	20
0915	0330	6.0	22.0	20667	1200	2.42	12.0	12.0	3.0	20
0915	0430	6.0	22.0	20680	1300	2.42	12.0	12.0	5.0	26
0915	0530	6.0	22.0	20693	1300	2.42	12.0	12.0	5.0	26
0915	0630	6.0	22.0	20705	1200	5.0	12.0	12.0	6.0	30
0915	0730	6.0	21.5	20717	1200	5.1	12.9	12.2	7.1	32

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0915	0830	6.0	21.5	20730	1300	5.1	12.9	12.0	6.6	32
0915	0930	6.0	21.0	20743	1300	5.0	12.9	12.0	5.5	28
0915	1030	6.0	21.0	20754	1100	4.5	12.5	12.5	3.0	21
0915	1130	6.0	21.5	20767	1300	-2.42	13.0	13.0	1.0	13
0915	1230	6.0	22.0	20780	1300	-2.42	12.9	13.0	1.0	13
0915	1330	6.0	24.0	20794	1400	-2.42	12.9	13.0	2.0	17
0915	1430	6.0	24.0	20809	1500	-2.42	13.0	12.9	1.2	18
0915	1530	6.0	22.0	20821	1200	-2.42	12.5	12.5		14
0915	1630	6.0	22.0	20834	1300	-2.42	12.5	12.0	1.0	20
0915	1730	6.0	22.0	20847	1300	3.0	13.0	13.0	2.0	22
0915	1830	6.0	22.0	20860	1300	3.5	12.5	12.0	5.0	26
0915	1930	6.0	22.0	20873	1300	4.0	12.5	12.0	5.0	30
0915	2030	6.0	22.0	20886	1300	4.0	13.0	12.0	6.0	30
0915	2130	6.0	22.0	20899	1300	4.0	12.5	12.0	5.0	30
0915	2230	6.0	22.0	20912	1300	4.5	12.5	12.0	7.0	32
0915	2330	6.0	22.0	20922	1000	5.0	12.5	12.0	7.0	22
0916	0030	6.0	22.0	20936	1400	5.0	12.5	12.0	7.5	35
0916	0130	6.0	22.0	20950	1400	5.0	12.5	12.0	7.5	35
0916	0230	6.0	22.0	20963	1300	5.0	13.0	12.0	7.5	35
0916	0330	6.0	22.0	20975	1200	5.0	12.5	12.0	7.0	30
0916	0430	6.0	22.0	20989	1400	5.0	12.5	12.0	7.0	30
0916	0530	6.0	22.0	21001	1200	5.0	13.0	12.0	8.0	30
0916	0630	6.0	22.0	21013	1200	5.0	13.0	12.0	8.0	35
0916	0730	6.0	22.0	21028	1500	5.2	12.5	11.9	8.0	37
0916	0830	6.0	22.5	21041	1300	5.0	13.0	12.0	9.0	36
0916	0930	6.0	21.0	21053	1200	5.8	12.9	12.2	8.5	38
0916	1030	6.0	19.0	21064	1100	5.8	12.5	12.0	8.0	37
0916	1130	6.0	19.0	21075	1100	5.9	12.5	12.0	7.0	34
0916	1230	6.0	22.5	21088	1300	5.9	12.5	11.8	9.3	43
0916	1330	6.0	18.5	21099	1100	6.2	12.9	12.3	8.8	40
0916	1430	6.0	18.5	21110	1100	6.2	12.9	12.2	8.9	40
0916	1530	6.0	18.0	21120	1000	6.0	13.0	12.5	8.0	34
0916	1630	6.0	18.0	21131	1100	6.0	13.0	12.5	8.0	34
0916	1730	6.0	18.0	21141	1000	6.0	13.0	12.0	7.0	32
0916	1830	6.0	18.0	21152	1100	6.5	13.0	12.5	8.0	36
0916	1930	6.0	18.0	21162	1000	6.0	12.5	12.0	8.0	38
0916	2030	6.0	18.0	21173	1100	6.0	12.5	12.0	8.0	36
0916	2130	6.0	18.0	21183	1000	6.0	12.7	12.0	8.0	36
0916	2230	6.0	18.0	21194	1100	6.0	12.5	12.0	7.5	36
0916	2330	6.0	18.5	21204	1000	6.0	12.5	12.0	8.0	35
0917	0030	6.0	18.5	21215	1100	6.0	13.0	12.0	8.5	35
0917	0130	6.0	18.5	21225	1000	6.0	13.0	12.0	8.5	35
0917	0230	6.0	18.5	21236	1100	6.0	13.0	12.0	8.5	35
0917	0330	6.0	18.5	21246	1000	6.0	12.5	12.0	8.5	35
0917	0430	6.0	18.5	21257	1100	6.0	13.0	12.0	9.0	40
0917	0530	6.0	18.5	21267	1000	6.0	13.0	12.0	9.0	40
0917	0630	6.0	18.5	21277	1000	6.0	13.0	12.0	9.0	40
0917	0730	6.0	18.5	21289	1200	5.9	12.5	12.0	8.9	41
0917	0830	6.0	18.5	21300	1100	6.1	12.4	12.0	9.0	42
0917	0930	6.0	18.5	21309	900	6.2	12.6	12.0	9.5	44

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0917	1030	6.0	20.0	21321	1200	6.5	12.5	11.9	10.8	75
0917	1130	6.0	20.0	21332	1100	7.0	12.5	12.0	11.0	84
0917	1230	6.0	22.0	21342	1000	6.9	12.7	12.1	10.5	52
0917	1330	6.0	18.0	21351	900	7.0	12.5	12.0	10.5	50
0917	1430	6.0	18.0	21361	1000	6.8	12.8	12.0	10.9	50
0917	1530	6.0	18.0	21371	1000	7.0	12.5	12.0	11.0	66
0917	1630	6.0	18.0	21381	1000	7.0	12.5	12.0	10.5	60
0917	1730	6.0	18.0	21392	1100	7.0	13.0	12.5	9.0	40
0917	1830	6.0	18.0	21402	1000	7.0	13.0	12.5	8.5	36
0917	1930	6.0	18.0	21412	1000	7.0	12.5	12.5	8.0	36
0917	2030	6.0	18.0	21423	1100	7.0	13.0	12.5	9.0	40
0917	2130	6.0	18.0	21432	900	7.0	12.5	12.0	10.0	46
0917	2230	6.0	18.0	21443	1100	7.0	13.0	12.0	10.0	46
0917	2330	6.0	18.0	21452	900	7.0	13.0	12.0	9.5	40
0918	0030	6.0	18.0	21463	100	7.0	13.0	12.0	9.0	35
0918	0130	6.0	18.0	21473	1000	7.0	12.5	12.0	8.5	35
0918	0230	6.0	18.0	21482	900	7.0	13.0	12.5	9.0	40
0918	0330	6.0	18.0	21494	1200	7.0	13.0	12.5	9.5	40
0918	0430	6.0	18.0	21502	800	7.0	13.0	12.0	9.5	45
0918	0530	6.0	18.0	21517	1500	7.0	12.5	12.0	10.0	50
0918	0630	6.0	18.0	21523	600	7.0	12.5	12.0	10.0	54
0918	0730	6.0	18.0	21535	1200	6.9	12.7	12.1	10.4	54
0918	0830	6.0+	18.0	21545	1000	6.9	12.6	12.0	10.2	50
0918	0930	6.0+	18.0	21554	900	6.9	12.8	12.1	10.4	52
0918	1030	6.0+	18.0	21565	1100	7.0	12.5	12.0	11.0	70
0918	1130	6.0+	18.0	21574	900	7.0	12.8	12.1	10.8	58
0918	1230	6.0+	12.0	21582	800	7.0	12.5	12.0	10.8	61
0918	1330	6.0+	9.0	21587	500	6.9	12.5	12.0	10.0	48
0918	1430	6.0+	9.0	21592	500	7.0	12.7	12.2	9.2	42
0918	1530	6.0	9.0	21597	500	7.0	12.5	12.0	9.0	40
0918	1630	6.0	9.0	21602	500	7.0	13.0	12.5	8.0	36
0918	1730	6.0	9.0	21607	500	7.0	13.0	12.5	7.5	32
0918	1830	6.0	9.0	21612	500	7.0	12.5	12.5	8.0	34
0918	1930	6.0	9.0	21617	500	7.0	12.5	12.5	8.0	34
0918	2030	6.0	9.0	21622	500	7.0	12.5	12.0	9.0	32
0918	2130	6.0	9.0	21627	500	7.0	13.0	12.5	9.5	44
0918	2230	6.0	9.0	21632	500	7.0	13.0	12.0	9.5	46
0918	2330	6.0	9.0	21636	400	7.0	13.0	12.0	9.5	40
0919	0030	6.0	9.0	21641	500	7.0	12.5	12.0	9.0	40
0919	0130	6.0	9.0	21646	500	7.0	12.5	12.0	9.0	38
0919	0230	6.0	9.0	21651	500	7.0	13.0	12.0	9.0	40
0919	0330	6.0	9.0	21656	500	7.0	12.5	12.0	8.5	35
0919	0430	6.0	9.0	21661	500	7.0	12.5	12.0	9.0	40
0919	0530	6.0	9.0	21667	600	7.0	12.5	12.0	9.0	44
0919	0630	6.0	9.0	21672	500	7.0	12.5	12.0	9.5	42
0919	0730	6.0	9.0	21677	500	6.8	12.5	12.0	8.6	40
0919	0830	6.0	8.0	21682	500	6.9	12.5	12.1	9.0	41
0919	0930	6.0	8.0	21686	400	6.7	12.9	12.4	8.1	34
0919	1030	6.0	8.0	21690	400	6.7	12.5	12.3	8.0	34
0919	1130	6.0+	8.0	21694	400	6.8	12.5	12.2	8.1	35

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0919	1230	6.0+	7.0	21698	400	6.8	12.5	12.0	9.5	41
0919	1330	6.0+	7.0	21702	400	6.8	12.8	12.4	8.8	38
0919	1430	6.0+	7.0	21706	400	6.8	12.5	11.9	9.9	50
0919	1530	6.0	8.0	21710	400	7.0	12.0	12.0	10.0	46
0919	1630	6.0	8.0	21714	400	7.0	12.5	12.0	9.0	40
0919	1730	6.0	8.0	21719	500	7.0	12.5	12.0	10.0	48
0919	1830	6.0	8.0	21723	400	7.0	12.5	12.0	11.0	87
0919	1930	6.0	7.0	21728	500	7.0	12.5	12.0	11.0	65
0919	2030	6.0	10.0	21733	500	7.0	12.5	12.0	10.0	52
0919	2130	6.0	10.0	21739	600	7.0	12.5	12.0	10.5	56
0919	2230	6.0	10.0	21744	500	7.0	12.5	12.0	10.0	52
0919	2330	6.0	10.0	21750	600	7.0	12.0	12.0	10.5	58
0920	0030	6.0	10.0	21755	500	7.0	12.5	12.0	11.0	70
0920	0130	6.0	9.5	21762	700	7.0	12.5	12.0	11.0	100
0920	0230	6.0	8.0	21766	400	7.0	12.5	12.0	11.0	100
0920	0330	6.0	7.5	21770	400	7.0	12.5	12.0	11.0	100
0920	0430	6.0	7.0	21774	400	7.0	12.5	12.0	11.5	100
0920	0530	6.0	7.0	21778	400	7.0	12.5	12.0	11.5	100
0920	0630	6.0	6.0	21781	300	7.0	12.5	12.0	11.0	100
0920	0730	6.0	6.0	21785	400	7.1	12.6	12.0	11.4	100
0920	0830	6.0	4.0	21787	200	7.1	12.5	12.1	11.4	100
0920	0930	6.0	5.0	21790	300	7.3	14.3	14.1	12.6	80
0920	1030	6.0	5.0	21793	300	7.5	14.5	14.1	12.7	87
0920	1130	6.0	8.0	21797	400	8.4	15.5	15.5	13.8	76
0920	1230	6.0	5.0	21800	300	7.8	24.8	24.4	24.8	30
0920	1330	6.0	5.0	21802	200	7.2	23.2	22.9	13.0	28
0920	1430	6.0	5.0	21804	200	7.3	18.8	18.5	15.9	50
0920	1530	6.0	4.5	21807	300	8.5	20.5	21.0	20.0	94
0920	1630	6.0	10.0	21811	400	5.0			8.0	14
0920	1730	6.0	16.0	21819	800					
0920	1830	6.0	23.0	21830	1100	-2.42				
0920	1930	6.0	26.0	21844	1400	-2.42	17.0	19.0	1.0	16
0920	2030	6.0	22.0	21859	1500	6.0	14.0	16.0	10.0	42
0920	2130	6.0	13.0	21870	1100	7.0	14.0	16.0	12.5	100
0920	2230	6.0	10.0	21875	500	7.5	14.5	16.5	12.0	62
0920	2330	6.0	10.0	21881	600	7.5	145	16.5	12.5	100
0921	0030	6.0	10.0	21887	600	7.5	15.0	16.5	12.0	56
0921	0130	6.0	10.0	21893	600	7.5	14.0	16.0	11.0	48
0921	0230	6.0	10.0	21898	500	7.5	14.5	16.5	12.5	100
0921	0330	6.0	10.0	21904	600	7.5	14.0	16.0	12.5	100
0921	0430	6.0	8.0	21908	400	7.5	14.5	16.5	12.5	76
0921	0530	6.0	10.0	21913	800	5.5	15.5	17.5	6.0	26
0921	0630	6.0	10.0	21921	800	5.5	15.5	17.5	6.0	26
0921	0730	6.0	12.0	21926	500	7.0	14.0	16.0	11.9	90
0921	0830	6.0	8.0	21930	400	7.2	14.5	16.5	12.5	97
0921	0930	6.0	5.0	21934	400	7.2	14.5	16.5	12.5	100
0921	1030	6.0	5.0	21936	200	7.2	14.5	16.2	12.2	86
0921	1130	6.0	8.0	21940	400	6.5	15.0	16.2	9.2	34
0921	1230	6.2	9.8	21944	400	6.0	15.5	18.0	7.2	27
0921	1330	6.0	11.0	21950	600	6.4	15.0	17.1	9.1	32

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0921	1430	6.0	11.0	21956	600	6.5	14.2	16.0	10.2	46
0921	1530	6.0	5.0	21959	300	7.5	14.0	16.0	10.2	46
0921	1630	6.0	5.0	21962	300	8.0	17.0	19.0	14.0	60
0921	1730	6.0	5.0	21965	300	8.0	17.0	19.0	8.5	30
0921	1830	6.0	5.0	21967	200	4.0	17.5	22.0	4.0	24
0921	1930	6.0	5.0	21969	200	5.0	15.0	17.0	6.0	28
0921	2030	6.0	5.0	21972	300	5.0	16.0	19.0	6.0	28
0921	2130	6.0	5.0	21974	200	3.0	18.0	22.0	4.0	20
0921	2230	6.0	5.0	21977	300	3.0	14.0	17.0	4.0	24
0921	2330	6.0	5.0	21979	200	3.0	15.0	17.0	4.0	24
0922	0030	6.0	5.0	21981	200	2.5	16.0	16.5	3.5	22
0922	0130	6.0	5.0	21984	300	2.4	16.5	25.0	3.0	19
0922	0230	6.1		21986	200	1.0			1.5	CLOSED
0922	0330	6.2	5.8	21989	300	5.0	15.0	16.5	7.0	29
0922	0430	6.2	5.8	21992	300	4.9	15.0	16.5	1.5	44
0922	0530	6.1	5.8	21995	300	3.5	15.5	17.4	4.7	24
0922	0630	6.3	8.0	21999	400	5.2	15.5	17.1	7.5	29
0922	0730	6.2	8.0	22003	400	6.0	14.2	16.0	8.5	36
0922	0830	6.3	8.0	22007	400	6.8	14.5	16.0	9.5	38
0922	0930	6.3	8.0	22011	400	6.8	14.5	16.2	9.5	40
0922	1030	6.4	5.0	22018	700	4.1	22.5	24.5	21.0	90
0922	1130	6.3	9.0	22022	400	8.1	24.4	25.5	15.6	36
0922	1230	6.3	9.0	22027	500	8.2	25.2	27.6	15.6	32
0922	1330	6.3	7.0	22034	700	8.0	26.5	28.0	17.8	36
0922	1430	6.3	7.0	22036	200	7.8	27.0	29.0	13.6	30
0922	1530	6.0	8.0	22040	400	7.5	30.0	30.0	13.0	26
0922	1630	6.0	8.0	22045	400	7.5	30.0	30.0+	15.0	26
0922	1730	6.0	8.0	22050	500	7.0	28.0	28.5	13.0	28
0922	1830	6.0	8.0	22054	400	7.0	30.0	30.0+	13.0	26
0922	1930	6.0	8.0	22059	500	7.0	30.0+	30.0+	12.0	26
0922	2030	6.0	8.0	22064	500	7.0	30.0+	30.0+	12.5	26
0922	2130	6.0	8.0	22068	400	7.0	30.0+	30.0+	12.0	26
0922	2230	6.0	8.0	22073	500	7.0	30.0+	30.0+	12.0	28
0922	2330	6.0	9.0	22078	500	7.0	28.0	30.0+	12.0	28
0923	0030	6.5	9.0	22083	500	7.0	28.0	30.0+	13.0	30
0923	0130	6.25	9.0	22088	500	7.0	28.0	30.0+	12.0	28
0923	0230	6.5	9.0	22092	400	6.5	27.0	30.0+	16.0	30
0923	0330	6.3	9.0	22097	500	6.0	27.0	30.0+	16.0	30
0923	0430	6.5	9.0	22101	400	7.0	30.0	30.0+	11.0	28
0923	0530	6.3	9.0	22107	600	7.0	30.0	30.0+	11.0	28
0923	0630	6.5	9.0	22111	400	7.0	30.0	30.0+	11.0	28
0923	0730	6.3	9.0	22116	500	6.8	30.0+	30.0+	11.9	26
0923	0830	6.6	13.0	22121	500	4.1	30.0+	30.0+	6.0	21
0923	0930	6.3	13.0	22128	700	5.0	30.0+	30.0+	8.6	22
0923	1030	6.2	13.0	22135	700	5.0	24.0	25.9	7.2	26
0923	1130	6.2	13.0	22143	800	5.0	30.0+	30.0+	7.0	24
0923	1230	6.2	11.0	22149	600	6.7	30.0+	30.0+	8.9	23
0923	1330	6.3	11.0	22155	600	3.6	30.0+	30.0+	5.0	20
0923	1430	6.4	11.0	22161	600	2.9	30.0+	30.0+	5.0	20
0923	1530	6.0	7.0	22167	600	-2.42	30.0+	30.0+	1.0	12

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0923	1630	6.0	7.0	22171	400	-2.42	30.0+	30.0+	1.0	14
0923	1730	6.0	7.0	22174	300	-2.42	30.0+	30.0+	1.0	14
0923	1830	6.0	7.0	22178	400	-2.42	30.0+	30.0+	1.0	14
0923	1930	6.0	10.0	22182	400	4.0	30.0+	30.0+	7.0	20
0923	2030	6.0	10.0	22188	600	3.0	30.0+	30.0+	5.0	20
0923	2130	6.0	10.0	22194	600	3.0	26.5	29.0	7.0	22
0923	2230	6.0	10.0	22199	500	5.0	26.0	29.0	8.5	24
0923	2330	6.0	12.5	22206	700	3.0	30.0+	30.0+	6.0	20
0924	0030	6.0	13.0	22211	500	4.5	29.0	30.0+	7.7	22
0924	0130	6.0	13.0	22219	800	4.5	29.0	30.0+	7.5	22
0924	0230	6.0	13.0	22227	800	4.8	27.5	29.0	7.5	24
0924	0330	6.0	13.0	22234	700	4.8	29.0	30.0	6.4	22
0924	0430	6.0	13.0	22242	800	4.9	30.0	30.0+	6.4	22
0924	0530	6.0	13.0	22249	700	4.8	30.0	30.0+	6.4	22
0924	0630	6.0	13.0	22257	800	4.8	30.0	30.0+	6.4	22
0924	0730	6.3	13.0	22264	700	4.3	30.0+	30.0+	5.5	22
0924	0830	6.3	17.5	22271	700	3.8	27.5	28.8	8.0	24
0924	0930	6.3	17.5	22280	900	6.2	24.5	26.1	11.2	28
0924	1030	6.3	17.5	22290	1000	6.9	20.5	22.0	13.2	36
0924	1130	6.3	14.0	22299	900	7.8	21.0	22.7	13.4	34
0924	1230	6.3	13.5	22308	900	7.5	21.6	23.2	12.9	33
0924	1330	6.3	12.0	22314	600	6.8	24.0	25.2	11.3	30
0924	1430	6.3	10.0	22320	600	6.5	25.6	27.2	11.0	27
0924	1530	6.0	10.0	22325	500	6.0	28.5	30.0	9.5	26
0924	1630	6.0	6.0	22330	500	-2.42	30.0+	30.0+	1.0	12
0924	1730	6.0	6.0	22333	300	-2.42	30.0+	30.0+	2.0	14
0924	1830	6.0	6.0	22336	300	-2.42	30.0+	30.0+	1.0	12
0924	1930	6.0	6.0	22340	400	-2.42	30.0+	30.0+		12
0924	2030	6.0	6.0	22343	300	-2.42	30.0+	30.0+		12
0924	2130	6.0	12.0	22348	500	-2.42	30.0+	30.0+	3.5	18
0924	2230	6.0	12.0	22355	700	-2.42	30.0+	30.0+	3.0	18
0924	2330	6.0	13.0	22362	700	2.42	30.0+	30.0+	4.0	20
0925	0030	6.0	13.0	22369	700	2.42	30.0+	30.0+	4.0	20
0925	0130	6.0	13.0	22375	600	2.42	30.0+	30.0+	4.0	20
0925	0230	6.0	13.0	22382	700	2.42	30.0+	30.0+	4.0	20
0925	0330	6.0	13.0	22389	700	2.42	30.0+	30.0+	4.0	20
0925	0430	6.0	12.0	22396	700	2.42	30.0+	30.0+	4.0	18
0925	0530	6.0	13.0	22403	700	2.42	30.0+	30.0+	4.0	20
0925	0630	6.0	13.0	22409	600	2.42	30.0+	30.0+	4.0	20
0925	0730	6.0	13.0	22416	700	2.43	30.0+	30.0+	4.5	19
0925	0830	6.0	13.0	22422	600	2.42	30.0+	30.0+	4.0	20
0925	0930	6.0	12.0	22429	700	3.5	30.0+	30.0+	4.5	20
0925	1030	6.0	10.0	22436	700	-2.42	30.0+	30.0+	3.5	20
0925	1130	6.0	10.0	22441	500	-2.42	30.0+	30.0+	2.1	16
0925	1230	6.0	10.0	22447	600	-2.42	30.0+	30.0+	2.7	16
0925	1330	6.0	10.0	22452	500	-2.42	30.0+	30.0+	3.0	18
0925	1430	6.0	10.0	22458	600	-2.42	30.0+	30.0+	3.0	18
0925	1530	6.0	10.0	22464	600	-2.42	30.0+	30.0+	3.5	18
0925	1630	6.0	10.0	22470	600	2.42	30.0+	30.0+	4.0	20
0925	1730	6.0	10.0	22475	500	2.42	30.0+	30.0+	4.0	18

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0925	1830	6.0	10.0	22481	600	-2.42	30.0+	30.0+	3.0	16
0925	1930	6.0	10.0	22486	500	2.42	30.0+	30.0+	4.0	18
0925	2030	6.0	10.0	22492	600	2.42	30.0+	30.0+	4.0	18
0925	2130	6.0	10.0	22497	500	2.42	30.0+	30.0+	4.0	18
0925	2230	6.0	10.0	22503	600	2.42	30.0+	30.0+	4.0	20
0925	2330	6.0	11.0	22508	500	2.42	30.0+	30.0+	4.5	20
0926	0030	6.0	11.0	22514	600	2.42	30.0+	30.0+	4.5	20
0926	0130	6.0	10.5	22520	600	2.42	30.0+	30.0+	4.5	20
0926	0230	6.0	10.0	22526	600	2.42	30.0+	30.0+	4.5	20
0926	0330	6.0	10.0	22531	500	2.42	29.0	30.0+	4.5	20
0926	0430	6.0	11.0	22538	700	2.42	30.0+	30.0+	4.5	20
0926	0530	6.0	11.0	22543	500	2.42	30.0+	30.0+	4.5	20
0926	0630	6.0	10.0	22547	400	2.42	30.0+	30.0+	4.5	20
0926	0730	6.0	11.0	22552	500	2.42	30.0+	30.0+	4.5	20
0926	0830	6.0	10.0	22559	700	3.0	30.0+	30.0+	4.0	21
0926	0930	6.0	10.0	22564	500	3.0	30.0+	30.0+	4.6	20
0926	1030	6.0	10.0	22570	600	-2.42	30.0+	30.0+	4.0	17
0926	1130	6.0	10.0	22576	600	-2.42	30.0+	30.0+	4.0	18
0926	1230	6.0	8.0	22581	500	3.2	30.0+	30.0+	4.0	16
0926	1330	6.0	8.0	22585	400	-2.42	30.0+	30.0+	2.6	16
0926	1430	6.0	8.0	22589	400	-2.42	30.0+	30.0+	4.0	18
0926	1530	6.0	10.0	22594	500	-2.42	30.0+	30.0+	4.0	16
0926	1630	6.0	10.0	22600	600	-2.42	30.0+	30.0+	4.0	16
0926	1730	6.0	10.0	22605	500	2.42	30.0+	30.0+	4.5	18
0926	1830	6.0	10.0	22610	500	2.42	30.0+	30.0+	4.5	18
0926	1930	6.0	10.0	22616	600	2.42	30.0+	30.0+	4.0	18
0926	2030	6.0	10.0	22621	500	2.42	30.0+	30.0+	4.0	18
0926	2130	6.0	10.0	22627	600	2.42	30.0+	30.0+	4.0	20
0926	2230	6.0	10.0	22632	500	2.42	30.0+	30.0+	3.5	16
0926	2330	6.0	10.0	22638	600	2.42	30.0+	30.0+	4.5	20
0927	0030	6.0	10.0	22643	500	2.42	30.0+	30.0+	4.5	20
0927	0130	6.0	10.0	22649	600	2.42	30.0+	30.0+	4.5	20
0927	0230	6.0	10.0	22654	600	2.42	30.0+	30.0+	4.5	20
0927	0330	6.0	10.0	22659	500	2.42	30.0+	30.0+	4.5	20
0927	0430	6.0	10.0	22665	600	2.42	30.0+	30.0+	4.5	20
0927	0530	6.0	10.0	22671	600	2.42	30.0+	30.0+	4.5	20
0927	0630	6.0	10.0	22676	500	2.42	30.0+	30.0+	4.5	20
0927	0730	6.3	10.0	22682	600	3.0	30.0+	30.0+	4.5	20
0927	0830	6.3	10.0	22687	500	3.0	30.0+	30.0+	4.4	18
0927	0930	6.3	10.0	22692	500	2.42	30.0+	30.0+	3.8	20
0927	1030	6.3	10.0	22698	600	-2.42	30.0+	30.0+	3.6	20
0927	1130	6.3	10.0	22703	500	3.0	30.0+	30.0+	4.5	20
0927	1230	6.3	10.0	22709	600	-2.42	30.0+	30.0+	4.4	20
0927	1330	6.0	10.0	22714	500	3.0	30.0+	30.0+	4.6	20
0927	1430	6.0	10.0	22719	500	-2.42	30.0+	30.0+	4.3	18
0927	1530	6.0	10.0	22725	600	2.42	30.0+	30.0+	4.0	16
0927	1630	6.0	10.0	22730	500	-2.42	30.0+	30.0+	4.0	16
0927	1730	6.0	10.0	22736	600	2.42	30.0+	30.0+	4.0	18
0927	1830	6.0	10.0	22741	500	2.42	30.0+	30.0+	4.0	18
0927	1930	6.0	10.0	22747	600	2.42	30.0+	30.0+	3.5	18

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
0927	2030	6.0	10.0	22752	500	2.42	28.5	29.5	4.0	20
0927	2130	6.0	10.0	22757	500	2.42	30.0+	30.0+	4.0	18
0927	2230	6.0	10.0	22764	700	-2.42	30.0+	30.0+	3.0	16
0927	2330	SHUTDOWN								
0930	2030	6.0	14.0	22868	10400	-2.42	30.0+	30.0+	1.5	12
0930	2130	6.0	14.0	22875	800	-2.42	30.0+	30.0+	1.0	
0930	2230	6.0	20.0	22886	1100	2.42	29.0	29.0	6.0	21
0930	2330	6.0	20.0	22898	1200	5.0	25.0	25.0	12.0	28
1001	0030	6.0	20.0	22910	1200	5.5	24.0	25.0	15.0	35
1001	0130	6.0	20.0	22921	1100	7.5	20.0	23.0	15.0	41
1001	0230	6.0	20.0	22933	1200	8.0	17.0	19.0	15.0	90
1001	0330	6.0	16.5	22943	1000	8.0	19.0	20.0	16.0	100
1001	0430	6.0	17.0	22952	900	8.0	23.0	25.0	15.0	35
1001	0530	6.0	17.0	22962	1000	8.0	24.0	25.0	12.0	30
1001	0630	6.0	17.0	22971	900	8.0	26.0	28.0	12.0	30
1001	0730	6.0	16.0	22980	900	6.9	27.5	27.5	11.9	28
1001	0830	6.0	16.0	22990	1000	7.0	24.3	25.5	11.9	30
1001	0930	6.0	14.0	22998	800	6.9	30.0+	30.0+	11.5	26
1001	1030	6.0	12.0	23006	800	6.8	28.5	30.0+	28.0	50
1001	1130	6.0	12.0	23012	600	5.0	30.0+	30.0+	7.5	22
1001	1230	6.0	12.0	23019	700	4.3	30.0+	30.0+	7.4	20
1001	1330	6.0	12.0	23025	600	4.0	30.0+	30.0+	7.0	18
1001	1430	6.0	12.0	23032	700	4.0	29.5	30.0+	6.0	22
1001	1530	6.0	12.0	23039	700	4.0	30.0+	30.0+	7.0	20
1001	1630	6.0	12.0	23045	600	3.5	30.0+	30.0+	7.0	20
1001	1730	6.0	12.0	23052	700	3.0	30.0+	30.0+	7.0	20
1001	1830	6.0	12.0	23058	600	3.5	30.0+	30.0+	7.0	20
1001	1930	6.0	12.0	23065	700	3.0	30.0+	30.0+	7.0	20
1001	2030	6.0	12.0	23072	700	3.0	29.0	29.0	7.0	22
1001	2130	6.0	12.0	23078	600	3.5	29.0	29.0	6.0	22
1001	2230	6.0	12.0	23085	700	4.0	29.0	30.0+	7.0	22
1001	2330	6.0	12.0	23092	700	3.0	30.0+	30.0+	7.0	20
1002	0030	6.0	17.0	23097	500	4.0	26.0	30.0+	7.0	20
1002	0130	6.0	12.0	23105	800	4.0	30.0+	30.0+	5.0	20
1002	0230	6.0	12.0	23110	500	4.0	30.0+	30.0+	5.0	20
1002	0330	6.0	12.0	23118	800	4.0	30.0+	30.0+	7.0	20
1002	0430	6.0	12.0	23125	700	3.0	28.0	28.0	7.0	22
1002	0530	6.0	12.0	23132	700	3.0	28.0	28.0	7.0	22
1002	0630	6.0	12.0	23137	500	4.0	28.0	30.0+	7.0	22
1002	0730	6.0	12.0	23144	700	4.0	30.0+	30.0+	6.1	20
1002	0830	6.0	12.0	23151	700	3.5	30.0+	30.0+	7.5	20
1002	0930	6.0	12.0	23157	600	3.9	26.6	28.9	7.0	22
1002	1030	6.0	10.0	23163	600	2.42	30.0+	30.0+	4.1	16
1002	1130	6.0	10.0	23168	500	-2.42	30.0+	30.0+	4.0	16
1002	1230	6.0	10.0	23174	600	-2.42	30.0+	30.0+	4.1	16
1002	1330	6.0	10.0	23179	500	-2.42	30.0+	30.0+	4.0	16
1002	1430	6.0	10.0	23184	500	-2.42	30.0+	30.0+	4.1	14
1002	1530	6.0	10.0	23190	600	-2.42	30.0+	30.0+	3.0	16
1002	1630	6.0	10.0	23196	600	-2.42	30.0+	30.0+	3.0	12
1002	1730	6.0	10.0	23201	500	-2.42	30.0+	30.0+	3.0	14

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1002	1830	6.0	10.0	23206	500	-2.42	30.0+	30.0+	3.5	14
1002	1930	6.0	10.0	23212	600	-2.42	30.0+	30.0+	4.0	16
1002	2030	6.0	10.0	23217	500	-2.42	30.0+	30.0+	4.0	18
1002	2130	6.0	10.0	23223	600	-2.42	30.0+	30.0+	3.5	16
1002	2230	6.0	10.0	23228	500	-2.42	30.0+	30.0+	4.0	18
1002	2330	6.0	10.0	23234	600	1.0	30.0+	30.0+	4.0	13
1003	0030	6.0	10.0	23239	500	2.0	30.0+	30.0+	4.0	13
1003	0130	6.0	10.0	23245	600	2.0	30.0+	30.0+	4.0	13
1003	0230	6.0	10.0	23250	500	3.0	30.0+	30.0+	7.0	22
1003	0330	6.0	10.0	23256	600	3.0	30.0+	30.0+	4.5	19
1003	0430	6.0	10.0	23262	600	3.0	30.0+	30.0+	4.0	13
1003	0530	6.0	10.0	23267	500	3.0	30.0+	30.0+	4.0	6
1003	0630	6.0	10.0	23272	500	3.0	30.0+	30.0+	4.0	16
1003	0730	6.0	10.0	23277	500	-2.42	30.0+	30.0+	5.0	20
1003	0830	6.0	10.0	23283	600	2.42	29.4	30.0	5.0	20
1003	0930				SHUTDOWN					
1003	1230	6.0	10.0	23304	2100	7.0	18.0	19.5	16.0	80
1003	1330	6.0	10.0	23310	600	6.0	29.4	30.0+	8.5	26
1003	1430	6.0	10.0	23315	500	2.42	30.0+	30.0+	4.1	16
1003	1530	6.0	10.0	23320	500	-2.42	30.0+	30.0+	3.0	14
1003	1630	6.0	10.0	23326	600	-2.42	30.0+	30.0+	5.0	18
1003	1730	6.0	10.0	23332	600	-2.42	17.0	18.0	4.0	22
1003	1830	6.0	10.0	23337	500	3.0	16.0	17.5	5.0	24
1003	1930	6.0	10.0	23342	500	3.0	16.5	18.0	4.0	24
1003	2030	6.0	10.0	23348	600	3.0	15.5	17.0	4.0	22
1003	2130	6.0	10.0	23353	500	3.0	15.5	17.5	4.0	22
1003	2230	6.0	10.0	23358	500	3.0	17.0	20.0	3.0	20
1003	2330	6.0	10.0	23365	700	2.42	19.5	20.5	3.0	19
1004	0030	6.0	10.0	23373	800	2.42	20.0	21.0	3.0	20
1004	0130	6.0	10.0	23380	700	2.42	20.0	22.0	3.0	20
1004	0230	6.0	10.0	23382	200	2.42	18.5	19.0	3.0	20
1004	0330	6.0	10.0	23387	500	2.42	18.5	19.0	3.0	20
1004	0430	6.0	10.0	23392	500	2.42	18.5	20.0	3.0	20
1004	0530	6.0	10.0	23399	700	2.0	20.5	22.0	2.0	13
1004	0630	6.0	10.0	23404	700	2.0	19.5	22.0	2.0	13
1004	0730	6.0	12.0	23408	400	-2.42	19.3	22.6	1.6	10
1004	0830	6.0	12.0	23415	700	-2.42	19.0	21.2	1.9	14
1004	0930	6.0	12.0	23422	700	-2.42	17.9	20.5	1.9	16
1004	1030	6.0	12.0	23428	600	-2.42	18.1	21.7	1.9	14
1004	1130	6.0	12.0	23435	700	-2.42	16.8	18.9	1.9	16
1004	1230	6.0	12.0	23442	700	-2.42	16.5	18.9	2.0	16
1004	1330	6.0	12.0	23449	700	-2.42	16.5	18.5	1.9	16
1004	1430	6.0	12.0	23455	600	-2.42	16.1	18.1	2.5	18
1004	1530	6.0	12.0	23462	700	-2.42	17.5	19.0	3.0	18
1004	1630	6.0	12.0	23468	600	-2.42	16.5	18.5	3.0	18
1004	1730	6.0	12.0	23475	700	-2.42	16.5	18.0	3.0	20
1004	1830	6.0	12.0	23482	700	-2.42	17.0	18.0	3.0	20
1004	1930	6.0	12.0	23489	700	-2.42	17.0	19.0	3.0	20
1004	2030	6.0	12.0	23495	600	-2.42	18.0	20.0	2.0	18
1004	2130	6.0	12.0	23502	700	-2.42	17.5	19.5	2.0	18

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
1004	2230	6.0	12.0	23509	700	-2.42	17.0	18.5	2.0	18
1004	2330	6.0	12.0	23515	600	2.0	16.0	17.0	2.0	20
1005	0030	6.0	12.0	23522	700	2.0	18.0	20.0	2.0	20
1005	0130	6.0	12.0	23530	800	2.0	18.0	19.0	2.0	20
1005	0230	6.0	12.0	23537	700	2.0	18.0	19.0	2.0	20
1005	0330	6.0	12.0	23544	700	2.0	18.0	19.0	2.0	20
1005	0430	6.0	14.0	23551	700	2.0	16.0	18.0	2.0	15
1005	0530	6.0	14.0	23557	600	2.0	18.0	20.0	2.0	15
1005	0630	6.0	14.5	23565	800	2.0	18.0	20.0	2.0	20
1005	0730	6.0	14.0	23573	800	-2.42	16.5	17.5	3.1	20
1005	0830	6.0	14.0	23581	800	-2.42	17.2	19.0	3.4	20
1005	0930	6.0	14.0	23588	700	-2.42	17.5	18.1	3.0	20
1005	1030	6.0	14.0	23596	800	-2.42	16.0	17.0	3.4	22
1005	1130	6.0	14.0	23605	900	-2.42	15.0	17.1	3.8	22
1005	1230	6.0	14.0	23612	700	-2.42	17.2	19.0	3.6	21
1005	1330	6.0	14.0	23620	800	-2.42	19.7	20.0	3.0	19
1005	1430	6.0	14.0	23628	800	-2.42	18.1	20.0	3.0	18
1005	1530	6.0	14.0	23636	800	-2.42	18.0	20.0	3.5	20
1005	1630	6.0	14.0	23643	700	-2.42	16.0	18.0	3.0	20
1005	1730	6.0	14.0	23652	900	-2.42	16.5	18.0	3.0	18
1005	1830	6.0	14.0	23659	700	-2.42	16.0	17.5	4.0	22
1005	1930	6.0	14.0	23667	800	2.42	218.0	18.0	3.0	20
1005	2030	6.0	14.0	23675	800	2.42	16.5	18.0	3.0	18
1005	2130	6.0	14.0	23683	800	-2.42	19.0	22.0	2.0	16
1005	2230	6.0	14.0	23691	800	-2.42	16.0	17.5	2.0	18
1005	2330	6.0	13.0	23699	800	2.42	15.0	16.5	4.0	23
1006	0030	6.0	13.0	23708	900	2.42	16.5	18.0	5.5	23
1006	0130	6.0	14.0	23715	700	4.0	15.0	16.5	6.0	29
1006	0230	6.0	14.0	23723	800	4.0	15.5	17.0	6.0	29
1006	0330	6.0	14.0	23731	800	5.0	16.5	18.0	8.0	30
1006	0430	6.0	14.0	23739	800	5.0	15.5	17.5	8.0	30
1006	0530	6.0	14.0	23748	900	5.0	15.0	17.5	8.0	30
1006	0630	6.0	14.0	23754	600	6.0	16.5	17.5	11.0	40
1006	0730	6.0	14.0	23761	700	6.8	16.8	18.7	11.0	40
1006	0830	6.0	14.0	23770	900	6.8	15.5	16.5	9.2	36
1006	0930	6.0	14.0	23778	800	6.8	14.5	15.7	10.2	38
1006	1030	6.0	14.0	23785	700	6.8	15.0	16.6	9.1	34
1006	1130	6.0	14.0	23794	900	5.2	16.0	17.3	5.5	25
1006	1230	6.0	10.0	23801	700	4.5	17.4	19.6	6.0	24
1006	1330	6.0	10.0	23807	600	5.1	17.0	18.4	9.1	30
1006	1430	6.0	9.0	23811	400	6.0	15.0	16.5	9.5	36
1006	1530	6.0	9.0	23816	500	6.0	17.0	18.5	9.0	30
1006	1630	6.0	9.0	23821	500	6.0	19.0	21.0	6.0	24
1006	1730	6.0	9.0	23826	500	5.0	19.0	21.0	5.5	22
1006	1830	6.0	9.0	23831	500	4.5	17.0	19.0	7.0	26
1006	1930	6.0	9.0	23836	500	5.0	15.0	16.0	6.0	26
1006	2030	6.0	9.0	23841	500	5.0	16.5	17.5	7.5	28
1006	2130	6.0	9.0	23846	500	5.0	16.5	19.0	7.0	36
1006	2230	6.0	9.0	23851	500	5.0	15.0	16.5	7.0	30
1006	2330	6.0	9.0	23856	500	5.0	17.0	18.0	7.5	29

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
1007	0030	6.0	10.0	23862	600	5.0	15.0	16.5	6.5	29
1007	0130	6.0	10.0	23867	500	5.0	15.0	17.0	6.5	29
1007	0230	6.0	10.0	23872	500	3.0	19.0	20.0	4.5	29
1007	0330	6.0	10.0	23876	400	2.42	20.0	24.0	3.0	27
1007	0430	6.0	14.0	23883	700	2.42	17.0	20.0	2.0	15
1007	0530	6.0	18.0	23890	700	2.42	17.0	19.0	2.5	13
1007	0630	6.0	17.0	23900	1000	2.0	21.0	22.5	2.5	12
1007	0730	6.0	17.0	23910	1000	2.42	17.4	19.0	5.0	22
1007	0830	6.0	17.0	23920	1000	3.0	17.5	19.0	5.0	22
1007	0930	6.0	17.0	23930	1000	3.0	16.0	17.9	4.0	22
1007	1030	6.0	16.0	23939	900	-2.42	16.5	18.3	3.0	18
1007	1130	6.0	16.0	23948	900	-2.42	16.5	18.3	3.0	18
1007	1230	6.0	16.0	23958	1000	4.8	14.5	16.4	6.9	30
1007	1330	6.0	16.0	23967	900	4.7	16.5	18.4	5.5	26
1007	1430	6.0	16.0	23976	900	4.8	14.5	16.7	6.3	27
1007	1530	6.0	16.0	23986	1000	5.0	17.0	18.5	6.0	24
1007	1630	6.0	16.0	23995	900	5.0	16.5	18.0	10.0	32
1007	1730	6.0	16.0	24004	900	6.5	16.0	17.5	11.5	42
1007	1830	6.0	16.0	24013	900	7.0	15.5	17.5	14.0	70
1007	1930	6.0	14.0	24022	900	8.5	23.0	24.0	16.0	38
1007	2030	6.0	14.0	24030	800	8.0	22.5	24.0	14.0	34
1007	2130	6.0	14.0	24038	800	8.5	29.0	30.0+	18.0	30
1007	2230	6.0	14.0	24046	800	7.5	24.5	24.0	13.5	30
1007	2330	6.0	14.0	24059	1300	7.5	30.0+	30.0+	12.5	25
1008	0030	6.0	14.0	24062	300	7.0	30.0+	30.0+	10.0	22
1008	0130	6.0	15.0	24071	900	5.0	30.0+	30.0+	7.0	18
1008	0230	6.0	15.0	24079	800	2.42	30.0+	30.0+	4.0	12
1008	0330	6.0	18.0	24088	900	2.0	30.0+	30.0+	2.5	11
1008	0430	6.0	19.0	24099	1100	2.42	30.0+	30.0+	2.5	12
1008	0530	6.0	19.0	24110	1100	2.42	30.0+	30.0+	2.5	15
1008	0630	6.0	20.0	24122	1200	2.42	30.0+	30.0+	7.0	20
1008	0730	6.0	19.0	24132	1000	3.2	30.0+	30.0+	7.5	20
1008	0830	6.0	19.0	24143	1100	4.0	30.0+	30.0+	7.5	22
1008	0930	6.0	19.0	24154	1100	3.7	30.0+	30.0+	6.6	19
1008	1030	6.0	19.0	24165	1100	2.45	30.0+	30.0+	5.0	16
1008	1130	6.0	19.0	24177	1200	-2.42	30.0+	30.0+	4.5	16
1008	1230	6.0	19.0	24189	1200	-2.42	30.0+	30.0+	6.0	19
1008	1330	6.0	19.0	24199	1000	3.0	30.0+	30.0+	8.2	20
1008	1430	6.0	19.0	24210	1100	3.0	30.0+	30.0+	6.4	18
1008	1530	6.0	19.0	24221	1100	5.0	30.0+	30.0+	12.0	24
1008	1630	6.0	19.0	24232	1100	7.0	24.0	24.0	15.0	34
1008	1730	6.0	19.0	24243	1100	8.0	20.0	23.0	18.0	52
1008	1830	6.0	16.0	24252	900	8.0	22.0	24.0	13.0	32
1008	1930	6.0	16.0	24261	900	7.5	30.0+	14.0	14.0	26
1008	2030	6.0	16.0	24270	900	7.5	22.0	23.0	13.5	32
1008	2130	6.0	16.0	24279	900	8.0	23.0	24.0	18.0	46
1008	2230	6.0	16.0	24288	900	9.0	20.5	23.0	17.0	48
1008	2330	6.0	17.0	24298	1000	8.0	21.0	23.0	15.0	40
1009	0030	6.0	16.0	24307	900	7.5	30.0+	30.0+	14.0	25
1009	0130	6.0	16.0	24315	800	3.5	30.0+	30.0+	7.5	12

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
1009	0230	6.0	16.0	24325	1000	3.5	30.0+	30.0+	3.0	11
1009	0330	6.0	18.0	24335	1000	1.0	30.0+	30.0+	3.0	11
1009	0430	6.0	17.5	24344	900	1.0	30.0+	30.0+	3.0	10
1009	0530	6.0	18.5	23354	1000	3.0	30.0+	30.0+	8.0	20
1009	0630	6.0	18.5	23363	900	3.0	30.0+	30.0+	9.0	20
1009	0730	6.0	19.0	24376	1300	4.3	30.0+	30.0+	7.4	20
1009	0830	6.0	19.0	24387	1100	4.4	30.0+	30.0+	10.1	23
1009	0930	6.0	19.0	24397	1000	4.9	30.0+	30.0+	12.0	25
1009	1030	6.0	19.0	24408	1100	5.0	30.0+	30.0+	12.0	25
1009	1130	6.0	19.0	24418	1000	5.0	30.0+	30.0+	10.0	24
1009	1230	6.0	19.0	24428	1000	5.0	30.0+	30.0+	12.0	26
1009	1330	6.0	19.0	24442	1400	5.7	30.0+	30.0+	13.9	28
1009	1430	6.0	17.0	24451	900	7.5	30.0+	30.0+	18.5	30
1009	1530	6.0	17.0	24460	900	7.0	30.0+	26.0	15.0	26
1009	1630	6.0	17.0	24471	1100	7.0	30.0+	30.0+	14.0	24
1009	1730	6.0	17.0	24480	900	7.0	30.0+	30.0+	13.5	26
1009	1830	6.0	17.0	24490	1000	6.5	30.0+	30.0+	12.0	26
1009	1930	6.0	17.0	24500	1000	6.0	30.0+	30.0+	14.0	24
1009	2030	6.0	17.0	24510	1000	7.0	30.0+	30.0+	18.0	26
1009	2130	6.0	17.0	24520	1000	7.5	30.0+	30.0+	18.0	26
1009	2230	6.0	17.0	24529	900	7.5	30.0+	30.0+	20.0	30
1009	2330	6.0	18.0	24539	1000	7.0	30.0+	30.0+	15.0	23
1010	0030	6.0	18.0	24550	1100	6.0	30.0+	30.0+	14.0	22
1010	0130	6.0	18.0	24558	800	6.0	30.0+	30.0+	12.5	28
1010	0230	6.0	18.0	24568	1000	6.0	30.0+	30.0+	16.0	28
1010	0330	6.0	18.0	24579	1100	6.0	30.0+	30.0+	13.0	28
1010	0430	6.0	18.0	24588	900	6.0	30.0+	30.0+	12.0	25
1010	0530	6.0	18.0	24599	1100	6.0	30.0+	30.0+	13.0	24
1010	0630	6.0	18.0	24609	1000	5.5	30.0+	30.0+	10.0	21
1010	0730	6.3	17.5	24619	1000	5.1	30.0+	30.0+	12.0	24
1010	0830	6.3	17.5	24629	1000	5.0	30.0+	30.0+	12.2	26
1010	0930	6.3	17.5	24639	1000	6.0	30.0+	30.0+	15.0	26
1010	1030	6.3	17.5	24649	1000	6.0	30.0+	30.0+	10.5	24
1010	1130	6.3	17.5	24659	1000	6.3	30.0+	30.0+	11.0	23
1010	1230	6.3	17.5	24669	1000	6.2	30.0+	30.0+	12.1	26
1010	1330	6.3	17.5	24679	1000	6.2	30.0+	30.0+	14.9	26
1010	1430	6.3	17.5	24689	1000	6.2	30.0+	30.0+	11.7	24
1010	1530	6.0	17.0	24699	1000	6.0	30.0+	30.0+	10.0	20
1010	1630	6.0	17.0	24708	900	4.5	30.0+	30.0+	6.0	18
1010	1730	6.0	17.0	24718	1000	2.42	30.0+	30.0+	4.0	14
1010	1830	6.0	19.0	24729	1100	2.42	30.0+	30.0+	7.0	18
1010	1930	6.0	19.0	24741	1200	3.0	30.0+	30.0+	8.0	20
1010	2030	6.0	19.0	24752	1100	4.0	30.0+	30.0+	11.0	24
1010	2130	6.0	19.0	24763	1100	4.0	30.0+	30.0+	10.0	30
1010	2230	6.0	19.0	24775	1200	5.0	30.0+	30.0+	11.0	34
1010	2330	6.0	20.0	24785	1000	5.0	30.0+	30.0+	12.5	25
1011	0030	6.0	20.0	24796	1100	7.0	30.0+	30.0+	17.0	23
1011	0130	6.0	20.0	24808	1200	6.0	30.0+	30.0+	19.0	28
1011	0230	6.0	20.0	24819	1100	6.5	30.0+	30.0+	16.5	30
1011	0330	6.0	20.0	24830	1100	8.0	17.0	20.0	15.0	55

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
1011	0430	6.0	18.0	24841	1100	9.0	19.0	22.0	15.0	52
1011	0530	6.0	18.0	24852	1100	7.5	30.0+	30.0+	14.0	28
1011	0630	6.0	18.0	24861	900	6.0	30.0+	30.0+	12.0	25
1011	0730	6.3	17.5	24872	1100	6.2	30.0+	30.0+	10.6	25
1011	0830	6.3	17.5	24882	1000	6.2	30.0+	30.0+	12.6	25
1011	0930	6.3	17.5	24891	900	6.1	30.0+	30.0+	11.5	24
1011	1030	6.3	17.5	24902	1100	6.0	30.0+	30.0+	13.7	24
1011	1130	6.3	17.5	24911	900	6.1	28.0	29.6	16.5	30
1011	1230	6.3	17.5	24921	1000	7.0	22.0	24.0	12.5	31
1011	1330	6.3	17.5	24931	1000	7.0	30.0+	30.0+	13.5	26
1011	1430	6.3	16.0	24941	1000	6.0	30.0+	30.0+	10.9	24
1011	1530	6.0	17.0	24951	1000	6.5	24.0	25.0	14.0	32
1011	1630	6.0	17.0	24960	900	8.0	20.0	22.0	17.0	54
1011	1730	6.0	15.0	24969	900	8.0	20.0	21.0	15.0	42
1011	1830	6.0	15.0	24978	900	8.5	25.0	26.0	16.0	36
1011	1930	6.0	15.0	24986	800	7.5	22.0	28.0	14.0	32
1011	2030	6.0	15.0	24995	900	7.0	30.0+	30.0+	19.0	26
1011	2130	6.0	15.0	25004	900	7.0	26.0	28.0	13.0	28
1011	2230	6.0	15.0	25012	800	5.0	30.0+	30.0+	10.0	24
1011	2330	6.0	15.0	25021	900	6.0	30.0+	30.0+	12.5	28
1012	0030	6.0	15.0	25030	900	5.5	30.0+	30.0+	12.0	22
1012	0130	6.0	15.0	25039	900	5.5	30.0+	30.0+	11.0	21
1012	0230	6.0	15.0	25047	800	5.0	30.0+	30.0+	10.0	21
1012	0330	6.0	15.0	25056	900	5.0	30.0+	30.0+	10.0	20
1012	0430	6.0	15.0	25064	800	5.0	30.0+	30.0+	11.0	22
1012	0530	6.0	15.0	25072	800	5.0	30.0+	30.0+	11.0	22
1012	0630	6.0	15.0	25081	900	5.0	30.0+	30.0+	10.0	22
1012	0730	6.0	15.0	25090	900	5.0	30.0+	30.0+	9.8	23
1012	0830	6.0	15.0	25099	900	5.0	30.0+	30.0+	9.1	24
1012	0930	6.0	15.0	25107	800	5.0	30.0+	30.0+	11.5	24
1012	1030	6.0	15.0	25116	900	3.1	30.0+	30.0+	7.9	18
1012	1130	6.0	13.5	25124	800	3.8	30.0+	30.0+	9.4	24
1012	1230	6.0	13.5	25131	700	4.8	30.0+	30.0+	11.0	22
1012	1330	6.0	13.5	25139	800	4.4	30.0+	30.0+	9.0	20
1012	1430	6.0	13.5	25148	900	4.0	30.0+	30.0+	8.5	18
1012	1530	6.0	13.0	25154	600	3.5	30.0+	30.0+	9.5	20
1012	1630	6.0	13.0	25161	600	4.0	30.0+	30.0+	9.0	20
1012	1730	6.0	13.0	25169	800	4.0	30.0+	30.0+	8.0	20
1012	1830	6.0	13.0	25176	700	4.0	30.0+	30.0+	8.0	20
1012	1930	6.0	13.0	25184	800	4.5	30.0+	30.0+	10.0	20
1012	2030	6.0	13.0	25191	700	5.0	30.0+	30.0+	10.0	22
1012	2130	6.0	13.0	25199	800	3.0	30.0+	30.0+	5.0	16
1012	2230	6.0	15.0	25205	600	-2.42	30.0+	30.0+	5.0	14
1012	2330	6.0	15.0	25213	800	5.0	30.0+	30.0+	12.0	22
1012	0030	6.0	15.0	25221	800	5.0	30.0+	30.0+	11.5	22
1012	0130	6.0	15.0	25230	900	5.0	30.0+	30.0+	11.5	22
1012	0230	6.0	15.0	25239	900	5.5	30.0+	30.0+	11.0	25
1012	0330	6.0	15.0	25247	800	5.5	30.0+	30.0+	12.5	22
1012	0430	6.0	15.0	25256	900	6.0	30.0+	30.0+	13.0	25
1012	0530	6.0	15.0	25265	900	5.0	30.0+	30.0+	12.0	21

DATE	TIME	AGIT. WATER FLOW	JACKET WATER FLOW	JACKET W. F. TOTAL	JACKET WATER HRLY USE	STEAM RATE FLOW	METER INLET PRESS.	INLET VALVE PRESS.	OUTLET VALVE PRESS.	VALVE POSIT.
1012	0630	6.0	15.0	25273	800	5.0	30.0+	30.0+	12.0	15

END OF BOM/FGT 008 ELKHORN

TABLE I-4

OPERATOR LOGGED DATA II

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE			FLUE GAS SCRUBBER		
					GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0913	0930	001		3.5						
0913	1030	004	3	3.6				7.0	30	30
0913	1130	008	4	3.8				7.0	30	30
0913	1230	012	4	3.8				7.0	30	30
0913	1330	016	4	4.0				7.5	30	30
0913	1430	020	4	4.0				7.5	30	30
0913	1530	025	5	4.5				7.5	30	30
0913	1630	029	4	5.0				7.5	30	30
SHUT DOWN DUE TO LIMIT SWITCH REPAIR										
0913	1830	035	6	5.0	0	0	2/1.40	7.5	30	30
0913	1930	041	6	6.0	17	17	2/1.40	7.5	30	30
0913	2030	045	4	6.0	28	11	2/2.80	7.0	30	30
0913	2130	051	6	6.0	55	27	2/2.80	5.7	35	55
0913	2230	057	6	6.0	90	35	3/2.80	7.0	35	55
0913	2330	063	6	7.0	129	39	3/2.80	7.0	35	55
0914	0030	071	3	7.0	181	52	3/2.80	7.0	35	55
0914	0130	077	6	7.0	217	36	3/2.80	7.0	35	55
0914	0230	084	7	7.0	259	42	3/2.80	7.0	35	55
0914	0330	091	7	7.0	302	43	3/2.80	7.0	35	55
0914	0430	098	7	6.5	344	42	3/2.50	7.0	35	55
0914	0530	106	8	6.5	396	52	3/2.50	7.0	35	55
0914	0630	112	6	6.5	431	35	3/2.80	7.0	35	55
0914	0730	119	7	8.0	475	44	3/2.80	7.5	35	55
0914	0830	127	8	8.0	524	49	4/3.00	7.5	35	55
0914	0930	135	8	8.0	591	67	4/3.00	7.0	35	55
0914	1030	143	8	8.3	653	62	4/3.13	7.0	35	55
0914	1130	151	8	8.3	714	61	4/3.15	7.0	35	55
0914	1230	159	8	8.3	781	67	4/3.15	7.5	35	55
0914	1330	168	9	8.4	844	63	4/3.00	7.5	35	55
0914	1430	176	8	8.3	907	63	4/2.80	7.0	35	45
0914	1530	184	8	8.0	962	55	4/2.80	7.0	35	45
0914	1630	191	7	7.4	1010	48	4/1.75	7.0	35	45
0914	1730	198	7	7.0	1045	35	4/1.75	7.0	35	45
0914	1830	205	7	7.0	1087	42	4/2.40	7.0	35	45
0914	1930	211	6	7.0	1131	44	4/2.40	7.0	35	45
0914	2030	219	8	7.0	1177	46	4/2.00	7.0	35	45
0914	2130	226	7	7.0	1217	40	4/2.00	7.0	35	45
0914	2230	233	7	7.0	1259	42	4/2.00	7.0	35	45
0914	2330	240	7	7.0	1301	42	4/2.00	7.0	35	45
0915	0030	247	7	8.0	1344	43	4/2.25	7.0	35	45
0915	0130	255	8	8.0	1393	49	4/2.25	7.0	35	45
0915	0230	263	8	7.5	1440	47	4/2.25	7.0	35	45
0915	0330	270	7	7.5	1486	46	4/2.25	7.0	35	45
0915	0430	277	7	7.5	1532	46	4/2.25	7.0	35	45
0915	0530	284	7	7.5	1578	46	4/2.25	7.0	35	45

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0915	0630	291	7	7.5	1625	47	4/2.25	7.0	35	50
0915	0730	299	8	7.9	1670	45	4/2.25	7.5	35	50
0915	0830	307	8	7.9	1726	56	4/3.50	7.5	35	50
0915	0930	315	8	8.4	1805	79	4/3.50	8.5	35	50
0915	1030	323	8	8.6	1867	62	4/3.00	7.5	35	45
0915	1130	331	8	8.0	1935	68	4/3.20	7.0	35	45
0915	1230	339	8	8.0	1996	61	4/3.00	7.0	35	45
0915	1330	347	8	8.0	2059	63	4/3.00	7.0	35	45
0915	1430	354	7	7.8	2120	61	4/2.60	7.0	35	45
0915	1530	361	7	7.2	2172	52	4/2.60	7.0	35	45
0915	1630	368	7	7.2	2224	52	4/2.60	7.0	35	45
0915	1730	376	8	7.2	2278	54	4/2.60	7.0	35	45
0915	1830	383	7	7.2	2332	54	4/2.60	7.0	35	45
0915	1930	389	6	6.0	2386	54	4/2.60	7.0	35	45
0915	2030	395	6	6.0	2441	55	4/2.90	7.0	35	45
0915	2130	401	6	6.5	2501	60	4/2.75	7.0	35	45
0915	2230	408	7	6.5	2558	57	4/2.75	7.0	35	45
0915	2330	413	5	6.5	2608	50	4/2.75	7.0	35	45
0916	0030	421	8	7.5	2669	61	4/2.75	7.0	35	45
0916	0130	428	7	7.5	2729	60	4/2.75	7.0	35	45
0916	0230	434	6	6.5	2783	54	4/2.75	7.0	35	45
0916	0330	441	7	7.0	2837	54	4/2.75	7.0	35	45
0916	0430	448	7	7.0	2899	62	4/2.75	7.0	35	45
0916	0530	454	6	7.0	2952	53	4/2.75	7.0	35	45
0916	0630	461	7	7.0	3006	54	4/2.75	7.0	35	45
0916	0730	469	8	7.0	3072	66	4/2.75	6.5	40	45
0916	0830	475	6	7.0	3128	56	4/2.90	7.0	40	45
0916	0930	483	8	7.2	3189	61	4/2.90	7.0	40	45
0916	1030	490	7	7.4	3246	57	4/2.95	7.0	40	45
0916	1130	497	7	7.4	3311	65	4/2.95	8.5	40	40
0916	1230	504	7	7.5	3371	60	4/3.05	7.0	40	40
0916	1330	512	8	7.5	3436	65	4/2.95	7.0	40	40
0916	1430	520	8	8.1	3503	67	4/3.15	7.5	40	40
0916	1530	527	7	8.1	3564	61	4/3.15	7.0	40	40
0916	1630	535	8	8.1	3630	66	4/3.45	7.0	40	40
0916	1730	544	9	8.5	3703	73	4/3.45	7.0	40	40
0916	1830	552	8	8.5	3773	70	4/3.45	7.0	40	40
0916	1930	560	8	8.5	3844	71	4/3.45	7.5	40	40
0916	2030	568	8	8.5	3918	74	4/3.45	7.0	40	40
0916	2130	577	9	8.5	3987	69	4/3.45	7.0	40	40
0916	2230	585	8	8.5	4060	73	4/3.55	7.0	40	40
0916	2330	593	8	8.5	4131	71	4/3.55	7.0	40	40
0917	0030	602	9	9.0	4206	75	4/3.55	7.0	40	40
0917	0130	610	8	9.0	4277	71	4/3.55	7.0	40	40
0917	0230	620	10	9.0	4358	81	4/3.55	7.0	40	40
0917	0330	628	8	9.0	4422	64	4/3.55	7.0	40	40
0917	0430	637	9	9.0	4498	76	4/3.55	7.0	40	40
0917	0530	646	9	9.0	4571	73	4/3.55	7.0	40	40
0917	0630	654	8	9.0	4641	70	4/3.55	7.0	40	40
0917	0730	662	8	9.1	5722	81	4/3.55	6.5	40	40

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								PH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0917	0830	671	9	9.3	4792	70	5/2.75	6.5	40	40
0917	0930	680	9	9.4	4858	66	5/2.85	7.5	40	40
0917	1030	690	10	9.3	4947	89	5/3.15	7.5	40	40
0917	1130	699	9	9.3	5024	77	5/3.15	7.0	40	40
0917	1230	708	9	9.3	5105	81	6/3.50	7.5	40	40
0917	1330	717	9	9.3	5219	114	7/3.50	7.5	40	40
0917	1430	726	9	9.3	5342	123	7/3.50	7.0	40	40
0917	1530	735	9	9.2	5461	119	7/3.24	7.0	40	40
0917	1630	744	9	9.2	5578	117	7/3.24	7.0	40	40
0917	1730	753	9	9.2	5699	121	7/3.24	7.0	40	40
0917	1830	763	10	9.5	5815	116	7/3.00	7.0	40	40
0917	1930	771	8	9.5	5919	104	7/3.00	7.0	40	40
0917	2030	781	10	9.5	6023	104	7/2.50	7.0	40	40
0917	2130	790	9	9.0	6111	88	7/2.50	7.0	40	40
0917	2230	799	9	9.0	6203	92	7/2.50	7.0	40	40
0917	2330	808	9	9.0	6291	88	7/2.50	7.0	40	40
0918	0030	818	10	10.0	6385	94	7/2.50	7.0	40	40
0918	0130	827	9	10.0	6471	86	7/2.50	7.0	40	40
0918	0230	836	9	10.0	6558	87	7/2.50	7.0	40	40
0918	0330	847	11	10.0	6658	100	7/2.50	7.0	40	40
0918	0430	855	8	10.0	6735	77	7/2.50	7.0	40	40
0918	0530	869	14	10.0	6860	125	7/2.50	7.0	40	40
0918	0630	875	6	10.0	6917	57	7/2.50	7.0	40	40
0918	0730	886	11	9.9	7019	102	7/2.50	7.0	40	40
0918	0830	894	8	10.0	7112	93	7/2.60	7.0	40	40
0918	0930	903	9	10.0	7220	88	7/2.60	7.0	40	40
0918	1030	913	10	9.3	7277	77	7/2.60	7.0	40	40
0918	1130	922	9	9.2	7395	118	7/2.60	7.0	40	40
0918	1230	930	8	8.8	7485	90	7/2.50	7.0	40	40
0918	1330	939	9	8.8	7574	89	7/2.50	7.0	40	40
0918	1430	948	9	8.8	7677	103	7/3.00	7.0	40	40
0918	1530	956	8	8.8	7775	98	7/2.85	7.0	40	40
0918	1630	964	8	8.8	7880	105	7/3.20	7.0	40	40
0918	1730	974	10	9.4	7994	114	7/3.20	7.0	40	40
0918	1830	983	9	9.4	8112	118	7/3.20	7.0	40	40
0918	1930	992	9	9.4	8229	117	7/3.20	7.0	40	40
0918	2030	1001	9	9.4	8344	115	7/3.20	7.0	40	40
0918	2130	1011	10	9.4	8460	116	7/3.20	7.0	40	40
0918	2230	1020	9	9.4	8579	119	7/3.40	7.0	40	40
0918	2330	1028	8	9.4	8695	116	7/3.40	7.0	40	40
0919	0030	1037	9	9.4	8813	118	7/3.25	7.0	40	40
0919	0130	1047	10	11.0	8931	118	7/3.25	7.0	40	40
0919	0230	1058	11	11.0	9050	119	7/3.49	7.0	40	40
0919	0330	1069	11	11.5	9177	127	7/3.50	7.0	40	40
0919	0430	1081	12	11.5	9306	129	7/3.50	7.0	40	40
0919	0530	1093	12	11.5	9447	141	7/3.50	7.0	40	40
0919	0630	1104	11	11.5	9565	118	7/3.50	7.0	40	40
0919	0730	1115	11	11.5	9692	127	7/3.50	7.0	40	40
0919	0830	1126	11	11.2	9813	121	8/3.00	7.0	40	40
0919	0930	1137	11	10.5	9945	132	8/3.00	7.0	40	40

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0919	1030	1146	9	10.0	10059	114	8/2.85	7.0	40	40
0919	1130	1156	10	9.9	10178	119	8/2.90	7.0	40	40
0919	1230	1165	9	9.9	10291	113	8/2.74	7.0	40	40
0919	1330	1176	11	9.8	10414	123	8/2.74	7.0	40	40
0919	1430	1191	15	31+	10528	114				
0919	1530	1208	17	9.5	10646	118	8/2.95	7.0	40	40
0919	1630	1217	9	9.5	10768	122	8/2.95	7.0	40	40
0919	1730	1227	10	9.5	10891	123	8/2.95	7.0	40	40
0919	1830	1236	9	9.5	11012	121	8/2.95	7.0	40	40
0919	1930	1246	10	9.5	11130	118	8/2.95	7.0	40	40
0919	2030	1255	9	9.7	11260	130	2/3.15	7.0	40	40
0919	2130	1265	10	9.7	11391	131	8/3.15	7.0	40	40
0919	2230	1274	9	9.7	11521	130	8/3.05	7.0	40	40
0919	2330	1283	9	9.7	11639	118	8/3.05	7.0	40	40
0920	0030	1293	10	10.5	11767	128	8/3.05	7.0	40	40
0920	0130	1305	12	11.0	11911	143	8/3.05	5.9	45	45
0920	0230	1315	10	11.5	12021	110	8/3.05	7.0	45	45
0920	0330	1326	11	11.5	12144	123	8/3.05	7.0	45	45
0920	0430	1337	11	1.6	12273	129	8/3.05	7.0	45	45
0920	0530	1348	11	11.5	12401	128	8/3.05	7.0	45	45
0920	0630	1360	12	11.0	12524	123	8/3.05	7.0	45	45
0920	0730	1372	12	11.8	12661	137	8/3.05	7.0	45	45
0920	0830	1384	12	12.2	12810	149	10/3.50	7.0	45	45
0920	0930	1396	12	12.8	12990	180	10/3.50	7.0	45	45
0920	1030	1409	13	13.2	13169	179	10/3.30	7.0	45	45
0920	1130	1423	14	13.2	13345	176	10/3.20	7.0	45	45
0920	1230	1436	13	13.2	13521	176	10/3.45	7.0	45	45
0920	1330	1449	13	13.2	13695	174	10/3.45	5.0	55	55
0920	1430	1461	12	13.3	13870	175	10/3.70	7.5	55	55
0920	1530	1474	13	13.4	14045	175	10/3.70	7.5	55	55
0920	1630	1494	20	31.0	14261	216	10/4.60	7.5	55	55
0920	1730	1520	26	31.0	14475	214	10/4.50	7.5	55	55
0920	1830	1539	19	15.9	14666	191	10/3.50	7.5	55	55
0920	1930	1554	15	13.4	14840	174	10/2.50	7.5	55	55
0920	2030	1566	12	13.3	14942	102	10/2.20	7.0	55	55
0920	2130	1579	13	12.0	15056	114	10/2.20	7.0	55	55
0920	2230	1591	12	11.5	15170	114	10/2.20	7.0	55	55
0920	2330	1604	13	13.5	15283	113	10/2.20	7.0	55	55
0921	0030	1618	14	13.5	15400	117	10/2.20	7.0	55	55
0920	0130	1632	14	13.5	15522	122	10/2.20	7.0	55	55
0921	0230	1645	13	11.9	15629	107	10/2.50	7.0	55	55
0921	0330	1658	13	12.0	15771	142	10/2.50	7.0	55	55
0921	0430	1671	13	13.2	15900	129	10/2.50	7.0	55	55
0921	0530	1684	13	13.2	16003	133	10/2.50	7.0	55	55
0921	0630	1697	13	14.6	16166	133	10/2.50	7.0	55	55
0921	0730	1711	14	15.0	16284	118	10/2.50	7.0	55	55
0921	0830	1726	15	16.5	16410	126	10/2.51	7.5	55	55
0921	0930	1750	24	30+	16541	131	10/3.15	7.5	55	55
0921	1030	1777	27	26.0	16687	146	10/3.15	7.5	55	55
0921	1130	1800	23	22.3	16849	162	10/3.15	7.5	55	55

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0921	1230	1824	24	27.4	17044	195	10/4.50	7.5	55	55
0921	1330	1850	26	22.4	17287	243	10/5.00	7.5	55	55
0921	1430	1865	15	10.0	17524	237	10/5.00	7.5	55	55
0921	1530	1880	15	15.7	17780	256	10/5.00	7.5	55	55
0921	1630	1895	15	15.7	18036	256	10/5.00	7.0	55	55
0921	1730	1910	15	16.3	18295	259	10/5.00	7.0	55	55
0921	1830	1923	13	16.3	18554	259	10/5.00	7.0	55	55
0921	1930	1937	14	16.3	18816	262	10/5.00	7.0	55	55
0921	2030	1951	14	16.3	19062	246	10/4.50	7.0	55	55
0921	2130	1964	13	16.3	19292	230	10/4.50	7.0	55	55
0921	2230	1980	16	16.3	19528	236	10/4.00	8.0	55	55
0921	2330	1997	17	16.3	19779	251	10/4.00	7.0	55	55
0922	0030	2012	15	16.3	19976	197	10/3.75	7.0	55	55
0922	0130	2027	15	16.2	20165	189	10/3.75	7.0	55	55
0922	0230	2040	13	16.2	20324	159	10/3.75	7.0	55	55
0922	0330	2056	16	17.1	20523	199	10/3.75	7.0	55	57
0922	0430	2072	16	16.0	20724	201	10/3.75	7.0	55	55
0922	0530	2089	17	16.0	20946	222	10/3.75	7.0	55	55
0922	0630	2103	16	17.7	21123	177	10/3.75	7.0	55	55
0922	0730	2117	14	16.0	21306	183	10/3.75	7.0	55	55
0922	0830	2130	13	15.0	21509	203	10/4.40	7.0	55	55
0922	0930	2143	13	15.7	21730	221	10/4.40	7.0	55	55
0922	1030	2157	14	15.4	21959	229	10/4.60	4.0	60	60
0922	1130	2170	13	14.9	22186	227	10/4.60	7.0	60	60
0922	1230	2182	12	15.0	22412	226	10/5.00	7.0	60	60
0922	1330	2197	15	15.2	22678	266	10/5.00	6.5	60	60
0922	1430	2212	15	16.2	22941	263	10/5.00		65	65
0922	1530	2226	14	15.5	23178	237	10/4.75	7.0	65	65
0922	1630	2241	15	16.0	23402	224	10/5.00			
0922	1730	2256	15	16.0	23666	264	10/5.00	7.0	65	65
0922	1830	2270	14	16.0	23925	259	10/5.00	7.0	65	65
0922	1930	2285	15	16.0	24183	258	10/5.00	7.5	65	55
0922	2030	2299	14	16.0	24438	255	10/5.00	7.5	65	55
0922	2130	2314	15	16.5	24699	261	10/5.00	7.0	65	55
0922	2230	2328	14	16.0	24947	248	10/4.75	7.0	65	55
0922	2330	2341	13	16.0	25212	265	10/4.75	7.0	65	55
0923	0030	2355	14	16.0	25473	261	10/4.75	7.0	65	55
0923	0130	2370	15	16.0	25724	251	10/4.75	7.0	65	55
0923	0230	2382	12	16.0	25946	222	10/4.75	7.0	65	55
0923	0330	2396	14	16.0	26218	272	10/4.80	7.0	65	55
0923	0430	2409	13	16.0	26457	237	10/4.80	7.0	65	55
0923	0530	2422	13	16.0	26709	252	10/4.50	7.0	65	55
0923	0630	2434	12	15.5	26914	205	10/4.50	7.0	65	55
0923	0730	2448	14	14.9	27162	248	10/4.50	7.0	65	57
0923	0830	2458	10	8.0	27345	183	10/2.00	5.5	65	57
0923	0930	2465	7	8.2	27449	104	10/2.00	7.5	50	50
0923	1030	2472	7	8.2	27553	104	10/2.00	7.5	50	50
0923	1130	2480	8	8.5	27660	107	10/2.20	8.2	50	50
0923	1230	2489	9	11.5	27765	105	10/2.00	7.5	45	45
0923	1330	2499	10	11.6	27867	102	10/2.00	7.5	45	45

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								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0923	1430	2510	11	12.7	27991	124	10/3.00	7.0	45	45
0923	1530	2521	11	9.0	28099	108	4/3.00	8.0	45	45
0923	1630	2526	5	3.0	28157	58	4/3.00	8.0	30	30
0923	1730	2530	4	4.2	28209	52	4/3.00	7.5	30	30
0923	1830	2534	4	3.5	28253	44	4/1.50	7.5	30	30
0923	1930	2539	5	7.5	28285	32	4/1.50	5.0	50	50
0923	2030	2548	9	11.5	28358	73	4/4.90	6.5	50	45
0923	2130	2559	11	11.5	28427	69	10/2.00	5.7	55	55
0923	2230	2571	12	12.0	28542	115	10/2.00	7.0	55	55
0923	2330	2583	12	10.0	28694	152	10/2.25	7.0	55	55
0924	0030	2589	6	10.0	28775	81	10/2.00	7.0	55	55
0924	0130	2598	9	7.5	28892	117	10/2.00	7.5	55	55
0924	0230	2605	7	7.5	28990	98	10/1.75	7.5	55	55
0924	0330	2612	7	6.5	29088	98	10/1.75	7.0	55	55
0924	0430	2617	5	7.1	29171	83	10/1.25	7.0	55	55
0924	0530	2624	7	7.0	29232	61	10/1.25	7.0	55	55
0924	0630	2631	7	7.0	29299	67	10/1.10	7.0	55	55
0924	0730	2637	6	6.5	29351	52	10/1.10	7.0	55	55
0924	0830	2647	10	13.1	29441	90	10/2.10	7.5	55	55
0924	0930	2658	11	13.7	29557	116	10/3.10	7.5	55	55
0924	1030	2672	14	13.8	29731	174	10/3.30	7.0	55	55
0924	1130	2684	12	13.4	29898	167	10/3.30	7.0	55	55
0924	1230	2698	14	13.0	30086	188	10/3.25	7.0	55	55
0924	1330	2710	12	13.0	30239	153	10/3.30	7.0	55	55
0924	1430	2723	13	12.7	30419	180	10/3.27			
0924	1530	2734	11	12.7	30575	156	10/3.27	7.5	55	55
0924	1630	2745	11	10.0	30711	136	10/1.50	7.5	50	50
0924	1730	2752	7	7.5	30788	77	10/1.50	7.5	50	50
0924	1830	2759	7	6.5	30856	68	10/1.10	7.5	50	50
0924	1930	2766	7.0	6.5	30914	58	10/1.10	7.0	50	50
0924	2030	2772	6	7.0	30965	51	3/2.50	6.5	50	50
0924	2130	2779	7	7.0	30999	34	3/2.40	7.0	50	50
0924	2230	2786	7	7.0	31040	41	3/2.40	7.0	50	50
0924	2330	2794	8	7.0	31081	41	3/2.40	7.0	50	50
0925	0030	2800	6	7.0	31118	37	3/2.40	7.0	50	50
0925	0130	2806	6	7.0	31152	34	3/2.75	7.0	50	50
0925	0230	2813	7	7.0	31193	41	3/2.75	7.0	50	50
0925	0330	2820	7	7.0	31238	45	3/2.75	7.0	50	50
0925	0430	2827	7	7.0	31282	44	3/2.75	7.0	50	50
0925	0530	2834	7	7.0	31327	45	3/2.75	7.0	50	50
0925	0630	2840	6	7.5	31371	44	3/2.75	7.0	50	50
0925	0730	2846	6	6.5	31460	89	3/2.75	7.5	50	50
0925	0830	2852	6	6.9	31465	15	6/3.40	7.0	50	50
0925	0930	2860	8	8.0	31571	106	6/3.40	7.0	50	50
0925	1030	2868	8	8.0	31682	111	8/3.20	7.0	50	50
0925	1130	2876	8	8.4	31796	114	8/3.20	7.0	50	50
0925	1230	2883	7	7.6	31906	110	8/2.85	7.0	50	50
0925	1330	2890	7	7.6	32009	103	8/2.85	7.0	50	50
0925	1430	2898	8	7.8	32119	110	7/2.50	5.5	50	50
0925	1530	2905	7	7.0	32205	86	7/2.50	7.0	50	50

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0925	1630	2912	7	7.0	32298	93	7/2.50	7.0	50	50
0925	1730	2919	7	7.0	32386	88	7/2.50	7.0	50	50
0925	1830	2926	7	7.0	32476	90	7/2.50	7.0	50	50
0925	1930	2933	7	7.0	32566	90	7/2.50	7.0	50	50
0925	2030	2940	7	7.0	32656	90	7/2.50	7.0	50	50
0925	2130	2947	7	7.0	32749	93	7/2.50	7.0	50	50
0925	2230	2954	7	7.0	32839	90	7/2.50	7.0	50	50
0925	2330	2960	6	7.2	32927	88	7/2.50	7.0	50	50
0926	0030	2968	8	7.2	33030	103	7/2.50	7.0	50	50
0926	0130	2974	6	7.2	33117	87	7/2.50	7.0	50	50
0926	0230	2982	8	7.2	33215	98	7/2.50	7.0	50	50
0926	0330	2989	7	7.2	33297	82	7/2.50	7.0	50	50
0926	0430	2997	8	7.2	33406	109	7/2.50	7.0	50	50
0926	0530	3004	7	7.2	33501	95	7/2.50	7.0	50	50
0926	0630	3009	5	7.2	33563	62	7/2.50	7.0	50	50
0926	0730	3015	6	7.2	33645	82	7/2.50	7.0	50	50
0926	0830	3023	8	8.0	33752	107	7/2.70	7.5	50	50
0926	0930	3030	7	8.0	33841	89	7/2.70	7.5	50	50
0926	1030	3038	8	8.2	33944	103	7/2.85	7.5	50	50
0926	1130	3046	8	8.2	34050	106	7/2.85	7.0	50	50
0926	1230	3053	7	7.9	34143	93	7/2.80	7.5	50	50
0926	1330	3061	8	7.7	34246	103	7/2.80	7.5	50	50
0926	1430	3068	7	7.6	34347	101	7/2.80	7.5	50	50
0926	1530	3075	7	7.3	34467	120	7/2.80	7.0	50	50
0926	1630	3082	7	8.0	334552	85	7/2.90	7.0	50	50
0926	1730	3090	8	8.0	34657	105	7/2.90	7.0	50	50
0926	1830	3097	7	8.0	34762	105	7/3.00	7.0	50	50
0926	1930	3105	8	8.0	34872	110	7/3.00	7.0	50	50
0926	2030	3113	8	8.5	34979	107	7/2.85	7.0	50	50
0926	2130	3122	9	8.5	35082	103	7/2.85	7.0	50	50
0926	2230	3130	8	8.8	35186	104	7/2.85	7.0	50	50
0926	2330	3139	9	8.8	33296	110	7/2.85	7.0	50	50
0927	0030	3147	8	9.0	35400	??	7/2.85	7.0	50	50
0927	0130	3156	9	9.1	35497	97	7/2.85	7.0	50	50
0927	0230	3165	9	9.0	35609	112	7/2.85	7.0	50	50
0927	0330	3173	8	9.0	35704	95	7/2.85	7.0	50	50
0927	0430	3182	9	9.0	35816	112	7/2.85	7.0	50	50
0927	0530	3190	8	9.0	35911	95	7/2.85	7.0	50	50
0927	0630	3199	9	9.0	36022	111	7/2.85	7.0	50	50
0927	0730	3209	10	9.0	36134	112	7/2.85	7.5	50	50
0927	0830	3215	6	9.5	36217	83	7/2.95	7.5	50	50
0927	0930	3225	10	9.2	36329	112	7/2.95	7.5	50	50
0927	1030	3234	9	9.2	36437	108	7/2.95	5.7	50	50
0927	1130	3243	9	9.2	36544	107	7/2.95	7.0	50	50
0927	1230	3252	9	9.4	36652	108	7/2.95	7.0	50	50
0927	1330	3261	9	9.4	36765	113	7/2.95	7.0	50	50
0927	1430	3269	8	9.6	36863	98	7/3.10	7.0	50	50
0927	1530	3279	10	9.7	36980	17	7/3.10	7.0	50	50
0927	1630	3288	9	10.2	37092	112	7/3.10	7.0	50	50
0927	1730	3296	8	10.0	37201	109	7/3.10	7.0	50	50

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
0927	1830	3304	8	10.0	37315	114	7/3.10	7.0	50	50
0927	1930	3312	8	10	37428	113	7/3.10	7.0	50	50
0927	2030	3321	9	10.5	37543	115	7/3.10	7.0	50	50
0927	2130	3329	8	10.5	37656	13	7/3.10	7.0	50	50
0927	2230	3333	4	3.5	37721	65	7/1.50	7.0	50	50
0927	2330	SHUTDOWN								
0930	2030	3343		14.5	38013	292	7/1.08	7.0	60	40
0930	2130	3353	10	12.0	38053	40	7/1.20	7.0	60	40
0930	2230	3361	8	10.0	38102	49	7/2.00	7.0	60	40
0930	2330	3371	10	10.0	38185	83	7/2.00	7.0	60	40
1001	0030	3380	9	10.0	38266	81	7/2.25	7.0	60	40
1001	0130	3388	8	10.0	38343	77	7/2.25	7.0	60	40
1001	0230	3397	9	11.0	38431	88	7/2.50	7.0	60	40
1001	0330	3405	8	11.0	38513	82	7/2.50	7.0	60	40
1001	0430	3413	8	11.0	38591	78	10/2.00	7.0	60	40
1001	0530	3423	10	11.0	38704	113	10/2.00	7.0	60	40
1001	0630	3432	9	12.5	38811	107	10/2.50	7.0	60	40
1001	0730	3443	11	12.7	38940	129	10/2.50	7.0	82	44
1001	0830	3453	10	13.0	39093	153	10/3.50	7.0	82	44
1001	0930	3464	11	13.0	39281	188	10/3.50	7.0	82	44
1001	1030	3474	10	13.7	39468	187	10/5.00	7.0	82	44
1001	1130	3485	11	13.5	39745	277	10/5.00	7.0	82	44
1001	1230	3496	11	13.3	40009	264	10/5.00	7.0	82	44
1001	1330	3505	9	13.3	40249	240	10/5.00	7.0	82	44
1001	1430	3517	12	13.3	40511	262	10/5.00	7.0	82	44
1001	1530	3527	10	13.2	40774	263	10/5.00	7.0	82	44
1001	1630	3538	11	13.2	41044	270	10/5.00	7.0	82	44
1001	1730	3548	10	13.2	41294	250	10/5.00	7.0	82	44
1001	1830	3558	10	13.1	41447	153	10/5.00	7.0	82	44
1001	1930	3569	11	13.2	41720	273	10/5.00	7.0	82	44
1001	2030	3579	10	13.2	41976	256	10/5.00	7.0	82	44
1001	2130	3590	11	13.2	42235	259	10/5.00	7.0	82	44
1001	2230	3601	11	13.2	42496	261	10/5.00	7.0	82	44
1001	2330	3613	12	13.2	42802	306	10/5.00	7.0	82	44
1002	0030	3621	8	13.2	42983	181	10/5.00	7.0	82	44
1002	0130	3632	11	13.2	43281	298	10/5.00	7.0	82	44
1002	0230	3644	12	13.2	43471	190	10/5.00	7.0	82	44
1002	0330	3653	9	13.2	43789	318	10/5.00	7.0	82	44
1002	0430	3664	11	13.2	44060	271	10/5.00	7.0	82	44
1002	0530	3675	11	13.2	44338	278	10/5.00	7.0	82	44
1002	0630	3684	9	13.1	44546	208	10/5.00	4.0	82	60
1002	0730	3695	11	13.2	44821	275	10/5.00	7.0	57	50
1002	0830	3705	10	13.2	45084	263	10/5.00	7.0	57	50
1002	0930	3716	11	13.4	45335	251	10/5.00	7.0	57	50
1002	1030	3727	11	13.4	45605	270	10/5.00	7.0	57	50
1002	1130	3737	10	13.3	45838	233	10/5.00	7.0	57	50
1002	1230	3748	11	13.3	46119	281	10/5.00	7.0+	57	50
1002	1330	3758	10	13.3	46348	229	10/5.00	7.0+	57	50
1002	1430	3769	11	13.3	46619	271	10/5.00	7.0+	57	50
1002	1530	3780	11	13.3	46882	263	10/5.00	7.0	57	50

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
					GEAR COUNTER READING			pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
1002	1630	3790	10	13.3	47140	258	10/5.00	7.0	57	50
1002	1730	3801	11	13.3	47398	258	10/5.00	7.0	57	50
1002	1830	3811	10	13.3	47656	258	10/5.00	7.0	57	50
1002	1930	3822	11	13.3	47914	258	10/5.00	7.0	57	55
1002	2030	3833	11	13.3	48182	268	10/5.00	7.0	57	55
1002	2130	3843	10	13.3	48433	251	10/5.00	7.0	57	50
1002	2230	3854	1	13.3	48690	257	10/5.00		57	50
1002	2330	3865	11	13.3	48691	1	10/5.00	7.0	57	50
1003	0030	3876	11	13.3	49222	631	10/5.00	7.0	57	50
1003	0130	3886	10	13.3	49483	261	10/5.02	7.0	57	50
1003	0230	3897	11	13.3	49726	243	10/5.00	7.0	57	50
1003	0330	3910	13	13.3	50043	317	10/5.00	7.0	57	50
1003	0430	3923	13	13.3	50285	242	10/5.00	7.0	57	50
1003	0530	3933	10	13.3	50531	246	10/5.00	7.0	57	50
1003	0630	3940	7	13.3	50769	238	10/5.00	7.0	57	50
1003	0730	3950	10	13.3	51019	250	10/5.00	7.0+	55	50
1003	0830	3959	9	12.6	51275	256	10/4.50	7.0+	55	50
SHUTDOWN					SHUTDOWN					
1003	1230	3964	5	9.0	51462	187				
1003	1330	3971	7	8.6	51568	106	10/1.80	7.0+	55	50
1003	1430	3978	7	8.8	51667	99	10/2.00	7.0+	55	50
1003	1530	3985	7	9.0	51764	97	10/2.00	7.0	55	50
1003	1630	3993	8	9.5	51872	108	10/2.00	7.0	55	50
1003	1730	4000	7	8.0	51950	78	10/1.10	7.0	40	40
1003	1830	4007	7	8.0	52006	56	10/1.10	6.5	40	50
1003	1930	4013	6	8.5	52068	62	10/1.50	7.0	40	50
1003	2030	4020	7	8.5	52143	75	10/1.50	6.7	40	50
1003	2130	4026	6	8.5	52221	78	10/1.50	7.0	50	50
1003	2230	4033	7	8.5	52291	70	10/1.20	7.0	50	50
1003	2330	4040	7	8.5	52364	73	10/1.20	7.0	50	50
1004	0030	4048	8	8.5	52438	74	10/1.20	7.0	50	50
1004	0130	4056	8	8.5	52501	63	10/1.20	7.0	50	50
1004	0230	4061	5	8.5	52556	55	10/1.20	7.0	50	50
1004	0330	4069	8	8.5	52616	60	10/1.20	7.0	50	50
1004	0430	4074	5	8.5	52678	62	10/1.20	7.0	50	50
1004	0530	4080	6	8.5	52736	58	10/1.20	7.0	50	50
1004	0630	4086	6	8.5	52789	53	10/1.20	7.0	50	50
1004	0730	4093	7	8.5	52853	64	10/1.20	7.0+	50	50
1004	0830	4099	6	8.0	52916	63	10/1.08	7.0+	50	50
1004	0930	4104	5	6.5	52969	53	10/1.08	7.0+	50	50
1004	1030	4109	5	5.5	53018	49	6/1.08	7.0+	50	50
1004	1130	4113	4	5.5	53050	32	6/1.08	7.0+	50	50
1004	1230	4118	5	5.5	53085	35	6/1.20	7.0	50	50
1004	1330	4122	4	5.5	53122	37	6/1.20	7.0+	50	50
1004	1430	4127	5	5.5	53159	37	6/1.20	7.0+	50	50
1004	1530	4131	4	5.5	53196	37	6/1.20	7.0	50	50
1004	1630	4135	4	5.5	53232	36	6/1.20	7.0	50	50
1004	1730	4140	5	6.0	53270	38	6/1.20	7.0	50	50
1004	1830	4146	6	6.5	53311	41	6/1.50	7.0	50	50
1004	1930	4151	5	6.5	53357	46	6/1.50	7.0	50	50

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
1004	2030	4157	6	8.0	53417	60	6/3.00	7.0	50	50
1004	2130	4163	6	7.0	53510	93	6/2.25	7.0	50	50
1004	2230	4168	5	7.0	53580	70	6/2.25	7.0	50	50
1004	2330	4174	6	7.0	53646	166	6/2.24	7.0	50	50
1005	0030	4180	6	7.0	53724	78	6/2.25	7.0	50	50
1005	0130	4186	6	7.0	53801	77	6/2.25	7.0	50	50
1005	0230	4192	6	7.0	53878	77	6/2.00	7.0	50	50
1005	0330	4198	6	7.0	53955	77	6/2.00	7.0	50	50
1005	0430	4203	5	7.0	53995	40	6/2.00	7.0	50	50
1005	0530	4207	4	7.0	54046	51	6/2.00	7.0	50	50
1005	0630	4213	6	7.0	54101	55	6/2.00	7.0	50	50
1005	0730	4218	5	7.0	54160	59	6/2.00	6.5	50	50
1005	0830	4223	5	5.0	54213	53	6/1.08	6.5	50	50
1005	0930	4228	5	6.5	54240	27	6/1.08	6.5	50	50
1005	1030	4233	5	6.5	54297	57	6/2.40	6.5	50	50
1005	1130	4239	6	6.5	54368	71	6/2.40	6.5	50	50
1005	1230	4244	5	7.0	54450	82	6/3.10	6.5	50	50
1005	1330	4250	6	7.4	54544	94	6/3.10	7.0	50	50
1005	1430	4256	6	7.1	54640	96	6/3.00	7.0	50	50
1005	1530	4262	6	7.0	54734	94	6/3.00	7.0	50	50
1005	1630	4266	4	4.0	54804	70	6/1.25	7.0	50	50
1005	1730	4270	4	6.0	54844	40	6/1.25	7.0	50	50
1005	1830	4273	3	6.0	54881	37	6/1.25	7.0	50	50
1005	1930	4278	5	6.0	54921	40	6/1.25	7.0	50	50
1005	2030	4283	5	7.0	54960	39	6/1.25	7.0	50	50
1005	2130	4289	6	7.0	54998	38	6/1.25	7.0	50	50
1005	2230	4294	5	7.0	55041	43	6/1.50	7.0	50	50
1005	2330	4299	5	6.5	55090	49	6/1.50	7.0	50	50
1006	0030	4304	5	6.5	55141	51	6/1.50	7.0	50	50
1006	0130	4310	6	6.5	55186	45	6/1.50	7.0	50	50
1006	0230	4315	5	6.5	55230	44	6/1.50	7.0	50	50
1006	0330	4320	5	6.5	55278	48	6/1.50	7.0	50	50
1006	0430	4324	4	6.5	55325	47	6/1.50	7.0	50	50
1006	0530	4332	8	6.5	55375	50	6/1.50	7.0	50	50
1006	0630	4336	4	6.5	55410	35	6/1.50	7.0	50	50
1006	0730	4341	5	6.5	55451	41	6/1.50	7.0	50	50
1006	0830	4349	8	5.3	55515	64	6/2.00	7.0+	50	50
1006	0930	4354	5	6.7	55579	64	6/2.20	7.0+	50	50
1006	1030	4360	6	8.5	55667	88	8/4.65	7.0+	50	50
1006	1130	4367	7	8.5	55875	208	8/4.65	7.0+	50	50
1006	1230	4375	8	8.7	56127	252	10/5.00	7.0+	50	50
1006	1330	4381	6	8.8	56368	241	10/4.00	6.0	50	50
1006	1430	4388	7	8.5	56593	225	10/4.00		50	50
1006	1530	4395	7	9.0	56796	203	10/4.00	7.0	50	50
1006	1630	4402	7	9.5	56997	201	10/3.50	7.0	50	50
1006	1730	4410	8	9.0	57176	179	10/3.50	7.0	50	50
1006	1830	4417	7	9.0	57335	159	10/2.50	7.0	50	50
1006	1930	4424	7	9.0	57466	131	10/2.50	7.0	50	50
1006	2030	4432	8	9.5	57598	132	10/2.75	7.0	50	50
1006	2130	4439	7	9.5	57742	144	10/2.75	7.0	50	50

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER	pH	REAGENT	REAGENT
					GEAR COUNTER READING			PUMP SPEED		PUMP STROKE	
1006	2230	4447	8	9.0	57870	128	10/2.50	7.0	50	50	
1006	2330	4455	8	9.1	58011	141	10/2.50	7.0	50	50	
1007	0030	4462	7	9.1	58149	138	10/2.50	7.0	50	50	
1007	0130	4469	7	9.1	58305	156	10/2.50	7.0	50	50	
1007	0230	4476	7	9.1	58456	151	10/2.50	7.0	50	50	
1007	0330	4483	7	9.0	58509	53	10/2.50	7.0	50	50	
1007	0430	4492	9	9.0	58669	160	10/2.50	7.0	50	50	
1007	0530	4497	5	7.0	58772	103	10/2.25	7.0	30	50	
1007	0630	4503	6	7.0	58875	103	10/2.25	7.0	30	50	
1007	0730	4508	5	7.0	59014	139	10/2.25	7.0	50	50	
1007	0830	4514	6	6.8	59117	103	10/2.00	7.0	50	50	
1007	0930	4520	6	6.8	59230	113	10/2.00	7.0	50	50	
1007	1030	4525	5	6.5	59314	84	10/1.20	7.0	50	50	
1007	1130	4531	6	6.5	59375	61	10/1.20	7.0	50	50	
1007	1230	4536	5	6.9	59434	59	10/1.20	7.0	50	50	
1007	1330	4542	6	6.7	59494	60	10/1.20	7.0	50	50	
1007	1430	4547	5	6.7	59548	54	6/1.20	7.0	50	50	
1007	1530	4553	6	6.7	59584	36	6/1.18	7.0	50	50	
1007	1630	4558	5	6.7	59621	37	6/1.30	7.0	50	50	
1007	1730	4564	6	7.0	59651	40	6/1.30	7.0	50	50	
1007	1830	4569	5	7.5	59712	51	6/2.00	7.0	50	50	
1007	1930	4576	7	8.0	59776	64	6/2.00	7.0	50	50	
1007	2030	4584	8	10.0	59850	74	6/3.00	7.0	50	50	
1007	2130	4592	8	11.0	59943	93	6/3.00	7.0	50	50	
1007	2230	4601	9	16.0	60091	148	10/4.75	7.0	50	50	
1007	2330	4619	18	14.0	60491	400	10/4.75	7.0	50	50	
1008	0030	4623	4	14.0	60585	94	10/4.75	7.0	50	50	
1008	0130	4634	11	14.0	60843	258	10/4.75	7.0	50	50	
1008	0230	4642	8	3.0	60983	140	10/1.70	7.0	50	50	
1008	0330	4646	4	3.0	61079	296	10/1.70	7.0	50	50	
1008	0430	4651	5	7.0	61199	120	10/2.00	7.0	50	50	
1008	0530	4657	6	7.0	61318	119	10/2.25	7.0	50	50	
1008	0630	4663	6	7.0	61437	119	10/2.25	7.0	50	50	
1008	0730	4668	5	7.5	61536	99	10/2.25	7.0	50	50	
1008	0830	4675	7	7.7	61648	112	10/2.00	7.0	50	50	
1008	0930	4682	7	7.9	61762	114	10/2.20	7.0	50	50	
1008	1030	4688	6	8.3	61876	114	10/2.20	7.0	50	50	
1008	1130	4695	7	8.4	61995	119	10/2.20	7.0	50	50	
1008	1230	4703	8	8.2	62090	95	8/1.20	7.0	50	50	
1008	1330	4707	4	8.0	62120	30	8/1.20	7.0	50	50	
1008	1430	4714	7	7.8	62168	48	8/1.20	7.0	50	50	
1008	1530	4720	6	7.8	62200	32	8/1.08	7.0	50	50	
1008	1630	4726	6	8.5	62257	57	8/1.25	7.0	50	50	
1008	1730	4733	7	9.0	62320	63	8/2.00	7.0	50	50	
1008	1830	4740	7	9.5	62404	84	8/2.00	7.0	50	50	
1008	1930	4748	8	10.0	62486	82	8/2.00	7.0	50	50	
1008	2030	4757	9	12.0	62590	104	8/3.20	7.0	50	50	
1008	2130	4766	9	12.0	62725	135	8/3.20	7.0	50	50	
1008	2230	4776	10	12	62858	133	8/3.20	7.0	50	50	
1008	2330	4785	9	12.0	63001	143	8/3.20	7.0	50	50	

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
1009	0030	4796	11	14.5	63150	149	8/3.75	7.0	50	50
1009	0130	4806	10	14.5	63296	146	8/4.25	7.0	50	50
1009	0230	4818	12	15.5	63469	173	8/4.25	7.0	50	50
1009	0330	4830	12	14.0	63692	223	10/4.50	7.0	50	50
1009	0430	4837	7	11.0	63826	134	10/2.00	7.0	50	50
1009	0530	4844	7	9.0	63924	98	10/2.00	7.0	50	50
1009	0630	4851	7	7.0	64017	93	10/1.50	7.0	50	50
1009	0730	4857	6	7.0	64096	79	10/1.50	7.0+	50	50
1009	0830	4862	5	7.3	64175	79	10/1.70	7.0+	50	50
1009	0930	4868	6	7.5	64265	90	10/1.70	7.0+	50	50
1009	1030	4874	6	7.8	64351	86	10/1.70	7.0+	50	50
1009	1130	4880	6	8.0	64431	80	10/1.70	7.0+	50	50
1009	1230	4886	6	8.0	64522	91	10/2.00	7.0+	50	50
1009	1330	4893	7	8.4	64651	129	10/2.00	7.0	50	50
1009	1430	4900	7	8.6	64743	92	10/1.90	6.5	50	50
1009	1530	4905	5	8.6	64836	93	10/1.90	7.0	50	50
1009	1630	4914	9	12.0	64956	120	10/2.50	7.0	50	50
1009	1730	4923	9	12.0	65083	127	10/2.50	7.0	50	50
1009	1830	4931	8	11.0	65217	134	10/2.65	7.0	50	50
1009	1930	4939	8	11.0	65355	138	10/2.65	7.0	50	50
1009	2030	4948	9	12.5	65502	147	10/3.00	7.0	50	50
1009	2130	4958	10	12.5	65656	154	10/3.00	7.0	50	50
1009	2230	4968	10	13.5	65835	179				
1009	2330	4978	10	13.5	66049	214	10/4.00	7.0	50	50
1010	0030	4987	9	7.1	66214	165	8/2.00	7.0	50	50
1010	0130	4993	6	11.0	66285	71	8/2.00	7.0	50	50
1010	0230	5001	3	11.0	66369	84	8/2.25	7.0	50	50
1010	0330	5010	9	11.5	66467	98	8/2.25	7.0	50	50
1010	0430	5018	8	11.5	66557	90	8/2.25	7.0	50	50
1010	0530	5027	9	11.5	66659	102	8/2.25	7.0+	50	50
1010	0630	5036	9	14.5	66747	8	8/2.25	7.0+	50	50
1010	0730	5047	11	14.5	66844	97	8/2.25	7.0+	50	50
1010	0830	5058	11	13.9	66931	87	8/1.90	7.0+	50	50
1010	0930	5069	11	16.0	67013	82	8/1.90	7.0+	50	50
1010	1030	5083	14	19.5	67094	81	8/2.00	7.0+	50	50
1010	1130	5097	14	19.5	67174	80	8/2.00	7.0+	50	50
1010	1230	5112	15	21.5	67264	90	8/2.10	7.0+	50	50
1010	1330	5126	14	20.0	67347	83	8/2.10	7.0+	50	50
1010	1430	5142	16	24.0	67445	98	8/2.70	7.0+	50	50
1010	1530	5151	9	10.0	67556	111	8/2.70	7.0	50	50
1010	1630	5158	7	11.0	67667	111	8/3.00	7.0	50	50
1010	1730	5167	9	11.0	67791	124	8/3.00	7.0	50	50
1010	1830	5176	9	11.0	67912	121	8/2.50	7.0	50	50
1010	1930	5184	8	10.0	68016	104	8/2.50	7.0	50	50
1010	2030	5190	6	8.0	68099	83	8/1.40	7.0	50	50
1010	2130	5197	7	9.0	68162	63	8/1.80	7.0	50	50
1010	2230	5203	6	9.5	68236	74	8/1.80	7.0	50	50
1010	2330	5210	7	9.5	68307	71	8/1.80	7.0	50	50
1011	0030	5217	7	10.5	68385	78	8/2.00	7.0	50	50
1011	0130	5226	9	11.2	68472	87	8/2.00	7.0	50	50

DATE	TIME	AGIT. COUNT RDING	AGIT SWEEP PER HR	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								pH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
1011	0230	5235	9	13.0	68559	87	8/2.50	7.0	50	50
1011	0330	5244	9	13.0	68655	96	8/2.50	7.0	50	50
1011	0430	5254	10	14.0	68769	14	8/3.25	7.0	50	50
1011	0530	5265	11	14.0	68910	141	8/3.25	7.0	50	50
1011	0630	5275	10	14.0	69037	127	8/3.25	7.0	50	50
1011	0730	5287	12	14.0	69182	145	8/3.25	7.0	50	50
1011	0830	5299	12	16.0	69338	156	10/4.00	7.0	50	50
1011	0930	5310	11	16.7	69552	214	10/4.25	7.0	50	50
1011	1030	5323	13	16.5	69781	229	10/4.20	7.0	50	50
1011	1130	5335	12	16.0	69901	120	10/4.15	7.0	50	50
1011	1230	5347	12	15.0	70191	290	10/3.50	7.0	50	50
1011	1330	5358	11	14.7	70377	186	10/3.50	7.0	50	50
1011	1430	5370	12	14.5	70558	181	10/3.50	7.0	50	50
1011	1530	5380	10	14.5	70735	177	10/3.50	7.0	50	50
1011	1630	5391	11	14.5	70912	177	10/3.25	7.0	50	50
1011	1730	5402	11	14.0	71083	171	10/3.25	7.0	50	50
1011	1830	5414	12	14.0	71257	174	10/3.25	7.0	50	50
1011	1930	5424	10	14.0	71423	166	10/3.25	7.0	50	50
1011	2030	5436	12	14.0	71595	172	10/3.50	7.0	50	50
1011	2130	5447	11	14.0	71781	186	10/3.50	7.0	50	50
1011	2230	5458	11	14.0	71959	178	10/3.35	7.0	50	50
1011	2330	5468	10	14.0	72105	46	10/3.35	7.0	50	50
1012	0030	5479	11	14.0	72202	97	10/3.00	7.0	50	50
1012	0130	5490	11	14.0	72439	237	10/3.00	7.0	50	50
1012	0230	5501	11	14.0	72585	146	10/3.00	7.0	50	50
1012	0330	5512	11	14.0	72749	164	10/3.00	7.0	50	50
1012	0430	5523	11	14.0	72893	144	10/2.75	7.0	50	50
1012	0530	5534	11	14.0	73032	139	10/2.75	7.0	50	50
1012	0630	5545	11	14.0	73180	148	10/2.75	7.0	50	50
1012	0730	5556	11	14.0	73324	144	10/2.75	7.0	50	50
1012	0830	5568	12	14.0	73473	149	10/2.75	7.0	50	50
1012	0930	5577	9	5.5	73609	136	10/2.75	7.0	50	50
1012	1030	5588	11	14.7	73746	137	10/2.50	7.0	50	50
1012	1130	5600	12	14.7	73881	135	10/2.50	7.0	50	50
1012	1230	5611	11	14.5	74009	128	10/2.50	7.0	50	50
1012	1330	5624	13	14.5	74154	145	10/2.50	7.0	50	50
1012	1430	5635	11	14.7	74280	126	10/2.75	7.0	50	50
1012	1530	5646	11	14.6	74416	136	10/2.75	7.0	50	50
1012	1630	5657	11	14.6	74555	139	10/2.65	7.0	50	50
1012	1730	5670	13	14.6	74704	149	10/2.65	7.0	50	50
1012	1830	5681	11	14.6	74834	130	10/2.75	7.0	50	50
1012	1930	5692	11	14.6	74997	163	10/2.75	7.0	50	50
1012	2030	5704	12	14.6	75120	123	10/2.75	7.0	50	50
1012	2130	5716	12	14.6	75265	145	10/2.75	7.0	50	50
1012	2230	5728	12	15.0	75411	146	10/2.85	7.0	50	50
1012	2330	5739	11	15.0	75571	160	10/2.85	7.0	50	50
1013	0030	5749	10	15.0	75691	120	10/2.85	7.0	50	50
1013	0130	5761	12	15.0	75852	161	10/2.85	7.0	50	50
1013	0230	5773	12	15.0	76001	149	10/2.852	7.0	50	50
1013	0330	5785	12	15.0	76147	146	10/2.85	7.0	50	50

DATE	TIME	AGIT. COUNT	AGIT SWEEP RDING	AGIT DRIVE SETNG	GRATE GEAR COUNTER READING	GRATE GEAR RPH	GRATE DRIVE SETNG	FLUE GAS SCRUBBER		
								PH	REAGENT PUMP SPEED	REAGENT PUMP STROKE
1013	0430	5797	12	15.0	76306	159	10/2.85	7.0	50	50
1013	0530	5808	11	14.5	76451	145	10/2.85	7.0	50	50
1013	0630	5820	12	15.0	76599	148	10/2.85	7.0	50	50
END OF BOM/FGT 008 ELKHORN										

APPENDIX J

Quench/ESP Operator Logged Data

Note: Five separate log sheets are included here.

QUENCH/ESP DATA LOG SHEET

BOM/FGT 008

TIME	GAS TEMPERATURES (F)				FRESH WATER				RECYCLE LIQUOR		TAR/LIQUOR	
	QUENCH INLET	QUENCH OUTLET	ESP OUTLET	RETURN GAS	METER GAL	GAL CONS	INLET TEMP	DISCH PRESS	LIQUOR PRESS	TEMP DEG F	PRESS PSIG	TEMP DEG F

September 13, 1983

0030	500	148	0	0	5505	40	70	48	30	137	0	204
0130	540	148	0	0	5509	40	70	48	30	138	0	208
0300	560	150	0	0	5518	90	70	48	30	138	0	202
0330	610	150	0	0	5522	40	70	46	30	140	0	198
0430	625	156	0	0	5528	60	70	48	30	140	0	200
0530	635	150	0	0	5537	90	70	48	30	138	0	210
0630	610	150	0	0	5550	130	70	24	30	136	0	215
0730	600	149	0	0	5553	30	70	20	30	136	0	190
0830	600	147	0	0	5556	30	70	20	30	138	0	190
0930	550	145	0	0	5558	20	70	20	30	132	0	205
1030	530	145	0	0	5561	30	70	20	30	136	0	198
1130	523	144	0	0	5565	40	72	20	30	137	0	185
1230	500	144	0	0	5570	50	72	30	30	138	0	162
1330	520	145	0	0	5580	100	72	46	32	129	0	170
1430	550	145	0	0	5597	170	72	48	32	138	0	160
1530	575	151	154	0	5607	100	73	48	32	139	0	142
1630	620	152	157	0	5614	70	77	20	32	140	0	177
1730	650	188	170	0	5621	70	72	46	32	96	0	193
2330	550	160	0	0	5664	430	70	40	38	140	0	200

September 14, 1983

0030	550	160	0	0	5679	260	70	40	38	140	0	190
0130	575	190	0	0	5684	260	70	40+	38	140	0	210
0230	600	160	0	0	5697	130	70	40	34	140	0	200
0330	610	160	0	0	5706	90	70	40	32	140	0	210
0430	500	180	0	0	5713	70	70	30	34	140	0	202
0630	650	160	0	0	5739	260	70	30	30	140	0	180

QUENCH/ESP DATA LOG SHEET

BOM/FGT 008

TIME	PRIMARY		SECONDARY		KEYSTONE 8" POS	8" HAND		FRESH WATER		RECYCLE LIQUOR		
	VOLT	AMP	VOLT	AMP		VALVE POS		#1	#2	#5	#6	#7

September 13, 1983

0030	330	6	33	14	100	100	50	0	100	100	100
0130	350	6	35	12	100	100	100	0	100	100	100
0300	350	7	34	12	100	100	100	0	100	100	100
0330	340	7	34	14	100	100	100	0	100	100	100
0430	350	7	35	14	100	100	100	20	100	100	100
0530	350	7	34	14	100	100	100	20	100	100	100
0630	340	7	34	14	100	100	100	20	100	100	100
0730	340	7	33	12							
0830	350	7	33	12							
0930	350	7	32	14							
1030	350	7	32	14							
1130	350	7	30	14							
1230	350	7	34	15							
1330	350	7	33	14							
1430	350	7	34	14							
1530	350	7	33	14							
1630	350	7	34	15							
1730	330	7	33	15							
2330	300	7	35	10							

September 14, 1983

0030	300	7	29	10
0130	280	5	29	8
0230	350	5	30	8
0330	340	5	32	10
0430	350	7	25	14
0630	300	7	25	16

QUENCH/ESP DATA LOG SHEET
BOM/FGT 008

TIME	GAS TEMPERATURE					GAS PRESSURE							
	QUENCH INLET	QUENCH OUTLET	ESP OUTLET	W.H.V. BOX	E.H.V. BOX	QUENCH INLET IN.WC	QUENCH OUTLET	QUENCH DIF.	E.S.P. OUTLET	E.S.P. DIF.	BLOWER DISCH. (PSI)	RETURN FLOW	PURGE PRESS

September 21, 1983

0830	STARTED N2 PURGE												
1030	BEGAN GAS FLOW												
1120	550	140	140	220	240	.5	-.5	1	-.75	.1	2.1	.2	.12
1200	650	144	142	230	250	1.2	1	.7	1	.1	2	.22	.12
1300	650	144	142	240	260	1	.2	.85	.5	.1	2	.25	.12
1400	700	150	146	240	260	.6	-.2	1	-.2	0	2	.28	.12
1500	680	148	147	240	260	-.6	-1.5	1.1	-1.5	.05	2	.28	.08
1600	700	147	148	240	255	-.9	-1.8	1.4	-1.9	.03	2	.28	.08
1700	725	148	148	240	255	-.1	-.1	1.3	-1.1	0	2	.28	.08
1800	700	150	149	248	255	-.11	-.18	1.3	-2.1	.2	2	.29	.05
1900	675	151	149	249	254	-.02	-.11	1.1	-1.5	.5	2	.27	.08
2000	700	150	148	250	260	-.06	-.18	1.27	-1.9	0	2	.28	.06
2100	685	151	149	255	260	-.09	-.16	1.2	-.19	0	2	.28	.06
2200	685	151	148	255	260	.09	-.16	1.2	-.2	0	2	.30	.06

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SEPTEMBER 22, 1983

1500	SETTING UP TAR NOZZLES												
1600	STEAM HEAT GAS COMPRESSOR IS ON LINE												
1700	640	151	142	230	250	.15	.1	.63	.1	0	2	.12	.15
1800	640	143	142	234	248	.9	.13	.75	.15	.5	2	.3	.15
1900	640	140	140	240	249	.1	.1	.6	.1	.5	2	.12	.14
2000	625	148	141	245	250	.15	.15	.48	.15	.11	2	.21	.14
2100	610	141	140	245	255	.20	.16	.45	.18	.5	2	.20	.14
2300	550	140	140	247	250	.20	.20	.30	.25	0	2	0	.13

SEPTEMBER 23, 1983

0000	550	140	140	250	250	.20	.49	.20	.30	0	2	0	.10
0100	575	137	135	270	285	.20	.46	.15	.4	0	2	0	.10
0200	500	139	137	270	280	.40	.40	.05	.40	.5	2	0	.15
0300	500	140	139	255	270	.40	.40	.10	.35	0	2	0	.17
0400	500	138	138	250	260	.40	.40	.05	.40	0	2	0	.19
0500	450	140	140	275	280	.30	.30	.10	.40	.5	2	0	.19
0630	405	134	130	270	280	.4	4.5	0	4.5	.5	2	0	.18
0700	410	136	130	270	280	4.5	4.5	.1	5	0	2.3	0	.18
0800	400	134	130	275	285	4.0	5.0	.2	5.5	0	2.3	0	.19
0900	280	128	124	285	295	0	-.5	.1	-.5	.1	2.0	0	0
1000	270	128	124	285	290	-1.5	-1	0	-1	.5	2.0	0	0
1100	500	144	140	220	240	-9	-10+	2+	-10+	.5	3.5	.1	0

TIME	GAS TEMPERATURE					GAS PRESSURE							
	QUENCH INLET	QUENCH OUTLET	ESP OUTLET	W.H.V. BOX	E.H.V. BOX	QUENCH INLET IN.WC	QUENCH OUTLET	QUENCH DIF.	E.S.P. OUTLET	E.S.P. DIF.	BLOWER DISCH. (PSI)	RETURN FLOW	PURGE PRESS
September 23, 1983													
1200	625	144	140	220	240	-5	-8	2+	-8	.1	3.5	.3	0
1300	650	148	140	220	240	-4	-7	2+	-7	.4	3.3	.28	0
1500	650	152	148	225	230	-4	-7	2+	-10	.5	3.3	.30	0
1600	360	155	150	230	235	-7	-11	2+	-10	0	3	.30	0
2100	600	150	149	240	245	-12	-1.5	0	-1.5	0	2	.19	.1
2200	625	160	150	250	248	-12	-2	-0	2.5	.10	2	.19	.1
2300	650	160	149	260	260	-12	-6	-0	-6.5	.25	.14	.30	0
SEPTEMBER 24, 1983													
0100	650	165	148	250	245	-12	-6	0	-9	.35	4	.30	0
0200	525	150	139	240	240	-12	-7	0	-9	.30	4	.30	0
0300	600	142	140	250	250	-12	-6	0	-8	.35	4	.30	0
0400	625	142	140	245	250	-14	-6	0	-8	.38	4	.30	0
0500	600	140	139	230	250	-12	-6	0	-8	.32	4	.30	0
0600	600	138	137	245	250	-12	-10	0	-10	.1	4	.30	0
0700	610	142	142	250	250	-12	-10	0	-10	.2	1.5	.26	0
0800	615	140	142	260	265	-12	-9	0	-9	.25	1.5	.24	0
1130	650	215	140	255	260	-6.5	-1.5	0	-2	.15	1.5	.18	.5
1200	650	215	140	260	265	-6	-.5	0	-1	0	1.5	.18	.1
1300	655	200	150	245	255	-3.7	0	0	-.5	.3	1.5	.18	.9
1400	660	148	149	248	250	-4	-4.5	1.0	-5	.50	2	.24	0
1500	600	143	148	240	250	-3.5	-3.5	-.7	-.4	.25	2	.23	0
1600	655	154	149	245	248	-4	-4.5	.15	-4.5	0	2	.24	0
1700	640	142	148	250	245	-5.5	-9.5	2.2	-9.4	0	1.8	.23	0
1800	575	142	150	245	250	-5.9	-9	2	-9.5	-.15	1.8	.23	0
1900	610	140	146	250	245	-.5	-9	2	-9	0	2	.23	0
2000	590	143	149	245	250	-6.5	-9	2	-9	0	2	.22	0
2100	625	145	150	250	245	-8	-9	2	-9	0	2	.22	0
2200	610	144	149	245	250	-9	-9	1	-10	-.4	2	.20	0
2300	600	144	144	250	250	-9	-8.5	.5	8.5	.10	2	.20	0
SEPTEMBER 25, 1983													
0000	600	145	147	245	250	-9	-10	.5	-10	50	2.5	.20	0
0100	575	150	143	250	235	-9	-8	0	-8	0	2.2	.20	0
0200	575	144	149	240	255	-9	-7	0	-8	0	2.2	.18	0
0300	575	145	148	245	250	-9	-9	0	-8	0	2.0	.18	0
0400	600	150	147	250	245	-10	-8	0	-8	0	2.8	.20	0
0500	625	154	148	260	255	-10	-8.5	0	-8	0	2.6	2.6	0
0600	625	148	142	260	250	-10	-8.5	0	-8	0	2.8	2.6	0
0700	610	148	142	260	255	-10	-10	0	-10	0	1.5	.20	0

TIME	GAS TEMPERATURE					GAS PRESSURE							
	QUENCH INLET	QUENCH OUTLET	ESP OUTLET	W.H.V. BOX	E.H.V. BOX	QUENCH INLET IN.WC	QUENCH OUTLET	QUENCH DIF.	E.S.P. OUTLET	E.S.P. DIF.	BLOWER DISCH. (PSI)	RETURN FLOW	PURGE PRESS

September 26, 1983

0800	615	152	144	260	260	-10	-9.5	0	-9.5	.15	1.5	.22	0
0900	550	142	144	260	255	-10	-9	0	-9	.5	1.5	.22	0
1000	580	140	140	260	255	-10	-9	0	-9	.65	1.5	.2	0
1100	550	140	144	255	255	-7.5	-8	2	-9	.7	1.5	.22	0
1200	610	144	142	255	250	-3.5	-10	2	-10	.4	1.5	.22	0
1300	615	144	142	260	265	-1	-9	2	-9	.35	1.5	.22	0
1400	630	150	148	270	260	0	-10	2	-9	.35	1.5	.22	0
1500	625	152	154	270	265	1	-9	2	-9	.15	1.5	.22	0
1600	625	148	152	275	265	1.5	-10	2	-10	.5	1.5	.22	0
1700	625	144	150	250	255	1.5	-10	+2	-9.5	0	1.5	.22	0
1800	610	152	148	243	248	-1.5	-10	2	-10	0	0	0	0

SEPTEMBER 27, 1983

1930	ON LINE												
2000	635	152	146	240	230	-7	-8	+2	-8.5	.1	3	.33	0
2100	675	144	150	245	245	-6	-9.5	+2	-9.5	.1	2.8	.32	0
2200	625	144	150	250	255	-4.5	-5.5	.75	-6	.05	1.2	.18	0

OCTOBER 1, 1983

0000	660	152	149	255	240	6	6	.75	6.5	0	1.2	.18	0
0100	670	152	148	250	240	6	6	.85	6.5	0	1.2	.17	0
0200	670	160	154	240	235	7	7	1	7	0	1.2	.18	0
0300	670	180	148	250	255	6	7	1.25	7	0	1.6	.16	11
0400	675	174	147	250	265	6	6	.5	6	0	1.0	.16	11
0500	700	164	149	260	260	6	6	.5	6.5	0	1.2	.16	11
0600	710	154	146	240	255	6	6	.40	6	0	1.3	.18	11
0700	675	152	148	250	255	6.5	7	-.5	7	-.4	1.4	.20	0
0800	700	152	147	245	250	6.5	8.5	.25	-8.5	.5	1.4	.20	0
0900	690	150	149	250	247	6.5	7	.45	-7	-5	1.4	.20	0
1000	700	160	150	255	250	8	8	.50	-8.5	.5	1.5	.20	0
1100	690	160	150	245	245	9	9	.3	-8.5	-10	1.5	.20	0
1200	700	168	148	250	255	-9	-8.5	.5	.8	-.5	1.4	.20	0
1300	690	162	150	247	250	-8	-8.5	.5	-8	-.5	1.4	.20	0
1400	680	150	146	249	253	-7	-8	.50	-8.5	-.5	1.5	.20	0
1500	680	142	148	240	242	-7	-8	.4	-8.5	.5	1.5	.22	0
1600	700	150	148	245	250	-7	-8	1.26	-8	0	1.3	.02	0
1700	665	154	146	245	245	-7	-7.5	1.25	-7.5	0	1.2	.10	0
1800	700	152	148	250	250	-7.5	-7	1.2	-7	.5	1.2	.20	0
1900	700	142	144	250	250	-8	-9	1.5	-9	.5	1.4	.22	0
2000	710	152	142	250	245	-8.5	-9.5	1.52	-9.5	.05	1.3	.22	0
2100	700	144	142	250	250	-8.5	-9.5	1.75	-9.5	.05	1.3	.22	0
2200	705	152	144	250	250	-8.5	-9.5	1.75	-9.5	.05	1.3	.22	0
2300	700	158	143	245	250	-8.0	-9.0	1.8	-9	0	1.3	.2	0

TIME	GAS TEMPERATURE					GAS PRESSURE							
	QUENCH INLET	QUENCH OUTLET	ESP OUTLET	W.H.V. BOX	E.H.V. BOX	QUENCH INLET IN.WC	QUENCH OUTLET	QUENCH DIF.	E.S.P. OUTLET	E.S.P. DIF.	BLOWER DISCH. (PSI)	RETURN FLOW	PURGE PRESS
OCTOBER 2, 1983													
0000	700	160	144	250	250	9	8.5	1.5	.9	0	1.2	.20	0
0100	690	150	142	250	250	9	8.5	1.8	.9	0	1.2	.20	0
0200	700	154	144	250	250	.8	.9	1.5	.9	0	1.0	.20	0
0300	700	154	143	250	240	.8	.92	1.75	.9	0	1.0	.20	0
0400	700	160	146	250	240	.8	10	+2	10	0	1.2	.15	0
0500	675	154	144	240	240	7.5	.9	1.75	.9	0	1.1	.18	0
0600	675	158	146	250	255	.8	9	.75	9	0	1.2	.18	0
0700	700	152	145	250	250	8	9.5	2	9.5	0	1.3	.18	0
0800	675	150	150	247	243	-9	-10	2	-10	3	1.3	.18	0
0900	700	150	148	251	248	-9.5	-10	2	-10	.5	1.2	.15	0
1000	700	148	150	255	250	-10	-10	2	-10	.5	1.2	.15	0
1100	690	147	147	250	255	-10	-10	2	-10	.5	1.2	.15	0
1200	680	148	150	245	248	-10	-10	2	-10	.5	1.2	.15	0
1300	675	148	147	255	250	-10	-10	2	-10	.3	1.2	.17	0
1400	680	151	146	240	245	-10	-10	2	-10	.4	1.1	.17	0
1500	680	154	146	260	245	-.4PSI	-10	2	-10	.05	1.2	.16	0
1600	675	153	147	255	250	-.46PSI	-10	2	-10	.05	1.0	.15	0
1700	675	150	142	245	245	-.49PSI	-10	2	-10	0	1.0	.15	0
1800	675	158	144	250	245	-.52PSI	-10	2	-10	0	1.0	.14	0
1900	670	150	142	250	245	-.51PSI	-10	2	-10	0	1.0	.13	0
2000	680	152	142	245	245	-.56PSI	-10	2	-10	0	1.0	.12	0
2100	675	150	138	240	250	-.54PSI	-10	2	-10	0	1.0	.11	0

QUENCH/ESP DATA LOG SHEET
BOM/FGT 008

TIME	^{O2} LEVEL	^{O2} FLOW	VANESSA VALVE POS.	KEYSTONE VALVE POS.	RETURN VALVE POS.	BLOWER BYPASS POS.	METER GAL.	FRESH WATER GAL. INLET CONS. TEMP	#1 PO PR	#2 PO PR	#3 PO PR	#4 PO PR	QUENCH TANK LEVEL
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SEPTEMBER 21, 1983

1125	200	2	OPEN	OPEN	OPEN	50	5797	62	50 20	0 0	0 0	0 0	15
1200	1800	2	OPEN	OPEN	OPEN	50	5799	20 62	50 20	0 0	0 0	0 0	17
1300	150	2	OPEN	OPEN	OPEN	50	5803	40 64	50 20	0 0	0 0	0 0	18
1400	200	2	OPEN	OPEN	OPEN	50	5807	40 66	50 20	0 0	0 0	0 0	18
1500	350	2	OPEN	OPEN	OPEN	50	5810	40 69	50 20	0 0	0 0	0 0	17
1600	350	2	OPEN	OPEN	OPEN	50	5815	50 68	50 20	0 0	0 0	0 0	18
1700	350	2	OPEN	OPEN	OPEN	50	5818	30 68	50 20	0 0	0 0	0 0	16
1800	350	2	OPEN	OPEN	OPEN	50	5823	50 68	50 25	0 0	0 0	0 0	18
1900	2500	2	OPEN	OPEN	OPEN	50	5828	50 68	50 25	0 0	0 0	0 0	18
2000	2000	2	OPEN	OPEN	OPEN	50	5833	50 68	50 25	0 0	0 0	0 0	19
2100	350	2	OPEN	OPEN	OPEN	50	5837	40 68	50 25	0 0	0 0	0 0	20
2200	350	2	OPEN	OPEN	OPEN	50	5842	50 68	50 25	0 0	0 0	0 0	19

SEPTEMBER 22, 1983

1700	300	2	OPEN	OPEN	OPEN	50	5857	150 68	50 20	0 0	0 0	0 0	19
1800	350	2	OPEN	OPEN	OPEN	50	5860	30 69	50 13	0 0	0 0	0 0	19
1900	300	2	OPEN	OPEN	OPEN	50	5862	20 68	50 13	0 0	0 0	0 0	19
2000	1400	2	OPEN	OPEN	OPEN	50	5865	30 68	50 13	0 0	0 0	0 0	20
2100	350	2	OPEN	OPEN	OPEN	50	5868	30 69	50 13	0 0	0 0	0 0	18
2300	300	2	OPEN	OPEN	OPEN	50	5873	50 68	50 13	0 0	0 0	0 0	18

SEPTEMBER 23, 1983

0000	0	2	OPEN	OPEN	OPEN	50	5876	30 68	50 13	0 0	0 0	0 0	17
0100	1	2	OPEN	OPEN	OPEN	50	5878	20 67	50 15	0 0	0 0	0 0	19
0200	0	2	OPEN	OPEN	OPEN	50	5881	30 64	50 25	0 0	0 0	0 0	17
0300	0	2	OPEN	OPEN	OPEN	50	5883	20 66	50 20	0 0	0 0	0 0	18
0400	0	2	OPEN	OPEN	OPEN	50	5886	30 67	40 15	0 0	0 0	0 0	19
0500	1	2	OPEN	OPEN	OPEN	50	5889	30 66	40 10	0 0	0 0	0 0	17
0630	200	2	OPEN	OPEN	OPEN	50	5893	40 66	40 10	0 0	0 0	0 0	18
0700	300	1.2	OPEN	OPEN	OPEN	50	5895	20 66	40 12	0 0	0 0	0 0	17
0800	100	2	OPEN	OPEN	OPEN	50	5896	10 66	40 12	0 0	0 0	0 0	20
0900	500	.5	OPEN	OPEN	OPEN	50	5899	30 66	40 12	0 0	0 0	0 0	19
1000	400	.5	OPEN	OPEN	OPEN	60	5901	20 66	40 12	0 0	0 0	0 0	19
1100	1100	2	OPEN	OPEN	OPEN	90	5907	60 68	40 12	0 0	0 0	0 0	19
1200	700	2	OPEN	OPEN	OPEN	90	5910	30 70	40 12	0 0	0 0	0 0	21
1300	500	1	OPEN	OPEN	OPEN	90	5912	20 70	40 12	0 0	0 0	0 0	17
1500	8000	.5	OPEN	OPEN	OPEN	90	5917	50 69	50 30	0 0	0 0	0 0	23
1600	300	2	OPEN	OPEN	OPEN	90	5922	50 68	50 30	0 0	0 0	0 0	20
2100	350	2	OPEN	OPEN	OPEN	90	5933	110 70	40 17	0 0	0 0	0 0	19
2200	100	2	OPEN	OPEN	OPEN	90	5936	30 70	40 17	0 0	0 0	0 0	20
2300	.02 1	1	OPEN	OPEN	OPEN	90	5939	30 70	30 20	0 0	0 0	0 0	20

TIME	LEVEL	O2 FLOW	VANESSA	KEYSTONE	RETURN	BLOWER	FRESH WATER			#1		#2		#3		#4		QUENCH
			VALVE POS.	VALVE POS.	VALVE POS.	BYPASS POS.	METER GAL.	GAL. CONS.	INLET TEMP	PO	PR	PO	PR	PO	PR	PO	PR	TANK LEVEL

SEPTEMBER 24, 1983

0000	.03	1	OPEN	OPEN	OPEN	30	5947	80	70	30	20	0	0	0	0	0	0	16
0100	.04	1	OPEN	OPEN	OPEN	30	5951	40	68	50	20	0	0	0	0	0	0	20
0200	.03	1	OPEN	OPEN	OPEN	30	5955	40	70	30	20	0	0	0	0	0	0	22
0300	.03	1	OPEN	OPEN	OPEN	30	5960	50	70	30	20	0	0	0	0	0	0	18
0400	.03	1	OPEN	OPEN	OPEN	30	5962	20	70	30	20	0	0	0	0	0	0	21
0500	.04	1	OPEN	OPEN	OPEN	30	5964	20	68	30	20	0	0	0	0	0	0	17
0600	4000	2	OPEN	OPEN	OPEN	30	5966	20	68	30	20	0	0	0	0	0	0	19
0700	8000	2	OPEN	OPEN	OPEN	30	5968	20	68	30	20	0	0	0	0	0	0	20
0800	4800	2	OPEN	OPEN	OPEN	30	5970	20	68	30	12	0	0	0	0	0	0	18
1130	1600	2	OPEN	OPEN	OPEN	50	5981	110	68	30	25	0	0	0	0	0	0	20
1200	900	2	OPEN	OPEN	OPEN	50	5984	30	68	40	20	0	0	0	0	0	0	17
1300	150	2	OPEN	OPEN	OPEN	50	5990	60	70	60	45	0	0	0	0	0	0	20
1400	350	2	OPEN	OPEN	OPEN	50	5996	60	70	60	45	0	0	0	0	0	0	20
1500	450	2	OPEN	OPEN	OPEN	50	6001	50	71	30	18	0	0	0	0	0	0	19
1600	350	2	OPEN	OPEN	OPEN	50	6005	40	71	40	20	0	0	0	0	0	0	18
1700	5000	2	OPEN	OPEN	OPEN	50	6008	30	71	30	13	0	0	0	0	0	0	19
1800	8700	2	OPEN	OPEN	OPEN	50	6011	30	72	30	15	0	0	0	0	0	0	19
1900	3900	2	OPEN	OPEN	OPEN	50	6016	50	71	30	15	0	0	0	0	0	0	19
2000	6800	2	OPEN	OPEN	OPEN	50	6017	10	71	30	15	0	0	0	0	0	0	19
2100	4500	2	OPEN	OPEN	OPEN	50	6021	40	71	30	15	0	0	0	0	0	0	20
2200	8000	2	OPEN	OPEN	OPEN	50	6024	40	71	30	15	0	0	0	0	0	0	19
2300	3500	2	OPEN	OPEN	OPEN	50	6027	30	70	30	15	0	0	0	0	0	0	16

SEPTEMBER 25, 1983

0000	5500	.2	OPEN	OPEN	OPEN	50	6030	30	70	30	15	0	0	0	0	0	0	18
0100	4700	.1	OPEN	OPEN	OPEN	50	6034	40	70	30	15	0	0	0	0	0	0	23
0200	9400	.2	OPEN	OPEN	OPEN	50	6037	30	70	30	14	0	0	0	0	0	0	19
0300	4100	.2	OPEN	OPEN	OPEN	50	6040	30	70	30	15	0	0	0	0	0	0	18
0400	4100	.1	OPEN	OPEN	OPEN	50	6042	20	70	20	20	0	0	0	0	0	0	17
0500	4700	.1	OPEN	OPEN	OPEN	50	6047	50	68	20	20	0	0	0	0	0	0	19
0600	9400	.1	OPEN	OPEN	OPEN	50	6052	50	68	20	20	0	0	0	0	0	0	19
0700	4500	2	OPEN	OPEN	OPEN	50	6055	30	66	20	20	0	0	0	0	0	0	22
0800	5400	1.5	OPEN	OPEN	OPEN	50	6060	50	68	20	20	0	0	0	0	0	0	19
0900	4700	2	OPEN	OPEN	OPEN	50	6064	40	68	20	20	0	0	0	0	0	0	20
1000	5000	2	OPEN	OPEN	OPEN	50	6067	30	68	20	20	0	0	0	0	0	0	17
1100	3400	2	OPEN	OPEN	OPEN	50	6072	50	70	20	20	0	0	0	0	0	0	19
1200	5000	2	OPEN	OPEN	OPEN	50	6077	50	70	20	20	0	0	0	0	0	0	17
1300	5300	1.5	OPEN	OPEN	OPEN	50	6080	30	71	20	20	0	0	0	0	0	0	21
1400	7400	2	OPEN	OPEN	OPEN	50	6084	40	72	20	20	0	0	0	0	0	0	18
1500	5000	1.5	OPEN	OPEN	OPEN	50	6088	40	72	20	20	0	0	0	0	0	0	17
1600	9000	2	OPEN	OPEN	OPEN	50	6092	40	72	20	20	0	0	0	0	0	0	19
1700	4800	2	OPEN	OPEN	OPEN	50	6096	4	75	15	15	0	0	0	0	0	0	18
1800	7000	2	OPEN	OPEN	OPEN	50	6099	30	74	15	15	0	0	0	0	0	0	21

TIME	O2 LEVEL	O2 FLOW	VANESSA VALVE POS.	KEYSTONE VALVE POS.	RETURN VALVE POS.	BLOWER BYPASS POS.	FRESH WATER			#1		#2		#3		#4		QUENCH TANK LEVEL
							METER GAL.	GAL. CONS.	INLET TEMP	PO	PR	PO	PR	PO	PR	PO	PR	
1930	ON LINE																	
2000	6400	4	OPEN	OPEN	OPEN	80	6118	190	78	50	40	0	0	0	0	0	0	24
2100	6900	3	OPEN	OPEN	OPEN	80	6125	70	72	50	40	0	0	0	0	0	0	17
2200	9000	2	OPEN	OPEN	OPEN	50				50	40	0	0	0	0	0	0	

OCTOBER 1, 1983

0000	34	1	OPEN	OPEN	OPEN	40	6154	290	70	50	42	0	0	0	0	0	0	19
0100	21	2	OPEN	OPEN	OPEN	40	6159	50	70	40	30	0	0	0	0	0	0	20
0200	14	2	OPEN	OPEN	OPEN	40	6163	40	70	100	46	0	0	0	0	0	0	24
0300	14	2	OPEN	OPEN	OPEN	50	6175	120	68	100	48	100	46	0	0	0	0	22
0400	10	1	OPEN	OPEN	OPEN	50	6180	50	68	0	0	100	46	0	0	0	0	20
0500	9	2	OPEN	OPEN	OPEN	50	6186	60	68	0	0	100	40	0	0	0	0	23
0600	31	2	OPEN	OPEN	OPEN	40	6190	40	69	0	0	80	35	0	0	0	0	19
0700	750	2	OPEN	OPEN	OPEN	40	6192	20	70	0	0	30	20	0	0	0	0	20
0800	700	2	OPEN	OPEN	OPEN	40	6194	20	70	0	0	30	20	0	0	0	0	20
0900	700	2	OPEN	OPEN	OPEN	40			70	0	0	30	20	0	0	0	0	20
1000	650	2	OPEN	OPEN	OPEN	40	6196	20	70	0	0	30	20	0	0	0	0	20
1100	600	2	OPEN	OPEN	OPEN	40	6199	30	70	100	50	0	0	0	0	0	0	18
1200	600	2	OPEN	OPEN	OPEN	40	6217	180	68	0	0	30	20	0	0	20	10	20
1300	600	2	OPEN	OPEN	OPEN	40	6229	120	68	20	15	10	10	0	0	10	10	20
1400	700	2	OPEN	OPEN	OPEN	40	6243	140	68	15	10	15	10	0	0	15	10	24
1500	500	2	OPEN	OPEN	OPEN	40	6252	90	66	15	20	10	5	0	0	10	15	29
1600	500	2	OPEN	OPEN	OPEN	50	6267	150	68	OFF	OFF	10	5	0	0	10	12	26
1700	600	2	OPEN	OPEN	OPEN	50	6281	140	68	OFF	OFF	20	10	0	0	10	12	27
1800	1800	2	OPEN	OPEN	OPEN	50	6295	140	68	OFF	OFF	20	10	0	0	10	12	26
1900	500	2	OPEN	OPEN	OPEN	40	6312	170	64	0	0	80	36	0	0	30	14	24
2000	700	2	OPEN	OPEN	OPEN	40	6335	230	64	0	0	80	32	0	0	30	14	26
2100	500	2	OPEN	OPEN	OPEN	40	6354	190	64	0	0	80	28	0	0	30	12	28
2200	500	2	OPEN	OPEN	OPEN	40	6367	130	64	0	0	80	28	0	0	30	12	22
2300	24	2	OPEN	OPEN	OPEN	40	6383	160	64	0	0	80	28	0	0	30	12	23

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0000	18	2	OPEN	OPEN	OPEN	40	6404	210	66	0	0	80	28	0	0	30	12	20
0100	6	2	OPEN	OPEN	OPEN	40	6423	190	64	0	0	80	28	0	0	30	15	19
0200	4	2	OPEN	OPEN	OPEN	40	6442	190	64	0	0	80	30	0	0	30	15	22
0300	4	2	OPEN	OPEN	OPEN	40	6452	100	65	0	0	80	20	0	0	30	15	20
0400	25	2	OPEN	OPEN	OPEN	40	6467	150	65	0	0	80	28	0	0	30	15	22
0500	15	2	OPEN	OPEN	OPEN	50	6480	130	65	0	0	80	30	0	0	30	15	20
0600	6	2	OPEN	OPEN	OPEN	50	6491	110	65	0	0	80	30	0	0	30	15	22
0700	5	2	OPEN	OPEN	OPEN	50	6510	190	65	0	0	80	30	0	0	30	15	19
0800	2000	2	OPEN	OPEN	OPEN	50	6524	140	63	0	0	30	20	0	0	30	10	21
0900	500	2	OPEN	OPEN	OPEN	50	6538	140	63	0	0	30	20	0	0	30	10	19
1000	500	2	OPEN	OPEN	OPEN	50	6551	130	67	0	0	50	20	0	0	30	10	18
1100	500	2	OPEN	OPEN	OPEN	50	6565	140	66	0	0	50	20	0	0	30	10	23
1200	2300	2	OPEN	OPEN	OPEN	50	6579	14	66	0	0	50	20	0	0	30	10	21
1300	500	2	OPEN	OPEN	OPEN	50	6597	180	67	0	0	50	20	0	0	30	10	20
1400	450	2	OPEN	OPEN	OPEN	50	6608	110	68	0	0	50	20	0	0	30	10	21

TIME	O ₂ LEVEL	O ₂ FLOW	VANESSA	KEYSTONE	RETURN	BLOWER	FRESH WATER			#1		#2		#3		#4		QUENCH
			VALVE POS.	VALVE POS.	VALVE POS.	BYPASS POS.	METER GAL.	GAL. CONS.	INLET TEMP	PO	PR	PO	PR	PO	PR	PO	PR	TANK LEVEL

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1500	500	2	OPEN	OPEN	OPEN	50	6621	130	67	0	0	50	20	0	0	30	10	22
1600	500	2	OPEN	OPEN	OPEN	50	6635	140	66	0	0	50	20	0	0	30	10	24
1700	500	2	OPEN	OPEN	OPEN	50	6649	140	66	0	0	50	20	0	0	30	10	26
1800	500	2	OPEN	OPEN	OPEN	50	6664	150	66	0	0	50	20	0	0	30	10	21
1900	500	2	OPEN	OPEN	OPEN	100	6677	130	65	0	0	50	20	0	0	30	10	23
2000	600	2	OPEN	OPEN	OPEN	100	6691	140	65	0	0	50	20	0	0	30	10	19
2100	600	2	OPEN	OPEN	OPEN	100	6705	140	64	0	0	50	20	0	0	30	10	22

QUENCH/ESP DATA LOG SHEET
BOM/FGT 008

TIME	INLT TEMP	RECYCLE #5		LIQUOR #6		LIQUOR #7		LIQUOR TEMPERATURE SURGE		LIQUOR PRESSURE		ATOM		E.S.P.						
		PO	PR	PO	PR	PO	PR	SURGE TANK	TANK DISCH	COMB. SUPPLY	TANK LEVEL	PUMPl DISCH	PUMP2 DISCH	SUPPLY LINE	NOZZLE	STEAM PRESS	PRIMARY VOLT	AMPS	SECONDARY VOLT	AMPS
SEPTEMBER 21, 1983																				
1130	140	100	20	100	20	100	20	210	210	0	160	20	30	0	0	0	300	7	22	15
1200	142	100	20	100	20	100	20	200	200	0	150	20	30	0	0	0	350	7	25	14
1300	142	100	20	100	20	100	20	210	210	0	170	20	30	0	0	0	335	7.5	26	12
1400	142	100	20	100	25	100	25	210	210	0	180	20	30	0	0	0	320	7	25	14
1500	140	100	25	100	26	100	26	178	178	0	190	20	50	0	0	0	320	7	25	14
1600	142	100	28	100	30	100	28	190	191	0	190	20	42	0	0	0	320	7	25	14
1700	145	100	28	100	29	100	28	198	199	0	230	20	46	0	0	0	320	7	25	14
1800	143	100	30	100	33	100	31	200	200	0	240	110	100	0	0	0	320	7	26	14
1900	140	100	30	100	33	100	30	200	199	0	240	94	100	0	0	0	320	7	26	14
2000	140	100	34	100	33	100	32	199	198	0	255	115	100	0	0	0	330	7	26	14
2100	139	100	34	100	33	100	31	198	208	0	260	105	100	0	0	0	330	7	26	14
2200	139	100	38	100	32	100	32	200	194	0	310	95	100	0	0	0	330	7	27	14
SEPTEMBER 22, 1983																				
1700	134	100	35	100	35	100	33	0	185	140	280	40	50	0	35	40	325	7	23	14
1800	140	100	40	100	35	100	31	0	180	98	270	39	50	0	35	20	300	7	19	12
1900	140	100	40	100	32	100	30	0	174	195	260	40	54	0	35	30	310	7	19	12
2000	140	100	40	100	35	100	33	0	180	200	270	40	50	0	35	30	300	7	19	12
2100	139	100	40	100	33	100	31	0	150	60	270	40	50	0	35+	30	300	7	19	12
2200		NOT ABLE TO BURN TAR DUE TO FRIED NOZZLE																		
2300	147	100	40	100	33	100	32	0	215	0	275	30	40	0	0	0	0	0	0	0
SEPTEMBER 23, 1983																				
0000	145	100	40	100	35	100	32	0	180	0	375	40	65	40	25	20	300	6	18	12
0100	150	100	40	100	35	100	30	0	175	0	115	BYPASS		0	0	20	300	7	17	10
0200	150	100	40	100	30	100	30	0	160	0	115	BYPASS		0	0	20	275	7	17	12
0300	155	100	38	100	30	100	30	0	160	0	100	BYPASS		0	0	20	300	7	17	12
0400	140	100	37	100	35	100	30	0	150	0	98	BYPASS		0	0	20	300	7	17	12
0500	130	100	35	100	35	100	30	0	130	0	125	BYPASS		0	0	20	300	6	16	10
0630	132	100	30	100	35	100	30	0	185	0	140	20	40	0	0	0	290	6	16	10
0700	134	100	30	100	35	100	30	0	185	0	140	20	40	0	0	0	300	6	17	12
0800	134	100	30	100	35	100	0	0	208	0	180	20	45	0	0	0	300	6	17	12
0900	128	100	30	100	30	100	0	0	195	0	175	20	45	0	0	0	320	7	19	14
1000	130	100	30	100	30	100	0	0	197	0	230	0	45	0	0	0	300	7	18	12
1100	140	100	30	100	30	100	0	0	190	0	260	20	0	0	0	0	340	7	27	12
1200	140	100	30	100	30	100	0	0	190	0	260	45	0	0	0	0	330	7	27	14
1300	140	100	30	100	30	100	0	0	190	0	260	45	0	0	0	0	350	7	26	14
1500	138	100	34	100	33	100	31	0	190	0	275	170	0	0	0	0	340	7	26	13
1600	149	100	35	100	34	100	31	0	188	0	320	40	0	0	0	0	340	7	26	12
2100	150	100	30	100	32	100	30	0	190	180	320	40	5	35	35	25	325	7	22	15
2200	142	100	33	100	34	100	30	0	185	190	270	40	55	35	0	25	320	7	25	14
2300	140	100	32	100	32	100	30	0	185	0	210	40	60	0	0	0	350	7	35	12

TIME	INLT TEMP	RECYCLE LIQUOR						LIQUOR TEMPERATURE				SURGE			LIQUOR PRESSURE			ATOM		E.	
		#5		#6		#7		SURGE TANK	TANK DISCH	TEMPERATURE COMB. SUPPLY	TANK LEVEL	PUMPL DISCH	PUMP2 DISCH	SUPPLY LINE	NOZZLE	STEAM PRESS	PRIMARY VOLT	AMPS	SECONDARY VOLT	AMPS	
SEPTEMBER 24, 1983																					
0000	145	100	30	100	32	100	30	0	180	0	240	40	55	40	35	25	330	8	31	14	
0100	142	100	30	100	30	100	30	0	142	0	180	20	110	0	0	40	325	8	35	12	
0200	142	100	30	100	32	100	30	0	185	0	180	40	110	40	40	40	320	7	32	12	
0300	140	100	30	100	30	100	30	0	180	0	370	35	100	40	50	40	325	7	34	14	
0400	138	100	30	100	30	100	30	0	180	0	140	30	100	40	40	40	330	7	33	14	
0500	138	100	32	100	32	100	32	0	178	0	160	35	100	40	45	40	340	8	34	12	
0600	138	100	32	100	30	100	30	0	196	0	210	35	100	40	45	40	330	8	35	14	
0700	138	100	32	100	30	100	30	0	190	0	210	35	0	40	45	40	320	7	35	16	
0800	140	100	32	100	32	100	0	0	195	0	220	80	0	80	80	60	330	7	37	14	
1130	16	100	30	100	30	100	0	0	185	0	240	20	0	0	45	45	300	7	36	14	
1200	130	100	30	100	30	100	0	0	188	0	265	40	0	40	40	35	340	7	37	14	
1300	135	100	32	100	34	100	31	0	190	0	240	15	0	55	0	37	340	7	37	14	
1400	142	100	30	100	30	100	29	0	185	0	250	25	0	60	0	35	350	7	38	14	
1500	140	100	28	100	27	100	29	0	190	0	285	20	0	55	0	35	350	7	35	14	
1600	140	100	35	100	34	100	30	0	180	0	310	40	0	40	0	25	350	7	35	14	
1700	140	100	30	100	30	100	30	0	180	0	280	40	0	38	0	26	350	7	35	14	
1800	140	100	28	100	27	100	28	0	180	0	225	40	0	38	0	25	340	7	37	14	
1900	140	100	28	100	28	100	25	0	190	0	230	20	0	70	0	45	340	7	37	14	
2000	141	100	27	100	28	100	25	0	185	0	240	20	0	75	0	30	350	7	37	14	
2100	140	100	27	100	28	100	25	0	190	0	260	23	0	75	0	50	350	7	37	14	
2200	140	100	28	100	29	100	28	0	190	0	240	19	0	75	0	35	350	7	37	14	
2300	140	100	27	100	28	100	28	0	180	0	230	40	100+	42	40	30	325	7	37	14	
SEPTEMBER 25, 1983																					
0000	140	100	28	100	28	100	28	0	180	0	160	40	100+	40	38	35	350	7	40	10	
0100	138	100	28	100	29	100	28	0	186	0	150	20	100+	20	40	40	325	6	38	12	
0200	138	100	28	100	28	100	28	0	200	0	170	20	100+	30	40	40	350	6	39	12	
0300	139	100	28	100	28	100	28	0	190	0	185	20	100+	40	40	40	350	6	29	14	
0400	140	100	28	100	20	100	30	0	200	0	210	30	100+	30	40	40	325	7	40	10	
0500	138	100	32	100	35	100	30	0	190	0	190	30	70	20	40	40	350	6	38	12	
0600	129	100	32	100	35	100	30	0	200	0	190	30	60	20	40	40	350	6	38	12	
0700	136	100	30	100	35	100	30	0	190	0	215	20	90	30	40	40	330	6	35	14	
0800	138	100	30	100	35	100	30	0	190	0	275	20	90	30	40	40	320	6	36	12	
0900	136	100	30	100	35	100	30	0	190	0	215	85	100	85	85	65	330	7	37	14	
1000	136	100	30	100	32	100	30	0	180	0	190	40	0	40	40	35	340	7	37	16	
1100	138	100	30	100	28	100	32	0	190	0	160	20	60	20	40	40	350	6	38	12	
1200	142	100	30	100	30	100	32	0	190	0	210	20	60	20	60	75	350	7	37	12	
1300	140	100	30	100	35	100	35	0	186	0	200	80	90	85	80	65	350	7	37	14	
1400	138	100	30	100	35	100	32	0	182	0	140	20	0	20	40	40	340	7	37	14	
1500	140	100	25	100	28	100	28	0	188	0	190	20	0	20	45	45	340	7	38	16	
1600	142	100	30	100	30	100	30	0	185	0	190	20	0	20	0	0	350	7	38	12	
1700	140	100	30	100	30	100	30	0	185	0	240	20	0	0	0	0	350	7	38	12	
1800	140	100	35	100	34	100	30	0	185	0	230	20	0	0	0	0	90	2	6	3	

		RECYCLE LIQUOR			LIQUOR TEMPERATURE				LIQUOR PRESSURE			ATOM	E.S.P.		
TIME	INLT	#5	#6	#7	SURGE	TANK	COMB.	TANK	PUMP1	PUMP2	SUPPLY	NOZZLE	STEAM	PRIMARY	SECONDARY
	TEMP	PO	PR	PO	PR	PO	PR	LEVEL	DISCH	DISCH	LINE		PRESS	VOLT	AMPS

SEPTEMBER 27, 1983

2000	132	100	35	100	34	100	30	0	190	0	170	10	20	20	0	0	340	7	35	14
2100	140	100	35	100	32	100	30	0	184	0	195	15	0	20	0	0	330	7	32	16
2200		100	35	100	32	100	30	0	190	0	0	0	0	0	0	0	350	6	32	12

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0000	140	100	34	100	35	100	30	0	180	0	260	50	38	44	40	25	350	7	25	12
0100	138	100	34	100	34	100	30	0	180	0	250	42	30	40	40	20	340	7	25	12
0200	140	100	24	100	35	100	30	0	190	0	190	42	30	40	40	20	340	7	25	12
0300	130	100	32	100	35	100	32	0	165	0	220	44	30	42	40	25	320	7	26	12
0400	136	100	35	100	35	100	30	0	160	0	230	42	28	45	40	25	350	6	35	12
0500	140	100	35	100	30	100	32	0	162	0	200	42	30	42	40	25	325	6	34	12
0600	144	100	35	100	30	100	31	0	160	0	180	44	30	42	42	20	0	0	0	0
0700	144	100	35	100	30	100	31	0	180	0	150	48	30	40	0	25	325	7	34	13
0800	144	100	35	100	34	100	32	0	160	0	120	48	30	40	0	25	340	7	34	15
0900	140	100	35	100	34	100	32	0	180	0	130	20	0	0	0	0	350	7	35	17
1000	143	100	35	100	34	100	32	0	165	0	130	20	0	0	0	0	340	7	35	18
1100	138	100	35	100	35	100	32	0	170	0	170	20	10	0	0	0	340	7	35	18
1200	137	100	35	100	35	100	30	0	160	0	330	25	15	0	0	0	340	7	35	18
1300	137	100	35	100	35	100	32	0	170	0	440	100	100	100	0	55	340	7	36	17
1400	137	100	35	100	35	100	32	0	170	0	450	45	50	35	0	25	340	7	37	17
1500	134	100	35	100	35	100	32	0	170	0	440	40	50	25	30	20	330	7	39	18
1600	132	100	35	100	35	100	30	0	172	0	410	20	80	65	65	45	340	7	38	17
1700	134	100	35	100	35	100	32	0	175	0	300	20	90	65	65	45	340	6	39	16
1800	134	100	35	100	35	100	32	0	178	0	220	20	90	65	60	45	350	7	40	16
1900	132	100	35	100	35	100	32	0	170	0	180	20	90	65	60	45	320	7	40	16
2000	132	100	35	100	35	100	32	0	168	0	175	20	90	65	60	45	340	7	39	18
2100	132	100	35	100	35	100	32	0	170	0	85	20	90	65	60	45	330	6	37	16
2200	132	100	35	100	35	100	32	0	170	0	205	20	85	65	60	50	330	7	38	18
2300	132	100	35	100	35	100	32	0	169	0	160	20	70	60	55	40	330	7	37	17

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0000	132	100	35	100	35	100	32	0	160	0	120	20	20	0	40	48	340	7	58	18
0100	130	100	34	100	35	100	32	0	180	0	130	20	90	64	60	40	330	6	40	18
0200	130	100	34	100	35	100	32	0	180	0	120	20	100	68	60	40	320	6	38	18
0300	130	100	35	100	35	100	30	0	165	0	180	20	60	0	40	40	310	6	40	16
0400	130	100	35	100	35	100	32	0	170	0	290	20	60	0	40	40	350	7	40	18
0500	130	100	35	100	34	100	30	0	180	0	300	20	100	60	55	40	340	6	37	16
0600	130	100	35	100	35	100	32	0	175	0	250	20	80	50	45	40	350	7	40	18
0700	130	100	35	100	35	100	32	0	180	0	250	20	100	0	40	40	320	5	37	18
0800	137	100	35	100	35	100	30	0	180	0	180	20	100	60	0	55	340	7	37	18
0900	130	100	35	100	35	100	30	0	180	0	120	20	100	65	0	50	320	7	37	18
1000	136	100	35	100	35	100	30	0	180	0	90	20	90	0	0	0	340	7	37	18
1100	130	100	35	100	35	100	30	0	185	0	180	30	90	0	0	0	340	7	37	18
1200	137	100	35	100	35	100	30	0	170	0	320	30	100	60	0	45	340	7	37	18
1300	132	100	35	100	35	100	30	0	175	0	250	30	100	65	0	50	340	7	37	18

TIME	INLT	RECYCLE LIQUOR						LIQUOR TEMPERATURE				LIQUOR PRESSURE				ATOM		E.	
		#5		#6		#7		SURGE	TANK	COMB.	TANK	PUMP1	PUMP2	SUPPLY	NOZZLE	STEAM	PRIMARY	SECONDARY	
	TEMP	PO	PR	PO	PR	PO	PR	TANK	DISCH	SUPPLY	LEVEL	DISCH	DISCH	LINE		PRESS	VOLT	AMPS	VOLT
OCTOBER 2, 1983																			
1400	133	100	35	100	35	100	31	0	170	0	200	30	100	65	0	45	340	7	37
1500	132	100	35	100	35	100	32	0	170	0	220	30	100	65	65	50	330	7	37
1600	132	100	35	100	35	100	30	0	170	0	110	30	90	65	60	50	330	7	37
1700	130	100	35	100	35	100	31	0	172	0	220	20	100	20	60	55	340	7	40
1800	128	100	35	100	35	100	31	0	170	0	250	20	100	67	65	45	320	7	40
1900	128	100	35	100	35	100	32	0	170	0	135	20	100	68	70	60	330	7	38
2000	128	100	35	100	35	100	30	0	170	0	230	20	0	0	0	40	320	7	36
2100		100	35	100	35	100	30	0	174	0	235	20	0	70	70	55	300	7	32

APPENDIX K

Gas Chromatograph Data

The results of each successful gas chromatograph analysis are included here. Results from both the HP5880A (analysis for permanent gasses and hydrocarbons) and the HP5793 (analysis for gaseous sulfur species) are included in separate tables.

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/13/1983															
19:05	11.764	7.246	0.001	0.002	0.000	52.36	0.033	24.96	0.001	0.001	118.7	112.7	96.37	25.10	0.866
19:23	11.628	7.138	0.001	0.001	0.000	52.03	0.027	24.98	0.000	0.000	118.2	112.3	95.81	24.96	0.861
19:41	11.595	7.140	0.027	0.047	0.000	51.75	0.279	24.85	0.016	0.015	122.2	115.9	95.72	24.92	0.860
19:59	13.075	6.933	0.077	0.143	0.000	50.00	1.052	24.35	0.047	0.044	137.1	129.1	95.72	24.42	0.843
20:34	13.094	7.011	0.061	0.102	0.000	50.83	0.812	23.78	0.035	0.029	131.3	123.6	95.76	24.46	0.844
20:52	13.400	7.175	0.071	0.112	0.000	50.20	0.885	23.83	0.041	0.033	133.7	125.8	95.74	24.39	0.842
21:09	13.819	6.970	0.080	0.142	0.000	49.52	1.093	23.99	0.047	0.041	138.7	130.3	95.70	24.22	0.836
21:27	14.052	6.850	0.074	0.145	0.000	49.15	1.159	24.05	0.045	0.043	140.3	131.7	95.56	24.09	0.832
21:45	14.169	6.861	0.071	0.127	0.000	49.14	1.075	24.00	0.041	0.037	139.1	130.5	95.52	24.06	0.831
22:03	13.734	6.754	0.070	0.142	0.000	50.62	1.147	23.00	0.043	0.042	135.6	127.2	95.55	24.16	0.834
22:20	14.053	6.462	0.072	0.163	0.000	49.02	1.282	24.35	0.046	0.048	142.9	134.2	95.49	24.00	0.828
22:38	13.986	6.677	0.064	0.141	0.000	49.61	1.167	24.16	0.041	0.042	140.2	131.6	95.89	24.17	0.834
22:56	14.019	6.660	0.065	0.159	0.000	49.07	1.247	24.05	0.044	0.048	141.2	132.5	95.36	24.00	0.829
23:13	14.160	6.664	0.068	0.181	0.000	49.23	1.397	24.04	0.047	0.055	143.9	134.9	95.84	24.09	0.831
23:31	14.227	6.634	0.063	0.170	0.000	48.96	1.373	23.89	0.044	0.051	143.0	134.0	95.41	23.95	0.827
23:49	13.969	6.694	0.062	0.177	0.000	49.53	1.387	23.90	0.045	0.054	142.5	133.6	95.82	24.14	0.833
9/14/1983															
0:07	13.712	6.625	0.064	0.186	0.000	50.66	1.450	22.58	0.047	0.056	138.3	129.5	95.38	24.06	0.831
0:24	14.573	6.805	0.066	0.182	0.000	49.16	1.496	23.38	0.047	0.054	144.1	134.8	95.77	23.97	0.827
0:42	15.126	6.908	0.076	0.195	0.000	48.91	1.610	23.15	0.052	0.058	146.9	137.2	96.08	23.92	0.826
1:18	16.151	6.853	0.094	0.196	0.000	48.09	1.699	22.89	0.058	0.056	150.7	140.3	96.08	23.63	0.816
1:35	15.826	6.896	0.093	0.166	0.000	48.51	1.526	22.63	0.054	0.047	146.2	136.3	95.75	23.65	0.816
1:40	15.590	7.028	0.073	0.191	0.000	48.73	1.623	22.75	0.050	0.056	147.0	137.1	96.09	23.82	0.822
1:53	15.826	6.909	0.097	0.177	0.000	48.20	1.574	22.86	0.056	0.050	147.8	137.8	95.75	23.65	0.816
2:11	15.953	6.807	0.096	0.161	0.000	48.50	1.514	22.61	0.054	0.045	146.3	136.4	95.74	23.60	0.815
2:29	16.105	6.858	0.099	0.161	0.000	48.02	1.494	22.90	0.055	0.045	147.6	137.6	95.73	23.57	0.814
2:48	16.114	6.984	0.114	0.167	0.000	48.15	1.546	22.60	0.060	0.046	147.7	137.6	95.78	23.60	0.814
3:05	16.194	6.846	0.116	0.159	0.000	47.85	1.471	23.02	0.059	0.043	148.3	138.2	95.75	23.55	0.813
3:23	15.945	6.814	0.121	0.166	0.000	47.93	1.473	23.16	0.062	0.045	148.3	138.3	95.72	23.60	0.815
3:41	15.921	6.944	0.126	0.155	0.000	48.07	1.407	23.04	0.062	0.042	147.0	137.1	95.77	23.65	0.816
3:59	15.412	6.663	0.126	0.150	0.000	48.35	1.325	23.88	0.062	0.041	147.1	137.6	96.01	23.82	0.822
4:17	15.766	6.407	0.116	0.152	0.000	47.75	1.350	24.33	0.059	0.042	149.8	140.0	95.97	23.67	0.817
4:35	15.962	6.147	0.121	0.155	0.000	47.37	1.355	24.95	0.061	0.042	152.6	142.8	96.16	23.63	0.816
4:52	15.844	6.196	0.134	0.151	0.000	47.42	1.298	24.73	0.072	0.042	151.4	141.6	95.88	23.60	0.815
5:10	16.025	6.025	0.146	0.148	0.000	47.37	1.340	24.95	0.067	0.039	153.0	143.2	96.11	23.58	0.814
5:28	16.253	6.024	0.146	0.149	0.000	47.12	1.337	25.12	0.068	0.040	154.3	144.4	96.26	23.56	0.813
5:46	16.250	6.119	0.138	0.150	0.000	47.15	1.319	25.07	0.066	0.041	153.9	143.9	96.31	23.60	0.814
6:04	15.711	5.727	0.133	0.155	0.000	48.86	1.331	24.33	0.065	0.042	149.9	140.2	96.36	23.68	0.818
6:22	16.752	5.626	0.130	0.151	0.000	46.48	1.333	25.89	0.064	0.042	158.1	147.9	96.47	23.43	0.809
6:40	16.661	5.456	0.142	0.163	0.000	46.43	1.374	26.11	0.069	0.045	159.5	149.3	96.45	23.42	0.808
6:57	17.268	5.343	0.133	0.159	0.000	45.80	1.415	26.29	0.066	0.044	162.2	151.6	96.52	23.25	0.803
7:15	16.958	5.374	0.141	0.171	0.000	46.02	1.428	26.26	0.071	0.048	161.8	151.3	96.47	23.33	0.805
7:33	17.395	5.407	0.135	0.173	0.000	45.64	1.515	26.00	0.069	0.048	163.2	152.4	96.39	23.18	0.800
7:51	17.022	5.350	0.139	0.174	0.000	45.74	1.438	26.27	0.071	0.049	162.2	151.6	96.26	23.24	0.802

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/14/1983															
8:09	16.828	5.512	0.121	0.170	0.000	46.29	1.458	25.70	0.068	0.049	159.5	149.1	96.19	23.30	0.804
8:27	16.594	5.555	0.118	0.172	0.000	46.36	1.412	25.92	0.064	0.050	158.9	148.7	96.25	23.39	0.807
8:45	16.156	5.570	0.115	0.166	0.000	46.79	1.379	25.90	0.062	0.048	156.8	146.9	96.19	23.49	0.811
9:03	15.859	5.820	0.112	0.169	0.000	47.24	1.382	25.52	0.062	0.049	154.7	144.9	96.21	23.62	0.815
9:21	15.686	5.911	0.109	0.161	0.000	47.48	1.347	25.38	0.059	0.048	153.1	143.4	96.19	23.67	0.817
9:39	15.607	6.110	0.099	0.179	0.000	47.83	1.446	24.74	0.061	0.054	152.1	142.3	96.13	23.70	0.818
9:57	15.655	6.252	0.094	0.192	0.000	47.68	1.532	24.44	0.060	0.059	152.4	142.5	95.96	23.65	0.816
10:15	15.614	6.042	0.082	0.198	0.000	47.45	1.562	24.57	0.056	0.060	152.8	142.9	95.63	23.53	0.812
10:33	15.612	6.362	0.084	0.199	0.000	47.84	1.622	23.72	0.056	0.059	150.7	140.7	95.55	23.55	0.813
10:51	15.361	6.717	0.075	0.194	0.000	48.06	1.540	23.53	0.053	0.058	148.2	138.4	95.59	23.70	0.818
11:09	15.792	7.501	0.072	0.206	0.000	48.26	1.635	22.36	0.051	0.062	147.0	136.9	95.93	23.79	0.821
11:27	15.700	7.808	0.067	0.201	0.000	48.67	1.624	21.82	0.048	0.060	144.6	134.6	96.00	23.89	0.825
11:45	15.584	8.003	0.061	0.215	0.000	48.92	1.717	21.40	0.049	0.065	144.0	134.0	96.01	23.94	0.826
12:03	14.795	7.653	0.054	0.188	0.000	51.53	1.573	20.12	0.043	0.057	135.0	125.6	96.02	24.11	0.832
12:21	16.034	8.014	0.058	0.214	0.000	48.86	1.766	20.95	0.047	0.065	144.5	134.1	96.01	23.82	0.822
12:39	15.849	7.795	0.061	0.204	0.000	48.97	1.702	21.48	0.048	0.062	144.7	134.6	96.17	23.89	0.825
12:57	16.080	7.737	0.058	0.196	0.000	48.73	1.678	21.75	0.054	0.061	146.0	135.8	96.34	23.87	0.824
13:15	16.115	7.678	0.061	0.191	0.000	48.91	1.658	21.73	0.048	0.059	145.7	135.4	96.45	23.88	0.824
13:33	16.242	7.167	0.071	0.192	0.000	48.13	1.664	22.70	0.052	0.058	149.5	139.2	96.27	23.72	0.819
13:51	16.094	6.674	0.072	0.180	0.000	47.89	1.549	23.59	0.051	0.054	150.4	140.3	96.15	23.65	0.817
14:09	15.723	6.646	0.078	0.177	0.000	49.59	1.544	22.43	0.053	0.052	145.4	135.5	96.29	23.78	0.821
14:27	16.461	7.008	0.087	0.177	0.000	47.98	1.586	23.02	0.056	0.051	150.3	140.0	96.42	23.68	0.818
14:45	16.259	6.890	0.103	0.180	0.000	48.08	1.612	23.16	0.061	0.054	150.9	140.6	96.40	23.71	0.818
15:03	16.451	6.983	0.102	0.169	0.000	48.05	1.552	23.07	0.058	0.050	150.3	140.0	96.49	23.70	0.818
16:28	16.308	6.549	0.127	0.174	0.000	47.34	1.590	23.98	0.065	0.051	153.8	143.5	96.19	23.58	0.814
16:46	16.375	6.473	0.126	0.161	0.000	47.13	1.529	24.03	0.062	0.047	153.1	142.9	95.93	23.49	0.811
17:04	16.254	6.247	0.126	0.150	0.000	47.89	1.448	23.95	0.061	0.041	151.3	141.2	96.16	23.56	0.813
17:22	16.537	6.402	0.127	0.165	0.000	46.93	1.541	24.08	0.064	0.045	154.0	143.6	95.88	23.42	0.808
17:40	16.744	6.282	0.122	0.151	0.000	46.91	1.473	24.33	0.061	0.043	154.3	144.0	96.11	23.42	0.808
17:58	16.695	5.932	0.127	0.161	0.000	46.98	1.460	24.69	0.065	0.046	155.6	145.3	96.16	23.39	0.807
18:16	16.948	5.871	0.133	0.148	0.000	46.45	1.405	25.17	0.065	0.043	157.2	146.8	96.24	23.34	0.806
18:34	16.971	5.652	0.127	0.148	0.000	46.17	1.380	25.56	0.063	0.041	158.1	147.7	96.11	23.27	0.803
18:53	16.837	5.596	0.118	0.146	0.000	46.12	1.300	25.84	0.061	0.042	157.6	147.4	96.06	23.29	0.804
19:11	16.534	5.593	0.130	0.159	0.000	46.36	1.365	25.75	0.066	0.045	157.6	147.4	96.00	23.35	0.806
19:34	16.518	5.772	0.125	0.150	0.000	46.72	1.302	25.86	0.061	0.043	156.8	146.8	96.55	23.54	0.813
19:52	16.616	5.664	0.121	0.168	0.000	46.03	1.435	25.78	0.062	0.049	158.6	148.4	95.92	23.31	0.805
20:10	16.590	5.804	0.100	0.147	0.000	46.20	1.300	25.58	0.054	0.042	155.5	145.4	95.82	23.32	0.805
20:28	16.513	5.498	0.103	0.168	0.000	45.85	1.378	26.13	0.059	0.049	158.5	148.3	95.74	23.26	0.803
20:48	16.686	5.148	0.087	0.128	0.000	45.71	1.146	27.05	0.047	0.036	158.1	148.2	96.04	23.27	0.803
21:06	16.396	5.426	0.091	0.152	0.000	46.02	1.247	26.49	0.051	0.044	157.2	147.2	95.92	23.34	0.806
21:23	16.319	5.525	0.082	0.143	0.000	46.13	1.211	26.32	0.049	0.042	155.6	145.8	95.82	23.36	0.806
21:41	16.077	5.919	0.082	0.145	0.000	46.62	1.202	25.74	0.049	0.043	152.9	143.2	95.87	23.50	0.811
21:59	16.096	6.080	0.085	0.162	0.000	46.69	1.324	25.33	0.053	0.049	153.5	143.7	95.87	23.50	0.811
22:17	16.387	6.018	0.078	0.168	0.000	46.41	1.381	25.34	0.051	0.051	155.0	145.0	95.88	23.42	0.808
22:34	16.552	6.095	0.079	0.191	0.000	46.19	1.512	25.07	0.053	0.058	156.7	146.4	95.81	23.35	0.806
22:52	15.957	6.383	0.071	0.188	0.000	47.28	1.492	24.12	0.050	0.057	151.3	141.3	95.60	23.50	0.811

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/14/1983															
23:10	15.676	6.799	0.076	0.195	0.000	47.54	1.543	23.61	0.052	0.060	149.6	139.6	95.55	23.62	0.815
23:28	15.645	6.849	0.077	0.208	0.000	47.46	1.630	23.58	0.052	0.064	150.6	140.5	95.57	23.63	0.816
23:45	15.679	6.972	0.069	0.194	0.000	47.84	1.593	23.07	0.048	0.059	148.1	138.1	95.53	23.63	0.816
9/15/1983															
0:03	15.152	7.204	0.065	0.208	0.000	49.65	1.673	21.36	0.048	0.064	142.0	132.2	95.43	23.77	0.820
0:21	15.750	7.745	0.068	0.222	0.000	48.42	1.855	21.23	0.052	0.069	145.9	135.5	95.42	23.68	0.817
0:39	15.773	8.195	0.072	0.228	0.000	48.95	1.945	20.06	0.053	0.070	143.3	132.9	95.35	23.71	0.819
0:56	15.830	7.972	0.077	0.204	0.000	48.72	1.796	20.63	0.052	0.062	143.3	133.0	95.34	23.68	0.817
1:14	14.836	7.374	0.082	0.195	0.000	49.44	1.717	21.58	0.050	0.058	142.1	132.4	95.34	23.85	0.823
1:32	15.877	7.351	0.086	0.180	0.000	48.34	1.619	21.84	0.052	0.054	145.0	134.9	95.40	23.60	0.815
1:50	15.823	7.194	0.098	0.179	0.000	48.11	1.568	22.31	0.054	0.052	146.0	136.0	95.39	23.59	0.814
2:08	15.709	6.788	0.094	0.158	0.000	48.93	1.481	22.05	0.051	0.046	143.3	133.5	95.31	23.54	0.813
2:25	15.747	7.076	0.110	0.163	0.000	48.01	1.480	22.65	0.055	0.046	145.7	135.9	95.34	23.59	0.814
2:43	15.317	7.022	0.115	0.176	0.000	48.23	1.523	22.79	0.060	0.050	145.8	136.0	95.28	23.67	0.817
3:01	15.460	6.915	0.115	0.167	0.000	47.97	1.489	23.01	0.057	0.048	146.3	136.6	95.24	23.61	0.815
3:20	15.337	6.996	0.114	0.167	0.000	48.09	1.482	22.99	0.055	0.047	145.7	136.0	95.28	23.66	0.817
3:38	15.716	6.937	0.122	0.174	0.000	47.72	1.559	22.87	0.060	0.049	147.7	137.7	95.20	23.53	0.812
3:56	15.999	6.731	0.122	0.168	0.000	47.27	1.501	23.33	0.060	0.047	149.4	139.3	95.23	23.43	0.809
4:13	16.163	6.356	0.120	0.171	0.000	47.04	1.552	23.70	0.059	0.049	151.7	141.5	95.21	23.32	0.805
4:31	16.260	6.259	0.127	0.168	0.000	46.60	1.528	24.18	0.060	0.047	153.3	143.1	95.23	23.29	0.804
4:49	16.250	6.233	0.133	0.171	0.000	46.57	1.547	24.25	0.062	0.046	153.9	143.7	95.26	23.29	0.804
5:07	15.930	6.067	0.137	0.162	0.000	46.85	1.459	24.55	0.063	0.044	152.8	142.8	95.26	23.36	0.806
5:25	16.108	6.120	0.136	0.164	0.000	46.68	1.471	24.49	0.062	0.045	153.3	143.2	95.27	23.32	0.805
5:43	16.413	6.199	0.154	0.157	0.000	46.50	1.448	24.30	0.066	0.042	153.6	143.4	95.28	23.26	0.803
6:01	16.204	6.242	0.152	0.159	0.000	46.68	1.423	24.29	0.068	0.043	152.7	142.7	95.26	23.32	0.805
6:19	16.314	6.055	0.143	0.157	0.000	46.43	1.427	24.59	0.066	0.043	153.9	143.7	95.22	23.25	0.803
6:36	16.816	5.778	0.133	0.162	0.000	45.85	1.450	24.94	0.068	0.046	156.9	146.5	95.24	23.08	0.797
6:54	16.961	4.928	0.144	0.165	0.000	46.29	1.494	25.06	0.067	0.044	158.4	147.8	95.16	22.88	0.790
7:12	17.183	5.735	0.147	0.175	0.000	45.26	1.611	24.89	0.069	0.048	160.1	149.3	95.12	22.92	0.791
7:30	16.873	5.765	0.137	0.168	0.000	45.61	1.493	24.96	0.065	0.047	157.7	147.2	95.12	23.02	0.795
7:48	16.950	5.648	0.142	0.178	0.000	45.28	1.553	25.24	0.067	0.049	159.8	149.2	95.11	22.97	0.793
8:06	16.680	5.730	0.127	0.156	0.000	48.39	1.385	25.21	0.060	0.043	156.2	146.0	97.78	23.83	0.822
8:24	17.218	5.748	0.131	0.189	0.000	46.65	1.586	26.14	0.064	0.051	163.9	153.1	97.78	23.67	0.817
8:42	17.460	5.668	0.111	0.171	0.000	46.48	1.498	26.29	0.056	0.048	163.4	152.6	97.77	23.60	0.815
9:00	17.463	5.769	0.111	0.189	0.000	46.44	1.571	26.07	0.059	0.053	164.0	153.1	97.73	23.59	0.814
9:18	17.211	5.915	0.094	0.166	0.000	46.89	1.419	25.95	0.051	0.046	160.2	149.7	97.74	23.70	0.818
9:35	16.927	5.651	0.087	0.187	0.000	46.71	1.504	26.52	0.052	0.054	162.4	151.9	97.70	23.71	0.819
9:53	16.710	5.802	0.075	0.166	0.000	47.07	1.391	26.35	0.046	0.048	159.2	149.0	97.66	23.79	0.821
10:11	15.836	6.057	0.071	0.183	0.000	49.15	1.464	24.69	0.047	0.054	152.2	142.3	97.55	24.02	0.829
10:29	16.236	6.640	0.072	0.201	0.000	48.20	1.616	24.60	0.049	0.059	155.2	144.9	97.67	24.03	0.830
10:47	16.321	7.065	0.071	0.229	0.000	48.51	1.794	23.73	0.052	0.069	155.3	144.7	97.83	24.10	0.832
11:06	16.114	7.125	0.061	0.204	0.000	49.03	1.666	23.60	0.045	0.061	152.0	141.7	97.91	24.20	0.835
11:24	15.889	7.087	0.060	0.220	0.000	48.94	1.766	23.41	0.045	0.066	152.0	141.7	97.48	24.12	0.833
11:42	15.853	7.243	0.053	0.200	0.000	49.21	1.709	23.07	0.043	0.061	149.6	139.4	97.45	24.15	0.834

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR
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9/15/1983

12:18	15.770	7.424	0.052	0.206	0.000	49.33	1.726	22.71	0.043	0.062	148.4	138.3	97.32	24.17	0.834
12:36	16.009	7.377	0.056	0.215	0.000	49.15	1.781	22.63	0.046	0.065	149.9	139.5	97.32	24.09	0.832
12:40	15.775	7.352	0.054	0.213	0.000	49.24	1.728	22.94	0.044	0.065	149.5	139.3	97.40	24.18	0.835
12:54	16.189	7.308	0.055	0.210	0.000	48.99	1.783	22.86	0.044	0.063	151.0	140.6	97.50	24.08	0.831
13:12	16.304	7.190	0.053	0.197	0.000	48.87	1.700	23.27	0.043	0.060	151.5	141.2	97.69	24.09	0.832
13:30	15.896	7.063	0.056	0.206	0.000	49.43	1.705	23.21	0.046	0.063	150.4	140.2	97.68	24.18	0.835
13:48	15.678	7.293	0.054	0.193	0.000	50.07	1.659	22.67	0.043	0.058	147.1	137.1	97.71	24.29	0.838
14:06	15.030	7.246	0.052	0.181	0.000	51.98	1.594	21.60	0.047	0.056	140.7	131.1	97.78	24.47	0.845
14:24	15.762	7.363	0.055	0.189	0.000	49.85	1.702	22.77	0.048	0.058	148.1	138.0	97.79	24.29	0.839
14:42	15.931	7.338	0.063	0.194	0.000	49.66	1.745	22.74	0.049	0.058	149.3	139.0	97.77	24.23	0.837
15:18	16.093	7.053	0.062	0.180	0.000	49.39	1.644	23.25	0.048	0.054	150.0	139.8	97.78	24.16	0.834
15:36	16.285	7.048	0.064	0.165	0.000	49.42	1.596	23.09	0.046	0.048	149.2	139.0	97.76	24.11	0.832
15:40	16.033	7.165	0.058	0.176	0.000	49.50	1.634	23.07	0.045	0.052	148.9	138.8	97.73	24.18	0.835
15:54	16.317	6.843	0.070	0.170	0.000	49.17	1.561	23.68	0.049	0.050	151.2	141.0	97.91	24.11	0.832
16:12	15.841	6.594	0.080	0.168	0.000	50.58	1.551	22.90	0.051	0.049	147.2	137.2	97.82	24.17	0.834
16:30	16.224	6.916	0.096	0.174	0.000	49.33	1.598	23.39	0.057	0.050	151.0	140.7	97.83	24.12	0.833
16:48	16.293	6.826	0.104	0.173	0.000	49.16	1.608	23.55	0.060	0.049	152.0	141.7	97.82	24.09	0.831
17:06	16.283	6.734	0.114	0.178	0.000	49.09	1.637	23.53	0.062	0.051	152.5	142.2	97.67	24.03	0.829
17:24	16.376	6.701	0.120	0.181	0.000	48.70	1.622	23.93	0.064	0.052	154.1	143.8	97.75	24.02	0.829
17:43	16.544	6.396	0.127	0.174	0.000	48.19	1.572	24.56	0.066	0.049	156.2	145.8	97.68	23.92	0.826
18:01	15.725	6.185	0.116	0.163	0.000	50.00	1.468	23.64	0.061	0.046	149.0	139.1	97.41	24.03	0.830
18:19	16.422	6.084	0.120	0.184	0.000	47.80	1.602	25.21	0.065	0.053	158.3	147.9	97.54	23.86	0.824
18:37	16.795	5.768	0.122	0.173	0.000	47.25	1.572	25.58	0.062	0.047	160.0	149.5	97.36	23.66	0.817
19:11	16.858	5.554	0.134	0.170	0.000	47.97	1.553	26.28	0.072	0.049	162.7	152.1	98.64	23.97	0.828
19:29	16.766	5.759	0.135	0.153	0.000	47.22	1.413	25.80	0.065	0.044	158.9	148.5	97.35	23.68	0.818
19:47	16.701	5.683	0.129	0.152	0.000	47.03	1.382	26.00	0.063	0.042	158.8	148.5	97.17	23.64	0.816
20:04	15.841	5.759	0.121	0.144	0.000	48.69	1.297	25.15	0.059	0.039	152.0	142.3	97.10	23.87	0.824
20:22	16.249	5.776	0.115	0.152	0.000	47.40	1.316	26.01	0.059	0.042	156.4	146.4	97.12	23.77	0.820
20:40	16.719	5.738	0.114	0.156	0.000	47.18	1.367	25.73	0.060	0.043	157.6	147.4	97.10	23.63	0.816
20:58	16.602	5.854	0.115	0.187	0.000	47.18	1.516	25.57	0.064	0.052	159.1	148.7	97.14	23.67	0.817
21:15	16.777	5.890	0.121	0.184	0.000	46.97	1.534	25.53	0.065	0.050	159.8	149.3	97.11	23.62	0.815
21:33	16.370	5.914	0.119	0.173	0.000	47.40	1.440	25.58	0.064	0.047	157.3	147.2	97.11	23.74	0.820
21:51	16.341	5.644	0.127	0.168	0.000	47.09	1.418	26.21	0.065	0.047	159.1	149.0	97.12	23.71	0.818
22:09	16.758	5.273	0.119	0.157	0.000	46.69	1.371	26.82	0.062	0.043	161.4	151.2	97.29	23.60	0.815
22:26	17.021	5.109	0.114	0.180	0.000	46.39	1.454	27.10	0.063	0.050	164.5	154.0	97.47	23.55	0.813
22:44	17.524	5.175	0.117	0.171	0.000	46.06	1.476	26.97	0.063	0.047	165.8	155.0	97.61	23.46	0.810
23:02	17.530	5.199	0.120	0.180	0.000	45.96	1.514	27.03	0.065	0.050	166.7	155.9	97.64	23.47	0.810
23:20	17.608	5.000	0.121	0.192	0.000	45.74	1.575	27.33	0.067	0.054	168.9	157.9	97.68	23.42	0.808
23:38	17.437	5.020	0.128	0.174	0.000	46.10	1.505	27.21	0.066	0.048	166.9	156.1	97.69	23.48	0.810
23:55	17.653	5.152	0.132	0.197	0.000	45.77	1.613	27.14	0.072	0.055	169.2	158.2	97.78	23.46	0.810

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0:13	17.580	5.263	0.135	0.178	0.000	45.87	1.559	26.72	0.069	0.050	166.6	155.7	97.42	23.40	0.808
0:31	17.585	5.275	0.131	0.198	0.000	45.65	1.617	26.71	0.071	0.056	167.7	156.7	97.29	23.36	0.806
0:49	17.669	5.281	0.136	0.183	0.000	45.63	1.583	26.66	0.070	0.051	167.1	156.1	97.26	23.33	0.805

GAS CHROMATOGRAPH DATA

DATE	H2	CO2	C2H4	C2H6	O2	N2	CH4	CO	C3H6	C3H8	HHV	LHV	TMP	MW	S.G.
TIME	%	%	%	%	%	%	%	%	%	%	BTU/SCF		%		WRT AIR

9/16/1983															
1:07	17.544	5.222	0.134	0.190	0.000	45.65	1.583	26.73	0.071	0.054	167.1	156.2	97.18	23.33	0.805
1:24	17.376	5.405	0.144	0.189	0.000	45.94	1.611	26.40	0.072	0.052	165.9	155.0	97.18	23.40	0.808
1:42	17.318	5.432	0.143	0.185	0.000	45.96	1.579	26.46	0.072	0.051	165.5	154.7	97.20	23.43	0.809
2:18	17.251	5.220	0.139	0.180	0.000	45.91	1.543	26.74	0.070	0.050	165.6	154.8	97.10	23.39	0.807
2:36	17.333	5.552	0.142	0.193	0.000	46.26	1.641	26.09	0.072	0.054	165.2	154.3	97.34	23.48	0.810
2:40	17.341	5.145	0.140	0.176	0.000	45.82	1.536	26.87	0.067	0.047	166.1	155.3	97.14	23.37	0.807
2:55	17.292	5.629	0.140	0.178	0.000	46.73	1.563	25.98	0.068	0.049	163.4	152.6	97.62	23.59	0.814
3:12	17.284	5.783	0.141	0.189	0.000	46.64	1.617	25.72	0.070	0.051	163.4	152.6	97.50	23.57	0.814
3:30	17.180	5.869	0.138	0.183	0.000	46.87	1.577	25.65	0.069	0.051	162.2	151.5	97.58	23.64	0.816
3:48	16.868	5.910	0.140	0.187	0.000	47.22	1.586	25.61	0.070	0.053	161.4	150.8	97.65	23.75	0.820
4:06	16.488	5.320	0.120	0.174	0.000	48.65	1.465	25.50	0.061	0.048	157.7	147.4	97.82	23.81	0.822
4:24	17.442	5.448	0.124	0.181	0.000	46.44	1.538	26.58	0.064	0.051	165.3	154.5	97.87	23.59	0.814
4:42	17.133	5.503	0.128	0.182	0.000	46.73	1.514	26.59	0.064	0.049	164.1	153.5	97.89	23.69	0.818
5:00	17.173	5.350	0.129	0.165	0.000	46.71	1.433	26.82	0.062	0.044	163.7	153.2	97.89	23.66	0.817
5:17	17.424	5.022	0.126	0.180	0.000	46.14	1.516	27.22	0.064	0.050	167.0	156.2	97.73	23.49	0.811
5:35	17.620	4.872	0.132	0.191	0.000	45.62	1.615	27.35	0.065	0.051	169.5	158.5	97.53	23.35	0.806
5:53	17.510	4.835	0.133	0.173	0.000	45.73	1.476	27.48	0.063	0.046	167.6	156.8	97.44	23.36	0.806
6:11	16.712	4.938	0.130	0.180	0.000	46.84	1.477	26.92	0.064	0.049	163.5	153.1	97.31	23.55	0.813
6:29	17.156	4.872	0.136	0.176	0.000	45.90	1.499	27.52	0.066	0.048	167.1	156.4	97.37	23.44	0.809
6:47	17.322	4.757	0.132	0.183	0.000	45.72	1.516	27.64	0.066	0.051	168.3	157.5	97.38	23.38	0.807
7:05	17.647	4.843	0.140	0.200	0.000	45.50	1.679	27.29	0.070	0.056	170.5	159.4	97.43	23.30	0.804
7:23	17.681	4.851	0.141	0.207	0.000	45.36	1.703	27.31	0.070	0.058	171.2	160.0	97.38	23.28	0.804
7:40	17.748	4.752	0.139	0.200	0.000	45.29	1.710	27.40	0.069	0.055	171.5	160.3	97.36	23.24	0.802
7:58	17.497	4.817	0.141	0.186	0.000	46.26	1.504	27.70	0.061	0.050	169.0	158.2	98.22	23.58	0.814
8:49	17.495	5.151	0.146	0.185	0.000	45.82	1.565	26.76	0.062	0.049	166.7	155.8	97.23	23.35	0.806
9:07	17.170	4.997	0.155	0.191	0.000	46.11	1.617	26.85	0.066	0.053	166.9	156.0	97.20	23.39	0.808
9:25	17.271	5.030	0.159	0.190	0.000	45.95	1.598	26.93	0.068	0.051	167.3	156.4	97.24	23.39	0.807
9:43	16.957	5.314	0.156	0.191	0.000	46.50	1.599	26.41	0.066	0.049	164.5	153.8	97.24	23.51	0.812
10:01	17.051	5.426	0.165	0.177	0.000	46.54	1.533	26.37	0.068	0.046	163.9	153.2	97.38	23.55	0.813
10:19	16.980	5.565	0.170	0.191	0.000	46.77	1.600	26.15	0.072	0.051	164.2	153.4	97.55	23.64	0.816
10:36	17.220	5.497	0.172	0.175	0.000	46.67	1.560	26.29	0.072	0.047	164.7	153.9	97.71	23.61	0.815
10:54	17.213	5.406	0.167	0.184	0.000	46.50	1.573	26.37	0.073	0.049	165.1	154.3	97.54	23.55	0.813
11:13	17.247	5.245	0.171	0.188	0.000	46.33	1.619	26.63	0.073	0.049	166.7	155.8	97.55	23.51	0.812
11:31	17.047	5.251	0.170	0.181	0.000	46.73	1.547	26.84	0.072	0.048	165.8	155.1	97.88	23.67	0.817
11:51	17.073	5.157	0.172	0.183	0.000	46.61	1.577	26.86	0.072	0.047	166.3	155.5	97.74	23.60	0.815
12:09	16.565	5.259	0.171	0.175	0.000	47.55	1.502	26.10	0.070	0.045	161.2	150.8	97.43	23.67	0.817
12:27	17.098	5.151	0.172	0.195	0.000	46.37	1.634	27.04	0.075	0.051	167.9	157.1	97.78	23.60	0.815
12:45	17.220	5.031	0.173	0.188	0.000	46.29	1.602	27.09	0.075	0.049	168.0	157.1	97.72	23.53	0.812
13:07	16.722	4.819	0.174	0.203	0.000	47.22	1.684	27.39	0.074	0.053	168.6	157.8	98.34	23.80	0.821
13:25	17.397	4.982	0.176	0.180	0.000	46.37	1.585	27.20	0.073	0.049	168.6	157.7	98.01	23.56	0.813
13:43	17.485	4.955	0.177	0.200	0.000	46.11	1.669	27.24	0.077	0.054	170.4	159.3	97.96	23.51	0.812
14:01	17.219	4.956	0.185	0.185	0.000	46.23	1.583	27.16	0.077	0.049	168.2	157.4	97.65	23.50	0.811
14:19	17.229	5.061	0.176	0.201	0.000	46.21	1.651	26.84	0.078	0.055	168.2	157.2	97.50	23.47	0.810
18:56	17.320	5.012	0.176	0.185	0.000	45.96	1.586	27.24	0.072	0.048	168.5	157.7	97.60	23.47	0.810
19:14	16.987	5.063	0.178	0.195	0.000	46.07	1.612	27.11	0.073	0.050	167.6	156.8	97.34	23.49	0.811
19:32	17.175	5.028	0.170	0.187	0.000	45.94	1.582	27.08	0.070	0.050	167.5	156.7	97.29	23.43	0.809

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/16/1983															
19:50	17.245	4.954	0.166	0.211	0.000	45.81	1.707	27.05	0.072	0.055	169.4	158.4	97.28	23.38	0.807
20:08	17.161	5.172	0.157	0.187	0.000	46.38	1.620	26.45	0.065	0.047	165.4	154.6	97.24	23.43	0.809
20:26	17.264	5.118	0.166	0.212	0.000	45.92	1.720	26.76	0.070	0.055	168.6	157.6	97.29	23.40	0.808
20:44	17.106	5.114	0.174	0.182	0.000	46.19	1.560	26.87	0.070	0.048	166.3	155.5	97.31	23.47	0.810
21:02	16.992	5.027	0.178	0.190	0.000	46.13	1.593	27.11	0.073	0.049	167.3	156.6	97.35	23.49	0.811
21:20	17.224	5.058	0.173	0.183	0.000	46.25	1.571	27.01	0.070	0.047	167.2	156.4	97.59	23.50	0.811
22:17	17.525	5.352	0.176	0.198	0.000	47.00	1.651	27.20	0.073	0.052	170.1	159.0	99.23	23.92	0.826
22:35	17.193	5.173	0.171	0.188	0.000	46.29	1.592	26.86	0.070	0.049	166.9	156.1	97.59	23.53	0.812
22:53	17.262	5.002	0.176	0.188	0.000	46.03	1.598	27.10	0.072	0.049	168.1	157.2	97.48	23.45	0.810
23:11	17.226	4.954	0.176	0.191	0.000	45.96	1.582	27.20	0.074	0.050	168.3	157.4	97.41	23.44	0.809
9/17/1983															
0:18	17.499	4.995	0.177	0.188	0.000	46.71	1.582	27.81	0.070	0.047	170.9	160.0	99.08	23.84	0.823
0:35	17.359	4.815	0.170	0.217	0.000	45.84	1.746	27.17	0.072	0.057	170.7	159.6	97.45	23.37	0.807
0:53	17.601	4.841	0.169	0.199	0.000	45.49	1.664	27.20	0.072	0.052	170.3	159.2	97.28	23.28	0.803
1:11	16.515	4.558	0.176	0.188	0.000	46.42	1.578	27.66	0.075	0.051	167.4	156.9	97.22	23.50	0.811
1:29	16.988	4.648	0.169	0.190	0.000	46.07	1.595	27.43	0.071	0.049	168.2	157.4	97.21	23.39	0.807
1:46	17.062	4.722	0.172	0.189	0.000	45.90	1.612	27.39	0.073	0.051	168.5	157.7	97.17	23.37	0.807
2:04	17.190	4.887	0.171	0.188	0.000	46.22	1.576	27.00	0.072	0.049	167.2	156.4	97.35	23.42	0.808
2:22	17.365	4.971	0.170	0.204	0.000	45.82	1.683	27.08	0.074	0.053	169.5	158.5	97.42	23.39	0.807
2:40	17.114	5.068	0.164	0.193	0.000	46.14	1.595	26.86	0.072	0.050	166.7	155.9	97.25	23.44	0.809
2:58	16.912	4.944	0.173	0.184	0.000	46.23	1.577	27.16	0.074	0.049	166.9	156.2	97.31	23.49	0.811
3:16	17.124	4.986	0.174	0.195	0.000	46.06	1.596	27.21	0.079	0.050	168.3	157.5	97.48	23.49	0.811
3:33	17.410	4.851	0.168	0.180	0.000	45.92	1.571	27.31	0.071	0.047	168.7	157.8	97.53	23.41	0.808
3:51	17.446	4.699	0.166	0.208	0.000	45.68	1.671	27.56	0.075	0.056	171.3	160.3	97.56	23.37	0.807
4:45	17.148	4.663	0.166	0.183	0.000	46.44	1.562	27.04	0.071	0.047	166.8	156.1	97.32	23.39	0.807
5:02	17.095	4.823	0.176	0.193	0.000	45.79	1.592	27.43	0.075	0.051	168.7	157.9	97.22	23.39	0.808
7:08	16.894	3.667	0.173	0.173	0.000	46.07	1.478	27.35	0.073	0.045	166.1	155.6	95.93	22.91	0.791
7:25	16.713	4.786	0.166	0.165	0.000	45.54	1.409	27.27	0.070	0.042	164.2	153.8	96.16	23.21	0.801
7:43	17.333	4.776	0.157	0.197	0.000	44.99	1.614	27.11	0.067	0.051	168.3	157.4	96.30	23.06	0.796
9:32	17.037	4.675	0.174	0.183	0.000	45.24	1.572	27.10	0.070	0.046	166.9	156.2	96.09	23.07	0.796
9:50	17.019	4.677	0.179	0.172	0.000	45.22	1.511	27.19	0.070	0.046	166.4	155.8	96.08	23.08	0.797
10:08	16.723	4.548	0.172	0.177	0.000	46.09	1.512	26.64	0.069	0.045	163.6	153.1	95.97	23.11	0.798
11:37	17.190	4.333	0.167	0.195	0.000	44.81	1.618	27.55	0.069	0.050	169.4	158.6	95.98	22.94	0.792
11:55	16.962	4.204	0.176	0.181	0.000	44.95	1.548	27.90	0.069	0.046	168.9	158.3	96.04	23.00	0.794
12:13	17.008	4.156	0.176	0.181	0.000	45.49	1.546	27.39	0.073	0.046	167.5	156.8	96.06	22.99	0.794
12:31	17.470	4.739	0.173	0.191	0.000	44.55	1.587	27.24	0.070	0.049	169.1	158.1	96.08	22.96	0.793
12:49	17.160	4.387	0.169	0.182	0.000	44.84	1.563	27.63	0.068	0.046	168.7	158.0	96.05	22.98	0.793
13:06	17.402	4.484	0.169	0.189	0.000	44.64	1.584	27.42	0.068	0.048	169.3	158.3	96.00	22.92	0.791
13:24	17.686	4.804	0.172	0.196	0.000	44.26	1.614	26.97	0.070	0.050	169.3	158.2	95.83	22.84	0.789
13:42	17.085	4.570	0.172	0.183	0.000	44.90	1.560	27.18	0.068	0.046	167.1	156.4	95.76	22.95	0.792
14:00	17.230	4.480	0.173	0.195	0.000	44.66	1.610	27.35	0.075	0.051	169.1	158.2	95.82	22.91	0.791
14:18	17.354	4.591	0.168	0.191	0.000	44.65	1.617	27.11	0.073	0.051	168.6	157.7	95.80	22.89	0.790
14:36	17.528	4.586	0.162	0.192	0.000	44.43	1.627	27.17	0.071	0.050	169.3	158.3	95.82	22.85	0.789
14:54	17.163	4.405	0.168	0.200	0.000	44.61	1.665	27.33	0.073	0.052	169.4	158.4	95.67	22.87	0.789

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

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15:12	17.358	4.487	0.168	0.190	0.000	44.55	1.595	27.29	0.072	0.049	168.9	158.0	95.76	22.86	0.789
15:30	17.320	4.560	0.171	0.187	0.000	44.58	1.602	27.20	0.068	0.047	168.4	157.5	95.73	22.87	0.790
15:49	17.283	4.732	0.168	0.196	0.000	44.72	1.614	26.93	0.070	0.052	167.8	156.9	95.76	22.92	0.791
16:07	17.044	4.882	0.164	0.173	0.000	45.73	1.538	25.99	0.065	0.043	162.4	151.8	95.62	22.97	0.793
16:25	17.536	5.051	0.163	0.203	0.000	44.60	1.683	26.46	0.071	0.053	167.9	156.8	95.82	22.91	0.791
16:43	17.440	5.064	0.164	0.182	0.000	44.89	1.582	26.29	0.069	0.046	165.5	154.6	95.73	22.93	0.791
17:01	17.388	5.253	0.170	0.210	0.000	44.83	1.719	26.01	0.074	0.055	166.7	155.6	95.71	22.95	0.792
17:19	17.290	5.421	0.172	0.191	0.000	45.09	1.623	25.80	0.073	0.049	164.3	153.4	95.70	23.01	0.794
17:37	17.427	5.420	0.160	0.191	0.000	45.07	1.642	25.65	0.070	0.050	164.2	153.2	95.68	22.96	0.793
17:37	17.302	5.312	0.160	0.203	0.000	45.04	1.696	25.79	0.073	0.053	165.1	154.1	95.63	22.96	0.793
18:13	17.122	5.382	0.161	0.191	0.000	45.28	1.617	25.69	0.073	0.051	163.2	152.4	95.57	23.01	0.794
18:31	17.294	5.124	0.153	0.191	0.000	44.97	1.607	26.14	0.071	0.051	164.9	154.1	95.61	22.94	0.792
18:49	17.200	5.005	0.158	0.187	0.000	45.00	1.590	26.38	0.072	0.050	165.2	154.4	95.64	22.95	0.792
19:07	17.158	5.048	0.161	0.186	0.000	45.09	1.572	26.33	0.072	0.049	164.8	154.0	95.66	22.98	0.793
19:25	17.158	5.157	0.160	0.184	0.000	45.08	1.568	26.30	0.072	0.049	164.6	153.8	95.73	23.02	0.794
19:43	17.141	5.102	0.155	0.186	0.000	45.02	1.569	26.36	0.069	0.049	164.6	153.9	95.65	22.99	0.794
20:01	17.215	4.877	0.156	0.198	0.000	44.77	1.628	26.63	0.075	0.054	166.8	155.9	95.61	22.92	0.791
20:19	17.204	4.771	0.149	0.189	0.000	44.66	1.560	26.87	0.070	0.051	166.4	155.6	95.52	22.89	0.790
20:37	17.253	4.699	0.155	0.188	0.000	44.55	1.572	27.02	0.071	0.050	167.2	156.4	95.56	22.87	0.789
20:55	17.071	4.577	0.158	0.181	0.000	44.76	1.524	27.25	0.071	0.048	166.8	156.1	95.64	22.93	0.791
21:13	17.334	4.617	0.157	0.186	0.000	44.55	1.566	27.08	0.071	0.049	167.6	156.7	95.61	22.85	0.789
21:31	17.538	4.762	0.146	0.181	0.000	44.43	1.538	26.85	0.067	0.048	166.8	155.9	95.55	22.81	0.787
21:49	17.408	4.850	0.154	0.187	0.000	44.46	1.577	26.77	0.070	0.049	166.9	156.0	95.53	22.85	0.789
22:07	17.018	4.822	0.145	0.173	0.000	44.95	1.466	26.77	0.067	0.046	164.0	153.4	95.46	22.93	0.792
22:25	17.476	4.685	0.148	0.201	0.000	44.16	1.647	26.99	0.070	0.054	168.8	157.7	95.43	22.76	0.786
22:43	17.368	4.720	0.153	0.185	0.000	44.39	1.568	26.98	0.071	0.049	167.3	156.4	95.49	22.82	0.788
23:01	17.345	4.975	0.157	0.187	0.000	44.48	1.561	26.64	0.071	0.049	166.2	155.3	95.46	22.86	0.789
23:19	17.297	5.046	0.157	0.180	0.000	44.58	1.530	26.48	0.070	0.047	165.0	154.2	95.39	22.87	0.789
23:45	17.598	5.081	0.153	0.199	0.000	44.90	1.627	26.67	0.066	0.052	167.9	156.8	96.35	23.06	0.796

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0:03	17.272	5.222	0.161	0.185	0.000	44.75	1.578	26.16	0.066	0.048	164.5	153.6	95.45	22.92	0.791
0:21	17.408	5.348	0.152	0.185	0.000	44.76	1.598	25.86	0.068	0.049	164.1	153.1	95.43	22.89	0.790
0:39	17.334	5.263	0.149	0.191	0.000	45.01	1.604	25.87	0.068	0.051	164.0	153.1	95.54	22.93	0.792
0:56	17.179	5.168	0.154	0.186	0.000	45.03	1.560	26.28	0.070	0.050	164.4	153.6	95.67	23.00	0.794
1:14	17.009	5.078	0.151	0.177	0.000	45.30	1.529	26.38	0.069	0.048	163.6	152.9	95.74	23.05	0.796
1:32	17.276	5.126	0.147	0.185	0.000	45.00	1.558	26.39	0.069	0.050	164.9	154.1	95.80	23.00	0.794
1:50	17.121	5.084	0.148	0.176	0.000	45.00	1.496	26.43	0.068	0.048	163.7	153.1	95.58	22.98	0.793
2:08	16.659	4.902	0.141	0.168	0.000	45.95	1.445	26.00	0.066	0.045	159.9	149.6	95.38	23.02	0.795
2:25	17.391	4.964	0.138	0.183	0.000	44.53	1.549	26.49	0.065	0.049	165.2	154.4	95.36	22.82	0.788
2:43	17.141	4.888	0.143	0.194	0.000	44.62	1.571	26.66	0.070	0.052	165.6	154.9	95.33	22.87	0.789
3:01	16.997	4.940	0.148	0.169	0.000	45.49	1.438	27.22	0.068	0.045	165.0	154.5	96.51	23.26	0.803
4:13	16.964	4.861	0.145	0.172	0.000	44.98	1.448	27.13	0.063	0.045	164.6	154.1	95.81	23.05	0.796
4:31	17.059	4.843	0.141	0.169	0.000	44.97	1.446	26.83	0.062	0.045	163.8	153.3	95.57	22.96	0.793
4:48	17.488	4.952	0.141	0.186	0.000	44.34	1.538	26.69	0.066	0.050	166.2	155.3	95.44	22.82	0.788

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/18/1983															
5:24	17.277	5.024	0.149	0.182	0.000	44.75	1.522	26.58	0.066	0.048	165.0	154.2	95.59	22.93	0.792
6:17	17.659	5.116	0.144	0.187	0.000	44.39	1.557	26.42	0.066	0.050	166.2	155.2	95.59	22.84	0.788
6:35	17.769	5.039	0.144	0.190	0.000	44.19	1.578	26.56	0.067	0.050	167.3	156.2	95.59	22.80	0.787
6:40	17.589	4.947	0.150	0.182	0.000	44.84	1.549	26.92	0.067	0.048	167.4	156.5	96.29	23.03	0.795
6:53	17.474	5.230	0.149	0.173	0.000	45.03	1.468	26.78	0.066	0.045	165.5	154.7	96.42	23.15	0.799
7:11	17.457	5.029	0.150	0.174	0.000	45.10	1.481	26.93	0.066	0.045	166.1	155.3	96.43	23.12	0.798
10:10	17.695	5.001	0.145	0.185	0.000	45.84	1.618	27.03	0.062	0.047	168.6	157.6	97.62	23.37	0.807
10:28	17.611	5.068	0.150	0.198	0.000	44.81	1.666	26.93	0.066	0.051	169.0	157.9	96.55	23.10	0.797
10:46	17.538	5.170	0.156	0.185	0.000	44.90	1.597	26.79	0.067	0.047	167.5	156.5	96.45	23.12	0.798
11:04	17.890	5.248	0.155	0.192	0.000	44.64	1.667	26.55	0.068	0.049	168.7	157.5	96.46	23.03	0.795
11:21	17.519	5.369	0.157	0.188	0.000	45.18	1.647	26.32	0.068	0.048	166.5	155.5	96.49	23.16	0.799
11:39	17.337	5.524	0.163	0.191	0.000	45.45	1.656	25.99	0.070	0.049	165.2	154.2	96.43	23.21	0.801
11:57	17.141	5.711	0.172	0.181	0.000	45.82	1.618	25.72	0.071	0.046	163.2	152.4	96.48	23.31	0.805
12:15	17.841	5.588	0.177	0.179	0.000	45.07	1.638	25.84	0.071	0.045	166.1	154.9	96.45	23.10	0.797
12:33	18.135	5.496	0.172	0.177	0.000	44.46	1.609	25.90	0.070	0.045	166.8	155.5	96.06	22.90	0.791
12:51	18.026	5.335	0.175	0.184	0.000	44.69	1.634	26.33	0.071	0.046	168.3	157.0	96.49	23.02	0.795
13:09	17.827	5.482	0.184	0.169	0.000	44.88	1.522	26.31	0.075	0.042	166.3	155.3	96.49	23.11	0.798
13:26	18.172	5.411	0.182	0.176	0.000	44.42	1.574	26.46	0.072	0.044	168.5	157.2	96.51	23.01	0.794
13:44	18.220	5.577	0.179	0.193	0.000	44.47	1.670	26.07	0.073	0.049	168.8	157.3	96.50	23.01	0.794
14:02	17.979	5.450	0.181	0.170	0.000	44.66	1.521	26.51	0.071	0.041	167.3	156.2	96.58	23.09	0.797
14:20	17.866	5.382	0.180	0.186	0.000	44.63	1.615	26.55	0.073	0.047	168.4	157.2	96.53	23.09	0.797
14:38	17.840	5.072	0.181	0.185	0.000	44.79	1.636	26.96	0.072	0.046	169.9	158.7	96.78	23.11	0.798
14:56	18.014	5.383	0.188	0.185	0.000	45.00	1.647	26.69	0.075	0.046	169.9	158.6	97.23	23.24	0.802
15:14	18.025	5.562	0.190	0.192	0.000	44.88	1.670	26.43	0.076	0.048	169.5	158.2	97.07	23.22	0.802
15:31	17.916	5.569	0.190	0.176	0.000	45.01	1.585	26.41	0.074	0.043	167.8	156.6	96.97	23.23	0.802
15:49	18.112	5.612	0.203	0.179	0.000	44.99	1.615	26.36	0.077	0.044	168.9	157.6	97.20	23.25	0.802
16:07	17.684	5.700	0.184	0.167	0.000	46.42	1.532	25.85	0.071	0.041	164.4	153.4	97.65	23.51	0.811
16:25	18.077	5.744	0.169	0.181	0.000	45.54	1.596	26.34	0.071	0.047	168.0	156.7	97.77	23.44	0.809
16:43	18.365	5.606	0.166	0.193	0.000	45.23	1.694	26.45	0.071	0.050	170.5	159.0	97.82	23.35	0.806
17:01	18.425	5.487	0.166	0.184	0.000	45.43	1.660	26.29	0.070	0.048	169.6	158.1	97.77	23.30	0.804
17:19	18.579	5.743	0.167	0.193	0.000	45.20	1.707	26.20	0.000	0.050	168.9	157.3	97.84	23.30	0.804
17:38	18.119	5.672	0.163	0.188	0.000	45.58	1.635	26.52	0.070	0.049	169.1	157.8	97.99	23.47	0.810
17:55	18.155	5.711	0.168	0.178	0.000	45.49	1.559	26.56	0.072	0.046	168.5	157.2	97.94	23.46	0.810
18:14	18.116	5.562	0.169	0.176	0.000	45.55	1.568	26.70	0.074	0.047	169.0	157.7	97.96	23.46	0.810
18:32	18.241	5.525	0.169	0.186	0.000	45.27	1.637	26.79	0.076	0.049	170.6	159.2	97.94	23.41	0.808
18:50	18.043	5.493	0.174	0.174	0.000	45.49	1.569	26.91	0.071	0.045	169.3	158.1	97.97	23.47	0.810
19:08	17.937	5.760	0.185	0.181	0.000	45.67	1.623	26.37	0.075	0.046	168.2	157.0	97.85	23.50	0.811
19:26	18.011	5.825	0.189	0.189	0.000	45.69	1.672	26.20	0.076	0.048	168.7	157.4	97.91	23.50	0.811
19:44	18.081	5.628	0.195	0.183	0.000	45.60	1.645	26.50	0.075	0.045	169.5	158.2	97.95	23.46	0.810
20:02	17.850	5.431	0.196	0.177	0.000	46.21	1.607	26.26	0.075	0.044	167.5	156.3	97.85	23.47	0.810
20:19	18.400	5.556	0.196	0.183	0.000	45.38	1.656	26.45	0.076	0.047	170.6	159.0	97.94	23.37	0.807
20:38	18.445	5.633	0.192	0.200	0.000	45.41	1.750	26.25	0.077	0.052	171.4	159.7	98.01	23.38	0.807
20:56	18.438	5.463	0.193	0.185	0.000	45.20	1.645	26.76	0.075	0.047	171.5	160.0	98.00	23.36	0.806
21:14	18.283	5.560	0.201	0.179	0.000	45.29	1.627	26.56	0.076	0.044	170.2	158.8	97.82	23.37	0.807
21:32	18.280	5.581	0.191	0.196	0.000	45.19	1.719	26.45	0.076	0.049	171.0	159.5	97.73	23.34	0.806
21:50	18.316	5.534	0.192	0.181	0.000	45.12	1.634	26.64	0.074	0.045	170.5	159.1	97.74	23.33	0.805

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/18/1983															
22:08	18.099	5.658	0.185	0.185	0.000	45.31	1.628	26.45	0.074	0.047	169.1	157.8	97.64	23.38	0.807
22:26	18.200	5.422	0.183	0.186	0.000	45.13	1.635	26.80	0.075	0.047	170.7	159.3	97.68	23.33	0.805
22:44	18.364	5.511	0.186	0.179	0.000	44.98	1.628	26.64	0.073	0.045	170.4	159.0	97.61	23.28	0.804
23:02	18.078	5.668	0.193	0.183	0.000	45.27	1.618	26.43	0.076	0.046	169.0	157.7	97.56	23.37	0.807
23:20	18.201	5.643	0.190	0.198	0.000	45.08	1.716	26.34	0.076	0.050	170.4	158.9	97.49	23.30	0.804
23:38	18.273	5.548	0.187	0.178	0.000	45.08	1.616	26.50	0.073	0.044	169.6	158.2	97.51	23.28	0.804
23:56	18.162	5.775	0.197	0.190	0.000	45.20	1.677	26.18	0.077	0.047	169.3	157.8	97.50	23.34	0.806
9/19/1983															
0:14	17.910	5.683	0.183	0.179	0.000	45.42	1.580	26.39	0.072	0.045	167.6	156.4	97.47	23.39	0.807
0:32	18.255	5.658	0.174	0.202	0.000	45.08	1.734	26.17	0.073	0.052	170.0	158.5	97.40	23.26	0.803
0:50	18.143	5.609	0.193	0.173	0.000	45.11	1.564	26.53	0.074	0.042	168.7	157.4	97.44	23.31	0.805
1:08	17.669	5.513	0.190	0.188	0.000	45.54	1.644	26.50	0.075	0.047	168.2	157.1	97.37	23.39	0.807
2:06	18.213	5.732	0.201	0.194	0.000	46.17	1.722	26.50	0.077	0.048	171.1	159.6	98.86	23.69	0.818
2:24	18.366	5.968	0.188	0.189	0.000	45.38	1.719	25.93	0.072	0.049	169.4	157.8	97.86	23.41	0.808
2:42	18.161	5.699	0.190	0.189	0.000	45.16	1.682	26.48	0.075	0.048	170.2	158.7	97.68	23.38	0.807
3:17	18.063	5.878	0.193	0.191	0.000	45.61	1.707	26.01	0.075	0.048	168.7	157.3	97.77	23.45	0.810
3:35	18.439	5.588	0.191	0.199	0.000	45.05	1.735	26.40	0.074	0.050	171.6	159.9	97.73	23.29	0.804
3:40	18.317	5.786	0.200	0.189	0.000	45.37	1.721	26.03	0.074	0.047	169.7	158.2	97.74	23.36	0.806
3:53	18.221	5.455	0.199	0.182	0.000	45.20	1.662	26.65	0.073	0.045	170.6	159.2	97.69	23.32	0.805
4:11	17.734	5.567	0.192	0.186	0.000	46.44	1.648	25.88	0.073	0.046	166.4	155.2	97.77	23.49	0.811
4:28	18.489	5.431	0.186	0.190	0.000	44.75	1.696	26.50	0.071	0.048	171.3	159.7	97.36	23.16	0.799
4:46	18.242	5.401	0.202	0.186	0.000	44.99	1.660	26.85	0.075	0.046	171.5	160.0	97.65	23.30	0.804
5:04	18.333	5.376	0.188	0.193	0.000	44.98	1.673	26.79	0.075	0.049	171.7	160.2	97.65	23.27	0.803
5:22	18.368	5.522	0.194	0.175	0.000	45.18	1.608	26.70	0.071	0.043	170.4	159.0	97.85	23.35	0.806
5:39	18.238	5.487	0.196	0.199	0.000	45.06	1.709	26.73	0.076	0.050	171.8	160.3	97.74	23.34	0.806
5:57	18.246	5.494	0.190	0.192	0.000	45.14	1.662	26.75	0.073	0.048	171.1	159.7	97.79	23.35	0.806
6:15	18.369	5.485	0.190	0.182	0.000	45.06	1.643	26.88	0.072	0.045	171.4	160.0	97.92	23.36	0.806
6:33	18.421	5.578	0.184	0.199	0.000	45.05	1.688	26.74	0.073	0.050	172.0	160.4	97.99	23.37	0.807
6:50	18.301	5.941	0.184	0.185	0.000	45.34	1.637	26.08	0.074	0.047	168.7	157.2	97.79	23.41	0.808
8:02	18.271	5.300	0.184	0.195	0.000	45.03	1.659	26.88	0.073	0.049	171.5	160.1	97.64	23.27	0.803
8:19	18.399	5.411	0.174	0.184	0.000	44.80	1.630	26.78	0.070	0.047	170.9	159.4	97.50	23.22	0.802
8:37	18.092	5.754	0.186	0.160	0.000	45.77	1.514	25.93	0.072	0.039	165.6	154.4	97.52	23.37	0.807
8:55	18.051	5.743	0.170	0.160	0.000	45.25	1.431	26.59	0.069	0.040	166.5	155.4	97.50	23.39	0.807
9:13	18.395	5.346	0.167	0.207	0.000	45.05	1.741	26.46	0.072	0.054	171.5	159.9	97.50	23.20	0.801
9:31	19.299	5.771	0.170	0.202	0.000	44.45	1.848	25.95	0.071	0.052	173.7	161.6	97.81	23.11	0.798
9:50	18.070	5.733	0.177	0.174	0.000	45.71	1.569	26.65	0.073	0.044	168.6	157.4	98.20	23.56	0.813
10:07	18.427	5.606	0.160	0.168	0.000	45.55	1.534	26.66	0.068	0.044	169.0	157.7	98.22	23.46	0.810
10:25	18.644	5.420	0.163	0.190	0.000	44.99	1.678	26.83	0.070	0.050	172.3	160.7	98.03	23.30	0.804
10:43	18.420	5.584	0.168	0.173	0.000	45.15	1.560	26.56	0.070	0.044	169.2	157.8	97.72	23.32	0.805
11:06	18.272	5.771	0.175	0.171	0.000	45.88	1.558	26.77	0.069	0.043	169.4	158.1	98.71	23.66	0.817
11:24	18.481	5.518	0.178	0.192	0.000	45.45	1.664	26.95	0.071	0.049	172.3	160.8	98.56	23.51	0.812
11:42	18.292	5.692	0.185	0.177	0.000	45.80	1.603	26.77	0.073	0.045	170.3	158.9	98.63	23.62	0.815
12:18	18.363	5.529	0.197	0.183	0.000	45.41	1.666	26.52	0.076	0.046	170.8	159.3	98.00	23.39	0.807
12:36	18.497	5.619	0.205	0.189	0.000	45.04	1.715	26.31	0.000	0.047	169.5	158.0	97.62	23.24	0.802

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP °F	MW	S.G. WRT AIR

9/19/1983															
12:40	18.373	5.622	0.201	0.186	0.000	45.53	1.666	26.90	0.078	0.046	172.2	160.7	98.60	23.57	0.814
12:54	18.434	5.479	0.199	0.187	0.000	44.95	1.663	26.67	0.078	0.047	171.6	160.1	97.71	23.28	0.804
13:12	17.968	4.926	0.199	0.178	0.000	45.94	1.626	26.71	0.078	0.045	169.7	158.4	97.67	23.30	0.804
13:29	18.302	5.877	0.208	0.202	0.000	45.18	1.752	25.93	0.078	0.050	170.2	158.6	97.58	23.33	0.805
13:47	18.090	5.836	0.201	0.177	0.000	45.47	1.613	26.01	0.072	0.044	167.5	156.2	97.51	23.38	0.807
14:05	18.045	5.772	0.199	0.174	0.000	45.99	1.601	25.61	0.079	0.043	166.0	154.8	97.51	23.38	0.807
14:21	18.955	5.871	0.177	0.218	0.000	44.59	1.793	25.67	0.071	0.057	171.7	159.7	97.40	23.11	0.798
14:39	19.209	5.839	0.196	0.295	0.000	43.81	2.279	25.58	0.087	0.080	179.8	167.0	97.38	22.98	0.793
14:57	18.820	5.753	0.193	0.258	0.000	44.33	2.143	25.78	0.080	0.066	176.6	164.2	97.42	23.09	0.797
15:13	19.690	6.060	0.180	0.166	0.000	44.17	1.923	25.25	0.064	0.040	172.6	160.2	97.54	22.96	0.793
15:31	17.501	6.036	0.137	0.074	0.000	46.46	0.903	26.59	0.046	0.016	156.1	146.2	97.76	23.70	0.818
15:49	17.936	6.074	0.185	0.155	0.000	45.57	1.386	26.12	0.067	0.037	164.2	153.2	97.54	23.49	0.811
16:06	18.055	6.033	0.176	0.161	0.000	46.40	1.470	25.26	0.066	0.041	162.7	151.6	97.67	23.48	0.810
16:24	18.698	6.158	0.176	0.195	0.000	45.24	1.687	25.59	0.072	0.051	169.0	157.3	97.87	23.36	0.806
16:42	18.365	6.177	0.199	0.177	0.000	45.49	1.595	25.65	0.073	0.044	167.1	155.6	97.77	23.43	0.809
17:00	17.937	6.046	0.192	0.169	0.000	45.60	1.531	25.93	0.071	0.042	165.6	154.5	97.52	23.46	0.810
17:18	18.226	6.059	0.181	0.182	0.000	45.34	1.600	25.73	0.069	0.046	166.7	155.4	97.44	23.36	0.806
17:36	18.136	5.782	0.174	0.178	0.000	45.27	1.584	26.19	0.066	0.044	167.4	156.2	97.43	23.34	0.805
17:54	18.107	5.482	0.181	0.176	0.000	44.91	1.555	26.81	0.068	0.043	169.1	157.9	97.33	23.27	0.803
18:12	18.390	5.212	0.165	0.175	0.000	44.66	1.562	26.98	0.066	0.045	170.4	159.0	97.25	23.13	0.798
18:30	18.607	5.006	0.163	0.192	0.000	44.20	1.679	27.21	0.067	0.050	173.4	161.8	97.18	23.01	0.794
18:48	18.945	5.357	0.162	0.207	0.000	44.03	1.802	26.50	0.069	0.054	173.9	161.9	97.14	22.95	0.792
19:06	18.625	5.855	0.173	0.197	0.000	45.12	1.749	25.26	0.071	0.051	168.2	156.5	97.09	23.11	0.798
19:24	18.761	6.507	0.172	0.191	0.000	44.68	1.696	25.07	0.073	0.049	167.4	155.7	97.20	23.21	0.801
19:42	19.341	6.370	0.167	0.178	0.000	44.33	1.655	25.27	0.068	0.045	169.0	157.1	97.42	23.11	0.798
20:00	18.081	5.982	0.163	0.192	0.000	46.37	1.694	24.81	0.071	0.050	164.3	152.9	97.41	23.37	0.807
20:18	18.519	5.818	0.161	0.190	0.000	45.13	1.699	26.02	0.075	0.051	169.6	158.0	97.66	23.29	0.804
20:36	18.813	5.651	0.172	0.188	0.000	44.90	1.730	25.99	0.071	0.048	170.8	159.0	97.56	23.16	0.799
20:54	18.758	6.024	0.166	0.190	0.000	44.86	1.707	25.61	0.071	0.049	169.1	157.4	97.43	23.20	0.801
21:12	18.590	6.101	0.164	0.196	0.000	45.11	1.727	25.66	0.074	0.052	169.1	157.5	97.68	23.32	0.805
21:30	18.872	5.843	0.165	0.194	0.000	44.75	1.709	26.07	0.074	0.051	171.1	159.4	97.72	23.22	0.802
21:48	18.827	6.256	0.177	0.186	0.000	45.16	1.709	25.34	0.075	0.048	168.7	156.9	97.78	23.32	0.805
22:06	18.196	6.290	0.153	0.195	0.000	46.17	1.712	24.78	0.071	0.052	164.7	153.2	97.62	23.44	0.809
22:24	18.978	5.735	0.154	0.187	0.000	44.59	1.691	25.93	0.070	0.050	170.5	158.7	97.38	23.08	0.797
22:42	18.862	5.906	0.163	0.185	0.000	44.76	1.715	25.59	0.072	0.048	169.3	157.6	97.30	23.12	0.798
23:00	18.387	5.922	0.154	0.197	0.000	44.94	1.724	25.76	0.070	0.053	168.6	157.0	97.21	23.21	0.801
23:18	18.728	5.626	0.150	0.176	0.000	44.61	1.637	26.21	0.068	0.046	169.6	158.0	97.26	23.10	0.797
23:36	18.534	5.964	0.160	0.196	0.000	44.77	1.695	25.87	0.068	0.053	169.1	157.5	97.31	23.22	0.801
23:54	18.459	6.032	0.158	0.192	0.000	44.92	1.675	25.83	0.069	0.050	168.4	156.9	97.38	23.27	0.803
9/20/1983															
0:12	18.323	5.823	0.160	0.183	0.000	44.94	1.640	26.32	0.066	0.047	168.9	157.5	97.50	23.30	0.804
0:30	18.525	5.832	0.158	0.194	0.000	44.99	1.660	26.26	0.069	0.051	169.9	158.4	97.74	23.32	0.805
0:48	18.481	5.856	0.165	0.182	0.000	45.28	1.633	26.27	0.069	0.047	169.3	157.8	97.98	23.41	0.808
2:12	19.005	5.870	0.187	0.181	0.000	45.97	1.641	26.81	0.072	0.046	173.2	161.5	99.79	23.78	0.821

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GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/20/1983															
4:03	18.847	5.641	0.183	0.177	0.000	46.22	1.560	27.03	0.077	0.044	172.5	160.9	99.78	23.79	0.821
4:21	19.001	5.873	0.183	0.191	0.000	44.91	1.698	26.46	0.071	0.049	172.8	161.0	98.44	23.39	0.808
4:39	18.775	5.916	0.183	0.190	0.000	44.86	1.652	26.51	0.073	0.048	171.8	160.1	98.20	23.40	0.808
4:56	18.970	5.829	0.178	0.177	0.000	44.63	1.568	26.74	0.071	0.046	171.9	160.2	98.20	23.34	0.806
5:14	18.678	5.949	0.189	0.176	0.000	45.18	1.605	26.30	0.073	0.046	170.1	158.6	98.19	23.43	0.809
5:32	18.616	5.955	0.183	0.190	0.000	45.10	1.638	26.43	0.074	0.049	171.0	159.3	98.24	23.46	0.810
5:49	18.649	5.794	0.184	0.178	0.000	45.14	1.581	26.61	0.073	0.045	170.7	159.2	98.25	23.44	0.809
6:07	18.675	5.728	0.194	0.176	0.000	45.18	1.608	26.62	0.075	0.046	171.3	159.7	98.30	23.43	0.809
6:25	18.785	5.853	0.188	0.188	0.000	44.89	1.657	26.62	0.077	0.050	172.4	160.7	98.31	23.42	0.808
6:43	18.698	5.793	0.198	0.172	0.000	45.09	1.539	26.72	0.077	0.045	171.0	159.5	98.33	23.45	0.809
7:40	18.762	6.102	0.205	0.166	0.000	45.25	1.538	26.21	0.076	0.042	169.5	158.0	98.36	23.49	0.811
7:54	18.843	6.030	0.211	0.180	0.000	45.28	1.623	25.52	0.077	0.044	168.8	157.1	97.81	23.29	0.804
8:12	19.024	6.332	0.187	0.196	0.000	44.54	1.723	25.61	0.075	0.050	170.7	158.8	97.74	23.26	0.803
8:29	18.798	6.246	0.194	0.199	0.000	44.86	1.730	25.55	0.077	0.050	170.1	158.2	97.71	23.30	0.804
8:47	18.927	6.527	0.194	0.190	0.000	44.82	1.661	25.39	0.087	0.048	169.3	157.5	97.85	23.36	0.806
9:05	18.278	5.827	0.185	0.176	0.000	45.21	1.612	26.09	0.082	0.044	168.3	157.0	97.51	23.33	0.805
9:23	18.709	6.364	0.190	0.194	0.000	44.93	1.705	25.42	0.085	0.049	169.1	157.4	97.65	23.33	0.805
9:40	19.026	6.666	0.196	0.189	0.000	44.79	1.666	25.18	0.088	0.048	169.0	157.1	97.85	23.36	0.806
10:47	19.098	6.400	0.199	0.193	0.000	44.75	1.555	25.86	0.079	0.047	170.2	158.4	98.19	23.40	0.808
11:05	19.000	6.332	0.222	0.166	0.000	44.72	1.558	25.77	0.079	0.034	169.2	157.5	97.88	23.33	0.805
11:22	18.927	6.509	0.227	0.182	0.000	44.94	1.639	25.58	0.084	0.044	169.9	158.1	98.13	23.44	0.809
11:40	18.457	5.806	0.236	0.175	0.000	44.83	1.622	26.44	0.083	0.041	170.9	159.4	97.69	23.32	0.805
11:58	18.738	6.214	0.244	0.192	0.000	44.58	1.706	25.83	0.087	0.046	171.3	159.5	97.63	23.29	0.804
12:16	19.322	6.514	0.215	0.202	0.000	44.48	1.775	25.52	0.083	0.041	172.4	160.3	98.15	23.32	0.805
12:35	19.261	6.551	0.224	0.191	0.000	44.99	1.717	25.52	0.084	0.046	171.7	159.7	98.58	23.47	0.810
12:53	18.839	6.732	0.228	0.193	0.000	45.53	1.729	25.28	0.084	0.046	169.8	157.9	98.65	23.63	0.816
13:10	19.083	6.499	0.211	0.193	0.000	45.15	1.733	25.49	0.081	0.048	171.0	159.1	98.49	23.48	0.811
13:28	18.503	6.926	0.214	0.199	0.000	45.68	1.702	24.91	0.084	0.050	167.2	155.6	98.26	23.65	0.816
13:46	18.865	6.196	0.204	0.179	0.000	44.90	1.594	26.12	0.080	0.044	170.4	158.8	98.18	23.42	0.809
14:04	18.717	6.368	0.213	0.179	0.000	45.41	1.612	25.47	0.081	0.044	168.2	156.6	98.09	23.46	0.810
14:22	19.409	6.563	0.212	0.198	0.000	44.75	1.750	25.74	0.081	0.050	173.2	161.1	98.75	23.48	0.811
14:40	19.398	7.125	0.220	0.187	0.000	45.12	1.699	24.91	0.080	0.046	169.8	157.7	98.79	23.59	0.814
14:58	19.307	6.882	0.216	0.196	0.000	45.20	1.728	25.19	0.079	0.048	170.8	158.7	98.85	23.59	0.814
15:15	18.620	6.838	0.218	0.192	0.000	46.03	1.702	25.03	0.080	0.043	167.7	156.0	98.76	23.74	0.819
15:33	19.533	7.090	0.231	0.175	0.000	45.04	1.627	25.00	0.080	0.043	169.7	157.6	98.83	23.57	0.814
15:51	19.737	7.488	0.225	0.188	0.000	44.90	1.710	24.51	0.081	0.045	169.8	157.6	98.88	23.59	0.814
16:09	19.024	7.652	0.169	0.142	0.000	45.98	1.333	24.37	0.063	0.037	160.9	149.6	98.78	23.81	0.822
16:27	18.349	7.454	0.155	0.159	0.000	46.54	1.402	24.68	0.061	0.043	160.6	149.5	98.84	23.96	0.827
16:45	18.937	7.053	0.152	0.237	0.000	45.58	1.901	24.90	0.070	0.067	170.4	158.3	98.89	23.71	0.818
17:03	19.932	7.244	0.124	0.249	0.000	44.80	2.078	24.35	0.067	0.071	173.4	160.7	98.91	23.46	0.810
17:21	17.687	8.597	0.082	0.167	0.000	47.79	1.539	22.65	0.045	0.049	152.1	141.2	98.61	24.23	0.837
17:38	18.657	8.850	0.089	0.190	0.000	46.15	1.567	22.13	0.052	0.056	154.7	143.3	97.74	23.78	0.821
17:56	17.780	7.260	0.087	0.202	0.000	46.36	1.639	23.98	0.051	0.060	158.8	147.7	97.42	23.66	0.817
18:14	17.269	7.632	0.110	0.154	0.000	47.34	1.428	23.40	0.050	0.043	152.2	141.7	97.43	23.87	0.824
18:32	17.250	7.043	0.109	0.174	0.000	47.23	1.558	24.22	0.054	0.050	156.7	146.0	97.69	23.84	0.823
18:50	17.123	8.046	0.144	0.203	0.000	48.30	1.818	22.25	0.063	0.056	154.0	143.0	98.00	24.09	0.832

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/20/1983

19:08	17.484	7.279	0.138	0.197	0.000	47.94	1.805	23.04	0.064	0.054	157.4	146.2	98.00	23.88	0.824
19:26	17.956	7.306	0.161	0.191	0.000	47.15	1.750	23.42	0.069	0.051	159.9	148.5	98.05	23.78	0.821
19:44	17.238	8.108	0.163	0.175	0.000	48.27	1.676	22.07	0.067	0.046	152.0	141.1	97.81	24.04	0.830
20:02	17.382	7.179	0.172	0.169	0.000	47.86	1.638	23.00	0.068	0.042	155.1	144.1	97.51	23.77	0.820
21:15	17.583	5.751	0.196	0.174	0.000	46.28	1.571	25.98	0.073	0.043	165.2	154.2	97.65	23.54	0.812
21:33	18.633	6.059	0.206	0.174	0.000	45.35	1.597	25.64	0.076	0.043	168.0	156.5	97.78	23.35	0.806
21:51	18.701	6.466	0.205	0.161	0.000	45.20	1.460	25.69	0.077	0.040	166.7	155.3	98.00	23.47	0.810
22:09	18.546	6.159	0.182	0.183	0.000	44.98	1.583	26.16	0.075	0.047	169.1	157.6	97.92	23.43	0.809
22:27	18.816	6.085	0.191	0.192	0.000	44.85	1.677	26.15	0.080	0.050	171.4	159.7	98.09	23.38	0.807
22:44	18.656	6.204	0.199	0.195	0.000	45.21	1.699	25.83	0.080	0.050	170.3	158.5	98.12	23.45	0.809
23:02	18.456	6.007	0.197	0.203	0.000	45.36	1.772	26.00	0.082	0.053	171.1	159.4	98.12	23.46	0.810
23:20	18.371	6.073	0.202	0.190	0.000	45.49	1.709	25.98	0.080	0.048	169.8	158.3	98.15	23.51	0.812
23:38	18.311	6.526	0.208	0.185	0.000	45.64	1.662	25.32	0.082	0.046	167.1	155.6	97.98	23.55	0.813
23:56	18.244	6.786	0.212	0.172	0.000	45.90	1.575	24.91	0.081	0.041	164.3	153.0	97.92	23.61	0.815

9/21/1983

0:14	18.748	7.117	0.203	0.185	0.000	45.53	1.657	24.48	0.081	0.046	165.6	153.9	98.05	23.56	0.813
0:32	18.707	7.220	0.205	0.190	0.000	45.61	1.652	24.41	0.084	0.048	165.4	153.7	98.12	23.61	0.815
0:50	18.722	6.851	0.219	0.176	0.000	45.47	1.592	24.97	0.084	0.043	166.5	154.9	98.13	23.55	0.813
1:08	18.658	6.620	0.210	0.182	0.000	45.44	1.618	25.18	0.081	0.045	167.2	155.6	98.04	23.50	0.811
1:26	18.479	6.262	0.213	0.191	0.000	45.30	1.670	25.50	0.082	0.047	168.5	156.9	97.75	23.40	0.808
1:44	18.308	6.163	0.223	0.178	0.000	45.42	1.597	25.77	0.083	0.044	167.9	156.5	97.78	23.45	0.809
2:02	18.479	5.795	0.221	0.203	0.000	45.16	1.767	26.05	0.084	0.050	171.7	159.9	97.81	23.34	0.806
2:20	18.397	5.715	0.212	0.207	0.000	45.23	1.766	26.34	0.083	0.052	172.3	160.6	98.01	23.40	0.808
2:39	18.252	5.679	0.224	0.184	0.000	45.37	1.641	26.53	0.084	0.045	170.8	159.3	98.00	23.44	0.809
2:57	17.793	5.761	0.228	0.170	0.000	45.84	1.545	26.53	0.084	0.041	168.1	157.0	98.00	23.59	0.814
3:15	17.849	5.660	0.229	0.184	0.000	45.81	1.639	26.49	0.084	0.045	169.4	158.2	98.00	23.54	0.813
3:33	18.192	5.862	0.246	0.180	0.000	45.52	1.657	26.25	0.088	0.043	170.2	158.7	98.03	23.50	0.811
3:51	18.235	5.758	0.244	0.191	0.000	45.32	1.681	26.44	0.088	0.046	171.4	159.9	98.01	23.46	0.810
4:12	18.450	6.098	0.241	0.190	0.000	45.57	1.697	26.12	0.086	0.044	171.1	159.4	98.50	23.59	0.814
4:30	18.828	6.522	0.224	0.198	0.000	45.20	1.745	25.29	0.083	0.048	170.0	158.1	98.13	23.45	0.810
4:48	18.629	6.592	0.224	0.197	0.000	45.39	1.728	25.15	0.086	0.050	168.8	157.1	98.05	23.50	0.811
5:05	18.350	6.834	0.210	0.178	0.000	45.95	1.617	24.76	0.082	0.045	164.8	153.3	98.02	23.61	0.815
5:23	18.070	7.176	0.197	0.200	0.000	46.43	1.724	24.10	0.083	0.052	163.2	151.8	98.03	23.73	0.819
5:41	18.011	7.300	0.185	0.202	0.000	46.58	1.722	23.87	0.080	0.053	162.1	150.7	98.01	23.76	0.820
5:59	18.154	7.103	0.181	0.204	0.000	46.43	1.782	24.10	0.078	0.054	163.8	152.3	98.08	23.70	0.818
6:16	18.047	7.055	0.179	0.183	0.000	46.94	1.707	23.74	0.076	0.048	161.0	149.6	97.98	23.70	0.818
6:34	18.480	6.695	0.198	0.203	0.000	46.12	1.785	24.51	0.083	0.052	166.6	154.9	98.13	23.57	0.814
6:52	18.304	6.322	0.219	0.186	0.000	45.98	1.663	25.25	0.086	0.047	167.1	155.6	98.06	23.55	0.813
7:10	17.042	6.077	0.213	0.180	0.000	44.08	1.601	23.65	0.082	0.045	156.9	146.1	92.97	22.42	0.774
7:28	17.730	6.395	0.223	0.178	0.000	46.25	1.572	25.66	0.088	0.046	165.6	154.4	98.14	23.74	0.820
7:45	18.051	5.941	0.228	0.187	0.000	45.45	1.618	26.12	0.084	0.045	168.7	157.4	97.72	23.46	0.810
8:03	18.525	6.090	0.223	0.188	0.000	44.90	1.675	25.88	0.079	0.045	169.8	158.2	97.60	23.32	0.805
8:21	18.564	6.062	0.215	0.194	0.000	44.96	1.717	25.96	0.081	0.049	170.8	159.1	97.81	23.36	0.806
9:15	17.454	5.278	0.223	0.169	0.000	45.89	1.541	27.00	0.076	0.039	168.1	157.2	97.67	23.50	0.811

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/21/1983															
9:32	18.784	5.369	0.217	0.202	0.000	44.32	1.761	26.68	0.078	0.050	174.4	162.5	97.46	23.09	0.797
9:50	18.570	5.814	0.220	0.216	0.000	44.49	1.766	26.25	0.082	0.054	172.8	161.0	97.46	23.22	0.801
10:08	18.855	5.996	0.221	0.214	0.000	44.42	1.856	25.57	0.082	0.053	172.5	160.4	97.27	23.11	0.798
11:18	18.584	6.225	0.224	0.201	0.000	44.94	1.736	25.51	0.079	0.049	169.8	158.1	97.55	23.31	0.805
11:36	18.334	6.174	0.219	0.181	0.000	44.89	1.605	25.70	0.075	0.043	167.7	156.2	97.22	23.29	0.804
11:54	18.321	6.007	0.226	0.187	0.000	44.75	1.645	25.88	0.078	0.045	168.9	157.4	97.13	23.23	0.802
12:11	18.489	6.378	0.208	0.199	0.000	44.87	1.702	25.27	0.075	0.049	168.0	156.4	97.24	23.27	0.803
12:30	18.918	6.323	0.216	0.209	0.000	44.56	1.821	25.33	0.076	0.050	171.2	159.2	97.51	23.22	0.801
12:48	18.536	5.956	0.219	0.202	0.000	44.93	1.752	25.83	0.076	0.049	170.7	159.0	97.55	23.27	0.803
13:06	18.235	6.175	0.216	0.211	0.000	45.19	1.777	25.39	0.078	0.052	168.8	157.2	97.32	23.32	0.805
13:24	18.170	6.091	0.227	0.199	0.000	44.88	1.735	25.63	0.079	0.048	168.9	157.3	97.06	23.26	0.803
13:42	17.924	5.678	0.229	0.184	0.000	45.14	1.612	25.96	0.079	0.044	167.5	156.2	96.84	23.21	0.801
13:59	17.979	6.184	0.228	0.202	0.000	45.05	1.713	25.46	0.082	0.049	167.6	156.2	96.95	23.29	0.804
14:17	17.754	5.845	0.234	0.156	0.000	45.44	1.469	26.19	0.079	0.035	165.6	154.7	97.20	23.39	0.807
14:35	17.468	5.731	0.238	0.165	0.000	45.69	1.476	26.33	0.084	0.039	165.7	154.8	97.22	23.46	0.810
14:53	18.244	5.844	0.244	0.223	0.000	44.93	1.893	25.66	0.091	0.055	171.9	160.1	97.18	23.22	0.801
15:11	18.736	5.812	0.229	0.195	0.000	44.48	1.757	26.03	0.085	0.047	172.3	160.4	97.37	23.15	0.799
15:29	18.452	6.153	0.240	0.189	0.000	44.77	1.696	25.68	0.089	0.046	169.7	158.1	97.31	23.27	0.803
15:47	18.341	5.808	0.244	0.207	0.000	44.55	1.774	26.01	0.090	0.050	171.7	160.0	97.08	23.17	0.800
16:05	18.410	4.759	0.230	0.206	0.000	44.18	1.804	27.10	0.084	0.050	175.4	163.6	96.83	22.91	0.791
16:23	18.706	5.984	0.248	0.200	0.000	44.07	1.808	25.72	0.090	0.047	172.2	160.3	96.87	23.04	0.795
16:40	18.789	6.130	0.237	0.200	0.000	44.14	1.772	25.41	0.089	0.048	171.0	159.0	96.82	23.03	0.795
16:58	18.655	6.279	0.231	0.193	0.000	44.40	1.720	25.22	0.086	0.046	169.0	157.3	96.82	23.10	0.797
17:16	18.607	6.072	0.231	0.205	0.000	44.25	1.782	25.60	0.085	0.050	171.0	159.1	96.88	23.09	0.797
17:34	18.690	6.161	0.230	0.203	0.000	44.29	1.784	25.43	0.086	0.050	170.7	158.8	96.92	23.09	0.797
17:52	18.249	5.871	0.224	0.202	0.000	45.18	1.753	25.48	0.086	0.051	169.0	157.4	97.10	23.21	0.801
18:12	18.086	5.167	0.218	0.212	0.000	45.10	1.820	26.82	0.086	0.052	173.6	162.0	97.56	23.26	0.803
18:30	18.169	5.329	0.238	0.203	0.000	44.96	1.787	26.61	0.086	0.049	172.9	161.3	97.43	23.23	0.802
18:47	18.116	5.373	0.244	0.202	0.000	44.95	1.780	26.46	0.089	0.050	172.4	160.8	97.26	23.21	0.801
19:05	18.361	5.241	0.232	0.216	0.000	44.90	1.888	26.35	0.087	0.054	174.0	162.2	97.33	23.13	0.798
19:23	18.371	5.262	0.240	0.205	0.000	44.66	1.816	26.79	0.089	0.051	174.7	162.9	97.48	23.18	0.800
19:41	18.458	5.397	0.247	0.213	0.000	44.56	1.860	26.62	0.090	0.053	175.2	163.3	97.49	23.18	0.800
19:59	18.500	5.374	0.239	0.214	0.000	44.47	1.885	26.47	0.089	0.053	175.0	163.0	97.30	23.11	0.798
20:18	18.433	5.295	0.224	0.218	0.000	44.49	1.881	26.63	0.087	0.054	175.0	163.2	97.31	23.12	0.798
20:36	18.364	5.483	0.228	0.207	0.000	44.84	1.807	26.36	0.085	0.051	172.9	161.2	97.42	23.20	0.801
20:54	18.384	5.345	0.227	0.210	0.000	44.78	1.818	26.74	0.086	0.052	174.4	162.7	97.64	23.24	0.802
21:12	18.612	5.321	0.205	0.210	0.000	44.60	1.831	26.75	0.083	0.053	174.9	163.0	97.67	23.18	0.800
21:30	18.504	5.438	0.206	0.205	0.000	44.53	1.784	26.50	0.083	0.052	173.2	161.4	97.31	23.13	0.798
21:48	18.269	5.235	0.215	0.207	0.000	44.76	1.778	26.75	0.085	0.052	173.4	161.8	97.35	23.17	0.800
22:06	18.459	5.132	0.202	0.212	0.000	44.63	1.811	26.85	0.082	0.054	174.5	162.8	97.43	23.13	0.798
22:24	18.563	5.358	0.201	0.216	0.000	44.50	1.855	26.76	0.082	0.057	175.1	163.2	97.59	23.17	0.800
22:42	18.103	5.386	0.214	0.191	0.000	44.76	1.704	26.78	0.078	0.046	171.6	160.2	97.26	23.22	0.802
23:00	18.471	5.357	0.208	0.217	0.000	44.48	1.840	26.71	0.079	0.054	174.5	162.7	97.41	23.15	0.799
23:18	18.432	5.291	0.208	0.200	0.000	44.69	1.758	26.92	0.079	0.051	173.9	162.2	97.63	23.22	0.801
23:36	18.315	5.389	0.217	0.198	0.000	44.80	1.753	26.76	0.082	0.050	173.0	161.4	97.56	23.25	0.802
23:54	18.620	5.365	0.213	0.216	0.000	44.33	1.846	26.57	0.081	0.054	174.7	162.8	97.30	23.08	0.797

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/22/1983															
0:12	18.136	5.397	0.199	0.193	0.000	45.12	1.721	26.40	0.075	0.048	170.4	159.0	97.28	23.22	0.801
0:30	18.398	5.641	0.201	0.212	0.000	44.81	1.808	26.28	0.078	0.053	172.3	160.6	97.48	23.24	0.802
0:48	18.420	5.772	0.203	0.193	0.000	44.80	1.674	26.28	0.078	0.049	170.6	159.1	97.47	23.26	0.803
1:06	18.329	5.759	0.199	0.189	0.000	44.77	1.681	26.17	0.076	0.047	169.8	158.3	97.21	23.21	0.801
1:24	18.102	5.401	0.197	0.210	0.000	44.81	1.764	26.56	0.077	0.053	171.7	160.2	97.18	23.20	0.801
1:42	18.033	5.816	0.202	0.187	0.000	44.90	1.633	26.15	0.074	0.046	168.3	157.0	97.04	23.25	0.803
2:18	17.750	5.138	0.186	0.203	0.000	45.31	1.729	26.81	0.074	0.052	170.6	159.4	97.26	23.27	0.803
2:36	17.458	4.910	0.185	0.191	0.000	45.56	1.678	27.32	0.073	0.049	170.5	159.4	97.42	23.36	0.806
2:40	18.022	5.333	0.201	0.205	0.000	44.68	1.736	26.80	0.076	0.051	171.8	160.4	97.10	23.19	0.800
2:54	18.214	5.506	0.193	0.213	0.000	45.00	1.783	26.50	0.079	0.055	172.1	160.5	97.54	23.28	0.804
3:12	18.475	5.629	0.193	0.189	0.000	44.83	1.657	26.55	0.075	0.048	171.2	159.6	97.65	23.28	0.803
3:30	18.500	5.735	0.196	0.189	0.000	44.75	1.693	26.48	0.077	0.048	171.5	159.9	97.66	23.29	0.804
3:48	18.746	6.057	0.188	0.194	0.000	44.66	1.673	25.98	0.078	0.050	170.5	158.8	97.62	23.27	0.803
4:54	18.856	6.267	0.198	0.188	0.000	45.19	1.628	26.49	0.078	0.048	172.1	160.3	98.95	23.65	0.816
5:11	18.607	5.843	0.166	0.181	0.000	44.59	1.583	26.45	0.071	0.048	169.9	158.4	97.54	23.25	0.803
5:29	18.418	5.682	0.179	0.189	0.000	44.46	1.664	26.40	0.075	0.049	170.4	158.9	97.12	23.15	0.799
5:47	18.508	6.232	0.184	0.195	0.000	44.80	1.665	25.65	0.080	0.052	168.7	157.1	97.37	23.29	0.804
6:05	18.552	5.850	0.178	0.170	0.000	44.68	1.544	26.37	0.075	0.044	169.0	157.6	97.47	23.25	0.803
6:23	18.684	5.628	0.184	0.210	0.000	44.47	1.761	26.47	0.080	0.055	173.2	161.4	97.54	23.18	0.800
6:40	18.495	5.645	0.195	0.176	0.000	44.66	1.588	26.61	0.077	0.044	170.5	159.0	97.49	23.24	0.802
6:58	18.415	5.813	0.204	0.198	0.000	44.70	1.725	26.18	0.083	0.050	171.1	159.4	97.37	23.24	0.802
7:16	18.317	5.414	0.198	0.194	0.000	44.71	1.683	26.84	0.079	0.050	172.2	160.7	97.49	23.24	0.802
7:34	18.173	5.420	0.213	0.176	0.000	44.76	1.632	26.75	0.079	0.043	170.7	159.3	97.25	23.21	0.801
7:51	18.539	5.622	0.227	0.197	0.000	44.47	1.724	26.10	0.084	0.049	171.5	159.8	97.01	23.07	0.797
8:09	18.199	6.079	0.197	0.177	0.000	45.15	1.599	25.62	0.076	0.045	166.5	155.2	97.14	23.29	0.804
8:27	18.702	6.137	0.191	0.190	0.000	44.72	1.670	25.60	0.077	0.049	169.1	157.4	97.34	23.21	0.801
8:45	18.383	6.217	0.190	0.172	0.000	44.85	1.502	25.88	0.077	0.054	167.0	155.7	97.33	23.32	0.805
9:02	18.908	6.472	0.181	0.207	0.000	44.71	1.769	25.08	0.078	0.055	169.4	157.5	97.46	23.23	0.802
9:20	17.769	5.837	0.179	0.182	0.000	45.93	1.605	25.71	0.074	0.048	165.3	154.2	97.33	23.41	0.808
9:56	18.979	5.568	0.199	0.209	0.000	44.14	1.818	26.30	0.080	0.053	174.3	162.3	97.34	23.03	0.795
10:14	18.207	5.627	0.204	0.173	0.000	45.15	1.625	26.06	0.074	0.042	168.2	156.8	97.16	23.21	0.801
10:32	18.655	5.131	0.227	0.198	0.000	44.10	1.773	26.97	0.083	0.049	175.2	163.4	97.18	23.01	0.794
10:50	18.759	6.288	0.238	0.199	0.000	44.32	1.758	25.55	0.087	0.049	171.1	159.2	97.25	23.19	0.800
11:07	18.414	5.985	0.229	0.182	0.000	44.56	1.672	25.84	0.083	0.044	169.4	157.8	97.01	23.17	0.800
11:25	18.925	6.444	0.216	0.201	0.000	44.32	1.746	25.12	0.082	0.050	169.8	157.8	97.11	23.13	0.798
11:43	18.967	6.366	0.214	0.204	0.000	44.29	1.745	25.52	0.084	0.051	171.2	159.3	97.43	23.20	0.801
12:01	19.201	6.449	0.216	0.190	0.000	44.30	1.703	25.59	0.082	0.047	171.5	159.5	97.77	23.25	0.803
12:19	19.407	6.598	0.196	0.213	0.000	44.38	1.831	25.01	0.082	0.056	171.8	159.6	97.77	23.21	0.801
12:37	18.930	6.559	0.198	0.179	0.000	44.85	1.612	25.43	0.079	0.048	168.6	156.9	97.88	23.38	0.807
12:55	19.347	6.245	0.197	0.216	0.000	44.13	1.835	25.59	0.082	0.055	173.6	161.4	97.70	23.14	0.799
13:13	19.214	6.226	0.199	0.179	0.000	44.32	1.636	25.88	0.078	0.045	171.2	159.3	97.78	23.22	0.802
13:31	19.271	6.090	0.210	0.210	0.000	43.91	1.806	25.87	0.086	0.053	174.1	161.9	97.50	23.09	0.797
13:49	18.936	6.275	0.220	0.196	0.000	44.38	1.725	25.63	0.084	0.049	171.2	159.3	97.49	23.21	0.801
14:07	18.892	6.212	0.204	0.211	0.000	44.53	1.824	25.16	0.083	0.054	170.7	158.7	97.17	23.11	0.798
14:25	19.270	6.396	0.204	0.194	0.000	44.01	1.721	25.37	0.080	0.049	171.0	159.0	97.29	23.08	0.797
14:42	19.160	6.356	0.214	0.199	0.000	43.98	1.770	25.52	0.083	0.049	172.0	159.9	97.32	23.11	0.798

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/22/1983

15:18	19.248	6.328	0.199	0.180	0.000	44.12	1.689	25.56	0.077	0.045	170.7	158.8	97.44	23.13	0.798
15:36	19.149	6.131	0.206	0.209	0.000	44.03	1.779	25.75	0.082	0.053	172.9	160.8	97.39	23.10	0.797
15:40	19.121	6.258	0.204	0.209	0.000	44.23	1.807	25.15	0.081	0.053	171.1	159.0	97.12	23.04	0.795
15:54	18.598	5.906	0.209	0.165	0.000	44.64	1.552	25.89	0.076	0.040	168.1	156.6	97.08	23.14	0.799
17:06	19.133	6.263	0.201	0.203	0.000	44.08	1.759	25.50	0.079	0.051	171.5	159.5	97.26	23.09	0.797
17:24	19.147	6.139	0.205	0.180	0.000	43.97	1.682	25.75	0.077	0.044	171.0	159.1	97.20	23.05	0.796
17:42	18.806	6.100	0.217	0.191	0.000	44.31	1.687	25.82	0.081	0.047	170.8	159.0	97.25	23.15	0.799
18:00	18.774	6.085	0.208	0.190	0.000	44.45	1.684	25.88	0.078	0.047	170.6	158.9	97.41	23.20	0.801
18:18	19.211	6.223	0.200	0.221	0.000	44.20	1.865	25.55	0.082	0.057	173.5	161.3	97.60	23.15	0.799
18:35	18.965	6.484	0.199	0.181	0.000	44.70	1.621	25.41	0.078	0.046	168.7	157.0	97.68	23.30	0.804
18:53	18.889	6.323	0.214	0.203	0.000	44.49	1.762	25.74	0.083	0.051	171.9	159.9	97.76	23.30	0.804
19:11	18.959	6.302	0.199	0.203	0.000	44.47	1.748	25.55	0.079	0.052	171.0	159.1	97.57	23.23	0.802
19:29	18.816	6.458	0.196	0.201	0.000	44.74	1.752	25.28	0.080	0.051	169.6	157.8	97.58	23.29	0.804
19:47	18.780	6.151	0.206	0.191	0.000	44.38	1.671	25.86	0.079	0.048	170.4	158.7	97.36	23.20	0.801
20:05	19.024	6.295	0.191	0.204	0.000	44.32	1.787	25.19	0.076	0.051	170.2	158.3	97.13	23.08	0.797
20:33	19.213	6.034	0.217	0.198	0.000	44.65	1.783	26.41	0.080	0.049	175.1	163.0	98.63	23.41	0.808
20:51	19.068	6.224	0.210	0.214	0.000	44.41	1.856	25.74	0.080	0.054	173.5	161.4	97.85	23.25	0.803
21:09	18.861	6.323	0.194	0.188	0.000	44.75	1.724	25.69	0.077	0.048	170.4	158.6	97.85	23.34	0.806
21:27	19.023	6.116	0.193	0.202	0.000	44.53	1.757	25.98	0.083	0.053	172.7	160.7	97.93	23.28	0.804
21:45	19.065	6.257	0.199	0.197	0.000	44.33	1.745	25.69	0.080	0.050	171.6	159.7	97.61	23.20	0.801
22:03	18.585	6.437	0.189	0.203	0.000	44.93	1.758	25.06	0.078	0.052	168.2	156.4	97.30	23.27	0.803
22:21	19.316	6.106	0.177	0.212	0.000	43.86	1.817	25.81	0.077	0.056	173.6	161.4	97.43	23.05	0.796
22:39	18.798	6.332	0.193	0.181	0.000	45.30	1.371	26.62	0.075	0.045	169.4	157.9	98.91	23.69	0.818
22:57	18.672	6.066	0.201	0.197	0.000	44.27	1.751	25.85	0.080	0.050	171.0	159.2	97.14	23.14	0.799
23:15	18.876	6.033	0.194	0.198	0.000	44.03	1.746	25.96	0.078	0.050	171.8	159.9	97.16	23.09	0.797
23:33	18.935	6.175	0.199	0.191	0.000	44.09	1.728	25.70	0.077	0.048	170.9	159.0	97.14	23.09	0.797
23:51	18.663	6.161	0.209	0.203	0.000	44.34	1.786	25.68	0.082	0.051	171.1	159.2	97.18	23.17	0.800

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0:09	19.090	6.180	0.202	0.198	0.000	43.99	1.764	25.66	0.080	0.051	171.9	159.9	97.22	23.07	0.796
0:27	19.202	6.229	0.206	0.198	0.000	43.98	1.787	25.68	0.081	0.050	172.6	160.5	97.42	23.10	0.798
0:45	18.891	6.270	0.207	0.200	0.000	44.30	1.752	25.70	0.082	0.051	171.4	159.5	97.45	23.21	0.801
1:03	18.178	6.386	0.210	0.208	0.000	44.85	1.695	25.76	0.083	0.054	169.0	157.5	97.42	23.41	0.808
1:21	19.093	6.724	0.203	0.203	0.000	44.39	1.814	24.95	0.082	0.052	170.3	158.3	97.51	23.24	0.802
1:39	18.784	6.784	0.203	0.200	0.000	44.49	1.749	25.03	0.082	0.052	168.9	157.0	97.37	23.29	0.804
1:57	18.819	6.338	0.204	0.193	0.000	44.39	1.735	25.63	0.080	0.049	170.6	158.7	97.45	23.24	0.802
2:15	19.305	6.564	0.206	0.209	0.000	44.11	1.837	25.22	0.083	0.054	172.3	160.1	97.59	23.18	0.800
2:33	18.872	6.334	0.205	0.193	0.000	44.51	1.733	25.58	0.081	0.049	170.6	158.7	97.56	23.25	0.803
2:51	19.155	6.343	0.229	0.201	0.000	44.00	1.807	25.47	0.086	0.050	172.6	160.4	97.35	23.11	0.798
3:09	19.268	6.735	0.231	0.212	0.000	44.02	1.897	24.80	0.087	0.053	172.0	159.7	97.31	23.13	0.798
3:27	18.967	6.255	0.219	0.197	0.000	44.16	1.779	25.57	0.083	0.049	171.7	159.7	97.28	23.13	0.798
3:45	18.699	6.430	0.221	0.200	0.000	44.32	1.768	25.46	0.044	0.050	169.5	157.7	97.19	23.20	0.801
4:03	18.891	6.331	0.216	0.207	0.000	44.14	1.826	25.46	0.083	0.052	171.7	159.7	97.21	23.14	0.799
4:38	18.966	6.567	0.213	0.206	0.000	45.13	1.784	25.75	0.083	0.052	172.4	160.4	98.75	23.59	0.814
4:56	18.748	6.168	0.210	0.198	0.000	44.42	1.752	25.80	0.082	0.050	171.3	159.4	97.43	23.22	0.801

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/23/1983															
5:14	19.207	6.362	0.204	0.195	0.000	43.80	1.739	25.58	0.078	0.049	171.7	159.6	97.22	23.07	0.796
5:32	18.533	6.249	0.206	0.201	0.000	44.51	1.764	25.53	0.080	0.051	169.8	158.1	97.13	23.20	0.801
5:49	18.656	6.087	0.219	0.191	0.000	44.37	1.720	25.90	0.081	0.048	170.9	159.2	97.28	23.19	0.801
6:07	18.989	6.199	0.210	0.207	0.000	44.51	1.812	25.57	0.083	0.054	172.2	160.2	97.63	23.21	0.801
6:25	19.112	6.376	0.212	0.218	0.000	44.21	1.887	25.56	0.082	0.056	173.6	161.4	97.71	23.22	0.802
6:42	18.670	6.532	0.223	0.183	0.000	44.73	1.689	25.48	0.077	0.044	169.0	157.3	97.63	23.36	0.806
7:18	18.688	6.506	0.206	0.183	0.000	45.11	1.710	25.07	0.077	0.046	167.8	156.1	97.59	23.34	0.806
7:36	18.551	6.239	0.210	0.220	0.000	44.67	1.867	25.85	0.081	0.057	172.5	160.6	97.75	23.36	0.806
7:40	18.736	6.353	0.225	0.205	0.000	44.57	1.804	25.78	0.083	0.052	172.1	160.2	97.80	23.35	0.806
7:53	18.880	6.311	0.214	0.185	0.000	44.84	1.674	25.85	0.077	0.047	170.7	158.9	98.08	23.40	0.808
8:11	18.578	6.534	0.200	0.198	0.000	45.43	1.746	25.25	0.080	0.053	168.8	157.1	98.07	23.50	0.811
8:29	19.476	5.658	0.167	0.222	0.000	43.96	1.961	26.65	0.074	0.061	178.3	165.9	98.23	23.15	0.799
8:47	18.840	5.866	0.157	0.208	0.000	44.66	1.833	26.62	0.071	0.057	174.3	162.3	98.31	23.38	0.807
9:05	18.320	5.901	0.143	0.199	0.000	45.14	1.721	26.75	0.069	0.058	171.5	159.9	98.30	23.53	0.812
9:22	18.711	5.564	0.125	0.184	0.000	44.82	1.638	27.23	0.064	0.052	172.6	161.1	98.39	23.41	0.808
9:40	18.727	5.838	0.118	0.197	0.000	44.93	1.571	26.85	0.062	0.057	171.0	159.4	98.35	23.45	0.810
9:58	18.847	5.742	0.116	0.212	0.000	44.81	1.656	26.88	0.064	0.063	172.7	161.0	98.39	23.41	0.808
11:25	18.957	5.758	0.122	0.187	0.000	45.32	1.663	27.32	0.057	0.049	173.7	162.0	99.43	23.67	0.817
11:43	18.775	5.427	0.118	0.192	0.000	44.46	1.664	27.34	0.058	0.052	173.3	161.7	98.09	23.29	0.804
12:01	18.743	5.707	0.128	0.208	0.000	44.44	1.773	26.80	0.064	0.057	173.3	161.5	97.93	23.28	0.804
12:18	17.547	6.296	0.120	0.167	0.000	46.15	1.474	25.98	0.057	0.046	162.5	151.7	97.84	23.70	0.818
12:36	18.671	5.828	0.151	0.165	0.000	44.84	1.515	26.59	0.063	0.043	169.0	157.6	97.86	23.33	0.805
12:54	18.527	5.720	0.170	0.194	0.000	44.89	1.673	26.51	0.072	0.051	171.1	159.6	97.82	23.32	0.805
13:12	18.211	5.694	0.181	0.178	0.000	45.17	1.597	26.62	0.073	0.046	169.5	158.1	97.77	23.40	0.808
13:31	18.646	6.134	0.181	0.195	0.000	44.83	1.700	26.05	0.076	0.051	170.6	158.9	97.86	23.37	0.807
13:48	18.311	6.290	0.182	0.188	0.000	45.22	1.639	25.80	0.076	0.049	168.0	156.5	97.76	23.46	0.810
14:06	18.094	6.384	0.172	0.191	0.000	45.82	1.658	25.19	0.075	0.051	165.4	154.0	97.63	23.49	0.811
14:24	18.444	6.357	0.170	0.207	0.000	45.13	1.751	25.50	0.078	0.056	168.9	157.2	97.70	23.41	0.808
14:42	18.791	6.414	0.170	0.203	0.000	44.88	1.805	25.24	0.077	0.054	169.6	157.7	97.63	23.30	0.804
15:36	17.719	5.419	0.133	0.274	0.000	45.01	2.090	26.58	0.079	0.079	174.6	162.9	97.38	23.32	0.805
15:40	18.338	6.399	0.175	0.223	0.000	45.24	1.860	25.21	0.081	0.060	169.3	157.5	97.59	23.40	0.808
15:53	17.265	5.465	0.126	0.270	0.000	45.35	2.146	26.58	0.078	0.079	173.5	161.9	97.36	23.43	0.809
16:11	17.365	5.515	0.099	0.195	0.000	46.00	1.818	26.12	0.061	0.057	166.3	155.3	97.22	23.41	0.808
16:29	17.279	5.556	0.090	0.167	0.000	45.89	1.557	26.74	0.057	0.050	164.5	153.8	97.39	23.51	0.812
16:47	16.831	5.683	0.082	0.164	0.000	46.26	1.492	26.68	0.054	0.049	161.9	151.5	97.30	23.63	0.816
17:05	17.040	5.443	0.074	0.147	0.000	46.01	1.374	27.21	0.052	0.049	162.6	152.3	97.40	23.58	0.814
17:22	17.119	5.438	0.075	0.155	0.000	46.12	1.380	27.29	0.052	0.049	163.4	153.0	97.68	23.64	0.816
17:40	17.268	5.379	0.077	0.175	0.000	46.21	1.534	26.59	0.055	0.058	163.8	153.2	97.35	23.48	0.810
17:58	18.074	5.178	0.080	0.194	0.000	44.94	1.719	27.09	0.055	0.062	170.4	159.1	97.39	23.23	0.802
18:16	17.393	5.232	0.072	0.195	0.000	46.62	1.715	25.96	0.054	0.063	164.4	153.5	97.30	23.39	0.807
18:34	17.873	5.290	0.080	0.207	0.000	45.00	1.776	27.00	0.057	0.067	170.4	159.1	97.34	23.28	0.804
18:52	17.691	5.289	0.077	0.206	0.000	45.07	1.757	27.08	0.059	0.067	169.9	158.7	97.30	23.32	0.805
19:09	17.290	5.373	0.068	0.172	0.000	46.47	1.606	26.23	0.048	0.055	163.1	152.3	97.32	23.45	0.810
19:27	17.922	5.713	0.103	0.128	0.000	45.60	1.249	26.61	0.053	0.037	162.2	151.5	97.41	23.41	0.808
19:45	18.833	5.895	0.141	0.184	0.000	44.56	1.588	26.11	0.069	0.052	169.3	157.7	97.43	23.17	0.800
20:03	18.292	5.974	0.159	0.187	0.000	45.42	1.669	25.55	0.071	0.051	166.9	155.5	97.37	23.30	0.804

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/23/1983															
20:21	18.328	6.265	0.163	0.197	0.000	45.18	1.687	25.61	0.076	0.055	167.9	156.3	97.56	23.39	0.807
20:39	18.324	6.313	0.180	0.208	0.000	45.21	1.810	25.28	0.082	0.056	168.6	157.0	97.46	23.36	0.806
20:57	18.323	6.134	0.196	0.197	0.000	45.09	1.748	25.70	0.082	0.052	169.4	157.8	97.52	23.35	0.806
21:16	18.503	5.948	0.198	0.185	0.000	44.99	1.702	25.94	0.080	0.048	169.9	158.2	97.59	23.30	0.804
21:34	18.685	5.934	0.201	0.203	0.000	44.75	1.809	25.84	0.083	0.053	171.8	159.9	97.56	23.23	0.802
21:52	18.305	5.991	0.208	0.185	0.000	45.05	1.678	25.95	0.082	0.047	169.2	157.7	97.50	23.33	0.805
22:10	18.686	5.960	0.194	0.217	0.000	44.55	1.861	25.78	0.083	0.058	172.4	160.5	97.39	23.18	0.800
22:28	18.047	5.476	0.198	0.188	0.000	45.06	1.670	26.72	0.081	0.049	170.7	159.3	97.49	23.32	0.805
22:46	18.411	5.877	0.190	0.204	0.000	44.87	1.760	25.84	0.083	0.053	170.3	158.6	97.29	23.22	0.802
23:04	18.235	5.882	0.210	0.200	0.000	44.93	1.748	26.17	0.084	0.052	170.9	159.3	97.51	23.33	0.805
23:22	19.540	4.973	0.158	0.241	0.000	43.39	2.052	26.92	0.079	0.067	180.7	168.2	97.42	22.79	0.787
23:40	18.303	5.170	0.170	0.247	0.000	44.24	2.052	27.09	0.082	0.067	177.7	165.7	97.43	23.14	0.799
23:57	18.188	5.327	0.150	0.222	0.000	44.58	1.872	26.94	0.077	0.062	174.0	162.3	97.42	23.22	0.801
9/24/1983															
0:16	18.430	5.406	0.136	0.230	0.000	44.51	1.892	26.90	0.075	0.067	174.9	163.0	97.65	23.23	0.802
0:34	18.591	5.272	0.123	0.209	0.000	44.48	1.829	27.13	0.068	0.059	174.5	162.8	97.76	23.20	0.801
0:52	18.802	5.294	0.122	0.209	0.000	44.37	1.811	27.03	0.069	0.060	174.7	162.9	97.77	23.16	0.799
1:09	18.623	5.293	0.129	0.238	0.000	44.32	1.972	27.07	0.073	0.068	176.8	164.8	97.78	23.19	0.800
1:27	18.720	5.177	0.110	0.177	0.000	44.55	1.651	27.19	0.063	0.051	172.2	160.7	97.69	23.15	0.799
1:45	18.294	5.262	0.115	0.193	0.000	44.84	1.667	27.21	0.067	0.056	171.7	160.3	97.71	23.28	0.804
2:03	18.021	5.342	0.116	0.204	0.000	45.06	1.707	26.99	0.068	0.060	170.8	159.5	97.57	23.32	0.805
2:21	18.604	5.187	0.111	0.202	0.000	44.48	1.666	27.27	0.067	0.059	173.0	161.4	97.64	23.17	0.800
2:39	18.405	5.315	0.113	0.195	0.000	44.66	1.646	27.11	0.065	0.058	171.5	160.1	97.57	23.23	0.802
2:57	17.984	5.376	0.114	0.189	0.000	44.91	1.647	27.11	0.064	0.054	169.9	158.7	97.45	23.31	0.805
3:15	17.741	5.422	0.112	0.178	0.000	45.31	1.550	27.01	0.062	0.051	167.5	156.5	97.43	23.39	0.807
3:33	17.993	5.709	0.114	0.190	0.000	45.29	1.629	26.58	0.065	0.055	168.1	156.9	97.62	23.41	0.808
3:51	18.169	5.667	0.109	0.217	0.000	45.00	1.752	26.48	0.066	0.064	170.3	158.8	97.52	23.32	0.805
4:09	17.512	5.748	0.090	0.173	0.000	46.45	1.395	25.95	0.056	0.054	161.3	150.6	97.42	23.51	0.812
4:27	18.108	5.884	0.109	0.192	0.000	45.13	1.667	26.25	0.062	0.055	167.7	156.4	97.46	23.36	0.806
4:45	18.145	5.799	0.109	0.198	0.000	45.01	1.747	26.12	0.065	0.062	168.6	157.2	97.25	23.27	0.803
5:57	17.887	5.915	0.114	0.195	0.000	47.63	1.690	25.34	0.060	0.053	164.4	153.1	98.88	23.81	0.822
6:14	18.197	5.814	0.124	0.211	0.000	45.01	1.790	26.23	0.066	0.059	170.0	158.5	97.50	23.32	0.805
6:32	18.073	5.938	0.118	0.184	0.000	45.18	1.677	26.02	0.064	0.053	167.0	155.7	97.31	23.33	0.805
6:50	18.072	5.848	0.115	0.185	0.000	45.45	1.677	25.68	0.064	0.054	165.9	154.6	97.15	23.27	0.803
7:07	17.880	5.955	0.124	0.201	0.000	45.38	1.732	25.88	0.067	0.057	167.0	155.7	97.28	23.37	0.807
7:25	17.567	5.988	0.124	0.167	0.000	45.71	1.452	26.00	0.064	0.047	162.6	151.9	97.12	23.44	0.809
7:43	17.750	5.923	0.116	0.160	0.000	45.51	1.379	26.09	0.059	0.045	162.4	151.6	97.03	23.37	0.807
8:01	17.771	5.845	0.120	0.185	0.000	45.24	1.583	26.17	0.063	0.052	165.6	154.5	97.03	23.33	0.805
8:18	16.281	6.583	0.118	0.159	0.000	47.69	1.298	24.63	0.059	0.045	152.1	142.2	96.86	23.82	0.822
8:36	18.997	6.500	0.162	0.183	0.000	44.44	1.597	25.21	0.073	0.051	167.4	155.7	97.22	23.17	0.800
8:54	18.349	6.015	0.186	0.197	0.000	44.75	1.704	25.83	0.079	0.053	169.2	157.6	97.16	23.23	0.802
9:12	17.853	6.141	0.189	0.184	0.000	45.30	1.620	25.70	0.078	0.049	166.0	154.8	97.12	23.38	0.807
9:29	17.963	6.255	0.196	0.211	0.000	45.16	1.787	25.37	0.084	0.057	167.9	156.4	97.08	23.34	0.806
9:47	18.094	6.029	0.200	0.209	0.000	44.91	1.782	25.67	0.083	0.056	169.3	157.7	97.03	23.25	0.803

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/24/1983															
10:05	17.849	6.235	0.198	0.190	0.000	45.44	1.705	25.12	0.078	0.051	165.3	154.0	96.86	23.31	0.805
10:23	18.341	6.063	0.185	0.222	0.000	44.63	1.887	25.52	0.082	0.060	170.7	158.9	96.99	23.17	0.800
10:40	18.010	6.214	0.195	0.178	0.000	45.11	1.617	25.51	0.079	0.048	165.9	154.6	96.97	23.31	0.804
10:58	18.208	6.201	0.200	0.206	0.000	44.67	1.792	25.47	0.084	0.055	169.0	157.4	96.89	23.21	0.801
11:16	17.905	6.393	0.185	0.198	0.000	45.11	1.735	25.21	0.079	0.054	166.1	154.8	96.87	23.32	0.805
11:34	17.939	6.545	0.183	0.191	0.000	45.06	1.671	25.13	0.080	0.052	165.1	153.8	96.86	23.34	0.806
11:51	18.118	6.200	0.176	0.197	0.000	44.74	1.684	25.59	0.078	0.054	167.3	155.9	96.84	23.23	0.802
12:09	18.139	6.187	0.174	0.178	0.000	44.79	1.602	25.46	0.075	0.048	165.6	154.3	96.65	23.18	0.800
12:27	18.583	5.994	0.180	0.210	0.000	44.14	1.781	25.84	0.081	0.058	171.1	159.3	96.86	23.07	0.796
12:45	18.412	5.931	0.189	0.179	0.000	44.20	1.576	26.15	0.079	0.048	168.8	157.3	96.77	23.10	0.798
13:03	18.556	6.204	0.187	0.212	0.000	44.24	1.798	25.44	0.082	0.058	170.1	158.3	96.77	23.09	0.797
13:20	18.189	5.930	0.179	0.181	0.000	44.44	1.588	26.04	0.076	0.049	167.6	156.3	96.67	23.13	0.799
13:39	18.261	6.027	0.184	0.195	0.000	44.34	1.666	25.91	0.079	0.053	168.7	157.2	96.72	23.13	0.799
13:57	18.430	6.113	0.181	0.199	0.000	44.15	1.707	25.70	0.080	0.053	169.1	157.5	96.62	23.07	0.796
14:15	18.485	6.103	0.183	0.211	0.000	43.88	1.690	25.62	0.081	0.057	169.2	157.5	96.31	22.97	0.793
14:33	18.434	6.081	0.180	0.192	0.000	43.96	1.657	25.71	0.078	0.053	168.4	156.9	96.34	23.00	0.794
14:51	18.282	5.897	0.188	0.174	0.000	43.41	1.470	25.67	0.078	0.047	165.6	154.3	95.22	22.71	0.784
15:08	18.799	6.116	0.182	0.205	0.000	43.69	1.669	25.50	0.079	0.055	169.4	157.6	96.29	22.89	0.790
15:26	18.425	6.063	0.175	0.162	0.000	44.10	1.405	25.94	0.073	0.043	165.6	154.4	96.39	23.03	0.795
15:44	18.468	6.557	0.178	0.206	0.000	44.35	1.642	24.83	0.079	0.056	165.9	154.3	96.37	23.07	0.796
16:02	18.005	6.150	0.168	0.167	0.000	44.51	1.415	25.54	0.072	0.046	163.1	152.1	96.08	23.07	0.796
16:20	21.878	6.137	0.151	0.246	0.000	40.05	2.108	25.63	0.079	0.070	184.8	171.0	96.35	22.06	0.761
16:38	18.006	6.329	0.135	0.235	0.000	44.25	1.938	24.89	0.074	0.067	167.5	155.9	95.93	23.00	0.794
16:55	17.868	6.211	0.120	0.194	0.000	44.35	1.698	25.53	0.066	0.056	165.3	154.0	96.10	23.09	0.797
17:13	17.573	6.112	0.111	0.176	0.000	44.48	1.544	25.96	0.061	0.051	163.5	152.6	96.06	23.16	0.799
17:31	17.850	6.101	0.101	0.158	0.000	44.63	1.429	26.15	0.054	0.049	163.1	152.3	96.52	23.22	0.802
17:49	18.436	5.926	0.106	0.184	0.000	44.14	1.609	26.25	0.057	0.053	167.9	156.5	96.76	23.09	0.797
18:07	18.578	6.007	0.103	0.211	0.000	44.04	1.766	25.86	0.058	0.060	169.3	157.6	96.68	23.03	0.795
18:25	18.341	5.878	0.102	0.195	0.000	44.27	1.739	26.21	0.059	0.061	169.1	157.6	96.86	23.12	0.798
18:43	17.958	5.522	0.093	0.148	0.000	45.38	1.412	26.13	0.048	0.042	162.6	151.8	96.74	23.16	0.800
19:18	18.323	5.619	0.110	0.200	0.000	44.07	1.691	26.67	0.061	0.057	170.2	158.7	96.80	23.07	0.796
19:36	18.185	5.652	0.107	0.170	0.000	44.34	1.515	26.67	0.056	0.048	167.0	155.9	96.74	23.12	0.798
19:40	18.467	5.830	0.102	0.175	0.000	44.24	1.536	26.43	0.056	0.050	167.5	156.2	96.89	23.11	0.798
19:54	18.467	5.704	0.106	0.184	0.000	44.14	1.625	26.43	0.058	0.053	168.7	157.3	96.77	23.05	0.796
20:12	18.138	5.851	0.182	0.207	0.000	44.30	1.694	26.29	0.059	0.061	169.7	158.3	96.78	23.15	0.799
20:30	17.889	5.893	0.100	0.196	0.000	44.60	1.684	26.38	0.055	0.055	167.4	156.2	96.85	23.24	0.802
20:48	17.785	5.958	0.098	0.172	0.000	44.93	1.551	26.25	0.054	0.049	164.6	153.7	96.84	23.29	0.804
21:06	17.977	5.838	0.097	0.164	0.000	44.78	1.527	26.22	0.050	0.046	164.6	153.6	96.70	23.19	0.800
21:24	17.516	5.930	0.095	0.153	0.000	45.46	1.392	26.26	0.053	0.044	161.7	151.0	96.91	23.39	0.808
21:42	17.625	6.050	0.097	0.161	0.000	45.36	1.443	25.97	0.049	0.045	161.7	151.0	96.81	23.35	0.806
22:18	17.493	6.081	0.104	0.193	0.000	45.37	1.585	25.86	0.056	0.056	163.4	152.5	96.79	23.37	0.807
22:36	17.765	5.976	0.101	0.196	0.000	45.05	1.695	25.87	0.054	0.056	165.5	154.3	96.76	23.26	0.803
22:40	17.374	6.057	0.100	0.160	0.000	46.13	1.452	25.28	0.051	0.045	158.9	148.2	96.65	23.37	0.807
22:54	17.694	6.063	0.105	0.200	0.000	45.12	1.704	25.78	0.058	0.057	165.3	154.2	96.78	23.30	0.804
23:12	17.652	5.882	0.108	0.192	0.000	45.16	1.663	26.01	0.057	0.054	165.3	154.2	96.77	23.28	0.804
23:30	17.649	5.872	0.113	0.185	0.000	45.07	1.630	26.11	0.059	0.052	165.2	154.2	96.74	23.28	0.803

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/24/1983															
23:48	17.842	5.852	0.111	0.180	0.000	44.90	1.646	26.08	0.059	0.054	165.8	154.7	96.72	23.22	0.801
9/25/1983															
0:06	17.050	5.817	0.094	0.096	0.000	46.92	1.110	25.53	0.041	0.024	153.2	143.2	96.68	23.46	0.810
0:24	17.617	6.013	0.100	0.172	0.000	45.23	1.453	26.18	0.051	0.049	162.8	152.1	96.86	23.36	0.806
0:41	18.185	5.860	0.105	0.199	0.000	44.74	1.714	25.94	0.055	0.057	167.4	156.0	96.86	23.16	0.799
0:59	17.933	6.060	0.102	0.180	0.000	45.15	1.583	25.74	0.054	0.052	164.1	153.0	96.86	23.27	0.803
1:17	16.886	5.349	0.101	0.194	0.000	45.73	1.628	26.79	0.055	0.056	164.9	154.2	96.79	23.41	0.808
1:35	17.507	5.946	0.103	0.191	0.000	45.24	1.654	26.07	0.056	0.055	164.8	153.9	96.83	23.35	0.806
1:53	17.440	5.874	0.101	0.185	0.000	45.28	1.621	26.24	0.055	0.053	164.6	153.7	96.85	23.36	0.806
2:11	17.364	5.958	0.103	0.200	0.000	45.35	1.692	26.04	0.056	0.058	164.9	153.9	96.82	23.38	0.807
2:29	17.593	5.905	0.110	0.203	0.000	45.07	1.763	26.05	0.057	0.058	166.6	155.4	96.81	23.30	0.804
2:47	17.821	6.026	0.119	0.206	0.000	44.98	1.809	25.77	0.060	0.059	167.1	155.8	96.84	23.27	0.803
3:05	17.583	6.277	0.135	0.207	0.000	45.44	1.837	25.29	0.061	0.059	165.4	154.2	96.90	23.38	0.807
3:23	17.503	6.539	0.138	0.203	0.000	45.72	1.856	24.77	0.060	0.059	163.6	152.4	96.85	23.43	0.809
4:15	18.311	6.671	0.131	0.203	0.000	46.21	1.861	25.02	0.056	0.056	166.8	155.2	98.52	23.70	0.818
4:33	17.965	6.363	0.135	0.192	0.000	45.38	1.796	25.14	0.055	0.053	165.2	153.8	97.08	23.35	0.806
4:51	18.039	6.222	0.128	0.182	0.000	45.33	1.746	25.29	0.058	0.052	165.2	153.8	97.04	23.30	0.804
5:09	18.080	6.298	0.122	0.178	0.000	45.32	1.711	25.11	0.057	0.051	164.1	152.8	96.92	23.27	0.803
5:27	17.812	6.079	0.118	0.176	0.000	45.36	1.653	25.51	0.057	0.050	163.8	152.7	96.81	23.29	0.804
5:53	18.161	6.132	0.141	0.182	0.000	45.60	1.741	25.66	0.057	0.050	166.8	155.4	97.72	23.45	0.809
6:11	17.261	5.887	0.126	0.175	0.000	46.66	1.616	24.86	0.056	0.047	159.6	148.8	96.68	23.37	0.807
6:28	17.691	5.860	0.122	0.178	0.000	45.14	1.621	26.05	0.060	0.049	165.0	154.0	96.77	23.27	0.803
6:46	17.736	5.705	0.115	0.168	0.000	45.02	1.555	26.29	0.060	0.047	165.0	154.0	96.70	23.22	0.802
7:04	17.923	5.613	0.119	0.177	0.000	44.69	1.598	26.46	0.060	0.050	166.8	155.7	96.69	23.15	0.799
7:22	17.765	5.606	0.121	0.190	0.000	44.76	1.670	26.49	0.063	0.053	167.5	156.4	96.72	23.19	0.801
7:39	17.790	5.642	0.108	0.152	0.000	44.95	1.438	26.51	0.055	0.042	164.0	153.2	96.69	23.21	0.801
7:57	17.757	5.645	0.114	0.161	0.000	44.88	1.440	26.54	0.057	0.046	164.4	153.6	96.64	23.21	0.801
8:15	17.314	5.622	0.115	0.184	0.000	45.68	1.544	25.88	0.062	0.054	162.6	151.9	96.45	23.25	0.803
8:32	17.617	5.764	0.118	0.196	0.000	44.90	1.662	26.22	0.064	0.056	166.3	155.2	96.60	23.23	0.802
8:50	17.852	5.853	0.117	0.179	0.000	44.84	1.587	26.07	0.061	0.051	165.3	154.2	96.61	23.19	0.800
9:08	17.877	5.584	0.117	0.203	0.000	44.63	1.691	26.34	0.066	0.064	168.2	156.9	96.57	23.12	0.798
9:26	18.051	5.648	0.124	0.234	0.000	44.30	1.859	26.27	0.069	0.068	171.0	159.5	96.63	23.08	0.797
9:43	18.023	5.628	0.131	0.229	0.000	44.36	1.900	26.20	0.073	0.072	171.4	159.7	96.62	23.08	0.797
10:01	18.038	5.818	0.133	0.219	0.000	44.55	1.880	25.92	0.072	0.069	170.0	158.5	96.70	23.13	0.798
10:19	17.807	5.505	0.132	0.238	0.000	44.59	1.989	26.21	0.074	0.075	171.9	160.2	96.62	23.11	0.798
10:37	17.880	5.405	0.142	0.223	0.000	44.58	1.958	26.09	0.071	0.063	170.9	159.3	96.42	23.02	0.795
10:54	18.197	5.573	0.143	0.242	0.000	44.38	2.121	25.79	0.073	0.069	173.1	161.2	96.59	22.99	0.794
11:12	17.678	5.170	0.143	0.257	0.000	44.65	2.151	26.21	0.079	0.061	173.3	161.6	96.40	23.01	0.794
11:30	17.955	5.677	0.150	0.228	0.000	44.79	2.050	25.59	0.075	0.064	170.8	159.1	96.58	23.08	0.797
11:47	17.815	5.839	0.157	0.225	0.000	45.07	1.999	25.38	0.077	0.063	169.2	157.6	96.62	23.16	0.799
12:05	17.534	5.834	0.146	0.209	0.000	46.10	1.924	24.62	0.072	0.058	164.4	153.1	96.50	23.20	0.801
12:23	17.844	5.985	0.140	0.201	0.000	45.20	1.888	25.26	0.068	0.055	166.7	155.3	96.64	23.19	0.800
12:41	18.093	6.299	0.133	0.201	0.000	44.94	1.852	24.89	0.069	0.057	165.9	154.4	96.53	23.15	0.799
12:58	17.594	6.493	0.131	0.205	0.000	45.40	1.825	24.75	0.070	0.058	163.7	152.4	96.52	23.31	0.805

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP. %	MW	S.G. WRT AIR
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9/25/1983

13:16	17.537	6.254	0.123	0.201	0.000	44.47	1.837	24.39	0.066	0.057	162.1	150.9	94.93	22.84	0.788
13:35	17.950	6.450	0.123	0.199	0.000	45.16	1.810	24.62	0.066	0.057	163.9	152.5	96.44	23.19	0.800
13:53	17.711	6.433	0.125	0.200	0.000	45.19	1.774	24.81	0.068	0.056	163.5	152.2	96.37	23.23	0.802
14:11	17.287	6.159	0.107	0.163	0.000	47.01	1.546	24.06	0.057	0.046	155.9	145.2	96.44	23.34	0.806
16:52	18.009	5.716	0.122	0.196	0.000	44.45	1.672	26.38	0.064	0.055	168.2	156.9	96.66	23.13	0.799
17:10	17.932	5.860	0.122	0.170	0.000	44.69	1.399	26.32	0.061	0.048	164.3	153.4	96.60	23.19	0.800
17:28	18.215	5.787	0.114	0.194	0.000	44.37	1.623	26.32	0.062	0.056	168.0	156.7	96.74	23.12	0.798
17:45	17.945	5.717	0.118	0.175	0.000	44.65	1.457	26.53	0.061	0.050	165.7	154.7	96.70	23.18	0.800
18:03	17.974	5.884	0.115	0.175	0.000	44.80	1.434	26.25	0.006	0.050	163.3	152.4	96.68	23.19	0.801
18:21	18.155	5.821	0.116	0.198	0.000	44.64	1.591	26.08	0.062	0.057	166.9	155.6	96.73	23.14	0.799
18:39	18.093	5.853	0.115	0.197	0.000	44.66	1.577	26.15	0.066	0.057	166.8	155.6	96.77	23.18	0.800
18:57	17.653	5.713	0.112	0.163	0.000	45.08	1.366	26.59	0.058	0.046	163.5	152.8	96.78	23.29	0.804
19:15	17.994	5.821	0.116	0.180	0.000	44.78	1.474	26.27	0.061	0.052	165.3	154.2	96.75	23.20	0.801
19:32	18.215	5.734	0.113	0.211	0.000	44.42	1.735	26.22	0.064	0.061	169.2	157.8	96.77	23.11	0.798
19:50	18.108	5.725	0.111	0.175	0.000	44.61	1.573	26.33	0.059	0.050	166.5	155.4	96.74	23.14	0.799
20:08	17.847	5.684	0.119	0.103	0.000	45.06	1.568	25.95	0.063	0.053	163.5	152.5	96.45	23.12	0.798
20:26	18.133	5.643	0.111	0.193	0.000	44.46	1.666	26.39	0.060	0.055	168.3	156.9	96.71	23.10	0.797
20:44	18.121	5.713	0.118	0.203	0.000	44.41	1.728	26.20	0.063	0.057	168.6	157.2	96.61	23.08	0.797
21:01	16.925	5.717	0.117	0.169	0.000	46.00	1.519	26.04	0.108	0.075	163.0	152.4	96.67	23.44	0.809
21:19	17.832	5.790	0.121	0.193	0.000	44.81	1.662	26.21	0.095	0.072	168.1	156.8	96.79	23.23	0.802
21:37	17.972	5.887	0.123	0.197	0.000	44.64	1.704	25.99	0.067	0.057	167.3	156.0	96.64	23.16	0.799
21:55	18.023	5.640	0.124	0.182	0.000	44.53	1.634	26.37	0.067	0.053	167.6	156.4	96.63	23.11	0.798
22:13	18.036	5.614	0.119	0.190	0.000	44.50	1.690	26.18	0.067	0.055	167.7	156.4	96.45	23.05	0.796
22:32	18.173	5.797	0.122	0.202	0.000	44.43	1.739	26.04	0.071	0.058	168.7	157.2	96.63	23.09	0.797
22:50	17.763	5.696	0.128	0.170	0.000	44.69	1.556	26.35	0.062	0.047	165.5	154.5	96.46	23.15	0.799
23:08	18.115	5.608	0.127	0.193	0.000	44.18	1.695	26.24	0.071	0.056	168.5	157.2	96.29	22.98	0.793
23:26	18.286	5.561	0.128	0.221	0.000	43.82	1.850	26.17	0.071	0.063	171.1	159.4	96.16	22.88	0.790
23:44	17.635	5.891	0.124	0.158	0.000	44.77	1.460	25.92	0.062	0.045	162.4	151.6	96.06	23.11	0.798

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0:02	17.617	5.666	0.125	0.191	0.000	44.85	1.654	25.64	0.065	0.055	164.4	153.3	95.87	23.01	0.794
0:20	18.120	5.501	0.120	0.202	0.000	43.95	1.752	26.21	0.064	0.058	169.0	157.5	95.98	22.87	0.789
0:38	17.684	5.667	0.124	0.181	0.000	44.43	1.616	26.12	0.064	0.051	165.4	154.4	95.94	23.01	0.794
0:55	17.598	5.822	0.125	0.169	0.000	44.60	1.515	25.99	0.064	0.048	163.4	152.5	95.93	23.07	0.796
1:13	17.786	5.757	0.122	0.208	0.000	44.31	1.755	25.80	0.066	0.060	166.8	155.6	95.87	22.97	0.793
1:31	17.773	5.688	0.120	0.196	0.000	44.32	1.722	26.00	0.062	0.055	166.6	155.4	95.94	22.98	0.793
1:49	17.613	5.619	0.121	0.172	0.000	44.39	1.517	26.30	0.063	0.049	164.5	153.6	95.84	23.01	0.794
2:07	17.224	5.465	0.120	0.182	0.000	45.75	1.604	25.35	0.062	0.052	161.3	150.5	95.81	23.07	0.796
14:00	18.198	5.388	0.144	0.168	0.000	45.07	1.460	26.93	0.046	0.047	167.7	156.6	97.45	23.27	0.803
14:17	18.213	5.766	0.137	0.173	0.000	45.22	1.506	26.24	0.048	0.049	166.0	154.9	97.35	23.30	0.804
14:35	18.350	5.495	0.134	0.203	0.000	44.74	1.664	26.69	0.057	0.057	170.4	159.0	97.40	23.22	0.801
14:53	17.961	5.544	0.133	0.161	0.000	45.32	1.419	26.76	0.042	0.043	165.5	154.6	97.39	23.35	0.806
15:10	18.348	5.485	0.132	0.180	0.000	44.89	1.513	26.81	0.049	0.049	168.4	157.2	97.45	23.25	0.802
15:28	18.218	5.663	0.129	0.177	0.000	45.33	1.517	26.69	0.048	0.048	167.5	156.3	97.81	23.41	0.808
15:45	18.034	5.705	0.135	0.164	0.000	45.40	1.449	26.59	0.067	0.043	166.1	155.1	97.59	23.41	0.808

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/26/1983

16:03	18.186	5.560	0.130	0.168	0.000	45.30	1.460	26.53	0.068	0.046	166.6	155.5	97.45	23.31	0.805
16:21	18.311	5.762	0.130	0.196	0.000	45.03	1.585	26.36	0.072	0.055	168.6	157.2	97.50	23.31	0.805
16:38	18.267	5.692	0.133	0.174	0.000	45.22	1.518	26.31	0.068	0.046	166.9	155.7	97.43	23.30	0.804
16:56	18.140	5.669	0.133	0.175	0.000	45.14	1.494	26.60	0.070	0.048	167.3	156.2	97.47	23.34	0.806
17:14	18.321	5.658	0.133	0.189	0.000	45.02	1.579	26.43	0.072	0.053	168.6	157.3	97.45	23.28	0.803
17:31	18.014	5.680	0.141	0.167	0.000	45.26	1.473	26.59	0.074	0.045	166.7	155.6	97.45	23.37	0.807
17:49	18.176	5.753	0.129	0.175	0.000	45.17	1.477	26.56	0.069	0.048	167.0	155.9	97.56	23.37	0.807
18:07	18.290	5.646	0.122	0.202	0.000	45.39	1.695	25.86	0.069	0.057	167.9	156.5	97.32	23.23	0.802
18:25	18.452	5.632	0.124	0.175	0.000	44.89	1.518	26.52	0.067	0.047	168.1	156.8	97.43	23.24	0.802
18:43	18.338	5.582	0.125	0.176	0.000	44.96	1.528	26.58	0.066	0.048	168.0	156.7	97.41	23.25	0.803
19:01	18.167	5.607	0.130	0.201	0.000	44.95	1.634	26.59	0.072	0.056	169.4	158.1	97.41	23.29	0.804
19:19	18.342	5.687	0.127	0.167	0.000	45.06	1.510	26.40	0.066	0.045	167.1	155.8	97.41	23.27	0.803
19:36	17.882	5.201	0.124	0.182	0.000	45.30	1.546	26.98	0.067	0.050	168.2	157.1	97.34	23.29	0.804
19:54	18.127	5.785	0.132	0.214	0.000	45.12	1.710	26.09	0.075	0.062	169.0	157.5	97.32	23.30	0.804
20:12	18.251	5.629	0.118	0.170	0.000	45.15	1.567	26.31	0.063	0.046	166.9	155.7	97.31	23.25	0.802
20:30	18.341	5.450	0.123	0.176	0.000	44.88	1.527	26.70	0.067	0.049	168.4	157.1	97.31	23.20	0.801
20:47	17.964	5.539	0.132	0.201	0.000	45.06	1.625	26.55	0.056	0.001	166.8	155.7	97.13	23.24	0.802
21:05	18.295	5.558	0.130	0.173	0.000	45.03	1.528	26.34	0.069	0.047	167.2	155.9	97.18	23.19	0.801
21:23	18.111	5.608	0.129	0.184	0.000	45.19	1.563	26.37	0.069	0.051	167.3	156.1	97.27	23.27	0.803
21:41	18.139	5.354	0.134	0.192	0.000	44.77	1.604	26.87	0.054	0.054	169.4	158.1	97.17	23.19	0.801
21:58	18.159	5.486	0.131	0.161	0.000	45.01	1.417	26.73	0.067	0.043	166.5	155.5	97.21	23.24	0.802
22:16	18.037	5.439	0.131	0.199	0.000	45.00	1.610	26.63	0.072	0.055	168.8	157.6	97.17	23.23	0.802
22:34	18.249	5.506	0.130	0.174	0.000	44.86	1.518	26.63	0.047	0.047	167.4	156.2	97.16	23.19	0.801
22:52	18.111	5.480	0.131	0.183	0.000	44.93	1.546	26.57	0.050	0.050	167.3	156.2	97.05	23.19	0.801
23:10	18.291	5.403	0.133	0.189	0.000	44.70	1.595	26.81	0.051	0.051	169.3	158.0	97.22	23.17	0.800
23:27	17.796	5.231	0.133	0.165	0.000	45.13	1.422	27.20	0.045	0.046	166.6	155.7	97.17	23.28	0.804
23:45	18.292	5.353	0.129	0.178	0.000	44.72	1.517	26.91	0.049	0.049	168.5	157.3	97.20	23.17	0.800

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0:03	18.280	5.656	0.138	0.204	0.000	44.67	1.670	26.51	0.056	0.056	169.7	158.3	97.24	23.22	0.801
0:21	18.111	5.637	0.124	0.168	0.000	45.12	1.455	26.46	0.072	0.048	166.1	155.1	97.20	23.27	0.803
0:39	18.070	5.492	0.124	0.187	0.000	44.87	1.534	26.71	0.051	0.052	167.5	156.4	97.08	23.21	0.801
0:56	18.052	5.339	0.130	0.199	0.000	44.73	1.631	26.88	0.054	0.055	169.5	158.2	97.07	23.18	0.800
1:14	18.529	5.411	0.127	0.181	0.000	44.50	1.572	26.68	0.049	0.049	169.2	157.8	97.10	23.08	0.797
1:32	18.311	5.417	0.125	0.190	0.000	44.68	1.575	26.70	0.052	0.053	168.8	157.5	97.11	23.14	0.799
1:50	18.216	5.455	0.128	0.181	0.000	44.78	1.550	26.67	0.049	0.049	167.9	156.7	97.08	23.17	0.800
2:08	17.364	4.997	0.119	0.174	0.000	47.93	1.477	25.10	0.063	0.047	159.4	148.7	97.28	23.38	0.807
2:26	17.877	5.313	0.132	0.183	0.000	46.46	1.548	26.12	0.048	0.049	165.1	154.1	97.73	23.41	0.808
2:44	17.645	5.437	0.126	0.173	0.000	47.09	1.461	25.72	0.062	0.047	162.2	151.3	97.76	23.51	0.812
3:02	17.650	5.255	0.128	0.189	0.000	47.44	1.584	25.48	0.050	0.051	162.8	151.8	97.82	23.49	0.811
3:20	18.259	5.276	0.137	0.166	0.000	45.47	1.468	26.85	0.044	0.044	167.4	156.3	97.71	23.31	0.805
3:38	18.388	5.399	0.131	0.183	0.000	45.00	1.553	26.96	0.048	0.049	169.5	158.2	97.72	23.29	0.804
3:56	18.559	5.319	0.139	0.201	0.000	44.60	1.655	27.13	0.054	0.054	172.3	160.8	97.71	23.22	0.802
4:14	18.193	5.497	0.130	0.170	0.000	45.30	1.474	26.75	0.045	0.045	167.0	155.9	97.61	23.33	0.805
4:31	18.491	5.654	0.128	0.206	0.000	44.94	1.676	26.42	0.055	0.055	170.0	158.5	97.63	23.27	0.803

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/27/1983															
4:49	18.238	5.811	0.130	0.195	0.000	45.20	1.650	26.37	0.051	0.052	168.4	157.1	97.69	23.38	0.807
5:07	18.436	5.528	0.129	0.182	0.000	44.93	1.551	26.79	0.048	0.048	169.0	157.7	97.64	23.28	0.803
5:25	18.410	5.503	0.126	0.196	0.000	45.02	1.613	26.64	0.054	0.055	169.6	158.2	97.62	23.27	0.803
5:43	18.434	5.647	0.131	0.187	0.000	44.99	1.614	26.51	0.050	0.050	168.9	157.5	97.62	23.28	0.804
6:01	18.205	5.792	0.125	0.184	0.000	45.35	1.534	26.31	0.050	0.050	166.6	155.4	97.60	23.37	0.807
6:18	18.345	5.554	0.127	0.189	0.000	44.96	1.585	26.69	0.050	0.050	168.9	157.6	97.55	23.28	0.803
6:36	18.347	5.408	0.123	0.174	0.000	45.00	1.491	26.96	0.046	0.046	168.3	157.1	97.60	23.28	0.803
6:54	18.756	5.462	0.132	0.212	0.000	44.43	1.698	26.78	0.057	0.057	172.5	160.8	97.59	23.15	0.799
7:12	18.446	5.443	0.132	0.173	0.000	44.88	1.520	26.88	0.046	0.046	168.8	157.5	97.57	23.24	0.802
7:30	18.428	5.358	0.129	0.179	0.000	44.94	1.535	26.58	0.066	0.047	168.5	157.1	97.26	23.15	0.799
7:48	17.932	5.419	0.125	0.187	0.000	45.53	1.535	26.58	0.066	0.050	167.0	155.9	97.42	23.33	0.805
8:06	18.013	5.618	0.117	0.170	0.000	45.86	1.508	26.05	0.069	0.046	164.8	153.8	97.45	23.36	0.806
8:24	18.340	5.607	0.127	0.188	0.000	45.08	1.561	26.54	0.051	0.052	168.2	156.9	97.55	23.29	0.804
8:42	18.330	5.706	0.134	0.198	0.000	45.01	1.630	26.38	0.053	0.054	168.7	157.4	97.49	23.28	0.804
8:59	18.409	5.586	0.133	0.187	0.000	44.99	1.629	26.46	0.050	0.050	168.9	157.5	97.50	23.25	0.802
9:17	18.172	5.508	0.137	0.183	0.000	45.15	1.520	26.73	0.050	0.050	167.9	156.7	97.50	23.31	0.805
9:35	18.119	5.515	0.141	0.173	0.000	45.22	1.505	26.68	0.079	0.046	167.9	156.7	97.48	23.32	0.805
9:53	18.263	5.627	0.141	0.187	0.000	45.14	1.574	26.47	0.079	0.052	168.7	157.4	97.53	23.31	0.805
10:22	17.997	5.723	0.146	0.166	0.000	46.23	1.437	26.95	0.051	0.052	167.1	156.1	98.75	23.75	0.820
10:39	18.312	5.596	0.144	0.192	0.000	45.02	1.609	26.47	0.078	0.061	169.6	158.2	97.48	23.27	0.803
10:57	18.379	5.599	0.146	0.186	0.000	45.07	1.623	26.35	0.075	0.051	169.2	157.7	97.48	23.25	0.803
11:15	17.004	5.066	0.143	0.165	0.000	48.29	1.411	25.16	0.045	0.045	157.5	147.0	97.33	23.50	0.811
11:32	17.316	4.963	0.128	0.179	0.000	47.91	1.473	25.33	0.073	0.050	160.5	149.7	97.42	23.43	0.809
11:50	16.991	5.019	0.138	0.173	0.000	48.50	1.470	25.02	0.048	0.048	157.8	147.3	97.40	23.51	0.812
12:08	17.319	5.263	0.137	0.170	0.000	47.62	1.452	25.41	0.078	0.049	160.6	149.9	97.50	23.50	0.811
13:01	18.427	5.416	0.148	0.193	0.000	44.88	1.604	26.78	0.054	0.054	170.3	158.9	97.56	23.23	0.802
13:18	18.098	5.057	0.152	0.202	0.000	44.96	1.675	27.15	0.056	0.056	171.4	160.1	97.41	23.21	0.801
13:36	18.245	5.617	0.150	0.168	0.000	45.12	1.472	26.57	0.078	0.045	167.6	156.4	97.46	23.30	0.804
13:54	18.261	5.480	0.157	0.204	0.000	44.90	1.668	26.62	0.057	0.057	170.3	158.9	97.41	23.24	0.802
14:11	18.285	5.522	0.159	0.176	0.000	45.12	1.541	26.58	0.048	0.048	168.1	156.9	97.48	23.27	0.803
14:29	18.588	5.701	0.141	0.201	0.000	44.74	1.654	26.41	0.056	0.057	170.2	158.7	97.54	23.23	0.802
14:47	18.265	5.650	0.148	0.201	0.000	45.04	1.695	26.45	0.055	0.055	169.8	158.3	97.55	23.30	0.804
15:05	18.152	5.720	0.143	0.166	0.000	45.41	1.460	26.38	0.045	0.046	165.7	154.6	97.52	23.36	0.806
15:22	17.959	5.662	0.140	0.197	0.000	45.33	1.597	26.55	0.054	0.055	167.9	156.7	97.54	23.39	0.807
15:40	18.174	5.837	0.135	0.158	0.000	45.46	1.469	26.23	0.040	0.041	164.8	153.8	97.55	23.38	0.807
15:58	18.321	5.638	0.145	0.190	0.000	45.04	1.580	26.57	0.051	0.051	168.8	157.4	97.59	23.31	0.805
16:16	18.413	5.556	0.143	0.195	0.000	44.95	1.624	26.68	0.079	0.054	170.6	159.1	97.69	23.30	0.804
16:33	18.021	5.758	0.144	0.160	0.000	45.47	1.421	26.62	0.072	0.041	166.0	155.1	97.71	23.46	0.810
16:51	18.248	5.464	0.145	0.180	0.000	45.09	1.496	26.97	0.049	0.049	168.7	157.5	97.69	23.34	0.806
17:09	18.428	5.523	0.150	0.170	0.000	45.07	1.523	26.78	0.070	0.044	169.2	157.9	97.77	23.32	0.805
17:27	18.382	5.396	0.140	0.181	0.000	44.97	1.521	27.05	0.069	0.049	170.0	158.7	97.76	23.31	0.805
17:44	18.324	5.545	0.139	0.177	0.000	45.12	1.535	26.79	0.074	0.048	169.1	157.8	97.74	23.34	0.806
18:03	17.905	5.568	0.144	0.180	0.000	46.00	1.503	26.38	0.069	0.047	166.2	155.1	97.79	23.47	0.810
18:21	18.380	5.456	0.141	0.172	0.000	45.04	1.464	26.98	0.072	0.046	169.1	157.8	97.76	23.33	0.805
18:39	18.229	5.651	0.141	0.193	0.000	45.14	1.611	26.59	0.078	0.053	169.5	158.1	97.68	23.36	0.806
18:56	18.413	5.575	0.134	0.168	0.000	45.06	1.456	26.83	0.073	0.046	168.5	157.2	97.76	23.34	0.806

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

9/27/1983

19:14	18.099	5.473	0.146	0.179	0.000	45.26	1.521	26.88	0.073	0.048	168.7	157.5	97.67	23.37	0.807
19:32	18.324	5.446	0.139	0.200	0.000	44.97	1.624	26.86	0.074	0.056	170.8	159.4	97.69	23.30	0.804
19:50	18.118	5.680	0.143	0.164	0.000	45.39	1.449	26.75	0.070	0.043	167.1	156.0	97.81	23.45	0.809
20:08	18.333	5.587	0.143	0.184	0.000	45.13	1.557	26.56	0.077	0.050	169.0	157.6	97.62	23.31	0.805
20:25	18.411	5.524	0.141	0.188	0.000	45.03	1.592	26.70	0.074	0.052	170.0	158.6	97.71	23.30	0.804
20:43	18.413	5.497	0.153	0.193	0.000	44.91	1.634	26.67	0.080	0.053	170.8	159.3	97.61	23.27	0.803
21:01	18.387	5.539	0.154	0.184	0.000	44.93	1.549	26.72	0.079	0.050	169.8	158.4	97.59	23.28	0.804
21:19	18.352	5.478	0.154	0.187	0.000	44.98	1.610	26.74	0.079	0.050	170.4	159.0	97.62	23.28	0.804
21:37	18.454	5.470	0.153	0.206	0.000	44.82	1.694	26.67	0.082	0.057	171.9	160.3	97.60	23.24	0.802
21:54	18.265	5.445	0.131	0.173	0.000	44.96	1.542	27.15	0.078	0.047	170.0	158.8	97.79	23.36	0.806
22:12	17.541	5.410	0.116	0.176	0.000	45.84	1.477	27.56	0.075	0.051	168.2	157.4	98.24	23.67	0.817
22:30	17.164	5.286	0.095	0.168	0.000	46.29	1.384	28.01	0.067	0.050	166.8	156.3	98.52	23.84	0.823
22:48	17.441	5.283	0.086	0.160	0.000	46.05	1.412	27.66	0.061	0.047	166.4	155.7	98.20	23.67	0.817
23:06	17.360	5.157	0.086	0.186	0.000	45.74	1.552	27.78	0.062	0.057	168.7	157.9	97.98	23.60	0.815

9/30/1983

20:21	18.083	6.357	0.170	0.196	0.000	46.37	1.847	24.82	0.072	0.055	166.1	154.6	97.97	23.56	0.813
20:38	18.337	6.561	0.170	0.198	0.000	45.45	1.803	24.73	0.075	0.056	166.4	154.7	97.38	23.37	0.807
20:56	18.455	6.450	0.170	0.225	0.000	45.34	1.979	24.42	0.085	0.061	168.4	156.4	97.19	23.25	0.803
21:14	18.158	6.769	0.164	0.209	0.000	46.10	1.851	23.76	0.076	0.061	163.4	151.8	97.15	23.38	0.807
21:31	17.735	7.298	0.157	0.174	0.000	46.87	1.639	23.16	0.070	0.052	156.9	145.8	97.15	23.60	0.815
21:49	17.338	6.864	0.168	0.167	0.000	46.93	1.573	24.16	0.072	0.047	158.1	147.3	97.32	23.69	0.818
22:07	17.793	6.988	0.185	0.164	0.000	46.81	1.630	23.64	0.073	0.047	158.7	147.6	97.33	23.59	0.814
22:25	17.987	7.133	0.178	0.166	0.000	46.89	1.635	23.26	0.074	0.049	158.2	147.0	97.37	23.57	0.814
22:42	18.652	6.294	0.169	0.172	0.000	46.08	1.666	23.74	0.073	0.049	162.1	150.5	96.90	23.12	0.798
23:00	18.224	6.615	0.156	0.138	0.000	46.30	1.396	24.54	0.064	0.035	159.2	148.2	97.47	23.47	0.810
23:18	18.012	6.313	0.154	0.149	0.000	46.09	1.414	25.24	0.070	0.045	161.5	150.5	97.48	23.49	0.811
23:36	17.860	6.178	0.155	0.138	0.000	45.96	1.298	25.72	0.053	0.025	160.3	149.6	97.39	23.49	0.811
23:53	18.098	6.218	0.165	0.153	0.000	45.74	1.440	25.54	0.067	0.055	163.4	152.4	97.48	23.45	0.809

10/ 1/1983

0:11	18.425	6.277	0.161	0.164	0.000	45.45	1.475	25.33	0.069	0.054	164.3	153.1	97.41	23.35	0.806
0:29	18.131	6.019	0.147	0.141	0.000	45.49	1.312	26.05	0.056	0.044	162.8	152.0	97.39	23.39	0.807
0:47	18.218	6.211	0.153	0.159	0.000	45.41	1.418	25.69	0.067	0.049	163.8	152.8	97.37	23.39	0.807
1:05	17.925	5.941	0.152	0.157	0.000	45.66	1.400	25.93	0.064	0.026	162.8	151.9	97.26	23.39	0.807
1:22	17.910	5.928	0.144	0.147	0.000	45.66	1.347	25.98	0.068	0.044	162.6	151.8	97.23	23.39	0.807
1:40	18.630	5.624	0.148	0.172	0.000	44.66	1.484	26.33	0.075	0.050	168.3	156.9	97.18	23.12	0.798
1:58	17.798	6.082	0.162	0.140	0.000	45.72	1.272	25.95	0.071	0.036	161.4	150.7	97.23	23.45	0.809
2:16	17.901	6.179	0.152	0.174	0.000	45.57	1.493	25.51	0.073	0.049	163.4	152.3	97.11	23.38	0.807
2:34	18.217	5.854	0.147	0.152	0.000	45.22	1.404	25.99	0.069	0.045	164.4	153.3	97.09	23.25	0.803
2:51	18.479	5.631	0.158	0.147	0.000	44.78	1.342	26.48	0.070	0.042	166.3	155.1	97.13	23.17	0.800
3:09	17.164	5.403	0.168	0.165	0.000	46.15	1.431	26.50	0.077	0.048	163.7	153.1	97.10	23.45	0.810
3:27	18.757	5.436	0.154	0.161	0.000	44.30	1.440	26.88	0.076	0.050	169.9	158.5	97.26	23.09	0.797
3:52	19.238	5.635	0.160	0.158	0.000	44.63	1.453	26.84	0.072	0.039	171.2	159.5	98.23	23.26	0.803

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/ 1/1983															
4:11	19.330	5.984	0.152	0.149	0.000	44.25	1.382	25.91	0.067	0.039	167.4	155.8	97.27	23.03	0.795
4:28	19.194	5.538	0.147	0.168	0.000	44.01	1.497	26.44	0.070	0.046	170.3	158.6	97.11	22.94	0.792
4:46	18.833	5.444	0.153	0.146	0.000	44.31	1.351	26.74	0.069	0.041	168.1	156.8	97.09	23.03	0.795
5:04	18.818	5.674	0.157	0.154	0.000	44.60	1.418	26.25	0.071	0.040	167.4	156.0	97.18	23.09	0.797
5:22	18.685	5.657	0.147	0.163	0.000	44.71	1.418	26.28	0.069	0.064	167.7	156.3	97.20	23.13	0.798
5:40	18.961	5.652	0.145	0.143	0.000	44.53	1.338	26.28	0.067	0.041	166.7	155.4	97.16	23.05	0.796
5:58	18.639	5.767	0.162	0.156	0.000	44.72	1.382	26.17	0.073	0.045	166.5	155.2	97.11	23.14	0.799
6:15	18.871	5.802	0.144	0.159	0.000	44.50	1.400	25.98	0.068	0.047	166.5	155.1	96.97	23.04	0.795
6:33	19.100	5.736	0.139	0.149	0.000	44.36	1.382	26.11	0.065	0.044	167.1	155.7	97.09	23.01	0.794
6:51	18.821	5.446	0.149	0.145	0.000	44.49	1.342	26.52	0.068	0.043	167.3	156.0	97.03	23.02	0.795
7:09	18.735	5.494	0.142	0.162	0.000	44.66	1.426	26.27	0.067	0.046	167.3	156.0	97.01	23.03	0.795
7:27	18.800	5.603	0.132	0.159	0.000	44.58	1.409	26.14	0.069	0.050	166.8	155.5	96.94	23.02	0.795
7:45	18.887	5.488	0.137	0.129	0.000	44.51	1.250	26.49	0.061	0.035	165.6	154.5	96.98	23.00	0.794
8:03	18.394	5.360	0.143	0.157	0.000	45.13	1.400	26.14	0.069	0.045	165.5	154.3	96.84	23.06	0.796
8:20	18.844	5.468	0.135	0.168	0.000	44.45	1.457	26.40	0.066	0.050	168.4	157.0	97.04	23.01	0.794
8:38	18.705	5.277	0.129	0.139	0.000	44.76	1.312	26.56	0.062	0.042	166.1	154.9	96.98	23.01	0.794
8:56	18.393	5.272	0.147	0.153	0.000	44.74	1.387	26.66	0.069	0.044	166.9	155.8	96.86	23.05	0.796
9:14	18.369	4.868	0.141	0.154	0.000	44.67	1.360	27.23	0.067	0.046	168.3	157.2	96.90	23.01	0.794
9:32	18.732	5.534	0.139	0.153	0.000	44.63	1.391	26.26	0.065	0.046	166.6	155.3	96.95	23.03	0.795
9:50	18.563	5.490	0.141	0.142	0.000	44.69	1.298	26.58	0.062	0.047	166.0	154.9	97.01	23.09	0.797
10:08	18.307	5.262	0.139	0.144	0.000	44.99	1.312	26.64	0.062	0.043	165.4	154.4	96.90	23.09	0.797
10:26	18.438	5.172	0.148	0.181	0.000	44.67	1.541	26.74	0.075	0.024	169.0	157.7	96.99	23.04	0.795
10:44	18.599	5.298	0.146	0.164	0.000	44.75	1.466	26.53	0.068	0.040	168.1	156.7	97.06	23.05	0.796
11:02	18.824	5.704	0.148	0.158	0.000	44.65	1.418	26.03	0.070	0.051	166.9	155.5	97.05	23.06	0.796
11:19	18.341	5.325	0.156	0.169	0.000	45.02	1.519	26.44	0.071	0.049	168.0	156.7	97.10	23.12	0.798
11:37	18.557	5.423	0.159	0.167	0.000	44.65	1.479	26.51	0.068	0.046	168.4	157.0	97.06	23.08	0.797
12:14	18.516	5.437	0.156	0.174	0.000	44.71	1.506	26.38	0.072	0.027	167.8	156.5	96.97	23.06	0.796
12:32	18.733	5.423	0.155	0.174	0.000	44.49	1.559	26.44	0.071	0.027	169.2	157.7	97.07	23.02	0.795
12:50	18.550	5.470	0.167	0.169	0.000	44.67	1.501	26.48	0.068	0.048	168.7	157.3	97.12	23.10	0.797
13:08	18.658	5.518	0.172	0.182	0.000	44.72	1.612	26.26	0.077	0.048	170.0	158.4	97.25	23.11	0.798
13:26	18.584	5.375	0.159	0.186	0.000	44.66	1.607	26.56	0.078	0.045	170.5	159.0	97.26	23.10	0.797
13:44	18.501	5.536	0.160	0.173	0.000	44.94	1.515	26.33	0.073	0.050	168.3	157.0	97.28	23.17	0.800
14:02	18.271	5.388	0.164	0.172	0.000	45.60	1.554	26.00	0.072	0.050	167.0	155.7	97.27	23.20	0.801
14:20	18.566	5.535	0.169	0.197	0.000	44.66	1.674	26.61	0.084	0.049	171.8	160.2	97.55	23.21	0.801
14:38	18.918	5.458	0.167	0.194	0.000	44.41	1.687	26.51	0.081	0.050	172.7	160.9	97.48	23.08	0.797
14:56	18.368	5.664	0.178	0.184	0.000	45.07	1.603	26.30	0.077	0.060	169.5	158.1	97.50	23.28	0.804
15:14	18.969	5.670	0.171	0.195	0.000	44.63	1.705	26.19	0.083	0.060	172.4	160.5	97.68	23.16	0.799
15:32	18.629	5.593	0.170	0.193	0.000	44.78	1.678	26.33	0.080	0.056	171.2	159.6	97.51	23.19	0.801
15:50	18.545	5.425	0.174	0.192	0.000	44.77	1.665	26.62	0.081	0.054	171.8	160.2	97.52	23.19	0.801
16:08	18.751	5.501	0.155	0.181	0.000	44.90	1.572	26.40	0.076	0.027	169.5	158.0	97.57	23.17	0.800
16:26	18.480	5.230	0.163	0.198	0.000	44.76	1.687	26.80	0.087	0.058	172.5	160.9	97.46	23.16	0.799
16:44	18.719	5.529	0.158	0.186	0.000	45.06	1.705	26.25	0.076	0.027	170.4	158.7	97.71	23.21	0.801
17:02	18.624	5.348	0.175	0.198	0.000	44.82	1.727	26.66	0.084	0.058	173.1	161.4	97.70	23.20	0.801
17:19	18.371	5.548	0.040	0.041	0.000	44.51	1.614	26.40	0.083	0.032	164.7	153.6	96.63	23.01	0.794
19:24	18.598	5.749	0.195	0.218	0.000	45.00	1.579	26.33	0.074	0.021	170.0	158.4	97.77	23.30	0.804
19:42	18.178	5.589	0.193	0.197	0.000	44.31	1.407	26.04	0.072	0.046	166.1	154.9	96.02	22.92	0.791

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/ 1/1983

20:00	17.944	5.631	0.190	0.181	0.000	44.48	1.345	25.95	0.070	0.044	164.0	153.0	95.84	22.94	0.792
20:18	18.326	5.674	0.191	0.209	0.000	43.98	1.495	25.88	0.078	0.054	167.5	156.1	95.88	22.85	0.789
20:36	18.348	5.586	0.197	0.214	0.000	43.81	1.478	25.99	0.075	0.052	167.8	156.4	95.74	22.79	0.787
20:58	18.439	5.599	0.202	0.202	0.000	44.27	1.438	26.15	0.076	0.050	168.0	156.7	96.43	22.97	0.793
21:15	18.437	5.715	0.193	0.196	0.000	44.32	1.425	25.94	0.072	0.045	166.7	155.4	96.35	22.96	0.793
21:33	18.242	5.614	0.189	0.204	0.000	44.41	1.487	26.08	0.074	0.030	166.9	155.7	96.33	22.98	0.793
21:51	18.163	5.676	0.204	0.201	0.000	44.46	1.429	26.10	0.069	0.033	166.3	155.2	96.34	23.02	0.795
22:08	18.426	5.678	0.190	0.216	0.000	44.18	1.478	26.06	0.077	0.032	167.7	156.3	96.34	22.95	0.792
22:26	18.699	5.638	0.189	0.220	0.000	43.93	1.548	25.99	0.077	0.025	169.0	157.4	96.32	22.86	0.789
22:44	18.030	5.590	0.190	0.181	0.000	44.58	1.337	26.24	0.066	0.031	164.7	153.7	96.25	23.03	0.795
23:02	18.166	5.666	0.197	0.195	0.000	44.34	1.412	26.08	0.068	0.031	165.8	154.7	96.15	22.97	0.793
23:19	18.276	5.807	0.176	0.211	0.000	44.33	1.460	25.72	0.076	0.028	165.5	154.3	96.08	22.94	0.792
23:37	18.138	5.625	0.173	0.189	0.000	44.45	1.341	26.02	0.069	0.027	164.3	153.2	96.04	22.95	0.792
23:55	17.951	5.524	0.187	0.185	0.000	44.36	1.345	26.29	0.067	0.028	164.7	153.7	95.94	22.95	0.792

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0:13	18.364	5.637	0.177	0.204	0.000	43.89	1.429	26.09	0.074	0.029	166.5	155.3	95.90	22.84	0.788
0:31	18.594	5.624	0.173	0.205	0.000	43.76	1.451	26.02	0.075	0.026	167.2	155.8	95.92	22.78	0.786
0:48	18.127	5.550	0.180	0.184	0.000	44.13	1.310	26.28	0.068	0.028	164.7	153.8	95.85	22.89	0.790
1:06	17.898	5.433	0.182	0.191	0.000	44.50	1.354	26.25	0.068	0.028	164.5	153.6	95.90	22.94	0.792
1:24	18.038	5.761	0.183	0.196	0.000	44.35	1.416	25.81	0.072	0.030	164.4	153.3	95.85	22.93	0.792
1:42	18.024	5.769	0.184	0.194	0.000	44.28	1.354	25.89	0.071	0.027	163.9	152.9	95.80	22.93	0.792
2:17	18.127	5.696	0.164	0.173	0.000	44.21	1.270	26.10	0.064	0.040	163.5	152.6	95.85	22.92	0.791
2:35	18.270	5.694	0.175	0.193	0.000	43.90	1.385	25.97	0.071	0.033	165.2	154.1	95.68	22.82	0.788
2:40	18.105	5.518	0.179	0.192	0.000	44.14	1.345	26.21	0.069	0.030	165.0	154.0	95.80	22.87	0.789
2:53	18.062	5.657	0.176	0.194	0.000	44.03	1.315	26.12	0.070	0.027	164.2	153.2	95.65	22.87	0.789
3:11	17.761	5.002	0.165	0.178	0.000	44.31	1.275	26.89	0.065	0.030	164.8	154.1	95.68	22.85	0.789
3:29	17.981	5.644	0.173	0.192	0.000	44.25	1.359	25.98	0.068	0.027	163.8	152.9	95.67	22.89	0.790
3:46	17.821	5.574	0.180	0.191	0.000	44.17	1.337	26.17	0.070	0.032	163.9	153.1	95.54	22.88	0.790
4:04	17.725	5.716	0.174	0.175	0.000	44.93	1.257	25.36	0.063	0.027	159.5	148.9	95.42	22.90	0.791
4:22	18.483	5.706	0.172	0.195	0.000	43.57	1.367	25.87	0.071	0.026	165.2	154.0	95.46	22.71	0.784
4:41	18.109	5.688	0.170	0.166	0.000	44.15	1.222	26.07	0.063	0.043	162.9	152.0	95.68	22.88	0.790
4:59	17.921	5.578	0.181	0.176	0.000	44.17	1.292	26.10	0.064	0.031	163.2	152.4	95.52	22.85	0.789
5:17	17.896	5.484	0.168	0.187	0.000	44.18	1.310	26.21	0.069	0.026	163.6	152.7	95.52	22.84	0.789
5:35	18.096	5.649	0.159	0.168	0.000	44.08	1.235	26.04	0.062	0.026	162.3	151.5	95.52	22.83	0.788
5:52	18.076	5.644	0.158	0.156	0.000	44.15	1.142	26.13	0.054	0.026	161.2	150.5	95.54	22.85	0.789
6:10	17.707	5.592	0.168	0.167	0.000	44.30	1.217	26.17	0.061	0.026	161.4	150.8	95.41	22.89	0.790
6:28	17.846	5.553	0.162	0.181	0.000	44.13	1.266	26.14	0.065	0.024	162.4	151.7	95.37	22.83	0.788
6:46	17.869	5.897	0.161	0.169	0.000	44.52	1.217	25.41	0.062	0.025	159.4	148.7	95.33	22.87	0.790
7:04	18.192	5.817	0.170	0.160	0.000	43.94	1.187	25.80	0.058	0.028	161.4	150.5	95.35	22.79	0.787
7:22	17.763	5.759	0.159	0.154	0.000	44.43	1.138	25.80	0.053	0.025	159.0	148.4	95.28	22.87	0.790
7:40	17.596	5.644	0.160	0.159	0.000	44.74	1.160	25.70	0.058	0.024	158.6	148.1	95.25	22.89	0.790
7:57	18.023	5.831	0.158	0.171	0.000	44.28	1.231	25.35	0.062	0.025	159.8	149.1	95.13	22.77	0.786
8:15	18.153	5.742	0.172	0.187	0.000	43.73	1.315	25.75	0.069	0.027	163.1	152.1	95.14	22.71	0.784
8:33	17.808	5.223	0.173	0.179	0.000	44.05	1.292	26.30	0.065	0.027	163.3	152.5	95.11	22.71	0.784

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

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8:51	17.758	5.264	0.173	0.180	0.000	43.97	1.262	26.32	0.065	0.029	162.9	152.2	95.02	22.71	0.784
9:09	17.134	4.803	0.164	0.171	0.000	44.71	1.235	26.69	0.064	0.048	162.0	151.6	95.02	22.81	0.787
9:27	17.921	5.226	0.166	0.176	0.000	43.84	1.288	26.35	0.063	0.027	163.5	152.7	95.05	22.67	0.782
9:45	17.686	5.336	0.169	0.169	0.000	44.13	1.209	26.26	0.060	0.028	161.6	151.0	95.05	22.75	0.785
10:03	17.487	5.742	0.166	0.167	0.000	44.77	1.165	25.45	0.060	0.027	157.8	147.3	95.03	22.87	0.790
10:21	17.754	5.236	0.155	0.167	0.000	44.00	1.213	26.48	0.062	0.026	162.3	151.7	95.10	22.73	0.785
10:39	17.693	5.182	0.159	0.166	0.000	44.00	1.204	26.50	0.062	0.026	162.1	151.5	95.00	22.71	0.784
10:57	17.373	5.306	0.171	0.171	0.000	44.25	1.217	26.45	0.062	0.027	161.4	150.9	95.03	22.83	0.788
11:15	17.591	5.289	0.171	0.180	0.000	44.13	1.244	26.35	0.066	0.028	162.3	151.7	95.04	22.77	0.786
11:32	17.736	5.348	0.157	0.164	0.000	44.13	1.173	26.28	0.059	0.027	161.2	150.6	95.08	22.75	0.785
11:50	17.709	5.396	0.178	0.166	0.000	44.08	1.231	26.13	0.060	0.029	161.6	151.0	94.97	22.73	0.785
12:08	17.670	5.293	0.177	0.191	0.000	44.05	1.319	26.23	0.069	0.027	163.2	152.5	95.02	22.73	0.785
12:27	17.723	5.184	0.180	0.188	0.000	44.03	1.337	26.39	0.070	0.038	164.4	153.6	95.15	22.74	0.785
12:45	17.891	5.245	0.177	0.180	0.000	43.85	1.279	26.37	0.073	0.069	165.0	154.1	95.14	22.71	0.784
13:03	17.790	5.259	0.177	0.174	0.000	44.00	1.270	26.34	0.066	0.051	163.7	153.0	95.13	22.73	0.785
14:40	18.587	5.350	0.175	0.179	0.000	46.36	1.576	27.35	0.085	0.058	173.3	161.8	99.72	23.80	0.821
14:58	18.272	5.104	0.192	0.188	0.000	45.97	1.644	27.26	0.087	0.059	173.2	161.7	98.78	23.57	0.813
15:16	18.117	5.330	0.187	0.199	0.000	45.74	1.712	26.81	0.086	0.062	172.1	160.6	98.24	23.49	0.811
15:34	17.086	5.317	0.179	0.202	0.000	43.78	1.707	26.02	0.086	0.064	166.2	155.2	94.45	22.69	0.783
15:52	17.381	5.435	0.190	0.200	0.000	43.95	1.670	26.09	0.089	0.064	167.2	156.1	95.06	22.81	0.787
16:11	17.442	5.508	0.163	0.184	0.000	43.84	1.556	25.98	0.083	0.062	164.9	154.0	94.81	22.75	0.785
16:59	18.208	5.357	0.186	0.200	0.000	45.32	1.749	26.98	0.087	0.057	173.2	161.7	98.14	23.43	0.809
17:17	17.905	5.323	0.183	0.199	0.000	44.94	1.717	26.80	0.088	0.060	171.4	160.0	97.22	23.25	0.803
17:35	17.218	5.387	0.182	0.202	0.000	43.83	1.681	26.30	0.092	0.064	167.4	156.4	94.95	22.81	0.787
17:53	17.507	5.400	0.196	0.201	0.000	44.54	1.670	26.57	0.099	0.064	169.5	158.3	96.24	23.10	0.797
18:12	18.026	5.208	0.176	0.206	0.000	44.58	1.691	26.92	0.085	0.066	172.0	160.5	96.95	23.13	0.798
18:30	17.724	5.302	0.177	0.208	0.000	44.33	1.738	26.69	0.087	0.069	170.9	159.6	96.32	23.04	0.795
18:48	17.815	5.372	0.178	0.194	0.000	44.77	1.655	26.60	0.086	0.063	169.7	158.4	96.74	23.16	0.799
19:06	17.091	4.923	0.192	0.210	0.000	45.20	1.728	27.04	0.092	0.069	170.3	159.3	96.55	23.21	0.801
19:24	17.630	5.163	0.183	0.189	0.000	44.81	1.608	26.85	0.087	0.064	169.4	158.3	96.58	23.13	0.799
19:42	18.049	5.306	0.189	0.182	0.000	45.60	1.566	26.86	0.085	0.059	170.2	158.9	97.90	23.42	0.808
20:00	17.002	5.256	0.187	0.175	0.000	44.05	1.556	26.37	0.085	0.055	164.8	154.1	94.73	22.80	0.787
20:17	17.283	5.121	0.036	0.034	0.000	44.03	1.592	26.72	0.085	0.057	162.4	151.9	94.96	22.76	0.786
21:14	17.821	5.029	0.163	0.171	0.000	44.31	1.524	26.81	0.075	0.053	167.9	156.8	95.96	22.89	0.790
21:33	17.613	5.083	0.165	0.177	0.000	44.75	1.556	26.88	0.075	0.051	167.9	156.9	96.35	23.06	0.796
22:11	17.851	5.078	0.159	0.176	0.000	45.01	1.535	27.16	0.077	0.057	169.4	158.3	97.10	23.21	0.801
22:29	18.050	4.970	0.161	0.173	0.000	44.94	1.603	27.12	0.077	0.034	170.0	158.8	97.13	23.14	0.799
22:47	17.773	5.149	0.169	0.158	0.000	45.20	1.462	27.07	0.077	0.046	167.7	156.7	97.11	23.25	0.803
23:05	17.792	5.043	0.170	0.169	0.000	45.03	1.514	27.18	0.077	0.048	168.9	157.9	97.02	23.20	0.801
23:23	17.947	5.043	0.158	0.169	0.000	45.04	1.519	27.07	0.073	0.048	168.8	157.7	97.07	23.17	0.800
23:41	18.264	5.086	0.156	0.159	0.000	45.31	1.435	27.25	0.072	0.046	169.3	158.1	97.78	23.31	0.804
23:59	18.186	5.276	0.157	0.153	0.000	45.73	1.404	26.95	0.072	0.043	167.6	156.5	97.97	23.41	0.808

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0:16	18.641	5.118	0.145	0.160	0.000	46.10	1.467	27.53	0.068	0.046	171.5	160.1	99.27	23.63	0.816
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GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/ 3/1983

0:34	18.811	4.957	0.145	0.163	0.000	46.55	1.467	27.84	0.070	0.048	173.1	161.7	100.05	23.78	0.821
1:10	18.303	4.845	0.142	0.144	0.000	46.37	1.383	27.64	0.065	0.044	169.4	158.4	98.94	23.59	0.814
1:28	17.954	5.087	0.151	0.162	0.000	45.55	1.472	27.00	0.070	0.054	168.0	156.9	97.50	23.31	0.804
1:46	17.968	5.021	0.149	0.153	0.000	45.81	1.373	27.36	0.071	0.050	167.9	157.0	97.96	23.43	0.809
2:04	18.356	4.910	0.145	0.153	0.000	45.55	1.394	27.42	0.069	0.047	169.4	158.2	98.05	23.33	0.805
2:22	18.689	4.902	0.135	0.148	0.000	45.86	1.383	27.56	0.064	0.045	170.4	159.1	98.78	23.45	0.810
2:40	18.753	4.715	0.138	0.147	0.000	45.77	1.378	27.87	0.066	0.048	171.7	160.4	98.88	23.43	0.809
2:58	18.595	4.913	0.147	0.152	0.000	46.27	1.378	27.72	0.070	0.046	171.0	159.7	99.30	23.62	0.815
3:16	18.647	4.631	0.136	0.145	0.000	46.52	1.331	28.02	0.064	0.045	171.2	160.0	99.54	23.64	0.816
3:34	19.068	4.715	0.144	0.146	0.000	46.58	1.373	27.96	0.065	0.042	172.8	161.4	100.09	23.69	0.818
3:51	18.759	4.778	0.141	0.137	0.000	46.71	1.305	27.94	0.064	0.042	170.9	159.7	99.88	23.73	0.819
4:09	18.826	4.724	0.139	0.145	0.000	46.16	1.362	27.72	0.065	0.045	171.1	159.8	99.18	23.50	0.811

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17:12	17.473	6.078	0.154	0.175	0.000	47.29	1.591	27.01	0.064	0.053	167.7	156.8	99.89	24.24	0.837
17:30	17.866	5.974	0.150	0.180	0.000	46.43	1.656	25.83	0.065	0.055	166.0	154.8	98.20	23.64	0.816
17:46	17.581	6.186	0.155	0.184	0.000	46.92	1.659	26.51	0.066	0.053	167.4	156.3	99.31	24.06	0.831
18:06	17.027	6.092	0.140	0.178	0.000	48.14	1.610	24.60	0.059	0.049	158.4	147.7	97.89	23.80	0.822
18:25	17.833	6.195	0.149	0.197	0.000	46.67	1.764	25.38	0.065	0.055	165.8	154.5	98.30	23.70	0.818
18:43	17.882	6.050	0.154	0.184	0.000	46.46	1.703	25.54	0.064	0.050	165.6	154.3	98.08	23.61	0.815
19:02	17.514	6.228	0.172	0.174	0.000	47.09	1.623	25.06	0.067	0.047	162.1	151.2	97.97	23.72	0.819
19:20	17.356	6.523	0.154	0.159	0.000	47.42	1.499	24.76	0.063	0.044	158.7	148.0	97.98	23.82	0.822
19:38	17.105	6.540	0.160	0.168	0.000	47.43	1.543	26.01	0.066	0.046	162.7	152.0	99.07	24.19	0.835
19:56	17.099	6.558	0.154	0.149	0.000	47.07	1.408	25.07	0.060	0.040	157.6	147.1	97.61	23.80	0.821
20:14	16.787	6.402	0.147	0.145	0.000	47.41	1.366	25.37	0.058	0.040	156.9	146.6	97.73	23.89	0.825
20:32	16.943	6.274	0.152	0.160	0.000	47.41	1.487	26.49	0.062	0.043	162.7	152.2	99.02	24.18	0.835
20:50	16.870	6.516	0.145	0.156	0.000	47.34	1.467	25.16	0.059	0.043	157.8	147.3	97.75	23.88	0.824
21:08	16.760	6.111	0.145	0.175	0.000	47.35	1.558	26.59	0.063	0.048	163.5	153.0	98.80	24.13	0.833
21:26	17.110	6.462	0.144	0.173	0.000	47.48	1.584	25.99	0.061	0.048	162.8	152.1	99.04	24.16	0.834
21:44	17.218	6.453	0.150	0.177	0.000	47.24	1.620	24.82	0.063	0.048	160.0	149.2	97.79	23.78	0.821
22:03	16.727	6.647	0.148	0.178	0.000	46.62	1.609	23.59	0.064	0.049	154.4	143.8	95.63	23.33	0.805
22:21	17.481	6.621	0.155	0.194	0.000	46.83	1.733	24.41	0.068	0.053	161.3	150.2	97.54	23.65	0.817
22:39	17.583	6.834	0.152	0.186	0.000	47.26	1.710	24.96	0.067	0.052	162.9	151.8	98.80	24.02	0.829
22:57	17.220	7.145	0.157	0.176	0.000	47.52	1.631	23.62	0.057	0.048	156.2	145.4	97.58	23.83	0.822
23:15	17.338	6.947	0.189	0.193	0.000	47.29	1.757	24.72	0.072	0.051	162.7	151.6	98.56	24.03	0.829
23:33	17.636	6.859	0.235	0.201	0.000	46.97	1.927	23.61	0.077	0.053	162.8	151.3	97.57	23.64	0.816
23:51	17.714	6.871	0.200	0.101	0.000	46.89	1.754	24.92	0.068	0.048	162.9	151.7	98.57	23.92	0.826

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0:09	17.232	6.834	0.169	0.165	0.000	47.91	1.622	24.42	0.061	0.044	158.8	148.0	98.46	24.02	0.829
0:27	17.649	6.916	0.177	0.172	0.000	46.74	1.676	25.05	0.060	0.046	162.9	151.8	98.48	23.93	0.826
0:45	17.472	6.710	0.166	0.179	0.000	46.56	1.667	24.41	0.061	0.048	160.3	149.3	97.27	23.60	0.815
1:03	17.047	6.620	0.150	0.153	0.000	48.04	1.415	24.76	0.056	0.043	156.5	146.0	98.29	24.01	0.829
1:04	17.275	6.266	0.139	0.166	0.000	46.60	1.534	25.15	0.059	0.046	159.9	149.2	97.23	23.59	0.814

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR
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10/ 5/1983

1:22	17.343	5.997	0.120	0.170	0.000	46.34	1.531	25.85	0.060	0.047	162.1	151.4	97.46	23.59	0.814
1:40	17.421	6.036	0.135	0.178	0.000	46.21	1.552	26.58	0.062	0.050	165.4	154.6	98.21	23.79	0.821
1:53	17.351	7.270	0.177	0.163	0.000	47.51	1.551	24.06	0.062	0.045	157.4	146.6	98.19	23.99	0.828
1:58	17.350	5.903	0.128	0.154	0.000	46.29	1.411	26.92	0.054	0.042	164.0	153.4	98.25	23.81	0.822
2:25	17.162	6.363	0.140	0.161	0.000	47.32	1.453	26.57	0.060	0.045	163.2	152.6	99.28	24.21	0.836
2:43	16.553	6.366	0.135	0.148	0.000	47.08	1.365	25.44	0.054	0.041	156.1	146.0	97.18	23.79	0.821
3:01	16.680	6.268	0.120	0.140	0.000	46.08	1.280	26.69	0.053	0.039	159.2	149.2	97.35	23.80	0.822
3:19	16.404	6.133	0.116	0.147	0.000	46.81	1.297	25.94	0.052	0.040	156.2	146.2	96.94	23.74	0.819
3:37	16.395	6.695	0.121	0.155	0.000	47.26	1.363	25.92	0.056	0.044	157.2	147.1	98.02	24.12	0.833
3:56	16.316	6.902	0.131	0.153	0.000	47.46	1.408	24.39	0.055	0.043	152.5	142.5	96.86	23.85	0.823
4:16	16.782	6.841	0.139	0.166	0.000	47.13	1.517	24.38	0.057	0.045	155.6	145.1	97.05	23.76	0.820
4:32	17.220	6.657	0.149	0.179	0.000	46.62	1.595	24.57	0.062	0.049	159.0	148.2	97.10	23.62	0.815
4:50	17.128	6.746	0.148	0.176	0.000	47.06	1.577	25.11	0.061	0.048	160.1	149.4	98.05	23.92	0.826
5:00	17.475	7.071	0.148	0.184	0.000	47.21	1.652	24.57	0.065	0.051	160.6	149.6	98.42	23.98	0.828
5:26	17.326	7.278	0.152	0.192	0.000	47.28	1.736	23.16	0.065	0.052	156.6	145.6	97.24	23.72	0.819
5:44	17.206	7.573	0.165	0.182	0.000	47.65	1.718	22.59	0.064	0.049	154.2	143.3	97.20	23.78	0.821
6:02	17.188	7.526	0.174	0.177	0.000	47.47	1.649	22.84	0.064	0.048	154.3	143.4	97.14	23.77	0.821
6:20	16.930	7.080	0.158	0.168	0.000	47.75	1.586	23.59	0.060	0.045	154.6	144.0	97.37	23.84	0.823
6:30	17.378	6.856	0.158	0.167	0.000	46.98	1.585	24.06	0.059	0.045	157.5	146.7	97.28	23.66	0.817
6:57	17.638	6.855	0.178	0.167	0.000	46.81	1.655	23.77	0.061	0.045	158.5	147.4	97.18	23.56	0.813
7:15	17.292	6.776	0.148	0.157	0.000	46.81	1.478	24.34	0.057	0.043	156.6	146.0	97.10	23.63	0.816
7:33	17.035	6.711	0.143	0.158	0.000	47.02	1.486	24.47	0.055	0.043	156.2	145.7	97.12	23.69	0.818
8:59	17.403	6.107	0.139	0.168	0.000	47.20	1.522	26.59	0.059	0.049	164.9	154.1	99.24	24.09	0.832
9:17	16.914	5.822	0.136	0.172	0.000	46.75	1.500	26.52	0.063	0.050	163.0	152.5	97.92	23.81	0.822
9:35	17.087	6.338	0.136	0.164	0.000	46.82	1.478	24.63	0.060	0.046	157.0	146.4	96.76	23.52	0.812
9:53	17.240	6.202	0.151	0.172	0.000	46.47	1.531	24.87	0.065	0.047	159.3	148.6	96.74	23.45	0.809
10:11	17.002	6.078	0.152	0.166	0.000	47.01	1.492	24.75	0.066	0.046	157.7	147.1	96.76	23.50	0.811
10:29	17.334	6.185	0.169	0.180	0.000	46.70	1.605	25.69	0.069	0.049	163.6	152.7	97.98	23.76	0.820
10:47	17.313	6.401	0.171	0.174	0.000	46.51	1.580	24.47	0.069	0.048	159.2	148.4	96.74	23.46	0.810
11:06	17.085	6.369	0.145	0.149	0.000	46.94	1.400	24.77	0.060	0.042	156.4	146.0	96.97	23.59	0.814
11:25	17.016	6.115	0.152	0.169	0.000	46.73	1.483	26.14	0.065	0.047	162.1	151.6	97.91	23.83	0.822
11:44	17.049	5.995	0.156	0.149	0.000	46.51	1.391	25.71	0.061	0.042	159.4	149.0	97.07	23.57	0.814
12:01	16.290	6.086	0.150	0.141	0.000	46.96	1.314	26.55	0.058	0.040	158.5	148.5	97.58	23.94	0.826
12:19	17.062	6.320	0.153	0.169	0.000	46.65	1.493	24.86	0.064	0.047	158.3	147.7	96.82	23.54	0.813
12:37	16.820	6.130	0.127	0.146	0.000	46.91	1.311	26.35	0.059	0.042	159.4	149.1	97.90	23.90	0.825
12:56	16.894	5.994	0.139	0.164	0.000	46.52	1.423	26.63	0.062	0.046	162.3	151.9	97.87	23.83	0.823
13:14	17.339	6.146	0.146	0.162	0.000	46.67	1.488	25.83	0.062	0.046	161.9	151.2	97.90	23.74	0.820
13:32	17.344	6.140	0.149	0.175	0.000	47.06	1.535	23.85	0.065	0.049	156.5	145.7	96.36	23.30	0.804
13:50	17.119	6.850	0.155	0.168	0.000	47.06	1.524	24.04	0.063	0.047	156.1	145.5	97.03	23.66	0.817
14:08	17.458	6.410	0.154	0.176	0.000	46.66	1.580	24.40	0.066	0.051	159.2	148.3	96.95	23.48	0.810
14:26	17.616	6.922	0.155	0.177	0.000	47.14	1.603	24.30	0.065	0.050	159.7	148.6	98.03	23.82	0.822
14:44	17.155	7.435	0.154	0.158	0.000	48.04	1.493	23.53	0.061	0.045	154.0	143.4	98.07	24.04	0.830
15:02	17.280	7.154	0.182	0.155	0.000	47.47	1.485	23.23	0.063	0.043	153.7	143.0	97.06	23.68	0.818
15:20	17.288	7.177	0.187	0.166	0.000	47.34	1.559	23.19	0.066	0.045	154.8	144.0	97.02	23.67	0.817
15:56	17.709	6.689	0.206	0.163	0.000	46.75	1.632	23.94	0.062	0.044	159.4	148.3	97.19	23.52	0.812
16:15	17.379	7.025	0.144	0.142	0.000	47.37	1.389	23.66	0.053	0.040	153.3	142.8	97.20	23.69	0.818

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/ 5/1983

16:33	17.170	6.775	0.140	0.139	0.000	47.11	1.321	24.41	0.053	0.039	154.2	143.8	97.16	23.70	0.818
16:51	17.121	6.950	0.152	0.148	0.000	47.29	1.422	23.85	0.055	0.041	153.7	143.2	97.03	23.69	0.818
17:09	17.164	6.762	0.147	0.139	0.000	47.33	1.342	24.16	0.054	0.039	153.8	143.3	97.13	23.69	0.818
17:27	17.267	6.831	0.150	0.145	0.000	47.21	1.372	24.11	0.056	0.041	154.5	143.9	97.18	23.68	0.817
17:45	17.331	6.813	0.147	0.147	0.000	47.22	1.379	24.09	0.057	0.041	154.7	144.1	97.23	23.67	0.817
18:21	17.343	6.720	0.182	0.172	0.000	47.15	1.592	24.08	0.067	0.047	158.3	147.4	97.36	23.67	0.817
18:39	17.197	6.871	0.181	0.154	0.000	47.36	1.478	24.04	0.064	0.042	156.0	145.3	97.39	23.75	0.820
18:59	16.968	6.889	0.172	0.134	0.000	47.88	1.387	23.89	0.055	0.037	153.0	142.6	97.40	23.83	0.823
19:17	17.192	6.703	0.158	0.129	0.000	47.46	1.293	24.36	0.056	0.035	154.0	143.6	97.38	23.75	0.820
19:35	16.787	6.829	0.143	0.130	0.000	48.05	1.238	25.22	0.056	0.036	154.6	144.5	98.49	24.19	0.835
19:53	16.500	6.969	0.143	0.149	0.000	47.90	1.335	24.18	0.060	0.042	151.9	141.8	97.28	23.94	0.826
20:11	16.394	7.027	0.145	0.156	0.000	48.40	1.392	23.65	0.062	0.044	150.7	140.6	97.27	23.96	0.827
20:29	16.659	7.352	0.156	0.156	0.000	48.29	1.432	24.30	0.064	0.044	154.3	144.0	98.46	24.27	0.838
20:47	16.417	6.793	0.160	0.152	0.000	48.20	1.422	24.13	0.064	0.043	152.8	142.6	97.38	23.95	0.827
21:05	16.834	7.015	0.164	0.148	0.000	48.13	1.417	24.74	0.065	0.041	156.1	145.7	98.55	24.20	0.835
21:23	17.055	7.286	0.173	0.166	0.000	48.19	1.534	24.07	0.070	0.046	156.5	145.8	98.59	24.19	0.835
21:41	16.600	7.751	0.170	0.149	0.000	46.98	1.435	23.15	0.066	0.041	150.5	140.2	96.34	23.76	0.820
21:59	16.612	7.720	0.172	0.140	0.000	48.97	1.362	23.48	0.064	0.037	150.6	140.4	98.56	24.38	0.842
22:17	16.756	7.564	0.189	0.157	0.000	48.50	1.472	22.67	0.072	0.043	150.5	140.0	97.42	23.99	0.828
22:36	17.000	7.400	0.172	0.150	0.000	48.33	1.405	23.09	0.067	0.041	151.4	140.9	97.65	23.97	0.827
22:54	17.113	7.297	0.186	0.157	0.000	47.97	1.477	23.27	0.070	0.043	153.5	142.9	97.59	23.90	0.825
23:12	16.991	7.211	0.187	0.160	0.000	48.19	1.491	24.42	0.070	0.044	157.1	146.5	98.76	24.25	0.837
23:30	17.438	7.210	0.205	0.167	0.000	47.68	1.591	24.26	0.073	0.045	159.5	148.6	98.67	24.09	0.832
23:48	17.607	7.068	0.205	0.170	0.000	47.45	1.609	23.34	0.074	0.046	157.4	146.3	97.57	23.72	0.819

10/ 6/1983

0:06	17.613	7.111	0.206	0.173	0.000	47.47	1.612	23.23	0.076	0.047	157.2	146.1	97.54	23.71	0.819
0:24	17.624	7.329	0.215	0.194	0.000	47.62	1.764	22.69	0.082	0.052	157.8	146.5	97.57	23.74	0.819
0:42	17.836	6.969	0.185	0.160	0.000	47.41	1.509	23.53	0.070	0.043	157.1	146.0	97.72	23.69	0.818
1:00	17.620	6.994	0.190	0.147	0.000	47.53	1.408	23.69	0.072	0.032	155.5	144.7	97.68	23.75	0.820
1:18	17.456	6.632	0.170	0.163	0.000	47.38	1.456	24.40	0.075	0.046	158.1	147.3	97.78	23.76	0.820
1:37	18.016	6.509	0.194	0.179	0.000	46.96	1.623	25.13	0.079	0.045	164.7	153.4	98.73	23.84	0.823
1:55	17.435	6.443	0.100	0.145	0.000	46.39	1.384	24.79	0.071	0.037	156.8	146.2	96.79	23.47	0.810
2:13	17.287	5.533	0.178	0.148	0.000	48.05	1.356	25.39	0.075	0.040	159.4	148.8	98.06	23.72	0.819
2:31	17.428	6.150	0.170	0.168	0.000	46.91	1.486	25.54	0.073	0.046	162.0	151.2	97.97	23.74	0.820
2:55	17.633	6.216	0.179	0.152	0.000	47.39	1.438	25.71	0.068	0.041	162.3	151.5	98.82	23.94	0.826
3:13	17.550	6.096	0.195	0.171	0.000	46.89	1.524	25.65	0.074	0.047	163.6	152.7	98.19	23.76	0.820
3:31	18.025	5.972	0.183	0.166	0.000	46.61	1.518	26.72	0.073	0.047	168.3	157.1	99.32	23.93	0.826
3:49	18.078	5.745	0.150	0.169	0.000	46.35	1.517	26.10	0.073	0.046	165.9	154.8	98.22	23.57	0.814
4:07	17.742	6.030	0.195	0.191	0.000	47.22	1.647	26.33	0.080	0.053	168.3	157.1	99.48	24.05	0.830
4:25	17.896	6.292	0.183	0.167	0.000	47.42	1.562	26.00	0.072	0.045	165.9	154.8	99.64	24.10	0.832
4:43	17.523	6.635	0.190	0.185	0.000	47.77	1.646	25.59	0.078	0.051	164.9	153.8	99.66	24.25	0.837
5:01	17.940	6.569	0.186	0.176	0.000	47.43	1.652	24.44	0.075	0.047	162.3	151.0	98.52	23.81	0.822
5:20	18.071	6.025	0.192	0.155	0.000	47.18	1.540	25.34	0.070	0.040	163.9	152.7	98.61	23.72	0.819
5:38	17.998	6.037	0.184	0.160	0.000	47.12	1.486	25.58	0.070	0.043	163.9	152.8	98.67	23.77	0.821

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/ 6/1983															
5:56	18.058	5.811	0.171	0.160	0.000	46.89	1.418	26.14	0.070	0.043	165.0	154.0	98.76	23.75	0.820
8:30	18.747	6.051	0.207	0.175	0.000	46.93	1.716	24.92	0.078	0.047	167.5	155.7	98.86	23.61	0.815
8:48	18.303	6.085	0.208	0.176	0.000	47.22	1.675	25.84	0.078	0.049	168.6	157.1	99.63	23.95	0.827
9:06	18.292	5.934	0.190	0.156	0.000	47.00	1.556	25.28	0.075	0.041	164.7	153.4	98.52	23.63	0.816
9:24	17.112	5.755	0.197	0.138	0.000	48.12	1.282	27.10	0.074	0.035	163.6	153.2	99.82	24.30	0.839
9:42	17.367	5.860	0.181	0.148	0.000	47.33	1.312	26.22	0.073	0.039	161.9	151.3	98.53	23.89	0.825
10:00	17.300	5.560	0.196	0.157	0.000	47.19	1.320	27.70	0.079	0.041	167.1	156.5	99.54	24.14	0.833
10:18	17.810	5.455	0.194	0.171	0.000	46.51	1.462	26.80	0.081	0.047	167.7	156.7	98.53	23.69	0.818
10:36	17.810	5.483	0.186	0.173	0.000	46.67	1.498	26.73	0.076	0.048	167.6	156.6	98.67	23.73	0.819
10:54	17.569	5.804	0.198	0.193	0.000	47.19	1.638	27.23	0.084	0.054	170.8	159.6	99.96	24.19	0.835
11:13	17.465	5.582	0.181	0.200	0.000	47.19	1.705	26.04	0.081	0.057	167.2	156.0	98.50	23.77	0.820
10/ 7/1983															
21:09	18.608	5.785	0.205	0.169	0.000	45.63	1.673	25.76	0.086	0.048	169.4	157.7	97.97	23.36	0.806
21:27	17.575	5.921	0.205	0.163	0.000	46.25	1.510	26.19	0.086	0.040	165.4	154.5	97.94	23.66	0.817
21:44	17.970	6.508	0.201	0.198	0.000	46.05	1.709	25.34	0.100	0.063	167.4	156.0	98.15	23.69	0.818
22:02	18.346	6.109	0.188	0.187	0.000	45.87	1.667	25.39	0.097	0.042	167.4	155.9	97.90	23.46	0.810
22:20	18.401	5.847	0.184	0.189	0.000	45.32	1.652	26.14	0.094	0.032	169.5	158.0	97.86	23.39	0.807
22:38	17.728	5.556	0.174	0.192	0.000	45.75	1.616	26.60	0.097	0.036	168.5	157.4	97.76	23.50	0.811
22:55	17.979	5.941	0.200	0.217	0.000	45.66	1.838	25.87	0.107	0.038	170.3	158.8	97.84	23.49	0.811
23:13	18.386	5.981	0.184	0.194	0.000	45.33	1.752	25.89	0.096	0.036	169.9	158.3	97.85	23.40	0.808
23:31	18.521	5.916	0.190	0.204	0.000	45.26	1.808	25.92	0.100	0.028	171.1	159.4	97.95	23.38	0.807
23:49	18.126	5.668	0.196	0.219	0.000	45.53	1.897	26.11	0.108	0.037	172.2	160.5	97.90	23.42	0.808
10/ 8/1983															
0:07	18.688	6.135	0.183	0.199	0.000	45.79	1.857	24.93	0.096	0.023	168.6	156.7	97.91	23.35	0.806
0:24	18.979	6.100	0.186	0.205	0.000	45.11	1.865	25.40	0.100	0.025	171.4	159.4	97.97	23.29	0.804
0:42	18.598	5.960	0.200	0.232	0.000	45.27	1.963	25.59	0.117	0.030	173.0	161.0	97.95	23.35	0.806
1:18	19.177	5.806	0.166	0.211	0.000	44.72	1.899	25.99	0.104	0.020	174.0	161.9	98.09	23.22	0.801
1:36	18.877	5.594	0.167	0.214	0.000	44.67	1.807	26.66	0.108	0.018	174.4	162.5	98.11	23.28	0.804
1:54	19.306	5.830	0.162	0.237	0.000	44.46	1.986	26.07	0.122	0.017	176.3	164.0	98.19	23.21	0.801
2:12	19.749	5.900	0.155	0.215	0.000	44.37	2.030	25.63	0.106	0.015	175.9	163.3	98.17	23.09	0.797
2:29	19.238	6.004	0.142	0.169	0.000	45.01	1.616	26.02	0.086	0.021	169.9	158.2	98.30	23.32	0.805
2:47	18.215	6.111	0.140	0.184	0.000	45.98	1.612	25.87	0.094	0.012	166.3	155.0	98.21	23.58	0.814
3:05	18.260	6.398	0.127	0.183	0.000	46.01	1.596	25.57	0.096	0.011	165.1	153.9	98.26	23.63	0.816
3:23	18.457	6.527	0.118	0.151	0.000	46.08	1.405	25.66	0.076	0.011	163.0	151.9	98.49	23.68	0.818
3:41	18.204	5.959	0.131	0.168	0.000	45.87	1.507	26.63	0.087	0.013	167.1	155.9	98.57	23.67	0.817
3:59	18.010	6.256	0.133	0.194	0.000	46.80	1.693	25.40	0.106	0.012	165.3	154.0	98.61	23.76	0.820
4:17	18.592	6.169	0.133	0.150	0.000	46.07	1.510	26.07	0.076	0.012	166.0	154.7	98.78	23.66	0.817
4:35	18.620	6.800	0.151	0.122	0.000	46.83	1.355	24.80	0.058	0.014	159.9	148.8	98.75	23.76	0.820
4:54	17.797	7.015	0.135	0.107	0.000	48.27	1.204	24.21	0.051	0.016	153.2	142.7	98.81	24.04	0.830
5:11	17.426	6.625	0.183	0.140	0.000	47.61	1.437	25.17	0.071	0.027	159.5	148.8	98.69	24.02	0.829
5:29	17.943	7.344	0.213	0.165	0.000	47.81	1.664	23.67	0.085	0.029	160.0	148.7	98.92	24.04	0.830
5:47	17.904	8.140	0.250	0.154	0.000	48.91	1.824	21.66	0.076	0.030	155.2	143.8	98.95	24.17	0.834

GAS CHROMATOGRAPH DATA

DATE	H2	CO2	C2H4	C2H6	O2	N2	CH4	CO	C3H6	C3H8	HHV	LHV	TMP	MW	S.G.
TIME	%	%	%	%	%	%	%	%	%	%	BTU/SCF	BTU/SCF	%		WRT AIR

10/ 8/1983															
6:05	17.511	8.033	0.210	0.158	0.000	49.51	1.767	21.58	0.079	0.022	152.4	141.3	98.86	24.23	0.837
6:23	17.289	7.217	0.224	0.173	0.000	48.33	1.793	23.56	0.087	0.031	159.2	148.1	98.71	24.12	0.832
6:41	17.316	7.430	0.219	0.153	0.000	48.45	1.687	23.38	0.074	0.027	156.8	145.9	98.74	24.16	0.834
6:59	17.766	7.688	0.167	0.145	0.000	48.47	1.575	22.86	0.073	0.015	154.1	143.2	98.76	24.10	0.832
7:17	17.903	7.200	0.149	0.156	0.000	48.31	1.584	23.28	0.064	0.018	155.8	144.8	98.67	23.96	0.827
7:17	17.903	7.200	0.149	0.156	0.000	48.29	1.585	23.38	0.061	0.039	156.6	145.5	98.76	23.99	0.828
7:34	17.738	7.255	0.144	0.152	0.000	48.09	1.540	23.68	0.061	0.038	156.4	145.5	98.70	24.03	0.830
7:34	17.738	7.255	0.144	0.152	0.000	48.09	1.540	23.68	0.061	0.038	156.4	145.5	98.70	24.03	0.830
7:52	17.204	6.796	0.146	0.152	0.000	48.11	1.475	24.58	0.062	0.038	157.0	146.4	98.57	24.07	0.831
7:52	17.204	6.796	0.146	0.152	0.000	48.11	1.475	24.58	0.062	0.038	157.0	146.4	98.57	24.07	0.831
8:10	17.466	6.658	0.169	0.172	0.000	47.80	1.661	24.60	0.068	0.044	160.8	149.8	98.64	23.98	0.828
8:10	17.466	6.658	0.169	0.172	0.000	47.80	1.661	24.60	0.068	0.044	160.8	149.8	98.64	23.98	0.828
8:28	18.368	6.941	0.172	0.180	0.000	47.17	1.732	24.04	0.071	0.046	162.9	151.4	98.72	23.80	0.822
8:28	18.368	6.941	0.172	0.180	0.000	47.17	1.732	24.04	0.071	0.046	162.9	151.4	98.72	23.80	0.822
8:46	17.657	7.028	0.170	0.168	0.000	47.98	1.604	23.99	0.070	0.042	158.8	147.8	98.71	24.01	0.829
8:46	17.657	7.028	0.170	0.168	0.000	47.98	1.604	23.99	0.070	0.042	158.8	147.8	98.71	24.01	0.829
9:04	17.984	6.863	0.183	0.191	0.000	47.50	1.785	24.05	0.076	0.050	162.8	151.4	98.68	23.88	0.824
9:04	17.984	6.863	0.182	0.191	0.000	47.50	1.785	24.05	0.076	0.050	162.8	151.4	98.68	23.88	0.824
9:22	18.459	6.892	0.189	0.174	0.000	47.19	1.756	23.81	0.073	0.044	162.9	151.3	98.59	23.73	0.819
9:22	18.459	6.892	0.189	0.174	0.000	47.19	1.756	23.81	0.073	0.044	162.9	151.3	98.59	23.73	0.819
9:40	17.963	7.144	0.162	0.164	0.000	47.72	1.615	23.11	0.065	0.042	156.8	145.6	97.99	23.75	0.820
9:40	17.963	7.144	0.162	0.164	0.000	47.72	1.615	23.81	0.065	0.042	159.0	147.8	98.69	23.95	0.827
9:58	17.776	6.726	0.166	0.179	0.000	47.71	1.682	24.39	0.071	0.046	161.5	150.3	98.74	23.93	0.826
9:58	17.776	6.726	0.166	0.179	0.000	47.71	1.682	24.39	0.071	0.046	161.5	150.3	98.74	23.93	0.826
10:16	18.105	6.620	0.173	0.176	0.000	47.50	1.685	24.65	0.069	0.045	163.4	152.1	99.02	23.91	0.825
10:16	18.105	6.620	0.173	0.176	0.000	47.50	1.685	24.65	0.069	0.045	163.4	152.1	99.02	23.91	0.825
10:34	17.310	6.795	0.178	0.139	0.000	47.26	1.465	24.65	0.062	0.034	157.6	146.9	97.89	23.85	0.823
10:34	17.381	6.795	0.178	0.139	0.000	48.26	1.465	24.65	0.062	0.034	157.8	147.1	98.97	24.13	0.833
10:52	16.816	6.358	0.181	0.143	0.000	48.44	1.451	25.29	0.064	0.035	158.1	147.7	98.78	24.16	0.834
10:52	16.816	6.358	0.181	0.143	0.000	48.44	1.451	25.29	0.064	0.035	158.1	147.7	98.78	24.16	0.834
11:10	17.420	6.924	0.166	0.155	0.000	48.17	1.477	24.43	0.069	0.039	157.8	147.0	98.85	24.11	0.832
11:10	17.420	6.924	0.166	0.155	0.000	48.17	1.477	24.43	0.069	0.039	157.8	147.0	98.85	24.11	0.832
11:28	17.349	6.355	0.160	0.138	0.000	47.88	1.393	25.51	0.059	0.035	159.4	148.8	98.88	24.06	0.830
11:28	17.349	6.355	0.160	0.138	0.000	47.88	1.393	25.51	0.059	0.035	159.4	148.8	98.88	24.06	0.830
11:46	17.419	6.519	0.154	0.134	0.000	47.84	1.328	25.45	0.060	0.033	158.6	148.1	98.94	24.09	0.831
11:46	17.419	6.519	0.154	0.134	0.000	47.84	1.328	25.45	0.060	0.033	158.6	148.1	98.94	24.09	0.831
12:04	17.096	6.809	0.147	0.151	0.000	48.43	1.419	24.69	0.062	0.038	156.4	145.9	98.85	24.18	0.835
12:04	17.096	6.809	0.147	0.151	0.000	48.43	1.419	24.69	0.062	0.038	156.4	145.9	98.85	24.18	0.835
12:22	17.227	6.667	0.140	0.147	0.000	48.11	1.427	25.07	0.058	0.038	157.8	147.3	98.89	24.14	0.833
12:22	17.227	6.667	0.140	0.147	0.000	48.11	1.427	25.07	0.058	0.038	157.8	147.3	98.89	24.14	0.833
12:41	17.384	7.061	0.146	0.152	0.000	48.42	1.442	24.32	0.061	0.040	156.4	145.8	99.03	24.20	0.835
12:41	17.384	7.061	0.146	0.152	0.000	48.42	1.442	24.32	0.061	0.040	156.4	145.8	99.03	24.20	0.835
12:59	17.367	7.433	0.161	0.165	0.000	48.58	1.567	23.55	0.068	0.043	155.8	145.0	98.94	24.22	0.836
12:59	17.367	7.433	0.161	0.165	0.000	48.58	1.567	23.55	0.068	0.043	155.8	145.0	98.94	24.22	0.836
13:17	17.453	7.544	0.158	0.169	0.000	48.78	1.625	23.25	0.064	0.043	155.7	144.7	99.09	24.25	0.837
13:17	17.453	7.544	0.158	0.169	0.000	48.78	1.625	23.25	0.064	0.043	155.7	144.7	99.09	24.25	0.837

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR
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10/ 8/1983

13:35	17.685	7.566	0.170	0.147	0.000	48.62	1.478	23.43	0.061	0.036	155.1	144.2	99.20	24.24	0.837
13:35	17.685	7.566	0.170	0.147	0.000	48.62	1.478	23.43	0.061	0.036	155.1	144.2	99.20	24.24	0.837
13:53	17.487	8.250	0.207	0.158	0.000	49.62	1.675	21.63	0.069	0.038	151.7	140.6	99.13	24.36	0.841
13:53	17.487	8.250	0.207	0.158	0.000	49.62	1.675	21.63	0.069	0.038	151.7	140.6	99.13	24.36	0.841
14:11	17.315	8.748	0.217	0.165	0.000	50.12	1.744	20.59	0.072	0.039	148.8	137.8	99.01	24.45	0.844
14:11	17.315	8.748	0.217	0.165	0.000	50.12	1.744	20.59	0.072	0.039	148.8	137.8	99.01	24.45	0.844
14:29	17.192	7.994	0.173	0.136	0.000	49.46	1.393	22.65	0.059	0.031	149.8	139.3	99.09	24.42	0.843
14:29	17.192	7.994	0.173	0.136	0.000	49.49	1.393	22.65	0.059	0.031	149.8	139.3	99.11	24.42	0.843
14:47	16.632	7.296	0.174	0.139	0.000	49.42	1.366	23.93	0.060	0.033	152.0	141.8	99.05	24.44	0.844
14:47	16.632	7.296	0.174	0.139	0.000	49.42	1.366	23.93	0.060	0.033	152.0	141.8	99.05	24.44	0.844
15:05	17.361	7.212	0.208	0.156	0.000	48.49	1.529	24.00	0.071	0.038	157.4	146.6	99.06	24.23	0.836
15:05	17.361	7.212	0.208	0.156	0.000	48.49	1.529	24.00	0.071	0.038	157.4	146.6	99.06	24.23	0.836
15:23	17.348	7.465	0.224	0.162	0.000	48.61	1.605	23.42	0.074	0.039	156.8	145.8	98.95	24.23	0.836
15:23	17.348	7.465	0.224	0.162	0.000	48.61	1.605	23.42	0.074	0.039	156.8	145.8	98.95	24.23	0.836
15:41	17.292	7.528	0.228	0.144	0.000	48.85	1.552	23.15	0.067	0.033	154.6	143.8	98.85	24.23	0.836
15:41	17.292	7.528	0.228	0.144	0.000	48.85	1.552	23.15	0.067	0.033	154.6	143.8	98.85	24.23	0.836
15:59	17.318	8.003	0.194	0.136	0.000	49.13	1.435	22.49	0.062	0.030	150.5	139.9	98.79	24.30	0.839
16:17	17.099	7.196	0.203	0.149	0.000	48.49	1.506	24.08	0.067	0.034	156.2	145.6	98.83	24.23	0.836
16:35	17.191	7.128	0.200	0.147	0.000	48.31	1.471	24.23	0.067	0.035	156.5	145.9	98.78	24.18	0.835
16:53	17.231	6.894	0.215	0.168	0.000	48.20	1.606	24.53	0.094	0.032	160.2	149.3	98.97	24.18	0.835
17:11	17.749	7.083	0.232	0.187	0.000	47.72	1.775	24.07	0.105	0.036	163.1	151.7	98.95	24.05	0.830
17:29	17.609	7.515	0.230	0.166	0.000	48.28	1.653	23.29	0.099	0.030	158.2	147.0	98.87	24.15	0.833
17:47	17.485	7.431	0.228	0.166	0.000	48.19	1.617	23.61	0.099	0.031	158.4	147.4	98.86	24.17	0.834
18:05	18.026	7.033	0.239	0.181	0.000	47.55	1.754	23.87	0.105	0.034	163.1	151.6	98.79	23.93	0.826
18:23	17.997	6.898	0.239	0.181	0.000	47.35	1.731	24.33	0.107	0.034	164.3	152.8	98.87	23.94	0.826
18:39	17.887	6.726	0.250	0.183	0.000	47.15	1.777	24.68	0.109	0.034	165.7	154.3	98.80	23.91	0.825
18:57	18.113	6.572	0.246	0.159	0.000	47.36	1.689	24.58	0.104	0.027	164.5	153.1	98.85	23.86	0.823
19:15	17.909	6.460	0.238	0.161	0.000	47.39	1.620	24.92	0.103	0.029	164.1	152.9	98.83	23.89	0.825
19:33	17.794	6.511	0.220	0.171	0.000	47.27	1.647	25.07	0.102	0.033	164.5	153.3	98.82	23.92	0.826
19:52	18.046	6.709	0.229	0.185	0.000	46.84	1.762	25.04	0.109	0.035	167.0	155.5	98.95	23.92	0.826
20:10	17.832	6.248	0.215	0.178	0.000	46.95	1.659	25.63	0.103	0.035	166.7	155.4	98.85	23.88	0.824
20:47	18.969	6.316	0.223	0.219	0.000	46.61	1.976	25.85	0.124	0.089	176.9	164.6	100.38	24.00	0.828
21:05	18.521	6.020	0.218	0.168	0.000	46.52	1.654	25.68	0.093	0.122	170.8	159.1	99.00	23.72	0.819
21:23	18.229	6.497	0.211	0.172	0.000	46.67	1.600	25.34	0.086	0.050	166.2	154.8	98.86	23.83	0.822
21:41	18.048	6.516	0.213	0.215	0.000	46.65	1.844	25.10	0.116	0.057	169.0	157.3	98.75	23.82	0.822
21:59	18.114	6.061	0.213	0.180	0.000	46.67	1.696	25.69	0.089	0.057	168.4	156.9	98.77	23.75	0.820
22:16	17.514	6.312	0.208	0.176	0.000	47.23	1.647	25.56	0.088	0.052	165.3	154.2	98.79	23.96	0.827
22:34	18.234	5.993	0.222	0.214	0.000	46.31	1.914	25.79	0.109	0.040	172.0	160.2	98.83	23.70	0.818
22:52	18.522	5.703	0.213	0.206	0.000	45.97	1.861	26.25	0.103	0.040	173.5	161.7	98.87	23.60	0.814
23:10	18.566	5.660	0.227	0.186	0.000	45.93	1.790	26.35	0.088	0.041	172.8	161.0	98.84	23.58	0.814
23:27	18.509	5.511	0.224	0.202	0.000	45.74	1.813	26.73	0.101	0.041	174.6	162.8	98.87	23.57	0.814
23:45	19.180	5.554	0.224	0.189	0.000	45.35	1.774	26.49	0.093	0.042	175.2	163.2	98.90	23.42	0.808

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0:03	18.409	5.476	0.231	0.186	0.000	45.98	1.714	26.60	0.091	0.047	172.6	161.0	98.73	23.57	0.814
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GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/ 9/1983

0:21	18.080	5.712	0.200	0.177	0.000	46.12	1.591	26.87	0.089	0.040	170.3	159.0	98.88	23.75	0.820
0:39	18.648	5.441	0.207	0.202	0.000	45.26	1.767	27.18	0.104	0.039	175.8	164.0	98.86	23.53	0.812
0:57	18.961	5.328	0.208	0.194	0.000	45.17	1.805	27.06	0.098	0.039	176.5	164.6	98.86	23.43	0.809
1:14	18.344	5.636	0.213	0.180	0.000	45.96	1.710	26.69	0.090	0.041	172.1	160.5	98.86	23.64	0.816
1:36	19.019	6.158	0.212	0.206	0.000	45.78	1.906	25.94	0.107	0.039	174.7	162.5	99.37	23.68	0.817
1:54	18.900	5.933	0.241	0.207	0.000	45.55	1.913	26.01	0.107	0.060	175.6	163.4	98.92	23.55	0.813
2:11	18.380	5.734	0.211	0.157	0.000	46.18	1.567	26.45	0.075	0.038	169.1	157.7	98.79	23.65	0.816
2:29	18.439	6.442	0.220	0.173	0.000	46.11	1.648	25.64	0.087	0.045	168.4	156.9	98.80	23.74	0.819
2:47	18.337	6.476	0.208	0.180	0.000	46.48	1.697	25.18	0.091	0.036	166.9	155.4	98.69	23.73	0.819
3:05	18.021	5.887	0.189	0.183	0.000	46.56	1.680	25.91	0.093	0.030	167.7	156.3	98.55	23.68	0.818
3:23	17.384	6.271	0.176	0.154	0.000	47.25	1.444	25.75	0.077	0.032	161.7	151.0	98.54	23.93	0.826
3:41	17.477	6.677	0.181	0.180	0.000	47.33	1.621	24.90	0.121	0.035	162.7	151.7	98.53	23.96	0.827
3:58	17.640	6.697	0.193	0.198	0.000	47.31	1.774	24.61	0.131	0.830	184.6	171.7	99.38	24.27	0.838
4:16	17.974	7.724	0.227	0.164	0.000	48.10	1.718	22.60	0.115	0.646	173.6	161.0	99.27	24.29	0.838
4:35	17.221	8.657	0.183	0.152	0.000	49.53	1.491	21.25	0.102	0.591	161.9	150.1	99.17	24.63	0.850
4:53	17.340	8.123	0.188	0.165	0.000	48.91	1.611	22.01	0.111	0.656	168.1	156.0	99.11	24.49	0.845
5:11	17.878	6.693	0.211	0.168	0.000	47.53	1.653	24.01	0.066	0.048	160.8	149.5	98.26	23.77	0.821
5:29	17.672	7.620	0.206	0.154	0.000	48.20	1.572	22.93	0.106	0.590	170.1	157.9	99.05	24.30	0.839
5:47	17.453	8.414	0.294	0.180	0.000	49.01	1.927	21.05	0.131	0.687	171.8	159.0	99.14	24.49	0.845
6:05	17.433	8.720	0.203	0.183	0.000	49.49	1.829	20.33	0.113	0.749	168.2	155.5	99.05	24.53	0.847
6:22	17.450	8.150	0.188	0.149	0.000	48.87	1.539	22.00	0.104	0.039	151.7	140.8	98.48	24.20	0.835
6:40	16.931	7.956	0.184	0.143	0.000	49.15	1.423	22.52	0.054	0.044	149.4	138.9	98.40	24.28	0.838
6:58	16.962	7.250	0.221	0.169	0.000	48.38	1.635	23.66	0.065	0.051	156.7	145.9	98.39	24.14	0.833
7:16	17.364	7.146	0.233	0.169	0.000	47.93	1.666	23.80	0.063	0.043	158.8	147.8	98.41	24.02	0.829
7:34	17.559	7.541	0.238	0.160	0.000	48.05	1.650	23.16	0.060	0.045	157.1	146.0	98.46	24.05	0.830
7:52	17.600	7.704	0.240	0.163	0.000	48.22	1.678	22.70	0.060	0.045	156.1	145.0	98.42	24.05	0.830
8:10	17.386	7.505	0.257	0.192	0.000	48.12	1.871	22.92	0.074	0.043	159.1	147.8	98.37	24.04	0.830
8:28	16.951	6.788	0.204	0.149	0.000	48.59	1.549	24.02	0.055	0.036	155.8	145.2	98.35	24.06	0.831
8:46	17.231	7.017	0.214	0.154	0.000	47.80	1.540	24.31	0.116	0.573	172.7	160.8	98.96	24.29	0.839
9:04	17.278	6.951	0.231	0.161	0.000	47.81	1.603	24.21	0.061	0.048	159.1	148.2	98.36	24.00	0.828
9:21	17.510	7.229	0.213	0.161	0.000	47.82	1.626	23.75	0.062	0.042	158.1	147.2	98.41	24.00	0.828
9:39	16.767	7.058	0.190	0.159	0.000	48.40	1.508	24.11	0.061	0.035	155.1	144.6	98.28	24.14	0.833
9:57	17.164	6.882	0.220	0.186	0.000	47.77	1.731	24.26	0.073	0.042	160.5	149.5	98.34	24.00	0.828
10:15	17.674	7.041	0.233	0.200	0.000	47.63	1.887	23.61	0.079	0.047	162.4	150.9	98.40	23.90	0.825
10:33	17.558	6.922	0.248	0.180	0.000	47.51	1.749	24.29	0.067	0.048	162.4	151.2	98.57	23.97	0.827
10:51	17.784	7.048	0.275	0.198	0.000	47.35	1.937	23.84	0.145	0.759	184.1	171.0	99.33	24.25	0.837
11:09	17.554	7.380	0.247	0.180	0.000	48.10	1.765	23.13	0.069	0.067	159.3	148.1	98.49	24.02	0.829
11:27	17.252	6.989	0.217	0.163	0.000	48.00	1.624	24.11	0.063	0.053	158.8	147.9	98.47	24.04	0.830
11:45	17.050	6.671	0.198	0.149	0.000	47.84	1.475	24.90	0.116	0.564	172.7	161.0	98.97	24.29	0.839
12:03	17.263	6.637	0.212	0.167	0.000	47.50	1.581	24.84	0.065	0.042	160.5	149.7	98.30	23.94	0.826
12:22	17.440	6.920	0.217	0.173	0.000	47.62	1.678	24.19	0.126	0.707	178.4	165.9	99.08	24.26	0.838
12:40	17.168	6.857	0.199	0.171	0.000	47.59	1.599	24.51	0.123	0.687	176.8	164.6	98.90	24.28	0.838
13:18	17.901	6.161	0.182	0.153	0.000	46.38	1.434	24.91	0.078	0.045	161.0	150.0	97.25	23.42	0.809
13:54	16.674	5.193	0.190	0.167	0.000	47.59	1.502	24.61	0.077	0.046	157.1	146.6	96.04	23.24	0.802
15:39	18.318	5.964	0.220	0.194	0.000	45.08	1.728	25.83	0.087	0.056	170.1	158.5	97.49	23.32	0.805
15:57	18.888	5.896	0.235	0.194	0.000	44.69	1.825	25.76	0.091	0.056	173.0	161.0	97.63	23.19	0.801

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR
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10/ 9/1983

16:15	18.382	6.073	0.210	0.171	0.000	45.37	1.589	25.55	0.080	0.047	167.0	155.6	97.47	23.33	0.805
16:33	18.275	6.264	0.215	0.210	0.000	45.30	1.800	25.16	0.090	0.060	168.9	157.2	97.38	23.34	0.806
16:51	18.505	5.975	0.215	0.209	0.000	45.00	1.806	25.59	0.093	0.059	171.1	159.3	97.45	23.26	0.803
17:09	18.331	5.850	0.209	0.164	0.000	45.58	1.584	25.68	0.080	0.044	167.0	155.6	97.52	23.32	0.805
17:27	17.726	6.576	0.199	0.175	0.000	46.23	1.566	24.90	0.080	0.049	162.5	151.5	97.50	23.59	0.814
17:45	17.683	6.067	0.197	0.195	0.000	45.83	1.640	25.69	0.086	0.056	166.3	155.1	97.44	23.50	0.811
18:03	18.033	5.887	0.207	0.184	0.000	45.70	1.662	25.68	0.083	0.051	167.4	156.1	97.49	23.39	0.807
18:21	18.051	5.959	0.179	0.168	0.000	45.54	1.529	26.02	0.075	0.046	166.1	155.0	97.57	23.43	0.809
18:39	18.009	6.201	0.195	0.177	0.000	45.72	1.592	25.50	0.079	0.049	165.6	154.3	97.52	23.46	0.810
18:57	18.035	6.319	0.205	0.192	0.000	45.82	1.724	25.09	0.083	0.054	166.4	154.9	97.52	23.46	0.810
19:15	17.753	6.549	0.182	0.168	0.000	46.38	1.563	24.83	0.075	0.045	161.8	150.7	97.55	23.59	0.814
19:33	18.250	5.965	0.185	0.176	0.000	45.48	1.621	25.81	0.076	0.048	167.4	156.0	97.61	23.38	0.807
19:54	18.788	5.854	0.195	0.191	0.000	45.11	1.740	25.98	0.070	0.055	171.3	159.5	97.98	23.31	0.805
20:12	17.940	5.632	0.172	0.147	0.000	45.79	1.372	26.40	0.052	0.042	164.3	153.4	97.54	23.42	0.808
20:30	17.864	5.556	0.210	0.206	0.000	45.17	1.740	26.56	0.074	0.057	170.9	159.5	97.44	23.36	0.806
20:48	18.394	5.472	0.204	0.178	0.000	45.04	1.637	26.38	0.062	0.047	169.8	158.4	97.41	23.21	0.801
21:05	18.026	6.040	0.187	0.186	0.000	45.48	1.586	25.74	0.067	0.052	166.2	154.9	97.37	23.39	0.807
21:23	18.324	5.778	0.198	0.218	0.000	44.82	1.812	26.04	0.079	0.061	171.7	160.0	97.34	23.24	0.802
21:41	18.618	5.650	0.205	0.190	0.000	44.65	1.691	26.22	0.067	0.051	171.0	159.4	97.35	23.15	0.799
21:59	18.245	5.818	0.211	0.183	0.000	45.35	1.624	25.70	0.065	0.050	167.4	156.0	97.25	23.26	0.803
22:16	18.653	5.740	0.190	0.198	0.000	44.64	1.720	26.06	0.071	0.055	171.0	159.3	97.33	23.15	0.799
22:34	18.502	6.360	0.195	0.199	0.000	45.15	1.779	24.94	0.070	0.054	167.6	155.9	97.25	23.26	0.803
22:52	18.094	6.005	0.182	0.173	0.000	45.31	1.530	25.84	0.062	0.048	165.6	154.4	97.25	23.34	0.806
23:10	17.927	5.900	0.164	0.172	0.000	45.39	1.464	26.12	0.062	0.048	165.0	154.0	97.24	23.37	0.807
23:27	17.713	5.523	0.169	0.190	0.000	45.11	1.562	26.76	0.069	0.053	168.1	157.0	97.16	23.33	0.805
23:45	18.247	5.518	0.166	0.204	0.000	44.70	1.724	26.46	0.074	0.057	170.9	159.4	97.15	23.17	0.800

10/10/1983

0:03	18.242	5.714	0.164	0.188	0.000	44.97	1.638	26.05	0.067	0.052	168.1	156.7	97.09	23.20	0.801
0:21	18.910	6.005	0.192	0.216	0.000	44.00	1.879	25.71	0.078	0.060	173.0	160.9	97.04	23.03	0.795
0:39	18.438	6.191	0.162	0.200	0.000	44.70	1.766	25.49	0.071	0.055	168.6	156.9	97.08	23.20	0.801
0:57	18.233	6.550	0.146	0.152	0.000	45.38	1.451	24.95	0.054	0.041	161.1	150.0	96.96	23.31	0.805
1:14	18.233	5.958	0.156	0.158	0.000	45.29	1.480	25.62	0.055	0.043	163.9	152.8	96.99	23.22	0.802
1:32	18.345	6.024	0.151	0.176	0.000	45.09	1.553	25.56	0.097	0.050	166.2	154.8	97.05	23.22	0.802
1:50	18.566	5.960	0.148	0.195	0.000	44.71	1.637	25.63	0.072	0.056	167.8	156.3	96.97	23.12	0.798
2:08	18.221	5.805	0.146	0.183	0.000	45.40	1.643	25.52	0.067	0.051	166.0	154.6	97.04	23.20	0.801
2:26	18.119	6.412	0.142	0.193	0.000	45.19	1.615	25.35	0.070	0.054	165.1	153.8	97.15	23.36	0.806
2:44	18.691	6.060	0.133	0.183	0.000	44.54	1.597	25.79	0.065	0.050	167.6	156.1	97.11	23.14	0.799
3:01	18.842	5.924	0.135	0.179	0.000	44.43	1.579	25.89	0.064	0.049	168.2	156.6	97.10	23.08	0.797
3:19	18.867	5.791	0.135	0.175	0.000	44.25	1.487	26.33	0.063	0.049	168.6	157.1	97.14	23.08	0.797
3:38	18.162	5.737	0.130	0.167	0.000	44.96	1.417	26.43	0.062	0.047	165.6	154.6	97.11	23.25	0.803
3:56	17.881	5.877	0.139	0.188	0.000	44.99	1.520	26.29	0.069	0.053	166.2	155.1	97.01	23.31	0.805
4:14	18.103	5.661	0.129	0.171	0.000	44.96	1.510	26.34	0.061	0.048	166.2	155.1	96.99	23.21	0.801
4:32	17.921	5.963	0.134	0.175	0.000	45.21	1.490	25.98	0.064	0.049	164.4	153.4	96.98	23.31	0.804
4:50	17.647	6.356	0.143	0.179	0.000	45.58	1.528	25.35	0.064	0.049	162.1	151.2	96.89	23.41	0.808

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/10/1983

5:07	17.688	6.170	0.142	0.200	0.000	45.25	1.652	25.59	0.073	0.056	165.1	153.9	96.82	23.34	0.806
5:25	18.274	6.168	0.136	0.181	0.000	45.04	1.620	25.33	0.066	0.051	165.0	153.7	96.86	23.20	0.801
5:43	18.373	6.480	0.138	0.177	0.000	45.02	1.593	24.95	0.064	0.049	163.8	152.4	96.84	23.22	0.801
6:01	18.223	6.260	0.137	0.179	0.000	45.33	1.596	24.94	0.065	0.051	163.4	152.1	96.78	23.21	0.801
6:19	18.233	6.200	0.138	0.189	0.000	45.02	1.642	25.23	0.069	0.053	165.2	153.8	96.78	23.19	0.800
6:37	17.958	6.287	0.165	0.204	0.000	45.27	1.804	24.84	0.074	0.057	165.5	154.1	96.66	23.22	0.802
6:55	18.825	6.238	0.179	0.208	0.000	44.59	1.974	24.55	0.074	0.057	169.4	157.3	96.69	22.98	0.793
7:29	18.506	6.465	0.168	0.166	0.000	45.07	1.570	24.51	0.058	0.044	162.6	151.2	96.55	23.10	0.797
7:47	18.449	6.638	0.167	0.176	0.000	45.15	1.651	24.20	0.064	0.046	162.5	151.1	96.54	23.13	0.798
8:05	18.332	6.223	0.148	0.194	0.000	45.69	1.729	24.13	0.070	0.055	163.1	151.6	96.57	23.10	0.797
8:23	18.749	5.868	0.129	0.170	0.000	44.63	1.567	25.35	0.061	0.047	165.6	154.1	96.57	22.95	0.792
8:41	18.258	5.578	0.130	0.154	0.000	44.73	1.350	26.21	0.055	0.042	164.1	153.1	96.51	23.04	0.795
8:59	17.929	5.008	0.126	0.165	0.000	44.81	1.434	26.95	0.060	0.046	166.6	155.6	96.53	23.03	0.795
9:17	17.915	5.317	0.128	0.156	0.000	44.72	1.344	26.87	0.056	0.043	165.1	154.3	96.55	23.10	0.797
9:35	17.833	5.453	0.122	0.177	0.000	44.67	1.430	26.67	0.065	0.050	165.7	154.8	96.48	23.11	0.798
9:53	17.760	5.511	0.132	0.212	0.000	44.58	1.644	26.40	0.080	0.061	168.1	157.0	96.38	23.09	0.797
10:10	18.450	5.438	0.112	0.190	0.000	44.31	1.663	26.08	0.070	0.054	168.4	156.9	96.36	22.89	0.790
10:28	17.784	5.658	0.116	0.167	0.000	45.09	1.433	26.14	0.061	0.047	163.4	152.6	96.50	23.16	0.800
10:46	17.612	5.732	0.130	0.204	0.000	45.00	1.589	25.87	0.077	0.060	165.1	154.1	96.28	23.14	0.799
11:04	18.494	5.708	0.122	0.214	0.000	44.13	1.757	25.73	0.094	0.061	169.7	158.0	96.31	22.90	0.791
11:22	18.155	5.759	0.110	0.160	0.000	44.71	1.447	25.82	0.082	0.045	164.0	152.9	96.29	23.03	0.795
11:41	17.886	5.816	0.139	0.192	0.000	44.88	1.583	25.74	0.096	0.055	165.8	154.6	96.39	23.12	0.798
11:59	18.772	5.498	0.137	0.215	0.000	43.76	1.831	25.87	0.097	0.063	172.2	160.3	96.25	22.77	0.786
12:17	18.705	5.504	0.125	0.169	0.000	44.12	1.553	25.93	0.084	0.046	167.6	156.1	96.24	22.81	0.788
12:35	18.190	5.599	0.155	0.197	0.000	44.32	1.645	25.96	0.073	0.056	167.9	156.5	96.19	22.94	0.792
12:53	18.568	5.437	0.152	0.203	0.000	43.89	1.721	26.00	0.075	0.058	170.2	158.6	96.10	22.78	0.786
13:11	18.249	4.772	0.125	0.151	0.000	44.09	1.403	27.23	0.055	0.042	167.7	156.7	96.12	22.79	0.787
13:29	17.960	5.451	0.138	0.141	0.000	44.53	1.282	26.51	0.051	0.039	163.1	152.4	96.10	22.99	0.794
13:47	17.647	5.545	0.158	0.171	0.000	44.57	1.459	26.31	0.064	0.049	164.6	153.8	95.97	23.03	0.795
14:05	18.086	5.438	0.140	0.201	0.000	44.41	1.662	25.86	0.076	0.058	167.4	156.1	95.93	22.87	0.789
14:23	18.137	5.255	0.125	0.167	0.000	44.13	1.457	26.51	0.061	0.047	166.1	155.1	95.89	22.83	0.788
14:41	17.861	5.496	0.149	0.162	0.000	44.41	1.425	26.27	0.058	0.045	164.3	153.4	95.87	22.94	0.792
15:08	17.985	5.873	0.133	0.149	0.000	45.20	1.343	26.12	0.065	0.051	163.2	152.4	96.92	23.28	0.803
15:26	17.901	6.099	0.130	0.157	0.000	44.98	1.387	25.31	0.067	0.052	161.0	150.1	96.08	23.09	0.797
15:44	17.724	6.284	0.135	0.134	0.000	45.37	1.264	24.96	0.048	0.037	156.9	146.3	95.95	23.14	0.799
16:02	17.229	6.432	0.165	0.160	0.000	45.62	1.448	24.70	0.057	0.044	157.6	147.0	95.85	23.25	0.802
16:20	17.038	6.680	0.139	0.143	0.000	46.10	1.342	24.36	0.052	0.040	153.9	143.6	95.89	23.36	0.806
16:38	17.324	6.749	0.136	0.149	0.000	46.00	1.409	24.02	0.054	0.041	154.6	144.0	95.87	23.28	0.804
16:56	17.801	6.818	0.148	0.157	0.000	45.56	1.496	23.82	0.058	0.044	156.8	145.9	95.90	23.17	0.800
17:14	17.452	7.271	0.150	0.160	0.000	46.39	1.501	22.80	0.058	0.045	152.6	141.8	95.83	23.31	0.805
17:32	16.772	7.502	0.147	0.134	0.000	47.00	1.366	22.77	0.048	0.037	148.0	137.8	95.77	23.52	0.812
17:50	17.319	7.491	0.171	0.183	0.000	46.30	1.675	22.45	0.067	0.052	153.9	143.0	95.71	23.33	0.805
18:08	17.277	7.636	0.175	0.142	0.000	46.97	1.467	21.93	0.050	0.039	148.6	138.0	95.69	23.38	0.807
18:26	17.281	7.777	0.195	0.191	0.000	46.73	1.720	21.63	0.068	0.053	152.2	141.2	95.64	23.36	0.806
18:44	17.478	7.551	0.204	0.183	0.000	46.26	1.739	22.13	0.065	0.050	154.5	143.4	95.65	23.27	0.803
19:02	17.650	7.851	0.225	0.172	0.000	46.44	1.773	21.43	0.059	0.045	153.0	141.8	95.64	23.27	0.803

GAS CHROMATOGRAPH DATA

DATE	H2	CO2	C2H4	C2H6	O2	N2	CH4	CO	C3H6	C3H8	HHV	LHV	TMP	MW	S.G.
TIME	%	%	%	%	%	%	%	%	%	%	BTU/SCF	BTU/SCF	%		WRT AIR

10/10/1983

19:20	17.555	7.917	0.222	0.170	0.000	46.75	1.769	21.15	0.059	0.045	151.7	140.5	95.64	23.30	0.804
19:57	18.033	7.535	0.150	0.148	0.000	47.50	1.521	22.20	0.058	0.045	152.5	141.5	97.19	23.58	0.814
20:15	18.223	6.779	0.161	0.142	0.000	45.35	1.444	23.64	0.057	0.044	157.0	145.9	95.84	23.04	0.795
20:33	17.382	6.566	0.154	0.136	0.000	45.72	1.335	24.24	0.049	0.039	154.6	144.1	95.62	23.17	0.800
20:51	17.067	6.907	0.141	0.138	0.000	46.15	1.304	23.82	0.050	0.040	151.8	141.4	95.62	23.31	0.805
21:08	16.867	6.540	0.134	0.143	0.000	46.29	1.327	24.13	0.051	0.043	152.4	142.2	95.53	23.28	0.804
21:26	17.273	6.665	0.137	0.162	0.000	45.63	1.425	24.11	0.059	0.046	155.3	144.7	95.51	23.18	0.800
21:44	17.624	6.140	0.141	0.162	0.000	44.95	1.438	24.99	0.059	0.045	159.5	148.7	95.54	23.01	0.794
22:02	17.368	6.332	0.149	0.171	0.000	45.56	1.498	24.20	0.062	0.047	157.1	146.4	95.39	23.06	0.796
22:19	17.679	5.843	0.141	0.172	0.000	44.45	1.503	25.56	0.062	0.048	162.4	151.5	95.45	22.92	0.791
22:37	17.704	5.970	0.135	0.177	0.000	44.65	1.498	25.19	0.064	0.049	161.4	150.4	95.43	22.93	0.791
22:55	17.287	6.573	0.141	0.175	0.000	45.28	1.480	24.32	0.064	0.049	157.1	146.4	95.36	23.12	0.798
23:13	17.947	5.938	0.141	0.193	0.000	44.25	1.624	25.19	0.070	0.054	164.1	152.8	95.41	22.84	0.788
23:30	18.276	5.793	0.154	0.181	0.000	43.94	1.628	25.34	0.063	0.049	165.3	154.0	95.42	22.73	0.785
23:48	18.250	5.987	0.155	0.178	0.000	43.94	1.578	25.16	0.062	0.048	164.1	152.8	95.36	22.76	0.786

10/11/1983

0:06	17.925	6.086	0.148	0.149	0.000	44.66	1.422	24.83	0.051	0.039	159.3	148.4	95.32	22.86	0.789
0:24	18.568	6.151	0.148	0.181	0.000	43.67	1.550	24.86	0.065	0.050	163.9	152.5	95.25	22.67	0.783
0:41	18.294	5.895	0.143	0.168	0.000	43.87	1.504	25.22	0.060	0.047	163.2	152.0	95.20	22.70	0.783
0:59	17.946	5.710	0.152	0.166	0.000	43.90	1.439	25.72	0.058	0.044	163.1	152.1	95.14	22.75	0.785
1:17	18.258	5.738	0.144	0.187	0.000	43.65	1.532	25.53	0.068	0.050	165.0	153.8	95.16	22.67	0.782
1:35	18.139	5.806	0.149	0.170	0.000	43.72	1.463	25.60	0.060	0.046	163.7	152.6	95.15	22.71	0.784
1:53	18.164	5.673	0.149	0.186	0.000	43.55	1.547	25.74	0.066	0.051	165.6	154.3	95.12	22.67	0.782
2:11	18.382	5.663	0.145	0.187	0.000	43.36	1.558	25.71	0.068	0.052	166.3	155.0	95.12	22.61	0.780
2:28	18.372	5.797	0.146	0.193	0.000	43.62	1.592	25.63	0.099	0.054	167.3	155.8	95.50	22.74	0.785
2:46	18.323	5.489	0.158	0.199	0.000	43.48	1.662	26.04	0.070	0.054	168.8	157.3	95.47	22.68	0.783
3:04	17.946	5.598	0.173	0.183	0.000	44.00	1.557	25.91	0.065	0.050	165.8	154.6	95.48	22.81	0.787
3:22	17.598	5.226	0.164	0.194	0.000	44.27	1.629	26.23	0.068	0.052	166.6	155.5	95.42	22.82	0.788
3:41	18.480	5.083	0.164	0.188	0.000	43.45	1.610	26.52	0.066	0.050	170.0	158.5	95.61	22.62	0.781
3:58	18.034	5.282	0.183	0.172	0.000	43.81	1.533	26.38	0.058	0.050	167.2	156.0	95.50	22.75	0.785
4:16	18.000	5.550	0.174	0.189	0.000	44.01	1.581	25.86	0.065	0.050	166.2	155.0	95.48	22.79	0.787
4:34	18.382	5.785	0.166	0.200	0.000	43.69	1.661	25.50	0.070	0.054	167.3	155.8	95.51	22.73	0.784
4:52	18.295	5.734	0.164	0.183	0.000	43.74	1.542	25.77	0.064	0.049	166.2	154.9	95.54	22.76	0.786
5:10	18.617	6.149	0.161	0.170	0.000	43.71	1.544	25.12	0.060	0.046	164.7	153.3	95.58	22.75	0.785
5:28	18.057	5.735	0.161	0.194	0.000	44.02	1.630	25.64	0.067	0.052	166.1	154.8	95.56	22.82	0.788
5:45	17.828	6.042	0.162	0.180	0.000	44.42	1.536	25.21	0.062	0.048	162.6	151.6	95.49	22.92	0.791
6:03	17.582	6.095	0.159	0.181	0.000	44.73	1.520	25.05	0.063	0.049	161.2	150.3	95.43	22.98	0.793
6:21	17.766	6.030	0.138	0.187	0.000	44.57	1.532	25.21	0.067	0.051	162.3	151.3	95.55	22.95	0.792
6:39	18.209	5.871	0.136	0.189	0.000	44.09	1.589	25.40	0.067	0.052	164.9	153.6	95.60	22.82	0.788
6:57	18.174	5.651	0.142	0.173	0.000	44.07	1.484	25.85	0.061	0.047	164.8	153.7	95.65	22.82	0.788
7:15	18.253	5.449	0.149	0.197	0.000	43.71	1.638	26.08	0.070	0.054	168.2	156.8	95.59	22.73	0.785
7:33	18.043	5.583	0.151	0.190	0.000	43.97	1.591	25.93	0.067	0.052	166.4	155.2	95.57	22.81	0.787
7:51	18.252	5.636	0.153	0.188	0.000	43.88	1.560	25.82	0.066	0.051	166.4	155.1	95.60	22.77	0.786
8:09	18.082	5.794	0.138	0.181	0.000	44.20	1.525	25.56	0.065	0.050	164.2	153.1	95.60	22.85	0.789

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV BTU/SCF	TMP %	MW	S.G. WRT AIR

10/11/1983															
8:26	18.111	5.875	0.138	0.187	0.000	44.33	1.568	25.41	0.068	0.052	164.5	153.3	95.74	22.89	0.790
8:44	18.366	5.809	0.140	0.208	0.000	43.92	1.679	25.55	0.077	0.059	167.7	156.1	95.80	22.82	0.788
9:02	17.687	5.228	0.132	0.210	0.000	44.54	1.750	25.98	0.078	0.060	167.5	156.3	95.66	22.85	0.789
9:20	18.462	5.488	0.137	0.197	0.000	43.73	1.682	25.73	0.071	0.055	168.1	156.6	95.56	22.67	0.783
9:38	17.993	5.505	0.141	0.211	0.000	44.06	1.733	25.70	0.076	0.059	167.5	156.1	95.48	22.77	0.786
9:56	18.173	5.504	0.147	0.214	0.000	43.91	1.801	25.60	0.077	0.059	168.6	157.1	95.48	22.71	0.784
10:14	18.386	5.584	0.134	0.190	0.000	43.93	1.677	25.56	0.068	0.052	166.9	155.5	95.58	22.71	0.784
10:32	18.331	5.533	0.140	0.204	0.000	43.82	1.709	25.66	0.073	0.056	168.0	156.5	95.53	22.70	0.784
10:50	18.359	5.595	0.149	0.196	0.000	43.77	1.665	25.70	0.071	0.055	167.7	156.2	95.55	22.71	0.784
11:08	18.249	5.610	0.143	0.186	0.000	43.94	1.624	25.67	0.066	0.051	166.3	155.0	95.54	22.75	0.785
11:27	18.109	5.826	0.146	0.193	0.000	44.17	1.616	25.56	0.070	0.054	165.7	154.4	95.74	22.87	0.790
11:45	18.378	5.808	0.146	0.178	0.000	43.74	1.552	25.71	0.063	0.048	165.9	154.6	95.63	22.78	0.786
12:03	18.064	5.586	0.146	0.183	0.000	43.94	1.539	25.99	0.065	0.050	165.8	154.7	95.56	22.80	0.787
12:21	18.395	5.710	0.142	0.197	0.000	43.67	1.626	25.84	0.073	0.056	167.8	156.3	95.71	22.77	0.786
12:39	18.395	5.681	0.145	0.183	0.000	43.71	1.550	26.02	0.066	0.051	167.2	155.8	95.80	22.80	0.787
12:57	17.534	5.447	0.145	0.182	0.000	44.57	1.489	26.27	0.066	0.051	164.6	153.7	95.76	22.98	0.793
13:15	18.256	5.636	0.141	0.177	0.000	43.98	1.514	26.05	0.065	0.050	166.2	155.0	95.87	22.85	0.789
13:33	18.280	5.765	0.134	0.178	0.000	44.12	1.504	25.81	0.068	0.052	165.4	154.2	95.90	22.88	0.790
13:51	18.101	5.679	0.139	0.176	0.000	44.16	1.496	26.02	0.066	0.051	165.4	154.3	95.89	22.91	0.791
14:09	18.103	5.688	0.131	0.164	0.000	44.32	1.447	25.95	0.061	0.047	164.2	153.1	95.91	22.92	0.791
14:27	17.622	5.336	0.132	0.191	0.000	44.52	1.555	26.40	0.073	0.056	166.1	155.2	95.89	22.97	0.793
14:45	17.538	5.294	0.134	0.190	0.000	44.57	1.606	26.47	0.071	0.054	166.5	155.5	95.93	22.99	0.794
15:03	17.722	5.418	0.145	0.184	0.000	44.44	1.544	26.32	0.067	0.052	165.9	154.9	95.89	22.96	0.793
15:21	18.002	5.100	0.139	0.183	0.000	44.10	1.543	26.76	0.066	0.051	168.1	156.9	95.94	22.85	0.789
15:39	18.342	5.686	0.142	0.198	0.000	43.86	1.630	25.96	0.072	0.055	168.1	156.6	95.95	22.85	0.789
15:57	17.838	5.994	0.138	0.170	0.000	44.60	1.436	25.64	0.061	0.047	162.4	151.5	95.92	23.04	0.795
16:15	18.108	6.124	0.126	0.171	0.000	44.48	1.464	25.46	0.061	0.047	162.8	151.7	96.03	23.02	0.795
16:33	18.203	5.888	0.132	0.186	0.000	44.12	1.580	25.82	0.069	0.053	166.2	154.9	96.06	22.95	0.792
16:51	18.580	5.806	0.135	0.179	0.000	43.75	1.476	25.93	0.064	0.049	166.4	155.1	95.97	22.83	0.788
16:51	18.580	5.806	0.135	0.179	0.000	43.75	1.476	25.93	0.064	0.049	166.4	155.1	95.97	22.83	0.788
17:53	18.528	6.039	0.137	0.181	0.000	44.84	1.531	26.25	0.070	0.054	168.1	156.7	97.63	23.34	0.806
18:11	18.299	6.101	0.130	0.175	0.000	44.22	1.482	25.56	0.069	0.054	164.4	153.2	96.09	22.98	0.793
18:28	18.392	6.185	0.133	0.194	0.000	43.94	1.579	25.36	0.074	0.057	165.6	154.2	95.92	22.91	0.791
18:46	18.623	6.040	0.127	0.174	0.000	43.81	1.490	25.57	0.066	0.051	165.4	154.0	95.95	22.85	0.789
19:04	18.714	6.124	0.135	0.183	0.000	43.72	1.554	25.42	0.069	0.053	166.3	154.7	95.97	22.84	0.788
19:22	18.758	5.983	0.136	0.177	0.000	43.51	1.521	25.76	0.066	0.051	166.9	155.4	95.96	22.80	0.787
19:39	18.841	6.232	0.140	0.193	0.002	43.49	1.592	25.32	0.070	0.054	167.0	155.4	95.93	22.80	0.787
19:57	18.730	5.793	0.141	0.183	0.000	43.44	1.544	25.89	0.067	0.051	167.7	156.2	95.85	22.74	0.785
20:15	18.957	6.116	0.133	0.188	0.000	43.41	1.563	25.46	0.070	0.054	167.3	155.7	95.95	22.76	0.786
20:33	18.564	5.661	0.125	0.195	0.000	43.62	1.604	26.04	0.073	0.056	168.5	157.0	95.94	22.79	0.787
20:50	18.533	5.694	0.128	0.181	0.000	43.96	1.567	25.52	0.067	0.052	165.9	154.5	95.71	22.74	0.785
21:08	18.491	5.938	0.131	0.182	0.000	43.91	1.554	25.64	0.067	0.051	166.1	154.7	95.96	22.86	0.789
21:26	18.462	6.020	0.129	0.189	0.000	43.96	1.592	25.43	0.071	0.054	165.9	154.5	95.91	22.86	0.789
21:44	18.260	6.123	0.133	0.200	0.000	44.13	1.635	25.23	0.076	0.059	165.6	154.2	95.85	22.91	0.791
22:02	17.681	5.317	0.131	0.168	0.000	44.56	1.463	26.38	0.062	0.047	164.4	153.6	95.82	22.94	0.792
22:19	17.783	5.341	0.125	0.184	0.000	44.55	1.522	26.17	0.070	0.054	165.2	154.2	95.79	22.91	0.791

GAS CHROMATOGRAPH DATA

DATE TIME	H2 %	CO2 %	C2H4 %	C2H6 %	O2 %	N2 %	CH4 %	CO %	C3H6 %	C3H8 %	HHV BTU/SCF	LHV	TMP %	MW	S.G. WRT AIR

10/11/1983															
22:37	18.028	5.007	0.133	0.203	0.000	43.80	1.664	26.82	0.078	0.060	170.4	159.0	95.80	22.78	0.786
22:55	17.627	5.178	0.139	0.199	0.000	44.30	1.667	26.43	0.075	0.058	167.7	156.6	95.67	22.87	0.789
23:31	17.029	5.156	0.121	0.173	0.000	44.86	1.446	26.79	0.066	0.050	163.6	153.0	95.70	23.05	0.796
23:48	17.890	5.361	0.135	0.189	0.000	44.25	1.588	26.27	0.071	0.054	166.8	155.7	95.81	22.88	0.790
10/12/1983															
0:06	17.641	5.271	0.139	0.181	0.000	44.40	1.523	26.48	0.067	0.052	165.8	154.9	95.75	22.92	0.791
0:24	17.521	5.190	0.143	0.191	0.000	44.43	1.567	26.54	0.071	0.055	166.5	155.5	95.71	22.92	0.791
0:42	17.614	5.055	0.141	0.176	0.000	44.37	1.483	26.84	0.065	0.050	166.3	155.5	95.79	22.91	0.791
1:18	17.774	5.149	0.138	0.174	0.000	44.38	1.514	26.61	0.065	0.050	166.3	155.4	95.85	22.89	0.790
1:36	17.749	5.924	0.142	0.188	0.000	44.22	1.570	26.91	0.070	0.053	168.3	157.2	96.82	23.29	0.804
1:54	17.264	5.075	0.148	0.189	0.000	44.69	1.545	26.75	0.069	0.053	166.1	155.3	95.79	23.00	0.794
2:12	17.290	5.117	0.137	0.179	0.000	44.70	1.480	26.79	0.066	0.051	165.1	154.4	95.81	23.01	0.794
2:30	17.452	5.080	0.134	0.185	0.000	44.55	1.508	26.82	0.069	0.053	166.2	155.4	95.86	22.97	0.793
2:48	17.759	5.237	0.134	0.188	0.000	44.39	1.587	26.42	0.070	0.054	166.8	155.8	95.84	22.90	0.791
3:06	17.714	5.247	0.137	0.169	0.000	44.46	1.486	26.46	0.063	0.048	165.2	154.3	95.79	22.91	0.791
3:23	17.314	5.161	0.139	0.189	0.000	44.73	1.560	26.54	0.071	0.054	165.6	154.8	95.75	22.98	0.793
3:41	17.476	5.141	0.145	0.208	0.000	44.46	1.671	26.50	0.078	0.060	167.8	156.8	95.73	22.92	0.791
3:59	17.308	5.364	0.146	0.175	0.000	44.84	1.473	26.31	0.064	0.050	163.6	152.9	95.73	23.02	0.795
4:17	17.846	5.205	0.135	0.187	0.000	44.19	1.554	26.53	0.069	0.053	167.1	156.0	95.77	22.86	0.789
4:35	17.818	4.948	0.144	0.188	0.000	44.14	1.614	26.77	0.069	0.052	168.5	157.4	95.74	22.81	0.787
4:53	17.536	5.082	0.150	0.186	0.000	44.37	1.565	26.64	0.068	0.052	166.7	155.8	95.65	22.88	0.790
5:11	17.534	5.004	0.150	0.182	0.000	44.30	1.553	26.86	0.067	0.051	167.2	156.2	95.70	22.89	0.790
5:29	17.305	5.101	0.143	0.170	0.000	44.65	1.455	26.75	0.063	0.048	164.6	153.9	95.69	22.97	0.793
5:47	17.653	5.290	0.142	0.190	0.000	44.40	1.557	26.33	0.071	0.054	166.1	155.1	95.68	22.90	0.790
6:04	17.335	5.158	0.132	0.177	0.000	44.67	1.488	26.60	0.065	0.050	164.6	153.9	95.67	22.96	0.793
6:22	17.247	5.270	0.129	0.174	0.000	44.77	1.480	26.48	0.064	0.049	163.7	153.0	95.66	23.00	0.794
7:59	17.686	5.290	0.143	0.175	0.000	45.82	1.585	27.10	0.072	0.051	168.6	157.6	97.92	23.51	0.812
8:17	17.783	5.178	0.129	0.188	0.000	45.37	1.642	26.81	0.080	0.050	168.8	157.6	97.24	23.27	0.803
8:35	17.533	4.972	0.124	0.193	0.000	45.26	1.659	27.20	0.078	0.048	169.3	158.2	97.07	23.25	0.803
8:53	17.907	5.001	0.124	0.188	0.000	45.09	1.719	26.84	0.073	0.044	169.6	158.4	96.98	23.13	0.798
9:11	17.900	5.200	0.108	0.196	0.000	45.04	1.738	26.66	0.077	0.047	169.3	158.0	96.96	23.15	0.799
9:29	17.689	5.001	0.111	0.181	0.000	45.11	1.574	27.04	0.072	0.022	167.2	156.3	96.79	23.15	0.799
9:47	17.677	5.149	0.134	0.188	0.000	45.20	1.636	26.80	0.073	0.032	167.8	156.8	96.89	23.20	0.801
10:05	17.925	5.205	0.139	0.212	0.000	44.83	1.825	26.52	0.082	0.031	170.3	158.9	96.78	23.09	0.797
10:24	17.819	5.332	0.146	0.192	0.000	45.07	1.723	26.52	0.072	0.038	168.6	157.4	96.91	23.18	0.800
10:42	17.890	5.234	0.160	0.202	0.000	44.74	1.778	26.65	0.075	0.041	170.4	159.0	96.77	23.10	0.798
11:18	17.527	5.024	0.164	0.184	0.000	45.13	1.647	26.83	0.070	0.055	168.4	157.4	96.64	23.14	0.799
11:36	18.107	4.867	0.173	0.208	0.000	44.41	1.832	26.86	0.078	0.051	172.9	161.4	96.59	22.93	0.792
11:54	17.669	5.162	0.177	0.185	0.008	44.90	1.647	26.66	0.068	0.058	168.6	157.5	96.54	23.10	0.797
12:12	17.916	4.946	0.163	0.186	0.000	44.50	1.685	27.05	0.069	0.050	170.6	159.4	96.56	23.00	0.794
12:30	17.717	4.891	0.167	0.198	0.000	44.47	1.740	27.15	0.074	0.051	171.3	160.1	96.46	23.01	0.794
12:48	17.758	5.254	0.172	0.194	0.000	44.68	1.692	26.59	0.072	0.053	169.1	157.9	96.46	23.07	0.796
13:06	17.616	5.285	0.173	0.189	0.000	44.80	1.680	26.48	0.070	0.055	168.1	157.0	96.34	23.08	0.797
13:24	17.675	5.237	0.168	0.199	0.000	44.68	1.729	26.59	0.074	0.052	169.3	158.1	96.41	23.07	0.796

GAS CHROMATOGRAPH DATA

DATE	H2	CO2	C2H4	C2H6	O2	N2	CH4	CO	C3H6	C3H8	HHV	LHV	TMP	MW	S.G.
TIME	%	%	%	%	%	%	%	%	%	%	BTU/SCF	BTU/SCF	%		WRT AIR

10/12/1983

13:41	17.669	5.130	0.164	0.185	0.000	44.72	1.630	26.75	0.070	0.053	168.4	157.3	96.37	23.05	0.796
14:00	17.804	5.303	0.166	0.181	0.000	44.79	1.632	26.44	0.069	0.059	168.0	156.8	96.44	23.06	0.796
14:18	17.836	1.294	0.143	0.188	0.598	48.20	1.688	26.58	0.072	0.044	168.5	157.3	96.64	22.49	0.776
14:36	17.901	5.451	0.155	0.201	0.000	44.92	1.793	26.30	0.075	0.029	169.0	157.7	96.83	23.15	0.799
14:54	17.317	5.141	0.161	0.180	0.000	45.38	1.588	26.95	0.068	0.068	167.7	156.8	96.85	23.29	0.804
15:12	17.509	5.471	0.162	0.200	0.000	45.37	1.743	26.26	0.074	0.052	167.8	156.6	96.84	23.27	0.803
15:30	17.558	5.187	0.159	0.182	0.000	45.16	1.634	26.89	0.066	0.043	168.1	157.1	96.87	23.23	0.802
15:48	17.779	5.198	0.164	0.194	0.000	44.91	1.677	26.89	0.072	0.045	169.7	158.5	96.93	23.18	0.800
16:06	17.886	5.052	0.151	0.175	0.000	44.99	1.577	26.97	0.066	0.047	168.7	157.6	96.92	23.14	0.799
16:24	17.891	5.154	0.153	0.194	0.000	44.98	1.708	26.80	0.073	0.045	169.9	158.7	97.00	23.16	0.800
16:42	17.913	5.009	0.159	0.191	0.000	44.79	1.709	27.01	0.071	0.046	170.7	159.4	96.89	23.11	0.798
17:00	17.865	5.063	0.164	0.185	0.000	44.85	1.656	27.03	0.067	0.044	169.9	158.7	96.93	23.14	0.799
17:18	17.857	5.167	0.156	0.192	0.000	44.89	1.680	26.87	0.071	0.042	169.7	158.5	96.92	23.16	0.799
17:36	17.903	4.975	0.164	0.217	0.000	44.76	1.851	26.94	0.081	0.044	172.6	161.1	96.94	23.10	0.797
17:54	17.689	5.131	0.166	0.183	0.000	45.16	1.666	26.80	0.067	0.046	168.8	157.6	96.91	23.19	0.801
18:20	18.093	5.272	0.163	0.206	0.000	45.26	1.665	26.99	0.076	0.063	171.7	160.3	97.78	23.36	0.806
18:37	17.879	5.074	0.157	0.221	0.000	44.80	1.787	26.36	0.075	0.064	170.4	158.9	96.42	22.99	0.793
18:55	17.773	5.247	0.165	0.178	0.000	45.14	1.547	26.68	0.069	0.045	167.4	156.3	96.85	23.19	0.800
19:13	18.034	5.233	0.165	0.199	0.000	44.85	1.646	26.67	0.074	0.051	169.8	158.5	96.92	23.12	0.798
19:31	18.022	4.996	0.165	0.197	0.000	44.70	1.642	27.09	0.072	0.051	171.0	159.7	96.93	23.09	0.797
19:48	17.586	5.255	0.162	0.181	0.000	45.32	1.522	26.77	0.069	0.046	166.8	155.9	96.91	23.26	0.803
20:24	18.145	5.604	0.162	0.188	0.000	44.69	1.582	26.38	0.070	0.049	168.2	157.0	96.87	23.15	0.799
20:42	18.402	5.758	0.159	0.184	0.000	44.51	1.537	26.24	0.078	0.050	168.2	156.9	96.92	23.13	0.798
20:59	18.214	6.025	0.165	0.176	0.000	44.78	1.483	25.86	0.074	0.047	165.6	154.4	96.83	23.20	0.801
21:17	17.876	5.439	0.153	0.187	0.000	45.14	1.538	26.50	0.073	0.051	167.3	156.2	96.96	23.22	0.802
21:35	18.078	5.381	0.158	0.197	0.000	44.87	1.606	26.48	0.072	0.053	168.8	157.5	96.90	23.14	0.799
21:53	17.889	5.325	0.166	0.190	0.000	44.91	1.557	26.67	0.077	0.052	168.4	157.2	96.83	23.16	0.800
22:11	17.669	5.213	0.154	0.173	0.000	45.44	1.515	26.65	0.078	0.048	166.6	155.7	96.94	23.24	0.802
22:28	18.023	5.250	0.159	0.205	0.000	44.81	1.682	26.69	0.076	0.056	170.4	159.1	96.96	23.14	0.799
22:46	18.305	5.366	0.155	0.193	0.000	44.74	1.693	26.32	0.016	0.053	168.5	157.1	96.84	23.04	0.795
23:04	18.008	5.233	0.163	0.190	0.000	44.93	1.601	26.66	0.078	0.051	169.2	157.9	96.92	23.14	0.799
23:22	17.981	5.242	0.165	0.207	0.000	44.73	1.678	26.69	0.080	0.057	170.5	159.1	96.83	23.11	0.798
23:40	18.287	5.282	0.162	0.188	0.000	44.61	1.611	26.49	0.075	0.050	169.5	158.1	96.76	23.03	0.795
23:57	17.939	5.115	0.170	0.196	0.000	44.66	1.608	26.85	0.083	0.053	170.0	158.8	96.68	23.07	0.796

10/13/1983

0:15	18.078	5.129	0.155	0.191	0.000	44.71	1.605	26.78	0.075	0.051	169.6	158.3	96.77	23.06	0.796
0:33	17.866	5.248	0.162	0.182	0.000	45.00	1.567	26.65	0.074	0.048	168.0	156.9	96.80	23.15	0.799
0:51	17.776	5.214	0.176	0.181	0.000	44.89	1.543	26.79	0.078	0.048	168.2	157.1	96.70	23.14	0.799
1:09	17.926	5.275	0.164	0.188	0.000	44.62	1.578	26.71	0.075	0.050	168.7	157.5	96.58	23.07	0.796
1:27	18.248	5.163	0.161	0.203	0.000	44.48	1.659	26.84	0.076	0.055	171.3	159.9	96.89	23.05	0.796
1:44	18.244	5.048	0.162	0.185	0.000	44.51	1.549	27.00	0.076	0.051	170.4	159.1	96.83	23.03	0.795
2:21	18.043	5.150	0.164	0.201	0.000	44.57	1.669	26.85	0.076	0.055	170.8	159.5	96.78	23.07	0.796
2:39	18.055	5.202	0.160	0.197	0.000	44.76	1.677	26.62	0.077	0.054	170.1	158.7	96.80	23.08	0.797
2:57	17.786	5.264	0.177	0.196	0.000	44.90	1.589	26.69	0.084	0.054	169.0	157.8	96.74	23.15	0.799

GAS CHROMATOGRAPH DATA

DATE	H2	CO2	C2H4	C2H6	O2	N2	CH4	CO	C3H6	C3H8	HHV	LHV	TMP	MW	S.G.
TIME	%	%	%	%	%	%	%	%	%	%	BTU/SCF	BTU/SCF	%		WRT AIR

10/13/1983

3:15	18.207	5.203	0.170	0.200	0.000	44.56	1.657	26.66	0.078	0.054	170.7	159.3	96.79	23.04	0.795
3:32	18.193	5.362	0.171	0.203	0.000	44.54	1.686	26.39	0.078	0.055	170.2	158.7	96.68	23.03	0.795
3:50	18.013	5.050	0.175	0.179	0.000	44.71	1.556	26.94	0.077	0.041	169.3	158.1	96.73	23.06	0.796
4:08	17.705	5.210	0.173	0.183	0.000	45.09	1.576	26.44	0.077	0.049	167.2	156.1	96.51	23.10	0.797
4:26	17.979	5.464	0.173	0.193	0.000	44.69	1.602	26.46	0.079	0.053	168.7	157.4	96.69	23.12	0.798
4:44	17.560	5.275	0.168	0.187	0.000	44.74	1.549	26.74	0.080	0.052	167.5	156.5	96.34	23.11	0.798
5:02	17.825	5.288	0.165	0.183	0.000	44.99	1.536	26.59	0.076	0.051	167.5	156.4	96.70	23.14	0.799
5:20	17.768	5.224	0.161	0.201	0.000	44.90	1.656	26.61	0.079	0.056	169.1	157.9	96.65	23.12	0.798
5:38	17.893	5.315	0.161	0.110	0.000	44.87	1.570	26.46	0.074	0.049	166.2	155.2	96.50	23.07	0.796
5:55	17.745	5.501	0.175	0.196	0.000	44.89	1.615	26.26	0.083	0.054	167.7	156.5	96.52	23.14	0.799
6:13	18.013	5.220	0.165	0.211	0.000	44.41	1.682	26.68	0.080	0.058	170.7	159.3	96.52	23.02	0.794
6:31	18.000	5.274	0.160	0.186	0.000	44.67	1.599	26.43	0.076	0.051	168.2	157.0	96.45	23.02	0.794
6:49	17.889	5.221	0.169	0.176	0.000	44.77	1.533	26.65	0.078	0.047	167.8	156.7	96.53	23.06	0.796
7:07	17.964	5.107	0.173	0.168	0.000	44.67	1.490	26.84	0.075	0.044	168.0	156.9	96.54	23.03	0.795

SULFUR GAS CHROMATOGRAPH DATA

DATE	H2S	COS	C2H5SH	CH3SH	TOTAL
TIME	% TOT	% TOT	% TOT	% TOT	PPM

9/14/1983					
21:53	87.7	12.3	---	---	2431
21:57	87.6	12.4	---	---	2481
22:02	87.1	12.9	---	---	2495
22:10	87.4	12.6	---	---	2477
23:11	92.8	7.2	---	---	1750
9/15/1983					
0:00	91.9	8.1	---	---	2055
0:29	98.9	1.1	---	---	2079
1:04	92.9	7.1	---	---	1515
2:51	90.3	9.7	---	---	2121
4:00	90.5	9.5	---	---	2169
4:57	89.8	10.2	---	---	2188
5:59	88.6	11.4	---	---	2305
8:12	90.6	9.4	---	---	2049
9:15	91.5	8.5	---	---	1896
9:24	91.8	8.2	---	---	1883
9:40	90.8	9.2	---	---	2010
9:46	89.5	10.5	---	---	2188
9:57	90.8	9.2	---	---	2029
10:36	91.1	8.9	---	---	1930
10:45	91.0	9.0	---	---	1994
10:51	92.5	7.5	---	---	1834
10:55	87.8	12.2	---	---	2454
10:59	87.9	12.1	---	---	2451
11:30	97.8	2.2	---	---	1175
11:58	91.2	8.8	---	---	2114
12:45	92.6	7.4	---	---	1899
13:11	93.1	6.9	---	---	1816
15:25	90.9	9.1	---	---	1968
15:39	88.5	11.5	---	---	2254
15:43	90.1	9.9	---	---	2101
15:49	88.8	11.2	---	---	2291
15:54	88.7	11.3	---	---	2293
15:58	88.8	11.2	---	---	2311
16:02	89.3	10.7	---	---	2282
16:06	91.5	8.5	---	---	2017
16:11	86.5	13.5	---	---	2407
16:58	86.7	13.3	---	---	2384
17:49	88.3	11.7	---	---	2302
19:13	86.5	13.5	---	---	2359
19:26	86.2	13.8	---	---	2441
19:32	85.2	14.8	---	---	2517
19:55	86.0	14.0	---	---	2428
19:60	95.9	4.1	---	---	2105
20:04	84.8	15.2	---	---	2420
21:33	86.0	14.0	---	---	2309
22:02	85.1	14.9	---	---	2325

SULFUR GAS CHROMATOGRAPH DATA

DATE	H2S	COS	C2H5SH	CH3SH	TOTAL
TIME	% TOT	% TOT	% TOT	% TOT	PPM

9/16/1983					
0:00	86.1	13.9	---	---	2259
0:59	88.2	11.8	---	---	1390
2:29	86.2	13.8	---	---	2183
3:11	87.6	12.4	---	---	1933
3:55	85.8	14.2	---	---	2223
4:57	86.2	13.8	---	---	2068
8:26	85.5	14.5	---	---	2518
8:31	85.3	14.7	---	---	2558
8:36	85.8	14.2	---	---	2560
9:44	86.7	13.3	---	---	2459
10:00	84.9	15.1	---	---	2574
11:05	86.9	13.1	---	---	2421
11:13	85.6	14.4	---	---	2578
12:00	85.5	14.5	---	---	2475
12:09	86.4	13.6	---	---	2461
12:18	91.8	8.2	---	---	1456
12:22	88.1	11.9	---	---	2235
12:26	90.4	9.6	---	---	1929
12:48	91.0	9.0	---	---	1774
13:21	92.2	7.8	---	---	1533
13:26	91.6	8.4	---	---	1888
13:32	90.4	9.6	---	---	2043
13:46	93.0	7.0	---	---	1600
13:56	91.3	8.7	---	---	1940
13:60	91.9	8.1	---	---	967
16:50	97.3	2.7	---	---	1640
19:57	95.4	4.6	---	---	2212
20:03	86.6	13.4	---	---	2487
20:49	87.1	12.9	---	---	2366
21:07	87.2	12.8	---	---	2358
21:43	87.0	13.0	---	---	2355
22:10	87.4	12.6	---	---	2318
22:32	87.2	12.8	---	---	2321
22:38	87.6	12.4	---	---	2338
23:04	87.5	12.5	---	---	2302
23:29	87.8	12.2	---	---	2282
9/17/1983					
0:00	88.4	11.6	---	---	2204
1:00	88.3	11.7	---	---	2180
2:02	88.6	11.4	---	---	2125
3:04	88.7	11.3	---	---	2091
3:59	88.6	11.4	---	---	2107
7:23	88.3	11.7	---	---	1600
16:06	87.2	12.8	---	---	1703

SULFUR GAS CHROMATOGRAPH DATA

DATE	H2S	COS	C2H5SH	CH3SH	TOTAL
TIME	% TOT	% TOT	% TOT	% TOT	PPM

9/17/1983					
16:26	88.0	12.0	---	---	1815
17:36	87.6	12.4	---	---	1762
18:09	87.9	12.1	---	---	1792
19:19	87.3	12.7	---	---	1653
20:23	87.2	12.8	---	---	1640
20:37	87.8	12.2	---	---	1743
20:47	87.8	12.2	---	---	1769
22:13	87.3	12.7	---	---	1648
22:36	87.5	12.5	---	---	1695
23:28	87.3	12.7	---	---	1587
23:34	87.9	12.1	---	---	1726
9/18/1983					
0:08	86.1	13.9	---	---	853
0:33	87.4	12.6	---	---	1626
0:52	87.7	12.3	---	---	1705
1:31	87.5	12.5	---	---	1555
1:38	88.1	11.9	---	---	1706
1:54	87.3	12.7	---	---	1277
2:59	87.4	12.6	---	---	1402
4:08	86.5	13.5	---	---	1189
6:51	86.5	13.5	---	---	1284
12:06	85.6	14.4	---	---	1064
15:52	86.5	13.5	---	---	1137
15:56	87.6	12.4	---	---	1275
16:04	87.6	12.4	---	---	1248
16:21	83.0	17.0	---	---	2683
16:25	86.9	13.1	---	---	2513
16:32	85.5	14.5	---	---	2556
16:38	85.4	14.6	---	---	2596
16:43	84.4	15.6	---	---	2650
17:03	72.2	27.8	---	---	2750
17:39	86.2	13.8	---	---	2577
17:44	86.1	13.9	---	---	2581
17:48	86.3	13.7	---	---	2582
17:53	86.3	13.7	---	---	2575
18:07	81.8	18.2	---	---	2659
19:10	88.7	11.3	---	---	2335
19:25	89.0	11.0	---	---	2331
19:31	86.0	14.0	---	---	2577
19:35	86.4	13.6	---	---	2555
19:39	85.6	14.4	---	---	2603
19:47	93.4	6.6	---	---	1743
19:54	93.2	6.8	---	---	1796
19:58	92.0	8.0	---	---	2049
20:02	87.0	13.0	---	---	2493
20:12	82.2	17.8	---	---	2696
20:16	87.0	13.0	---	---	2446
20:50	92.2	7.8	---	---	1569
20:54	89.6	10.4	---	---	2240

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

9/18/1983					
21:00	89.0	11.0	---	---	2359
21:10	85.7	14.3	---	---	2401
21:15	92.9	7.1	---	---	1777
21:28	86.6	13.4	---	---	2607
21:34	87.7	12.3	---	---	2517
21:38	87.2	12.8	---	---	2579
21:42	88.3	11.7	---	---	2490
22:17	82.7	17.3	---	---	2666
22:21	86.5	13.5	---	---	2616
22:33	86.4	13.6	---	---	2625
22:37	86.6	13.4	---	---	2619
22:43	86.9	13.1	---	---	2603
22:47	85.7	14.3	---	---	2667
22:51	89.7	10.3	---	---	2268
22:56	92.3	7.7	---	---	1321
23:04	87.7	12.3	---	---	2514
23:58	86.9	13.1	---	---	2623
0:19	85.3	14.7	---	---	2691
0:24	89.1	10.9	---	---	2362
0:30	87.9	12.1	---	---	2421
1:07	85.3	14.7	---	---	2678
2:09	85.6	14.4	---	---	2589
3:03	85.8	14.2	---	---	2581
4:17	80.2	19.8	---	---	2779
5:04	85.3	14.7	---	---	2605
6:10	86.8	13.2	---	---	2569
7:02	86.4	13.6	---	---	2585
8:05	83.3	16.7	---	---	2593
9:07	86.8	13.2	---	---	2503
9:25	85.0	15.0	---	---	2665
9:52	87.2	12.8	---	---	2463
10:52	86.7	13.3	---	---	2518
11:12	85.6	14.4	---	---	2595
11:55	87.7	12.3	---	---	2390
11:59	86.2	13.8	---	---	2589
12:07	87.2	12.8	---	---	2616
12:11	85.4	14.6	---	---	1924
12:25	82.4	17.6	---	---	2591
12:30	85.1	14.9	---	---	2678
12:40	80.8	19.2	---	---	2799
12:45	81.6	18.4	---	---	2734
12:49	84.8	15.2	---	---	2696
12:54	85.6	14.4	---	---	2662
12:59	85.6	14.4	---	---	2659
13:12	73.6	26.4	---	---	2983
13:32	91.8	8.2	---	---	1936
13:38	86.0	14.0	---	---	2668
13:45	88.9	11.1	---	---	2322

SULFUR GAS CHROMATOGRAPH DATA

DATE	H2S	COS	C2H5SH	CH3SH	TOTAL
TIME	% TOT	% TOT	% TOT	% TOT	PPM

9/20/1983					
19:57	94.1	5.9	---	---	1533
20:36	93.3	6.7	---	---	1618
21:12	93.7	6.3	---	---	1696
21:56	93.9	6.1	---	---	1717
23:57	93.7	6.3	---	---	1664
9/21/1983					
1:11	93.7	6.3	---	---	1855
2:03	93.8	6.2	---	---	1894
3:14	93.5	6.5	---	---	1842
4:14	93.7	6.3	---	---	1910
5:06	94.1	5.9	---	---	1752
6:08	94.1	5.9	---	---	1714
7:00	93.9	6.1	---	---	1863
7:41	93.1	6.9	---	---	1809
10:12	93.1	6.9	---	---	1489
11:39	93.4	6.6	---	---	1401
16:51	88.1	6.0	5.8	---	1924
17:19	89.5	6.2	4.3	---	1938
17:44	89.6	6.4	4.0	---	1957
18:12	87.3	8.4	4.3	---	2445
19:11	82.0	9.2	8.8	---	1967
19:41	89.2	5.9	5.0	---	1987
20:08	88.5	6.9	4.6	---	1868
20:26	90.5	5.7	3.8	---	1870
20:49	91.5	3.4	5.1	---	1738
21:30	86.1	5.6	8.3	---	1700
22:09	86.7	5.6	7.8	---	1688
23:56	84.0	5.4	10.5	---	1643
9/22/1983					
1:04	83.6	5.7	10.7	---	1620
2:01	85.0	5.6	9.5	---	1587
2:57	84.5	5.4	10.1	---	1566
4:57	85.6	2.6	11.8	---	1384
5:59	84.0	5.0	11.0	---	1492
9:51	84.6	5.7	9.7	---	1548
10:20	87.6	5.6	6.9	---	1410
11:51	89.3	5.5	5.2	---	1586
13:01	88.5	5.1	6.4	---	1963
13:55	86.7	5.2	8.1	---	1895
15:10	85.3	6.5	8.3	---	2087
16:58	90.0	5.6	4.3	---	1734
18:05	84.4	6.6	9.0	---	1827
19:11	87.5	5.5	7.0	---	1777
20:10	86.9	5.5	7.6	---	1758
23:32	88.0	5.5	6.5	---	1857
9/23/1983					
0:56	82.9	5.7	11.4	---	1136
2:01	85.1	4.2	10.7	---	1438
3:01	86.9	2.8	10.3	---	1316

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

9/23/1983					
5:58	89.3	2.6	8.1	---	1235
6:58	85.3	4.7	10.1	---	1320
8:45	84.0	5.3	10.7	---	1467
10:35	83.1	5.7	11.2	---	1448
12:06	81.1	5.7	13.2	---	1429
12:51	85.6	6.0	8.5	---	1557
13:58	84.3	4.1	11.5	---	1469
15:02	85.4	5.3	9.3	---	1825
15:53	86.0	5.2	8.8	---	1709
16:24	86.3	7.2	6.5	---	1530
17:05	85.2	5.8	9.0	---	1401
17:48	83.5	8.2	8.3	---	1617
18:40	83.1	7.9	9.0	---	1722
19:18	83.3	8.2	8.4	---	1497
20:51	82.8	5.7	11.5	---	1819
22:10	83.1	5.8	11.0	---	1799
23:24	84.7	5.2	10.1	---	1929
9/24/1983					
0:01	86.1	6.8	7.1	---	1787
0:53	84.2	5.7	10.0	---	1675
3:20	80.3	5.2	14.5	---	1430
3:59	84.7	4.9	10.4	---	1308
4:54	82.1	6.5	11.4	---	1671
5:59	78.3	7.9	13.8	---	1415
7:03	81.5	5.7	12.8	---	1544
9:07	82.6	6.3	11.1	---	1913
12:08	80.5	7.2	12.4	---	1798
15:09	82.7	5.4	11.9	---	1926
18:34	78.8	6.6	14.6	---	1738
19:42	78.6	5.3	16.0	---	1317
20:46	81.8	6.1	12.2	---	1712
22:04	77.4	8.3	14.3	---	1535
22:48	84.9	6.1	9.1	---	1771
23:34	88.2	3.7	8.1	---	1675
9/25/1983					
0:10	78.5	10.8	10.7	---	1271
1:10	82.6	6.4	11.0	---	1825
2:03	80.7	8.5	10.7	---	1791
3:10	83.8	5.5	10.7	---	1974
4:14	82.5	6.6	10.9	---	1885
5:22	83.7	5.7	10.6	---	2051
6:24	81.0	8.2	10.8	---	1898
7:10	82.6	5.2	12.1	---	1332
9:52	82.3	5.8	11.8	---	1613
11:26	83.1	5.7	11.2	---	1717
12:36	82.9	6.2	10.9	---	1645
13:29	84.3	4.9	10.8	---	1420
14:45	85.2	5.6	9.3	---	1436
16:41	87.6	6.2	6.2	---	1693

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

9/25/1983					
17:13	86.9	6.2	6.9	---	1582
17:45	86.5	6.4	7.1	---	1621
18:20	85.3	6.9	7.8	---	1736
19:01	79.5	6.0	14.5	---	999
19:36	86.7	6.0	7.3	---	2053
20:07	86.6	6.1	7.3	---	1614
20:37	87.5	5.9	6.6	---	1660
21:11	86.3	6.3	7.4	---	1633
21:45	86.2	6.0	7.7	---	1573
22:16	85.1	7.6	7.2	---	1545
22:46	87.0	6.3	6.7	---	1582
23:16	87.3	6.0	6.7	---	1594
9/26/1983					
0:05	82.6	8.3	9.1	---	1827
1:22	84.1	5.6	10.3	---	1918
2:06	86.1	6.0	7.8	---	1923
3:04	84.3	6.2	9.5	---	1851
4:03	82.0	7.2	10.9	---	1658
5:03	77.4	8.7	13.9	---	1256
6:01	83.2	6.8	10.0	---	1752
8:16	76.1	11.8	12.1	---	1155
11:41	79.3	6.3	14.4	---	1282
12:53	78.7	6.7	14.6	---	1285
15:03	80.9	6.7	12.4	---	1535
17:29	86.3	4.4	9.3	---	1395
18:59	77.8	6.7	15.6	---	1535
20:06	78.7	8.9	12.4	---	1755
21:01	82.1	6.3	11.7	---	1646
22:02	80.9	6.8	12.2	---	1626
23:01	82.6	6.5	10.9	---	1813
23:58	82.6	6.5	10.9	---	1727
9/27/1983					
1:09	82.9	6.0	11.1	---	1871
2:09	79.2	9.5	11.3	---	1640
3:02	85.4	5.8	8.8	---	1963
4:01	84.4	6.0	9.6	---	1923
4:60	84.4	5.9	9.6	---	1872
5:59	84.7	5.8	9.5	---	1904
7:58	82.8	6.9	10.3	---	1970
9:28	81.4	5.8	12.8	---	1584
9:28	81.4	5.8	12.8	---	1584
11:33	82.2	4.2	13.6	---	1486
12:09	83.9	6.6	9.5	---	1319
13:01	82.9	5.8	11.3	---	1578
14:02	83.7	4.0	12.3	---	1496
15:04	80.4	5.1	14.4	---	1415
16:12	79.8	5.5	14.7	---	1481
17:02	81.9	6.0	12.1	---	1556
17:45	82.7	6.0	11.4	---	1537

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

9/27/1983					
18:45	93.4	6.6	---	---	1556
19:04	93.7	6.3	---	---	1721
19:16	83.4	5.7	10.9	---	1947
19:59	84.3	5.9	9.8	---	1933
20:40	93.9	6.1	---	---	1807
21:01	82.4	5.4	12.1	---	1988
21:45	85.5	5.4	9.0	---	1985
22:20	83.7	6.6	9.7	---	1512
22:56	85.4	7.4	7.2	---	1301
9/30/1983					
20:03	92.2	7.8	---	---	1283
20:41	91.6	8.4	---	---	1663
21:38	81.4	7.5	11.1	---	1732
22:24	83.9	6.8	9.3	---	1696
10/ 1/1983					
2:11	83.9	6.3	9.8	---	1518
3:38	73.9	6.0	20.1	---	1993
4:07	84.0	9.4	6.6	---	1806
4:48	85.2	6.6	8.2	---	1805
5:43	84.1	6.3	9.6	---	1849
6:48	83.9	6.3	9.8	---	1924
7:56	82.8	6.4	10.7	---	1776
9:05	81.2	5.1	13.7	---	1344
12:02	83.6	2.8	13.6	---	1316
13:03	83.5	3.0	13.5	---	1360
14:02	79.2	6.1	14.7	---	1241
14:53	83.3	4.8	11.9	---	1453
15:56	81.1	4.2	14.8	---	1339
16:39	83.8	6.2	9.9	---	1650
17:45	85.5	6.5	8.0	---	1460
20:04	80.0	7.5	12.5	---	1967
21:00	82.6	6.1	11.3	---	1800
21:57	83.2	6.1	10.7	---	1946
23:59	80.8	6.2	12.9	---	1833
10/ 2/1983					
0:59	83.2	6.0	10.8	---	1923
3:00	81.5	6.3	12.2	---	1900
4:03	82.4	6.2	11.4	---	1836
4:60	83.1	6.0	10.9	---	1775
5:56	82.6	6.3	11.1	---	1730
10:01	81.5	6.1	12.4	---	1563
15:31	84.1	2.1	13.8	---	1691
18:20	89.5	6.8	3.7	---	1365
19:15	82.3	4.8	12.9	---	1431
20:37	85.8	6.1	8.1	---	1622
21:04	86.9	5.9	7.2	---	1571
21:38	84.0	5.2	10.8	---	1335
22:11	85.2	6.0	8.8	---	1583
23:07	82.5	5.4	12.0	---	1700

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

10/ 2/1983					
23:31	87.5	5.9	6.6	---	1555
10/ 3/1983					
0:05	87.0	5.8	7.2	---	1952
1:06	81.8	6.0	12.2	---	1695
2:03	84.0	6.1	9.9	---	1951
3:11	80.5	2.9	16.6	---	1220
15:14	88.2	6.1	5.8	---	1837
15:15	88.2	6.1	5.8	---	1837
15:46	85.9	6.4	7.7	---	1572
16:60	86.7	5.9	7.4	---	1929
18:00	83.4	6.2	10.4	---	1895
19:00	84.8	9.4	5.8	---	1696
21:30	84.9	2.3	12.8	---	1544
22:04	86.0	6.7	7.3	---	1632
23:04	82.8	6.5	10.7	---	1616
10/ 4/1983					
0:00	83.2	6.4	10.4	---	1666
1:23	85.2	6.6	8.3	---	1881
3:06	83.7	6.7	9.6	---	1883
4:00	85.8	6.3	7.9	---	2081
5:02	82.9	6.8	10.3	---	1787
6:00	83.4	6.7	9.9	---	1853
6:59	84.0	6.8	9.2	---	2019
7:60	83.6	6.0	10.4	---	2008
9:01	81.4	5.8	12.7	---	1622
10:29	77.4	6.5	16.1	---	1452
11:04	83.5	7.2	9.4	---	1463
13:01	79.1	6.2	14.7	---	1559
14:05	80.5	5.8	13.7	---	1531
15:05	80.9	6.0	13.1	---	1517
16:05	75.5	9.1	15.3	---	1356
16:42	83.9	6.6	9.6	---	1537
17:06	87.7	6.3	6.0	---	1476
17:48	84.9	5.8	9.3	---	1631
19:12	85.4	6.2	8.5	---	1690
19:33	89.7	6.2	4.1	---	1661
20:07	83.3	8.7	8.0	---	1492
20:37	86.8	6.7	6.5	---	1689
21:27	83.7	7.5	8.8	---	1749
23:30	86.6	3.7	9.7	---	1319
10/ 5/1983					
6:06	81.4	7.6	11.0	---	1538
9:01	82.5	8.0	9.4	---	1380
11:42	84.9	6.9	8.2	---	1258
12:35	82.4	7.3	10.4	---	1640
13:07	86.6	6.4	6.9	---	1705
14:18	77.4	10.5	12.1	---	1644
14:52	84.4	5.4	10.2	---	1242
17:27	81.5	6.2	12.3	---	1586

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

10/ 5/1983					
21:01	82.3	6.1	11.6	---	1560
22:00	82.4	4.9	12.7	---	1437
23:05	81.9	5.7	12.4	---	1524
23:59	83.7	5.3	11.1	---	1572
10/ 6/1983					
1:60	83.7	3.0	13.3	---	1405
3:00	81.9	6.4	11.7	---	1568
5:06	82.2	3.4	14.4	---	1265
6:06	81.3	6.0	12.7	---	1592
9:10	78.6	5.7	15.8	---	1273
10:22	81.3	6.6	12.0	---	1591
13:06	80.9	6.2	12.9	---	1584
15:04	84.3	6.1	9.6	---	1517
18:02	80.3	6.3	13.4	---	1568
20:17	78.7	5.2	16.1	---	1426
10/ 7/1983					
13:16	83.6	5.7	10.6	---	1499
13:50	84.7	5.8	9.5	---	1463
15:06	81.3	5.0	13.6	---	1680
15:31	88.2	5.1	6.7	---	1527
16:07	82.4	7.5	10.0	---	1508
17:22	81.4	5.4	13.2	---	1710
17:50	87.3	5.3	7.4	---	1592
18:24	86.7	5.5	7.8	---	1686
19:01	86.2	5.3	8.6	---	1725
19:28	87.7	5.9	6.5	---	1630
19:49	89.0	5.6	5.4	---	1507
22:02	85.4	5.5	9.1	---	1958
22:49	87.1	5.4	7.4	---	2064
23:59	87.2	5.5	7.3	---	2089
10/ 8/1983					
1:05	85.1	5.6	9.3	---	1993
2:10	83.1	6.2	10.6	---	1948
4:39	80.6	5.7	13.7	---	1843
5:59	85.4	6.1	8.5	---	1655
6:44	85.7	5.7	8.6	---	1826
7:24	86.6	5.7	7.8	---	1894
7:56	87.6	5.6	6.8	---	1830
8:24	89.1	5.1	5.8	---	1662
8:56	85.6	6.0	8.4	---	1614
9:30	85.7	6.1	8.2	---	1569
9:52	87.4	6.9	5.7	---	1584
10:19	86.6	6.5	7.0	---	1542
10:43	88.4	5.9	5.7	---	1612
11:04	89.4	5.5	5.2	---	1615
11:33	87.6	5.6	6.9	---	1669
11:55	89.8	5.0	5.2	---	1666
12:20	89.1	3.9	7.0	---	1355
12:47	87.4	5.6	6.9	---	1504

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

10/ 8/1983					
13:09	89.1	5.4	5.5	---	1563
14:11	80.6	5.7	13.7	---	1449
14:42	85.6	6.5	7.9	---	1497
14:58	89.2	6.7	4.1	---	1691
15:19	89.8	5.1	5.2	---	1635
15:31	88.7	6.5	4.8	---	1553
15:50	88.1	6.1	5.9	---	1787
16:08	87.9	6.8	5.3	---	1586
16:23	89.3	5.5	5.1	---	1657
16:36	90.3	5.2	4.6	---	1705
16:50	89.8	5.7	4.5	---	1635
17:05	89.0	5.8	5.2	---	1602
17:21	89.2	5.8	4.9	---	1652
18:44	82.5	6.3	11.2	---	1643
20:12	80.7	7.1	12.2	---	1675
21:09	84.1	6.1	9.8	---	1865
22:03	83.4	6.8	9.8	---	1829
23:16	83.2	6.0	10.8	---	1937
10/ 9/1983					
0:00	85.7	5.8	8.5	---	1780
0:59	85.2	5.4	9.4	---	1875
1:57	85.2	5.4	9.4	---	1878
2:58	84.6	5.4	10.0	---	1726
3:56	85.5	5.0	9.5	---	1824
4:57	84.5	5.9	9.6	---	1733
5:57	85.1	5.5	9.3	---	1811
6:56	84.8	6.0	9.2	---	1789
7:59	85.1	5.6	9.3	---	1778
8:22	89.6	5.7	4.8	---	1503
11:14	84.6	5.7	9.7	---	1572
12:14	84.9	5.1	10.0	---	1493
14:47	83.7	4.2	12.1	---	1336
15:45	84.1	6.1	9.7	---	1530
17:11	87.9	6.4	5.7	---	1654
18:05	83.7	7.6	8.6	---	1707
19:04	85.5	5.7	8.9	---	1846
20:31	85.8	5.9	8.3	---	1766
22:52	85.1	5.9	9.0	---	1655
23:56	88.8	5.5	5.6	---	1768
10/10/1983					
0:24	89.8	5.3	5.0	---	1896
1:03	86.6	5.7	7.7	---	1651
2:59	86.8	5.9	7.3	---	1688
4:04	85.5	5.6	8.8	---	1704
5:21	86.6	5.8	7.6	---	1604
5:54	88.8	5.7	5.5	---	1708
6:54	87.3	5.1	7.6	---	1875
7:57	86.6	3.1	10.3	---	1391
8:38	87.1	5.6	7.3	---	1314

SULFUR GAS CHROMATOGRAPH DATA

DATE TIME	H2S % TOT	COS % TOT	C2H5SH % TOT	CH3SH % TOT	TOTAL PPM

10/10/1983					
10:32	85.9	5.0	9.0	---	1357
12:50	85.4	4.1	10.5	---	1528
13:41	85.5	5.4	9.0	---	1375
14:30	85.0	7.1	7.9	---	1543
16:06	82.4	6.9	10.7	---	1426
16:50	86.3	6.2	7.6	---	1500
17:57	85.2	5.3	9.5	---	1643
19:02	85.5	4.9	9.6	---	1571
20:11	85.0	3.8	11.2	---	1378
21:00	85.3	4.6	10.1	---	1227
22:06	82.0	6.6	11.4	---	1285
23:04	85.2	5.5	9.3	---	1478
10/11/1983					
4:03	89.3	6.1	4.6	---	1649
4:58	86.7	5.5	7.9	---	1809
6:00	85.9	5.5	8.6	---	1790
6:57	85.9	5.6	8.5	---	1725
8:01	86.1	5.5	8.4	---	1908
9:52	84.0	5.5	10.5	---	1601
11:03	84.7	5.4	9.9	---	1618
13:04	85.3	4.2	10.6	---	1391
14:06	84.6	4.2	11.1	---	1353
15:05	86.5	3.1	10.4	---	1407
16:03	86.8	2.8	10.4	---	1391
17:18	87.4	3.9	8.7	---	1373
17:51	90.2	2.7	7.1	---	1340
18:40	86.9	5.3	7.8	---	1705
20:12	86.0	5.3	8.7	---	1625
21:05	86.5	5.3	8.3	---	1683
22:06	84.6	5.8	9.7	---	1556
23:49	85.6	5.9	8.5	---	1690
10/12/1983					
1:06	86.5	6.0	7.4	---	1802
2:05	84.5	6.4	9.1	---	1657
3:16	86.7	6.3	7.1	---	1842
4:10	86.7	5.9	7.3	---	1863
5:01	87.1	5.8	7.1	---	1921
6:06	85.4	5.9	8.7	---	1858
7:17	84.4	4.2	11.4	---	1406
13:24	85.0	5.9	9.1	---	1679
14:15	86.3	6.2	7.5	---	1663
16:06	84.8	6.2	9.0	---	1602
16:45	87.8	6.0	6.3	---	1640
17:09	89.8	6.1	4.1	---	1609
17:36	90.1	5.4	4.5	---	1749
18:05	88.8	6.1	5.1	---	1617
19:04	90.2	---	9.8	---	1338
20:02	86.3	5.7	8.0	---	1536
21:03	88.7	0.8	10.5	---	1279

SULFUR GAS CHROMATOGRAPH DATA

DATE	H2S	COS	C2H5SH	CH3SH	TOTAL
TIME	% TOT	% TOT	% TOT	% TOT	PPM

10/12/1983					
22:05	85.5	4.7	9.8	---	1432
23:02	90.3	---	9.7	---	1382
10/13/1983					
0:01	85.4	5.6	9.1	---	1521
1:11	86.0	5.9	8.2	---	1864

APPENDIX L

Continuous Output Transducer Data

These are averages of the continuous output transducer data averaged for the time periods over which material and energy balance calculations were made.

AVERAGE FROM PERIOD: 9/14/83 0:00 TO 9/15/83 14:00

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	13.235	DEG C	2.765
T-702	24.676	DEG C	3.316
T-703	59.814	DEG C	2.503
T-710	21.758	DEG C	2.254
T-711	81.208	DEG C	8.591
T-712	21.160	DEG C	1.750
T-713	29.043	DEG C	5.624
T-705	397.919	DEG C	60.540
T-706	350.842	DEG C	43.653
T-707	327.912	DEG C	34.885
T-812	888.778	DEG C	73.134
T-813	842.786	DEG C	60.265
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	674.790	DEG C	63.921
T-820	597.728	DEG C	47.047
T-823	68.538	DEG C	2.170
T-822	66.403	DEG C	1.889
T-806	125.577	DEG C	121.662
T-811	759.869	DEG C	83.267
F-701	999.744	SCFM	7.155
TT2-703	59.589	DEG C	0.366
P-703	5.194	IN WC	0.884
P-704	4.369	IN WC	0.921
P-705	0.846	IN WC	0.186
P-706	0.626	IN WC	0.190
F-707	—OFF—	SCFM	
WT-720	7.786	TONS	1.859
P-707	10.503	IN WC	22.731
P-810	-0.111	IN WC	0.092
F-802	4092.308	CFM	99.704
F-803	7569.231	CFM	3688.941
TT1-703	59.475	DEG C	0.331
CO	25.408	%	1.801
CO2	6.831	%	0.774
O2	0.238	%	0.413
SIGMA	159.204	BTU/SCF	4.968
T-715	150.807	DEG C	3.585
T-821	443.709	DEG C	94.071
T-703A	45.569	DEG C	7.290
AG VEL	7.690	SPH	0.575
GR VEL	2.491	RPD/T	0.461
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 13.292

AVERAGE FROM PERIOD: 9/15/83 14:00 TO 9/16/83 8:00

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	12.062	DEG C	1.735
T-702	23.338	DEG C	1.694
T-703	58.231	DEG C	1.802
T-710	21.043	DEG C	2.076
T-711	67.665	DEG C	8.176
T-712	20.662	DEG C	2.009
T-713	32.419	DEG C	2.952
T-705	423.455	DEG C	17.738
T-706	373.969	DEG C	13.664
T-707	348.766	DEG C	13.082
T-812	1030.451	DEG C	56.156
T-813	955.571	DEG C	56.438
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	791.724	DEG C	48.544
T-820	674.177	DEG C	36.680
T-823	—OFF—	DEG C	
T-822	66.981	DEG C	0.920
T-806	287.160	DEG C	15.283
T-811	956.403	DEG C	88.897
F-701	993.683	SCFM	5.044
TT2-703	58.702	DEG C	0.143
P-703	5.176	IN WC	0.314
P-704	4.071	IN WC	0.334
P-705	1.105	IN WC	0.075
P-706	0.872	IN WC	0.077
F-707	—OFF—	SCFM	
WT-720	8.530	TONS	1.445
P-707	0.927	IN WC	0.069
P-810	-0.081	IN WC	0.012
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	58.556	DEG C	0.146
CO	26.754	%	1.468
CO2	5.672	%	0.615
O2	-0.018	%	0.128
SIGMA	160.520	BTU/SCF	4.811
T-715	151.594	DEG C	3.569
T-821	534.245	DEG C	29.413
T-703A	36.735	DEG C	5.461
PH	—OFF—	PH	
AG VEL	6.840	SPH	0.441
GR VEL	2.667	RPD/T	0.113
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 16.899

AVERAGE FROM PERIOD: 9/16/83 10:30 TO 9/17/83 7:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	12.956	DEG C	1.908
T-702	23.721	DEG C	1.980
T-703	57.959	DEG C	1.629
T-710	20.552	DEG C	2.008
T-711	67.462	DEG C	2.404
T-712	20.531	DEG C	1.849
T-713	32.419	DEG C	1.669
T-705	453.191	DEG C	11.872
T-706	412.432	DEG C	7.681
T-707	391.181	DEG C	5.982
T-812	1140.655	DEG C	19.630
T-813	1078.173	DEG C	19.201
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	890.132	DEG C	23.176
T-820	750.259	DEG C	22.506
T-823	75.000	DEG C	0.000
T-822	70.138	DEG C	1.412
T-806	277.811	DEG C	14.827
T-811	1078.645	DEG C	20.292
F-701	1156.151	SCFM	33.553
TT2-703	58.717	DEG C	0.168
P-703	8.560	IN WC	0.426
P-704	7.086	IN WC	0.379
P-705	1.472	IN WC	0.115
P-706	1.145	IN WC	0.110
F-707	—OFF—	SCFM	
WT-720	7.648	TONS	2.328
P-707	2.698	IN WC	11.253
P-810	-0.461	IN WC	0.017
F-802	4500.000	CFM	0.000
F-803	9000.000	CFM	0.000
TT1-703	58.580	DEG C	0.160
CO	27.461	%	3.967
CO2	5.114	%	0.693
O2	-0.008	%	0.298
SIGMA	165.307	BTU/SCF	1.996
T-715	150.848	DEG C	2.216
T-821	545.501	DEG C	11.198
T-703A	37.098	DEG C	1.856
PH	—OFF—	PH	
AG VEL	8.358	SPH	0.838
GR VEL	3.366	RPD/T	0.229
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.194

AVERAGE FROM PERIOD: 9/17/83 10:30 TO 9/18/83 10:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	16.785	DEG C	2.537
T-702	27.098	DEG C	2.823
T-703	58.158	DEG C	1.389
T-710	20.637	DEG C	2.424
T-711	67.362	DEG C	2.053
T-712	20.207	DEG C	1.505
T-713	32.264	DEG C	2.253
T-705	438.355	DEG C	27.933
T-706	400.379	DEG C	12.262
T-707	384.208	DEG C	10.549
T-812	1128.219	DEG C	50.130
T-813	1178.447	DEG C	25.439
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	995.066	DEG C	25.637
T-820	831.669	DEG C	19.415
T-823	75.500	DEG C	0.500
T-822	71.890	DEG C	1.569
T-806	238.794	DEG C	10.086
T-811	1154.252	DEG C	26.470
F-701	1298.256	SCFM	15.220
TT2-703	58.694	DEG C	0.239
P-703	8.929	IN WC	2.027
P-704	7.708	IN WC	2.115
P-705	1.224	IN WC	0.128
P-706	0.820	IN WC	0.154
F-707	—OFF—	SCFM	
WT-720	7.485	TONS	2.418
P-707	2.409	IN WC	11.623
P-810	-0.664	IN WC	0.073
F-802	4650.000	CFM	150.000
F-803	9500.000	CFM	0.000
TT1-703	58.555	DEG C	0.233
CO	26.993	%	4.000
CO2	4.897	%	0.761
O2	-0.071	%	0.055
SIGMA	144.715	BTU/SCF	17.274
T-715	150.150	DEG C	2.063
T-821	585.958	DEG C	13.532
T-703A	38.154	DEG C	1.608
PH	—OFF—	PH	
AG VEL	9.296	SPH	0.600
GR VEL	2.762	RPD/T	0.383
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 20.065

AVERAGE FROM PERIOD: 9/18/83 13:30 TO 9/19/83 13:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	11.916	DEG C	3.250
T-702	22.304	DEG C	3.115
T-703	57.684	DEG C	1.035
T-710	18.620	DEG C	1.338
T-711	79.893	DEG C	1.560
T-712	18.291	DEG C	1.136
T-713	30.526	DEG C	1.165
T-705	464.181	DEG C	14.696
T-706	427.644	DEG C	9.824
T-707	414.425	DEG C	9.412
T-812	1182.965	DEG C	25.578
T-813	1262.812	DEG C	18.803
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	1090.159	DEG C	18.075
T-820	1540.046	DEG C	7500.710
T-823	—OFF—	DEG C	
T-822	71.910	DEG C	0.324
T-806	387.814	DEG C	89.089
T-811	1203.444	DEG C	19.177
F-701	1447.891	SCFM	3.547
TT2-703	59.628	DEG C	0.163
P-703	9.416	IN WC	0.423
P-704	7.553	IN WC	0.377
P-705	1.863	IN WC	0.077
P-706	1.378	IN WC	0.104
F-707	—OFF—	SCFM	
WI-720	6.919	TONS	2.701
P-707	1.387	IN WC	0.098
P-810	-0.765	IN WC	0.024
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	59.472	DEG C	0.165
CO	27.934	%	0.342
CO2	5.773	%	0.204
O2	-0.067	%	0.071
SIGMA	159.099	BTU/SCF	1.768
T-715	149.082	DEG C	2.112
T-821	641.073	DEG C	13.504
T-703A	43.105	DEG C	1.253
PH	—OFF—	PH	
AG VEL	9.970	SPH	1.173
GR VEL	3.146	RPD/T	0.285
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.104

AVERAGE FROM PERIOD: 9/19/83 14:30 TO 9/20/83 4:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	8.203	DEG C	1.433
T-702	19.120	DEG C	1.556
T-703	59.248	DEG C	1.327
T-710	18.982	DEG C	1.527
T-711	80.534	DEG C	1.939
T-712	18.716	DEG C	1.805
T-713	29.817	DEG C	2.436
T-705	437.745	DEG C	27.646
T-706	406.683	DEG C	24.592
T-707	395.702	DEG C	22.803
T-812	1372.457	DEG C	189.679
T-813	1277.403	DEG C	62.557
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	1113.939	DEG C	68.039
T-820	921.635	DEG C	49.644
T-823	—OFF—	DEG C	
T-822	72.241	DEG C	1.216
T-806	282.538	DEG C	67.609
T-811	1226.590	DEG C	51.698
F-701	1450.048	SCFM	6.557
TT2-703	60.491	DEG C	0.449
P-703	10.599	IN WC	0.863
P-704	8.564	IN WC	0.898
P-705	2.036	IN WC	0.105
P-706	1.595	IN WC	0.124
F-707	—OFF—	SCFM	
WI-720	7.881	TONS	2.226
P-707	1.501	IN WC	0.060
P-810	-0.770	IN WC	0.016
F-802	—OFF—	CFM	
F-803	7415.442	CFM	654.308
TT1-703	60.334	DEG C	0.450
CO	27.143	%	0.613
CO2	6.040	%	0.316
O2	-0.032	%	0.060
SIGMA	160.518	BTU/SCF	2.717
T-715	150.390	DEG C	3.565
T-821	678.922	DEG C	47.873
T-703A	43.176	DEG C	1.986
PH	—OFF—	PH	
AG VEL	14.536	SPH	8.402
GR VEL	2.958	RPD/T	0.104
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 11.767

AVERAGE FROM PERIOD: 9/21/83 2:30 TO 9/23/83 7:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	4.550	DEG C	2.525
T-702	14.965	DEG C	2.446
T-703	59.132	DEG C	1.170
T-710	17.036	DEG C	1.318
T-711	85.013	DEG C	3.456
T-712	16.889	DEG C	1.110
T-713	30.441	DEG C	1.398
T-705	447.872	DEG C	23.871
T-706	425.120	DEG C	18.021
T-707	413.825	DEG C	17.619
T-812	1420.460	DEG C	93.706
T-813	1326.971	DEG C	26.516
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	1320.970	DEG C	54.249
T-820	1174.600	DEG C	54.491
T-823	—OFF—	DEG C	
T-822	76.827	DEG C	0.767
T-806	225.195	DEG C	19.092
T-811	1226.976	DEG C	33.290
F-701	1384.269	SCFM	6.212
TT2-703	61.431	DEG C	0.795
P-703	20.798	IN WC	2.086
P-704	14.341	IN WC	2.222
P-705	6.456	IN WC	1.089
P-706	5.777	IN WC	1.126
F-707	—OFF—	SCFM	
WT-720	7.115	TONS	2.572
P-707	4.116	IN WC	0.841
P-810	0.208	IN WC	0.231
F-802	—OFF—	CFM	
F-803	8367.491	CFM	566.499
TT1-703	61.247	DEG C	0.813
CO	26.879	%	1.053
CO2	6.087	%	0.502
O2	-0.055	%	0.251
SIGMA	162.511	BTU/SCF	2.721
T-715	154.935	DEG C	5.310
T-821	926.823	DEG C	50.369
T-703A	50.332	DEG C	3.274
PH	—OFF—	PH	
AG VEL	16.586	SPH	3.341
GR VEL	4.148	RPD/T	0.877
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 14.631

AVERAGE FROM PERIOD: 9/24/83 16:30 TO 9/25/83 8:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	13.635	DEG C	3.656
T-702	25.172	DEG C	3.275
T-703	59.291	DEG C	1.154
T-710	16.636	DEG C	1.434
T-711	87.109	DEG C	2.689
T-712	16.477	DEG C	1.290
T-713	26.742	DEG C	2.110
T-705	402.451	DEG C	25.626
T-706	365.478	DEG C	15.007
T-707	352.017	DEG C	13.991
T-812	1072.170	DEG C	159.107
T-813	626.146	DEG C	564.525
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	382.283	DEG C	151.841
T-820	619.141	DEG C	50.445
T-823	—OFF—	DEG C	
T-822	66.685	DEG C	1.361
T-806	103.968	DEG C	16.994
T-811	789.403	DEG C	75.927
F-701	994.159	SCFM	3.537
TT2-703	60.738	DEG C	0.086
P-703	5.989	IN WC	0.629
P-704	3.958	IN WC	0.654
P-705	2.031	IN WC	0.145
P-706	1.759	IN WC	0.120
F-707	—OFF—	SCFM	
WT-720	5.786	TONS	3.640
P-707	1.047	IN WC	0.275
P-810	-0.965	IN WC	0.014
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	60.596	DEG C	0.084
CO	26.305	%	0.632
CO2	5.932	%	0.313
O2	-0.063	%	0.100
SIGMA	154.503	BTU/SCF	1.282
T-715	158.998	DEG C	3.171
T-821	424.523	DEG C	36.269
T-703A	49.246	DEG C	2.689
PH	—OFF—	PH	
AG VEL	6.960	SPH	0.334
GR VEL	2.265	RPD/T	0.605
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.636

AVERAGE FROM PERIOD: 9/25/83 9:30 TO 9/26/83 7:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	17.716	DEG C	3.961
T-702	28.331	DEG C	3.533
T-703	59.308	DEG C	1.162
T-710	16.522	DEG C	1.590
T-711	86.397	DEG C	1.476
T-712	16.446	DEG C	1.449
T-713	28.351	DEG C	1.742
T-705	410.391	DEG C	21.538
T-706	376.138	DEG C	14.584
T-707	364.819	DEG C	14.098
T-812	1292.704	DEG C	112.798
T-813	1191.581	DEG C	115.660
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	527.166	DEG C	89.955
T-820	712.240	DEG C	40.738
T-823	71.000	DEG C	0.000
T-822	72.220	DEG C	1.415
T-806	127.241	DEG C	19.540
T-811	959.374	DEG C	59.309
F-701	1132.161	SCFM	87.106
TT2-703	60.556	DEG C	0.306
P-703	8.130	IN WC	0.645
P-704	5.122	IN WC	0.835
P-705	3.008	IN WC	0.371
P-706	2.569	IN WC	0.392
F-707	—OFF—	SCFM	
WT-720	7.372	TONS	2.221
P-707	2.355	IN WC	11.201
P-810	-1.354	IN WC	0.126
F-802	4800.000	CFM	0.000
F-803	11500.000	CFM	0.000
TT1-703	60.419	DEG C	0.314
CO	26.272	%	2.332
CO2	5.693	%	0.537
O2	-0.007	%	0.391
SIGMA	150.840	BTU/SCF	8.853
T-715	158.977	DEG C	2.744
T-821	496.346	DEG C	38.198
T-703A	49.100	DEG C	1.211
PH	—OFF—	PH	
AG VEL	7.446	SPH	0.285
GR VEL	2.570	RPD/T	0.265
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 21.429

AVERAGE FROM PERIOD: 9/26/83 8:30 TO 9/27/83 6:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	20.116	DEG C	4.244
T-702	30.676	DEG C	3.770
T-703	60.105	DEG C	1.202
T-710	17.015	DEG C	1.620
T-711	87.354	DEG C	1.124
T-712	16.548	DEG C	1.387
T-713	29.087	DEG C	1.625
T-705	429.337	DEG C	15.955
T-706	397.513	DEG C	8.207
T-707	387.165	DEG C	8.877
T-812	1357.675	DEG C	56.261
T-813	1349.045	DEG C	28.886
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	653.561	DEG C	21.315
T-820	806.990	DEG C	14.326
T-823	—OFF—	DEG C	
T-822	75.406	DEG C	0.739
T-806	476.674	DEG C	75.698
T-811	1156.827	DEG C	42.174
F-701	1284.300	SCFM	3.767
TT2-703	60.658	DEG C	0.124
P-703	11.742	IN WC	0.352
P-704	6.712	IN WC	0.376
P-705	5.030	IN WC	0.357
P-706	4.975	IN WC	0.398
F-707	—OFF—	SCFM	
WT-720	7.204	TONS	2.550
P-707	3.264	IN WC	0.452
P-810	-1.096	IN WC	0.134
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	60.518	DEG C	0.133
CO	26.325	%	0.440
CO2	5.683	%	0.169
O2	-0.065	%	0.248
SIGMA	154.476	BTU/SCF	1.261
T-715	158.872	DEG C	2.577
T-821	588.733	DEG C	17.631
T-703A	50.520	DEG C	1.511
PH	—OFF—	PH	
AG VEL	8.420	SPH	0.623
GR VEL	2.794	RED/T	0.097
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 22.894

AVERAGE FROM PERIOD: 9/27/83 7:30 TO 9/27/83 21:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	25.149	DEG C	4.544
T-702	35.396	DEG C	4.522
T-703	59.982	DEG C	0.948
T-710	16.724	DEG C	1.591
T-711	86.638	DEG C	1.063
T-712	16.448	DEG C	1.455
T-713	29.643	DEG C	1.731
T-705	435.922	DEG C	17.404
T-706	405.700	DEG C	8.544
T-707	398.112	DEG C	10.537
T-812	1462.789	DEG C	62.417
T-813	1356.253	DEG C	54.369
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	913.417	DEG C	124.466
T-820	923.021	DEG C	42.545
T-823	—OFF—	DEG C	
T-822	78.928	DEG C	1.720
T-806	365.764	DEG C	117.956
T-811	1221.848	DEG C	34.286
F-701	1427.155	SCFM	31.459
TT2-703	60.764	DEG C	0.053
P-703	16.911	IN WC	1.347
P-704	7.627	IN WC	0.630
P-705	9.284	IN WC	1.099
P-706	8.618	IN WC	0.913
F-707	—OFF—	SCFM	
WT-720	6.758	TONS	2.558
P-707	6.250	IN WC	0.808
P-810	-0.285	IN WC	0.243
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	60.614	DEG C	0.079
CO	26.177	%	0.931
CO2	5.643	%	0.239
O2	0.003	%	0.345
SIGMA	154.064	BTU/SCF	1.093
T-715	157.417	DEG C	2.788
T-821	719.813	DEG C	44.284
T-703A	52.362	DEG C	1.082
PH	—OFF—	PH	
AG VEL	9.636	SPH	0.814
GR VEL	2.971	RPD/T	0.109
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 23.657

AVERAGE FROM PERIOD: 10/ 1/83 0:30 TO 10/ 2/83 6:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	20.789	DEG C	3.240
T-702	30.980	DEG C	2.975
T-703	59.785	DEG C	0.946
T-710	16.333	DEG C	1.010
T-711	79.492	DEG C	5.156
T-712	16.481	DEG C	0.952
T-713	32.140	DEG C	1.509
T-705	444.750	DEG C	17.649
T-706	416.209	DEG C	8.528
T-707	406.852	DEG C	9.971
T-812	1608.164	DEG C	92.708
T-813	1405.801	DEG C	462.050
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	847.114	DEG C	99.828
T-820	813.994	DEG C	36.795
T-823	—OFF—	DEG C	
T-822	87.930	DEG C	1.158
T-806	284.521	DEG C	25.297
T-811	1100.257	DEG C	88.319
F-701	1580.484	SCFM	5.593
TT2-703	60.979	DEG C	0.237
P-703	18.874	IN WC	3.152
P-704	15.002	IN WC	3.325
P-705	3.872	IN WC	0.404
P-706	2.925	IN WC	0.398
F-707	—OFF—	SCFM	
WT-720	6.812	TONS	2.751
P-707	1.160	IN WC	1.341
P-810	-0.907	IN WC	0.361
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	60.807	DEG C	0.242
CO	26.112	%	0.339
CO2	5.691	%	0.214
O2	-0.560	%	0.411
SIGMA	159.201	BTU/SCF	3.767
T-715	154.383	DEG C	1.899
T-821	573.046	DEG C	45.203
T-703A	48.824	DEG C	3.978
PH	—OFF—	PH	
AG VEL	12.624	SPH	0.983
GR VEL	3.587	RPD/T	1.345
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 22.982

AVERAGE FROM PERIOD: 10/ 2/83 8:30 TO 10/ 3/83 8:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	18.217	DEG C	4.982
T-702	28.633	DEG C	4.731
T-703	58.492	DEG C	0.798
T-710	16.252	DEG C	0.951
T-711	85.988	DEG C	1.505
T-712	16.332	DEG C	0.908
T-713	31.185	DEG C	1.499
T-705	436.835	DEG C	15.318
T-706	408.806	DEG C	8.418
T-707	401.205	DEG C	10.194
T-812	1646.800	DEG C	58.331
T-813	1375.054	DEG C	367.809
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	843.586	DEG C	88.018
T-820	814.384	DEG C	32.441
T-823	—OFF—	DEG C	
T-822	88.988	DEG C	1.943
T-806	246.505	DEG C	9.119
T-811	1105.181	DEG C	95.188
F-701	1583.931	SCFM	4.469
TT2-703	60.121	DEG C	0.106
P-703	21.146	IN WC	1.117
P-704	16.410	IN WC	1.113
P-705	4.736	IN WC	0.629
P-706	4.200	IN WC	0.842
F-707	—OFF—	SCFM	
WT-720	6.722	TONS	2.767
P-707	-0.144	IN WC	0.470
P-810	-1.211	IN WC	0.165
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	59.938	DEG C	0.114
CO	26.628	%	0.709
CO2	5.296	%	0.286
O2	-0.549	%	0.235
SIGMA	159.915	BTU/SCF	4.364
T-715	156.798	DEG C	1.861
T-821	547.312	DEG C	28.798
T-703A	53.122	DEG C	1.604
PH	—OFF—	PH	
AG VEL	13.048	SPH	0.731
GR VEL	4.909	RPD/T	0.135
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 21.836

AVERAGE FROM PERIOD: 10/ 3/83 18:30 TO 10/ 4/83 9:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	9.381	DEG C	1.080
T-702	20.769	DEG C	0.988
T-703	57.112	DEG C	0.504
T-710	15.089	DEG C	0.724
T-711	89.026	DEG C	3.040
T-712	14.967	DEG C	0.695
T-713	25.270	DEG C	1.914
T-705	377.240	DEG C	19.581
T-706	338.771	DEG C	11.994
T-707	328.901	DEG C	11.946
T-812	1148.142	DEG C	117.748
T-813	1241.303	DEG C	1320.743
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	354.172	DEG C	682.383
T-820	556.435	DEG C	28.403
T-823	—OFF—	DEG C	
T-822	79.827	DEG C	0.814
T-806	273.003	DEG C	9.284
T-811	857.101	DEG C	64.375
F-701	998.349	SCFM	3.810
TT2-703	60.063	DEG C	0.178
P-703	7.079	IN WC	0.809
P-704	5.307	IN WC	0.769
P-705	1.773	IN WC	0.120
P-706	1.543	IN WC	0.083
F-707	—OFF—	SCFM	
WT-720	6.004	TONS	3.784
P-707	0.798	IN WC	0.045
P-810	0.217	IN WC	0.012
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
Tf1-703	59.911	DEG C	0.176
CO	26.759	%	1.143
CO2	5.762	%	0.492
O2	-0.414	%	0.626
SIGMA	158.255	BTU/SCF	1.833
T-715	147.284	DEG C	1.582
T-821	445.126	DEG C	19.650
T-703A	50.607	DEG C	2.852
PH	—OFF—	PH	
AG VEL	8.323	SPH	0.545
GR VEL	1.225	RPD/T	0.131
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 18.461

AVERAGE FROM PERIOD: 10/ 4/83 10:30 TO 10/ 5/83 8:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	11.267	DEG C	1.783
T-702	22.333	DEG C	1.652
T-703	57.463	DEG C	0.798
T-710	16.162	DEG C	1.147
T-711	89.888	DEG C	1.869
T-712	15.836	DEG C	1.024
T-713	24.202	DEG C	1.134
T-705	446.106	DEG C	17.226
T-706	405.131	DEG C	10.519
T-707	394.207	DEG C	10.258
T-812	1091.356	DEG C	61.654
T-813	950.357	DEG C	744.215
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	297.821	DEG C	697.310
T-820	554.283	DEG C	16.915
T-823	—OFF—	DEG C	
T-822	81.562	DEG C	1.491
T-806	307.517	DEG C	15.572
T-811	826.060	DEG C	42.462
F-701	1155.375	SCFM	3.538
TT2-703	59.780	DEG C	0.123
P-703	9.660	IN WC	0.551
P-704	7.045	IN WC	0.518
P-705	2.615	IN WC	0.160
P-706	2.265	IN WC	0.165
F-707	—OFF—	SCFM	
WT-720	7.698	TONS	2.000
P-707	0.416	IN WC	0.177
P-810	-0.096	IN WC	0.146
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	59.609	DEG C	0.140
CO	25.201	%	0.898
CO2	6.644	%	0.421
O2	-0.261	%	0.636
SIGMA	154.785	BTU/SCF	1.123
T-715	147.448	DEG C	2.452
T-821	227.284	DEG C	161.974
T-703A	52.960	DEG C	1.667
PH	—OFF—	PH	
AG VEL	6.421	SPH	0.805
GR VEL	1.721	RPD/T	0.543
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.190

AVERAGE FROM PERIOD: 10/ 5/83 15:30 TO 10/ 6/83 8:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	7.984	DEG C	2.898
T-702	19.028	DEG C	3.024
T-703	58.287	DEG C	0.961
T-710	16.218	DEG C	1.142
T-711	84.117	DEG C	5.358
T-712	15.935	DEG C	0.978
T-713	28.033	DEG C	3.559
T-705	485.092	DEG C	23.895
T-706	448.342	DEG C	14.392
T-707	437.505	DEG C	14.740
T-812	1227.884	DEG C	70.387
T-813	146.703	DEG C	279.846
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	1088.497	DEG C	483.839
T-820	599.466	DEG C	31.668
T-823	—OFF—	DEG C	
T-822	83.749	DEG C	1.409
T-806	293.147	DEG C	7.472
T-811	876.326	DEG C	83.739
F-701	1298.301	SCFM	8.101
TT2-703	60.610	DEG C	0.114
P-703	10.412	IN WC	0.559
P-704	6.882	IN WC	0.575
P-705	3.530	IN WC	0.247
P-706	3.064	IN WC	0.277
F-707	—OFF—	SCFM	
WT-720	7.844	TONS	2.039
P-707	3.390	IN WC	0.815
P-810	-0.769	IN WC	0.017
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TF1-703	60.443	DEG C	0.119
CO	25.074	%	1.280
CO2	6.981	%	0.740
O2	0.005	%	0.644
SIGMA	154.922	BTU/SCF	5.041
T-715	149.092	DEG C	1.858
T-821	63.100	DEG C	3.060
T-703A	48.974	DEG C	4.212
PH	—OFF—	PH	
AG VEL	6.355	SPH	1.048
GR VEL	1.454	RPD/T	0.282
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.865

AVERAGE FROM PERIOD: 10/ 6/83 10:30 TO 10/ 7/83 7:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	12.386	DEG C	1.509
T-702	22.723	DEG C	1.303
T-703	60.553	DEG C	1.096
T-710	17.702	DEG C	1.761
T-711	89.866	DEG C	2.941
T-712	17.313	DEG C	1.130
T-713	29.421	DEG C	4.006
T-705	451.056	DEG C	23.176
T-706	415.247	DEG C	16.254
T-707	407.576	DEG C	17.524
T-812	1423.295	DEG C	200.886
T-813	1023.656	DEG C	480.666
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	-399.572	DEG C	187.061
T-820	670.580	DEG C	51.457
T-823	—OFF—	DEG C	
T-822	91.345	DEG C	30.644
T-806	270.546	DEG C	129.249
T-811	1023.498	DEG C	764.145
F-701	1444.989	SCFM	9.711
TT2-703	61.546	DEG C	0.288
P-703	15.376	IN WC	2.104
P-704	11.598	IN WC	2.171
P-705	3.778	IN WC	0.325
P-706	3.193	IN WC	0.283
F-707	—OFF—	SCFM	
WT-720	7.210	TONS	2.777
P-707	1.517	IN WC	1.948
P-810	-1.610	IN WC	0.199
F-802	0.000	CFM	0.000
F-803	—OFF—	CFM	
TT1-703	61.379	DEG C	0.272
CO	25.109	%	2.587
CO2	6.880	%	0.556
O2	-0.395	%	0.225
SIGMA	152.566	BTU/SCF	15.626
T-715	413.860	DEG C	2540.215
T-821	64.159	DEG C	6.204
T-703A	52.761	DEG C	3.402
PH	—OFF—	PH	
AG VEL	8.581	SPH	0.816
GR VEL	2.779	RPD/T	0.810
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 17.849

AVERAGE FROM PERIOD: 10/ 7/83 9:30 TO 10/ 8/83 5:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	9.182	DEG C	2.975
T-702	19.610	DEG C	2.893
T-703	59.716	DEG C	1.024
T-710	16.229	DEG C	1.109
T-711	82.289	DEG C	5.419
T-712	16.037	DEG C	0.969
T-713	27.242	DEG C	3.148
T-705	465.272	DEG C	44.033
T-706	426.341	DEG C	38.234
T-707	418.125	DEG C	37.164
T-812	1501.342	DEG C	152.779
T-813	1257.433	DEG C	622.686
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	78.307	DEG C	1020.165
T-820	661.467	DEG C	58.910
T-823	—OFF—	DEG C	
T-822	85.501	DEG C	1.966
T-806	349.101	DEG C	99.596
T-811	888.038	DEG C	133.810
F-701	1604.553	SCFM	8.281
TT2-703	61.482	DEG C	0.309
P-703	16.802	IN WC	1.137
P-704	12.224	IN WC	1.300
P-705	4.578	IN WC	0.475
P-706	3.894	IN WC	0.451
F-707	—OFF—	SCFM	
WT-720	7.037	TONS	2.414
P-707	3.698	IN WC	1.624
P-810	-1.548	IN WC	0.273
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	61.308	DEG C	0.310
CO	25.134	%	1.644
CO2	7.007	%	0.690
O2	-0.527	%	0.257
SIGMA	156.455	BTU/SCF	3.772
T-715	153.650	DEG C	5.839
T-821	61.765	DEG C	6.420
T-703A	49.575	DEG C	5.340
PH	—OFF—	PH	
AG VEL	8.771	SPH	3.260
GR VEL	2.381	RPD/T	1.318
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.887

AVERAGE FROM PERIOD: 10/ 8/83 11:30 TO 10/ 9/83 23:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	9.247	DEG C	3.398
T-702	19.640	DEG C	3.374
T-703	59.698	DEG C	0.938
T-710	16.203	DEG C	1.363
T-711	78.454	DEG C	5.890
T-712	15.840	DEG C	1.128
T-713	29.126	DEG C	3.642
T-705	489.376	DEG C	33.271
T-706	454.912	DEG C	26.518
T-707	447.520	DEG C	27.809
T-812	1587.428	DEG C	170.925
T-813	1452.939	DEG C	464.759
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	91.277	DEG C	788.627
T-820	757.679	DEG C	66.176
T-823	—OFF—	DEG C	
T-822	91.726	DEG C	3.764
T-806	391.733	DEG C	75.060
T-811	1007.076	DEG C	106.484
F-701	1813.444	SCFM	14.824
TT2-703	61.599	DEG C	0.284
P-703	23.738	IN WC	1.387
P-704	15.566	IN WC	1.745
P-705	8.172	IN WC	0.630
P-706	7.159	IN WC	0.585
F-707	—OFF—	SCFM	
WT-720	7.224	TONS	2.499
P-707	3.392	IN WC	1.219
P-810	-0.807	IN WC	0.335
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	61.406	DEG C	0.289
CO	25.698	%	1.439
CO2	7.000	%	0.890
O2	-0.561	%	0.286
SIGMA	155.800	BTU/SCF	6.932
T-715	156.946	DEG C	3.765
T-821	75.085	DEG C	8.820
T-703A	48.548	DEG C	4.031
PH	—OFF—	PH	
AG VEL	10.102	SPH	2.425
GR VEL	2.338	RPD/T	0.916
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.294

AVERAGE FROM PERIOD: 10/10/83 0:30 TO 10/10/83 23:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	10.299	DEG C	1.760
T-702	20.667	DEG C	1.484
T-703	59.618	DEG C	0.833
T-710	15.261	DEG C	1.149
T-711	77.747	DEG C	4.273
T-712	15.297	DEG C	1.240
T-713	26.953	DEG C	2.178
T-705	421.858	DEG C	32.083
T-706	385.959	DEG C	21.191
T-707	379.437	DEG C	21.772
T-812	238.584	DEG C	863.573
T-813	-330.298	DEG C	1194.089
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	904.790	DEG C	496.668
T-820	561.820	DEG C	54.219
T-823	—OFF—	DEG C	
T-822	89.121	DEG C	1.176
T-806	357.625	DEG C	93.078
T-811	733.437	DEG C	168.660
F-701	1446.319	SCFM	5.546
TT2-703	61.601	DEG C	0.143
P-703	14.717	IN WC	1.683
P-704	11.357	IN WC	1.847
P-705	3.360	IN WC	0.293
P-706	2.769	IN WC	0.340
F-707	—OFF—	SCFM	
WI-720	6.369	TONS	2.991
P-707	2.771	IN WC	1.332
P-810	-1.621	IN WC	0.408
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	61.441	DEG C	0.145
CO	24.742	%	1.493
CO2	6.309	%	0.718
O2	-0.063	%	0.329
SIGMA	157.578	BTU/SCF	2.603
T-715	156.860	DEG C	2.801
T-821	67.503	DEG C	49.175
T-703A	45.211	DEG C	3.394
PH	—OFF—	PH	
AG VEL	13.048	SPH	4.435
GR VEL	2.151	RPD/T	0.389
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.505

AVERAGE FROM PERIOD: 10/11/83 9:30 TO 10/11/83 21:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	9.213	DEG C	1.440
T-702	19.423	DEG C	1.286
T-703	60.292	DEG C	1.416
T-710	15.230	DEG C	1.016
T-711	78.538	DEG C	2.176
T-712	14.717	DEG C	0.884
T-713	26.785	DEG C	0.812
T-705	399.621	DEG C	14.170
T-706	371.298	DEG C	8.983
T-707	370.781	DEG C	9.989
T-812	-414.751	DEG C	365.868
T-813	-193.220	DEG C	264.314
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	357.204	DEG C	63.545
T-820	776.652	DEG C	10.709
T-823	—OFF—	DEG C	
T-822	90.754	DEG C	0.734
T-806	363.856	DEG C	47.974
T-811	1093.028	DEG C	16.300
F-701	1724.210	SCFM	30.618
TT2-703	62.187	DEG C	0.839
P-703	27.305	IN WC	0.498
P-704	19.298	IN WC	0.726
P-705	8.006	IN WC	0.300
P-706	7.140	IN WC	0.237
F-707	—OFF—	SCFM	
WI-720	7.169	TONS	2.804
P-707	2.430	IN WC	0.840
P-810	-0.768	IN WC	0.060
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	62.010	DEG C	0.852
CO	25.411	%	0.266
CO2	5.793	%	0.303
O2	-0.784	%	0.131
SIGMA	148.007	BTU/SCF	24.110
T-715	154.181	DEG C	2.308
T-821	72.923	DEG C	2.604
T-703A	46.191	DEG C	1.129
PH	—OFF—	PH	
AG VEL	14.690	SPH	0.818
GR VEL	3.542	RPD/T	0.351
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.393

AVERAGE FROM PERIOD: 10/11/83 23:30 TO 10/12/83 6:30

SIGNAL	AVERAGE	UNITS	STD.DEV.
T-701	3.624	DEG C	1.663
T-702	14.330	DEG C	1.699
T-703	59.941	DEG C	1.226
T-710	16.003	DEG C	1.154
T-711	81.556	DEG C	1.977
T-712	15.955	DEG C	1.188
T-713	27.800	DEG C	1.171
T-705	401.184	DEG C	11.879
T-706	367.348	DEG C	8.362
T-707	370.224	DEG C	8.330
T-812	262.731	DEG C	90.981
T-813	—OFF—	DEG C	
T-814	—OFF—	DEG C	
T-815	—OFF—	DEG C	
T-816	—OFF—	DEG C	
T-817	—OFF—	DEG C	
T-818	—OFF—	DEG C	
T-819	467.439	DEG C	162.737
T-820	701.955	DEG C	12.247
T-823	—OFF—	DEG C	
T-822	86.703	DEG C	1.872
T-806	377.814	DEG C	4.253
T-811	1050.999	DEG C	15.542
F-701	1631.198	SCFM	13.924
TT2-703	60.655	DEG C	0.068
P-703	27.222	IN WC	0.182
P-704	20.126	IN WC	0.325
P-705	7.096	IN WC	0.176
P-706	6.673	IN WC	0.084
F-707	—OFF—	SCFM	
WT-720	6.685	TONS	2.227
P-707	2.538	IN WC	0.092
P-810	-0.991	IN WC	0.056
F-802	—OFF—	CFM	
F-803	—OFF—	CFM	
TT1-703	60.464	DEG C	0.079
CO	26.620	%	0.231
CO2	5.265	%	0.112
O2	-0.784	%	0.053
SIGMA	161.674	BTU/SCF	0.758
T-715	157.937	DEG C	2.324
T-821	63.063	DEG C	3.488
T-703A	46.833	DEG C	1.022
PH	—OFF—	PH	
AG VEL	13.970	SPH	0.187
GR VEL	2.865	RPD/T	0.174
P-702	0.000	IN WC	0.000

AVERAGE BASE TEMPERATURE 19.863

APPENDIX M

Stack Sampling Report

This is the report submitted by Interpoll, Inc., Circle Pines, Minnesota to the University of Minnesota Particle Technology Laboratory. The appendices to the stack sampling report have not been included here. The appendices include raw data and calculations.

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RESULTS OF THE SEPTEMBER 19, 1983,
ELKHORN BITUMINOUS COAL
TEST BURN EMISSION TESTS ON THE
WELLMAN-GALUSHA GASIFIER AT THE
TWIN CITIES RESEARCH CENTER
IN MINNEAPOLIS, MINNESOTA

Submitted to:

UNIVERSITY OF MINNESOTA
Room 130 Mechanical Eng. Bldg.
111 Church Street S.E.
Minneapolis, Minnesota 55455

Attention: David Y. H. Pui, Ph.D.

Approved by:

Perry Tonnes, Ph.D.
President

Report Number 3-1628
October 10, 1983

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APPENDICES:

- A - Results of Volumetric Flow Rate Measurements
- B - Location of Test Ports and Traverse Points
- C - Method 2-5 Field Data Sheets
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- F - Operating Conditions of Gasifier and Fuel Composition
- G - Procedures
- H - Calculation of the Dry F-Factor
- I - Calculation Equations
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ABBREVIATIONS

ACFM	actual cubic feet per minute
cc (ml)	cubic centimeter (milliliter)
DSCFM	standard cubic foot of dry gas per minute
DSML	dry standard milliliter
DEG-F (°F)	degrees Fahrenheit
DIA.	diameter
FT/SEC	feet per second
GPM	gallons per minute
GR/ACF	grains per actual cubic foot
GR/DSCF	grains per dry standard cubic foot
g	gram
HP	horsepower
HRS	hours
IN.	inches
IN. HG.	inches of mercury
IN. WC.	inches of water
LB	pound
LB/DSCF	pounds per dry standard cubic foot
LB/HR	pounds per hour
LB/10 ⁶ BTU	pounds per million British Thermal Units heat input
LB/MMBTU	pounds per million British Thermal Units heat input
MW	megawatt
mg/DSCM	milligrams per dry standard cubic meter
microns (µm)	micrometer
MIN.	minutes
ohm-cm	ohm-centimeter
PPH	pounds per hour
PPM	parts per million
PSI	pounds per square inch
SQ. FT.	square feet
v/v	percent by volume
w/w	percent by weight

Standard conditions are defined as 68 °F (20 °C) and 29.92 IN. of mercury pressure.

INTRODUCTION

On September 19, 1983, Interpoll Inc. personnel conducted a series of flow rate and emission tests on the pilot low BTU Gasifier at the Bureau of Mines Twin Cities Research Center, Minneapolis, Minnesota. On-site testing was performed by a two-man team under the direction of S. Olson. Coordination between testing activities and gasifier operation was provided by Dave Thimsen of Black, Sivalls and Bryson (BSB).

The unit tested is a six-foot, six-inch Wellman-Galusha, single stage, fixed-bed gasifier with an agitator. This gasifier has a nominal operating capacity of 30 10⁶BTU/HR (bituminous coal). A combustion test chamber is attached to the gasifier and it also has a nominal capacity of 30 10⁶BTU/HR. The combustion test chamber is a horizontal, cylindrical chamber, seven feet I.D. by 21 feet long, and exhausts through an impingement tray-type scrubber and an induced draft fan to a three-foot diameter stack. Most of the testing in this work was performed at the combustion test chamber outlet, however, flow determinations were performed at the forced draft fan outlet to allow assessment of the combustion air usage and in the stack to ascertain the total volumetric flow rate of the combustion products. During this test, Elkhorn bituminous coal was gasified.

Particulate and sulfur dioxide determinations were performed in accordance with EPA Methods 1-6, CFR Title 40, Part 60, Appendix A (Revised July 1, 1982). A preliminary determination of the gas velocity profile was made before the first particulate run to allow selection of the appropriate nozzle diameter required for isokinetic sample withdrawal. An Interpoll sampling train which meets or exceeds specifications in the above-cited reference was used to collect particulate samples by means of a heated stainless steel-lined probe. A single diameter traverse was used in this work due to the high cost of installing a second test port at 90 degrees to the existing port.

The back half of the EPA Method 5 particulate sampling train was used to collect sulfur dioxide samples. This is the large impinger version specified in EPA Method 6 and provides for a complete stack traverse during sample collection. Collected sulfur dioxide samples were returned to the laboratory for sulfate analysis by the standard barium/Thorin I titration technique.

Nitric oxide concentrations in the flue gas were measured by means of a Monitor Labs chemiluminescent nitric oxide analyzer. Nitric oxide concentrations were read at each traverse point in the particulate determination. The nitric oxide concentrations were determined on a dry basis using the exhaust gas stream from the EPA Method 5 sampling train.

An integrated flue gas sample was extracted simultaneously with each particulate and sulfur dioxide sample using a specially designed gas sampling system. Integrated flue gas samples were collected in 44-liter Tedlar bags. After sampling was complete, the bags were sealed and returned to the laboratory for Orsat analysis. The integrity of the sample bags was insured by reading the oxygen concentration of the bag in the field immediately after sampling and again in the laboratory immediately prior to Orsat analysis using a Teledyne Model 320P oxygen analyzer.

Testing at the combustion chamber outlet test site was conducted from one test port on the combustion chamber outlet duct (see Appendix B). Each traverse point was sampled five minutes to give a total sampling time of 60 minutes per run. Test port and traverse port locations for the flow determinations are also given in Appendix B.

The important results of the tests are summarized in Section 2. Detailed results are presented in Section 3. Results of preliminary measurements, field data and all other supporting information are presented in the appendices.

The important results of the particulate determinations performed at the combustor outlet are summarized in Table 1. As will be noted, the particulate concentration ranged from .0066 to .0069 GR/ACF and the corresponding mass rate from 3.7 to 3.8 LB/HR. The particulate emission factor, the parameter used by most pollution control agencies to regulate emissions from boilers and combustors, ranged from .081 to .085 LB/10⁶BTU (EPA methods specify that the emission factor be calculated from oxygen concentrations in the flue gas derived from Orsat analysis). The heat input to the combustion test chamber was estimated to average 45.4 10⁶BTU/HR using the F-factor calculated from the producer gas composition together with the particulate emission factor and the particulate mass rates. This heat input rate was verified by the SO₂ emission factors and rates.

The results of the SO₂ determinations are given in Table 2. As will be noted, the SO₂ concentrations ranged from 261 to 270 ppm. The SO₂ emission rate was approximately 55 LB/HR and the SO₂ emission factor 1.21 LB/10⁶BTU. The measured SO₂ emission factor was almost identical to the value calculated from the sulfur content and heating value of the coal (1.25 LB/10⁶BTU). Nitric oxide concentrations averaged 144 ppm (dry). Plume opacity was estimated to be about 0%.

Volumetric flow rate determinations were performed at three different locations. The results of the flow rate determinations performed at the combustor outlet are given in Table 1 and ranged from 18,600 to 19,600 DSCFM. The flow rate at the combustor fan inlet duct was estimated at 10,800 DSCFM. The flow rate at the stack test site was 16,200 DSCFM.

Table 1. Summary of the Results of the September 19, 1983 Particulate Emission Test on the Combustor Outlet at the Bureau of Mines Coal Gasification Plant Located in Minneapolis, Minnesota

ITEM	RUN 1	RUN 2	RUN 3
Time of test (HRS)	0950/1050	1130/1230	1255/1355
Estimated gas burning rate (DSCFM)	4553	4280	4485
Estimated heat input (MMBTU/HR) *	46.6	43.8	45.9
Estimated percent of rated capacity	155	146	153
Volumetric flow			
ACTUAL (ACFM)	64200	66400	66100
STANDARD (DSCFM)	19600	19600	19700
Gas temperature (DEG-F)	1068	1221	1219
Moisture content (% v/v)	8.91	8.04	7.60
Gas composition (% v/v dry)			
carbon dioxide	7.40	7.80	7.80
oxygen	12.20	12.20	11.80
nitrogen	80.40	80.00	80.40
Oxygen analyzer (% v/v, dry)	11.63	11.93	12.30
Isokinetic variation (%)	102.2	99.4	101.0
Particulate concentration			
ACTUAL (GR/ACF)	.0072	.0069	.0068
STANDARD (GR/DSCF)	.024	.024	.024
Particulate mass rate (LB/HR)	4.0	3.9	3.9
Particulate emission factor (LB/MMBTU)			
F-factor method (O2 analyzer)	.080	.086	.087
F-factor method (Orsat)	.086	.089	.084

combustor from producer gas

Table 2. Summary of the Results of the September 19, 1983 Sulfur Dioxide Emission Test on the Combustor Outlet at the Bureau of Mines Coal Gasification Plant Located in Minneapolis, Minnesota

ITEM	Run 1	Run 2	Run 3
Time of test (HRS)	950-1050	1130-1230	1255-1355
SO ₂ concentration (PPM/dry)	286	293	292
(PPM/wet)	261	270	270
SO ₂ mass rate (LB/HR)	56	54	54
SO ₂ emission factor (LB/MMBTU) F-factor method	1.22	1.24	1.18

No difficulties were encountered in the field or in the laboratory evaluation of the flyash and sulfur dioxide samples. On the basis of this fact and a complete review of the entire data and results, it is our opinion that the particulate, sulfur dioxide, and oxides of nitrogen concentration emission rates and emission factors reported herein are accurate and closely reflect the actual values which existed at the time the tests were performed.

The results of all field and laboratory evaluations are presented in this section. Gas composition (Orsat and moisture) are presented first, followed by the computer printout of particulate, visible emission data and results of NO concentrations. Preliminary measurements including traverse point description are given in Appendices A and B.

The results have been calculated on a DEC PDP-11 Computer using standard Fortran programs. EPA-published equations have been used as the basis of the calculation techniques in these programs. It should be noted in interpreting these results that the particulate emission rates have been calculated by both the "concentration x flow" and the "ratio of areas" methods and the average reported. The average is the best estimate of the true value, since the bias introduced by anisokinetic sampling is approximately equal but of opposite sign in the two calculation techniques and thus cancels in the average.

3.1 Results of Orsat and Moisture Analyses

InterPoll Report No. 3-1628
U of M/ROM-Coal Gasification
Minneapolis, Minnesota

Test No. 1
Combustor Fan Inlet Duct

Results of Orsat & Moisture Analysis -- Methods 3 & 4 (% v/v)

Run 1

Date of run 09/19/83

Dry basis (orsat)*

carbon dioxide	.03
oxygen	20.90
carbon monoxide	.00
nitrogen	79.07

Wet basis (orsat)*

carbon dioxide	.03
oxygen	20.64
carbon monoxide	.00
nitrogen	78.07

Moisture content 1.27

Dry molecular weight 28.84

Wet molecular weight 28.70

Specific gravity
(relative to air) .9915

* Ambient air; sample not measured

FO M-13
.00

Interpoll Report No. 3-1628
U of M/BOM-Coal Gasification
Minneapolis, Minnesota

Test No. 1
Combustor Outlet

Results of Orsat & Moisture Analysis -- Methods 3 & 4 (% v/v)

	Run 1	Run 2	Run 3
Date of run	09/19/83	09/19/83	09/19/83
Dry basis (orsat)			
carbon dioxide	7.40	7.80	7.80
oxygen	12.20	12.20	11.80
carbon monoxide	.00	.00	.00
nitrogen	80.40	80.00	80.40
Wet basis (orsat)			
carbon dioxide	6.74	7.17	7.21
oxygen	11.11	11.22	10.90
carbon monoxide	.00	.00	.00
nitrogen	73.23	73.57	74.29
Moisture content	8.91	8.04	7.60
Dry molecular weight	29.67	29.74	29.72
Wet molecular weight	28.63	28.79	28.83
Specific gravity (relative to air)	.9890	.9946	.9958
Teledyne oxygen analyzer (velocity & time weighted avg.)			
	11.63	11.93	12.30

FO

1.18

M-14

1.12

1.17

Interpoll Report No. 3-1628
U of M/BOM-Coal Gasification
Minneapolis, Minnesota

Test No. 1
Scrubber Stack

Results of Orsat & Moisture Analysis -- Methods 3 & 4 (% v/v)

Run 1

Date of run 09/19/83

Dry basis (orsat)

carbon dioxide	1.46
oxygen	17.92
carbon monoxide	.00
nitrogen	80.62

Wet basis (orsat)

carbon dioxide	.90
oxygen	11.07
carbon monoxide	.00
nitrogen	49.79

Moisture content 38.24

Dry molecular weight 28.95

Wet molecular weight 24.76

Specific gravity
(relative to air) .8554

Test No. 1
Combustor Outlet

3.2 Results of Particulate Loading Determinations -- Method 5

	Run 1	Run 2	Run 3
Date of run	09/19/83	09/19/83	09/19/83
Time run start/end (HRS)	0950/1050	1130/1230	1255/1355
Pitot tube coefficient	.856	.856	.856
Water in sample			
condensate (ml)	56.0	56.0	56.0
silica gel (grams)	29.5	14.5	11.5
Total particulate material collected (grams) *	.0626	.0600	.0601
Meter correction coefficient	1.0030	1.0030	1.0030
Volume through gas meter			
at meter conditions...(CF)	41.87	38.90	39.50
standard conditions...(SCF)	41.15	37.99	38.65
Total sampling time (min)	60.0	60.0	60.0
Nozzle diameter (IN)	.374	.374	.374
Average stack gas temperature during determination (DEG-F)	1068	1221	1219
Volumetric flow			
actual.....(CFH)	64207	66436	66109
standard.....(DSCFH)	19630	18642	18662
Isokinetic variation (%)	102.2	99.4	101.0
Particle concentration			
actual.....(GR/ACF)	.0072	.0069	.0068
dry standard.....(GR/DSCF)	.0235	.0244	.0240
Particle mass flow (LB/HR)	4.00	3.88	3.86
Emission factor (LB/MMBTU)			
by F factor (320-F)	.080	.086	.089
by F factor (orstat)	.086	.089	.084

M-16

* Dry Catch Plus Organic Wet Catch
F factor: Run 1 =10636.0 Run 2 =10636.0 Run 3 =10636.0
10636.0

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U of M/BOM-Coal Gasification
Minneapolis, Minnesota

Test No. 1
Combustor Outlet

3.3 Results of Sulfur Dioxide Determinations -- Method 6

	Run 1	Run 2	Run 3
Date of run	9/19/83	9/19/83	9/19/83
Time run start/end (HRS)	950/1050	1130/1230	1255/1355
Average stack gas temperature during determination (DEG-F)	1068	1221	1219
Barometric Pressure (IN.HG.)	29.15	29.15	29.15
Meter Temperature (DEG-F)	67.1	69.8	68.8
meter correction coefficient	1.0030	1.0030	1.0030
Volume through gas meter			
at meter conditions...(CF)	41.89	38.90	39.50
standard conditions...(SCF)	41.15	37.99	38.65
Total sampling time (MIN)	60	60	60
moisture content (% v/v)	8.91	8.04	7.60
Oxygen content (% v/v dry)	12.20	12.20	11.80
Milliequivalents of SO ₂ in gas sample	27.7322	26.1964	26.5255
Sulfur dioxide concentration			
(GR/DSCF)	.3330	.3408	.3392
(MG/DSCM)	762	780	776
(PPM-dry)	286	293	292
(PPM-wet)	261	270	270
Dry standard volumetric flow (DSCFM)	19630	18642	18662
Sulfur dioxide mass rate (LB/HR)	56.03	54.45	54.25
Sulfur dioxide emission factor (LB/MMBTU)			
F-factor method*	1.216	1.244	1.164

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* F factor: Run 1 =10636.0 Run 2 =10636.0 Run 3 =10636.0

Test No. 1
 Scrubber Stack

3.4 Results of Opacity Observations - EPA Method 9

Percent Opacity	Optical Density	Relative Frequency (%)
0	.0000	100.00
5	.0223	.00
10	.0458	.00
15	.0703	.00
20	.0969	.00
25	.1249	.00
30	.1549	.00
35	.1871	.00
40	.2219	.00
45	.2596	.00
50	.3010	.00
55	.3468	.00
60	.3979	.00
65	.4559	.00
70	.5229	.00
75	.6021	.00
80	.6990	.00
85	.8239	.00
90	1.0000	.00
95	1.3010	.00
99	2.0000	.00
<hr/>		
.00	.00000	Time Average

Observer: D. Stock
 Cert. Date: 6/23/83
 Date of Observation: 9/19/83
 Time of Observation: 0900-0906

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Minneapolis, Minnesota

Test No. 1
Combuster Outlet

3.5 Results of NO Measurement--Monitor Labs Chemiluminescent NO
Analyzer

NO Concentration (PPM-DRY)		
Run 1	Run 2	Run 3
121	142	141
137	143	148
135	143	148
137	145	151
139	145	149
141	145	150
141	144	150
142	143	150
142	147	150
142	147	150
142	148	151
142	149	151
Average:	138.0	145.0
		149.0

APPENDIX N

Retort Pressure and Temperature Probe Data

Reference: Thimsen, Maurer et al (1984)

COAL: ELKHORN BITUMINOUS

5

COAL: ELKHORN BITUMINOUS

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 09/18/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	745	827
12	2.2		Blast Air (scfm)	1400	1400
18	2.6	1327			
24		1127			
30		1043	Saturation Temperature (deg C)	57.9	58.0
36	3.2	1038			
42	3.6	1004			
48		985			
54		968	Ashpit Pressure (inwc)	7.7	7.1
60	4.3	949			
66	4.7	932			
72		938			
78		752	Offtake Temperature (deg C)	420	445
84	5.2	527			

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008 COAL: ELKHORN BITUMINOUS
 DATE: 09/19/83
 RETORT ACCESS PORT NUMBER: 5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	916
0	1.0		Blast Air	1600
6	2.0		(scfm)	
12	2.4		Saturation	59.0
18	3.0		Temperature	
24	3.7		(deg C)	
30	4.1			
36	4.7	1021	Ashpit	10.0
42	5.0	996	Pressure	
48	5.3	979	(inwc)	
54	5.7	966		
60	6.0	954	Offtake	440
66	6.6	946	Temperature	
72	7.0	916	(deg C)	
78	7.1	649		
84	7.1			

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 09/22/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE PRESSURE (inwc) TEMPERATURE (deg C)

INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	840
0	3.0		Blast Air	2200
6	3.1		(scfm)	
12	4.0		Saturation	60.0
18	4.6		Temperature	
24	5.8		(deg C)	
30	6.2			
36	7.0	1029	Ashpit	18.5
42	7.6	1004	Pressure	
48	8.1	977	(inwc)	
54	8.8	949	Offtake	470
60	9.1	943	Temperature	
66	9.8	938	(deg C)	
72	10.1	866		
78	10.7	704		

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008
 DATE: 09/23/83
 RETORT ACCESS PORT NUMBER:

COAL: ELKHORN BITUMINOUS
 5

DATA: INCHES ABOVE GRATE PRESSURE (inwc) TEMPERATURE (deg C)

INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)
0	3.1	
6	3.2	
12	4.0	
18	5.0	
24	6.1	
30	6.7	
36	7.1	1068
42	7.9	1041
48	8.2	1021
54	8.7	996
60	9.1	977
66	9.6	968
72	10.0	832
78	10.6	638
84	10.6	466

TIME (hrs)	655	733
Blast Air (scfm)	2200	2200
Saturation Temperature (deg C)	61.0	60.5
Ashpit Pressure (inwc)	23.0	22.0
Offtake Temperature (deg C)	445	435

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 09/26/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	722	805
0	0.8		Blast Air (scfm)	1200	1200
6	0.9				
12	1.0		Saturation Temperature (deg C)	59.9	59.8
18	1.7				
24	1.9				
30	2.1				
36	2.3	1007			
42	2.7	982	Ashpit Pressure (inwc)	8.0	8.6
48	2.9	963			
54	3.1	946			
60	3.2	921	Offtake Temperature (deg C)	460	420
66	3.7	904			
72	3.9	832			
78	4.0	477			

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008
DATE: 09/27/83
RETORT ACCESS PORT NUMBER:

COAL: ELKHORN BITUMINOUS
5

DATA: INCHES ABOVE GRATE PRESSURE (inwc) TEMPERATURE (deg C)

INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)
0	1.8	
6	1.9	
12	2.0	
18	2.1	
24	2.3	
30	2.8	
36	3.0	1027
42	3.2	999
48	3.7	979
54	4.0	963
60	4.1	949
66	4.3	941
72	4.6	879
78	4.7	663

TIME (hrs)	721	800
Blast Air (scfm)	1400	1400
Saturation Temperature (deg C)	60.0	60.0
Ashpit Pressure (inwc)	11.3	12.5
Offtake Temperature (deg C)	435	435

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008
 DATE: 10/02/83
 RETORT ACCESS PORT NUMBER:

COAL: ELKHORN BITUMINOUS
 5

DATA:	INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	710	743
	0	8.0		Blast Air (scfm)	1800	1800
	6	8.2				
	12	9.0		Saturation Temperature (deg C)	60.0	60.0
	18	9.9				
	24	10.1				
	30	10.9				
	36	11.8	1077			
	42	12.1	1041	Ashpit Pressure (inwc)	21.6	20.6
	48	12.3	1013			
	54	12.8	993			
	60	12.9	977			
	66	13.1	952	Offtake Temperature (deg C)	425	460
	72	13.3	916			
	78	13.6	593			

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008
DATE: 10/03/83
RETORT ACCESS PORT NUMBER:

COAL: ELKHORN BITUMINOUS
5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	753	827
0	2.0		Blast Air	1800	1800
6	2.1		(scfm)		
12	2.9		Saturation	59.0	59.0
18	3.8		Temperature		
24	4.9		(deg C)		
30	5.9				
36	6.3	1043			
42	7.0	1018	Ashpit	18.8	18.2
48	7.8	999	Pressure		
54	7.9	954	(inwc)		
60	8.1	949			
66	8.8	954	Offtake	420	433
72	9.1	763	Temperature		
78	9.6	532	(deg C)		
84	9.7	460			

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 10/04/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	933	940
0	0.8		Blast Air (scfm)	1000	1000
6	1.0				
12	1.3		Saturation Temperature (deg C)	59.0	59.0
18	1.4				
24	1.9				
30	2.0				
36	2.5	935	Ashpit Pressure (inwc)	8.0	7.5
42	2.9	882			
48	3.2	863			
54	3.5	843			
60	4.0	838	Offtake Temperature (deg C)	444	444
66	4.2	832			
72	4.6	835			
78	4.9	699			
84	5.0	454			

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 10/05/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	735	850
0	1.1		Blast Air	1200	1200
6	1.2		(scfm)		
12	2.2				
18	2.3		Saturation	59.0	59.0
24	2.4		Temperature		
30	2.5		(deg C)		
36	2.6	1124			
42	2.8	1071	Ashpit	9.4	9.0
48	2.9	1038	Pressure		
54	3.1	1004	(inwc)		
60	3.3	979			
66	3.4	949	Offtake	456	452
72	4.0	927	Temperature		
78	4.1	677	(deg C)		
84	4.2	427			

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 10/06/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	830	900
36		1338	Blast Air (scfm)	1400	1400
42		1260			
48		1154	Saturation Temperature (deg C)	59.0	60.0
54		1060			
60		1016			
66		960			
72		929			
78		677	Ashpit Pressure (inwc)	10.8	11.4
84		496			
			Offtake Temperature (deg C)	468	509

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 10/09/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	1505	1525
0	2.1		Blast Air	2100	2100
6	2.1		(scfm)		
12	2.8		Saturation	61.0	61.0
18	3.1		Temperature		
24	3.8		(deg C)		
30	4.2				
36	4.9	1132			
42	5.7	1071	Ashpit	22.5	25.5
48	6.0	1021	Pressure		
54	6.6	1010	(inwc)		
60	7.1	899			
66	7.8	588	Offtake	494	470
72	8.2	471	Temperature		
			(deg C)		

RETORT TEMPERATURE AND PRESSURE PROBE DATA

TEST: BOM/FGT-008

COAL: ELKHORN BITUMINOUS

DATE: 10/12/83

RETORT ACCESS PORT NUMBER:

5

DATA: INCHES ABOVE GRATE	PRESSURE (inwc)	TEMPERATURE (deg C)	TIME (hrs)	
36		1027	Blast Air	910
42		1004	(scfm)	1800
48		977		
54		960	Saturation Temperature	60.0
60		949	(deg C)	
66		921		
72		741		
78		532	Ashpit Pressure	29.8
84		399	(inwc)	
			Offtake Temperature	400
			(deg C)	