



AIR HYGIENE, INC.

Testing Solutions for a Better World

**EMISSION COMPLIANCE TEST
FOR THE
MITSUBISHI, MODEL 501G, UNIT 1A
PREPARED FOR
FLORIDA POWER AND LIGHT
AT THE
WEST COUNTY ENERGY CENTER
LOXAHATCHEE, FLORIDA
OCTOBER 7-8, 2009**



AIR HYGIENE, INC.

Corporate Headquarters
5634 S. 122nd E. Ave. Ste. F
Tulsa, Oklahoma 74146

Las Vegas Office
5925 E. Lake Mead Blvd.
Las Vegas, Nevada 89156

Philadelphia Office
8900 State Road
Philadelphia, Pennsylvania 19136

Houston Office
1920 Treble Drive
Humble, Texas 77338

(918) 307-8865 or (888) 461-8778
www.airhygiene.com

RECEIVED

NOV 18 2009

BUREAU OF AIR REGULATION

EMISSION COMPLIANCE TEST
FOR THE
MITSUBISHI, MODEL 501G, UNIT 1A
PREPARED FOR
FLORIDA POWER AND LIGHT
AT THE
WEST COUNTY ENERGY CENTER
LOXAHATCHEE, FLORIDA
OCTOBER 7-8, 2009

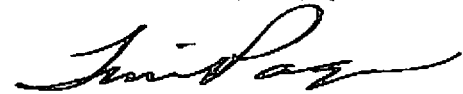
Prepared and Reviewed by:



Thomas K. Graham, P.E., QSTI, Director of Operations



Paul Little, Director of Customer Service



Tim Page, Test Technician



Jake Fahlenkamp, QSTI, Director of Quality Assurance

Table of Contents

1.0	INTRODUCTION	1
1.1	TEST PURPOSE AND OBJECTIVES	1
1.2	SUMMARY OF TEST PROGRAM	1
1.2.1	Participating Organizations	1
1.2.2	Industry	1
1.2.3	Air Permit and Federal Requirements	1
1.2.4	Plant Location	1
1.2.5	Equipment Tested	1
1.2.6	Emission Points	2
1.2.7	Pollutants Measured	2
1.2.8	Dates of Emission Test	2
1.3	KEY PERSONNEL	2
2.0	SUMMARY OF TEST RESULTS	2
3.0	SOURCE OPERATION	4
3.1	PROCESS DESCRIPTION	4
3.2	SAMPLING LOCATION	4
4.0	SAMPLING AND ANALYTICAL PROCEDURES	5
4.1	TEST METHODS	5
4.2	INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS	5

APPENDICES

Appendix A	Test Results and Calculations
Appendix B	Emission Data Records
Appendix C	Calibration Gas Certifications
Appendix D	Quality Assurance and Quality Control Data
Appendix E	Fuel Analysis Records
Appendix F	Stratification Test Data

**Emissions Compliance Test
Mitsubishi, Model 501G, Unit 1A
Florida Power and Light
West County Energy Center
Loxahatchee, Florida
October 7-8, 2009**

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the emissions testing study for nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), ammonia (NH₃), opacity, carbon dioxide (CO₂), and oxygen (O₂) from the exhaust of the Mitsubishi, Model 501G, Unit 1A for Florida Power and Light at the West County Energy Center near Loxahatchee, Florida. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on October 7-8, 2009.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to conduct an initial compliance emission test to document levels of selected pollutants at two test loads (Base Load and Base Load with Duct Burners). The information will be used to confirm compliance with the operating permit issued by the Florida Department of Environmental Protection (FDEP). The specific objective was to determine the emission concentration of NO_x, CO, VOC, NH₃, opacity, CO₂, and O₂ from the exhaust of Florida Power and Light's Mitsubishi, Model 501G, Unit 1A at Base Load and Base Load with Duct Burners of total capacity.

1.2 SUMMARY OF TEST PROGRAM

The following list details pertinent information related to this specific project:

- 1.2.1 Participating Organizations
 - Florida Department of Environmental Protection (FDEP)
 - Florida Power and Light
 - Black and Veatch
 - Air Hygiene
- 1.2.2 Industry
 - Electric Utility / Electric Services
- 1.2.3 Air Permit and Federal Requirements
 - Permit Number: PSD-FL-354
 - Emission Unit Identification (ID): 001
- 1.2.4 Plant Location
 - West County Energy Center near Loxahatchee, Florida
- 1.2.5 Equipment Tested
 - Mitsubishi, Model 501G, Unit 1A

1.2.6 Emission Points

- Exhaust from the Mitsubishi, Model 501G, Unit 1A
- For all gases, one sample point in the exhaust duct from the Mitsubishi, Model 501G, Unit 1A, determined after conducting a stratification test (refer to Appendix F)
- For all NH₃ testing, 24 sampling points in the exhaust duct from the Mitsubishi, Model 501G, Unit 1A (refer to Appendix A)
- For opacity, one sample visual observation point from the exit of the exhaust duct to the atmosphere from the Mitsubishi, Model 501G, Unit 1A

1.2.7 Pollutants Measured

- NO_x
- CO
- VOC
- NH₃
- Opacity
- CO₂
- O₂

1.2.8 Dates of Emission Test

- October 7-8, 2009

1.3 KEY PERSONNEL

Florida Power and Light:	John Mirino	305-242-3895
Florida Power and Light:	David Fawcett	561-904-4907
Florida Power and Light:	Emmett Callow	561-904-4922
Black and Veatch:	Bill Stevenson	913-458-8549
FDEP:	Michael Helmke	561-837-5936
Air Hygiene:	Jake Fahlenkamp	918-307-8865
Air Hygiene:	Tim Page	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on Florida Power and Light's Mitsubishi, Model 501G, Unit 1A located at the West County Energy Center on October 7-8, 2009 are summarized in the following table.

**TABLE 2.1
SUMMARY OF MITSUBISHI, 501G, UNIT #1A RESULTS**

Parameter	Base W/O DB Load	Permit Limits	Base W/DB Load	Permit Limits
Run Duration (min / run)	60	–	60	–
Bar. Pressure (in. Hg)	29.96	–	29.89	–
Amb. Temp. (°F)	91	–	92	–
Rel. Humidity (%)	80	–	63	–
Spec. Humidity (lb water / lb air)	0.025266	–	0.020348	–
Avg. Stack Temp. (°F)	187	–	176	–
Turbine Fuel Flow (lb/min)	1,834	–	1,626	–
Duct Burner Fuel Flow (lb/min)	0	–	200	–
Total Fuel Flow (SCFH)	2,556,425	–	2,544,963	–
Stack Flow (RM19) (SCFH)	57,323,606	–	51,359,105	–
Stack Moisture (% Method 4)	11.1	–	11.1	–
Power Output (megawatts)	248.5	–	247.7	–
NOx (ppmvd)	2.57	–	2.89	–
NOx (ppm@15%O ₂)	1.90	2.0	1.92	2.0
NOx (ppm@15%O ₂ &ISO)	2.48	–	2.28	–
NOx (lb/hr)	17.61	20.0	17.74	24.2
NOx (ton/year) at 8760 hr/year	77.14	–	77.70	–
NOx (lb/MMBtu)	0.007	–	0.007	–
CO (ppmvd)	0.45	–	3.15	–
CO (ppm@15%O ₂)	0.33	4.1	2.10	7.6
CO (ppm@15%O ₂ &ISO)	0.44	–	2.52	–
CO (lb/hr)	1.87	23.2	11.76	52.5
CO (ton/year) at 8760 hr/year	8.19	–	51.51	–
CO (lb/MMBtu)	0.001	–	0.005	–
VOC (ppmvd)	0.34	–	0.51	–
VOC (ppm@15%O ₂)	0.25	1.2	0.34	1.5
VOC (ppm@15%O ₂ &ISO)	0.31	–	0.41	–
VOC (lb/hr)	0.80	4.1	1.10	5.4
VOC (ton/year) at 8760 hr/year	3.52	–	4.80	–
VOC (lb/MMBtu)	0.000	–	0.000	–
Sulfur (gr S/100 scf)	0.0054	2	0.0054	2
NH ₃ (ppmvd)	2.59	–	2.48	–
NH ₃ (ppm@15%O ₂)	1.91	5.0	1.65	5.0
NH ₃ (lb/hr)	6.56	–	5.63	–
Opacity (%)	0	10	0	10
CO ₂ (%)	4.52	–	5.14	–
O ₂ (%)	12.91	–	12.02	–

The results of all measured pollutant emissions were below the required limits. All testing was performed without any real or apparent errors. All testing was conducted according to the approved testing protocol. Total hydrocarbons (THC) were report as VOC. Fuel Analysis, for C1-C6 and fuel sulfur content, was taken on October 7 and 8, 2009. The sample taken on October 8, 2009 contained insufficient sample for C1-C6 or fuel sulfur content analysis. The C1-C6 and fuel sulfur content analyses for both October 7 and 8, 2009 were obtained from the October 7, 2009 sample (Appendix E).

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

Florida Power and Light (FPL) owns and operates the West County Energy Center (West County) located at 20505 State Road 80 in Loxahatchee, Florida. West County is a nominal 2,500 megawatt (MW) greenfield power plant and consists of two combined cycle units (Unit 1 and 2). Each combined cycle unit consists of: three nominal 250 MW Mitsubishi Model 501G combustion turbine-electrical generator (CTGs) sets with evaporative inlet cooling systems; three supplementary-fired heat recovery steam generators (HRSGs) with selective catalytic reduction (SCR) reactors; one nominal 428 million British thermal units per hour (MMBtu/hour) based on low heat value (LHV) natural gas-fired duct burner (DB) located within each of the three HRSG's; and a common nominal 500 MW steam turbine-electrical generator (STG). The total nominal generating capacity of each of the "3 on 1" combined cycle units is approximately 1,250 MW.

Each CTG has a nominal heat input rate of 2,333 MMBtu/hr when firing natural gas and 2,117 MMBtu/hr when firing distillate fuel oil (based on a compressor inlet air temperature of 59 degrees Fahrenheit (°F), the lower heating value (LHV) of each fuel, and 100 percent load), includes an automated gas turbine control system, and has dual-fuel capability of firing natural gas as the primary fuel or ultra low sulfur distillate (ULSD) fuel oil as a restricted alternate fuel. Each HRSG recovers exhaust, heat energy from each of the CTGs. Each Unit delivers steam to each STG. The efficient combustion of natural gas and restricted firing of ULSD fuel oil minimizes the emissions of carbon monoxide (CO), particulate matter (PM), sulfuric acid mist (H₂SO₄), sulfur dioxide (SO₂) and volatile organic compounds (VOCs). Dry Low-NO_x (DLN) combustors for gas firing and water injection for oil firing reduce nitrogen oxides (NO_x) emissions. A selective catalyst reduction (SCR) system further reduces NO_x emissions.

3.2 SAMPLING LOCATION

The 501G stack is circular and measures 21.95 feet (ft) (263.38 inches) in diameter at the test ports which are approximately 138 ft above grade level with an exit elevation of approximately 150 ft above grade level. The test ports are located approximately 44.31 ft (531.75 inches) downstream and approximately 12 ft (144 inches) upstream from the nearest disturbances. All exhaust samples for gaseous emissions were continuously drawn from the exhaust system at the sample ports from a single point determined after conducting a stratification test (Appendix F). During the stratification test three points were traversed from each of the four ports. The probe was allowed to remain at a point for two times the system response time. For NH₃ testing, an initial velocity traverse was performed across the stack at base load from 24 total points. All NH₃ sampling occurred from the same 24 points by leaving the probe at each for an equal amount of time. All opacity observations were made by viewing the point where the exhaust system exited to the atmosphere at the top of the exhaust stack.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Mitsubishi, Model 501G, Unit 1A at the West County Energy Center was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on October 7-8, 2009.

**TABLE 4.1
SUMMARY OF SAMPLING METHODS**

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Stack Flow Rate	EPA Method 2	Pitot
Oxygen	EPA Method 3a	Paramagnetic Cell
Carbon Dioxide	EPA Method 3a	Nondispersive Infrared Analyzer
Nitrogen Oxides	EPA Method 7e	Chemiluminescent Analyzer
Opacity	EPA Method 9	Visual Observation
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer
Stack Flow Rate	EPA Method 19	Dry Oxygen F Factor
Total Hydrocarbons	EPA Method 25a	Flame Ionization Detector
Ammonia Slip	EPA CTM-027	Ion Chromatography M350.3
Sulfur Content Analysis	ASTM D 6667	Fuel Gas Sample and Laboratory Analysis

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 2, 3a, 7e, 9, 10, 19, 25a, and Conditional Test Method (CTM)-027.

Figure 4.1 depicts the sample system used for the NO_x, CO, THC, CO₂, and O₂ tests. A stainless steel probe was inserted into the sample ports of the stack to extract gas measurements from the emission stream at a single point in the stack determined after passing an initial stratification test. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the NO_x, CO, CO₂, and O₂ analyzers through rotameters that controlled the flow rate of the sample. Exhaust samples were routed to the THC analyzer prior to gas conditioning.

Figure 4.1 shows that the sample system was also equipped with a separate path through which a calibration gas could be delivered to the probe and back through the entire sampling system. This allowed for convenient performance of system bias checks as required by the testing methods.

All instruments were housed in an air-conditioned, trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e. NO_x calibration gases).

Table 4.2 provides a description of the analyzers used for the instrument portion of the tests. All data from the continuous monitoring instruments were recorded on a Logic Beach Portable Data Logging System Hyperlogger which retrieves calibrated electronic data from each instrument every one second and reports an average of the collected data every 30 seconds. Data records can be found in Appendix A and B of this report.

Figure 4.2 represents the sample system used for the wet chemistry tests (NH₃). A heated stainless steel probe with an inconel liner and stainless steel nozzle was inserted into the sample ports of the stack to extract gas measurements from the emission stream through a filter and glass impinger train. Flow rates are monitored with oil filled manometers and total sample volumes are measured with a dry gas meter.

Three test runs of approximately 60 minutes each were conducted on the Mitsubishi, Model 501G, Unit 1A at each of the multiple test loads for NO_x, CO, THC, CO₂, NH₃, opacity, and O₂.

The stack gas analysis for O₂ and CO₂ concentrations was performed in accordance with procedures set forth in EPA Method 3a. The O₂ analyzer uses a paramagnetic cell detector and the CO₂ analyzer uses a continuous nondispersive infrared analyzer.

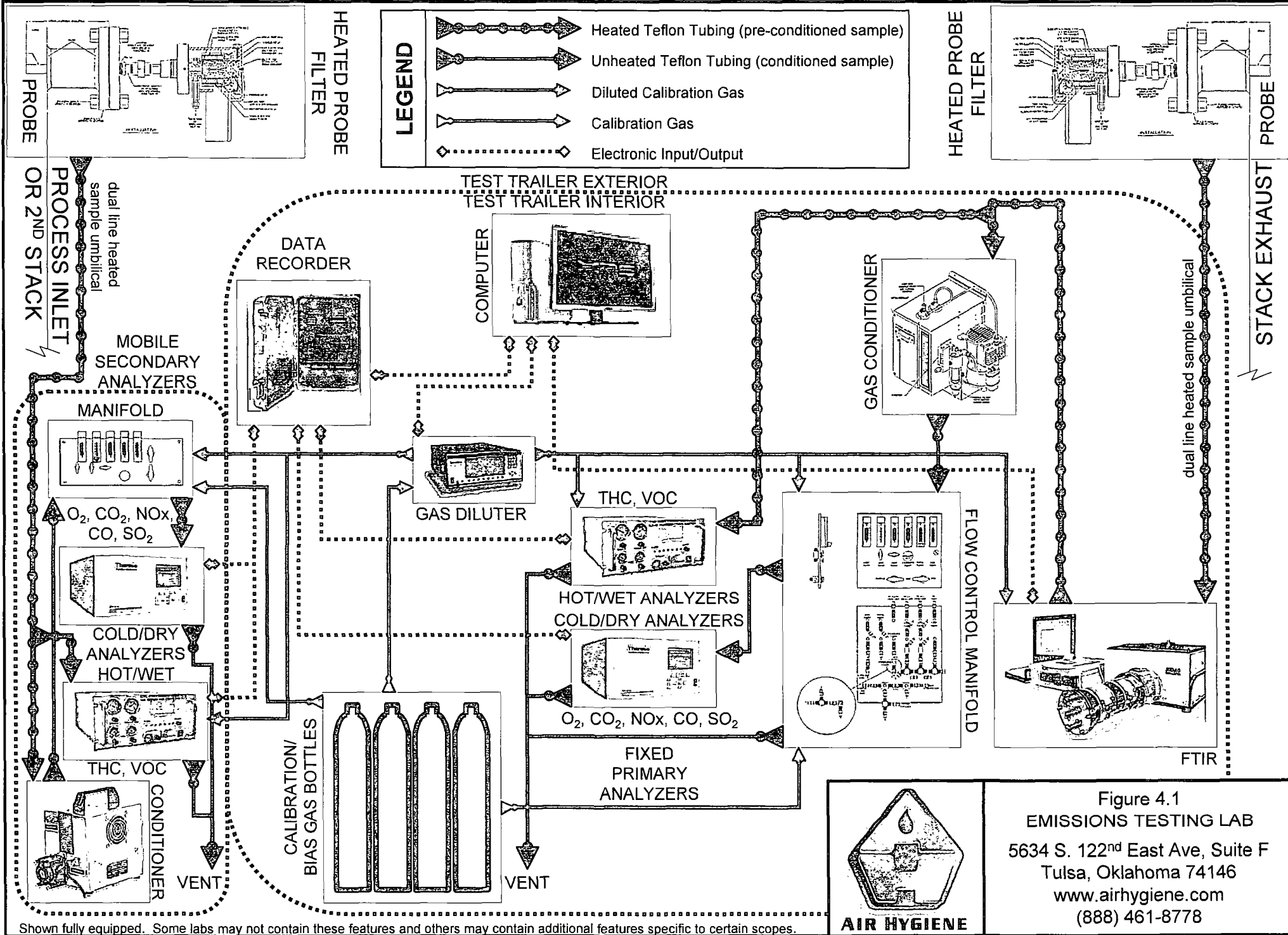
EPA Method 7e was used to determine concentrations of NO_x. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO₂ in nitrogen certified gas cylinder was used to verify at least a 90 percent NO₂ conversion on the day of the test.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

THC emission concentrations were quantified in accordance with procedures set forth in EPA Method 25a. A continuous flame ionization (FID) analyzer was used for this purpose. THC emission concentrations were reported as VOC.

**TABLE 4.2
ANALYTICAL INSTRUMENTATION**

Parameter	Model and Manufacturer	Range	Sensitivity	Detection Principle
NO _x	THERMO 42C	User may select up to 5,000 ppm	0.1 ppm	Thermal reduction of NO ₂ to NO. Chemiluminescence of reaction of NO with O ₃ . Detection by PMT. Inherently linear for listed ranges.
CO	THERMO 48C	User may select up to 5,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
CO ₂	CAI 200	0-20%	0.1%	Non-dispersive infrared.
THC	THERMO 51	User may select up to 10,000 ppm	0.1 ppm	Flame Ionization Detector.
O ₂	CAI 200	0-25%	0.1%	Paramagnetic cell, inherently linear.



Shown fully equipped. Some labs may not contain these features and others may contain additional features specific to certain scopes.

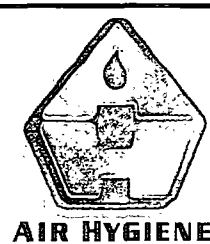
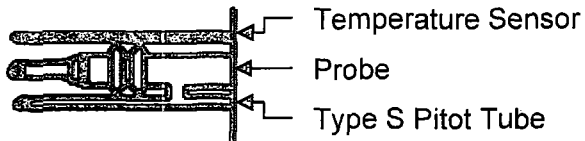
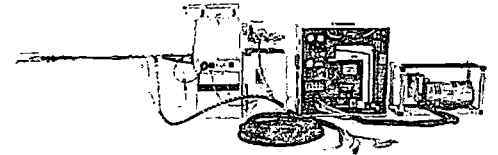


Figure 4.1
 EMISSIONS TESTING LAB
 5634 S. 122nd East Ave, Suite F
 Tulsa, Oklahoma 74146
 www.airhygiene.com
 (888) 461-8778



View of Probe End
(from the bottom)



Wet Chemistry Assembly
(photo)

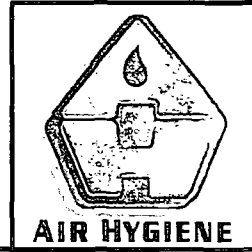
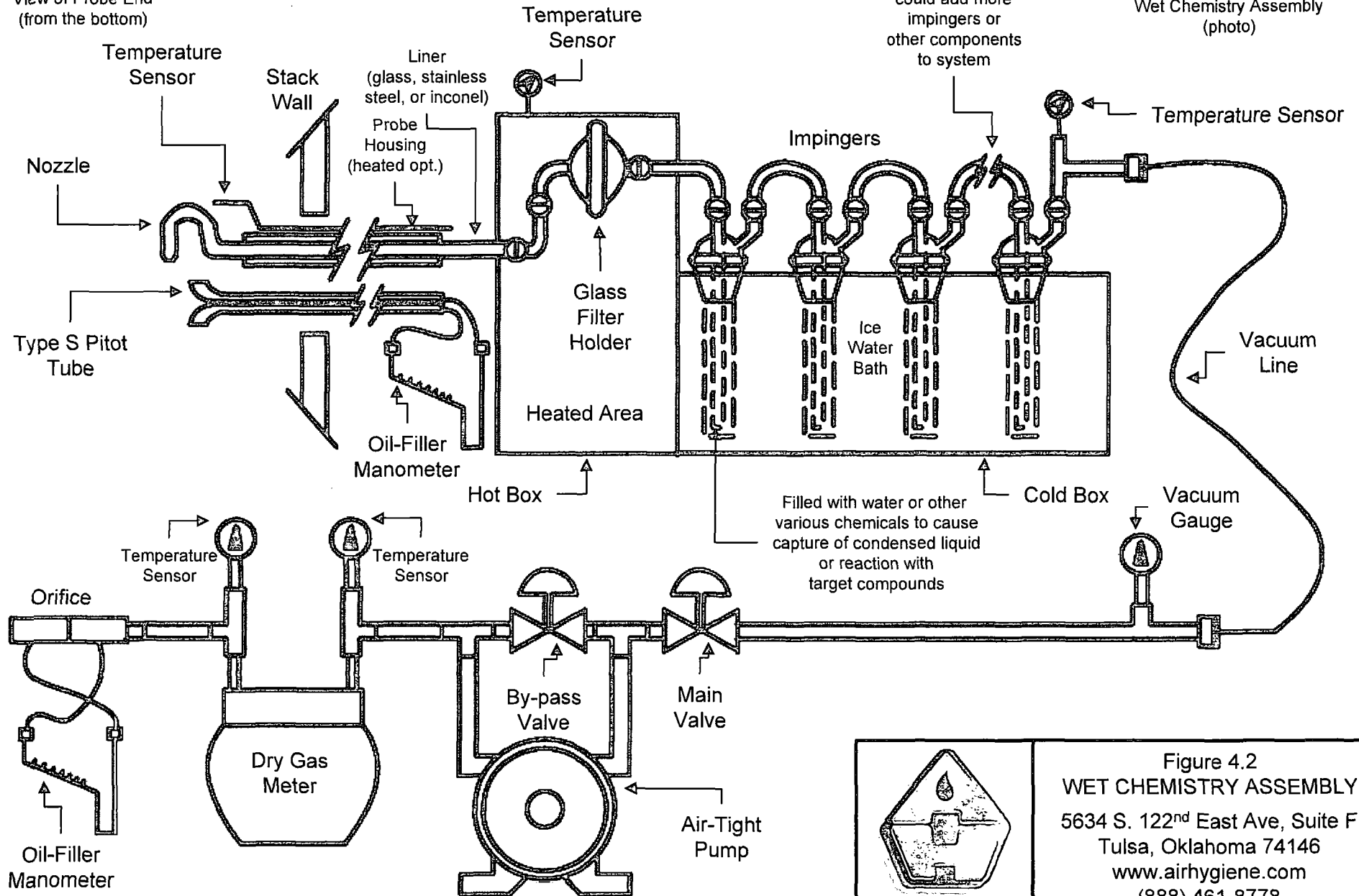


Figure 4.2
WET CHEMISTRY ASSEMBLY
 5634 S. 122nd East Ave, Suite F
 Tulsa, Oklahoma 74146
 www.airhygiene.com
 (888) 461-8778

APPENDIX A
TEST RESULTS AND CALCULATIONS

**TABLE A.1:
EMISSIONS TESTING SCHEDULE**

Unit	Load	Test Type	Run	Date	Start	Stop
1A	Base W/Db	Stratification Test	1	10/07/09	14:50:38	15:26:38
1A	Base W/O Db	Compliance	1-1	10/08/09	7:58:05	8:57:35
1A	Base W/O Db	Compliance	1-2	10/08/09	9:15:05	10:14:35
1A	Base W/O Db	Compliance	1-3	10/08/09	10:30:05	11:29:35
1A	Base W/Db	Compliance	2-1	10/07/09	16:05:28	17:04:58
1A	Base W/Db	Compliance	2-2	10/07/09	17:18:28	18:17:58
1A	Base W/Db	Compliance	2-3	10/07/09	18:32:28	19:31:58
1A	Base W/DB	Preliminaries	Base W/DB-V1	10/07/09	14:53:00	15:39:00
1A	Base W/DB	Ammonia	2-1	10/07/09	16:05:00	17:09:00
1A	Base W/DB	Ammonia	2-2	10/07/09	17:18:00	18:25:00
1A	Base W/DB	Ammonia	2-3	10/07/09	18:32:00	19:42:00
1A	Base W/O DB	Ammonia	1-1	10/08/09	7:38:00	8:45:00
1A	Base W/O DB	Ammonia	1-2	10/08/09	9:00:00	10:08:00
1A	Base W/O DB	Ammonia	1-3	10/08/09	10:17:00	11:24:00

TABLE A.2
mitsubishi, 501G, UNIT #1A BASE W/O DB LOAD DATA SUMMARY

Parameter	Base W/O Db Load, Run - 1-1	Base W/O Db Load, Run - 1-2	Base W/O Db Load, Run - 1-3	Average
Run Duration (min / run)	60	60	60	60
Bar. Pressure (in. Hg)	29.91	29.97	30.00	29.96
Amb. Temp. (°F)	92	85	96	91
Rel. Humidity (%)	92	85	63	80
Spec. Humidity (lb water / lb air)	0.030394	0.022187	0.023218	0.025266
Avg. Stack Temp. (°F)	184	188	188	187
Turbine Fuel Flow (lb/min)	1,836	1,830	1,835	1,834
Duct Burner Fuel Flow (lb/min)	0	0	0	0
Total Fuel Flow (SCFH)	2,559,213	2,552,010	2,558,051	2,556,425
Stack Flow (RM19) (SCFH)	57,380,775	57,289,441	57,300,602	57,323,606
Stack Moisture (% Method 4)	11.1	10.7	11.6	11.1
Power Output (megawatts)	248.6	248.0	249.0	248.5
NOx (ppmvd)	2.49	2.58	2.65	2.57
NOx (ppm@15%O ₂)	1.84	1.91	1.95	1.90
NOx (ppm@15%O ₂ &ISO)	2.64	2.39	2.42	2.48
NOx (lb/hr)	17.05	17.68	18.11	17.61
NOx (ton/year) at 8760 hr/year	74.69	77.44	79.31	77.14
NOx (lb/MMBtu)	0.007	0.007	0.007	0.007
CO (ppmvd)	0.65	0.44	0.26	0.45
CO (ppm@15%O ₂)	0.48	0.33	0.19	0.33
CO (ppm@15%O ₂ &ISO)	0.69	0.41	0.24	0.44
CO (lb/hr)	2.70	1.84	1.07	1.87
CO (ton/year) at 8760 hr/year	11.81	8.06	4.70	8.19
CO (lb/MMBtu)	0.001	0.001	0.000	0.001
VOC (ppmvd)	-0.04	0.18	0.87	0.34
VOC (ppm@15%O ₂)	-0.03	0.13	0.64	0.25
VOC (ppm@15%O ₂ &ISO)	-0.04	0.16	0.80	0.31
VOC (lb/hr)	-0.09	0.42	2.08	0.80
VOC (ton/year) at 8760 hr/year	-0.41	1.86	9.11	3.52
VOC (lb/MMBtu)	0.000	0.000	0.001	0.000
Sulfur (gr S/100 scf)	0.0054	0.0054	0.0054	0.0054
NH ₃ (ppmvd)	2.89	1.74	3.14	2.59
NH ₃ (ppm@15%O ₂)	2.13	1.28	2.32	1.91
NH ₃ (lb/hr)	7.32	4.40	7.96	6.56
Opacity (%)	0	0	0	0
CO ₂ (%)	4.56	4.45	4.55	4.52
O ₂ (%)	12.91	12.92	12.90	12.91

**TABLE A.3
MITSUBISHI, 501G, UNIT #1A BASE W/DB LOAD DATA SUMMARY**

Parameter	Base W/Db Load, Run - 2-1	Base W/Db Load, Run - 2-2	Base W/Db Load, Run - 2-3	Average
Run Duration (min / run)	60	60	60	60
Bar. Pressure (in. Hg)	29.91	29.88	29.88	29.89
Amb. Temp. (°F)	93	92	91	92
Rel. Humidity (%)	57	51	80	63
Spec. Humidity (lb water / lb air)	0.019088	0.016507	0.025450	0.020348
Avg. Stack Temp. (°F)	176	176	176	176
Turbine Fuel Flow (lb/min)	1,635	1,638	1,605	1,626
Duct Burner Fuel Flow (lb/min)	200	200	200	200
Total Fuel Flow (SCFH)	2,556,889	2,561,536	2,516,462	2,544,963
Stack Flow (RM19) (SCFH)	51,465,079	51,863,052	50,749,184	51,359,105
Stack Moisture (% Method 4)	10.9	10.2	12.1	11.1
Power Output (megawatts)	248.8	249.6	244.8	247.7
NOx (ppmvd)	2.92	2.91	2.84	2.89
NOx (ppm@15%O ₂)	1.93	1.94	1.89	1.92
NOx (ppm@15%O ₂ &ISO)	2.23	2.14	2.48	2.28
NOx (lb/hr)	17.94	18.04	17.24	17.74
NOx (ton/year) at 8760 hr/year	78.57	79.04	75.49	77.70
NOx (lb/MMBtu)	0.007	0.007	0.007	0.007
CO (ppmvd)	2.86	2.76	3.84	3.15
CO (ppm@15%O ₂)	1.90	1.84	2.55	2.10
CO (ppm@15%O ₂ &ISO)	2.19	2.03	3.35	2.52
CO (lb/hr)	10.71	10.39	14.18	11.76
CO (ton/year) at 8760 hr/year	46.91	45.53	62.09	51.51
CO (lb/MMBtu)	0.004	0.004	0.006	0.005
VOC (ppmvd)	0.79	0.28	0.48	0.51
VOC (ppm@15%O ₂)	0.52	0.19	0.32	0.34
VOC (ppm@15%O ₂ &ISO)	0.60	0.21	0.41	0.41
VOC (lb/hr)	1.68	0.61	1.00	1.10
VOC (ton/year) at 8760 hr/year	7.36	2.66	4.39	4.80
VOC (lb/MMBtu)	0.001	0.000	0.000	0.000
Sulfur (gr S/100 scf)	0.0054	0.0054	0.0054	0.0054
NH ₃ (ppmvd)	2.32	2.42	2.70	2.48
NH ₃ (ppm@15%O ₂)	1.54	1.62	1.79	1.65
NH ₃ (lb/hr)	5.29	5.56	6.05	5.63
Opacity (%)	0	0	0	0
CO ₂ (%)	5.11	5.10	5.20	5.14
O ₂ (%)	12.00	12.05	12.01	12.02

TEST RESULTS

**NO_x, CO, VOC, CO₂, and O₂ Emissions
Base Load**

Florida Power and Light
 October 8, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data

Fuel Fd factor	8,642	SCF exh/MMBtu
Fuel Heating Value (HFV)	992	Btu/SCF fuel
Turbine Fuel Flow	1,836	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,559,213	SCFH

Weather Data

Barometric Pressure	29.91	in. Hg
Relative Humidity	92	%
Ambient Temperature	92	°F
Specific Humidity	0.030394	lb H ₂ O / lb air

Unit Data

Unit Load	248.6	megawatts
Combustor Inlet Pressure	267	psig
Meas. Stack Moisture	11.1	%
Stack Exhaust Flow (M19)	57,360,775	SCFH

Data from: NHO Run 1

Base W/O Db Load, Run - 1-1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmv)	CO (ppmv)	VOC (ppmv)	CO ₂ (%)
10/08/09 07:58:05	3150	12.86	2.81	0.68	0.00	4.88
10/08/09 07:58:35	3180	12.86	2.77	0.69	0.00	4.84
10/08/09 07:59:05	3210	12.87	2.74	0.69	0.00	4.93
10/08/09 07:59:35	3240	12.87	2.79	0.70	0.00	4.85
10/08/09 08:00:05	3270	12.89	2.76	0.67	0.00	4.81
10/08/09 08:00:35	3300	12.88	2.68	0.69	0.00	4.95
10/08/09 08:01:05	3330	12.86	2.79	0.62	0.00	4.86
10/08/09 08:01:35	3360	12.87	2.82	0.73	0.00	4.97
10/08/09 08:02:05	3390	12.86	2.83	0.70	0.00	4.84
10/08/09 08:02:35	3420	12.86	2.79	0.73	0.00	4.93
10/08/09 08:03:05	3450	12.86	2.78	0.71	0.00	4.84
10/08/09 08:03:35	3480	12.87	1.79	0.72	0.00	4.92
10/08/09 08:04:05	3510	12.87	2.74	0.71	0.00	4.85
10/08/09 08:04:35	3540	12.87	2.72	0.68	0.00	4.85
10/08/09 08:05:05	3570	12.88	2.84	0.70	0.00	4.81
10/08/09 08:05:35	3600	12.87	2.74	0.62	0.00	4.82
10/08/09 08:06:05	3630	12.88	2.78	0.70	0.00	4.88
10/08/09 08:06:35	3660	12.88	2.76	0.72	0.00	4.93
10/08/09 08:07:05	3690	12.87	2.73	0.70	0.00	4.91
10/08/09 08:07:35	3720	12.87	2.76	0.69	0.00	4.90
10/08/09 08:08:05	3750	12.87	2.70	0.68	0.00	4.81
10/08/09 08:08:35	3780	12.88	2.74	0.70	0.00	4.82
10/08/09 08:09:05	3810	12.87	2.72	0.71	0.00	4.87
10/08/09 08:09:35	3840	12.87	2.73	0.72	0.00	4.96
10/08/09 08:10:05	3870	12.87	2.67	0.66	0.00	4.91
10/08/09 08:10:35	3900	12.87	2.70	0.68	0.00	4.92
10/08/09 08:11:05	3930	12.88	2.72	0.62	0.00	4.98
10/08/09 08:11:35	3960	12.87	2.75	0.74	0.00	4.84
10/08/09 08:12:05	3990	12.86	2.69	0.70	0.00	4.88
10/08/09 08:12:35	4020	12.86	2.66	0.72	0.00	4.89
10/08/09 08:13:05	4050	12.85	2.69	0.73	0.00	4.84
10/08/09 08:13:35	4080	12.86	2.65	0.73	0.00	4.91
10/08/09 08:14:05	4110	12.85	2.64	0.69	0.00	4.83
10/08/09 08:14:35	4140	12.86	2.68	0.68	0.00	4.96
10/08/09 08:15:05	4170	12.88	2.72	0.69	-0.01	4.82
10/08/09 08:15:35	4200	12.87	2.62	0.69	-0.01	4.93
10/08/09 08:16:05	4230	12.87	2.69	0.68	-0.01	4.95
10/08/09 08:16:35	4260	12.88	2.67	0.70	-0.01	4.96
10/08/09 08:17:05	4290	12.88	2.56	0.65	0.00	4.91
10/08/09 08:17:35	4320	12.88	2.60	0.67	0.00	4.92
10/08/09 08:18:05	4350	12.88	2.50	0.72	0.00	4.96
10/08/09 08:18:35	4380	12.88	2.49	0.71	0.00	4.92
10/08/09 08:19:05	4410	12.87	2.43	0.69	0.00	4.85
10/08/09 08:19:35	4440	12.86	2.49	0.72	0.00	4.96
10/08/09 08:20:05	4470	12.85	2.48	0.70	0.00	4.80
10/08/09 08:20:35	4500	12.86	2.49	0.71	0.00	4.84
10/08/09 08:21:05	4530	12.87	2.52	0.71	0.00	4.94
10/08/09 08:21:35	4560	12.86	2.51	0.73	0.00	4.85
10/08/09 08:22:05	4590	12.88	2.60	0.71	0.00	4.83
10/08/09 08:22:35	4620	12.87	2.49	0.72	0.00	4.97
10/08/09 08:23:05	4650	12.87	2.45	0.71	0.00	4.83
10/08/09 08:23:35	4680	12.87	2.37	0.70	0.00	4.86
10/08/09 08:24:05	4710	12.87	2.45	0.73	0.00	4.87
10/08/09 08:24:35	4740	12.87	2.50	0.66	0.00	4.92
10/08/09 08:25:05	4770	12.86	2.44	0.64	0.00	4.86
10/08/09 08:25:35	4800	12.87	2.51	0.75	0.00	4.90
10/08/09 08:26:05	4830	12.87	2.49	0.68	0.00	4.88
10/08/09 08:26:35	4860	12.88	2.54	0.72	0.00	4.91
10/08/09 08:27:05	4890	12.87	2.52	0.71	0.00	4.90
10/08/09 08:27:35	4920	12.87	2.53	0.72	0.00	4.91
10/08/09 08:28:05	4950	12.86	2.47	0.71	0.00	4.80
10/08/09 08:28:35	4980	12.85	2.50	0.72	0.00	4.90
10/08/09 08:29:05	5010	12.86	2.59	0.68	-0.01	4.95
10/08/09 08:29:35	5040	12.88	2.59	0.69	-0.01	4.86
10/08/09 08:30:05	5070	12.88	2.58	0.72	0.00	4.85
10/08/09 08:30:35	5100	12.86	2.54	0.72	0.00	4.90
10/08/09 08:31:05	5130	12.85	2.57	0.75	0.00	4.93
10/08/09 08:31:35	5160	12.85	2.52	0.68	0.00	4.93
10/08/09 08:32:05	5190	12.85	2.55	0.71	0.00	4.87
10/08/09 08:32:35	5220	12.85	2.54	0.73	0.00	4.96
10/08/09 08:33:05	5250	12.85	2.53	0.69	0.00	4.86
10/08/09 08:33:35	5280	12.85	2.57	0.69	0.00	4.89
10/08/09 08:34:05	5310	12.85	2.49	0.70	0.00	4.92
10/08/09 08:34:35	5340	12.85	2.54	0.70	0.00	4.83
10/08/09 08:35:05	5370	12.86	2.54	0.73	0.00	4.97
10/08/09 08:35:35	5400	12.87	2.56	0.68	0.00	4.92
10/08/09 08:36:05	5430	12.86	2.58	0.71	0.00	4.93
10/08/09 08:36:35	5460	12.87	2.56	0.72	0.00	4.95
10/08/09 08:37:05	5490	12.87	2.53	0.68	0.00	4.93
10/08/09 08:37:35	5520	12.87	2.51	0.71	0.00	4.90
10/08/09 08:38:05	5550	12.87	2.52	0.69	0.00	4.90
10/08/09 08:38:35	5580	12.87	2.52	0.70	-0.01	4.83
10/08/09 08:39:05	5610	12.87	2.60	0.70	-0.01	4.83
10/08/09 08:39:35	5640	12.88	2.49	0.67	0.00	4.95

Florida Power and Light
 October 8, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data		
Fuel Fd factor	8,642	SCF exVM/MBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1,836	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,559,213	SCFH

Weather Data		
Barometric Pressure	29.91	In. Hg
Relative Humidity	92	%
Ambient Temperature	92	°F
Specific Humidity	0.030394	lb H ₂ O / lb air

Unit Data		
Unit Load	248.6	megawatts
Combustor Inlet Pressure	267	psig
Meas. Stack Moisture	11.1	%
Stack Exhaust Flow (M19)	57,380,775	SCFH

Data from: NH3 Run 1

Base W/O Db Load, Run - 1-1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/08/09 08:40:05	5670	12.87	2.52	0.70	0.00	4.95
10/08/09 08:40:35	5700	12.87	2.51	0.89	0.00	4.98
10/08/09 08:41:05	5730	12.85	2.49	0.70	0.00	4.91
10/08/09 08:41:35	5760	12.85	2.53	0.73	0.00	4.90
10/08/09 08:42:05	5790	12.85	2.54	0.68	0.00	4.85
10/08/09 08:42:35	5820	12.86	2.54	0.66	0.00	4.85
10/08/09 08:43:05	5850	12.88	2.47	0.71	0.00	4.82
10/08/09 08:43:35	5880	12.88	2.51	0.67	0.00	4.95
10/08/09 08:44:05	5910	12.87	2.48	0.70	0.00	4.89
10/08/09 08:44:35	5940	12.87	2.45	0.70	0.00	4.89
10/08/09 08:45:05	5970	12.86	2.45	0.59	0.00	4.93
10/08/09 08:45:35	6000	12.86	2.49	0.59	0.00	4.88
10/08/09 08:46:05	6030	12.85	2.49	0.65	0.00	4.96
10/08/09 08:46:35	6060	12.84	2.50	0.66	0.00	4.85
10/08/09 08:47:05	6090	12.86	2.48	0.67	0.00	4.87
10/08/09 08:47:35	6120	12.86	2.51	0.69	-0.01	4.89
10/08/09 08:48:05	6150	12.86	2.45	0.65	0.00	4.91
10/08/09 08:48:35	6180	12.86	2.51	0.71	0.00	4.87
10/08/09 08:49:05	6210	12.87	2.45	0.62	0.00	4.95
10/08/09 08:49:35	6240	12.87	2.45	0.69	-0.01	4.84
10/08/09 08:50:05	6270	12.86	2.40	0.67	0.00	4.93
10/08/09 08:50:35	6300	12.86	2.43	0.66	0.00	4.95
10/08/09 08:51:05	6330	12.87	2.40	0.67	0.00	4.84
10/08/09 08:51:35	6360	12.86	2.42	0.66	0.00	4.82
10/08/09 08:52:05	6390	12.87	2.42	0.70	0.00	4.81
10/08/09 08:52:35	6420	12.86	2.35	0.67	0.00	4.95
10/08/09 08:53:05	6450	12.87	2.40	0.61	0.00	4.89
10/08/09 08:53:35	6480	12.86	2.40	0.66	0.00	4.94
10/08/09 08:54:05	6510	12.86	2.41	0.67	0.00	4.91
10/08/09 08:54:35	6540	12.87	2.34	0.62	0.00	4.94
10/08/09 08:55:05	6570	12.89	2.36	0.66	0.00	4.85
10/08/09 08:55:35	6600	12.88	2.28	0.71	0.00	4.88
10/08/09 08:56:05	6630	12.88	2.34	0.68	0.00	4.92
10/08/09 08:56:35	6660	12.87	2.34	0.69	0.00	4.93
10/08/09 08:57:05	6690	12.86	2.41	0.59	0.00	4.86
10/08/09 08:57:35	6720	12.85	2.40	0.64	0.00	4.81
RAW AVERAGE		12.87	2.56	0.69	0.00	4.89

Serial Number:	O ₂	NOx	CO	VOC	CO ₂
	(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
INST-22-0001	-0.01	0.12	0.03	0.09	0.12
Initial Zero	-0.04	0.06	0.01	-0.02	0.56
Final Zero	-0.03	0.09	0.02	0.04	0.34
Avg. Zero					
Initial UpScale	11.96	5.03	5.13	2.86	9.37
Final UpScale	11.96	5.04	5.16	2.81	9.57
Avg. UpScale	11.96	5.04	5.15	2.84	9.47
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm% dry basis)	12.91	2.49	0.65	-0.04	4.56
Concentration (ppm@ 15%O ₂)	N/A	1.84	0.48	-0.03	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.64	0.69	-0.04	N/A
Emission Rate (lb/hr)	N/A	17.05	2.70	-0.09	299,074.32
Emission Rate (tons/year) at 8760 hr/yr	N/A	74.69	11.81	-0.41	1,309,945.54
Emission Rate (lb/MMBtu)	N/A	0.007	0.001	0.000	N/A

Florida Power and Light
 October 8, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data

Fuel Fd factor	8,642	SCF eqv/MMBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1,830	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,552,010	SCFH

Weather Data

Barometric Pressure	29.97	in. Hg
Relative Humidity	85	%
Ambient Temperature	85	°F
Specific Humidity	0.022187	lb H ₂ O / lb air

Unit Data

Unit Load	248.0	megawatts
Combustor Inlet Pressure	267	psig
Meas. Stack Moisture	10.7	%
Stack Exhaust Flow (M19)	57,289,441	SCFH

Data from: NH3 Run 2

Base W/O Db Load, Run - 1-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmv)	VOC (ppmv)	CO ₂ (%)
10/08/09 09:15:05	7770	12.88	2.62	0.64	0.00	4.91
10/08/09 09:15:35	7800	12.89	2.57	0.67	0.00	4.90
10/08/09 09:16:05	7830	12.88	2.63	0.64	0.00	4.83
10/08/09 09:16:35	7860	12.86	2.65	0.63	0.02	4.88
10/08/09 09:17:05	7890	12.84	2.75	0.61	0.00	4.91
10/08/09 09:17:35	7920	12.85	2.77	0.64	0.00	4.83
10/08/09 09:18:05	7950	12.88	2.85	0.60	0.00	4.81
10/08/09 09:18:35	7980	12.89	2.78	0.67	-0.01	4.89
10/08/09 09:19:05	8010	12.86	2.65	0.64	0.01	4.97
10/08/09 09:19:35	8040	12.86	2.66	0.58	0.00	4.83
10/08/09 09:20:05	8070	12.85	2.72	0.58	0.02	4.97
10/08/09 09:20:35	8100	12.85	2.77	0.61	0.05	4.97
10/08/09 09:21:05	8130	12.86	2.71	0.61	0.06	4.90
10/08/09 09:21:35	8160	12.86	2.66	0.63	0.02	4.94
10/08/09 09:22:05	8190	12.85	2.63	0.61	0.02	4.83
10/08/09 09:22:35	8220	12.85	2.64	0.59	0.06	4.86
10/08/09 09:23:05	8250	12.86	2.66	0.63	0.05	4.82
10/08/09 09:23:35	8280	12.86	2.61	0.61	0.06	4.81
10/08/09 09:24:05	8310	12.88	2.56	0.63	0.12	4.89
10/08/09 09:24:35	8340	12.88	2.64	0.64	0.10	4.96
10/08/09 09:25:05	8370	12.87	2.61	0.61	0.07	4.89
10/08/09 09:25:35	8400	12.86	2.61	0.58	0.10	4.81
10/08/09 09:26:05	8430	12.85	2.68	0.61	0.02	4.95
10/08/09 09:26:35	8460	12.86	2.68	0.63	0.02	4.84
10/08/09 09:27:05	8490	12.87	2.70	0.62	0.00	4.94
10/08/09 09:27:35	8520	12.86	2.70	0.64	0.00	4.81
10/08/09 09:28:05	8550	12.86	2.70	0.60	0.04	4.96
10/08/09 09:28:35	8580	12.86	2.71	0.61	0.02	4.82
10/08/09 09:29:05	8610	12.86	2.69	0.63	0.01	4.87
10/08/09 09:29:35	8640	12.86	2.75	0.59	0.05	4.81
10/08/09 09:30:05	8670	12.88	2.71	0.60	0.03	4.95
10/08/09 09:30:35	8700	12.88	2.74	0.61	0.07	4.95
10/08/09 09:31:05	8730	12.86	2.67	0.63	0.12	4.91
10/08/09 09:31:35	8760	12.86	2.78	0.59	0.06	4.84
10/08/09 09:32:05	8790	12.87	2.78	0.60	0.05	4.94
10/08/09 09:32:35	8820	12.87	2.75	0.58	0.13	4.83
10/08/09 09:33:05	8850	12.86	2.82	0.60	0.16	4.83
10/08/09 09:33:35	8880	12.87	2.68	0.58	0.17	4.83
10/08/09 09:34:05	8910	12.87	2.68	0.59	0.15	4.85
10/08/09 09:34:35	8940	12.87	2.66	0.59	0.17	4.90
10/08/09 09:35:05	8970	12.88	2.69	0.61	0.17	4.94
10/08/09 09:35:35	9000	12.87	2.69	0.61	0.18	4.83
10/08/09 09:36:05	9030	12.87	2.64	0.61	0.16	4.80
10/08/09 09:36:35	9060	12.86	2.73	0.58	0.15	4.88
10/08/09 09:37:05	9090	12.87	2.74	0.60	0.18	4.81
10/08/09 09:37:35	9120	12.87	2.75	0.57	0.17	4.91
10/08/09 09:38:05	9150	12.87	2.79	0.63	0.15	4.81
10/08/09 09:38:35	9180	12.87	2.64	0.56	0.15	4.90
10/08/09 09:39:05	9210	12.87	2.70	0.54	0.19	4.90
10/08/09 09:39:35	9240	12.87	2.61	0.58	0.19	4.89
10/08/09 09:40:05	9270	12.86	2.67	0.56	0.15	4.96
10/08/09 09:40:35	9300	12.86	2.65	0.60	0.18	4.85
10/08/09 09:41:05	9330	12.88	2.67	0.60	0.21	4.85
10/08/09 09:41:35	9360	12.88	2.65	0.59	0.18	4.90
10/08/09 09:42:05	9390	12.88	2.59	0.56	0.25	4.84
10/08/09 09:42:35	9420	12.88	2.63	0.52	0.18	4.85
10/08/09 09:43:05	9450	12.86	2.62	0.55	0.18	4.90
10/08/09 09:43:35	9480	12.86	2.69	0.56	0.22	4.92
10/08/09 09:44:05	9510	12.87	2.70	0.54	0.26	4.91
10/08/09 09:44:35	9540	12.87	2.75	0.55	0.25	4.95
10/08/09 09:45:05	9570	12.87	2.73	0.54	0.31	4.90
10/08/09 09:45:35	9600	12.88	2.65	0.55	0.26	4.91
10/08/09 09:46:05	9630	12.88	2.59	0.56	0.23	4.94
10/08/09 09:46:35	9660	12.88	2.61	0.56	0.22	4.95
10/08/09 09:47:05	9690	12.88	2.63	0.58	0.26	4.88
10/08/09 09:47:35	9720	12.88	2.60	0.55	0.27	4.82
10/08/09 09:48:05	9750	12.87	2.67	0.56	0.29	4.92
10/08/09 09:48:35	9780	12.86	2.67	0.55	0.19	4.85
10/08/09 09:49:05	9810	12.88	2.71	0.53	0.26	4.80
10/08/09 09:49:35	9840	12.88	2.76	0.53	0.31	4.83
10/08/09 09:50:05	9870	12.88	2.76	0.52	0.31	4.92
10/08/09 09:50:35	9900	12.88	2.76	0.52	0.36	4.94
10/08/09 09:51:05	9930	12.88	2.76	0.55	0.37	4.97
10/08/09 09:51:35	9960	12.88	2.68	0.52	0.37	4.92
10/08/09 09:52:05	9990	12.88	2.76	0.53	0.38	4.94
10/08/09 09:52:35	10020	12.88	2.69	0.53	0.37	4.83
10/08/09 09:53:05	10050	12.86	2.72	0.53	0.35	4.93
10/08/09 09:53:35	10080	12.84	2.62	0.54	0.34	4.93
10/08/09 09:54:05	10110	12.86	2.64	0.54	0.34	4.82
10/08/09 09:54:35	10140	12.86	2.57	0.51	0.35	4.81
10/08/09 09:55:05	10170	12.88	2.58	0.57	0.35	4.92
10/08/09 09:55:35	10200	12.87	2.45	0.53	0.35	4.81
10/08/09 09:56:05	10230	12.87	2.41	0.52	0.36	4.85
10/08/09 09:56:35	10260	12.87	2.42	0.52	0.36	4.97

Florida Power and Light
 October 8, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data			
Fuel Fd factor	8.642	SCF exbt/MMBtu	
Fuel Heating Value (HHV)	992	Btu/SCF fuel	
Turbine Fuel Flow	1,830	lb/min	
Duct Burner Fuel Flow	0	lb/min	
Total Fuel Flow	2,552,010	SCFH	

Weather Data		
Barometric Pressure	29.97	in. Hg
Relative Humidity	85	%
Ambient Temperature	85	°F
Specific Humidity	0.022187	lb H ₂ O / lb air

Unit Data		
Unit Load	248.0	megawatts
Combustor Inlet Pressure	267	psig
Meas. Stack Moisture	10.7	%
Stack Exhaust Flow (M19)	57,289,441	SCFH

Data from: NH3 Run 2

Base W/O Db Load, Run - 1-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/08/09 09:57:05	10290	12.87	2.43	0.54	0.34	4.85
10/08/09 09:57:35	10320	12.87	2.39	0.49	0.39	4.95
10/08/09 09:58:05	10350	12.87	2.37	0.50	0.35	4.91
10/08/09 09:58:35	10380	12.88	2.31	0.54	0.39	4.89
10/08/09 09:59:05	10410	12.86	2.34	0.53	0.36	4.90
10/08/09 09:59:35	10440	12.86	2.32	0.52	0.38	4.89
10/08/09 10:00:05	10470	12.88	2.35	0.49	0.36	4.95
10/08/09 10:00:35	10500	12.87	2.40	0.54	0.35	4.92
10/08/09 10:01:05	10530	12.88	2.36	0.50	0.36	4.90
10/08/09 10:01:35	10560	12.90	2.36	0.47	0.37	4.85
10/08/09 10:02:05	10590	12.88	2.36	0.50	0.42	4.92
10/08/09 10:02:35	10620	12.88	2.32	0.46	0.37	4.95
10/08/09 10:03:05	10650	12.89	2.40	0.46	0.37	4.84
10/08/09 10:03:35	10680	12.89	2.48	0.52	0.43	4.82
10/08/09 10:04:05	10710	12.87	2.39	0.49	0.43	4.94
10/08/09 10:04:35	10740	12.87	2.41	0.43	0.45	4.88
10/08/09 10:05:05	10770	12.88	2.43	0.49	0.38	4.82
10/08/09 10:05:35	10800	12.89	2.42	0.45	0.44	4.83
10/08/09 10:06:05	10830	12.89	2.43	0.36	0.43	4.86
10/08/09 10:06:35	10860	12.88	2.43	0.50	0.47	4.95
10/08/09 10:07:05	10890	12.88	2.42	0.48	0.45	4.95
10/08/09 10:07:35	10920	12.90	2.44	0.46	0.46	4.86
10/08/09 10:08:05	10950	12.87	2.51	0.50	0.50	4.94
10/08/09 10:08:35	10980	12.86	2.49	0.49	0.43	4.90
10/08/09 10:09:05	11010	12.88	2.50	0.47	0.42	4.82
10/08/09 10:09:35	11040	12.88	2.53	0.45	0.44	4.92
10/08/09 10:10:05	11070	12.89	2.52	0.48	0.42	4.83
10/08/09 10:10:35	11100	12.89	2.45	0.52	0.52	4.94
10/08/09 10:11:05	11130	12.90	2.44	0.49	0.51	4.90
10/08/09 10:11:35	11160	12.88	2.47	0.49	0.46	4.94
10/08/09 10:12:05	11190	12.87	2.56	0.46	0.53	4.84
10/08/09 10:12:35	11220	12.88	2.65	0.46	0.50	4.91
10/08/09 10:13:05	11250	12.88	2.64	0.46	0.55	4.86
10/08/09 10:13:35	11280	12.87	2.60	0.48	0.51	4.83
10/08/09 10:14:05	11310	12.89	2.56	0.51	0.53	4.81
10/08/09 10:14:35	11340	12.89	2.48	0.47	0.52	4.96
RAW AVERAGE		12.87	2.60	0.55	0.24	4.88

	Serial Number:	O ₂	NOx	CO	VOC	CO ₂
		(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
	INST-22-0001			INST-CO-0008	INST-TH-0010	INST-22-0001
	Initial Zero	-0.04	0.06	0.01	-0.02	0.56
	Final Zero	-0.04	0.06	0.23	0.22	0.41
	Avg. Zero	-0.04	0.06	0.12	0.10	0.49
Bias	Initial UpScale	11.96	5.04	5.16	2.81	9.57
	Final UpScale	11.95	4.91	4.81	3.12	9.51
	Avg. UpScale	11.96	4.98	4.99	2.97	9.54

Upscale Cal Gas 12.00 4.99 4.95 3.00 9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm% dry basis)	12.92	2.58	0.44	0.18	4.45
Concentration (ppm@ 15%O ₂)	N/A	1.91	0.33	0.13	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.39	0.41	0.16	N/A
Emission Rate (lb/hr)	N/A	17.68	1.84	0.42	290,985.89
Emission Rate (tons/year) at 8760 hr/yr	N/A	77.44	8.06	1.86	1,274,522.59
Emission Rate (lb/MMBtu)	N/A	0.007	0.001	0.000	N/A

Florida Power and Light
 October 8, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data

Fuel Fd factor	8.642	SCF exh/MMBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1.835	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,558,051	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	83	%
Ambient Temperature	96	*F
Specific Humidity	0.023216	lb H ₂ O / lb air

Unit Data

Unit Load	249.0	megawatts
Combustor Inlet Pressure	268	psig
Meas. Stack Moisture	11.6	%
Stack Exhaust Flow (M19)	57,300,602	SCFH

Data from: NH3 Run 3

Base W/O Db Load, Run - 1-3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmv)	CO (ppmv)	VOC (ppmv)	CO ₂ (%)
10/08/09 10:30:05	12270	12.87	2.57	0.45	0.85	4.82
10/08/09 10:30:35	12300	12.89	2.62	0.46	0.84	4.85
10/08/09 10:31:05	12330	12.90	2.65	0.43	0.76	4.93
10/08/09 10:31:35	12360	12.90	2.62	0.45	0.76	4.95
10/08/09 10:32:05	12390	12.89	2.60	0.43	0.77	4.84
10/08/09 10:32:35	12420	12.89	2.65	0.44	0.75	4.83
10/08/09 10:33:05	12450	12.90	2.69	0.42	0.74	4.81
10/08/09 10:33:35	12480	12.90	2.69	0.41	0.82	4.83
10/08/09 10:34:05	12510	12.91	2.65	0.43	0.80	4.85
10/08/09 10:34:35	12540	12.92	2.68	0.45	0.79	4.94
10/08/09 10:35:05	12570	12.90	2.62	0.43	0.71	4.83
10/08/09 10:35:35	12600	12.89	2.67	0.39	0.75	4.92
10/08/09 10:36:05	12630	12.89	2.72	0.40	0.80	4.87
10/08/09 10:36:35	12660	12.90	2.77	0.40	0.83	4.84
10/08/09 10:37:05	12690	12.92	2.78	0.38	0.76	4.92
10/08/09 10:37:35	12720	12.93	2.69	0.42	0.83	4.94
10/08/09 10:38:05	12750	12.91	2.56	0.43	0.85	4.91
10/08/09 10:38:35	12780	12.90	2.61	0.36	0.79	4.92
10/08/09 10:39:05	12810	12.90	2.68	0.37	0.76	4.88
10/08/09 10:39:35	12840	12.89	2.71	0.38	0.81	4.82
10/08/09 10:40:05	12870	12.92	2.76	0.39	0.69	4.87
10/08/09 10:40:35	12900	12.92	2.65	0.42	0.78	4.96
10/08/09 10:41:05	12930	12.91	2.56	0.41	0.73	4.92
10/08/09 10:41:35	12960	12.91	2.59	0.40	0.77	4.86
10/08/09 10:42:05	12990	12.92	2.63	0.32	0.83	4.91
10/08/09 10:42:35	13020	12.91	2.69	0.24	0.81	4.95
10/08/09 10:43:05	13050	12.90	2.64	0.41	0.82	4.86
10/08/09 10:43:35	13080	12.90	2.68	0.28	0.85	4.92
10/08/09 10:44:05	13110	12.90	2.68	0.38	0.90	4.91
10/08/09 10:44:35	13140	12.90	2.59	0.37	0.86	4.95
10/08/09 10:45:05	13170	12.90	2.54	0.28	0.89	4.85
10/08/09 10:45:35	13200	12.90	2.51	0.35	0.94	4.83
10/08/09 10:46:05	13230	12.90	2.52	0.31	0.86	4.83
10/08/09 10:46:35	13260	12.92	2.55	0.39	0.88	4.91
10/08/09 10:47:05	13290	12.91	2.55	0.31	0.75	4.88
10/08/09 10:47:35	13320	12.89	2.51	0.40	0.75	4.87
10/08/09 10:48:05	13350	12.83	2.52	0.36	0.86	4.90
10/08/09 10:48:35	13380	12.83	2.61	0.36	0.81	4.84
10/08/09 10:49:05	13410	12.87	2.65	0.32	0.84	4.80
10/08/09 10:49:35	13440	12.88	2.65	0.34	0.83	4.86
10/08/09 10:50:05	13470	12.88	2.57	0.22	0.81	4.89
10/08/09 10:50:35	13500	12.86	2.65	0.44	0.83	4.86
10/08/09 10:51:05	13530	12.86	2.66	0.30	0.84	4.89
10/08/09 10:51:35	13560	12.86	2.70	0.26	0.84	4.86
10/08/09 10:52:05	13590	12.86	2.67	0.27	0.83	4.92
10/08/09 10:52:35	13620	12.88	2.64	0.28	0.89	4.86
10/08/09 10:53:05	13650	12.89	2.56	0.33	0.89	4.92
10/08/09 10:53:35	13680	12.87	2.52	0.31	0.89	4.92
10/08/09 10:54:05	13710	12.85	2.66	0.26	0.92	4.81
10/08/09 10:54:35	13740	12.85	2.81	0.21	0.91	4.83
10/08/09 10:55:05	13770	12.85	2.80	0.39	0.88	4.85
10/08/09 10:55:35	13800	12.85	2.76	0.22	0.98	4.82
10/08/09 10:56:05	13830	12.85	2.70	0.27	0.93	4.93
10/08/09 10:56:35	13860	12.84	2.69	0.16	0.91	4.91
10/08/09 10:57:05	13890	12.85	2.71	0.22	1.02	4.86
10/08/09 10:57:35	13920	12.85	2.68	0.14	0.96	4.87
10/08/09 10:58:05	13950	12.85	2.67	0.20	0.97	4.88
10/08/09 10:58:35	13980	12.85	2.68	0.33	1.00	4.98
10/08/09 10:59:05	14010	12.85	2.63	0.32	0.93	4.93
10/08/09 10:59:35	14040	12.83	2.65	0.34	0.99	4.82
10/08/09 11:00:05	14070	12.82	2.72	0.28	1.02	4.89
10/08/09 11:00:35	14100	12.84	2.76	0.23	1.04	4.96
10/08/09 11:01:05	14130	12.85	2.70	0.30	1.01	4.85
10/08/09 11:01:35	14160	12.87	2.54	0.27	0.98	4.89
10/08/09 11:02:05	14190	12.86	2.40	0.28	0.99	4.80
10/08/09 11:02:35	14220	12.84	2.36	0.36	1.02	4.83
10/08/09 11:03:05	14250	12.85	2.48	0.34	1.04	4.88
10/08/09 11:03:35	14280	12.86	2.58	0.17	1.04	4.82
10/08/09 11:04:05	14310	12.87	2.55	0.29	1.10	4.97
10/08/09 11:04:35	14340	12.87	2.51	0.10	1.13	4.89
10/08/09 11:05:05	14370	12.86	2.48	0.34	1.18	4.89
10/08/09 11:05:35	14400	12.85	2.49	0.26	1.11	4.82
10/08/09 11:06:05	14430	12.86	2.57	0.27	1.11	4.83
10/08/09 11:06:35	14460	12.86	2.58	0.32	1.14	4.94
10/08/09 11:07:05	14490	12.85	2.61	0.23	1.04	4.80
10/08/09 11:07:35	14520	12.85	2.66	0.27	1.10	4.95
10/08/09 11:08:05	14550	12.84	2.59	0.30	1.08	4.93
10/08/09 11:08:35	14580	12.84	2.60	0.29	1.12	4.96
10/08/09 11:09:05	14610	12.86	2.62	0.33	1.07	4.83
10/08/09 11:09:35	14640	12.85	2.58	0.28	1.18	4.87
10/08/09 11:10:05	14670	12.86	2.62	0.26	1.14	4.87
10/08/09 11:10:35	14700	12.86	2.60	0.28	1.18	4.84
10/08/09 11:11:05	14730	12.86	2.60	0.15	1.16	4.91
10/08/09 11:11:35	14760	12.86	2.64	0.22	1.14	4.81

Florida Power and Light
 October 8, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data		
Fuel Fd factor	8,642	SCF exh/MMBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1,835	lb/min
Duct Burner Fuel Flow	0	lb/min
Total Fuel Flow	2,558,051	SCFH

Weather Data		
Barometric Pressure	30.00	In. Hg
Relative Humidity	63	%
Ambient Temperature	96	°F
Specific Humidity	0.023218	lb H ₂ O / lb air

Unit Data		
Unit Load	249.0	megawatts
Combustor Inlet Pressure	268	psig
Meas. Stack Moisture	11.6	%
Stack Exhaust Flow (M19)	57,300,602	SCFH

Data from: NH3 Run 3

Base W/O Db Load, Run - 1-3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/08/09 11:12:05	14790	12.85	2.62	0.18	1.13	4.89
10/08/09 11:12:35	14820	12.86	2.66	0.25	1.10	4.96
10/08/09 11:13:05	14850	12.87	2.67	0.08	1.15	4.92
10/08/09 11:13:35	14880	12.86	2.66	0.13	1.18	4.96
10/08/09 11:14:05	14910	12.86	2.68	0.26	1.10	4.94
10/08/09 11:14:35	14940	12.84	2.64	0.22	1.22	4.87
10/08/09 11:15:05	14970	12.84	2.71	0.24	1.19	4.81
10/08/09 11:15:35	15000	12.84	2.70	0.25	1.24	4.93
10/08/09 11:16:05	15030	12.86	2.74	0.26	1.17	4.95
10/08/09 11:16:35	15060	12.87	2.67	0.32	1.26	4.85
10/08/09 11:17:05	15090	12.86	2.65	0.24	1.27	4.91
10/08/09 11:17:35	15120	12.86	2.64	0.32	1.25	4.80
10/08/09 11:18:05	15150	12.87	2.61	0.28	1.21	4.81
10/08/09 11:18:35	15180	12.87	2.59	0.30	1.20	4.84
10/08/09 11:19:05	15210	12.86	2.61	0.30	1.27	4.85
10/08/09 11:19:35	15240	12.86	2.70	0.32	1.22	4.85
10/08/09 11:20:05	15270	12.86	2.74	0.22	1.23	4.92
10/08/09 11:20:35	15300	12.86	2.73	-0.04	1.27	4.96
10/08/09 11:21:05	15330	12.86	2.72	0.30	1.22	4.87
10/08/09 11:21:35	15360	12.87	2.70	0.28	1.22	4.84
10/08/09 11:22:05	15390	12.86	2.67	0.25	1.26	4.81
10/08/09 11:22:35	15420	12.87	2.67	0.24	1.32	4.84
10/08/09 11:23:05	15450	12.90	2.69	0.34	1.26	4.95
10/08/09 11:23:35	15480	12.89	2.64	0.21	1.32	4.91
10/08/09 11:24:05	15510	12.88	2.64	0.22	1.33	4.85
10/08/09 11:24:35	15540	12.92	2.69	0.29	1.26	4.91
10/08/09 11:25:05	15570	12.89	2.72	0.22	1.31	4.95
10/08/09 11:25:35	15600	12.90	2.75	0.11	1.30	4.84
10/08/09 11:26:05	15630	12.93	2.71	0.27	1.29	4.80
10/08/09 11:26:35	15660	12.91	2.63	0.29	1.24	4.87
10/08/09 11:27:05	15690	12.90	2.60	0.19	1.30	4.97
10/08/09 11:27:35	15720	12.91	2.62	0.23	1.25	4.96
10/08/09 11:28:05	15750	12.92	2.61	0.27	1.30	4.88
10/08/09 11:28:35	15780	12.91	2.63	0.23	1.26	4.85
10/08/09 11:29:05	15810	12.91	2.60	0.17	1.24	4.88
10/08/09 11:29:35	15840	12.91	2.58	0.23	1.39	4.94
RAW AVERAGE		12.88	2.64	0.30	1.01	4.88

	Serial Number: INST-22-0001 INST-NX-0010 INST-CO-0008 INST-TH-0010 INST-22-0001				
	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
Initial Zero	-0.04	0.06	0.23	0.22	0.41
Final Zero	-0.04	0.06	-0.12	0.38	0.31
Avg. Zero	-0.04	0.06	0.06	0.30	0.36
Initial UpScale	11.95	4.91	4.81	3.12	9.51
Final UpScale	12.00	4.93	4.62	3.27	9.41
Avg. UpScale	11.98	4.92	4.72	3.20	9.46
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15

EMISSIONS DATA					
	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.90	2.85	0.26	0.87	4.55
Concentration (ppm@ 15%O ₂)	N/A	1.95	0.19	0.64	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.42	0.24	0.80	N/A
Emission Rate (lb/hr)	N/A	18.11	1.07	2.08	297,578.28
Emission Rate (tons/year) at 8760 hr/yr	N/A	79.31	4.70	9.11	1,303,392.87
Emission Rate (lb/MMBtu)	N/A	0.007	0.000	0.001	N/A

TEST RESULTS

**NO_x, CO, VOC, CO₂, and O₂ Emissions
Base Load with Duct Burners**

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data		
Fuel Fd factor	8.642	SCF exH/MVBU
Fuel Heating Value (HRV)	992	Btu/SCF fuel
Turbine Fuel Flow	1.635	lb/min
Duct Burner Fuel Flow	200	lb/min
Total Fuel Flow	2,556.889	SCFH

Weather Data		
Barometric Pressure	29.91	in. Hg
Relative Humidity	57	%
Ambient Temperature	93	°F
Specific Humidity	0.019068	lb H ₂ O / lb air

Unit Data		
Unit Load	248.8	megawatts
Combustor Inlet Pressure	267	psig
Meas. Stack Moisture	10.9	%
Stack Exhaust Flow (M19)	51,465.079	SCFH

Data from: NHQ Run 1

Base W/Db Load, Run - 2-1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/07/09 16:05:28	31908	12.07	2.87	2.85	0.88	5.43
10/07/09 16:05:58	31938	12.07	2.87	2.90	0.98	5.44
10/07/09 16:06:28	31968	12.06	2.90	2.96	0.92	5.45
10/07/09 16:06:58	31998	12.06	2.94	3.02	0.93	5.45
10/07/09 16:07:28	32028	12.06	2.93	3.09	0.94	5.45
10/07/09 16:07:58	32058	12.06	2.94	3.04	0.90	5.45
10/07/09 16:08:28	32088	12.07	2.95	2.94	0.80	5.44
10/07/09 16:08:58	32118	12.08	2.89	2.84	0.78	5.44
10/07/09 16:09:28	32148	12.06	2.90	2.88	0.84	5.45
10/07/09 16:09:58	32178	12.06	2.93	2.93	0.88	5.45
10/07/09 16:10:28	32208	12.06	2.85	2.88	0.81	5.45
10/07/09 16:10:58	32238	12.07	2.86	2.93	0.88	5.45
10/07/09 16:11:28	32268	12.06	2.90	3.02	0.93	5.45
10/07/09 16:11:58	32298	12.07	2.88	2.98	0.86	5.44
10/07/09 16:12:28	32328	12.08	2.88	2.92	0.77	5.44
10/07/09 16:12:58	32358	12.06	2.81	2.80	0.83	5.44
10/07/09 16:13:28	32388	12.07	2.82	2.85	0.83	5.44
10/07/09 16:13:58	32418	12.07	2.84	2.78	0.85	5.43
10/07/09 16:14:28	32448	12.07	2.88	3.00	0.84	5.44
10/07/09 16:14:58	32478	12.07	2.94	2.96	0.81	5.45
10/07/09 16:15:28	32508	12.08	3.00	2.89	0.87	5.44
10/07/09 16:15:58	32538	12.07	2.94	2.91	0.86	5.44
10/07/09 16:16:28	32568	12.07	2.94	2.96	0.85	5.44
10/07/09 16:16:58	32598	12.09	2.95	2.84	0.88	5.43
10/07/09 16:17:28	32628	12.08	2.85	2.87	0.82	5.43
10/07/09 16:17:58	32658	12.06	2.91	2.87	0.78	5.44
10/07/09 16:18:28	32688	12.06	2.98	2.78	0.79	5.43
10/07/09 16:18:58	32718	12.06	3.01	2.84	0.77	5.44
10/07/09 16:19:28	32748	12.05	3.07	2.84	0.83	5.44
10/07/09 16:19:58	32778	12.09	3.10	2.90	0.85	5.43
10/07/09 16:20:28	32808	12.10	3.02	2.79	0.83	5.43
10/07/09 16:20:58	32838	12.08	2.93	2.75	0.80	5.43
10/07/09 16:21:28	32868	12.08	2.96	2.84	0.84	5.43
10/07/09 16:21:58	32898	12.08	3.04	2.88	0.78	5.44
10/07/09 16:22:28	32928	12.08	2.99	2.80	0.80	5.44
10/07/09 16:22:58	32958	12.09	3.01	2.78	0.82	5.43
10/07/09 16:23:28	32988	12.08	3.03	2.83	0.80	5.43
10/07/09 16:23:58	33018	12.09	2.96	2.78	0.84	5.44
10/07/09 16:24:28	33048	12.08	3.06	2.85	0.77	5.44
10/07/09 16:24:58	33078	12.09	2.99	2.85	0.79	5.43
10/07/09 16:25:28	33108	12.09	2.93	2.72	0.75	5.43
10/07/09 16:25:58	33138	12.08	2.87	2.72	0.77	5.44
10/07/09 16:26:28	33168	12.08	2.87	2.73	0.87	5.45
10/07/09 16:26:58	33198	12.08	2.90	2.77	0.80	5.43
10/07/09 16:27:28	33228	12.08	2.97	2.76	0.81	5.44
10/07/09 16:27:58	33258	12.09	2.95	2.78	0.82	5.44
10/07/09 16:28:28	33288	12.09	2.88	2.81	0.79	5.44
10/07/09 16:28:58	33318	12.10	2.89	2.87	0.80	5.44
10/07/09 16:29:28	33348	12.09	2.91	2.85	0.77	5.44
10/07/09 16:29:58	33378	12.07	2.93	2.68	0.72	5.45
10/07/09 16:30:28	33408	12.08	2.92	2.66	0.80	5.44
10/07/09 16:30:58	33438	12.08	2.93	2.74	0.78	5.44
10/07/09 16:31:28	33468	12.09	2.95	2.73	0.72	5.43
10/07/09 16:31:58	33498	12.08	3.00	2.67	0.75	5.44
10/07/09 16:32:28	33528	12.07	3.00	2.67	0.75	5.45
10/07/09 16:32:58	33558	12.09	3.04	2.65	0.78	5.44
10/07/09 16:33:28	33588	12.09	3.03	2.71	0.77	5.44
10/07/09 16:33:58	33618	12.08	2.83	2.77	0.82	5.45
10/07/09 16:34:28	33648	12.09	2.92	2.79	0.72	5.45
10/07/09 16:34:58	33678	12.11	2.93	2.59	0.73	5.43
10/07/09 16:35:28	33708	12.09	2.90	2.51	0.75	5.44
10/07/09 16:35:58	33738	12.08	3.00	2.60	0.82	5.45
10/07/09 16:36:28	33768	12.08	3.10	2.76	0.74	5.45
10/07/09 16:36:58	33798	12.09	3.11	2.73	0.80	5.44
10/07/09 16:37:28	33828	12.09	3.02	2.74	0.67	5.44
10/07/09 16:37:58	33858	12.08	3.04	2.64	0.75	5.44
10/07/09 16:38:28	33888	12.08	2.99	2.71	0.75	5.44
10/07/09 16:38:58	33918	12.08	3.01	2.62	0.75	5.45
10/07/09 16:39:28	33948	12.10	3.06	2.65	0.68	5.44
10/07/09 16:39:58	33978	12.09	3.01	2.56	0.67	5.44
10/07/09 16:40:28	34008	12.09	2.95	2.66	0.81	5.44
10/07/09 16:40:58	34038	12.09	3.04	2.76	0.67	5.45
10/07/09 16:41:28	34068	12.09	3.07	2.65	0.75	5.44
10/07/09 16:41:58	34098	12.08	3.14	2.63	0.70	5.45
10/07/09 16:42:28	34128	12.08	3.09	2.57	0.71	5.45
10/07/09 16:42:58	34158	12.08	3.05	2.57	0.72	5.44
10/07/09 16:43:28	34188	12.08	2.97	2.57	0.66	5.44
10/07/09 16:43:58	34218	12.07	2.99	2.60	0.72	5.45
10/07/09 16:44:28	34248	12.09	3.00	2.69	0.79	5.43
10/07/09 16:44:58	34278	12.10	2.94	2.65	0.69	5.43
10/07/09 16:45:28	34308	12.09	2.92	2.54	0.67	5.44
10/07/09 16:45:58	34338	12.09	2.98	2.54	0.63	5.44
10/07/09 16:46:28	34368	12.09	3.06	2.58	0.83	5.44
10/07/09 16:46:58	34398	12.07	3.13	2.60	0.68	5.45

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data			
Fuel Fd factor	9.642	SCF exhr/MBtu	
Fuel Heating Value (HHV)	992	Btu/SCF fuel	
Turbine Fuel Flow	1.635	lb/min	
Duct Burner Fuel Flow	200	lb/min	
Total Fuel Flow	2,556,889	SCFH	

Weather Data			
Barometric Pressure	29.91	in. Hg	
Relative Humidity	57	%	
Ambient Temperature	93	°F	
Specific Humidity	0.019088	lb H ₂ O / lb air	

Unit Data			
Unit Load	248.8	megawatts	
Combustor Inlet Pressure	267	psig	
Meas. Stack Moisture	10.9	%	
Stack Exhaust Flow (M19)	51,465,079	SCFH	

Data from: NH3 Run 1

Base W/Db Load, Run - 2-1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/07/09 16:47:28	34428	12.09	3.12	2.69	0.61	5.44
10/07/09 16:47:58	34458	12.10	3.04	2.60	0.67	5.45
10/07/09 16:48:28	34488	12.09	2.94	2.69	0.68	5.45
10/07/09 16:48:58	34518	12.09	2.90	2.62	0.63	5.44
10/07/09 16:49:28	34548	12.10	2.93	2.56	0.61	5.44
10/07/09 16:49:58	34578	12.08	2.95	2.53	0.64	5.44
10/07/09 16:50:28	34608	12.07	3.04	2.73	0.65	5.45
10/07/09 16:50:58	34638	12.10	3.07	2.72	0.65	5.43
10/07/09 16:51:28	34668	12.11	3.00	2.57	0.69	5.43
10/07/09 16:51:58	34698	12.09	2.89	2.65	0.57	5.44
10/07/09 16:52:28	34728	12.08	2.94	2.58	0.60	5.44
10/07/09 16:52:58	34758	12.08	3.04	2.59	0.59	5.44
10/07/09 16:53:28	34788	12.10	3.05	2.64	0.63	5.44
10/07/09 16:53:58	34818	12.08	3.06	2.61	0.63	5.44
10/07/09 16:54:28	34848	12.08	2.91	2.63	0.60	5.43
10/07/09 16:54:58	34878	12.08	2.94	2.69	0.57	5.44
10/07/09 16:55:28	34908	12.09	2.99	2.56	0.55	5.44
10/07/09 16:55:58	34938	12.07	2.98	2.50	0.53	5.44
10/07/09 16:56:28	34968	12.07	2.99	2.56	0.60	5.44
10/07/09 16:56:58	34998	12.09	3.00	2.67	0.62	5.44
10/07/09 16:57:28	35028	12.10	2.99	2.48	0.62	5.43
10/07/09 16:57:58	35058	12.09	2.93	2.45	0.53	5.43
10/07/09 16:58:28	35088	12.09	2.86	2.54	0.50	5.44
10/07/09 16:58:58	35118	12.08	2.97	2.53	0.56	5.43
10/07/09 16:59:28	35148	12.08	3.01	2.62	0.58	5.44
10/07/09 16:59:58	35178	12.08	3.12	2.70	0.56	5.43
10/07/09 17:00:28	35208	12.10	3.08	2.61	0.56	5.41
10/07/09 17:00:58	35238	12.10	2.99	2.61	0.60	5.42
10/07/09 17:01:28	35268	12.10	2.89	2.68	0.57	5.42
10/07/09 17:01:58	35298	12.09	2.89	2.55	0.51	5.42
10/07/09 17:02:28	35328	12.08	2.94	2.48	0.48	5.42
10/07/09 17:02:58	35358	12.08	3.08	2.57	0.56	5.43
10/07/09 17:03:28	35388	12.07	3.10	2.74	0.53	5.43
10/07/09 17:03:58	35418	12.09	3.09	2.71	0.63	5.43
10/07/09 17:04:28	35448	12.08	3.05	2.73	0.62	5.43
10/07/09 17:04:58	35478	12.09	3.05	2.72	0.55	5.42
RAW AVERAGE		12.08	2.97	2.72	0.73	5.44

	O ₂	NOx	CO	VOC	CO ₂
	(%)	(ppmvd)	(ppmvd)	(ppmvw)	(%)
Serial Number: INST-22-0001	INST-NX-0010	INST-CO-0008	INST-TH-0010	INST-22-0001	
Initial Zero	-0.02	-0.06	-0.12	0.11	0.50
Final Zero	-0.04	-0.02	-0.44	0.17	0.50
Avg. Zero	-0.03	-0.04	-0.28	0.14	0.50
Initial UpScale	12.07	5.10	4.98	2.80	9.35
Final UpScale	12.10	5.12	4.85	2.67	9.33
Avg. UpScale	12.09	5.11	4.92	2.74	9.34
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15

EMISSIONS DATA					
	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm% dry basis)	12.00	2.92	2.86	0.79	5.11
Concentration (ppm@ 15%O ₂)	N/A	1.93	1.90	0.52	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.23	2.19	0.60	N/A
Emission Rate (lb/hr)	N/A	17.94	10.71	1.68	300,543.61
Emission Rate (tons/year) at 8760 hr/yr	N/A	78.57	46.91	7.36	1,316,381.01
Emission Rate (lb/MBtu)	N/A	0.007	0.004	0.001	N/A

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data		
Fuel Fd factor	8.642	SCF exH/MWhU
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1.638	lb/min
Duct Burner Fuel Flow	200	lb/min
Total Fuel Flow	2,581,536	SCFH

Weather Data		
Barometric Pressure	29.88	in. Hg
Relative Humidity	51	%
Ambient Temperature	92	°F
Specific Humidity	0.018507	lb H ₂ O / lb air

Unit Data		
Unit Load	249.6	megawatts
Combustor Inlet Pressure	268	psig
Meas. Stack Moisture	10.2	%
Stack Exhaust Flow (M19)	51,863,052	SCFH

Data from: NHO Run 2

Base W/Db Load, Run - 2-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/07/09 17:18:28	36288	12.08	3.10	2.42	0.85	5.40
10/07/09 17:18:58	36318	12.08	3.03	2.45	0.76	5.39
10/07/09 17:19:28	36348	12.09	2.98	2.44	0.70	5.39
10/07/09 17:19:58	36378	12.10	2.94	2.47	0.72	5.40
10/07/09 17:20:28	36408	12.09	2.96	2.47	0.67	5.40
10/07/09 17:20:58	36438	12.09	2.99	2.50	0.64	5.40
10/07/09 17:21:28	36468	12.09	3.04	2.59	0.60	5.41
10/07/09 17:21:58	36498	12.10	3.03	2.45	0.53	5.40
10/07/09 17:22:28	36528	12.10	3.03	2.35	0.48	5.39
10/07/09 17:22:58	36558	12.08	3.00	2.36	0.58	5.40
10/07/09 17:23:28	36588	12.09	3.04	2.51	0.52	5.40
10/07/09 17:23:58	36618	12.09	3.05	2.41	0.52	5.40
10/07/09 17:24:28	36648	12.09	3.07	2.43	0.51	5.41
10/07/09 17:24:58	36678	12.09	3.07	2.46	0.50	5.40
10/07/09 17:25:28	36708	12.08	3.05	2.42	0.52	5.41
10/07/09 17:25:58	36738	12.09	2.97	2.47	0.47	5.40
10/07/09 17:26:28	36768	12.10	2.99	2.46	0.48	5.40
10/07/09 17:26:58	36798	12.10	2.98	2.38	0.50	5.39
10/07/09 17:27:28	36828	12.10	2.96	2.44	0.43	5.40
10/07/09 17:27:58	36858	12.10	2.96	2.43	0.46	5.40
10/07/09 17:28:28	36888	12.09	2.96	2.45	0.44	5.40
10/07/09 17:28:58	36918	12.08	2.93	2.42	0.46	5.40
10/07/09 17:29:28	36948	12.08	3.02	2.45	0.51	5.41
10/07/09 17:29:58	36978	12.09	3.05	2.58	0.48	5.40
10/07/09 17:30:28	37008	12.10	3.01	2.50	0.55	5.39
10/07/09 17:30:58	37038	12.11	2.85	2.47	0.39	5.39
10/07/09 17:31:28	37068	12.11	2.80	2.38	0.47	5.39
10/07/09 17:31:58	37098	12.10	2.82	2.46	0.39	5.40
10/07/09 17:32:28	37128	12.10	2.93	2.33	0.44	5.39
10/07/09 17:32:58	37158	12.10	2.95	2.35	0.39	5.39
10/07/09 17:33:28	37188	12.09	3.01	2.34	0.39	5.40
10/07/09 17:33:58	37218	12.09	3.02	2.38	0.40	5.40
10/07/09 17:34:28	37248	12.09	2.96	2.37	0.34	5.40
10/07/09 17:34:58	37278	12.10	2.89	2.31	0.38	5.40
10/07/09 17:35:28	37308	12.10	2.89	2.35	0.33	5.40
10/07/09 17:35:58	37338	12.09	2.99	2.29	0.37	5.39
10/07/09 17:36:28	37368	12.08	3.05	2.33	0.35	5.40
10/07/09 17:36:58	37398	12.11	3.07	2.34	0.35	5.39
10/07/09 17:37:28	37428	12.11	2.99	2.30	0.29	5.40
10/07/09 17:37:58	37458	12.10	2.89	2.27	0.31	5.40
10/07/09 17:38:28	37488	12.10	2.85	2.34	0.34	5.39
10/07/09 17:38:58	37518	12.08	2.94	2.41	0.34	5.39
10/07/09 17:39:28	37548	12.08	3.08	2.45	0.32	5.40
10/07/09 17:39:58	37578	12.09	3.06	2.44	0.36	5.39
10/07/09 17:40:28	37608	12.10	3.05	2.36	0.32	5.39
10/07/09 17:40:58	37638	12.10	2.99	2.32	0.37	5.39
10/07/09 17:41:28	37668	12.10	2.93	2.33	0.32	5.39
10/07/09 17:41:58	37698	12.10	2.94	2.34	0.36	5.39
10/07/09 17:42:28	37728	12.10	2.98	2.32	0.33	5.39
10/07/09 17:42:58	37758	12.10	3.02	2.32	0.25	5.39
10/07/09 17:43:28	37788	12.11	3.02	2.32	0.33	5.39
10/07/09 17:43:58	37818	12.10	2.96	2.35	0.28	5.38
10/07/09 17:44:28	37848	12.10	3.05	2.34	0.29	5.38
10/07/09 17:44:58	37878	12.11	3.05	2.38	0.26	5.38
10/07/09 17:45:28	37908	12.10	3.07	2.37	0.25	5.39
10/07/09 17:45:58	37938	12.09	3.03	2.35	0.27	5.39
10/07/09 17:46:28	37968	12.09	2.96	2.32	0.25	5.38
10/07/09 17:46:58	37998	12.10	2.98	2.34	0.29	5.39
10/07/09 17:47:28	38028	12.09	3.01	2.36	0.23	5.40
10/07/09 17:47:58	38058	12.10	3.04	2.38	0.28	5.39
10/07/09 17:48:28	38088	12.10	3.04	2.35	0.26	5.38
10/07/09 17:48:58	38118	12.10	3.01	2.33	0.18	5.39
10/07/09 17:49:28	38148	12.11	2.96	2.36	0.26	5.38
10/07/09 17:49:58	38178	12.11	2.94	2.47	0.26	5.38
10/07/09 17:50:28	38208	12.09	2.94	2.40	0.29	5.39
10/07/09 17:50:58	38238	12.07	3.03	2.45	0.27	5.40
10/07/09 17:51:28	38268	12.08	3.04	2.48	0.24	5.39
10/07/09 17:51:58	38298	12.10	2.96	2.43	0.24	5.38
10/07/09 17:52:28	38328	12.11	3.00	2.48	0.22	5.38
10/07/09 17:52:58	38358	12.10	3.00	2.47	0.27	5.39
10/07/09 17:53:28	38388	12.09	2.95	2.53	0.19	5.39
10/07/09 17:53:58	38418	12.09	2.97	2.34	0.23	5.38
10/07/09 17:54:28	38448	12.07	3.06	2.42	0.25	5.40
10/07/09 17:54:58	38478	12.09	3.04	2.45	0.24	5.38
10/07/09 17:55:28	38508	12.09	2.99	2.44	0.20	5.38
10/07/09 17:55:58	38538	12.08	2.88	2.49	0.23	5.38
10/07/09 17:56:28	38568	12.10	2.88	2.55	0.21	5.38
10/07/09 17:56:58	38598	12.09	2.83	2.50	0.18	5.38
10/07/09 17:57:28	38628	12.09	2.91	2.37	0.22	5.39
10/07/09 17:57:58	38658	12.09	2.91	2.52	0.21	5.39
10/07/09 17:58:28	38688	12.10	2.94	2.58	0.23	5.38
10/07/09 17:58:58	38718	12.11	2.90	2.55	0.17	5.37
10/07/09 17:59:28	38748	12.10	2.87	2.42	0.18	5.38
10/07/09 17:59:58	38778	12.09	2.95	2.44	0.19	5.38

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data

Fuel Fd factor	8.642	SCF edv/MMBtu
Fuel Heating Value (HfV)	992	Btu/SCF fuel
Turbine Fuel Flow	1,838	lb/min
Duct Burner Fuel Flow	200	lb/min
Total Fuel Flow	2,561,538	SCFH

Weather Data

Barometric Pressure	29.88	in. Hg
Relative Humidity	51	%
Ambient Temperature	92	°F
Specific Humidity	0.016507	lb H ₂ O / lb air

Unit Data

Unit Load	249.6	megawatts
Combustor Inlet Pressure	268	psig
Meas. Stack Moisture	10.2	%
Stack Exhaust Flow (M19)	51,863,052	SCFH

Data from: NH3 Run 2

Base W/Db Load, Run - 2-2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvw)	CO ₂ (%)
10/07/09 18:00:28	38808	12.10	2.98	2.50	0.19	5.37
10/07/09 18:00:58	38838	12.11	3.00	2.51	0.17	5.38
10/07/09 18:01:28	38868	12.11	3.05	2.44	0.14	5.37
10/07/09 18:01:58	38898	12.09	3.02	2.38	0.14	5.38
10/07/09 18:02:28	38928	12.08	3.05	2.42	0.13	5.37
10/07/09 18:02:58	38958	12.10	3.05	2.43	0.14	5.37
10/07/09 18:03:28	38988	12.10	3.04	2.39	0.11	5.37
10/07/09 18:03:58	39018	12.11	3.03	2.40	0.16	5.37
10/07/09 18:04:28	39048	12.10	3.03	2.47	0.15	5.37
10/07/09 18:04:58	39078	12.10	3.01	2.33	0.07	5.37
10/07/09 18:05:28	39108	12.09	3.02	2.33	0.15	5.37
10/07/09 18:05:58	39138	12.08	3.05	2.48	0.17	5.38
10/07/09 18:06:28	39168	12.09	3.06	2.50	0.09	5.37
10/07/09 18:06:58	39198	12.10	3.07	2.47	0.18	5.37
10/07/09 18:07:28	39228	12.10	3.10	2.46	0.11	5.38
10/07/09 18:07:58	39258	12.09	3.04	2.42	0.10	5.38
10/07/09 18:08:28	39288	12.08	3.04	2.54	0.07	5.37
10/07/09 18:08:58	39318	12.08	3.05	2.52	0.12	5.38
10/07/09 18:09:28	39348	12.08	3.12	2.55	0.10	5.38
10/07/09 18:09:58	39378	12.09	3.10	2.52	0.16	5.37
10/07/09 18:10:28	39408	12.10	3.01	2.49	0.11	5.37
10/07/09 18:10:58	39438	12.10	3.03	2.42	0.09	5.37
10/07/09 18:11:28	39468	12.10	2.99	2.51	0.09	5.37
10/07/09 18:11:58	39498	12.09	3.01	2.48	0.08	5.37
10/07/09 18:12:28	39528	12.10	3.02	2.51	0.11	5.37
10/07/09 18:12:58	39558	12.08	3.00	2.41	0.09	5.37
10/07/09 18:13:28	39588	12.08	2.98	2.44	0.11	5.37
10/07/09 18:13:58	39618	12.09	3.01	2.53	0.11	5.37
10/07/09 18:14:28	39648	12.09	2.97	2.45	0.07	5.37
10/07/09 18:14:58	39678	12.10	2.94	2.35	0.08	5.38
10/07/09 18:15:28	39708	12.08	2.97	2.42	0.13	5.38
10/07/09 18:15:58	39738	12.08	3.00	2.49	0.09	5.38
10/07/09 18:16:28	39768	12.09	3.01	2.50	0.09	5.38
10/07/09 18:16:58	39798	12.09	2.92	2.42	0.04	5.37
10/07/09 18:17:28	39828	12.09	2.93	2.40	0.08	5.37
10/07/09 18:17:58	39858	12.10	2.86	2.36	0.05	5.37
RAW AVERAGE		12.09	2.99	2.42	0.29	5.39

Bias	Serial Number:	O ₂	NOx	CO	VOC	CO ₂
		INST-22-0001 (%)	INST-NX-0010 (ppmvd)	INST-CO-0008 (ppmvd)	INST-TH-0010 (ppmvw)	INST-22-0001 (%)
	Initial Zero	-0.04	-0.02	-0.44	0.17	0.50
	Final Zero	-0.05	-0.01	-0.39	0.00	0.42
	Avg. Zero	-0.05	-0.02	-0.42	0.09	0.48
	Initial UpScale	12.10	5.12	4.85	2.67	9.33
	Final UpScale	11.99	5.15	4.51	2.60	9.26
	Avg. UpScale	12.05	5.14	4.68	2.64	9.30
	Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15

EMISSIONS DATA	O ₂	NOx	CO	VOC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.05	2.91	2.76	0.28	5.10
Concentration (ppm@ 15%O ₂)	N/A	1.94	1.84	0.19	N/A
Concentration (ppm@ 15%O ₂ & ISO)	N/A	2.14	2.03	0.21	N/A
Emission Rate (lb/hr)	N/A	18.04	10.39	0.61	302,283.19
Emission Rate (tons/year) at 8760 hr/yr	N/A	79.04	45.53	2.66	1,324,000.38
Emission Rate (lb/MMBtu)	N/A	0.007	0.004	0.000	N/A

Florida Power and Light
 October 7, 2009
 Mitsubishi, 501G, Unit #1A
 West County Energy Center

Fuel Data		
Fuel Fd factor	8,842	SCF exd/MMBtu
Fuel Heating Value (HHV)	992	Btu/SCF fuel
Turbine Fuel Flow	1,605	lb/min
Duct Burner Fuel Flow	200	lb/min
Total Fuel Flow	2,516,462	SCFH

Weather Data		
Barometric Pressure	29.88	In. Hg
Relative Humidity	80	%
Ambient Temperature	91	°F
Specific Humidity	0.025450	lb H ₂ O / lb air

Unit Data		
Unit Load	244.8	megawatts
Combustor Inlet Pressure	264	psig
Meas. Stack Moisture	12.1	%
Stack Exhaust Flow (M19)	50,749,184	SCFH

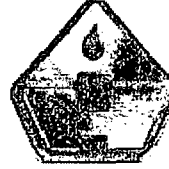
Data from: NH3 Run 3

Base W/Db Load, Run - 2-3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	NOx (ppmvd)	CO (ppmvd)	VOC (ppmvv)	CO ₂ (%)
10/07/09 18:32:28	40728	11.99	3.18	3.58	0.00	9.27
10/07/09 18:32:58	40758	12.01	3.28	3.78	1.35	8.95
10/07/09 18:33:28	40788	12.05	3.05	3.60	0.66	5.40
10/07/09 18:33:58	40818	12.06	2.94	2.68	0.42	5.39
10/07/09 18:34:28	40848	12.01	2.82	2.79	0.50	5.40
10/07/09 18:34:58	40878	11.95	2.86	3.15	0.52	5.44
10/07/09 18:35:28	40908	11.93	3.18	3.56	0.60	5.45
10/07/09 18:35:58	40938	11.98	3.28	3.76	0.58	5.42
10/07/09 18:36:28	40968	12.01	3.05	3.80	0.48	5.41
10/07/09 18:36:58	40998	11.99	2.77	3.63	0.71	5.42
10/07/09 18:37:28	41028	11.97	2.63	3.95	0.69	5.43
10/07/09 18:37:58	41058	11.94	2.66	3.91	0.69	5.44
10/07/09 18:38:28	41088	11.96	2.80	4.08	0.69	5.44
10/07/09 18:38:58	41118	11.98	2.91	4.08	0.49	5.41
10/07/09 18:39:28	41148	12.03	2.75	3.73	0.41	5.38
10/07/09 18:39:58	41178	12.03	2.56	3.38	0.32	5.39
10/07/09 18:40:28	41208	12.01	2.60	3.30	0.42	5.40
10/07/09 18:40:58	41238	12.01	2.82	3.51	0.46	5.40
10/07/09 18:41:28	41268	12.01	3.04	3.54	0.40	5.40
10/07/09 18:41:58	41298	12.01	3.18	3.40	0.40	5.41
10/07/09 18:42:28	41328	11.96	3.18	3.48	0.49	5.44
10/07/09 18:42:58	41358	12.01	3.11	3.73	0.37	5.41
10/07/09 18:43:28	41388	12.05	2.91	3.43	0.27	5.38
10/07/09 18:43:58	41418	12.02	2.73	3.24	0.37	5.41
10/07/09 18:44:28	41448	12.00	2.73	3.45	0.49	5.42
10/07/09 18:44:58	41478	12.00	2.87	3.56	0.37	5.42
10/07/09 18:45:28	41508	12.00	2.90	3.42	0.43	5.41
10/07/09 18:45:58	41538	12.02	2.89	3.55	0.33	5.41
10/07/09 18:46:28	41568	12.05	2.95	3.29	0.44	5.39
10/07/09 18:46:58	41598	12.02	2.81	3.41	0.34	5.41
10/07/09 18:47:28	41628	12.00	2.94	3.44	0.38	5.41
10/07/09 18:47:58	41658	12.01	3.03	3.34	0.32	5.41
10/07/09 18:48:28	41688	12.05	3.10	3.22	0.21	5.39
10/07/09 18:48:58	41718	12.04	3.02	3.07	0.20	5.39
10/07/09 18:49:28	41748	12.03	2.90	3.12	0.33	5.40
10/07/09 18:49:58	41778	12.01	2.86	3.17	0.28	5.41
10/07/09 18:50:28	41808	12.01	2.93	3.28	0.45	5.41
10/07/09 18:50:58	41838	12.05	3.02	3.38	0.30	5.39
10/07/09 18:51:28	41868	12.05	2.90	3.10	0.23	5.39
10/07/09 18:51:58	41898	12.03	2.76	3.19	0.29	5.40
10/07/09 18:52:28	41928	12.00	2.78	3.26	0.25	5.41
10/07/09 18:52:58	41958	12.03	2.83	3.29	0.28	5.39
10/07/09 18:53:28	41988	12.05	2.88	3.11	0.16	5.38
10/07/09 18:53:58	42018	12.04	2.83	3.03	0.22	5.39
10/07/09 18:54:28	42048	12.04	2.89	3.17	0.29	5.39
10/07/09 18:54:58	42078	12.00	2.88	3.29	0.34	5.41
10/07/09 18:55:28	42108	12.01	2.93	3.55	0.31	5.41
10/07/09 18:55:58	42138	12.00	2.99	3.49	0.26	5.40
10/07/09 18:56:28	42168	11.96	2.90	3.49	0.57	5.43
10/07/09 18:56:58	42198	11.97	2.91	3.94	0.45	5.43
10/07/09 18:57:28	42228	12.03	2.88	3.65	0.28	5.40
10/07/09 18:57:58	42258	12.04	2.65	3.30	0.24	5.39
10/07/09 18:58:28	42288	12.00	2.53	3.22	0.28	5.41
10/07/09 18:58:58	42318	12.02	2.55	3.33	0.21	5.41
10/07/09 18:59:28	42348	12.00	2.72	3.22	0.23	5.41
10/07/09 18:59:58	42378	11.98	2.87	3.40	0.32	5.42
10/07/09 19:00:28	42408	11.99	2.92	3.48	0.34	5.42
10/07/09 19:00:58	42438	12.04	2.86	3.42	0.20	5.39
10/07/09 19:01:28	42468	12.06	2.71	3.17	0.20	5.38
10/07/09 19:01:58	42498	12.02	2.55	3.10	0.20	5.40
10/07/09 19:02:28	42528	12.03	2.63	3.14	0.18	5.40
10/07/09 19:02:58	42558	12.02	2.67	3.00	0.14	5.40
10/07/09 19:03:28	42588	12.00	2.73	3.03	0.27	5.41
10/07/09 19:03:58	42618	12.02	2.83	3.19	0.25	5.41
10/07/09 19:04:28	42648	12.00	2.84	3.25	0.28	5.42
10/07/09 19:04:58	42678	12.02	2.84	3.19	0.30	5.41
10/07/09 19:05:28	42708	12.04	2.80	3.23	0.19	5.40
10/07/09 19:05:58	42738	12.03	2.75	3.18	0.27	5.40
10/07/09 19:06:28	42768	12.02	2.69	3.27	0.22	5.41
10/07/09 19:06:58	42798	12.02	2.73	3.23	0.21	5.41
10/07/09 19:07:28	42828	12.03	2.75	3.24	0.33	5.41
10/07/09 19:07:58	42858	11.99	2.76	3.44	0.39	5.42
10/07/09 19:08:28	42888	12.00	2.85	3.52	0.29	5.43
10/07/09 19:08:58	42918	12.00	2.95	3.53	0.51	5.42
10/07/09 19:09:28	42948	12.03	2.92	3.71	0.25	5.41
10/07/09 19:09:58	42978	12.09	2.86	3.11	0.13	5.38
10/07/09 19:10:28	43008	12.06	2.65	2.89	0.19	5.40
10/07/09 19:10:58	43038	12.06	2.64	3.09	0.15	5.39
10/07/09 19:11:28	43068	12.02	2.80	3.05	0.26	5.42
10/07/09 19:11:58	43098	12.01	2.99	3.32	0.22	5.42
10/07/09 19:12:28	43128	12.00	3.15	3.11	0.30	5.42
10/07/09 19:12:58	43158	11.95	3.11	3.38	0.37	5.44
10/07/09 19:13:28	43188	11.98	3.09	3.59	0.31	5.42
10/07/09 19:13:58	43218	12.07	2.90	3.30	0.15	5.39

TEST RESULTS

**NH₃ Emissions
Base Load**



Air Hygiene International, Inc.
5634 S. 122nd East Ave, Suite F
Tulsa, Oklahoma 74146
(888) 461-8778
www.airhygiene.com

AMMONIA ANALYSIS

PARAMETER	UNITS	RUN						BLANK
		1		2		3		
		Front (f)	Back (b)	Front (f)	Back (b)	Front (f)	Back (b)	
Sample Number		35	36	37	38	39	40	16
Lab Log Number		U1A-R1-FH	U1A-R1-BH	U1A-R2-FH	U1A-R2-BH	U1A-R3-FH	U1A-R3-BH	BLANK
Results (C_f or C_b)	(mg/L)	14.7000	0.3100	10.5000	0.2600	14.3000	0.1600	0.1000
Practical Quantitation Limit (PQL)	(mg/L)	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Sample Volume (V_{NH_3})	(ml)	230	210	190	230	250	210	80
DGM Volume (V_m) _{dscf}	(dscf)	55.46		54.99		53.34		55.46
DGM Volume (V_m) _{dstdL}	(L _{dstd})	1570.54		1557.19		1510.28		1570.54
Sum of NH_3 Ion (N)	(mg/L)	14.7000	0.3100	10.5000	0.2600	14.3000	0.1600	0.1000
Total Sample Volume (S)	(ml)	230	210	190	230	250	210	80
Volume of NH_3 (V_a)	(L)	0.00445	0.00009	0.00262	0.00008	0.00470	0.00004	0.00001
O ₂ Concentration	(%)	12.91		12.92		12.90		N/A
NH_3 Concentration (C_{NH_3})	(ppmvd)	2.89		1.74		3.14		0.007
C_{NH_3} @ 15% O ₂	(ppmvd)	2.13		1.28		2.32		N/A

Equations & Constants:

Example Using Data from the 1st run

DGM Volume (L_{dstd})

$$(V_m)_{dstdL} (L_{dstd}) = (V_m)_{dscf} \times 28.31685$$

$$(V_m)_{dstdL} (L_{dstd}) = 55.46 \text{ dscf} \times 28.31685 \text{ L/ft}^3 = 1570.54 \text{ L}_{dstd}$$

$(V_m)_{dscf}$ = Volume of gas sample measured by the DGM, corrected to standard conditions.

C_f = Concentration of NH_3 ion in the front half of train (main catch)

C_b = Concentration of NH_3 ion in the back half of train (breakthrough)

MW = molecular weight (ref. ASTM D 3588)

Volume of NH_3 (L)

$$V_a (L) = \frac{N \times S}{MW \times 1000} \times 22.4$$

$$V_a (L) = \frac{1000}{MW \times 1000}$$

$$V_a (L) = \frac{14.7 \text{ mg}}{L} \times \frac{230 \text{ ml}}{1000 \text{ ml}} \times \frac{L}{1000 \text{ ml}} \times \frac{22.4 \text{ L ideal gas}}{\text{g-mol substance}} \times \frac{\text{g-mol } NH_3}{17.03 \text{ g}} \times \frac{g}{1000 \text{ mg}} = 0.00445 \text{ L}$$

NH_3 Concentration (ppmvd)

$$C_{NH_3} (\text{ppmvd}) = \frac{V_{a(\text{front})} + V_{a(\text{back})}}{(V_m)_{dstdL}} \times 10^6$$

$$C_{NH_3} (\text{ppmvd}) = \frac{0.00445 \text{ L} + 0.00009 \text{ L}}{1570.54 \text{ L}_{dstd}} \times \frac{10^6 \text{ parts}}{1 \text{ part}} = 2.886 \text{ ppmvd}$$

22.4 = liters of ideal gas per mol of substance at 0°C and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)

CTM 027 (AMMONIA) - RESULTS

Plant Name	West County Energy Center	Date	10/08/09
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Stack Type	Circular

Historical Data						
Run Number		Base W/O DB-1	Base W/O DB-2	Base W/O DB-3	Average	
Run Start Time		7:38	9:00	10:17		hh:mm
Run Stop Time		8:45	10:08	11:24		hh:mm
Meter Calibration Factor	(Y)	1.054	1.054	1.054		
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840		
Average Nozzle Diameter	(D _{na})	0.248	0.248	0.248		in
Stack Test Data						
Initial Meter Volume	(V _m) _i	121.040	173.600	226.328		ft3
Final Meter Volume	(V _m) _f	173.310	225.824	277.393		ft3
Total Meter Volume	(V _m)	52.270	52.224	51.065	51.853	ft3
Total Sampling Time	(t)	60.0	60.0	60.0	60.0	min
Average Meter Temperature	(t _m) _{avg}	67.9	72.3	76.7	72.3	oF
Average Stack Temperature	(t _s) _{avg}	184.3	188.3	188.2	186.9	oF
Barometric Pressure	(P _b)	29.91	29.94	29.94	29.93	in Hg
Stack Static Pressure	(P _{static})	-0.65	-0.65	-0.65	-0.65	in H2O
Absolute Stack Pressure	(P _s)	29.86	29.89	29.89	29.88	in Hg
Average Orifice Pressure Drop	(ΔH) _{avg}	2.63	2.65	2.53	2.60	in H2O
Absolute Meter Pressure	(P _m)	30.03	30.06	30.06	30.05	in Hg
Avg Square Root Pitot Pressure	(ΔP ^{1/2}) _{avn}	0.97	1.00	0.97	0.98	(in H2O) ^{1/2}
Moisture Content Data						
Impingers 1-3 Water Volume Gain	(V _n)	130.8	111.8	140.1	127.6	ml
Impinger 4 Silica Gel Weight Gain	(W _n)	15.5	28.1	8.5	17.4	g
Total Water Volume Collected	(V _{lc})	146.4	140.0	148.6	145.0	ml
Standard Water Vapor Volume	(V _w) _{std}	6.889	6.588	6.993	6.823	scf
Standard Meter Volume	(V _m) _{std}	55.463	54.992	53.335	54.597	dscf
Calculated Stack Moisture	(B _{ws(calc)})	11.05	10.70	11.59	11.11	%
Saturated Stack Moisture	(B _{ws(svp)})	56.2	61.2	61.0	59.5	%
Reported Stack Moisture Content	(B _{ws})	11.05	10.70	11.59	11.11	%
Gas Analysis Data						
Carbon Dioxide Percentage	(%CO ₂)	4.6	4.5	4.6	4.5	%
Oxygen Percentage	(%O ₂)	12.9	12.9	12.9	12.9	%
Carbon Monoxide Percentage	(%CO)	0.0	0.0	0.0	0.0	%
Nitrogen Percentage	(%N ₂)	82.5	82.6	82.5	82.6	%
Dry Gas Molecular Weight	(M _d)	29.25	29.23	29.24	29.24	lb/lb-mole
Wet Stack Gas Molecular Weight	(M _w)	28.00	28.03	27.94	27.99	lb/lb-mole
Calculated Fuel Factor	(F _d)	1.752	1.793	1.758	1.768	
Fuel F-Factor	(F _d)	8642	8642	8642	8642	dscf/MMBtu
Percent Excess Air	(%EA)	145.4	145.3	145.1	145.2	%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(V _s)	60.92	62.83	61.19	61.64	ft/sec
Stack Cross-Sectional Area	(A _s)	378.35	378.35	378.35	378.35	ft2
Actual Stack Flow Rate	(Q _{aw})	1,382,896	1,426,222	1,389,056	1,399,391	acfm
Wet Standard Stack Flow Rate	(Q _{sw})	67,866	69,635	67,829	68,443	wkscfh
Dry Standard Stack Flow Rate	(Q _{sd})	1,006,091	1,036,448	999,408	1,013,982	dscfm
Percent of Isokinetic Rate	(I)	103.2	99.7	100.9	101.3	%
Ammonia Rate Data						
Stack Ammonia Concentration	(C _{NH3})	2.89	1.74	3.14	2.59	ppm
	(C _{NH3})	2.13	1.28	2.32	1.91	ppm@15%O ₂

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

ALARMS exist and have been acknowledged.

Source Information				
Plant Name	West County Energy Center			
Sampling Location	Unit 1A			
Fuel or Source Type	Gas, Natural			
Fuel F-Factor	8642	8642	8642	

Test Information			
Starting Test Date		10/08/09	
Project #		bv-09-westcounty.fl-comp#1	
Operator		TP	
Standard Temperature		68	oF
Standard Pressure		29.92	in Hg
Minimum Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		1A	
Load	% or w/DB	Base W/O DB	
Base Run Number		Base W/O DB	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Circular Stack			

Test Equipment Information					
Run		1	2	3	
Meter Box Number	from ACS	samp-cp-0005	samp-cp-0005	samp-cp-0005	
Meter Calibration Factor	(Y)	1.054	1.054	1.054	
Orifice Meter Coefficient	($\Delta H @$)	1.694	1.694	1.694	in H ₂ O
Pitot Identification	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840	
Nozzle Diameter	(D _n)	0.248	0.248	0.248	in
Probe Number	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Probe Length		120.00	120.00	120.00	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Sample Case / Oven Number	from ACS	samp-bh-0006	samp-bh-0006	samp-bh-0006	
Impinger Case Number	from ACS	samp-bc-0006	samp-bc-0006	samp-bc-0006	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	5634 S. 122nd East Ave., Suite F
City, State Country Zip	Tulsa, Oklahoma 74146
Project Manager	Jake Fahlenkamp
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name	West County Energy Center			Date	10/08/09
Sampling Location	Unit 1A			Project #	bv-09-westcounty.fl-comp#1
Operator	TP			# of Ports Used	4
Stack Type	Circular			Pitot Identification	samp-up-0002
Pitot Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Pitot Coefficient (C_p) 0.84

Stack Dimensions			
Diameter or Length of Stack	(D)	263.38	in
Width of Stack	(W)		in
Area of Stack	(A _s)	378.35	ft ²

Pressures			
Barometric Pressure	(P _b)	29.91	in Hg
Static Pressure	(P _{static})	-0.65	in H ₂ O
Absolute Stack Pressure	(P _s)	29.86	in Hg

Stack Gas Composition			
Composition Data:		Estimated Composition	
Carbon Dioxide Concentration	(%CO ₂)	4.6	%
Oxygen Concentration	(%O ₂)	13.0	%
Carbon Monoxide Concentration	(%CO)	0.0	%
Nitrogen Concentration	(%N ₂)	82.4	%
Stack Moisture Content	(B _{ws})	10.000	%
Stack Dry Molecular Weight	(M _d)	29.26	lb/lb-mole
Stack Wet Molecular Weight	(M _s)	28.13	lb/lb-mole

Results			
Avg Stack Gas Velocity	(v _s)	59.1	ft/sec
Avg Stack Dry Std Flow Rate	(Q _{sd})	60,134,561	dscf/hr
Avg Stack Dry Std Flow Rate	(Q _{sd})	1,002,243	dscf/min
Avg Stack Wet Flow Rate	(Q _{aw})	1,340,812	acf/min
Avg Stack Wet Std Flow Rate	(Q _{sw})	66,816,178	ascf/hr

Stack Cross Section Schematic			

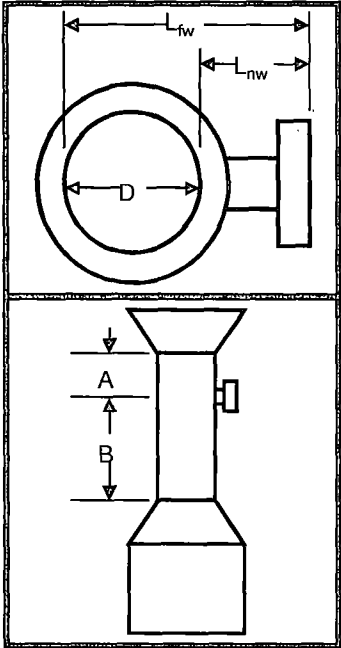
Velocity Traverse Data				
Run Number		Base W/O DB-V1		
Run Time	14:53	Start	15:39	End
Traverse Point	Velocity Head (Δp)	Null Angle (N _a)	Stack Temp (t _s)	Local Velocity (v _{s(l)})
	in H ₂ O	deg	oF	ft/sec
A-1	1.10	0	180	65.7
A-2	1.00	5	179	62.6
A-3	1.00	5	180	62.7
A-4	1.10	-10	180	65.7
A-5	1.20	5	178	68.6
A-6	1.10	0	177	65.6
B-1	0.98	-5	175	61.8
B-2	1.20	5	174	68.3
B-3	1.30	0	172	71.0
B-4	1.20	5	171	68.2
B-5	1.20	0	171	68.2
B-6	1.10	5	171	65.3
C-1	0.72	5	172	52.9
C-2	0.77	0	172	54.7
C-3	0.70	5	172	52.1
C-4	0.68	0	171	51.3
C-5	0.63	0	171	49.4
C-6	0.55	0	171	46.2
D-1	0.84	0	172	57.1
D-2	0.80	5	176	55.9
D-3	0.75	5	176	54.1
D-4	0.65	5	175	50.3
D-5	0.65	0	176	50.4
D-6	0.63	0	176	49.6
Average	0.91	3	175	
	0.95	= Square roots of Δp		

METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	West County Energy Center	Date	10/08/09
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	# of Ports Available	4
Stack Type	Circular	# of Ports Used	4
Stack Size	Large	Port Inside Diameter	6.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	282.38	in
Distance to Near Wall of Stack	(L _{nw})	19.00	in
Diameter of Stack	(D)	263.38	in
Area of Stack	(A _s)	378.35	ft ²

Distance from Port to Disturbances			
Distance Upstream	(A)	144.00	in
Diameters Upstream	(A _D)	0.55	diameters
Distance Downstream	(B)	531.75	in
Diameters Downstream	(B _D)	2.02	diameters



Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points	
Down Stream	Up Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12 ²	8 or 12 ²
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.
² 8 for Circular Stacks 12 to 24 inches
 12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
4	Ports by	6	Across
24	Pts Used	24	Required
		Particulate Traverse	

Location of Traverse Points in Circular Stacks									
Traverse Point	(Fraction of Stack Dimension from Inside Wall to Traverse Point)								
Number	Number of Traverse Points Across the Stack								
1	.146	.067	.044	.032	.026	.021	.018	.016	.014
2	.854	.250	.146	.105	.082	.067	.057	.049	.044
3		.750	.296	.194	.146	.118	.099	.085	.075
4		.933	.704	.323	.226	.177	.146	.125	.109
5			.854	.677	.342	.250	.201	.169	.146
6			.956	.806	.658	.356	.289	.220	.188
7				.895	.774	.644	.366	.283	.236
8				.968	.854	.750	.634	.375	.296
9					.918	.823	.731	.625	.382
10						.974	.882	.799	.618
11							.933	.854	.704
12								.979	.901

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall in	Distance Including Reference Length in
1	0.02	5 4/8	24 4/8
2	0.07	17 5/8	36 5/8
3	0.12	31 1/8	50 1/8
4	0.18	46 5/8	65 5/8
5	0.25	65 7/8	84 7/8
6	0.36	93 6/8	112 6/8
7			
8			
9			
10			
11			
12			

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	West County Energy Center			Date	10/08/09		
Sampling Location	Unit 1A			Project #	bv-09-westcounty.fl-comp#1		
Operator	TP			# of Ports Used	4		
Fuel Type	Gas, Natural	Minimum Fuel Factor	1.600	Maximum Fuel Factor	1.836		
Orsat Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Orsat Identification		

Gas Analysis Data										
Run Number		Base W/O DB-1			Run Start Time		7:38	Run Stop Time		8:45
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)	
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole	
1:07	4.6	12.9	0.7	4.6	12.9	0.0	82.5	29.25	0.00	
Results			Averages	4.6	12.9	0.0	82.5	29.25		
Average Calculated Fuel Factor				(F _o) _{avg}	1.752	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air				(%EA) _{avg}	145.4	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Gas Analysis Data										
Run Number		Base W/O DB-2			Run Start Time		9:00	Run Stop Time		10:08
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)	
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole	
1:08	4.5	12.9	0.4	4.5	12.9	0.0	82.6	29.23	0.00	
Results			Averages	4.5	12.9	0.0	82.6	29.23		
Average Calculated Fuel Factor				(F _o) _{avg}	1.793	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air				(%EA) _{avg}	145.3	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Gas Analysis Data										
Run Number		Base W/O DB-3			Run Start Time		10:17	Run Stop Time		11:24
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)	
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole	
1:07	4.6	12.9	0.3	4.6	12.9	0.0	82.5	29.24	0.00	
Results			Averages	4.6	12.9	0.0	82.5	29.24		
Average Calculated Fuel Factor				(F _o) _{avg}	1.758	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>	
Average Excess Air				(%EA) _{avg}	145.1	percent	Fuel Factor in Handbook Range?			<input checked="" type="checkbox"/>

Fuel Factor Fo		
Fuel Type	Minimum	Maximum
Coal, Anthracite	1.016	1.130
Coal, Lignite	1.016	1.130
Coal, Bituminous	1.083	1.230
Oil, Distillate	1.260	1.413
Oil, Residual	1.210	1.370
Gas, Natural	1.600	1.836
Gas, Propane	1.434	1.586
Gas, Butane	1.405	1.553
Wood	1.000	1.120
Wood Bark	1.003	1.130

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	West County Energy Center			Date	10/08/09		
Sampling Location	Unit 1A			Project #	bv-09-westcounty.fl-comp#1		
Operator	TP			# of Ports Used	4		
Stack Type	Circular			Meter Box Number	samp-cp-0005		
Train Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Meter Cal Factor (Y)	1.054	

Moisture Content Data								
Run Number	Base W/O DB-1		Run Start Time		7:38	Run Stop Time		8:45
Total Meter Volume	(V _m)	52.270	dcf	Barometric Press.		(P _b)	29.91	in Hg
Avg Stack Temp	(t _s) _{avg}	184	oF	Stack Static Press.		(P _{static})	-0.65	in H2O
Avg Meter Temp	(t _m) _{avg}	68	oF	Avg Orifice Press.		(ΔH) _{avg}	2.63	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4		H2SO4		Sil Gel			
Final Value	(V _f),(W _f)	803.40	707.80	652.20	954.60			
Initial Value	(V _i),(W _i)	704.90	680.50	647.40	939.10			
Net Value	(V _n),(W _n)	98.5	27.3	4.8	15.5			
Results								
Total Weight	(W _t)	146.10	g	Water Vol Weighed		(V _{wsg(std)})	6.889	scf
Std Meter Volume	(V _{m(std)})	55.441	dscf	Sat. Moisture Content		(B _{ws(svp)})	56.2	%
Calc Moisture Content	(B _{ws(calc)})	11.1	%	Final Moisture Content		(B _{ws})	11.1	%

Moisture Content Data								
Run Number	Base W/O DB-2		Run Start Time		9:00	Run Stop Time		10:08
Total Meter Volume	(V _m)	52.224	dcf	Barometric Press.		(P _b)	29.94	in Hg
Avg Stack Temp	(t _s) _{avg}	188	oF	Stack Static Press.		(P _{static})	-0.65	in H2O
Avg Meter Temp	(t _m) _{avg}	72	oF	Avg Orifice Press.		(ΔH) _{avg}	2.65	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4		H2SO4		Sil Gel			
Final Value	(V _f),(W _f)	756.60	732.00	623.60	924.50			
Initial Value	(V _i),(W _i)	709.60	688.20	602.80	896.40			
Net Value	(V _n),(W _n)	47.0	43.8	20.8	28.1			
Results								
Total Weight	(W _t)	139.70	g	Water Vol Weighed		(V _{wsg(std)})	6.587	scf
Std Meter Volume	(V _{m(std)})	54.997	dscf	Sat. Moisture Content		(B _{ws(svp)})	61.2	%
Calc Moisture Content	(B _{ws})	10.7	%	Final Moisture Content		(B _{ws})	10.7	%

Moisture Content Data								
Run Number	Base W/O DB-3		Run Start Time		10:17	Run Stop Time		11:24
Total Meter Volume	(V _m)	51.065	dcf	Barometric Press.		(P _b)	29.94	in Hg
Avg Stack Temp	(t _s) _{avg}	188	oF	Stack Static Press.		(P _{static})	-0.65	in H2O
Avg Meter Temp	(t _m) _{avg}	77	oF	Avg Orifice Press.		(ΔH) _{avg}	2.53	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	g	g	g	g	g	g	g	g
Contents	H2SO4		H2SO4		Sil Gel			
Final Value	(V _f),(W _f)	822.20	742.30	651.30	953.70			
Initial Value	(V _i),(W _i)	727.30	701.50	647.20	945.20			
Net Value	(V _n),(W _n)	94.9	40.8	4.1	8.5			
Results								
Total Weight	(W _t)	148.30	g	Water Vol Weighed		(V _{wsg(std)})	6.992	scf
Std Meter Volume	(V _{m(std)})	53.315	dscf	Sat. Moisture Content		(B _{ws(svp)})	61.0	%
Calc Moisture Content	(B _{ws})	11.6	%	Final Moisture Content		(B _{ws})	11.6	%

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/8/2009
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base W/O DB-1
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	175	oF
Avg Gas Meter Temp	(t _m)	79	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{pit})	0.91	in H2O
Stack Moisture Content	(B _{ws})	10.00	%
Stack Dry Molecular Weight	(M _d)	29.25	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.750	acfm
DP to DH Isokinetic Factor	(K)	2.73	

Leak Checks					
Train	Pre	0	ft3/min @	15	in Hg
OK? <input checked="" type="checkbox"/>	Post	0	ft3/min @	15	in Hg
Pitot	Pre	6.7/5.5	in. H ₂ O for	15	sec
OK? <input checked="" type="checkbox"/>	Post	6.7/5.5	in. H ₂ O for	15	sec
Orsat	OK?	<input type="checkbox"/>			

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _{ni})	0.2251	in
Probe # / Length	s _{samp-up-0002} / 120 in		
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Pressures			
Barometric Pressure	(P _b)	29.91	in Hg
Stack Static Pressure	(P _{static})	-0.65	in H2O
Absolute Stack Pressure	(P _s)	29.86	in Hg
Absolute Meter Pressure	(P _m)	30.03	in Hg

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Run Time			
Start	7:38	End	8:45

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	704.90	680.50	647.40	939.10				
Post	803.40	707.80	652.20	954.60				

Wash Volume	H ₂ O	50.0	ml	Filter #
	MeCl		ml	

Traverse Point #	Sampling Time (min)	Timer Time (hh:mm:ss)	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Probe Temp (oF)	Filter Temp (oF)	Impinger Exit Temp (oF)	Aux Temp (oF)	Meter Inlet Temp (t _m)	Meter Outlet Temp (t _{mo})	Pump Vacuum (in Hg)	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (V _s)	Cumulative Meter Volume (V _m) _{std}	Cumulative Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
A-1	0.0	0:00:00	121.040	1.000	2.732	2.700	189	251	224	56		66	62	3.0	1.00	63.13	2.458	106.0	58.994
A-2	2.5	0:02:30	123.340	1.200	3.278	3.300	189	252	225	52		65	64	4.0	1.10	69.16	4.955	102.1	59.458
A-3	5.0	0:05:00	125.675	1.300	3.551	3.600	187	252	226	50		67	66	5.0	1.14	71.87	7.593	101.2	60.746
A-4	7.5	0:07:30	128.150	1.300	3.551	3.600	187	253	225	52		68	63	5.0	1.14	71.87	10.354	102.0	62.124
A-5	10.0	0:10:00	130.735	1.200	3.278	3.300	186	258	227	55		69	63	4.5	1.10	69.00	12.945	101.9	62.136
A-6	12.5	0:12:30	133.165	1.200	3.278	3.300	185	254	236	58		73	63	4.5	1.10	68.94	15.579	102.2	62.317
B-1	15.0	0:15:00	135.645	1.200	3.278	3.300	183	248	236	63		70	64	4.5	1.10	68.84	18.032	101.3	61.825
B-2	17.5	0:17:30	137.950	1.200	3.278	3.300	181	251	238	64		70	64	4.5	1.10	68.73	20.581	101.1	61.743
B-3	20.0	0:20:00	140.345	1.300	3.551	3.600	181	254	234	64		72	65	5.5	1.14	71.53	23.231	101.0	61.948
B-4	22.5	0:22:30	142.840	1.200	3.278	3.300	180	252	232	65		72	65	5.0	1.10	68.67	25.894	101.3	62.146
B-5	25.0	0:25:00	145.350	1.200	3.278	3.300	180	252	230	66		72	65	5.0	1.10	68.67	28.415	101.0	61.995
B-6	27.5	0:27:30	147.725	1.200	3.278	3.300	180	252	226	67		72	65	5.0	1.10	68.67	30.970	100.9	61.940
C-1	30.0	0:30:00	150.133	0.770	2.103	2.100	183	259	244	63		71	65	2.0	0.88	55.14	32.947	100.7	60.826
C-2	32.5	0:32:30	152.000	0.770	2.103	2.100	183	255	266	54		71	65	2.0	0.88	55.14	34.933	100.5	59.885
C-3	35.0	0:35:00	153.875	0.800	2.185	2.200	181	256	254	52		72	65	2.0	0.89	56.12	37.330	101.4	59.728
C-4	37.5	0:37:30	156.140	0.700	1.912	1.900	180	258	258	52		72	65	1.5	0.84	52.45	39.308	101.4	58.962
C-5	40.0	0:40:00	158.010	0.550	1.502	1.500	180	256	256	51		72	66	1.0	0.74	46.49	41.134	101.6	58.071
C-6	42.5	0:42:30	159.740	0.550	1.502	1.500	180	257	256	51		72	67	1.0	0.74	46.49	42.780	101.3	57.040
D-1	45.0	0:45:00	161.301	0.870	2.377	2.400	187	253	254	53		71	66	2.0	0.93	58.79	44.579	100.6	56.310
D-2	47.5	0:47:30	163.000	0.800	2.185	2.200	188	251	256	53		71	67	2.0	0.89	56.42	46.694	100.6	56.032
D-3	50.0	0:50:00	165.000	0.770	2.103	2.100	189	253	255	52		72	68	1.5	0.88	55.40	48.804	100.8	55.776
D-4	52.5	0:52:30	167.000	0.700	1.912	1.900	188	256	254	52		72	68	1.5	0.84	52.78	51.388	102.4	56.059
D-5	55.0	0:55:00	169.450	0.600	1.639	1.600	188	257	257	53		72	66	1.0	0.77	48.86	53.568	103.1	55.897
D-6	57.5	0:57:30	171.515	0.600	1.639	1.600	188	252	255	55		72	66	1.0	0.77	48.86	55.463	103.2	55.463
Last Pt	60.0	1:00:00	173.310																
Final Val	60.0	1:00:00	173.310											Max Vac	5.5	Final Values	55.463	103.2	
Average Values				0.96		2.63	184	254	243	56		71	65		0.97	60.92			

CTM 027 (AMMONIA) - SAMPLE RECOVERY AND INTEGRITY DATA SHEET

Plant Name	West County Energy Center	Date	10/08/09
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Acetone Lot Number	

Run History Data				
Run Number	Base W/O DB-1	Base W/O DB-2	Base W/O DB-3	
Run Start Time	7:38	9:00	10:17	(hh:mm)
Run Stop Time	8:45	10:08	11:24	(hh:mm)
Train Prepared By	AS	AS	AS	
Train Recovered By	AS	AS	AS	
Recovery Date	10/8/2009	10/8/2009	10/8/2009	(mm/dd/yy)

Moisture Content Data					
Impingers 1, 2, and 3 - Liquid Volume					
Final Volume	(V _f)	2167.3	2116.0	2219.8	ml
Initial Volume	(V _i)	2036.5	2004.2	2079.7	ml
Net Volume	(V _n)	130.8	111.8	140.1	ml
Comments					
Impinger 4 - Silica Gel Weight					
Final Weight	(W _f)	954.6	924.5	953.7	g
Initial Weight	(W _i)	939.1	896.4	945.2	g
Net Weight	(W _n)	15.5	28.1	8.5	g
Comments					
Total Water Collected					
Total Volume	(V _c)	146.4	140.0	148.6	ml

TEST RESULTS

**NH₃ Emissions
Base Load with Duct Burners**



Air Hygiene International, Inc.
 5634 S. 122nd East Ave, Suite F
 Tulsa, Oklahoma 74146
 (888) 461-8778
 www.airhygiene.com

AMMONIA ANALYSIS

PARAMETER	UNITS	RUN						BLANK
		1		2		3		
		Front (f)	Back (b)	Front (f)	Back (b)	Front (f)	Back (b)	
Sample Number		29	30	31	32	33	34	16
Lab Log Number		U1A-R1-FH	U1A-R1-BH	U1A-R2-FH	U1A-R2-BH	U1A-R3-FH	U1A-R3-BH	BLANK
Results (C_f or C_b)	(mg/L)	14.3000	0.2300	15.6000	0.2100	12.5000	0.1900	0.1000
Practical Quantitation Limit (PQL)	(mg/L)	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Sample Volume (V_{NH_3})	(ml)	190	220	180	200	240	190	80
DGM Volume (V_m) _{dscf}	(dscf)	55.33		54.62		52.33		55.33
DGM Volume (V_m) _{dstdL}	(L _{dstd})	1566.74		1546.66		1481.79		1566.74
Sum of NH ₃ Ion (N)	(mg/L)	14.3000	0.2300	15.6000	0.2100	12.5000	0.1900	0.1000
Total Sample Volume (S)	(ml)	190	220	180	200	240	190	80
Volume of NH ₃ (V_a)	(L)	0.00357	0.00007	0.00369	0.00006	0.00395	0.00005	0.00001
O ₂ Concentration	(%)	12.00		12.05		12.01		N/A
NH ₃ Concentration (C_{NH_3})	(ppmvd)	2.32		2.42		2.70		0.007
C_{NH_3} @ 15% O ₂	(ppmvd)	1.54		1.62		1.79		N/A

Equations & Constants:

Example Using Data from the 1st run

DGM Volume (L_{dstd})

$$(V_m)_{dstdL} (L_{dstd}) = (V_m)_{dscf} \times 28.31685$$

$$(V_m)_{dstdL} (L_{dstd}) = 55.33 \text{ dscf} \times 28.31685 \text{ L/ft}^3 = 1566.74 \text{ L}_{dstd}$$

$(V_m)_{dscf}$ = Volume of gas sample measured by the DGM, corrected to standard conditions.

C_f = Concentration of NH₃ ion in the front half of train (main catch)

C_b = Concentration of NH₃ ion in the back half of train (breakthrough)

MW = molecular weight (ref. ASTM D 3588)

Volume of NH₃ (L)

$$V_a(L) = \frac{N \times S}{MW \times 1000} \times 22.4$$

$$V_a(L) = \frac{14.3 \text{ mg}}{L} \times \frac{190 \text{ ml}}{1000 \text{ ml}} \times \frac{22.4 \text{ L ideal gas}}{\text{g-mol substance}} \times \frac{\text{g-mol NH}_3}{17.03 \text{ g}} \times \frac{\text{g}}{1000 \text{ mg}} = 0.00357 \text{ L}$$

NH₃ Concentration (ppmvd)

$$C_{NH_3}(\text{ppmvd}) = \frac{V_{a(\text{front})} + V_{a(\text{back})}}{(V_m)_{dstdL}} \times 10^6$$

$$C_{NH_3}(\text{ppmvd}) = \frac{0.00357 \text{ L} + 0.00007 \text{ L}}{1566.74 \text{ L}_{dstd}} \times \frac{10^6 \text{ parts}}{1 \text{ part}} = 2.323 \text{ ppmvd}$$

22.4 = liters of ideal gas per mol of substance at 0°C and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)

CTM 027 (AMMONIA) - RESULTS

Plant Name	West County Energy Center	Date	10/07/09
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Stack Type	Circular

Historical Data						
Run Number		Base W/DB-1	Base W/DB-2	Base W/DB-3	Average	
Run Start Time		16:05	17:18	18:32		hh:mm
Run Stop Time		17:09	18:25	19:42		hh:mm
Meter Calibration Factor	(Y)	1.054	1.054	1.054		
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840		
Average Nozzle Diameter	(D _{na})	0.248	0.248	0.248		in
Stack Test Data						
Initial Meter Volume	(V _m) _i	964.314	17.641	70.433		ft3
Final Meter Volume	(V _m) _f	1017.230	70.050	120.554		ft3
Total Meter Volume	(V _m)	52.916	52.409	50.121	51.815	ft3
Total Sampling Time	(Θ)	60.0	60.0	60.0	60.0	min
Average Meter Temperature	(t _m) _{avg}	75.5	76.8	75.6	76.0	oF
Average Stack Temperature	(t _s) _{avg}	175.6	175.5	176.1	175.8	oF
Barometric Pressure	(P _b)	29.91	29.88	29.88	29.89	in Hg
Stack Static Pressure	(P _{static})	-0.65	-0.65	-0.65	-0.65	in H2O
Absolute Stack Pressure	(P _s)	29.86	29.83	29.83	29.84	in Hg
Average Orifice Pressure Drop	(ΔH) _{avg}	2.74	2.68	2.53	2.65	in H2O
Absolute Meter Pressure	(P _m)	30.03	30.00	30.00	30.01	in Hg
Avg Square Root Pitot Pressure	($\Delta P^{1/2}$) _{avg}	0.99	0.98	0.95	0.98	(in H2O) ^{1/2}
Moisture Content Data						
Impingers 1-3 Water Volume Gain	(V _n)	114.5	105.0	127.3	115.6	ml
Impinger 4 Silica Gel Weight Gain	(W _n)	29.1	26.2	25.9	27.1	g
Total Water Volume Collected	(V _{lc})	143.7	131.2	153.3	142.7	ml
Standard Water Vapor Volume	(V _w) _{std}	6.762	6.177	7.215	6.718	scf
Standard Meter Volume	(V _m) _{std}	55.329	54.620	52.329	54.093	dscf
Calculated Stack Moisture	(B _{ws(calc)})	10.89	10.16	12.12	11.05	%
Saturated Stack Moisture	(B _{ws(svp)})	46.3	46.3	46.9	46.5	%
Reported Stack Moisture Content	(B _{ws})	10.89	10.16	12.12	11.05	%
Gas Analysis Data						
Carbon Dioxide Percentage	(%CO ₂)	5.1	5.1	5.2	5.1	%
Oxygen Percentage	(%O ₂)	12.0	12.1	12.0	12.0	%
Carbon Monoxide Percentage	(%CO)	0.0	0.0	0.0	0.0	%
Nitrogen Percentage	(%N ₂)	82.9	82.8	82.8	82.8	%
Dry Gas Molecular Weight	(M _d)	29.30	29.30	29.31	29.30	lb/lb-mole
Wet Stack Gas Molecular Weight	(M _w)	28.07	28.15	27.94	28.05	lb/lb-mole
Calculated Fuel Factor	(F _c)	1.742	1.735	1.709	1.729	
Fuel F-Factor	(F _d)	8642	8642	8642	8642	dscf/MMBtu
Percent Excess Air	(%EA)	121.4	122.7	122.0	122.0	%
Volumetric Flow Rate Data						
Average Stack Gas Velocity	(V _s)	61.73	61.42	59.59	60.92	ft/sec
Stack Cross-Sectional Area	(A _s)	378.35	378.35	378.35	378.35	ft2
Actual Stack Flow Rate	(Q _{aw})	1,401,319	1,394,336	1,352,846	1,382,833	acfm
Wet Standard Stack Flow Rate	(Q _{sw})	69,708	69,300	67,180	68,729	wkscfh
Dry Standard Stack Flow Rate	(Q _{sd})	1,035,305	1,037,655	984,016	1,018,992	dscfm
Percent of Isokinetic Rate	(I)	99.8	99.1	97.9	98.9	%
Ammonia Rate Data						
Stack Ammonia Concentration	(C _{NH3})	2.32	2.42	2.70	2.48	ppm
	(C _{NH3})	1.54	1.62	1.79	1.65	ppm@15%O ₂

CTM 027 (AMMONIA) SOURCE SAMPLING TITLE PAGE

ALARMS exist and have been acknowledged.

Source Information				
Plant Name	West County Energy Center			
Sampling Location	Unit 1A			
Fuel or Source Type	Gas, Natural			
Fuel F-Factor	8642	8642	8642	

Test Information			
Starting Test Date		10/07/09	
Project #		bv-09-westcounty.fl-comp#1	
Operator		TP	
Standard Temperature		68	oF
Standard Pressure		29.92	in Hg
Minimum Required Sample Vol.	indust. spec.	35	scf
Run Duration	chk Subpart	60	minutes
Unit Number		1A	
Load	% or w/DB	Base W/DB	
Base Run Number		Base W/DB	
Number of Ports Available		4	
Number of Ports Used		4	
Port Inside Diameter		6.00	in
Circular Stack			

Test Equipment Information					
Run		1	2	3	
Meter Box Number	from ACS	samp-cp-0005	samp-cp-0005	samp-cp-0005	
Meter Calibration Factor	(Y)	1.054	1.054	1.054	
Orifice Meter Coefficient	($\Delta H @$)	1.694	1.694	1.694	in H ₂ O
Pitot Identification	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840	
Nozzle Diameter	(D _n)	0.248	0.248	0.248	in
Probe Number	from ACS	samp-up-0002	samp-up-0002	samp-up-0002	
Probe Length		120.00	120.00	120.00	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Sample Case / Oven Number	from ACS	samp-bh-0006	samp-bh-0006	samp-bh-0006	
Impinger Case Number	from ACS	samp-bc-0006	samp-bc-0006	samp-bc-0006	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	5634 S. 122nd East Ave., Suite F
City, State Country Zip	Tulsa, Oklahoma 74146
Project Manager	Jake Fahlenkamp
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 2 - DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant Name West County Energy Center		Date 10/07/09	
Sampling Location Unit 1A		Project # bv-09-westcounty.fl-comp#1	
Operator TP		# of Ports Used 4	
Stack Type Circular		Pitot Identification samp-up-0002	
Pitot Leak Check <input checked="" type="checkbox"/>	PreTest <input checked="" type="checkbox"/>	Pitot Coefficient (C_p) 0.84	
	PostTest <input checked="" type="checkbox"/>		

Stack Dimensions			
Diameter or Length of Stack	(D)	263.38	in
Width of Stack	(W)		in
Area of Stack	(A _s)	378.35	ft ²

Pressures			
Barometric Pressure	(P _b)	29.91	in Hg
Static Pressure	(P _{static})	-0.65	in H ₂ O
Absolute Stack Pressure	(P _s)	29.86	in Hg

Stack Gas Composition			
Composition Data:		Estimated Composition	
Carbon Dioxide Concentration	(%CO ₂)	5.5	%
Oxygen Concentration	(%O ₂)	12.0	%
Carbon Monoxide Concentration	(%CO)	0.0	%
Nitrogen Concentration	(%N ₂)	82.5	%
Stack Moisture Content	(B _{ws})	10.000	%
Stack Dry Molecular Weight	(M _d)	29.36	lb/lb-mole
Stack Wet Molecular Weight	(M _s)	28.22	lb/lb-mole

Results			
Avg Stack Gas Velocity	(V _s)	59.0	ft/sec
Avg Stack Dry Std Flow Rate	(Q _{sd})	60,034,765	dscf/hr
Avg Stack Dry Std Flow Rate	(Q _{sd})	1,000,579	dscf/min
Avg Stack Wet Flow Rate	(Q _{sw})	1,338,587	acf/min
Avg Stack Wet Std Flow Rate	(Q _{sw})	66,705,294	ascf/hr

Stack Cross Section Schematic			

Velocity Traverse Data				
Run Number		Base W/DB-V1		
Run Time	14:53	Start	15:39	End
Traverse Point	Velocity Head (Δp)	Null Angle (N _a)	Stack Temp (t _s)	Local Velocity (V _{s(0)})
	in H ₂ O	deg	oF	ft/sec
A-1	1.10	0	180	65.6
A-2	1.00	5	179	62.5
A-3	1.00	5	180	62.6
A-4	1.10	-10	180	65.6
A-5	1.20	5	178	68.4
A-6	1.10	0	177	65.5
B-1	0.98	-5	175	61.7
B-2	1.20	5	174	68.2
B-3	1.30	0	172	70.9
B-4	1.20	5	171	68.1
B-5	1.20	0	171	68.1
B-6	1.10	5	171	65.2
C-1	0.72	5	172	52.8
C-2	0.77	0	172	54.6
C-3	0.70	5	172	52.0
C-4	0.68	0	171	51.2
C-5	0.63	0	171	49.3
C-6	0.55	0	171	46.1
D-1	0.84	0	172	57.0
D-2	0.80	5	176	55.8
D-3	0.75	5	176	54.0
D-4	0.65	5	175	50.3
D-5	0.65	0	176	50.3
D-6	0.63	0	176	49.5
Average	0.91	3	175	
	0.95	= Square roots of Δp		

METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	West County Energy Center	Date	10/07/09
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	# of Ports Available	4
Stack Type	Circular	# of Ports Used	4
Stack Size	Large	Port Inside Diameter	6.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	282.38	in
Distance to Near Wall of Stack	(L _{nw})	19.00	in
Diameter of Stack	(D)	263.38	in
Area of Stack	(A _s)	378.35	ft ²

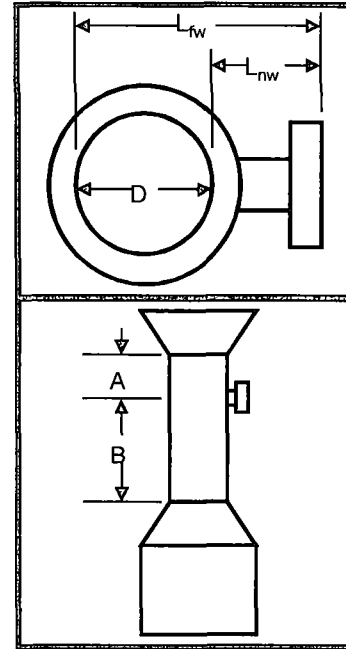
Distance from Port to Disturbances			
Distance Upstream	(A)	144.00	in
Diameters Upstream	(A _D)	0.55	diameters
Distance Downstream	(B)	531.75	in
Diameters Downstream	(B _D)	2.02	diameters

Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points	
Down Stream	Up Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
>= 8.00	>=2.00	8 or 12 ²	8 or 12 ²
Upstream Spec		24	16
Downstream Spec		24	16
Traverse Pts Required		24	16

¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

² 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Location of Traverse Points in Circular Stacks									
Traverse Point	(Fraction of Stack Dimension from Inside Wall to Traverse Point)								
Number	Number of Traverse Points Across the Stack								
1	.146	.067	.044	.032	.026	.021	.018	.016	.014
2	.854	.250	.146	.105	.082	.067	.057	.049	.044
3		.750	.296	.194	.146	.118	.099	.085	.075
4		.933	.704	.323	.226	.177	.146	.125	.109
5			.854	.677	.342	.250	.201	.169	.146
6			.956	.806	.658	.356	.269	.220	.188
7				.895	.774	.644	.366	.283	.236
8				.968	.854	.750	.634	.375	.296
9					.918	.823	.731	.625	.382
10					.974	.882	.799	.717	.618
11						.933	.854	.780	.704
12						.979	.901	.831	.764



Number of Traverse Points Used			
4	Ports by	6	Across
24	Pts Used	24	Required
			Particulate Traverse

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
		in	in
1	0.02	5 4/8	24 4/8
2	0.07	17 5/8	36 5/8
3	0.12	31 1/8	50 1/8
4	0.18	46 5/8	65 5/8
5	0.25	65 7/8	84 7/8
6	0.36	93 6/8	112 6/8
7			
8			
9			
10			
11			
12			

METHOD 3a - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	West County Energy Center			Date	10/07/09	
Sampling Location	Unit 1A			Project #	bv-09-westcounty.fl-comp#1	
Operator	TP			# of Ports Used	4	
Fuel Type	Gas, Natural	Minimum Fuel Factor	1.600	Maximum Fuel Factor	1.836	
Orsat Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Orsat Identification	

Gas Analysis Data									
Run Number		Base W/DB-1		Run Start Time		16:05	Run Stop Time		17:09
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole
1:04	5.1	12.0	2.9	5.1	12.0	0.0	82.9	29.30	0.00
Results			Averages		5.1	12.0	0.0	82.9	29.30
Average Calculated Fuel Factor			(F _o) _{avg}		1.742	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>
Average Excess Air			(%EA) _{avg}		121.4	percent	Fuel Factor in Handbook Range?		<input checked="" type="checkbox"/>

Gas Analysis Data									
Run Number		Base W/DB-2		Run Start Time		17:18	Run Stop Time		18:25
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole
1:07	5.1	12.1	2.8	5.1	12.1	0.0	82.8	29.30	0.00
Results			Averages		5.1	12.1	0.0	82.8	29.30
Average Calculated Fuel Factor			(F _o) _{avg}		1.735	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>
Average Excess Air			(%EA) _{avg}		122.7	percent	Fuel Factor in Handbook Range?		<input checked="" type="checkbox"/>

Gas Analysis Data									
Run Number		Base W/DB-3		Run Start Time		18:32	Run Stop Time		19:42
Sample Analysis Time	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (ppmCO)	Carbon Dioxide Conc. (%CO ₂)	Oxygen Conc. (%O ₂)	Carbon Monoxide Conc. (%CO)	Nitrogen Conc. (%N ₂)	Dry Molecular Weight (M _d)	Molecular Weight Deviation (ΔM _d)
hh:mm	percent	percent	ppm	percent	percent	percent	percent	lb/lb-mole	lb/lb-mole
1:10	5.2	12.0	3.8	5.2	12.0	0.0	82.8	29.31	0.00
Results			Averages		5.2	12.0	0.0	82.8	29.31
Average Calculated Fuel Factor			(F _o) _{avg}		1.709	Molecular Wt Deviation < 0.3?			<input checked="" type="checkbox"/>
Average Excess Air			(%EA) _{avg}		122.0	percent	Fuel Factor in Handbook Range?		<input checked="" type="checkbox"/>

Fuel Factor Fo		
Fuel Type	Minimum	Maximum
Coal, Anthracite	1.016	1.130
Coal, Lignite	1.016	1.130
Coal, Bituminous	1.083	1.230
Oil, Distillate	1.260	1.413
Oil, Residual	1.210	1.370
Gas, Natural	1.600	1.836
Gas, Propane	1.434	1.586
Gas, Butane	1.405	1.553
Wood	1.000	1.120
Wood Bark	1.003	1.130

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	West County Energy Center			Date	10/07/09		
Sampling Location	Unit 1A			Project #	bv-09-westcounty.fl-comp#1		
Operator	TP			# of Ports Used	4		
Stack Type	Circular			Meter Box Number	samp-cp-0005		
Train Leak Check	<input checked="" type="checkbox"/>	PreTest	<input checked="" type="checkbox"/>	PostTest	Meter Cal Factor (Y)	1.054	

Moisture Content Data							
Run Number	Base W/DB-1		Run Start Time	16:05	Run Stop Time		17:09
Total Meter Volume	(V _m)	52.916	dcf	Barometric Press.	(P _b)	29.91	in Hg
Avg Stack Temp	(t _s) _{avg}	176	oF	Stack Static Press.	(P _{static})	-0.65	in H2O
Avg Meter Temp	(t _m) _{avg}	76	oF	Avg Orifice Press.	(ΔH) _{avg}	2.74	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	g	g	g	g	g	g	g
Contents	H2SO4		H2SO4		Sil Gel		
Final Value	(V _f),(W _f)	773.00	735.00	626.80	929.50		
Initial Value	(V _i),(W _i)	722.10	694.20	604.20	900.40		
Net Value	(V _n),(W _n)	50.9	40.8	22.6	29.1		
Results							
Total Weight	(W _t)	143.40	g	Water Vol Weighed	(V _{wsg(std)})	6.761	scf
Std Meter Volume	(V _{m(std)})	55.340	dscf	Sat. Moisture Content	(B _{ws(svp)})	46.3	%
Calc Moisture Content	(B _{ws(calc)})	10.9	%	Final Moisture Content	(B _{ws})	10.9	%

Moisture Content Data							
Run Number	Base W/DB-2		Run Start Time	17:18	Run Stop Time		18:25
Total Meter Volume	(V _m)	52.409	dcf	Barometric Press.	(P _b)	29.88	in Hg
Avg Stack Temp	(t _s) _{avg}	176	oF	Stack Static Press.	(P _{static})	-0.65	in H2O
Avg Meter Temp	(t _m) _{avg}	77	oF	Avg Orifice Press.	(ΔH) _{avg}	2.68	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	g	g	g	g	g	g	g
Contents	H2SO4		H2SO4		Sil Gel		
Final Value	(V _f),(W _f)	762.10	717.30	657.40	941.20		
Initial Value	(V _i),(W _i)	698.50	686.80	646.70	915.00		
Net Value	(V _n),(W _n)	63.6	30.5	10.7	26.2		
Results							
Total Weight	(W _t)	131.00	g	Water Vol Weighed	(V _{wsg(std)})	6.177	scf
Std Meter Volume	(V _{m(std)})	54.620	dscf	Sat. Moisture Content	(B _{ws(svp)})	46.3	%
Calc Moisture Content	(B _{ws})	10.2	%	Final Moisture Content	(B _{ws})	10.2	%

Moisture Content Data							
Run Number	Base W/DB-3		Run Start Time	18:32	Run Stop Time		19:42
Total Meter Volume	(V _m)	50.121	dcf	Barometric Press.	(P _b)	29.88	in Hg
Avg Stack Temp	(t _s) _{avg}	176	oF	Stack Static Press.	(P _{static})	-0.65	in H2O
Avg Meter Temp	(t _m) _{avg}	76	oF	Avg Orifice Press.	(ΔH) _{avg}	2.53	in H2O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	g	g	g	g	g	g	g
Contents	H2SO4		H2SO4		Sil Gel		
Final Value	(V _f),(W _f)	777.80	723.40	628.90	979.60		
Initial Value	(V _i),(W _i)	707.50	690.20	605.30	953.70		
Net Value	(V _n),(W _n)	70.3	33.2	23.6	25.9		
Results							
Total Weight	(W _t)	153.00	g	Water Vol Weighed	(V _{wsg(std)})	7.214	scf
Std Meter Volume	(V _{m(std)})	52.327	dscf	Sat. Moisture Content	(B _{ws(svp)})	46.9	%
Calc Moisture Content	(B _{ws})	12.1	%	Final Moisture Content	(B _{ws})	12.1	%

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/7/2009
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base W/DB-1
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	175	oF
Avg Gas Meter Temp	(t _m)	79	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{pit})	91.00	in H2O
Stack Moisture Content	(B _{ws})	10.00	%
Stack Dry Molecular Weight	(M _d)	29.30	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.750	acfm
DP to DH Isokinetic Factor	(K)	2.73	

Leak Checks					
Train	Pre	0	ft3/min @	15	in Hg
OK? <input checked="" type="checkbox"/>	Post	0	ft3/min @	15	in Hg
Pitot	Pre	6.7/5.5	in. H ₂ O for	15	sec
OK? <input checked="" type="checkbox"/>	Post	6.7/5.5	in. H ₂ O for	15	sec
Orsat	OK?	<input type="checkbox"/>			

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _{ni})	0.0712	in
Probe # / Length	samp-up-0002	/ 120	in
Liner Material	inconel		
Sample Case / Orven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Pressures			
Barometric Pressure	(P _b)	29.91	in Hg
Stack Static Pressure	(P _{static})	-0.65	in H2O
Absolute Stack Pressure	(P _s)	29.86	in Hg
Absolute Meter Pressure	(P _m)	30.03	in Hg

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Run Time			
Start	16:05	End	17:09

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	722.10	694.20	604.20	900.40				
Post	773.00	735.00	626.80	929.50				

Wash Volume	H ₂ O	50.0	ml	Filter #
	MeCl		ml	

Traverse Point #	Sampling Time (⊙) min	Timer Time hh:mm:ss	Dry Gas Meter Reading (V _m) ft3	Velocity Head (Δp) in H2O	Desired Orifice ΔH (ΔH _d) in H2O	Actual Orifice ΔH (ΔH _a) in H2O	Stack Temp (t _s) oF	Probe Temp (t _p) oF	Filter Temp (t _f) oF	Impinger Exit Temp (t _{imp}) oF	Aux Temp (t _{aux}) oF	Meter Inlet Temp (t _{mi}) oF	Meter Outlet Temp (t _{mo}) oF	Pump Vacuum in Hg	Square Root ΔP (ΔP ^{1/2}) (in H2O) ^{1/2}	Local Stack Velocity (v _s) ft/sec	Cumulative Meter Volume (V _m) _{std} scf	Cumulative Percent IsoKinetic (%)	Est-Run Meter Volume (V _m) _{std} scf
A-1	0.0	0:00:00	964.314	0.850	2.322	2.300	190	249	228	68		75	73	2.5	0.92	58.20	2.358	110.4	56.601
A-2	2.5	0:02:30	966.565	0.840	2.295	2.300	188	248	230	68		75	73	2.5	0.92	57.77	4.307	101.9	51.685
A-3	5.0	0:05:00	968.425	0.800	2.186	2.100	187	249	236	67		76	70	2.0	0.89	56.33	6.342	100.7	50.740
A-4	7.5	0:07:30	970.365	0.750	2.049	2.100	176	250	237	66		74	70	2.0	0.87	54.08	8.271	99.4	49.628
A-5	10.0	0:10:00	972.200	0.600	1.639	1.600	176	252	238	60		75	70	1.5	0.77	48.37	10.185	100.5	48.890
A-6	12.5	0:12:30	974.025	0.550	1.503	1.500	176	253	237	60		76	71	1.5	0.74	46.31	12.040	101.5	48.160
B-1	15.0	0:15:00	975.797	0.800	2.186	2.200	173	245	231	61		75	71	2.0	0.89	55.72	14.126	101.2	48.433
B-2	17.5	0:17:30	977.785	0.840	2.295	2.300	172	247	230	63		76	72	2.5	0.92	57.05	16.264	100.9	48.791
B-3	20.0	0:20:00	979.825	0.800	2.186	2.200	173	246	228	62		77	74	2.5	0.89	55.72	18.379	100.9	49.010
B-4	22.5	0:22:30	981.850	0.800	2.186	2.200	173	249	234	62		77	72	2.5	0.89	55.72	20.472	100.8	49.132
B-5	25.0	0:25:00	983.850	0.650	1.776	1.800	171	249	240	63		77	72	2.0	0.81	50.15	22.427	101.0	48.931
B-6	27.5	0:27:30	985.720	0.650	1.776	1.800	172	251	247	64		78	73	2.0	0.81	50.18	24.333	101.0	48.666
C-1	30.0	0:30:00	987.547	1.100	3.005	3.000	174	250	246	65		78	73	4.5	1.05	65.39	26.785	100.8	49.449
C-2	32.5	0:32:30	989.890	1.200	3.278	3.300	175	255	243	65		78	73	4.5	1.10	68.35	29.089	100.0	49.867
C-3	35.0	0:35:00	992.090	1.300	3.552	3.600	172	250	246	61		79	74	6.0	1.14	70.97	31.663	99.7	50.660
C-4	37.5	0:37:30	994.550	1.400	3.825	3.800	172	253	249	61		81	74	6.5	1.18	73.65	34.384	99.5	51.576
C-5	40.0	0:40:00	997.155	1.300	3.552	3.600	171	251	254	61		81	75	6.0	1.14	70.92	37.216	100.0	52.541
C-6	42.5	0:42:30	999.870	1.300	3.552	3.600	173	252	251	63		82	79	6.0	1.14	71.03	39.756	99.7	53.009
D-1	45.0	0:45:00	1002.316	1.100	3.005	3.000	177	252	254	65		79	75	4.5	1.05	65.54	42.557	100.6	53.757
D-2	47.5	0:47:30	1005.000	1.300	3.552	3.600	177	251	255	67		79	74	6.0	1.14	71.25	44.964	100.1	53.956
D-3	50.0	0:50:00	1007.300	1.300	3.552	3.600	176	255	255	68		79	74	6.0	1.14	71.20	47.647	100.1	54.454
D-4	52.5	0:52:30	1009.865	1.300	3.552	3.600	174	250	256	68		80	77	6.0	1.14	71.08	50.185	99.8	54.747
D-5	55.0	0:55:00	1012.300	1.200	3.278	3.300	173	251	255	68		80	75	5.0	1.10	68.24	52.793	99.9	55.089
D-6	57.5	0:57:30	1014.800	1.200	3.278	3.300	174	251	255	67		80	75	5.0	1.10	68.30	55.329	99.8	55.329
Last Pt	60.0	1:00:00	1017.230																
Final Val	60.0	1:00:00	1017.230											Max Vac	6.5	Final Values	55.329	99.8	
Average Values				1.00		2.74	176	250	243	64		78	73		0.99	61.73			

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/7/2009
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base W/DB-2
# of Points Across	6	# of Ports Used	4

Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	176	oF
Avg Gas Meter Temp	(t _m)	76	
DH @ 0.75 SCFM	(ΔH@)	1.69	in H2O
Avg Pitot Tube Diff. Pressure	(ΔP _{pit})	0.99	in H2O
Stack Moisture Content	(B _w)	10.00	%
Stack Dry Molecular Weight	(M _d)	29.30	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.882	acfm
DP to DH Isokinetic Factor	(K)	2.71	

Train	Pre	0.0025	ft3/min @	15	in Hg
OK?	<input checked="" type="checkbox"/>	Post	0	ft3/min @	15
Pitot	Pre	6.7/5.5	in. H ₂ O for	15	sec
OK?	<input checked="" type="checkbox"/>	Post	6.7/5.5	in. H ₂ O for	15
Orsat	OK?	<input type="checkbox"/>			

Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _n)	0.2399	in
Probe # / Length	samp-up-0002 / 120		in
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Barometric Pressure	(P _b)	29.88	in Hg
Stack Static Pressure	(P _{static})	-0.65	in H2O
Absolute Stack Pressure	(P _s)	29.83	in Hg
Absolute Meter Pressure	(P _m)	30.00	in Hg

Start	17:18	End	18:25
--------------	-------	------------	-------

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	698.50	686.80	646.70	915.00				
Post	762.10	717.30	657.40	941.20				

Wash	H₂O	50.0	ml	Filter #	
Volume	MeCl		ml		

Traverse Point #	Sampling Time (θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (ΔP)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Probe Temp	Filter Temp	Impinger Exit Temp	Aux Temp	Meter Inlet Temp (t _m)	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s) _i	Cumulative Meter Volume (V _m) _{std}	Cumulative Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft3	in H2O	in H2O	in H2O	oF	oF	oF	oF	oF	oF	oF	in Hg	(in H2O) ^{1/2}	ft/sec	scf	%	scf
A-1	0.0	0:00:00	17.641	1.100	2.983	3.000	176	246	258	68		76	74	4.5	1.05	65.52	2.343	95.5	56.234
A-2	2.5	0:02:30	19.880	1.300	3.525	3.500	177	251	261	65		77	76	5.0	1.14	71.29	4.715	92.2	56.578
A-3	5.0	0:05:00	22.150	1.400	3.796	3.800	176	248	262	64		79	74	6.5	1.18	73.92	7.381	93.7	59.049
A-4	7.5	0:07:30	24.700	1.300	3.525	3.500	177	250	263	64		82	75	6.5	1.14	71.29	10.056	95.4	60.338
A-5	10.0	0:10:00	27.270	1.200	3.254	3.300	174	250	261	64		84	75	6.0	1.10	68.33	12.751	97.4	61.207
A-6	12.5	0:12:30	29.865	1.200	3.254	3.300	174	250	263	65		86	76	6.0	1.10	68.33	15.273	97.6	61.093
B-1	15.0	0:15:00	32.300	1.000	2.712	2.700	173	249	263	65		83	76	4.5	1.00	62.33	17.523	97.4	60.080
B-2	17.5	0:17:30	34.470	1.200	3.254	3.300	174	251	265	66		87	77	5.0	1.10	68.33	20.035	97.4	60.106
B-3	20.0	0:20:00	36.900	1.300	3.525	3.500	173	252	266	66		80	77	6.0	1.14	71.06	22.456	96.7	59.882
B-4	22.5	0:22:30	39.225	1.300	3.525	3.500	172	251	263	68		75	77	6.0	1.14	71.01	25.185	97.2	60.444
B-5	25.0	0:25:00	41.835	1.400	3.796	3.800	173	253	264	63		77	74	7.0	1.18	73.75	27.898	97.3	60.869
B-6	27.5	0:27:30	44.425	1.100	2.983	3.000	171	251	262	60		78	76	5.0	1.05	65.27	30.389	97.6	60.778
C-1	30.0	0:30:00	46.814	0.800	2.169	2.200	173	248	262	62		76	74	4.0	0.89	55.75	32.568	98.0	60.125
C-2	32.5	0:32:30	48.900	0.800	2.169	2.200	174	253	261	63		76	76	3.0	0.89	55.79	34.757	98.4	59.583
C-3	35.0	0:35:00	51.000	0.770	2.088	2.100	173	252	266	63		77	73	3.0	0.88	54.69	36.668	98.1	58.669
C-4	37.5	0:37:30	52.830	0.750	2.034	2.000	173	252	264	64		78	73	2.5	0.87	53.98	38.644	98.1	57.966
C-5	40.0	0:40:00	54.725	0.600	1.627	1.600	176	251	262	65		78	73	2.0	0.77	48.39	40.504	98.3	57.182
C-6	42.5	0:42:30	56.510	0.600	1.627	1.600	176	251	265	65		78	73	2.0	0.77	48.39	42.350	98.4	56.467
D-1	45.0	0:45:00	58.282	0.880	2.386	2.400	180	253	262	67		77	74	3.0	0.94	58.79	44.405	98.2	56.091
D-2	47.5	0:47:30	60.250	0.870	2.359	2.400	180	252	265	65		78	73	3.0	0.93	58.46	46.540	98.2	55.848
D-3	50.0	0:50:00	62.295	0.800	2.169	2.200	181	253	265	60		78	73	3.0	0.89	56.10	48.877	98.9	55.860
D-4	52.5	0:52:30	64.535	0.700	1.898	1.900	179	258	263	59		81	74	2.5	0.84	52.39	50.732	98.7	55.344
D-5	55.0	0:55:00	66.320	0.650	1.763	1.800	179	253	263	58		78	73	2.5	0.81	50.49	52.681	98.9	54.971
D-6	57.5	0:57:30	68.190	0.650	1.763	1.800	179	252	265	58		78	73	2.5	0.81	50.49	54.620	99.1	54.620
Last Pt	60.0	1:00:00	70.050																
Final Val	60.0	1:00:00	70.050											Max Vac	7.0	Final Values	54.620	99.1	
Average Values				0.99		2.68	176	251	263	64		79	75		0.98	61.42			

CTM 027 (AMMONIA) ISOKINETIC SAMPLING DATA

Plant Name	West County Energy Center	Date	10/7/2009
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Run #	Base W/DB-3
# of Points Across	6	# of Ports Used	4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Tube Coefficient	(C _p)	0.84	
Avg Stack Temp	(t _s)	176	oF
Avg Gas Meter Temp	(t _m)	77	
DH @ 0.75 SCFM	(ΔH _@)	1.69	in H ₂ O
Avg Pitot Tube Diff. Pressure	(ΔP _{pit})	0.98	in H ₂ O
Stack Moisture Content	(B _{ws})	10.00	%
Stack Dry Molecular Weight	(M _d)	29.30	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.873	acfm
DP to DH Isokinetic Factor	(K)	2.72	

Leak Checks					
Train	Pre	0.005	ft ³ /min @	15	in Hg
OK? <input checked="" type="checkbox"/>	Post	0	ft ³ /min @	15	in Hg
Pitot	Pre	6.7/5.5	in. H ₂ O for	15	sec
OK? <input checked="" type="checkbox"/>	Post	6.7/5.5	in. H ₂ O for	15	sec
Orsat	OK? <input type="checkbox"/>				

Sampling Equipment			
Meter #	samp-cp-0005		
Meterbox Cal. Factor	(Y)	1.054	
Nozzle #			
Average Nozzle Diameter	(D _{na})	0.2480	in
Rec. Nozzle Diameter	(D _n)	0.2388	in
Probe # / Length	samp-up-0002	/ 120	in
Liner Material	inconel		
Sample Case / Oven #	samp-bh-0006		
Impinger Case #	samp-bc-0006		

Pressures			
Barometric Pressure	(P _b)	29.88	in Hg
Stack Static Pressure	(P _{static})	-0.65	in H ₂ O
Absolute Stack Pressure	(P _s)	29.83	in Hg
Absolute Meter Pressure	(P _m)	30.00	in Hg

Nozzle Measurements				
Pre	0.248	0.248	0.248	PASS
Post	0.248	0.248	0.248	PASS

Run Time			
Start	18:32	End	19:42

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	707.50	690.20	605.30	953.70				
Post	777.80	723.40	628.90	979.60				

Wash	H ₂ O	50.0	ml	Filter #
Volume	MeCl		ml	

Traverse Point #	Sampling Time (⊙)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Probe Temp	Filter Temp	Impinger Exit Temp	Aux Temp	Meter Inlet Temp (t _m)	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumulative Meter Volume (V _m) _{std}	Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
A-1	0.0	0:00:00	70.433	0.850	2.311	2.300	180	249	264	68		74	72	2.5	0.92	57.78	2.115	98.3	50.762
A-2	2.5	0:02:30	72.450	0.850	2.311	2.300	180	251	264	68		76	72	2.5	0.92	57.78	4.339	100.9	52.070
A-3	5.0	0:05:00	74.575	0.750	2.039	2.000	179	251	262	66		80	72	2.5	0.87	54.23	6.277	99.4	50.218
A-4	7.5	0:07:30	76.435	0.600	1.631	1.600	181	252	262	67		77	73	2.5	0.77	48.58	8.222	101.3	49.334
A-5	10.0	0:10:00	78.300	0.550	1.495	1.500	179	253	264	67		77	73	1.0	0.74	46.44	10.010	101.7	48.050
A-6	12.5	0:12:30	80.015	0.550	1.495	1.500	179	250	264	68		77	73	1.0	0.74	46.44	11.752	101.5	47.007
B-1	15.0	0:15:00	81.685	0.800	2.175	2.200	175	251	265	68		78	72	2.5	0.89	55.83	13.856	101.3	47.507
B-2	17.5	0:17:30	83.700	0.800	2.175	2.200	176	248	264	66		77	73	2.5	0.89	55.88	15.971	101.3	47.914
B-3	20.0	0:20:00	85.725	0.700	1.903	1.900	175	248	263	68		79	72	2.0	0.84	52.23	17.926	101.1	47.804
B-4	22.5	0:22:30	87.600	0.650	1.767	1.800	177	250	261	68		77	72	1.5	0.81	50.41	19.911	101.5	47.786
B-5	25.0	0:25:00	89.500	0.600	1.631	1.600	174	249	268	60		79	72	1.5	0.77	48.32	21.734	101.5	47.420
B-6	27.5	0:27:30	91.250	0.600	1.631	1.600	174	248	260	62		77	72	1.5	0.77	48.32	23.486	101.1	46.971
C-1	30.0	0:30:00	92.928	1.000	2.718	2.700	174	250	260	64		76	72	3.5	1.00	62.38	25.719	100.6	47.482
C-2	32.5	0:32:30	95.060	1.000	2.718	2.700	175	251	267	66		77	72	4.0	1.00	62.43	28.012	100.4	48.020
C-3	35.0	0:35:00	97.250	1.200	3.262	3.300	174	252	260	68		78	72	5.0	1.10	68.33	30.509	100.1	48.815
C-4	37.5	0:37:30	99.635	1.300	3.534	3.500	175	251	259	60		80	73	5.5	1.14	71.18	33.085	99.8	49.627
C-5	40.0	0:40:00	102.100	1.200	3.262	3.300	172	253	265	61		80	73	5.0	1.10	68.22	35.591	99.6	50.246
C-6	42.5	0:42:30	104.500	1.200	3.262	3.300	174	254	258	63		81	73	5.0	1.10	68.33	38.111	99.5	50.815
D-1	45.0	0:45:00	106.915	1.000	2.718	2.700	175	251	264	64		79	73	4.0	1.00	62.43	40.444	99.6	51.087
D-2	47.5	0:47:30	109.150	1.100	2.990	3.000	179	250	255	65		79	73	4.0	1.05	65.68	42.742	99.2	51.290
D-3	50.0	0:50:00	111.350	1.300	3.534	3.500	176	250	260	66		81	73	4.0	1.14	71.23	45.002	98.5	51.431
D-4	52.5	0:52:30	113.515	1.300	3.534	3.500	174	251	255	67		84	74	4.0	1.14	71.12	47.342	98.0	51.645
D-5	55.0	0:55:00	115.765	1.200	3.262	3.300	174	249	266	67		82	74	5.0	1.10	68.33	49.784	97.8	51.948
D-6	57.5	0:57:30	118.110	1.200	3.262	3.300	175	252	264	66		82	74	5.0	1.10	68.38	52.329	97.9	52.329
Last Pt	60.0	1:00:00	120.554																
Final Val	60.0	1:00:00	120.554											Max Vac	5.5	Final Values	52.329	97.9	
Average Values				0.929		2.525	176	251	262	66		79	73		0.95	59.59			

CTM 027 (AMMONIA) - SAMPLE RECOVERY AND INTEGRITY DATA SHEET

Plant Name	West County Energy Center	Date	10/07/09
Sampling Location	Unit 1A	Project #	bv-09-westcounty.fl-comp#1
Operator	TP	Acetone Lot Number	

Run History Data				
Run Number	Base W/DB-1	Base W/DB-2	Base W/DB-3	
Run Start Time	16:05	17:18	18:32	(hh:mm)
Run Stop Time	17:09	18:25	19:42	(hh:mm)
Train Prepared By	AS	AS	AS	
Train Recovered By	AS	AS	AS	
Recovery Date	10/7/2009	10/7/2009	10/7/2009	(mm/dd/yy)



Moisture Content Data					
Impingers 1, 2, and 3 - Liquid Volume					
Final Volume	(V _f)	2138.6	2140.7	2133.9	ml
Initial Volume	(V _i)	2024.1	2035.7	2006.6	ml
Net Volume	(V _n)	114.5	105.0	127.3	ml
Comments					
Impinger 4 - Silica Gel Weight					
Final Weight	(W _f)	929.5	941.2	979.6	g
Initial Weight	(W _i)	900.4	915.0	953.7	g
Net Weight	(W _n)	29.1	26.2	25.9	g
Comments					
Total Water Collected					
Total Volume	(V _c)	143.7	131.2	153.3	ml

Ammonia Sample Log-In Sheet

Lab Tech: Albert Septiano
 Project: bv-09-westcounty.fl-comp#1
 Collected by: Albert Septiano
 Date Received: 10/7/2009 - 10/8/2009



AIR HYGIENE

BLANKS

AHI Lab #	Sample ID	Sample Source Description	Run #	Filter		Comments	Volume (ml)
				Contents	Sample Date		
BLANK	16	Unit 1A w/o DB		H ₂ SO ₄ , H ₂ O	10/7/2009	Normal	80

SAMPLES

AHI Lab #	Sample ID	Sample Source Description	Run #	Contents	Sample Date	Comments	Volume (ml)
U1A-R1-FH	29	Unit 1A Run 1 w/DB Front Half	1	H ₂ SO ₄ , H ₂ O	10/7/2009	Normal	190
U1A-R1-BH	30	Unit 1A Run 1 w/DB Back Half	1	H ₂ SO ₄ , H ₂ O	10/7/2009	Normal	220
U1A-R2-FH	31	Unit 1A Run 2 w/DB Front Half	2	H ₂ SO ₄ , H ₂ O	10/7/2009	Normal	180
U1A-R2-BH	32	Unit 1A Run 2 w/DB Back Half	2	H ₂ SO ₄ , H ₂ O	10/7/2009	Normal	200
U1A-R3-FH	33	Unit 1A Run 3 w/DB Front Half	3	H ₂ SO ₄ , H ₂ O	10/7/2009	Normal	240
U1A-R3-BH	34	Unit 1A Run 3 w/DB Back Half	3	H ₂ SO ₄ , H ₂ O	10/7/2009	Normal	190
U1A-R1-FH	35	Unit 1A Run 1 w/o DB Front Half	1	H ₂ SO ₄ , H ₂ O	10/8/2009	Normal	230
U1A-R1-BH	36	Unit 1A Run 1 w/o DB Back Half	1	H ₂ SO ₄ , H ₂ O	10/8/2009	Normal	210
U1A-R2-FH	37	Unit 1A Run 2 w/o DB Front Half	2	H ₂ SO ₄ , H ₂ O	10/8/2009	Normal	190
U1A-R2-BH	38	Unit 1A Run 2 w/o DB Back Half	2	H ₂ SO ₄ , H ₂ O	10/8/2009	Normal	230
U1A-R3-FH	39	Unit 1A Run 3 w/o DB Front Half	3	H ₂ SO ₄ , H ₂ O	10/8/2009	Normal	250
U1A-R3-BH	40	Unit 1A Run 3 w/o DB Back Half	3	H ₂ SO ₄ , H ₂ O	10/8/2009	Normal	210

Ammonia Sample Measurement

Lab Tech:	Albert Septiano
Project:	bv-09-westcounty.fl-comp#1
Date Analyzed:	10/7/2009
Time Analyzed:	8:30 AM
Temp (°F)	75.0
Humidity	48%
BP (In HG)	29.90
Analysis Method	350.3



Calibration Data		
Concentration (ppm)	Pre-Cal (ppm)	Pre-Cal (mV)
0.0	0.0	113.5
1.0	1.0	-2.0
5.0	5.0	-42.4
10.0	10.0	-58.0
20.0	20.0	-77.0
Slope		
Linearity	1.0000	N/A

Sample ID	Sample Amt Used (ml)	ISA/pH Volume (ml)	Meter Reading (mg/L)	Time Analyzed (hh:mm:ss)	Dilution Factor	Sample Volume	MQL (mg/L)	PQL (mg/L)	Final Conc. (mg/L)
BLANK	80.0	2.0	0.0	9:06:00	1.0	80.0	0.10	0.1	BPQL
U1A-R1-FH	90.0	2.0	14.3	9:00:00	1.0	190.0	0.10	0.1	14.3
U1A-R1-BH	80.0	2.0	0.2	9:13:00	1.0	220.0	0.10	0.1	0.2
U1A-R2-FH	80.0	2.0	15.6	9:22:00	1.0	180.0	0.10	0.1	15.6
U1A-R2-BH	80.0	2.0	0.2	9:30:00	1.0	200.0	0.10	0.1	0.2
U1A-R3-FH	85.0	2.0	12.5	9:38:00	1.0	240.0	0.10	0.1	12.5
U1A-R3-BH	90.0	2.0	0.2	9:44:00	1.0	190.0	0.10	0.1	0.2
U1A-R1-FH	90.0	2.0	14.7	14:35:00	1.0	230.0	0.10	0.1	14.7
U1A-R1-BH	90.0	2.0	0.3	14:42:00	1.0	210.0	0.10	0.1	0.3
U1A-R2-FH	90.0	2.0	10.5	14:49:00	1.0	190.0	0.10	0.1	10.5
U1A-R2-BH	90.0	2.0	0.3	14:57:00	1.0	230.0	0.10	0.1	0.3
U1A-R3-FH	90.0	2.0	14.3	15:05:00	1.0	250.0	0.10	0.1	14.3
U1A-R3-BH	90.0	2.0	0.2	15:11:00	1.0	210.0	0.10	0.1	0.2



Ammonia Analysis

Project Name: bv-09-westcounty.fl-comp#1
Date Received: 10/7/2009 - 10/8/2009

AHI Lab No.: BLANK
Sample ID: 16
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	BPQL	0.10	10/7/09 9:06
Volume	Volume in ml	N/A	80	N/A	10/7/09 8:30

AHI Lab No.: U1A-R1-FH
Sample ID: 29
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	14.3	0.10	10/7/09 9:00
Volume	Volume in ml	N/A	190	N/A	10/7/09 8:30

AHI Lab No.: U1A-R1-BH
Sample ID: 30
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.23	0.10	10/7/09 9:13
Volume	Volume in ml	N/A	220	N/A	10/7/09 8:30

AHI Lab No.: U1A-R2-FH
Sample ID: 31
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	15.6	0.10	10/7/09 9:22
Volume	Volume in ml	N/A	180	N/A	10/7/09 8:30

AHI Lab No.: U1A-R2-BH
Sample ID: 32
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.21	0.10	10/7/09 9:30
Volume	Volume in ml	N/A	200	N/A	10/7/09 8:30

AHI Lab No.: U1A-R3-FH
Sample ID: 33
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	12.5	0.10	10/7/09 9:38
Volume	Volume in ml	N/A	240	N/A	10/7/09 8:30

AHI Lab No.: U1A-R3-BH
Sample ID: 34
Sampling Date: 10/7/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.19	0.10	10/7/09 9:44
Volume	Volume in ml	N/A	190	N/A	10/7/09 8:30



Ammonia Analysis

AHI Lab No.: U1A-R1-FH
 Sample ID: 35
 Sampling Date: 10/8/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	14.7	0.10	10/7/09 14:35
Volume	Volume in ml	N/A	230	N/A	10/7/09 8:30

AHI Lab No.: U1A-R1-BH
 Sample ID: 36
 Sampling Date: 10/8/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.31	0.10	10/7/09 14:42
Volume	Volume in ml	N/A	210	N/A	10/7/09 8:30

AHI Lab No.: U1A-R2-FH
 Sample ID: 37
 Sampling Date: 10/8/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	10.5	0.10	10/7/09 14:49
Volume	Volume in ml	N/A	190	N/A	10/7/09 8:30

AHI Lab No.: U1A-R2-BH
 Sample ID: 38
 Sampling Date: 10/8/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.26	0.10	10/7/09 14:57
Volume	Volume in ml	N/A	230	N/A	10/7/09 8:30

AHI Lab No.: U1A-R3-FH
 Sample ID: 39
 Sampling Date: 10/8/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	14.3	0.10	10/7/09 15:05
Volume	Volume in ml	N/A	250	N/A	10/7/09 8:30

AHI Lab No.: U1A-R3-BH
 Sample ID: 40
 Sampling Date: 10/8/2009

Test Requested	Method Parameter	Prep Info	Result	PQL*	Analysis Date
Ammonia Nitrogen	EPA 350.3 Ammonia	N/A	0.16	0.10	10/7/09 15:11
Volume	Volume in ml	N/A	210	N/A	10/7/09 8:30

TEST RESULTS

**Opacity
Base Load**

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/o DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 1

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/o DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 2

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/o DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 3

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

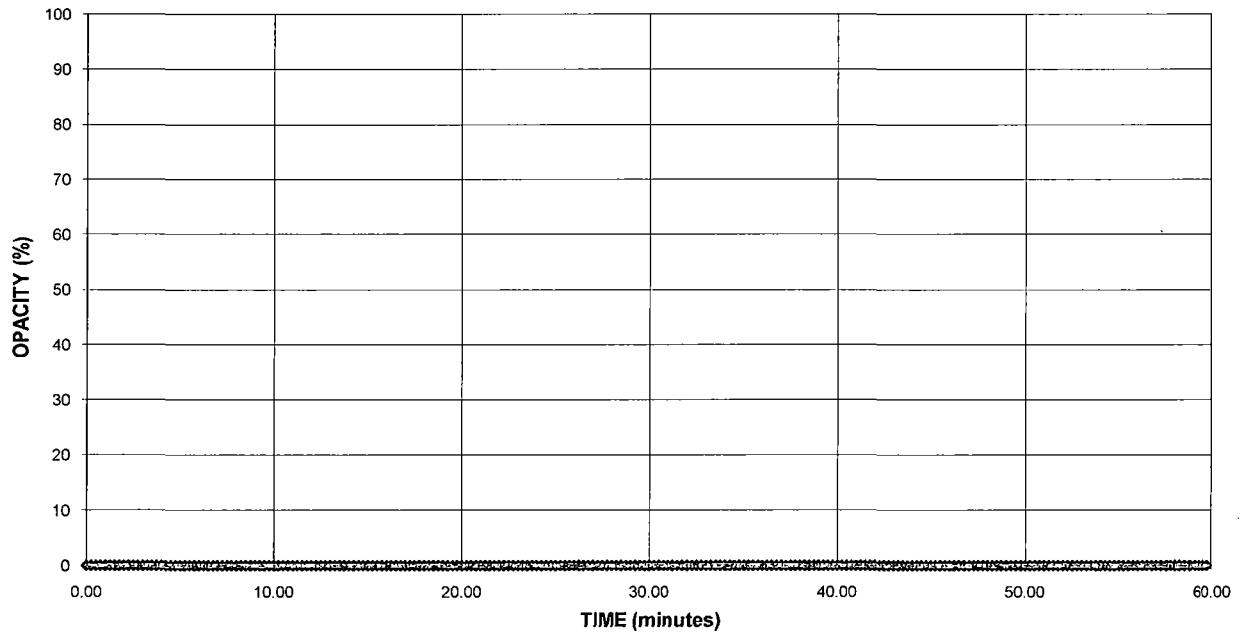
TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/o DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

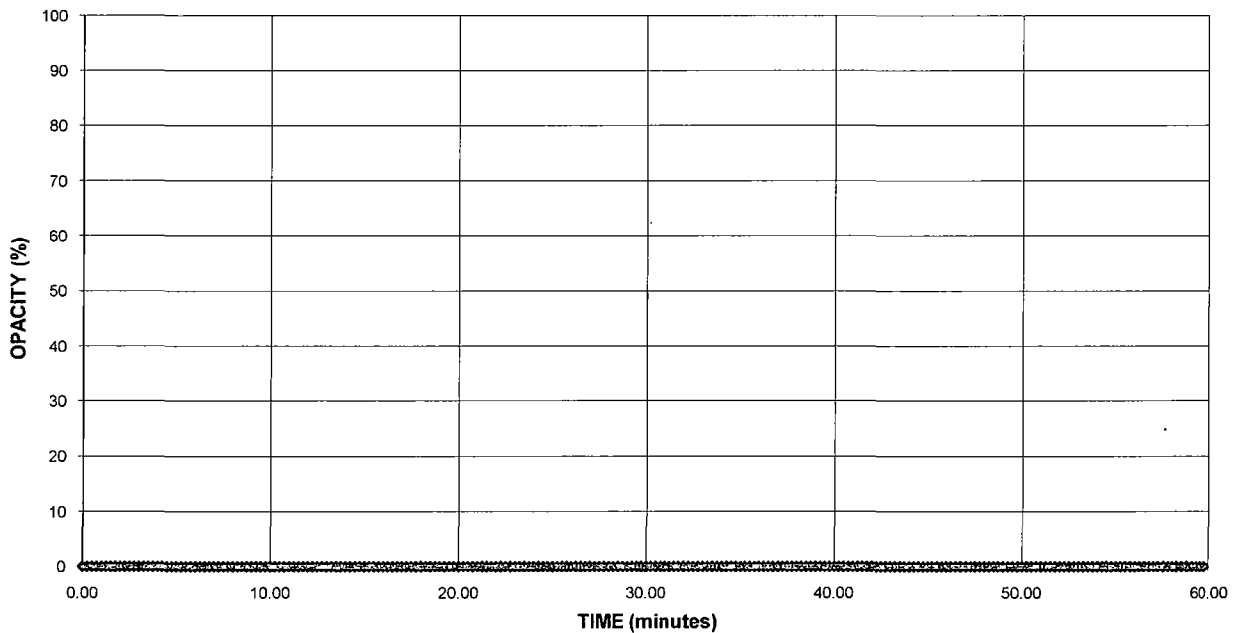
Run 1

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)

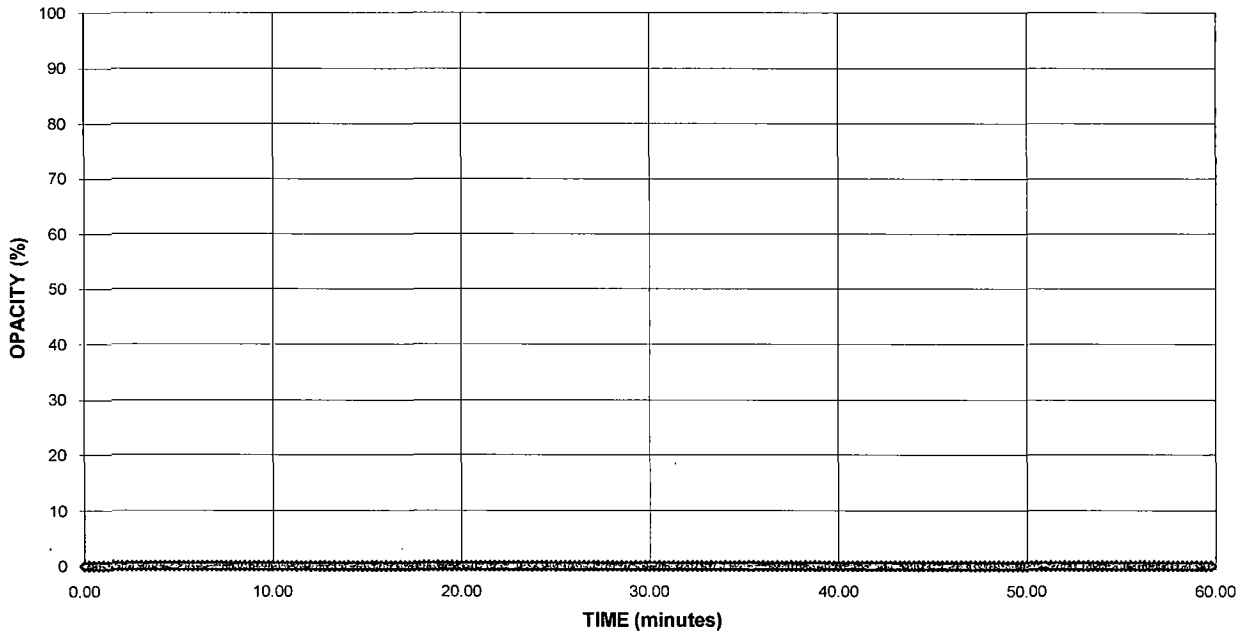


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/o DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

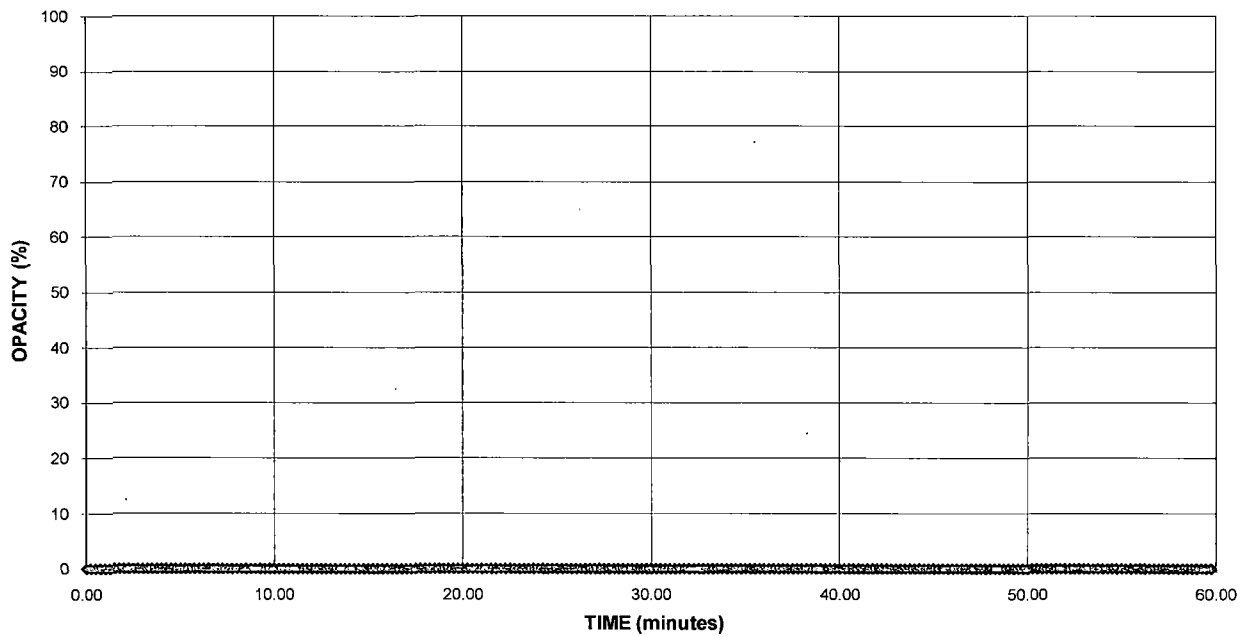
Run 2

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)

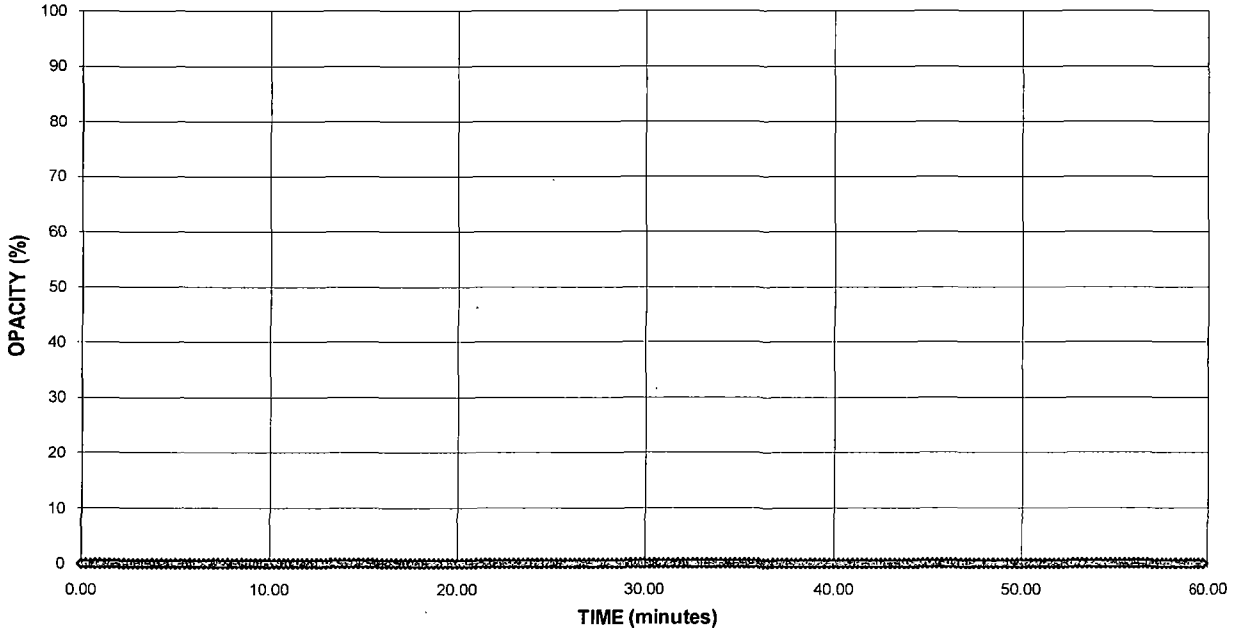


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/o DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

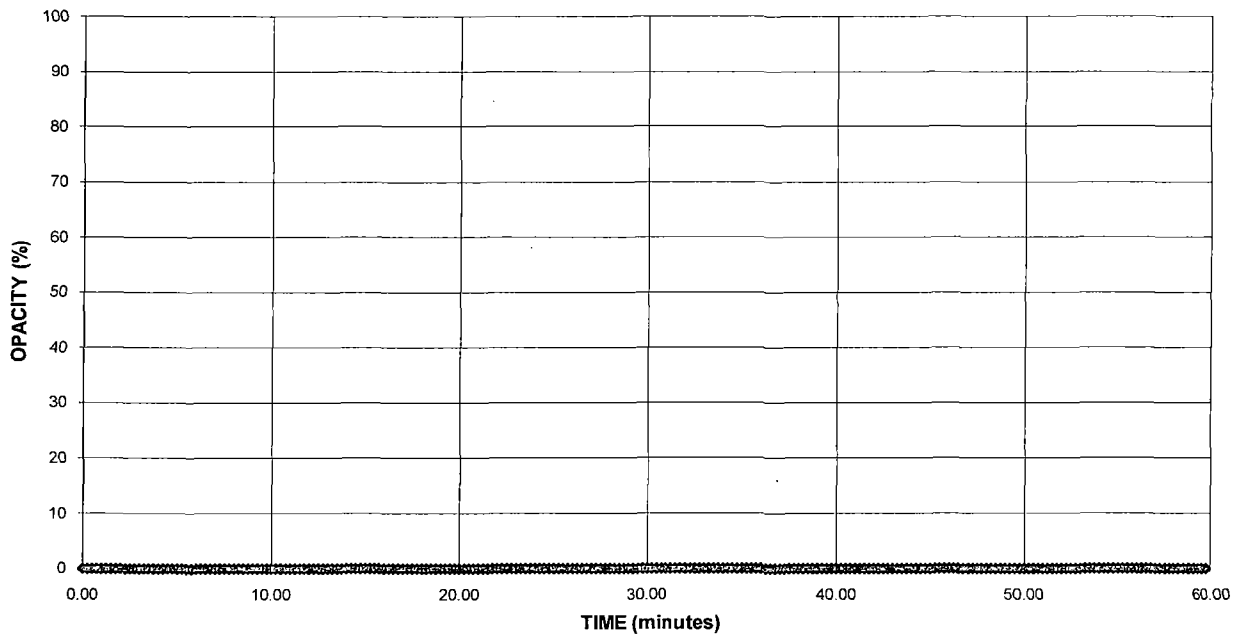
Run 3

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)



Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name: Florida Power & Light
 Facility Name: West County Energy Center
 Street Address: 20505 State Road 80
 City: Lexatcher Florida State: _____ Zip: 33470

Form Number _____ Page 1 of 6
 Continued on Form Number _____

Process: Electricity Production Unit #: 1A Operating Mode: W/O
Base
 Control Equipment: Ammonia Injection Operating Mode: Normal

Observation Date: 10/18/09 Time Zone: EST Start Time: 5:40 End Time: 8:10

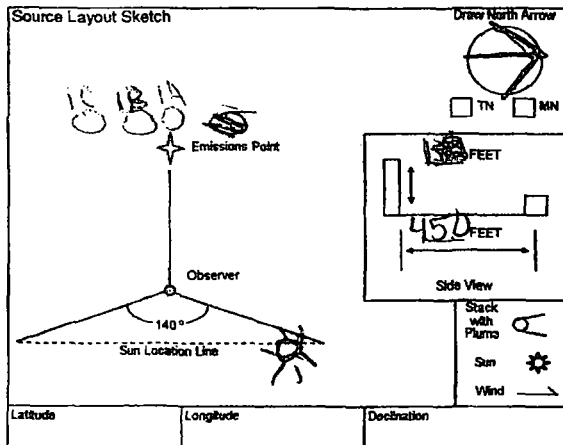
Describe Emissions Point: middle of three stacks
 Height of Emiss. Pt. Start: 138 End: 138 Height of Emiss. Pt. Rel. to Observer Start: 132 End: 132
 Distance to Emiss. Pt. Start: 450 End: 450 Direction to Emiss. Pt. (Degrees) Start: 28 End: 28

Min	Time Zone				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Start: 16 End: 16 Direction to Obs. Pt. (Degrees) Start: 22 End: 22
 Distance and Direction to Observation Point from Emission Point Start: 450SE End: 450SE

Describe Emissions Start: N/V End: N/V
 Emission Color Start: N/V End: N/V Water Droplet Plume Start: None End: None
N/V - NON VISIBLE

Describe Plume Background Start: Blue Sky End: Blue Sky
 Background Color Start: Blue End: Blue Sky Conditions Start: Scattered End: Same
 Wind Speed Start: 0-5 End: 0-5 Wind Direction Start: NW End: NW
 Ambient Temp. Start: 81 End: 81 Wet Bulb Temp. RH Percent 94



Observer's Name (Print): Devin Forlines
 Observer's Signature: _____ Date: 10/18/09
 Organization: Air Hygiene Inc.
 Certified By: Eastern Technical Associates Date: 4/22/09

Additional Information

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name
 Florida Power & Light
 Facility Name
 West County Energy Center
 Street Address
 20505 State Road 80
 City State Zip
 Loxahatchee Florida 33470

Form Number _____ Page 2 of 6
 Continued on Form Number _____

Process Unit # Operating Mode
 Electricity Production 1A Base D/W
 Control Equipment Operating Mode
 Ammonia Injection Normal

Observation Date
 10/18/09 Time Zone
 EST Start Time
 8:11 End Time
 8:31

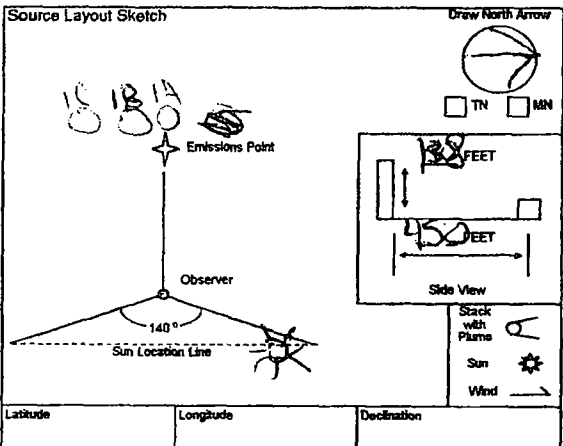
Describe Emissions Point
 middle of three stacks
 Height of Emiss. Pt. Start End
 138 138
 Height of Emiss. Pt. Rel. to Observer Start End
 132 132
 Distance to Emiss. Pt. Start End
 450 450
 Direction to Emiss. Pt. (Degrees) Start End
 28 28

min	Time Zone				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Direction to Obs. Pt. (Degrees)
 Start End Start End
 16 16 22 22
 Observer and Direction to Observation Point from Emission Point
 Start End
 450 SE 450 SE

Describe Emissions
 Start End
 N/V N/V
 Emission Color Water Droplet Plume
 Start End Start End
 N/V N/V None None

Describe Plume Background
 Start End
 Blue Sky Blue Sky
 Background Color Sky Conditions
 Start End Start End
 Blue Blue Scattered Same
 Wind Speed Wind Direction
 Start End Start End
 0-5 0-5 NW NW
 Ambient Temp. Wet Bulb Temp. RH Percent
 Start End Start End
 81 81 94



Observer's Name (Print)
 Duffin Griffin

Observer's Signature
 [Signature] Date
 10/18/09

Organization
 Air Hygienic, Inc.

Certified By
 Eastern Technical Associates Date
 9/22/09

Additional Information

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name
 Florida Power & Light
 Facility Name
 West County Energy Center
 Street Address
 20505 State Road 80
 City State Zip
 Loxatchee Florida 33470

Form Number _____ Page 3 of 6
 Continued on Form Number _____

Process Unit # Operating Mode
 Electricity Production 1A Base 50%
 Control Equipment Operating Mode
 Ammonia Injection Normal

Observation Date 10/8/09 Time Zone EST Start Time 8:32 End Time 9:02

Describe Emissions Point
 middle of three stacks

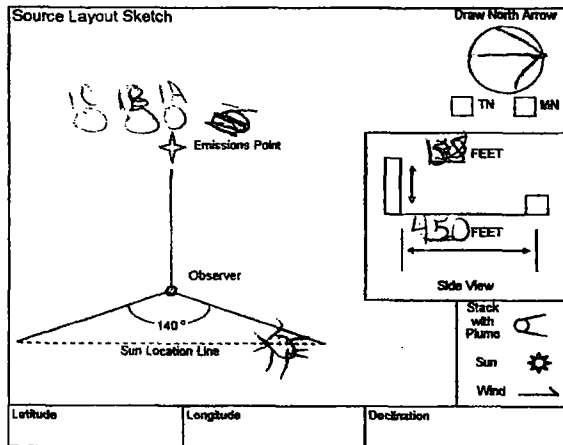
Min	Time Zone				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 28 End 28

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 22 End 22
 Distance and Direction to Observation Point from Emission Point Start 450 SE End 450 SE

Describe Emissions Start N/V End N/V Emission Color Start N/V End N/V Water Droplet Plume Start None End None

Describe Plume Background Start Blue Sky End Blue Sky Background Color Start Blue End Blue Sky Conditions Start Scattered End Same
 Wind Speed Start 0-5 End 0-5 Wind Direction Start _____ End _____ Ambient Temp. Start _____ End _____ Wet Bulb Temp. _____ RH Percent _____



Observer's Name (Print) Darin Grimes
 Observer's Signature [Signature] Date 10/8/09
 Organization Air Hygiene, Inc.
 Certified By Eastern Technical Associates Date 4/22/09

Additional Information

Method Used (Circle One) Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 4 of 6
Continued on Form Number _____

Company Name Florida Power & Light
Facility Name West County Energy Center
Street Address 20505 State Road 80
City Loxatchee State Florida Zip 33470

Observation Date 10/8/09 Time Zone EST Start Time 9:03 End Time 9:33

Process Electricity Production Unit # 1A Base Operating Mode Normal
Control Equipment Ammonia Injection Operating Mode Normal

Min	Sec	0	15	30	45	Comments
-----	-----	---	----	----	----	----------

Describe Emissions Point
middle of three stacks

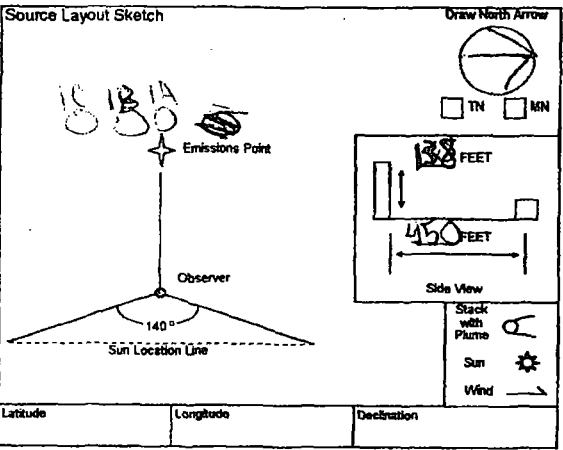
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 28 End 28

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 22 End 22
Distance and Direction to Observation Point from Emission Point Start 450 SE End 450 SE

Describe Emissions Start N/V End N/V Emission Color Start N/V End N/V Water Droplet Plume Start None End None

Describe Plume Background Start Blue Sky End Blue Sky Background Color Start Blue End Blue Sky Conditions Start Clear End Same
Wind Speed Start 0-5 End 0-5 Wind Direction Start _____ End _____
Ambient Temp. Start _____ End _____ Wet Bulb Temp. _____ RH Percent _____



Observer's Name (Print) Darin Grimes Date 10/8/09

Additional Information

Observer's Signature Darin Grimes Date 10/8/09
Organization Air Hygiene, Inc.
Certified By Eastern Technical Associates Date 10/20/09

Method Used (Circle One)
 Method 2A 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 5 of 6
 Continued on Form Number _____

Company Name Florida Power & Light
 Facility Name West County Energy Center
 Street Address 22505 State Road 80
 City Loxatchter Florida State _____ Zip 33420

Observation Date 10/17/09 Time Zone EST Start Time 9:34 End Time 10:04

Process Electricity Production Unit # 1A Rose Operating Mode W/2
 Control Equipment Ammonia Injection Operating Mode NORMAL

Min.	Sec.	Time Zone				Comments
		0	15	30	45	
1		0	0	0	0	
2		0	0	0	0	
3		0	0	0	0	
4		0	0	0	0	
5		0	0	0	0	
6		0	0	0	0	
7		0	0	0	0	
8		0	0	0	0	
9		0	0	0	0	
10		0	0	0	0	
11		0	0	0	0	
12		0	0	0	0	
13		0	0	0	0	
14		0	0	0	0	
15		0	0	0	0	
16		0	0	0	0	
17		0	0	0	0	
18		0	0	0	0	
19		0	0	0	0	
20		0	0	0	0	
21		0	0	0	0	
22		0	0	0	0	
23		0	0	0	0	
24		0	0	0	0	
25		0	0	0	0	
26		0	0	0	0	
27		0	0	0	0	
28		0	0	0	0	
29		0	0	0	0	
30		0	0	0	0	

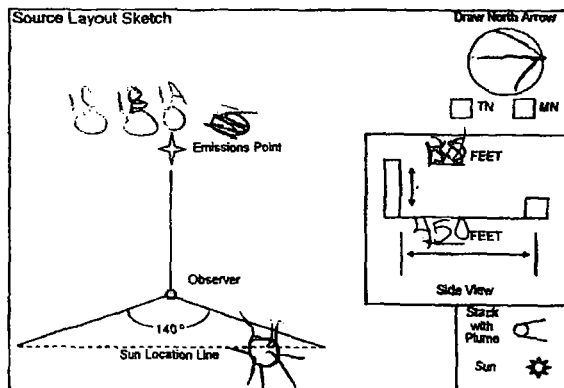
Describe Emissions Point
middle of three stacks

Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 28 End 28

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 22 End 22
 Distance and Direction to Observation Point from Emission Point Start 450 SE End 450 SE

Describe Emissions Start N/V End N/V Emission Color Start N/V End N/V Water Droplet Plume Start None End None

Describe Plume Background Start Blue Sky End Blue Sky Background Color Start Blue End Blue Sky Conditions Start Scattered End Same
 Wind Speed Start 0-5 End 0-5 Wind Direction _____ Ambient Temp. _____ Wet Bulb Temp. _____ RH Percent _____



Latitude _____ Longitude _____ Declination _____

Additional information _____

Observer's Name (Print) Devin L. James
 Observer's Signature _____ Date 10/18/09
 Organization Air Hygiene Int.
 Certified By Eastern Technical Associates Date 7/22/09

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 6 of 6
 Continued on Form Number _____

Company Name Florida Power & Light
 Facility Name West County Energy Center
 Street Address 20505 State Road 80
 City Luxatchee State Florida Zip 33450

Observation Date 10/8/09 Time Zone EST Start Time 10:05 End Time 10:35

Process Electricity Production Unit # A Base Units Operating Mode Normal
 Control Equipment Automatic Injection Operating Mode Normal

Min	Time Zone				Comments
	0	15	30	45	

Describe Emissions Port
middle of three stacks

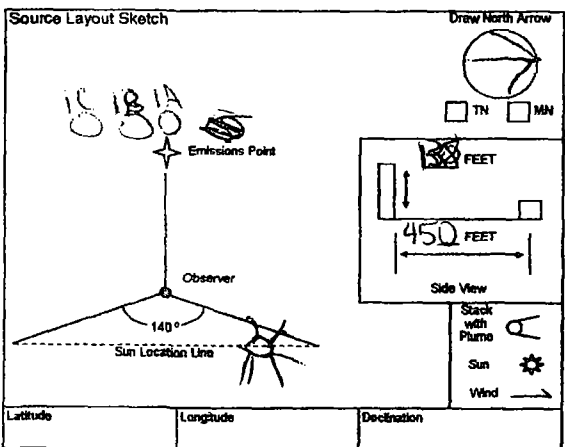
Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 28 End 28

1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 22 End 22
 Distance and Direction to Observation Point from Emission Point Start 450 SE End 450 SE

Describe Emissions
 Start N/V End N/V Emission Color Start N/V End N/V Water Droplet Plume Start None End None

Describe Plume Background
 Start Blue Sky End Blue Sky Background Color Start Blue End Blue Sky Conditions Start Scattered End Same
 Wind Speed Start 0-5 End 0-5 Wind Direction _____ Ambient Temp. _____ Wet Bulb Temp. _____ RH Percent _____



Observer's Name (Print) Drew Grimes
 Observer's Signature [Signature] Date 10/8/09
 Organization Air Hygiene, Inc.
 Certified By Eastern Technical Associates Date 7/20/09

Additional Information

TEST RESULTS

**Opacity
Base Load with Duct Burners**

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 1
Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 2

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

Run 3
Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

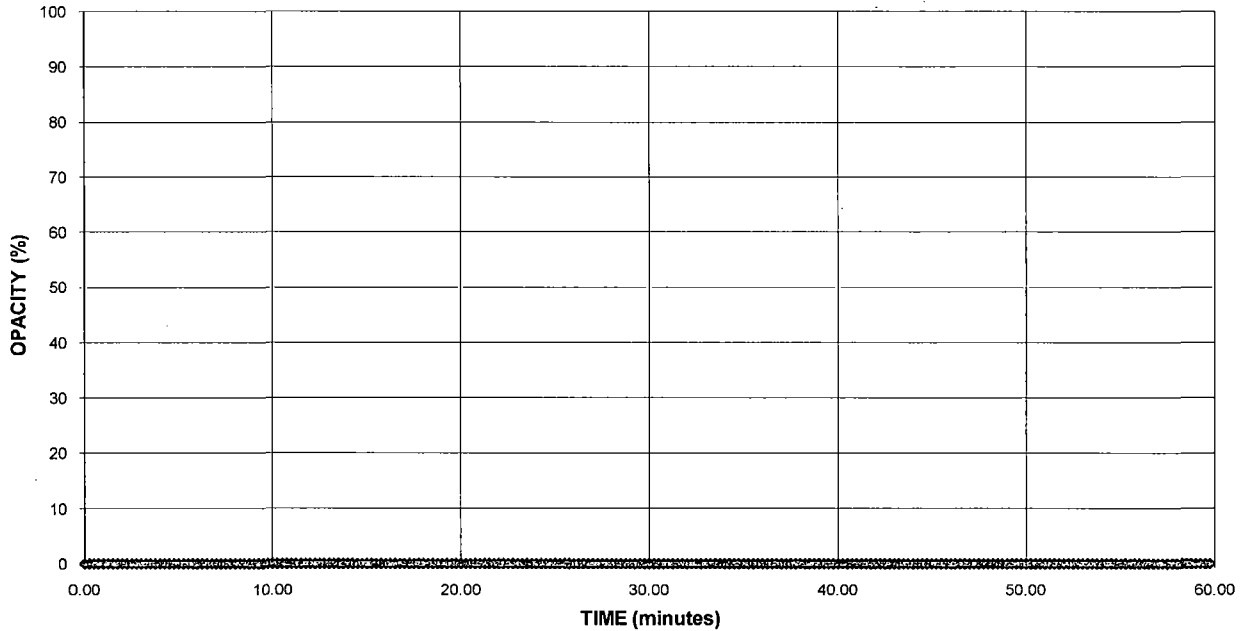
TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.	TIME (min)	OPACITY (%)	6 MIN AVG.
0.00	0	N/A	15.00	0	0.00	30.00	0	0.00	45.00	0	0.00
0.25	0	N/A	15.25	0	0.00	30.25	0	0.00	45.25	0	0.00
0.50	0	N/A	15.50	0	0.00	30.50	0	0.00	45.50	0	0.00
0.75	0	N/A	15.75	0	0.00	30.75	0	0.00	45.75	0	0.00
1.00	0	N/A	16.00	0	0.00	31.00	0	0.00	46.00	0	0.00
1.25	0	N/A	16.25	0	0.00	31.25	0	0.00	46.25	0	0.00
1.50	0	N/A	16.50	0	0.00	31.50	0	0.00	46.50	0	0.00
1.75	0	N/A	16.75	0	0.00	31.75	0	0.00	46.75	0	0.00
2.00	0	N/A	17.00	0	0.00	32.00	0	0.00	47.00	0	0.00
2.25	0	N/A	17.25	0	0.00	32.25	0	0.00	47.25	0	0.00
2.50	0	N/A	17.50	0	0.00	32.50	0	0.00	47.50	0	0.00
2.75	0	N/A	17.75	0	0.00	32.75	0	0.00	47.75	0	0.00
3.00	0	N/A	18.00	0	0.00	33.00	0	0.00	48.00	0	0.00
3.25	0	N/A	18.25	0	0.00	33.25	0	0.00	48.25	0	0.00
3.50	0	N/A	18.50	0	0.00	33.50	0	0.00	48.50	0	0.00
3.75	0	N/A	18.75	0	0.00	33.75	0	0.00	48.75	0	0.00
4.00	0	N/A	19.00	0	0.00	34.00	0	0.00	49.00	0	0.00
4.25	0	N/A	19.25	0	0.00	34.25	0	0.00	49.25	0	0.00
4.50	0	N/A	19.50	0	0.00	34.50	0	0.00	49.50	0	0.00
4.75	0	N/A	19.75	0	0.00	34.75	0	0.00	49.75	0	0.00
5.00	0	N/A	20.00	0	0.00	35.00	0	0.00	50.00	0	0.00
5.25	0	N/A	20.25	0	0.00	35.25	0	0.00	50.25	0	0.00
5.50	0	N/A	20.50	0	0.00	35.50	0	0.00	50.50	0	0.00
5.75	0	0.00	20.75	0	0.00	35.75	0	0.00	50.75	0	0.00
6.00	0	0.00	21.00	0	0.00	36.00	0	0.00	51.00	0	0.00
6.25	0	0.00	21.25	0	0.00	36.25	0	0.00	51.25	0	0.00
6.50	0	0.00	21.50	0	0.00	36.50	0	0.00	51.50	0	0.00
6.75	0	0.00	21.75	0	0.00	36.75	0	0.00	51.75	0	0.00
7.00	0	0.00	22.00	0	0.00	37.00	0	0.00	52.00	0	0.00
7.25	0	0.00	22.25	0	0.00	37.25	0	0.00	52.25	0	0.00
7.50	0	0.00	22.50	0	0.00	37.50	0	0.00	52.50	0	0.00
7.75	0	0.00	22.75	0	0.00	37.75	0	0.00	52.75	0	0.00
8.00	0	0.00	23.00	0	0.00	38.00	0	0.00	53.00	0	0.00
8.25	0	0.00	23.25	0	0.00	38.25	0	0.00	53.25	0	0.00
8.50	0	0.00	23.50	0	0.00	38.50	0	0.00	53.50	0	0.00
8.75	0	0.00	23.75	0	0.00	38.75	0	0.00	53.75	0	0.00
9.00	0	0.00	24.00	0	0.00	39.00	0	0.00	54.00	0	0.00
9.25	0	0.00	24.25	0	0.00	39.25	0	0.00	54.25	0	0.00
9.50	0	0.00	24.50	0	0.00	39.50	0	0.00	54.50	0	0.00
9.75	0	0.00	24.75	0	0.00	39.75	0	0.00	54.75	0	0.00
10.00	0	0.00	25.00	0	0.00	40.00	0	0.00	55.00	0	0.00
10.25	0	0.00	25.25	0	0.00	40.25	0	0.00	55.25	0	0.00
10.50	0	0.00	25.50	0	0.00	40.50	0	0.00	55.50	0	0.00
10.75	0	0.00	25.75	0	0.00	40.75	0	0.00	55.75	0	0.00
11.00	0	0.00	26.00	0	0.00	41.00	0	0.00	56.00	0	0.00
11.25	0	0.00	26.25	0	0.00	41.25	0	0.00	56.25	0	0.00
11.50	0	0.00	26.50	0	0.00	41.50	0	0.00	56.50	0	0.00
11.75	0	0.00	26.75	0	0.00	41.75	0	0.00	56.75	0	0.00
12.00	0	0.00	27.00	0	0.00	42.00	0	0.00	57.00	0	0.00
12.25	0	0.00	27.25	0	0.00	42.25	0	0.00	57.25	0	0.00
12.50	0	0.00	27.50	0	0.00	42.50	0	0.00	57.50	0	0.00
12.75	0	0.00	27.75	0	0.00	42.75	0	0.00	57.75	0	0.00
13.00	0	0.00	28.00	0	0.00	43.00	0	0.00	58.00	0	0.00
13.25	0	0.00	28.25	0	0.00	43.25	0	0.00	58.25	0	0.00
13.50	0	0.00	28.50	0	0.00	43.50	0	0.00	58.50	0	0.00
13.75	0	0.00	28.75	0	0.00	43.75	0	0.00	58.75	0	0.00
14.00	0	0.00	29.00	0	0.00	44.00	0	0.00	59.00	0	0.00
14.25	0	0.00	29.25	0	0.00	44.25	0	0.00	59.25	0	0.00
14.50	0	0.00	29.50	0	0.00	44.50	0	0.00	59.50	0	0.00
14.75	0	0.00	29.75	0	0.00	44.75	0	0.00	59.75	0	0.00

Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

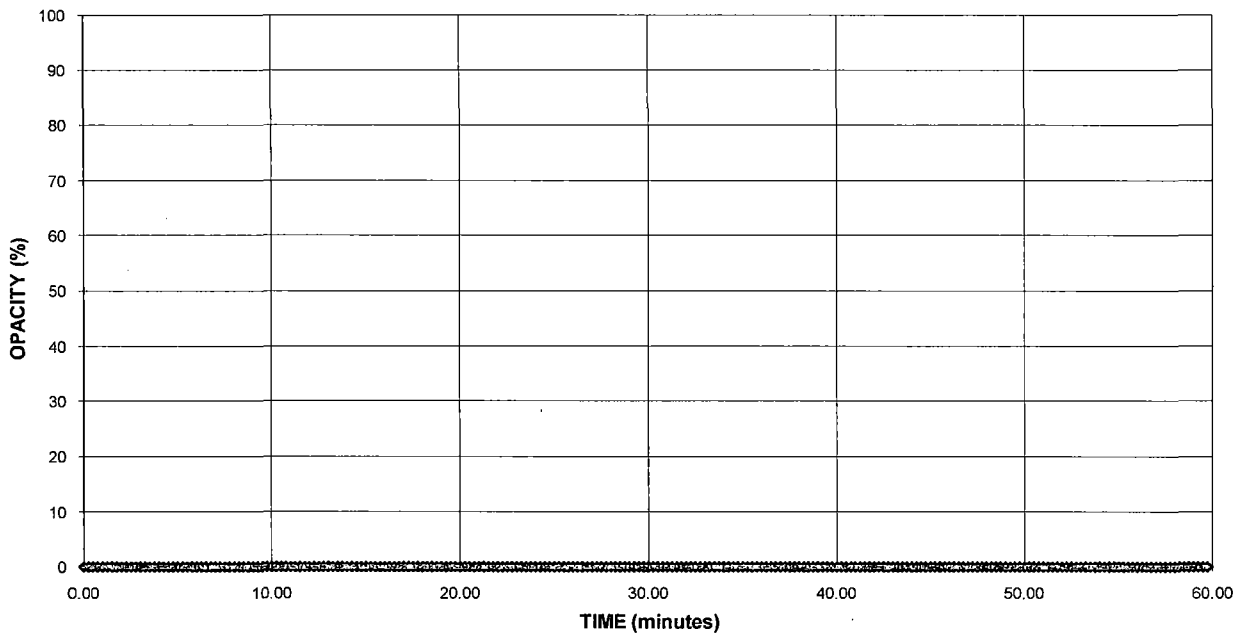
Run 1

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)

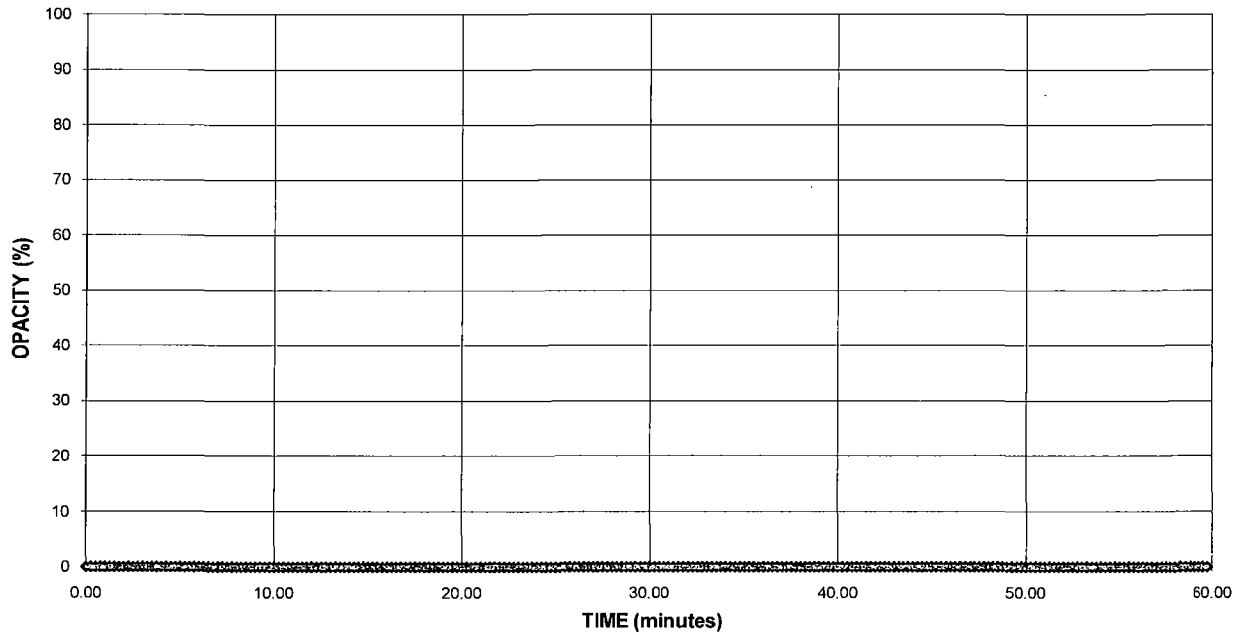


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/DB
Location: West County Energy Center
Date: October 5, 2009
Project #: bv-09-westcounty.fl-comp#1

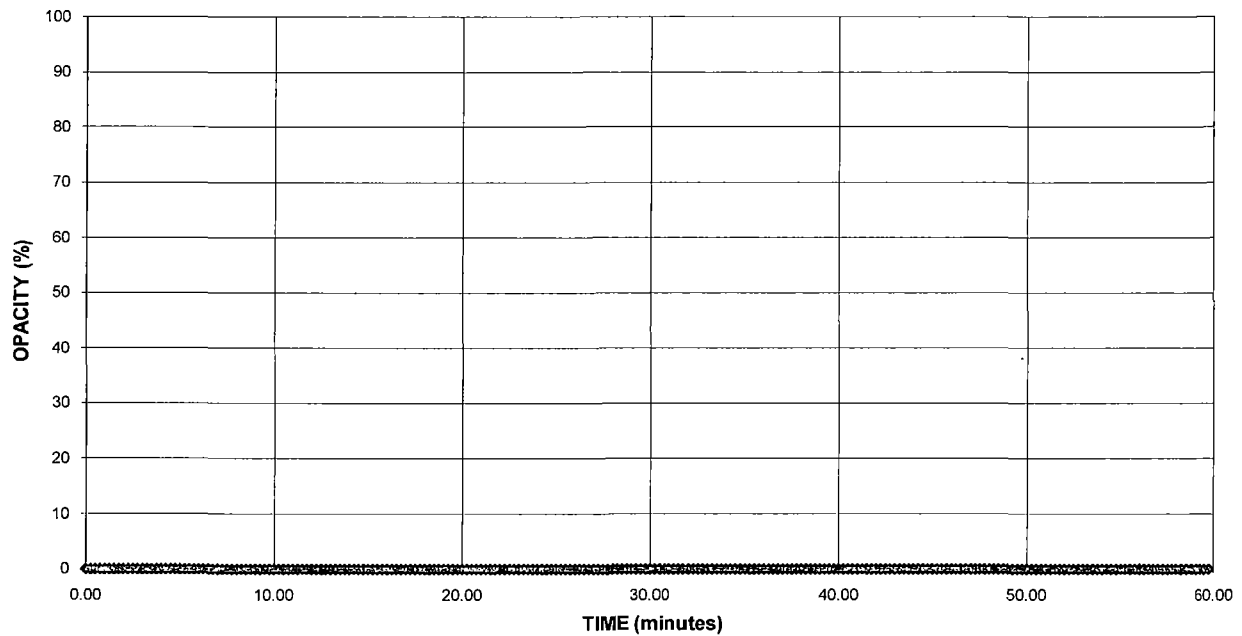
Run 2

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)

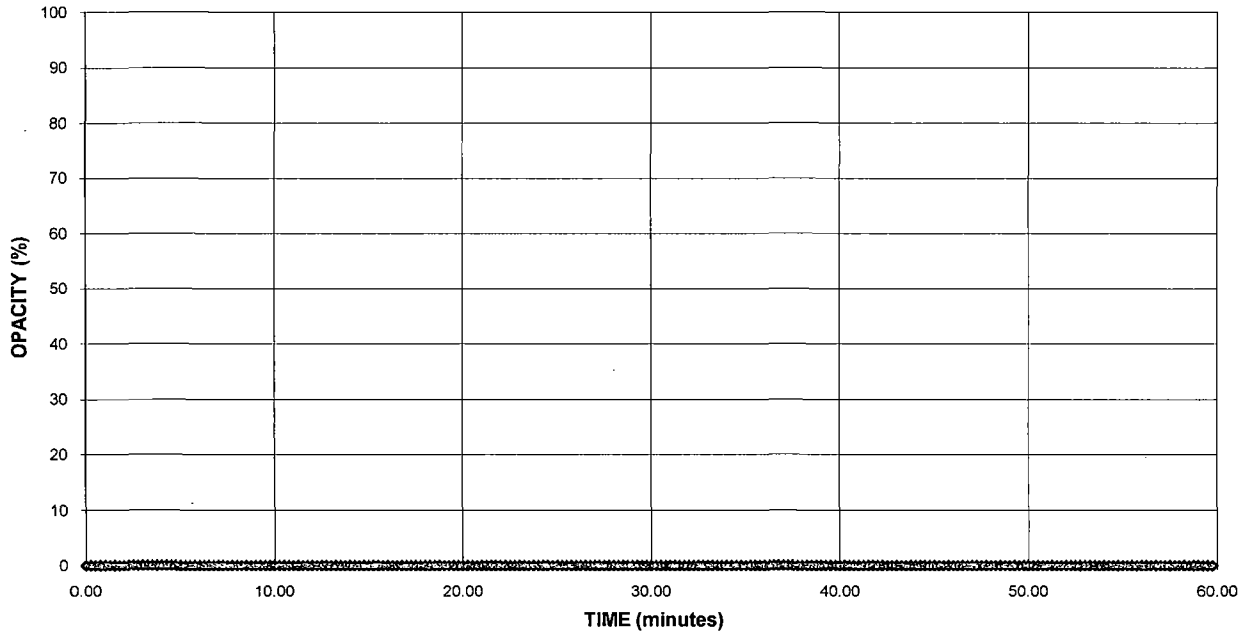


Company: Florida Power and Light
Equipment: Mitsubishi 501G, Unit 1C base load w/DB
Location: West County Energy Center
Date: October 6, 2009
Project #: bv-09-westcounty.fl-comp#1

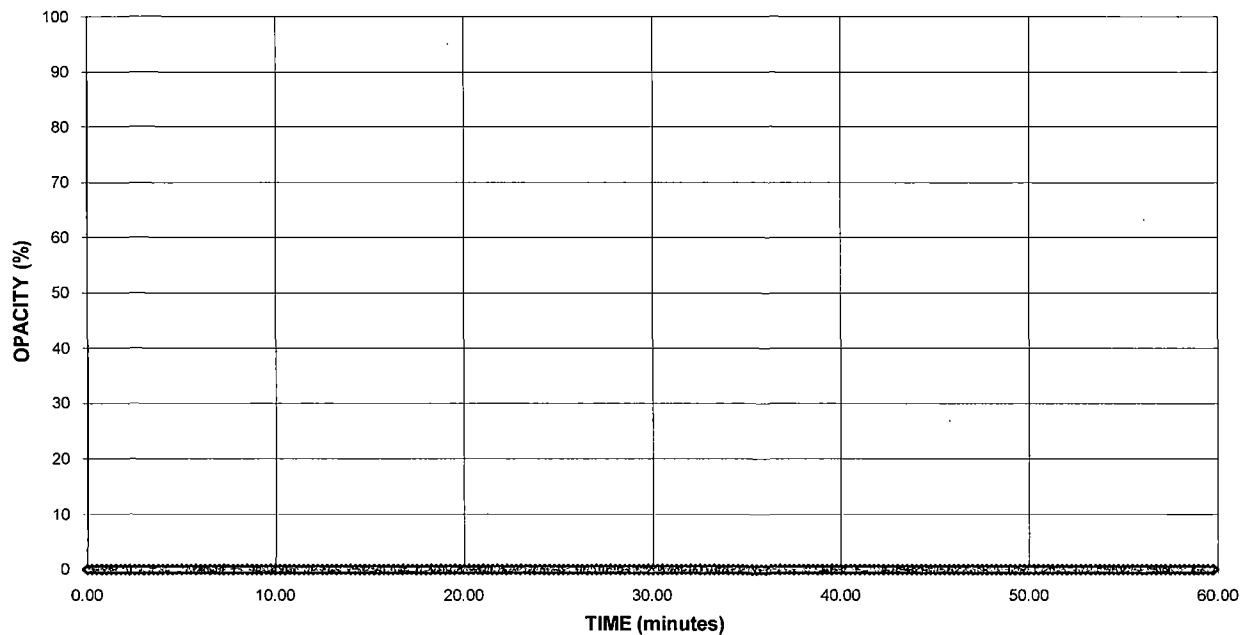
Run 3

Average Opacity: 0.00 %
Maximum Opacity: 0 %
6 Minute Average: 0.00 %
6 Minute Maximum: 0.00 %
Max Time w/ Opacity: 0.00 minutes

OPACITY READINGS (15 second intervals)



OPACITY RESULTS (6 minute averages)



Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name
Florida Power & Light
 Facility Name
West County Energy Center
 Street Address
20505 State Road 80
 City State Zip
Lexachter Florida 33470

Form Number _____ Page 1 of 6
 Continued on Form Number _____

Process Unit # Operating Mode
Electricity Production 1A Base
 Control Equipment Operating Mode
Automatic Injection Normal

Observation Date 10/7/09 Time Zone EST Start Time 14:50 End Time 15:20

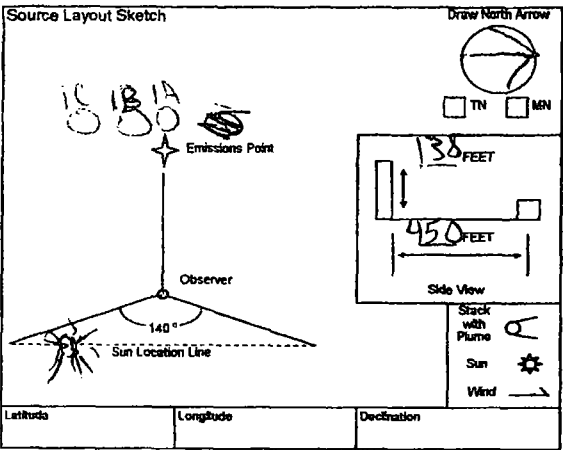
Describe Emissions Point
middle of three stacks
 Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 26 End 26

Min	Sec	Time Zone				Comments
		0	15	30	45	
1		0	0	0	0	
2		0	0	0	0	
3		0	0	0	0	
4		0	0	0	0	
5		0	0	0	0	
6		0	0	0	0	
7		0	0	0	0	
8		0	0	0	0	
9		0	0	0	0	
10		0	0	0	0	
11		0	0	0	0	
12		0	0	0	0	
13		0	0	0	0	
14		0	0	0	0	
15		0	0	0	0	
16		0	0	0	0	
17		0	0	0	0	
18		0	0	0	0	
19		0	0	0	0	
20		0	0	0	0	
21		0	0	0	0	
22		0	0	0	0	
23		0	0	0	0	
24		0	0	0	0	
25		0	0	0	0	
26		0	0	0	0	
27		0	0	0	0	
28		0	0	0	0	
29		0	0	0	0	
30		0	0	0	0	

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 22 End 22
 Distance and Direction to Observation Point from Emission Point Start 350 SW End 350 SW

Describe Emissions
 Start N/V End N/V Water Droplet Plume
 Emission Color Start N/V End N/V Start Noise End Noise

Describe Plume Background
 Start Blue Sky End Blue Sky Sky Conditions
 Background Color Start Blue End Blue Start Scattered End Same
 Wind Speed Start 0-5 End 0-5 Wind Direction Start NE End NE
 Ambient Temp. Start 93 End 93 Wet Bulb Temp. RH Percent 55



Observer's Name (Print)
DAVID COVINGS
 Observer's Signature _____ Date 10/7/09
 Organization
Air Hygiene, Inc.
 Certified By _____ Date 4/20/09
Eastern Technical Associates

Additional Information

Method Used (Circle One)
 Method 9 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 2 of 6

Company Name
Florida Power & Light
 Facility Name
West County Energy Center
 Street Address
22505 State Road 80
 City State Zip
Loxatchee Florida 33470

Continued on Form Number _____

Process Unit # Operating Mode
Electricity Production 1A Base
 Control Equipment Operating Mode
Automatic Emission Normal

Observation Date
10/17/09 Time Zone
EST Start Time
15:21 End Time
15:51

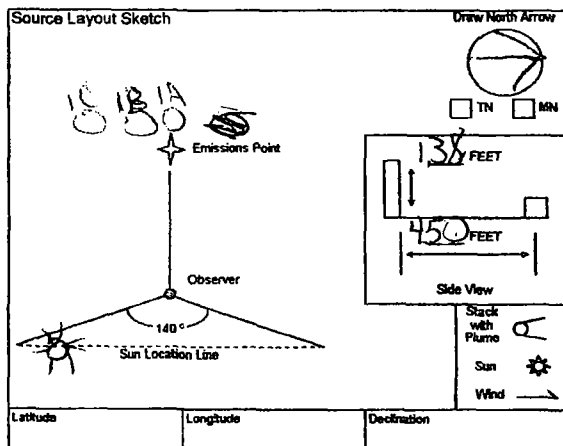
Describe Emissions Point
middle of three stacks
 Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 26 End 26

Min	Sec	Time Zone				Comments
		0	15	30	45	
1		0	0	0	0	
2		0	0	0	0	
3		0	0	0	0	
4		0	0	0	0	
5		0	0	0	0	
6		0	0	0	0	
7		0	0	0	0	
8		0	0	0	0	
9		0	0	0	0	
10		0	0	0	0	
11		0	0	0	0	
12		0	0	0	0	
13		0	0	0	0	
14		0	0	0	0	
15		0	0	0	0	
16		0	0	0	0	
17		0	0	0	0	
18		0	0	0	0	
19		0	0	0	0	
20		0	0	0	0	
21		0	0	0	0	
22		0	0	0	0	
23		0	0	0	0	
24		0	0	0	0	
25		0	0	0	0	
26		0	0	0	0	
27		0	0	0	0	
28		0	0	0	0	
29		0	0	0	0	
30		0	0	0	0	

Vertical Angle to Obs. Pt. Start 18 End 18 Direction to Obs. Pt. (Degrees) Start 22 End 22
 Distance and Direction to Observation Point from Emission Point Start 450 SW End 450 SW

Describe Emissions Start N/V End N/V Water Droplet Plume Start Noise End Noise
 Emission Color Start N/V End N/V

Describe Plume Background Start Blue Sky End Blue Sky Sky Conditions Start Scattered End Same
 Background Color Start Blue End Blue Wind Speed Start 0-5 End 0-5 Wind Direction Start NE End NE
 Ambient Temp. Start 93 End 93 Wet Bulb Temp. Start 57 End 57



Observer's Name (Print)
Darin Corliss

Observer's Signature
[Signature] Date
10/17/09

Additional Information

Organization
Air Hygiene, Inc.

Certified By
Eastern Technical Associates Date
7/20/09

Method Used (Circle One)
 Method B 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page **3** of **6**
 Continued on Form Number _____

Company Name: **Florida Power & Light**
 Facility Name: **West County Energy Center**
 Street Address: **20505 State Road 80**
 City: **Lexatcher Florida** State: **FL** Zip: **33470**

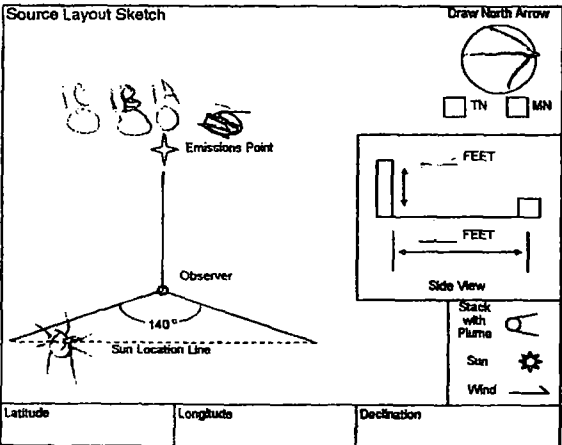
Process: **Electricity Production** Unit #: **1A Base** Operating Mode: **Normal**
 Control Equipment: **Automatic Injection** Operating Mode: **Normal**

Describe Emissions Point: **middle of three stacks**
 Height of Emiss. Pt. Start: **138** End: **138** Height of Emiss. Pt. Rel. to Observer Start: **132** End: **132**
 Distance to Emiss. Pt. Start: **450** End: **450** Direction to Emiss. Pt. (Degrees) Start: **26** End: **26**

Vertical Angle to Obs. Pt. Start: **16** End: **16** Direction to Obs. Pt. (Degrees) Start: **22** End: **22**
 Distance and Direction to Observation Point from Emission Point Start: **450 SW** End: **450 SW**

Describe Emissions
 Start: **N/V** End: **N/V** Emission Color: **N/V** Water Droplet Plume: **Noise** Start: **N/V** End: **N/V** Start: **Noise** End: **Noise**

Describe Plume Background
 Start: **Blue Sky** End: **Blue Sky** Background Color: **Blue** Sky Conditions: **Scattered Same**
 Wind Speed: **0-5** End: **0-5** Wind Direction: **NW** End: **NW**
 Ambient Temp: **92** End: **92** Wet Bulb Temp: **51** Humidity Percent: **51**



Obs	Time Zone		Start Time	End Time	Comments
	Min	Sec			
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Additional Information

Observer's Name (Print): **Devin Grimes**
 Observer's Signature: _____ Date: **10/2/09**
 Organization: **Air Hygiene, Inc.**
 Certified By: **Eastern Technical Associates** Date: **9/22/09**

Method Used (Circle One)
 Method 92 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name
 Florida Power & Light
 Facility Name
 West County Energy Center
 Street Address
 20505 State Road 80
 City State Zip
 Loxatchee Florida 33470

Form Number _____ Page 4 of 6
 Continued on Form Number _____

Process Unit # Operating Mode
 Electricity Production 1A Base
 Control Equipment Operating Mode
 Ammonia Injection Normal

Observation Date 10/7/09 Time Zone EST Start Time 16:31 End Time 17:01

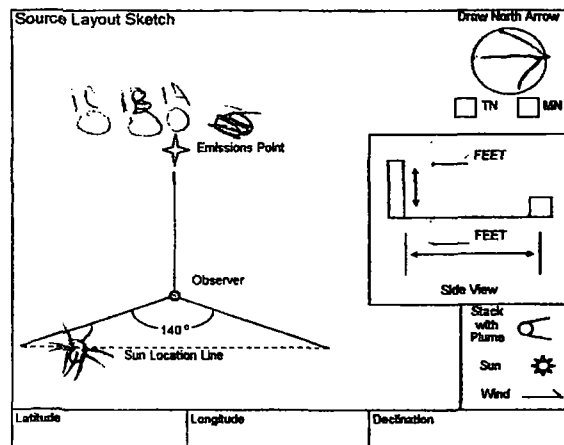
Describe Emissions Point
 middle of three stacks
 Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 26 End 26

Min	Time Zone				Comments
	0	15	30	45	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 22 End 22
 Distance to Observation Point from Emission Point Start 450 SW End 450 SW

Describe Emissions Start N/V End N/V
 Emission Color Start N/V End N/V Water Droplet Plume Start None End None

Describe Plume Background Start Blue Sky End Blue Sky
 Background Color Start Blue End Blue Sky Conditions Start Scattered End Same
 Wind Speed Start 0-5 End 0-5 Wind Direction Start NW End NW
 Ambient Temp. Start 92 End 92 Wet Bulb Temp. RH Percent Start 51



Observer's Name (Print) D. C. Williams
 Observer's Signature [Signature] Date 10/7/09
 Organization Air Hygiene Inc.
 Certified By Eastern Technical Associates Date 4/22/09

Additional Information

Method Used (Circle One) Method 9 203A 203B Other: _____

Company Name Florida Power & Light
 Facility Name West County Energy Center
 Street Address 25505 State Road 80
 City Luxachter State Florida Zip 33470

Process Electricity Production Unit # ABase Operating Mode Normal
 Control Equipment Automatic Injection Operating Mode Normal

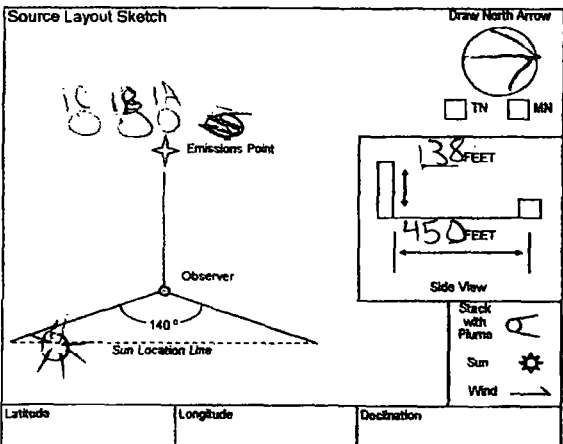
Describe Emissions Point
middle of three stacks

Height of Emiss. Pt. Start 138 End 138 Height of Emiss. Pt. Rel. to Observer Start 132 End 132
 Distance to Emiss. Pt. Start 450 End 450 Direction to Emiss. Pt. (Degrees) Start 26 End 26

Vertical Angle to Obs. Pt. Start 16 End 16 Direction to Obs. Pt. (Degrees) Start 22 End 22
 Distance and Direction to Observation Point from Emission Point Start 350SW End 350SW

Describe Emissions Start N/V End N/V Water Droplet Plume Start None End None
 Emission Color Start N/V End N/V

Describe Plume Background Start Blue Sky End Blue Sky Sky Conditions Start Scattered End Same
 Background Color Start Blue End Blue Wind Speed Start 0-5 End 0-5 Wind Direction Start NW End NW
 Ambient Temp. Start 91 End 91 Wet Bulb Temp. 80 RH Percent 80



Additional Information

VISUAL EMISSIONS OBSERVATION FORM

Form Number _____ Page 5 of 6
 Continued on Form Number _____

Observation Date		Time Zone			Start Time	End Time	Comments
Min	Sec	0	15	30	45		
10/7/09		EST			17:02	17:32	
1	0	0	0	0	0		
2	0	0	0	0	0		
3	0	0	0	0	0		
4	0	0	0	0	0		
5	0	0	0	0	0		
6	0	0	0	0	0		
7	0	0	0	0	0		
8	0	0	0	0	0		
9	0	0	0	0	0		
10	0	0	0	0	0		
11	0	0	0	0	0		
12	0	0	0	0	0		
13	0	0	0	0	0		
14	0	0	0	0	0		
15	0	0	0	0	0		
16	0	0	0	0	0		
17	0	0	0	0	0		
18	0	0	0	0	0		
19	0	0	0	0	0		
20	0	0	0	0	0		
21	0	0	0	0	0		
22	0	0	0	0	0		
23	0	0	0	0	0		
24	0	0	0	0	0		
25	0	0	0	0	0		
26	0	0	0	0	0		
27	0	0	0	0	0		
28	0	0	0	0	0		
29	0	0	0	0	0		
30	0	0	0	0	0		

Observer's Name (Print) Devin Forlines
 Observer's Signature [Signature] Date 10/7/09
 Organization Air Hygiene, Inc.
 Certified By Eastern Technical Associates Date 10/20/09

Method Used (Circle One)
 Method 92 203A 203B Other: _____

VISUAL EMISSIONS OBSERVATION FORM

Company Name
Florida Power & Light
 Facility Name
West County Energy Center
 Street Address
20505 State Road 80
 City State Zip
Levittown Florida 33450

Form Number _____ Page **6** of **6**
 Continued on Form Number _____

Process Unit # Operating Mode
Electricity Production A Base
 Control Equipment Operating Mode
Ammonia Injection Normal

Observation Date **10/7/09** Time Zone **EST** Start Time **17:33** End Time **18:03**

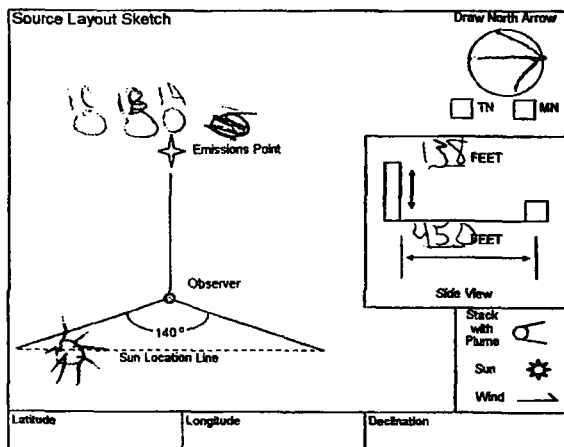
Describe Emissions Point
middle of three stacks
 Height of Emiss. Pt. Start **138** End **138** Height of Emiss. Pt. Rel. to Obs. Start **132** End **132**
 Distance to Emiss. Pt. Start **450** End **450** Direction to Emiss. Pt. (Degrees) Start **24** End **26**

min	sec	Time Zone				Comments
		0	15	30	45	
1		0	0	0	0	
2		0	0	0	0	
3		0	0	0	0	
4		0	0	0	0	
5		0	0	0	0	
6		0	0	0	0	
7		0	0	0	0	
8		0	0	0	0	
9		0	0	0	0	
10		0	0	0	0	
11		0	0	0	0	
12		0	0	0	0	
13		0	0	0	0	
14		0	0	0	0	
15		0	0	0	0	
16		0	0	0	0	
17		0	0	0	0	
18		0	0	0	0	
19		0	0	0	0	
20		0	0	0	0	
21		0	0	0	0	
22		0	0	0	0	
23		0	0	0	0	
24		0	0	0	0	
25		0	0	0	0	
26		0	0	0	0	
27		0	0	0	0	
28		0	0	0	0	
29		0	0	0	0	
30		0	0	0	0	

Vertical Angle to Obs. Pt. Start **16** End **16** Direction to Obs. Pt. (Degrees) Start **22** End **22**
 Distance and Direction to Observation Point from Emission Point Start **350 SW** End **350 SW**

Describe Emissions Start **N/V** End **N/V** Water Droplet Plume Start **None** End **None**
 Emission Color Start **N/V** End **N/V**

Describe Plume Background Start **Blue Sky** End **Blue Sky** Sky Conditions Start **scattered** End **Same**
 Background Color Start **Blue** End **Blue** Wind Speed Start **0-5** End **0-5** Wind Direction Start **NW** End **NW**
 Ambient Temp. Start **91** End **91** Wet Bulb Temp. Start **80** End **80** RH Percent



Additional Information

Observer's Name (Print) **Darin Eschmck**
 Observer's Signature **[Signature]** Date **10/7/09**
 Organization **Air Hygiene Inc.**
 Certified By **Eastern Technical Associates** Date **4/22/09**

CALCULATIONS

EXAMPLE CALCULATIONS (FFACTOR)

RM 19, (07-19-06),
2.0 Summary of Method,
2.1 Emission Rates. Oxygen
(O₂) or carbon dioxide (CO₂)
concentrations and appropriate F
factors (ratios of combustion gas
volumes to heat inputs) are used
to calculate pollutant emission
rates from pollutant
concentrations.

Mark's Std Hdbk, 10th ed.,pg 4-26

High Heat Value Dry (HHV_{dry}), calc for Methane (single component for the fuel gas)

$$HHV_{dry} (Btu / SCF) = \left[\left(\frac{M\%}{100} \right) \times GCM \right] \quad HHV_{dry} = \frac{97.19\%}{100.00} \times \frac{994.85 \text{ Btu}}{\text{SCF}} = \frac{966.93 \text{ Btu}}{\text{SCF}}$$

Mark's Std Hdbk, 10th ed., pg 4-26

Low Heat Value Dry (LHV_{dry}), calc for Methane (single component for the fuel gas)

$$LHV_{dry} (Btu / SCF) = \left[\left(\frac{M\%}{100} \right) \times NCM \right] \quad LHV_{dry} = \frac{97.19\%}{100.00} \times \frac{895.75 \text{ Btu}}{\text{SCF}} = \frac{870.62 \text{ Btu}}{\text{SCF}}$$

RM 19, (07-19-06),
12.2 Emission Rates of PM,
SO₂, and NOx. Select from the
following sections the applicable
procedure to compute the PM,
SO₂, or NOx emission rate (E) in
lb/MMBtu. The pollutant
concentration must be in lb/scf
and the F factor must be in
scf/MMBtu. If the pollutant
concentration (C) is not in the
appropriate units, use Table
19-1 in Section 17.0 to make the
proper conversion. An F factor is
the ratio of the gas volume of the
products of combustion to the
heat content of the fuel. The dry
F factor (F_d) includes all
components of combustion less
water, the wet F factor (F_w)
includes all components of
combustion, and the carbon F
factor (F_c) includes only carbon
dioxide.

Civil Eng. Ref. Man., 7th Ed., pg 14-9/GPA Ref. Bulletin 181-86, App. C

High Heat Value Wet (HHV_{wet}), calc for entire sample (all components of the fuel gas)

$$HHV_{wet} (Btu / SCF) = \frac{HHV_{dry}}{W / D. factor} \quad HHV_{wet} = \frac{992.13 \text{ Btu/SCF}}{1.0236} = 969.26 \text{ Btu/SCF}$$

Civil Eng. Ref. Man., 7th Ed., pg 14-9/GPA Ref. Bulletin 181-86, App. C

Low Heat Value Wet (LHV_{wet}), calc for entire sample (all components of the fuel gas)

$$LHV_{wet} (Btu / SCF) = \frac{LHV_{dry}}{W / D. factor} \quad LHV_{wet} = \frac{893.70 \text{ Btu/SCF}}{1.0236} = 873.09 \text{ Btu/SCF}$$

Lbs Component per Lb-Mol of Gas (CM), calc for Methane (single component for the fuel gas)

$$CM (lb / lb - mol) = \left[\left(\frac{M\%}{100} \right) \times MW \right] \quad CM = \frac{97.19\%}{100.00} \times \frac{16.04 \text{ lb}}{\text{lb-mol}} = 15.59 \text{ lb/lb-mol}$$

ASTM D 3588

Fuel Molecular Weight (MW_{Fuel})

$$MW_{Fuel} (lb / lb - mol) = \left[\sum (CM) \right] \quad MW_{Fuel} = 15.59 \text{ lb/lb-mol} \\ + 0.37 \text{ lb/lb-mol} \\ + \text{etc.} = 16.581 \text{ lb/lb-mol}$$

Btu per Lb of Gas Gross (GCV)

$$GCV (Btu / lb) = \left[\frac{HHV_{dry} \times G}{MW_{Fuel}} \right] \\ GCV = \frac{992.13 \text{ Btu/SCF} \times 385.23 \text{ ft}^3/\text{lbmol}}{16.581 \text{ lb/lb-mol}} = 23,051.06 \text{ Btu/lb}$$

ASTM D 3588 (SG)

Specific Gravity

$$SG = \left[\frac{MW_{Fuel}}{MW_{AIR}} \right] \quad SG = \frac{16.58 \text{ lb/lb-mol}}{28.96 \text{ lb/lb-mol}} = 0.5725$$

Btu per Lb of Gas Net (NCV)

$$NCV (Btu / lb) = \left[\frac{LHV_{dry} \times G}{MW_{Fuel}} \right] \\ NCV = \frac{893.70 \text{ Btu/SCF} \times 385.23 \text{ ft}^3/\text{lbmol}}{16.581 \text{ lb/lb-mol}} = 20,764.04 \text{ Btu/lb}$$

Weight Percent of Component (C%), methane

$$C_s (\%) = \left[\left(\frac{CM}{MW_{Fuel}} \right) \times 100 \right] \\ C_s = \frac{15.59 \text{ lb/lb-mol}}{16.58 \text{ lb/lb-mol}} \times 100 = 94.04 \%$$

RM 19, (07-19-06), **Weight Percent of Volatile Organic Compounds (VOC%)**

$$VOC_s (\%) = \left[\sum_{C_2H_6}^{C_4H_{10}} M\% \right] \quad VOC_s = 0.28\% + 0.05\% + 0.05\% + \text{etc.} = 0.42\%$$

RM 19, (07-19-06), 12.3.2 **Determined F Factors**. If the fuel burned is not listed in Table 19-2 or if the owner or operator chooses to determine an F factor rather than use the values in Table 19-2, use the procedure below: 12.3.2.1 Equations. Use the eq

RM 19, (07-19-06),

12.1 Nomenclature

K (scf/lb)/%

H 3.64
C 1.53
S 0.57
N₂ 0.14
O₂ 0.46

$$F_d = \frac{K(K_{Hut} \%H + K_c \%C + K_s \%S + K_n \%N - K_o \%O)}{GCV} \quad \text{Eq. 19-13}$$

$$F_d = \frac{10^6 \text{ Btu}}{\text{MMBtu}} \times \left[\frac{3.64 \text{ SCF}}{\text{lb} \cdot \%} \times 24.16\% + \frac{1.53 \text{ SCF}}{\text{lb} \cdot \%} \times 73.19\% + \frac{0.57 \text{ SCF}}{\text{lb} \cdot \%} \times 0.00\% + \frac{0.14 \text{ SCF}}{\text{lb} \cdot \%} \times 0.89\% - \frac{0.46 \text{ SCF}}{\text{lb} \cdot \%} \times 1.77\% \right] \times \frac{\text{lb}}{23,051.06 \text{ Btu}} = \frac{8,642.48 \text{ SCF}}{\text{MMBtu}}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

Note: RH_{sp} (gr/lb) calculated using temperature, relative humidity, and barometric pressure with psychrometric chart, psychrometric calculator, or built in psychrometric algorithm.

$$RH_{sp} \text{ (lb / lb)} = \left[\left(\frac{gr}{lb} \right) \times \frac{lb}{7000gr} \right] \qquad RH_{sp} = \frac{212.76 \text{ gr}}{lb} \times \frac{1 \text{ lb}}{7000 \text{ gr}} = 0.030394 \frac{\text{lb H}_2\text{O}}{\text{lb Air}}$$

Fuel Flow Conversion (Q_f)

Note: Q_f(lb/min) is a value uptained from the source operator.

$$Q_f = \left[Q_f \times G \times \left(\frac{1}{MW_{Fuel}} \right) \right] \qquad Q_f = \frac{1,835.67 \text{ lb}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{385.23 \text{ ft}^3}{\text{lb-mol}} \times \frac{\text{lb-mol}}{16.58 \text{ lb}} = 2,559,213 \text{ SCFH}$$

Combustor Inlet Pressure / Compressor Discharge Pressure (CIP / CDP)
(corrected from gauge to atmospheric pres. and conv. to mm Hg.)

Note: CIP / CDP (psig) is a value obtained from the source operator.

$$CIP / CDP = \left[(\text{psig} + P) \times \frac{51.71493 \text{ mmHg}}{1 \text{ psi}} \right] \qquad CIP / CDP = [267.4 \text{ psig} + 14.6904] \times \frac{51.71493 \text{ mmHg}}{1 \text{ psia}} = 14,587 \text{ mmHg (abs)}$$

EXAMPLE CALCULATIONS (CALIBRATION)

Analyzer Calibration Error

RM 7E, (08-15-06), 12.2 Analyzer Calibration Error. For non-dilution systems, use Equation 7E-1 to calculate the analyzer calibration error for the low-, mid-, and high-level calibration gases. (calc for NO_x analyzer mid gas, if applicable)

$$ACE = \left(\frac{C_{Dir} - C_V}{CS} \right) \times 100 \qquad \text{Eq. 7E-1} \qquad ACE = \frac{5.21 \text{ ppm} - 4.99 \text{ ppm}}{12.10 \text{ ppm}} \times 100 = 1.82 \%$$

Calibration Error and Estimated Point, RM 25A, THC Analyzer

RM 25A, (07-19-06), 8.4 Calibration Error Test. Immediately prior to the test series (within 2 hours of the start of the test), introduce zero gas and high-level calibration gas at the calibration valve assembly. Adjust the analyzer output to the appropriate levels, if necessary. Calculate the predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response. Then introduce low-level and mid-level calibration gases successively to the measurement system. ... These differences must be less than 5 percent of the respective calibration gas value. (calc for THC analyzer mid gas, if applicable)

$$E_p = \frac{C_{Dir(H)} - C_{Dir(Z)}}{C_{V(H)} - C_{V(Z)}} \times C_{Dir(M)} + C_{Dir(Z)} \qquad \text{Eq. of a line } y=mx+b \qquad E_p = \frac{8.44 \text{ ppm} - 0.03 \text{ ppm}}{8.40 \text{ ppm} - 0.00 \text{ ppm}} \times 4.94 \text{ ppm} + 0.03 = 4.98 \text{ ppm}$$

$$ACE = \left(\frac{C_{Dir} - C_V}{CS} \right) \times 100 \qquad \text{Eq. 7E-1} \qquad ACE_{THC} = \frac{4.87 \text{ ppm} - 4.98 \text{ ppm}}{4.94 \text{ ppm}} \times 100 = -2.14 \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (BIAS, DRIFT, AND CORRECTED RAW AVERAGE)

System Bias

RM 7E, (08-15-06), 12.3 System Bias. For non-dilution systems, use Equation 7E-2 to calculate the system bias separately for the low-level and upscale calibration gases. (calc for NOx analyzer upscale gas, Run 1 initial bias, if applicable)

$$SB = \left(\frac{C_S - C_{Dir}}{C_S} \right) \times 100 \quad \text{Eq. 7E-2} \quad SB = \frac{5.03 \text{ ppm} - 5.21 \text{ ppm}}{12.10 \text{ ppm}} \times 100 = -1.49 \%$$

Drift Assessment

RM 7E, (08-15-06), 12.5 Drift Assessment. Use Equation 7E-4 to separately calculate the low-level and upscale drift over each test run. (calc for NOx analyzer upscale drift, Run 1, if applicable)

$$D = |SB_{final} - SB_i| \quad \text{Eq. 7E-4} \quad D = | -1.40 \% - -1.49 \% | = 0.08 \%$$

Alternative Drift and Bias

RM 7E, (08-15-06), 13.2 / 13.3 System Bias and Drift. Alternatively, the results are acceptable if $|C_S - C_{dir}|$ is ≤ 0.5 ppmv or if $|C_S - C_V|$ is ≤ 0.5 ppmv (as applicable). (calc for NOx analyzer initial upscale, Run 1, if applicable)

$$SB / D_{Alt} = |C_S - C_{Dir}| \quad \text{Eq. Section 13.2 and 13.3} \quad SB / D_{Alt} = | 5.03 \text{ ppm} - 5.21 \text{ ppm} | = 0.18 \text{ ppm}$$

Bias Adjusted Average

RM 7E, (08-15-06), 12.6 Effluent Gas Concentration. For each test run, calculate C_{avg} , the arithmetic average of all valid NOx concentration values (e.g., 1-minute averages). Then adjust the value of C_{avg} for bias, using Equation 7E-5. (calc for NOx analyzer, Run 1, if applicable)

$$C_{Gas} = (C_{Avg} - C_O) \times \left(\frac{C_{MA}}{C_M - C_O} \right) \quad \text{Eq. 7E-5} \quad C_{Gas} = \left[2.56 \text{ ppm} - 0.09 \text{ ppm} \right] \times \left[\frac{4.99 \text{ ppm}}{5.04 \text{ ppm} - 0.09 \text{ ppm}} \right] = 2.49 \text{ ppm}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (RUNS)

Stack Exhaust Flow (Q_s) - RM19

$$Q_s = \left(\frac{FFactor \times Q_f \times HHV}{1,000,000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O_2)}} \right) \quad Q_s = \frac{8,642.48 \text{ SCF}}{\text{MMBtu}} \times \frac{2,559,212.77 \text{ SCF}}{\text{hr}} \times \frac{992.13 \text{ Btu}}{\text{SCF}}$$

$$\times \frac{\text{MMBtu}}{10^6 \text{ Btu}} \times \left(\frac{20.90\%}{20.9\% - 12.9\%} \right) = 57,380,774.77 \text{ SCFH}$$

Diluent-Corrected Pollutant Concentration, O₂ Based

RM 20, (11-26-02), 7.3.1 Correction of Pollutant Concentration Using O₂ Concentration. Calculate the O₂ corrected pollutant concentration, as follows: (calc for NOx gas, Run 1, if applicable)

$$C_{adj} = C_{Gas(T_{arg,e})} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O_2)}} \right) \quad \text{Eq. 20-4} \quad C_{adj} = 2.49 \text{ ppm} \times \left(\frac{20.9\% - 15.00\%}{20.9\% - 12.91\%} \right) = 1.84 \text{ ppm@15\%O}_2$$

Diluent-Corrected Polutant Concentration Corrected to ISO Conditions

40CFR60.335(b)(1), Conversion for conc. at ISO Conditions (68°F, 1 atm). Calculate, as follows: (calc for NOx@15% with Run 1 data, if applicable)

$$C_{ISO} = C_{Adj} \times \sqrt{\frac{P_o}{P_s}} \times e^{(19 \times (H_o - 0.00633))} \times \left(\frac{288}{T_a} \right)^{1.53}$$

$$C_{ISO} = 1.84 \text{ ppm@15\%O}_2 \times \left(\frac{267.4 \text{ psig} + 14.69232 \text{ psi}}{0.01933677 \text{ psi/mm Hg}} \right)^{19 \times (0.030394 \text{ lb/lb-0.00633})} \times \left(\frac{288 \text{ K}}{306 \text{ K}} \right)^{1.53} = 2.64 \text{ ppm@15\% and ISO}$$

EXAMPLE CALCULATIONS (RUNS)

Emissions Rate (lb/hr)

Calculation for pound per hour emission rate. Calculate, as follows: (calc for NOx gas Run 1, if applicable)

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_s \times MW}{G} \quad E_{lb/hr} = \frac{2.49 \text{ ppm}}{10^6 \text{ ppm/part}} \times \frac{57,380,775 \text{ SCFH} \times 46.01 \text{ lb/lb-mol}}{385.23 \text{ SCF/lb-mol}} = \frac{17.05 \text{ lb}}{\text{hr}}$$

Emissions Rate (ton/year)

Calculation for tons per year emission rate based on 8760 hours per year. Calculate, as follows: (calc for NOx gas Run 1, if applicable)

$$E_{ton/yr} = \frac{E_{lb/hr} \times hr_{year}}{2000} \quad E_{ton/yr} = \frac{17.05 \text{ lb}}{\text{hr}} \times \frac{8,760 \text{ hr}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = \frac{74.69 \text{ ton}}{\text{year}}$$

Emissions Rate (lb/MMBtu)

RM 19, (07-19-06), 12.2 Emission Rates of PM, SO₂, and NOx. Select from the following sections the applicable procedure to compute the PM, SO₂, or NOx emission rate (E) in ng/J (lb/million Btu). (calc for NOx gas Run 1, if applicable)

Oxygen Based

12.2.1 Oxygen-Based F Factor, Dry Basis. When measurements are on a dry basis for both O₂ (%O₂d) and pollutant (Cd) concentrations, use the following equation:

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d \text{ Factor} \times Conv_c \times 20.9\%}{20.9\% - C_{Gas(O_2)}} \quad \text{Eq. 19-1}$$

$$E_{lb/MMBtu} = \frac{2.49 \text{ ppm} \times 8,642.48 \text{ SCF/MMBtu} \times 0.0000001194 \text{ lb/ppm} \cdot \text{ft}^3 \times 20.9\%}{20.9\% - 12.91\%} = \frac{0.007 \text{ lb}}{\text{MMBtu}}$$

Conversion Constant

Conv_c for NOx

$$Conv_c (\text{lb} / \text{ppm} \cdot \text{ft}^3) = \frac{MW}{10^6} \quad Conv_c = \frac{46.01 \text{ lb}}{\text{lb} \cdot \text{mole}} \times \frac{\text{lb} \cdot \text{mole}}{385.23 \text{ SCF}} = \frac{0.0000001194 \text{ lb}}{\text{ppm} \cdot \text{ft}^3}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

RM 7E, (08-15-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

ACE = Analyzer calibration error, percent of calibration span.
B_{WS} = Moisture content of sample gas as measured by Method 4 or other approved method, percent/100.
C_{AVG} = Average unadjusted gas concentration indicated by data recorder for the test run.
C_D = Pollutant concentration adjusted to dry conditions.
C_{Dir} = Measured concentration of a calibration gas (low, mid, or high) when introduced in direct calibration mode.
C_{Gas} = Average effluent gas concentration adjusted for bias.
C_M = Average of initial and final system calibration bias (or 2-point system calibration error) check responses for the upscale calibration gas.
C_{MA} = Actual concentration of the upscale calibration gas, ppmv.
C_O = Average of the initial and final system calibration bias (or 2-point system calibration error) check responses from the low-level (or zero) calibration gas.
C_S = Measured concentration of a calibration gas (low, mid, or high) when introduced in system calibration mode.
C_{SS} = Concentration of NO_x measured in the spiked sample.
C_{Spike} = Concentration of NO_x in the undiluted spike gas.
C_{Calc} = Calculated concentration of NO_x in the spike gas diluted in the sample.
C_V = Manufacturer certified concentration of a calibration gas (low, mid, or high).
C_W = Pollutant concentration measured under moist sample conditions, wet basis.
CS = Calibration span.
D = Drift assessment, percent of calibration span.
E_p = The predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response.
Eff_{NO2} = NO₂ to NO converter efficiency, percent.
H = High calibration gas, designator.
L = Low calibration gas, designator.
M = Mid calibration gas, designator.
NO_FFinal = The average NO concentration observed with the analyzer in the NO mode during the converter efficiency test in Section 16.2.2.
NO_xCorr = The NO_x concentration corrected for the converter efficiency.
NO_xFinal = The final NO_x concentration observed during the converter efficiency test in Section 16.2.2.
NO_xPeak = The highest NO_x concentration observed during the converter efficiency test in Section 16.2.2.
Q_{Spike} = Flow rate of spike gas introduced in system calibration mode, L/min.
Q_{Total} = Total sample flow rate during the spike test, L/min.
R = Spike recovery, percent.
SB = System bias, percent of calibration span.
SB_i = Pre-run system bias, percent of calibration span.
SB_f = Post-run system bias, percent of calibration span.
SB / D_{Alt} = Alternative absolute difference criteria to pass bias and/or drift checks.
SCE = System calibration error, percent of calibration span.
SCE_i = Pre-run system calibration error, percent of calibration span.
SCE_f = Post-run system calibration error, percent of calibration span.
Z = Zero calibration gas, designator.

40CFR60.355(b)(1), (09-20-06), Nomenclature. The terms used in the equations are defined as follows:

P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg
P_o = observed combustor inlet absolute pressure at test, mm Hg
H_a = observed humidity of ambient air, g H₂O/g air
e = transcendental constant, 2.718
T_a = ambient temperature, K

RM 19, (07-29-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

AdjFactor = Percent oxygen or carbon dioxide adjustment applied to a target pollutant
B_{wa} = Moisture fraction of ambient air, percent.
Btu = British thermal unit
%_C = Concentration of carbon from an ultimate analysis of fuel, weight percent.
%_{CO_{2d}}, %_{CO_{2w}} = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
E = Pollutant emission rate, ng/J (lb/million Btu).
E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
E_{bi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
E_{bo} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
E_d = Average pollutant rate for each sampling period (e.g., 24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million Btu).
E_{di} = Average inlet SO₂ rate for each sampling period d, ng/J (lb/million Btu).
E_g = Pollutant rate from gas turbine, ng/J (lb/million Btu).
E_{ga} = Daily geometric average pollutant rate, ng/J (lbs/million Btu) or ppm corrected to 7 percent O₂.
E_g, E_{gi} = Matched pair hourly arithmetic average pollutant rate, outlet and inlet, respectively, ng/J (lb/million Btu) or ppm corrected to 7 percent O₂.
E_h = Hourly average pollutant, ng/J (lb/million Btu).
E_{hj} = Hourly arithmetic average pollutant rate for hour "j," ng/J (lb/million Btu) or ppm corrected to 7 percent O₂.
EXP = Natural logarithmic base (2.718) raised to the value enclosed by brackets.
F_c = Ratio of the volume of carbon dioxide produced to the gross calorific value of the fuel from Method 19
F_d, F_w, F_c = Volumes of combustion components per unit of heat content, scm/J (scf/million Btu).
ft³ = cubic feet
G = ideal gas conversion factor
(385.23 SCF/lb-mol at 68 deg F & 14.696 psia)
GCM = gross Btu per SCF (constant, compound based)
GCV = Gross calorific value of the fuel consistent with the ultimate analysis, kJ/kg (Btu/lb).
GCV_p, GCV_r = Gross calorific value for the product and raw fuel lots, respectively, dry basis, kJ/kg (Btu/lb).
%_H = Concentration of hydrogen from an ultimate analysis of fuel, weight percent.
H_g = Heat input rate to the steam generating unit from fuels fired in the steam generating unit, J/hr (million Btu/hr).
H_g = Heat input rate to gas turbine from all fuels fired in the gas turbine, J/hr (million Btu/hr).
%_{H₂O} = Concentration of water from an ultimate analysis of fuel, weight percent.
H_t = Total numbers of hours in the performance test period (e.g., 720 hours for 30-day performance test period).
K = volume of combustion component per pound of component (constant)
K = Conversion factor, 10⁻⁵ (kJ/J)/(%) [10⁶ Btu/million Btu].
K_c = (9.57 scm/kg)/% [(1.53 scf/lb)/%].
K_{co} = (2.0 scm/kg)/% [(0.321 scf/lb)/%].
K_{hd} = (22.7 scm/kg)/% [(3.64 scf/lb)/%].
K_{hw} = (34.74 scm/kg)/% [(5.57 scf/lb)/%].
K_n = (0.86 scm/kg)/% [(0.14 scf/lb)/%].
K_o = (2.85 scm/kg)/% [(0.46 scf/lb)/%].
K_s = (3.54 scm/kg)/% [(0.57 scf/lb)/%].
K_{sulfur} = 2x10⁴ Btu/wt%-MMBtu
K_w = (1.30 scm/kg)/% [(0.21 scf/lb)/%].
lb = pound
ln = Natural log of indicated value.
L_p, L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
%_N = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
M% = mole percent
mol = mole
MW = molecular weight (lb/lb-mol)
MW_{AIR} = molecular weight of air (28.9625 lb/lb-mole)¹
NCM = net Btu per SCF (constant based on compound)
%_O = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
%_{O_{2d}}, %_{O_{2w}} = Concentration of oxygen on a dry and wet basis, respectively, percent.
P_B = barometric pressure, in Hg
P_s = Potential SO₂ emissions, percent.
%_S = Sulfur content of as-fired fuel lot, dry basis, weight percent.
S_p = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
%_{Sr} = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
S(wt%) = weight percent of sulfur, per lab analysis by appropriate ASTM standard
S_i = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
S_p = Standard deviation of the hourly average emission rates for each performance test period, ng/J (lb/million Btu).
%S_p, %S_r = Sulfur content of the product and raw fuel lots respectively, dry basis, weight percent.
SCF = standard cubic feet
SH = specific humidity, pounds of water per pound of air
t_{0.95} = Values shown in Table 19-3 for the indicated number of data points n.
T_{amb} = ambient temperature, °F
W/D Factor = 1.0236 = conv. at 14.696 psia and
68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
X_{CO₂} = CO₂ Correction factor, percent.
X_k = Fraction of total heat input from each type of fuel k.

Calculations, Formulas, and Constants

The following information supports the spreadsheets for this testing project.

Given Data:

Ideal Gas Conversion Factor = 385.23 SCF/lb-mol at 68 deg F & 14.696 psia

Fuel Heating Value is based upon Air Hygiene's fuel gas calculation sheet. All calculations are based upon a correction to 68 deg F & 14.696 psia

High Heating Values (HHV) are used for the Fuel Heating Value, F-Factor, and Fuel Flow Data per EPA requirements.

80.06

0.0000002078239

ASTM D 3588

Molecular Weight of NOx (lb/lb-mole) = 46.01
 Molecular Weight of CO (lb/lb-mole) = 28.00
 Molecular Weight of SO₂ (lb/lb-mole) = 64.00
 Molecular Weight of THC (propane) (lb/lb-mole) = 44.00
 Molecular Weight of VOC (methane) (lb/lb-mole) = 16.00
 Molecular Weight of NH₃ (lb/lb-mole) = 17.03
 Molecular Weight of HCHO (lb/lb-mole) = 30.03

40CFR60, App. A, RM 19, Table 19-1

Conversion Constant for NOx = 0.0000001194351
 Conversion Constant for CO = 0.0000000726839
 Conversion Constant for SO₂ = 0.0000001661345
 Conversion Constant for THC = 0.0000001142175
 Conversion Constant for VOC (methane) = 0.0000000415336
 Conversion Constant for NH₃ = 0.000000442074
 Conversion Constant for HCHO = 0.0000000779534

NOTE: units are lb/ppm*ft³

Formulas:

1. Corrected Raw Average (C_{Gas}), 40CFR60, App. A, RM 7E, Eq. 7E-5 (08/15/06)

$$C_{Gas} = (C_{Avg} - C_O) \times \left(\frac{C_{MA}}{C_M - C_O} \right)$$

5. Emission Rate in lb/hr

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_S \times MW}{G}$$

2. Correction to % O₂, 40CFR60, App. A, RM 20, Eq. 20-5 (11/26/02)

$$C_{adj} = C_{Gas(Target)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O_2)}} \right)$$

6. Emission Rate in tons per year

$$E_{ton/yr} = \frac{E_{lb/hr} \times hr_{year}}{2000}$$

3. Correction to % O₂ and ISO Conditions

$$C_{ISO} = C_{Adj} \times \sqrt{\frac{P_r}{P_o}} \times e^{(19 \times (H_o - 0.00633))} \times \left(\frac{288}{T_a} \right)^{1.53}$$

7. Emission Concentration in lb/MMBtu (O₂ based)

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d Factor \times Conv_C \times 20.9\%}{20.9\% - C_{Gas(O_2)}}$$

4. Method 19 stack exhaust flow (scfh)

$$Q_S = \left(\frac{FFactor \times Q_f \times HHV}{1,000,000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O_2)}} \right)$$

8. Emission Concentration in g/hp*hr

$$E_{g/hp-hr} = \frac{E_{lb/hr} \times 453.6}{mw \times 1314.022} \text{ or } \frac{E_{lb/hr} \times 453.6}{hp}$$

APPENDIX B

UNIT OPERATION PARAMETERS

Florida Power and Light

Air Permit # :	PSD-FL-354
Plant Name or Location:	West County Energy Center
Date:	October 7-8, 2009
Project Number:	bv-09-westcounty.fl-comp#1
Manufacturer & Equipment:	Mitsubishi
Model:	501G
Unit Number:	1A
Test Load:	Base with and without Duct Burners
Tester(s) / Test Unit(s):	JRF/TP 210

		RUN					
	UNITS	1-1	1-2	1-3	2-1	2-2	2-3
Start Time	hh:mm:ss	07:58:05	09:15:05	10:30:05	16:05:28	17:18:28	18:32:28
End Time	hh:mm:ss	08:57:35	10:14:35	11:29:35	17:04:58	18:17:58	19:31:58
Bar. Pressure	in. Hg	29.91	29.97	30.00	29.91	29.88	29.88
Amb. Temp.	°F	92	85	96	93	92	91
Rel. Humidity	%	92	85	63	57	51	80
Spec. Humidity	lb water / lb air	0.030394	0.022187	0.023218	0.019088	0.016507	0.025450
Date	mm/dd/yy	10/08/09	10/08/09	10/08/09	10/07/09	10/07/09	10/07/09
Avg. Stack Temp.	°F	184	188	188	176	176	176
Comb. Inlet Pres.	psig	267.4	266.9	267.7	267.3	268.0	264.0
Turbine Fuel Flow	lb/min	1,836	1,830	1,835	1,635	1,638	1,605
Duct Burner Fuel Flow	lb/min	0	0	0	200	200	200
Total Fuel Flow	SCFH	2,559,213	2,552,010	2,558,051	2,556,889	2,561,536	2,516,462
Stack Moisture	% Method 4	11.1	10.7	11.6	10.9	10.2	12.1
Power Output	megawatts	248.6	248.0	249.0	248.8	249.6	244.8

UNIT OPERATION PARAMETERS

Base Load

	Combustor Inlet Pressure A	CT A Gas Flow	DB A Gas Flow	CT A Load
	psig	KPPH	KPPH	MW
08-Oct-09 07:58:05	267.57	109.08	0.00	248.57
08-Oct-09 07:59:05	267.68	109.67	0.00	248.99
08-Oct-09 08:00:05	267.55	109.40	0.00	248.85
08-Oct-09 08:01:05	267.54	109.75	0.00	248.68
08-Oct-09 08:02:05	267.55	110.26	0.00	248.84
08-Oct-09 08:03:05	267.58	110.24	0.00	248.65
08-Oct-09 08:04:05	267.67	110.53	0.07	248.86
08-Oct-09 08:05:05	267.87	110.80	0.00	249.28
08-Oct-09 08:06:05	267.87	111.88	0.00	249.22
08-Oct-09 08:07:05	267.79	111.41	0.00	249.82
08-Oct-09 08:08:05	267.53	106.86	0.21	248.55
08-Oct-09 08:09:05	267.61	106.65	0.00	248.39
08-Oct-09 08:10:05	267.50	109.99	0.00	248.71
08-Oct-09 08:11:05	267.48	108.71	0.00	248.63
08-Oct-09 08:12:05	267.47	108.64	0.00	248.48
08-Oct-09 08:13:05	267.37	109.56	0.00	248.65
08-Oct-09 08:14:05	267.41	112.65	0.00	248.85
08-Oct-09 08:15:05	267.55	110.24	0.00	248.95
08-Oct-09 08:16:05	267.42	110.69	0.00	248.89
08-Oct-09 08:17:05	267.62	111.52	0.00	249.30
08-Oct-09 08:18:05	267.56	110.13	0.00	248.82
08-Oct-09 08:19:05	267.53	109.52	0.09	248.56
08-Oct-09 08:20:05	267.65	109.21	0.00	248.88
08-Oct-09 08:21:05	267.58	110.06	0.00	248.88
08-Oct-09 08:22:05	267.51	109.87	0.00	248.45
08-Oct-09 08:23:05	267.49	112.06	0.00	249.07
08-Oct-09 08:24:05	267.46	110.68	0.00	248.68
08-Oct-09 08:25:05	267.56	109.30	0.00	248.80
08-Oct-09 08:26:05	267.38	109.39	0.00	248.58
08-Oct-09 08:27:05	267.38	109.54	0.00	248.39
08-Oct-09 08:28:05	267.33	109.04	0.00	248.17
08-Oct-09 08:29:05	267.36	111.96	0.00	248.77
08-Oct-09 08:30:05	267.40	111.23	0.00	249.46
08-Oct-09 08:31:05	267.30	112.22	0.00	248.75
08-Oct-09 08:32:05	267.41	111.92	0.00	249.13
08-Oct-09 08:33:05	267.45	110.24	0.00	249.20
08-Oct-09 08:34:05	267.23	109.16	0.00	247.78
08-Oct-09 08:35:05	267.19	108.65	0.00	248.11
08-Oct-09 08:36:05	267.05	109.06	0.00	247.99
08-Oct-09 08:37:05	267.12	109.02	0.00	247.93
08-Oct-09 08:38:05	267.14	108.71	0.00	247.91
08-Oct-09 08:39:05	267.21	109.87	0.00	248.54
08-Oct-09 08:40:05	267.32	110.06	0.00	248.27
08-Oct-09 08:41:05	267.37	110.97	0.00	248.71
08-Oct-09 08:42:05	267.45	110.91	0.00	248.53
08-Oct-09 08:43:05	267.34	110.08	0.00	248.31
08-Oct-09 08:44:05	267.12	108.76	0.00	248.13
08-Oct-09 08:45:05	267.27	110.01	0.00	248.08
08-Oct-09 08:46:05	267.28	112.51	0.00	248.57
08-Oct-09 08:47:05	267.34	110.37	0.00	248.63
08-Oct-09 08:48:05	267.19	109.54	0.00	248.18
08-Oct-09 08:49:05	266.97	109.06	0.00	247.93
08-Oct-09 08:50:05	266.91	108.87	0.00	247.55
08-Oct-09 08:51:05	266.90	108.79	0.00	247.66
08-Oct-09 08:52:05	266.83	112.65	0.00	247.88
08-Oct-09 08:53:05	266.96	110.98	0.00	248.00
08-Oct-09 08:54:05	266.98	110.39	0.00	248.60
08-Oct-09 08:55:05	267.18	111.83	0.00	248.55
08-Oct-09 08:56:05	267.04	111.77	0.00	248.29
08-Oct-09 08:57:05	267.18	111.25	0.00	248.32
Average	267.38	110.14	0.01	248.57

	Combustor Inlet Pressure A	CT A Gas Flow	DB A Gas Flow	CT A Load
	psig	KPPH	KPPH	MW
08-Oct-09 09:15:05	266.82	108.88	0.00	247.24
08-Oct-09 09:16:05	266.88	108.75	0.00	247.77
08-Oct-09 09:17:05	267.17	110.10	0.00	248.09
08-Oct-09 09:18:05	267.22	110.42	0.00	248.54
08-Oct-09 09:19:05	267.12	110.48	0.00	248.25
08-Oct-09 09:20:05	267.03	110.48	0.00	248.50
08-Oct-09 09:21:05	266.83	111.09	0.00	248.00
08-Oct-09 09:22:05	266.75	108.88	0.00	247.47
08-Oct-09 09:23:05	266.83	109.33	0.00	247.93
08-Oct-09 09:24:05	266.66	110.90	0.03	248.44
08-Oct-09 09:25:05	266.46	109.58	0.01	247.37
08-Oct-09 09:26:05	266.64	108.70	0.00	247.24
08-Oct-09 09:27:05	266.70	109.07	0.00	247.81
08-Oct-09 09:28:05	266.84	110.90	0.00	248.10
08-Oct-09 09:29:05	266.60	110.80	0.00	247.93
08-Oct-09 09:30:05	266.73	109.06	0.00	247.22
08-Oct-09 09:31:05	266.70	108.37	0.00	247.45
08-Oct-09 09:32:05	266.98	109.51	0.12	247.50
08-Oct-09 09:33:05	266.98	109.65	0.12	248.14
08-Oct-09 09:34:05	266.93	111.21	0.00	248.26
08-Oct-09 09:35:05	266.86	111.50	0.00	248.00
08-Oct-09 09:36:05	266.86	109.97	0.00	248.18
08-Oct-09 09:37:05	266.85	109.98	0.00	247.87
08-Oct-09 09:38:05	266.74	109.08	0.00	247.68
08-Oct-09 09:39:05	266.81	110.87	0.00	248.14
08-Oct-09 09:40:05	266.74	110.93	0.00	247.94
08-Oct-09 09:41:05	266.84	110.29	0.02	248.15
08-Oct-09 09:42:05	266.76	111.61	0.00	248.00
08-Oct-09 09:43:05	266.81	109.50	0.00	247.66
08-Oct-09 09:44:05	266.82	109.43	0.00	247.77
08-Oct-09 09:45:05	266.75	108.50	0.00	247.69
08-Oct-09 09:46:05	266.77	109.54	0.00	247.78
08-Oct-09 09:47:05	266.81	110.87	0.18	248.02
08-Oct-09 09:48:05	266.87	110.40	0.01	248.06
08-Oct-09 09:49:05	266.72	111.70	0.19	247.73
08-Oct-09 09:50:05	266.78	109.26	0.00	247.65
08-Oct-09 09:51:05	266.82	110.05	0.00	248.18
08-Oct-09 09:52:05	266.92	110.40	0.00	247.79
08-Oct-09 09:53:05	267.04	110.24	0.00	248.20
08-Oct-09 09:54:05	267.07	111.09	0.00	248.23
08-Oct-09 09:55:05	267.35	105.60	0.00	249.27
08-Oct-09 09:56:05	266.93	103.94	0.15	247.28
08-Oct-09 09:57:05	266.72	108.89	0.00	247.80
08-Oct-09 09:58:05	266.86	109.95	0.11	248.07
08-Oct-09 09:59:05	266.83	110.47	0.12	248.16
08-Oct-09 10:00:05	266.82	109.90	0.00	247.91
08-Oct-09 10:01:05	266.88	109.93	0.00	248.11
08-Oct-09 10:02:05	266.79	109.79	0.00	248.03
08-Oct-09 10:03:05	267.04	109.87	0.00	247.71
08-Oct-09 10:04:05	267.05	109.84	0.00	248.34
08-Oct-09 10:05:05	267.01	109.76	0.00	247.92
08-Oct-09 10:06:05	266.89	109.91	0.00	248.08
08-Oct-09 10:07:05	266.90	109.94	0.00	247.92
08-Oct-09 10:08:05	266.89	109.66	0.00	248.23
08-Oct-09 10:09:05	266.97	110.73	0.00	248.28
08-Oct-09 10:10:05	267.04	110.22	0.13	248.49
08-Oct-09 10:11:05	267.10	109.41	0.00	248.48
08-Oct-09 10:12:05	267.31	109.79	0.00	248.19
08-Oct-09 10:13:05	267.35	110.93	0.00	248.98
08-Oct-09 10:14:05	267.09	109.33	0.00	248.35
Average	266.89	109.82	0.02	247.99

	Combustor Inlet Pressure A	CT A Gas Flow	DB A Gas Flow	CT A Load
	psig	KPPH	KPPH	MW
08-Oct-09 10:30:05	267.23	109.48	0.00	248.41
08-Oct-09 10:31:05	267.15	109.61	0.00	248.39
08-Oct-09 10:32:05	267.18	109.58	0.00	247.99
08-Oct-09 10:33:05	267.26	110.05	0.00	248.54
08-Oct-09 10:34:05	267.26	109.83	0.00	248.53
08-Oct-09 10:35:05	267.20	110.01	0.10	248.53
08-Oct-09 10:36:05	267.64	109.88	0.00	248.40
08-Oct-09 10:37:05	267.77	110.30	0.13	249.12
08-Oct-09 10:38:05	267.58	110.08	0.04	248.78
08-Oct-09 10:39:05	267.85	109.95	0.00	248.56
08-Oct-09 10:40:05	267.92	110.44	0.00	249.40
08-Oct-09 10:41:05	267.82	110.45	0.00	249.37
08-Oct-09 10:42:05	268.08	109.78	0.00	249.00
08-Oct-09 10:43:05	268.29	110.20	0.00	249.69
08-Oct-09 10:44:05	268.25	110.25	0.00	249.82
08-Oct-09 10:45:05	267.93	110.32	0.00	249.97
08-Oct-09 10:46:05	267.76	109.75	0.00	249.06
08-Oct-09 10:47:05	267.89	110.06	0.00	249.37
08-Oct-09 10:48:05	267.99	110.36	0.00	249.55
08-Oct-09 10:49:05	268.15	110.66	0.00	249.80
08-Oct-09 10:50:05	268.13	109.82	0.00	249.19
08-Oct-09 10:51:05	268.14	110.30	0.00	249.38
08-Oct-09 10:52:05	268.12	110.02	0.17	249.70
08-Oct-09 10:53:05	268.01	110.43	0.00	249.46
08-Oct-09 10:54:05	268.36	110.26	0.00	249.13
08-Oct-09 10:55:05	268.56	110.51	0.00	250.02
08-Oct-09 10:56:05	268.40	109.87	0.00	250.01
08-Oct-09 10:57:05	268.18	110.76	0.00	249.76
08-Oct-09 10:58:05	268.03	110.71	0.00	249.86
08-Oct-09 10:59:05	267.88	110.44	0.00	249.75
08-Oct-09 11:00:05	267.89	109.93	0.00	249.16
08-Oct-09 11:01:05	267.41	110.17	0.00	249.40
08-Oct-09 11:02:05	266.94	110.06	0.00	248.27
08-Oct-09 11:03:05	267.15	109.50	0.00	248.17
08-Oct-09 11:04:05	267.28	110.14	0.00	248.74
08-Oct-09 11:05:05	267.32	109.97	0.00	248.59
08-Oct-09 11:06:05	267.42	109.83	0.00	248.60
08-Oct-09 11:07:05	267.50	109.89	0.00	248.80
08-Oct-09 11:08:05	267.38	109.41	0.00	248.81
08-Oct-09 11:09:05	267.41	109.93	0.00	248.59
08-Oct-09 11:10:05	267.30	109.97	0.00	248.74
08-Oct-09 11:11:05	267.39	110.12	0.00	248.43
08-Oct-09 11:12:05	267.57	109.84	0.00	248.65
08-Oct-09 11:13:05	267.60	109.65	0.00	248.58
08-Oct-09 11:14:05	267.71	110.19	0.00	249.07
08-Oct-09 11:15:05	267.85	110.24	0.00	249.09
08-Oct-09 11:16:05	267.67	110.69	0.00	249.23
08-Oct-09 11:17:05	267.43	109.93	0.00	248.81
08-Oct-09 11:18:05	267.39	110.01	0.00	248.63
08-Oct-09 11:19:05	267.39	109.87	0.00	248.62
08-Oct-09 11:20:05	267.46	109.93	0.00	248.56
08-Oct-09 11:21:05	267.50	109.72	0.00	248.91
08-Oct-09 11:22:05	267.43	110.14	0.00	248.37
08-Oct-09 11:23:05	267.47	109.76	0.00	248.30
08-Oct-09 11:24:05	267.69	110.12	0.00	248.59
08-Oct-09 11:25:05	267.97	109.90	0.00	248.84
08-Oct-09 11:26:05	268.01	110.79	0.00	249.61
08-Oct-09 11:27:05	267.92	110.51	0.00	249.32
08-Oct-09 11:28:05	268.01	110.35	0.00	249.63
08-Oct-09 11:29:05	267.95	110.42	0.00	249.60
Average	267.71	110.09	0.01	249.02

UNIT OPERATION PARAMETERS

Base Load with Duct Burners

	Combustor Inlet Pressure A	CT A Gas Flow	DB A Gas Flow	CT A Load
	psig	KPPH	KPPH	MW
07-Oct-09 16:05:28	266.99	97.99	11.92	248.52
07-Oct-09 16:06:28	267.15	98.08	11.93	248.52
07-Oct-09 16:07:28	267.26	98.22	11.94	248.59
07-Oct-09 16:08:28	267.15	98.05	11.94	248.70
07-Oct-09 16:09:28	267.04	98.09	11.95	248.58
07-Oct-09 16:10:28	267.13	98.08	11.94	248.65
07-Oct-09 16:11:28	267.07	98.26	11.93	248.80
07-Oct-09 16:12:28	266.91	98.00	11.93	248.24
07-Oct-09 16:13:28	266.73	98.00	11.93	248.11
07-Oct-09 16:14:28	266.90	97.90	11.93	248.10
07-Oct-09 16:15:28	267.10	98.01	11.95	248.25
07-Oct-09 16:16:28	267.10	98.19	11.94	248.71
07-Oct-09 16:17:28	267.10	98.24	11.94	248.37
07-Oct-09 16:18:28	267.27	97.74	11.94	248.42
07-Oct-09 16:19:28	267.45	98.33	11.94	248.89
07-Oct-09 16:20:28	267.33	97.86	11.94	248.76
07-Oct-09 16:21:28	267.28	97.29	11.95	248.37
07-Oct-09 16:22:28	267.44	98.47	11.96	249.14
07-Oct-09 16:23:28	267.50	98.28	11.96	248.92
07-Oct-09 16:24:28	267.46	98.26	11.96	248.98
07-Oct-09 16:25:28	267.27	97.90	11.96	249.09
07-Oct-09 16:26:28	267.34	97.71	11.96	248.41
07-Oct-09 16:27:28	267.43	97.94	11.97	249.00
07-Oct-09 16:28:28	267.33	97.88	11.96	248.60
07-Oct-09 16:29:28	267.30	98.18	11.96	249.00
07-Oct-09 16:30:28	267.40	97.84	11.96	248.53
07-Oct-09 16:31:28	267.53	98.32	11.97	249.07
07-Oct-09 16:32:28	267.50	98.27	11.97	249.03
07-Oct-09 16:33:28	267.40	98.32	11.97	249.12
07-Oct-09 16:34:28	267.15	97.95	11.98	248.57
07-Oct-09 16:35:28	267.14	98.15	11.97	248.77
07-Oct-09 16:36:28	267.52	97.89	11.98	248.73
07-Oct-09 16:37:28	267.40	98.57	11.98	249.44
07-Oct-09 16:38:28	267.31	98.40	11.98	248.72
07-Oct-09 16:39:28	267.36	98.51	11.98	249.00
07-Oct-09 16:40:28	267.31	98.14	11.97	249.13
07-Oct-09 16:41:28	267.33	98.21	11.98	248.91
07-Oct-09 16:42:28	267.57	98.02	11.98	249.11
07-Oct-09 16:43:28	267.42	98.05	11.98	249.28
07-Oct-09 16:44:28	267.33	98.39	11.98	248.83
07-Oct-09 16:45:28	267.44	97.73	11.98	248.80
07-Oct-09 16:46:28	267.58	98.09	11.98	248.96
07-Oct-09 16:47:28	267.61	98.25	11.98	249.09
07-Oct-09 16:48:28	267.25	98.25	11.98	249.21
07-Oct-09 16:49:28	267.29	98.14	11.98	248.77
07-Oct-09 16:50:28	267.36	98.10	11.99	248.79
07-Oct-09 16:51:28	267.31	97.74	11.99	248.85
07-Oct-09 16:52:28	267.31	97.77	11.99	248.65
07-Oct-09 16:53:28	267.55	97.94	11.98	249.23
07-Oct-09 16:54:28	267.60	98.47	11.99	249.22
07-Oct-09 16:55:28	267.68	98.68	11.99	249.15
07-Oct-09 16:56:28	267.68	97.94	12.00	249.31
07-Oct-09 16:57:28	267.57	98.93	12.00	249.24
07-Oct-09 16:58:28	267.51	97.95	12.02	249.13
07-Oct-09 16:59:28	267.54	97.71	12.04	248.93
07-Oct-09 17:00:28	267.53	97.68	12.05	249.12
07-Oct-09 17:01:28	267.34	97.36	12.07	248.79
07-Oct-09 17:02:28	267.37	97.29	12.07	248.66
07-Oct-09 17:03:28	267.68	98.33	12.08	248.85
07-Oct-09 17:04:28	267.59	98.16	12.07	249.51
Average	267.34	98.07	11.98	248.84

	Combustor Inlet Pressure A	CT A Gas Flow	DB A Gas Flow	CT A Load
	psig	KPPH	KPPH	MW
07-Oct-09 17:18:28	267.77	98.15	11.97	249.41
07-Oct-09 17:19:28	267.68	98.01	11.96	249.11
07-Oct-09 17:20:28	267.63	97.76	11.97	249.33
07-Oct-09 17:21:28	267.81	98.44	11.96	249.39
07-Oct-09 17:22:28	267.76	98.12	11.96	249.57
07-Oct-09 17:23:28	267.68	97.89	11.97	249.18
07-Oct-09 17:24:28	267.90	98.16	11.97	249.77
07-Oct-09 17:25:28	267.79	98.10	11.97	249.43
07-Oct-09 17:26:28	267.65	97.83	11.98	249.29
07-Oct-09 17:27:28	267.56	98.35	11.98	249.17
07-Oct-09 17:28:28	267.72	98.13	11.98	248.93
07-Oct-09 17:29:28	267.92	98.21	11.98	249.33
07-Oct-09 17:30:28	267.80	98.52	11.98	249.61
07-Oct-09 17:31:28	267.66	98.25	11.98	249.30
07-Oct-09 17:32:28	267.79	98.01	11.98	249.04
07-Oct-09 17:33:28	267.90	98.16	11.98	249.50
07-Oct-09 17:34:28	268.01	98.21	11.98	249.52
07-Oct-09 17:35:28	268.01	98.30	11.97	249.58
07-Oct-09 17:36:28	268.06	98.08	11.98	249.45
07-Oct-09 17:37:28	268.00	98.85	11.98	249.78
07-Oct-09 17:38:28	267.99	97.95	11.99	249.62
07-Oct-09 17:39:28	268.07	97.73	11.99	249.49
07-Oct-09 17:40:28	268.24	98.56	11.99	249.90
07-Oct-09 17:41:28	268.06	98.50	12.00	249.94
07-Oct-09 17:42:28	267.99	98.22	12.00	249.76
07-Oct-09 17:43:28	268.03	98.05	12.00	249.81
07-Oct-09 17:44:28	268.17	98.24	12.00	249.80
07-Oct-09 17:45:28	268.24	98.34	12.00	249.97
07-Oct-09 17:46:28	268.18	98.79	11.99	249.86
07-Oct-09 17:47:28	268.14	98.17	11.99	249.43
07-Oct-09 17:48:28	268.11	97.83	11.99	250.05
07-Oct-09 17:49:28	267.96	98.41	11.99	249.72
07-Oct-09 17:50:28	267.99	98.51	11.97	249.41
07-Oct-09 17:51:28	268.10	98.43	11.98	249.67
07-Oct-09 17:52:28	268.00	98.54	11.98	249.65
07-Oct-09 17:53:28	267.96	98.48	11.98	249.77
07-Oct-09 17:54:28	268.01	98.07	11.98	249.75
07-Oct-09 17:55:28	267.93	98.34	11.98	249.55
07-Oct-09 17:56:28	267.87	98.43	11.98	249.49
07-Oct-09 17:57:28	267.81	98.22	11.98	249.31
07-Oct-09 17:58:28	267.95	98.94	11.99	249.85
07-Oct-09 17:59:28	267.92	98.38	11.99	249.60
07-Oct-09 18:00:28	267.99	98.09	12.00	249.12
07-Oct-09 18:01:28	268.03	97.96	12.00	249.55
07-Oct-09 18:02:28	268.07	98.26	12.00	249.33
07-Oct-09 18:03:28	268.08	98.22	12.00	249.60
07-Oct-09 18:04:28	268.04	98.30	12.00	249.58
07-Oct-09 18:05:28	268.14	98.41	12.00	249.59
07-Oct-09 18:06:28	268.16	98.14	11.99	249.55
07-Oct-09 18:07:28	268.29	98.14	12.00	249.60
07-Oct-09 18:08:28	268.23	98.36	11.99	249.98
07-Oct-09 18:09:28	268.17	98.47	12.00	249.93
07-Oct-09 18:10:28	268.07	98.48	12.00	249.58
07-Oct-09 18:11:28	268.07	98.68	11.99	249.66
07-Oct-09 18:12:28	267.99	98.39	12.00	249.77
07-Oct-09 18:13:28	267.97	98.30	12.00	249.71
07-Oct-09 18:14:28	267.93	98.51	11.99	249.95
07-Oct-09 18:15:28	267.95	98.25	12.00	249.73
07-Oct-09 18:16:28	268.03	98.04	11.99	249.30
07-Oct-09 18:17:28	267.93	98.05	12.00	249.50
Average	267.97	98.26	11.99	249.57

Combustor Inlet Pressure A	CT A Gas Flow	DB A Gas Flow	CT A Load
psig	KPPH	KPPH	MW

07-Oct-09 18:32:28	267.36	98.04	12.02	248.88
07-Oct-09 18:33:28	266.70	98.12	12.03	249.06
07-Oct-09 18:34:28	265.96	98.10	12.02	247.56
07-Oct-09 18:35:28	265.74	97.49	12.02	246.92
07-Oct-09 18:36:28	264.69	97.97	12.01	247.19
07-Oct-09 18:37:28	263.77	96.90	12.01	244.79
07-Oct-09 18:38:28	263.45	99.52	12.00	244.90
07-Oct-09 18:39:28	263.02	95.52	12.00	244.09
07-Oct-09 18:40:28	262.87	94.51	12.00	242.67
07-Oct-09 18:41:28	263.77	96.01	12.00	244.07
07-Oct-09 18:42:28	264.04	96.24	12.00	245.99
07-Oct-09 18:43:28	264.11	98.68	12.00	246.04
07-Oct-09 18:44:28	263.74	96.96	12.01	244.83
07-Oct-09 18:45:28	263.58	100.22	12.00	245.18
07-Oct-09 18:46:28	263.61	95.66	12.00	244.24
07-Oct-09 18:47:28	263.78	94.31	12.00	243.82
07-Oct-09 18:48:28	264.06	95.88	12.01	244.49
07-Oct-09 18:49:28	264.03	95.80	12.01	244.46
07-Oct-09 18:50:28	264.21	93.61	12.01	244.47
07-Oct-09 18:51:28	264.18	94.79	12.00	244.64
07-Oct-09 18:52:28	264.34	96.02	12.00	244.23
07-Oct-09 18:53:28	264.64	97.45	12.00	245.30
07-Oct-09 18:54:28	264.58	95.45	12.00	245.47
07-Oct-09 18:55:28	264.67	94.59	12.00	245.26
07-Oct-09 18:56:28	264.58	96.31	12.00	246.10
07-Oct-09 18:57:28	264.37	96.93	12.00	245.55
07-Oct-09 18:58:28	263.94	96.48	12.00	245.28
07-Oct-09 18:59:28	264.13	94.43	12.00	244.15
07-Oct-09 19:00:28	264.36	97.58	11.99	245.28
07-Oct-09 19:01:28	263.73	96.05	12.00	244.87
07-Oct-09 19:02:28	263.74	96.62	12.00	244.17
07-Oct-09 19:03:28	263.98	94.39	12.00	244.47
07-Oct-09 19:04:28	264.15	94.92	11.99	244.34
07-Oct-09 19:05:28	263.94	95.37	11.99	244.08
07-Oct-09 19:06:28	263.70	95.46	12.02	244.11
07-Oct-09 19:07:28	263.86	93.92	12.02	244.12
07-Oct-09 19:08:28	264.00	96.76	12.02	244.67
07-Oct-09 19:09:28	264.01	93.80	12.02	244.53
07-Oct-09 19:10:28	263.61	94.98	12.01	243.96
07-Oct-09 19:11:28	264.39	94.46	12.02	243.92
07-Oct-09 19:12:28	264.94	95.89	12.02	246.19
07-Oct-09 19:13:28	264.45	105.89	12.02	246.97
07-Oct-09 19:14:28	263.65	101.60	12.02	245.10
07-Oct-09 19:15:28	263.96	93.79	12.02	243.02
07-Oct-09 19:16:28	264.25	94.93	12.02	244.03
07-Oct-09 19:17:28	264.30	94.82	12.02	244.79
07-Oct-09 19:18:28	264.05	92.55	12.03	245.15
07-Oct-09 19:19:28	263.76	94.12	12.02	244.25
07-Oct-09 19:20:28	264.15	92.81	12.03	244.24
07-Oct-09 19:21:28	264.24	98.33	12.02	245.52
07-Oct-09 19:22:28	263.47	97.75	12.02	244.62
07-Oct-09 19:23:28	262.71	98.72	12.02	243.28
07-Oct-09 19:24:28	262.77	94.58	12.02	243.87
07-Oct-09 19:25:28	263.24	97.03	12.02	243.86
07-Oct-09 19:26:28	262.87	98.33	12.02	244.61
07-Oct-09 19:27:28	262.56	96.38	12.02	243.75
07-Oct-09 19:28:28	262.61	96.41	12.02	243.50
07-Oct-09 19:29:28	262.61	93.07	12.02	243.47
07-Oct-09 19:30:28	263.02	98.16	12.02	243.44
07-Oct-09 19:31:28	263.78	96.33	12.02	243.44
Average	264.01	96.30	12.01	244.82

APPENDIX C
CALIBRATION GAS CERTIFICATIONS



CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2 Procedure: G-1

Cylinder Number: CC54452

Customer: AIR HYGIENE
P.O. Number: 9021401
Item Number: SGZCAH094
Notes:
File Name: 326407864E
Assay Date: 17-Mar-09

Shipping Order #: 32650786
Transfer #: 32640786
LOT #: LPX249096
Valve: CGA590
Cyl. Pressure:* 1900psig

Expiration Date: 16-Mar-12

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Carbon Dioxide	9 %	9.20 ±0.17 %
Oxygen	12 %	12.0 ±0.1 %
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS105	GMIS105	8.02	%	0.05	CO2	N2	AL-0105	10/27/2010	N.A.
SRM128	2658a	9.397	%	0.049	O2	N2	CAL014583	7/1/2011	72-C-45

Analysis Information:

Component 1: Carbon Dioxide		First Triad Analysis On: 3/16/2009					Second Triad Analysis On:				
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units		
Manufacturer:	KVB/Analect	Zero	0.18	0.28	0.20	Zero					
Model Number:	EN3024	Reference	7.62	7.58	7.66	Reference					
Serial Number:	3024	Candidate	8.75	8.60	8.78	Candidate					
Analytical Principle:	FTIR	Result	9.25	9.09	9.28	Result					
MPC Calibrated:	02/18/09	Mean Result: 9.20			%	Mean Result:					

Component 2: Oxygen		First Triad Analysis On: 3/17/2009					Second Triad Analysis On:				
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units		
Manufacturer:	Servomex	Zero	0.02	0.01	0.02	Zero					
Model Number:	4605C	Reference	9.30	9.31	9.31	Reference					
Serial Number:	1101	Candidate	11.84	11.84	11.85	Candidate					
Analytical Principle:	Paramag.	Result	11.96	11.96	11.97	Result					
MPC Calibrated:	02/24/09	Mean Result: 11.96			%	Mean Result:					

Analyst Signature: M. Adnane

Calculated by: M. Adnane



CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2 Procedure: G-1

Cylinder Number: AL-2533

Customer: AIR HYGIENE
P.O. Number: 110207
Item Number: SGZCAH095
Notes:

Shipping Order #: 27432766
Transfer #: 27432766
LOT #: LPX229603
Valve: CGA590
Cyl. Pressure:* 1900psig

*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 16-Nov-07

Expiration Date: 15-Nov-10

Component	Requested Concentration	Assay Concentration
Carbon Dioxide	19 %	19.3 ±0.1 %
Oxygen	21 %	20.9 ±0.2 %
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS327	GMIS327	14.05	%	0.06	CO2	N2	CC180047	7/24/2008	N.A.
GMIS355	GMIS355	10.0	%	0.1	O2	N2	CC180358	4/14/2009	N.A.

Analysis Information:

Component 1: Carbon Dioxide		First Triad Analysis On: 11/9/2007				Second Triad Analysis On:			
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units
Manufacturer:	KVB/Analect	Zero	0.29	0.30	0.31	Zero			
Model Number:	EN3024	Reference	16.07	16.08	16.17	Reference			
Serial Number:	3024	Candidate	21.93	22.11	21.98	Candidate			
Analytical Principle:	FTIR	Result	19.22	19.38	19.27	Result			
MPC Calibrated:	10/11/07	Mean Result: 19.29			%	Mean Result:			

Component 2: Oxygen		First Triad Analysis On: 11/16/2007				Second Triad Analysis On:			
Analyzer Information		Trial 1	Trial 2	Trial 3	Units	Trial 1	Trial 2	Trial 3	Units
Manufacturer:	Servomex	Zero	0.05	0.05	0.05	Zero			
Model Number:	4605C	Reference	9.92	9.92	9.91	Reference			
Serial Number:	1101	Candidate	20.88	20.70	20.68	Candidate			
Analytical Principle:	Paramag.	Result	20.91	20.93	20.91	Result			
MPC Calibrated:	11/06/07	Mean Result: 20.92			%	Mean Result:			

Analyst Signature: M. Adnane

Calculated by: M. Adnane



AIR LIQUIDE

Air Liquide America
Specialty Gases LLC



Scott

RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.: ALAS-47882

Project No.: 05-76528-008

Customer

AIR LIQUIDE AMERICA L.P.

ATTN: STEPHANIE PADGETT
801 W NORTH CARRIER PKWY
GRAND PRAIRIE TX 75050-1003

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: **AAL069415** Certification Date: **01Jun2009** Exp. Date: **30Nov2009**
Cylinder Pressure***: **2000 PSIG**

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
CARBON MONOXIDE	4.94 PPM	+/- 1%	Direct NIST and NMI
NITRIC OXIDE	4.96 PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	4.99 PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2635	02Oct2010	KAL003090	25.21 PPM	CARBON MONOXIDE
NTRM 2629	15Aug2013	KAL003016	19.83 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/APMA-360/42244670011	08May2009	NDIR
ECO PHYSICS/CLD 84M/84M0359	19May2009	CHEMI

ANALYZER READINGS

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

First Triad Analysis

Second Triad Analysis

Calibration Curve

CARBON MONOXIDE

Date: 27May2009 Response Unit: MV
Z1=0.00000 R1=25.22000 T1=5.01200
R2=25.21000 Z2=0.00000 T2=5.01300
Z3=0.00000 T3=5.01500 R3=25.21000
Avg. Concentration: 4.963 PPM

Date: 03Jun2009 Response Unit: MV
Z1=0.00000 R1=10.02000 T1=4.93600
R2=10.00000 Z2=0.00000 T2=4.94200
Z3=0.00000 T3=4.94000 R3=10.00000
Avg. Concentration: 4.916 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999978
Constants: A = -0.01235827
B = 0.985727112 C = 0.0015772
D = 0 E = 0

NITRIC OXIDE

Date: 27May2009 Response Unit: MV
Z1=0.00000 R1=19.83000 T1=4.94500
R2=19.86000 Z2=0.00000 T2=4.93500
Z3=0.00000 T3=4.95100 R3=19.78000
Avg. Concentration: 4.966 PPM

Date: 03Jun2009 Response Unit: MV
Z1=0.00000 R1=19.83000 T1=4.94800
R2=19.84000 Z2=0.00000 T2=4.94500
Z3=0.00000 T3=4.94300 R3=19.87000
Avg. Concentration: 4.962 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999996
Constants: A = 0.021602025
B = 1.002315407 C = 0
D = 0 E = 0

Special Notes:

AIR HYGIENE PART #SGZCAH070

APPROVED BY:

JEFF CROTEAU



AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121 Section 2.2, Procedure G-1

Cylinder S/N: CC60943

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 32650834
Transfer Number: 32650934
Lot Number: SFS130142
Valve: CGA 660
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

P.O. Number: 9021401
Item Number: SGZCAH072

Assay Date: 26-Mar-2009

Expiration Date: 26-Mar-2011

Table with 3 columns: Components, Requested Concentration, Assay Concentration. Rows include Nitrogen, Carbon Monoxide, Nitric Oxide, and NOx.

Reference Standard(s) Employed For Analysis

Table with 8 columns: Certified Concentration and Uncertainty, Component, Balance, Cyl. No., SRM/PRM/Mix No., Exp. Date, Sample No., Type. Lists standards for Carbon Monoxide and Nitric Oxide.

Analytical Data

Two detailed analytical data tables for Carbon Monoxide and Nitric Oxide, including analyzer information, trial results, and mean analytical results.

Analyst: [Signature] Tan Ngo

Approved by: [Signature] Thuan Tran



CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: CC150921

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 30555150
Transfer Number: 30555150
Lot Number: SFS124130
Valve: CGA 350
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when
gas pressure is below 150 psig

P.O. Number: 8080801
Item Number: SGZCAH001

Assay Date: 25-Aug-2008

Expiration Date: 25-Aug-2011


Components	Requested Concentration	Assay Concentration
Nitrogen	Balance	Balance
Methane	3 ppm	3.00 ± 0.03 ppm

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
9.863 ± 0.030 ppm	Methane	Air	FF28576	1659a	25-Apr-2012	11-G-24	SRM

Analytical Data

Component:	Methane	FIRST TRIAD ANALYSIS 25-Aug-2008			Units	
		Trial 1	Trial 2	Trial 3		
Analyzer Information:						
Analyzer Type:	Gas Chromatograph	Zero	0.058	0.0000	0.161	Area
Manufacturer:	Hewlett Packard	Reference	87.038	87.257	87.485	Area
Model Number:	G1540A	Candidate	28.557	28.535	28.651	Area
Serial Number:	US00003390/Meth	Result	3.005	2.999	2.992	ppm
MPR Last Calibrated:	12-Aug-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD		Mean Analytical Result:			2.999 ppm

Analyst:  Tan Ngo

Approved by:  Thuan Tran



AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121
Section 2.2, Procedure G-1

Cylinder S/N: CC150841

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 30336104
Transfer Number: 30336104
Lot Number: SFS123631
Valve: CGA 350

P.O. Number: 8071801
Item Number: SGZCAH002

Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when
gas pressure is below 150 psig

Assay Date: 4-Aug-2008

Expiration Date: 4-Aug-2011

Components	Requested Concentration	Assay Concentration
Nitrogen	Balance	Balance
Methane	5 ppm	4.94 ± 0.06 ppm

Reference Standard(s) Employed For Analysis

Certified Concentration and Uncertainty	Component	Balance	Cyl. No.	SRM/PRM/Mix No.	Exp. Date	Sample No.	Type
9.863 ± 0.030 ppm	Methane	Air	FF28576	1659a	25-Apr-2012	11-G-24	SRM

Analytical Data

Component:	Methane	FIRST TRIAD ANALYSIS 4-Aug-2008			Units	
		Zero	Trial 1	Trial 2		Trial 3
Analyzer Information	Gas Chromatograph	Zero	0.114	0.073	0.022	Area
Manufacturer:	Hewlett Packard	Reference	91.233	91.401	91.269	Area
Model Number:	G1540A	Candidate	45.834	45.729	45.799	Area
Serial Number:	US00003390/Meth	Result	4.949	4.931	4.948	ppm
MPR Last Calibrated:	11-Jul-2008	Evaluation	Valid	Valid	Valid	
Analytical Principle:	FID & TCD	Mean Analytical Result:				4.943 ppm

Analyst:

Gary Williams

Approved by:

Thuan Tran



AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121 Section 2.2, Procedure G-1

Cylinder S/N: CC53032

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 30736937
Transfer Number: 30736937
Lot Number: SFS125022
Valve: CGA 350

P.O. Number: 8082701
Item Number: SGZCAH006

Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 25-Sep-2008

Expiration Date: 25-Sep-2011

Table with 3 columns: Components, Requested Concentration, Assay Concentration. Rows for Nitrogen and Methane.

Reference Standard(s) Employed For Analysis

Table with 8 columns: Certified Concentration and Uncertainty, Component, Balance, Cyl. No., SRM/PRM/Mix No., Exp. Date, Sample No., Type. Row for Methane.

Analytical Data

Table with columns: Component, Analyzer Information, FIRST TRIAD ANALYSIS 25-Sep-2008 (Trial 1, 2, 3), Units. Rows for Methane analysis details.

Analyst: [Signature] Tan Ngo

Approved by: [Signature] Thuan Tran



AIR LIQUIDE

CERTIFICATION OF ANALYSIS

Interference Free Multi-Component EPA Protocol Gases

Note: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121 Section 2.2, Procedure G-1

Cylinder S/N: EB0011231

Customer: AIR HYGIENE
Location: TULSA, OK

Shipping Order Number: 33431111
Transfer Number: 33431111
Lot Number: SFS131864
Valve: CGA 660
Cylinder Pressure*: 2000 PSIG
*Cylinder should not be used when gas pressure is below 150 psig

P.O. Number: 9042601
Item Number: SGZCAH032

Assay Date: 21-May-2009

Expiration Date: 21-Nov-2009

Table with 3 columns: Components, Requested Concentration, Assay Concentration. Rows for Nitrogen and Nitrogen Dioxide.

Reference Standard(s) Employed For Analysis

Table with 10 columns: Certified Concentration and Uncertainty, Component, Balance, Cyl. No., SRM/PRM/Mix No., Exp. Date, Sample No., Type. Row for Nitrogen Dioxide.

Analytical Data

Complex table with columns for Component, Analyzer Information, FIRST TRIAD ANALYSIS (13-May-2009), SECOND TRIAD ANALYSIS (21-May-2009), and Units. Includes sub-rows for Zero, Reference, Candidate, Result, and Evaluation.

Analyst: [Signature] Tan Ngo

Approved by: [Signature] Thuan Tran

APPENDIX D

QUALITY ASSURANCE AND QUALITY CONTROL DATA

QA/QC PROGRAM

Air Hygiene ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA team and encompasses five major areas:

1. QA reviews of reports, laboratory work, and field testing
2. Equipment calibration and maintenance
3. Chain-of-custody
4. Training
5. Knowledge of current test methods

Each of these areas is discussed individually below.

QA Reviews

Air Hygiene's review procedure includes review of each source test report, along with laboratory and fieldwork, by the QA Team. The most important review is the one that takes place before a test program begins. The QA Team works closely with technical division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance

The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the Environmental Protection Agency. Quality control checks are also conducted in the field for each test program.

Chain-of-Custody

Air Hygiene maintains full chain-of-custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Air Hygiene documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.). Samples are stored in a locked area to which only Air Hygiene personnel have access. Field data sheets are secured at Air Hygiene's offices upon return from the field.

Training

Personnel's training is essential to ensure quality testing. Air Hygiene has formal and informal training programs, which include:

1. Attendance at EPA-sponsored training courses
2. Enrollment in EPA correspondence courses
3. A requirement for all technicians to read and understand Air Hygiene's QA manual
4. In-house training and QA meetings on a regular basis
5. Maintenance of training records

Knowledge of Current Test Methods

With the constant updating of standard test methods and the wide variety of emerging test procedures, it is essential that any qualified source tester keep abreast of new developments. Air Hygiene subscribes to services, which provide updates on EPA reference methods, rules, and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Air Hygiene personnel maintain membership in the Air and Waste Management Association and the American Industrial Hygiene Association.

COMBUSTION TESTING QUALITY ASSURANCE ACTIVITIES

A number of quality assurance activities were undertaken before, during, and after this testing project. This section of the report combined with the documentation in Appendix C describes each of those activities.

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within plus or minus two percent of the range of predicted values. NO₂ to NO conversion was checked via direct connect with an EPA Protocol certified concentration of NO₂ in a balance of nitrogen. Conversion was verified to be between 90 and 110 percent.

After each test run, the analyzers were checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documents the precision of the data just collected. The criterion for acceptable data is that the instrument drift is no more than three percent of the full-scale response. The quality assurance worksheets in the following pages summarize all multipoint calibration checks and zero to span checks performed during the tests. These worksheets (as prepared from the data records of Appendix A) show that no drifts in excess of three percent occurred in the zero to span checks following each test run.

The sampling systems were leak checked by demonstrating that a vacuum greater than 10 in Hg could be held for at least one minute with a decline of less than one inch of Hg. A leak test was conducted after the sample system was set up and before the system was dismantled. This test was conducted to ensure that ambient air had not diluted the sample. Any leakage detected prior to the tests would be repaired and another leak check conducted before testing commenced. No leaks were found during the pre or post-test leak checks.

The absence of leaks in the sampling system was also verified by a sampling system bias check. The sampling system's integrity was tested by comparing the responses of the analyzers to the calibration gases introduced via two paths. The first path was directly into the analyzer and the second path via the sample system at the sample probe. Any difference in the instrument responses by these two methods was attributed to sampling system bias or leakage. The criterion for acceptance is agreement within five percent of the span of the analyzer.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to plus or minus one percent accuracy for all gases. EPA Protocol No. 1 was used, where applicable to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration sheets as prepared by the vendor are contained in Appendix C.

Air Hygiene collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Air Hygiene makes no warranty as to the suitability of the test methods. Air Hygiene also assumes no liability relating to the interpretation and use of the test data.

INSTRUMENTAL ANALYSIS QUALITY ASSURANCE DATA

Date: October 7-8, 2009
Company: Florida Power and Light
Location: Loxahatchee, Florida
Techs: JRF/TP

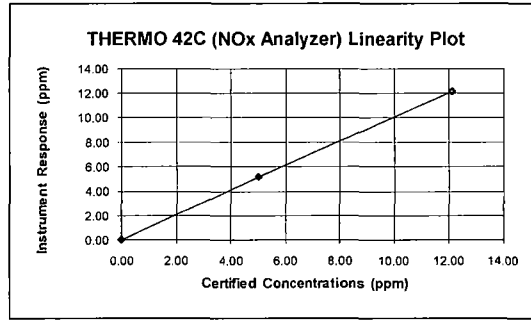
Sample System Leak Check

Date	Sample System	Leak Rate (l/min)
October 7-8, 2009	1	0

Calibration Date: October 8, 2009
 Client: Florida Power and Light

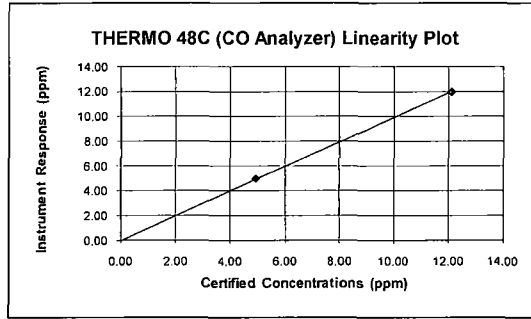
NOx Span (ppm) = 12.10

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.05	0.41	0.05	YES (%)
4.99	5.21	1.82	0.22	YES (%)
12.10	12.16	0.50	0.06	YES (%)
Linearity = 1.001				



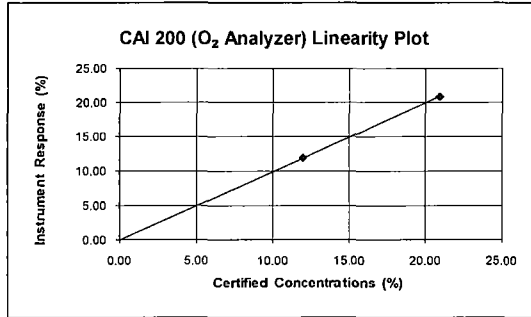
CO Span (ppm) = 12.10

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	-0.05	-0.41	0.05	YES (%)
4.94	4.96	0.17	0.02	YES (%)
12.10	12.00	-0.83	0.10	YES (%)
Linearity = 1.005				



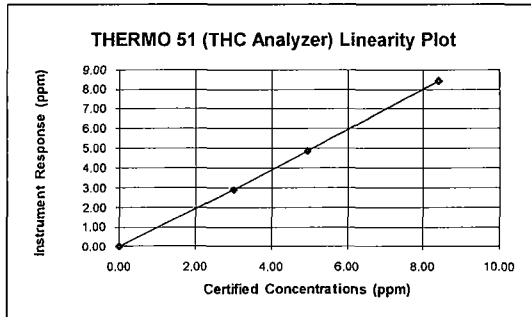
O₂ Span (%) = 20.90

CAI 200 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	-0.03	-0.14	0.03	YES (%)
12.00	11.92	-0.38	0.08	YES (%)
20.90	20.89	-0.05	0.01	YES (%)
Linearity = 0.999				



THC Range (ppm) = 10.5

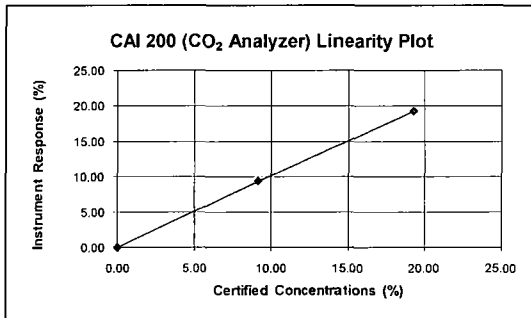
THERMO 51 (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2.5%) ¹
0.00	0.03	0.29	N/A	YES
3.00	2.92	-3.79	3.03	YES
4.94	4.87	-2.14	4.98	YES
8.40	8.44	0.38	N/A	YES
Linearity = 0.977				



¹Zero/high based on 2% of span, low/mid based on 5% of concentration

CO₂ Span (%) = 19.30

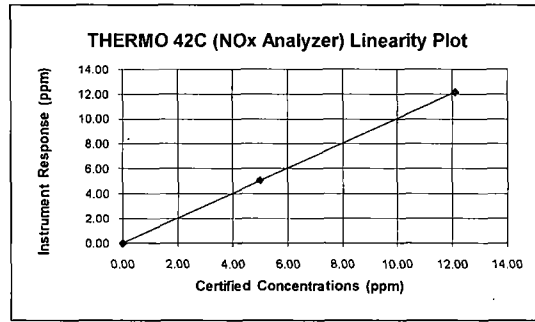
CAI 200 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.08	0.41	0.08	YES (%)
9.15	9.47	1.66	0.32	YES (%)
19.30	19.26	-0.21	0.04	YES (%)
Linearity = 1.006				



Calibration Date: October 7, 2009
 Client: Florida Power and Light

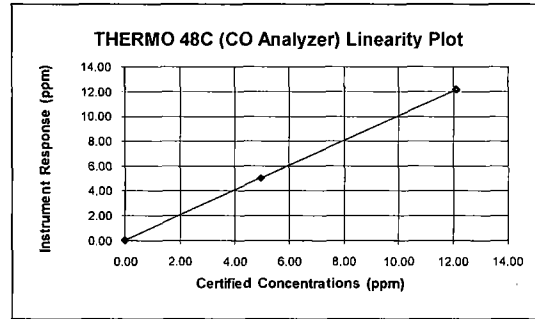
NOx Span (ppm) = 12.10

THERMO 42C (NOx Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.01	0.08	0.01	YES (%)
4.99	5.08	0.74	0.09	YES (%)
12.10	12.15	0.41	0.05	YES (%)
Linearity = 0.997				



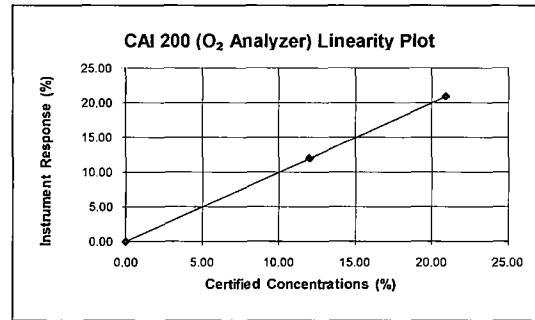
CO Span (ppm) = 12.10

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.08	0.66	0.08	YES (%)
4.95	5.05	0.83	0.10	YES (%)
12.10	12.18	0.66	0.08	YES (%)
Linearity = 1.000				



O2 Span (%) = 20.90

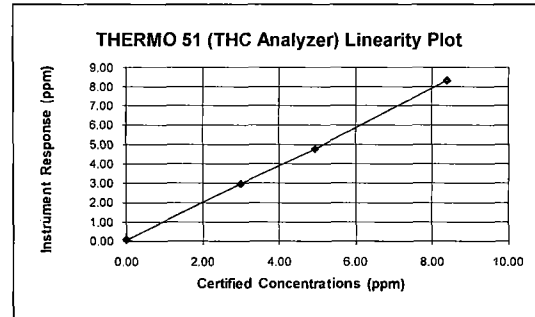
CAI 200 (O2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.06	0.29	0.06	YES (%)
12.00	11.96	-0.19	0.04	YES (%)
20.90	20.89	-0.05	0.01	YES (%)
Linearity = 1.004				



THC Range (ppm) = 10.5

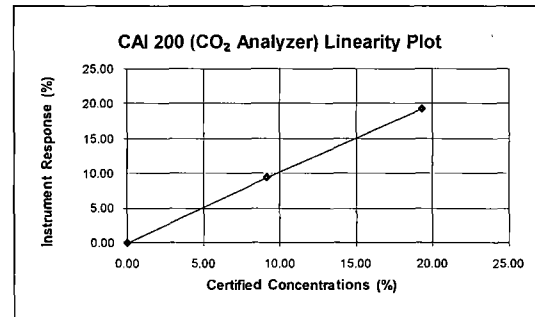
THERMO 51 (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2,5%) ¹
0.00	0.10	0.95	N/A	YES
3.00	2.98	-2.10	3.04	YES
4.94	4.78	-3.36	4.95	YES
8.40	8.34	-0.57	N/A	YES
Linearity = 1.002				

¹zero/high based on 2% of span, low/mid based on 5% of concentration



CO2 Span (%) = 19.30

CAI 200 (CO2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.00	0.00	0.00	YES (%)
9.15	9.44	1.50	0.29	YES (%)
19.30	19.26	-0.21	0.04	YES (%)
Linearity = 1.002				



NOx Converter Efficiency

Date: October 8, 2009

Analyzer: INST-NX-0010

RM 7E, (08-15-06), 8.2.4.1 Introduce a concentration of 40 to 60 ppmv NO₂ to the analyzer in direct calibration mode and record the NOx concentration displayed by the analyzer. ... Calculate the converter efficiency using Equation 7E-7 in Section 12.7. The specification for converter efficiency in Section 13.5 must be met. ... The NO₂ must be prepared according to the EPA Traceability Protocol and have an accuracy within 2.0 percent.

Audit Gas:	NO ₂ Concentration (C _v), ppmvd	48.00
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	2.10
	Analyzer Reading, NOx Channel, ppmvd	49.88
	Analyzer Reading, NO ₂ Channel (C _{Dir(NO2)}), ppmvd	47.78
	Converter Efficiency, %	99.54

RM 7E, (08-15-06), 13.5 NO₂ to NO Conversion Efficiency Test (as applicable). The NO₂ to NO conversion efficiency, calculated according to Equation 7E-7 or Equation 7E-9, must be greater than or equal to 90 percent.

$$Eff_{NO_2} = \left(\frac{C_{Dir}}{C_V} \right) \times 100 \quad \text{Eq. 7E-7} = \frac{47.78 \text{ ppmvd}}{48.00 \text{ ppmvd}} \times 100 = 99.54\%$$

Date/Time	Elapsed Time	NOx	NO
mm/dd/yy hh:mm:ss	Seconds	ppmvd	ppmvd
10/08/09 07:27:55	1340	26.77	1.08
10/08/09 07:28:05	1350	41.77	1.77
10/08/09 07:28:15	1360	45.57	2.25
10/08/09 07:28:25	1370	48.52	2.21
10/08/09 07:28:35	1380	49.11	2.15
10/08/09 07:28:45	1390	49.55	2.13
10/08/09 07:28:55	1400	49.88	2.10

NOx Converter Efficiency

Date: October 7, 2009

Analyzer: INST-NX-0010

RM 7E, (08-15-06), 8.2.4.1 Introduce a concentration of 40 to 60 ppmv NO₂ to the analyzer in direct calibration mode and record the NOx concentration displayed by the analyzer. ... Calculate the converter efficiency using Equation 7E-7 in Section 12.7. The specification for converter efficiency in Section 13.5 must be met. ... The NO₂ must be prepared according to the EPA Traceability Protocol and have an accuracy within 2.0 percent.

Audit Gas:	NO ₂ Concentration (C _v), ppmvd	48.00
Converter Efficiency Calculations:		
	Analyzer Reading, NO Channel, ppmvd	1.86
	Analyzer Reading, NOx Channel, ppmvd	49.19
	Analyzer Reading, NO ₂ Channel (C _{Dir(NO2)}), ppmvd	47.33
	Converter Efficiency, %	98.60

RM 7E, (08-15-06), 13.5 NO₂ to NO Conversion Efficiency Test (as applicable). The NO₂ to NO conversion efficiency, calculated according to Equation 7E-7 or Equation 7E-9, must be greater than or equal to 90 percent.

$$Eff_{NO_2} = \left(\frac{C_{Dir}}{C_V} \right) \times 100 \quad \text{Eq. 7E-7} = \frac{47.33 \text{ ppmvd}}{48.00 \text{ ppmvd}} \times 100 = 98.6\%$$

Date/Time	Elapsed Time	NOx	NO
mm/dd/yy hh:mm:ss	Seconds	ppmvd	ppmvd
10/07/09 07:30:28	1008	37.71	1.93
10/07/09 07:30:58	1038	46.74	2.24
10/07/09 07:31:28	1068	48.17	2.05
10/07/09 07:31:58	1098	48.79	1.94
10/07/09 07:32:28	1128	49.19	1.86
10/07/09 07:32:58	1158	48.63	2.16

DRIFT AND BIAS CHECK		
Strat Test Pre and Post QA/QC Check	O2	NOx
Initial Zero	-0.02	-0.06
Final Zero	-0.04	-0.02
Avg. Zero	-0.03	-0.04
Initial UpScale	12.07	5.10
Final UpScale	12.10	5.12
Avg. UpScale	12.09	5.11
Sys Resp (Zero)	0.06	0.01
Sys Resp (Upscale)	11.96	5.08
Upscale Cal Gas	12.00	4.99
Initial Zero Bias	-0.38%	-0.58%
Final Zero Bias	-0.48%	-0.25%
Zero Drift	0.10%	0.33%
Initial Upscale Bias	0.53%	0.17%
Final Upscale Bias	0.67%	0.33%
Upscale Drift	0.14%	0.17%
Alternative Specification Abs Diff	Initial Zero	0.08
	Final Zero	0.10
	Initial Upscale	0.11
	Final Upscale	0.14
Calibration Span	20.90	12.10
3% of Range (drift)	0.63	0.36
5% of Range (bias)	1.05	0.61

Response Time (min)	0.3	1.0
Sys. Response (min)	1.0	

Date/Time	z	O2 %	s z	NOx PPM	s
10/07/09 14:32:38		12.16		3.35	
10/07/09 14:32:48		7.83		3.34	
10/07/09 14:32:58	x	0.20		2.90	
10/07/09 14:33:08		0.05		2.07	
10/07/09 14:33:18		0.02		2.34	
10/07/09 14:33:28		0.01		3.83	
10/07/09 14:33:38		0.00		4.66	x
10/07/09 14:33:48		-0.02		4.77	
10/07/09 14:33:58		-0.02		4.84	
10/07/09 14:34:08		-0.02		4.85	
10/07/09 14:34:18		-0.02		4.85	
10/07/09 14:34:28		-0.03		4.83	
10/07/09 14:34:38		-0.02		4.84	
10/07/09 14:34:48		-0.02		4.86	x
10/07/09 14:34:58		2.59		4.85	
10/07/09 14:35:08		11.62	x	4.89	
10/07/09 14:35:18		11.98		3.84	
10/07/09 14:35:28		12.00		1.77	
10/07/09 14:35:38		12.02		0.50	
10/07/09 14:35:48		12.02	x	0.18	
10/07/09 14:35:58		12.02		0.09	
10/07/09 14:36:08		12.04		0.08	
10/07/09 14:36:18		12.03		0.07	

INJECTIONS

DRIFT AND BIAS CHECK						
Base W/O Db Load, Run - 1-1	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.87	2.56	0.69	0.00	4.89	
Corrected Average	12.91	2.49	0.65	-0.04	4.56	
Initial Zero	-0.01	0.12	0.03	0.09	0.12	
Final Zero	-0.04	0.06	0.01	-0.02	0.56	
Avg. Zero	-0.03	0.09	0.02	0.04	0.34	
Initial UpScale	11.96	5.03	5.13	2.86	9.37	
Final UpScale	11.96	5.04	5.16	2.81	9.57	
Avg. UpScale	11.96	5.04	5.15	2.84	9.47	
Sys Resp (Zero)	-0.03	0.05	-0.05	0.03	0.08	
Sys Resp (Upscale)	11.92	5.21	4.96	2.92	9.47	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	0.10%	0.58%	0.66%	0.57%	0.21%	
Final Zero Bias	-0.05%	0.08%	0.50%	-0.48%	2.49%	
Zero Drift	0.14%	0.50%	0.17%	1.05%	2.28%	
Initial Upscale Bias	0.19%	-1.49%	1.40%	-0.57%	-0.52%	
Final Upscale Bias	0.19%	-1.40%	1.65%	-1.05%	0.52%	
Upscale Drift	0.00%	0.08%	0.25%	0.48%	1.04%	
Alternative Specification Abs Diff	Initial Zero	0.02	0.07	0.08	--	0.04
	Final Zero	0.01	0.01	0.06	--	0.48
	Initial Upscale	0.04	0.18	0.17	--	0.10
	Final Upscale	0.04	0.17	0.20	--	0.10
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/O Db Load, Run - 1-2	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.87	2.60	0.55	0.24	4.88	
Corrected Average	12.92	2.58	0.44	0.18	4.45	
Initial Zero	-0.04	0.06	0.01	-0.02	0.56	
Final Zero	-0.04	0.06	0.23	0.22	0.41	
Avg. Zero	-0.04	0.06	0.12	0.10	0.49	
Initial UpScale	11.96	5.04	5.16	2.81	9.57	
Final UpScale	11.95	4.91	4.81	3.12	9.51	
Avg. UpScale	11.96	4.98	4.99	2.97	9.54	
Sys Resp (Zero)	-0.03	0.05	-0.05	0.03	0.08	
Sys Resp (Upscale)	11.92	5.21	4.96	2.92	9.47	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.05%	0.08%	0.50%	-0.48%	2.49%	
Final Zero Bias	-0.05%	0.08%	2.31%	1.81%	1.71%	
Zero Drift	0.00%	0.00%	1.82%	2.29%	0.78%	
Initial Upscale Bias	0.19%	-1.40%	1.65%	-1.05%	0.52%	
Final Upscale Bias	0.14%	-2.48%	-1.24%	1.90%	0.21%	
Upscale Drift	0.05%	1.07%	2.89%	2.95%	0.31%	
Alternative Specification Abs Diff	Initial Zero	0.01	0.01	0.06	--	0.48
	Final Zero	0.01	0.01	0.28	--	0.33
	Initial Upscale	0.04	0.17	0.20	--	0.10
	Final Upscale	0.03	0.30	0.15	--	0.04
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/O Db Load, Run - 1-3	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.88	2.64	0.30	1.01	4.88	
Corrected Average	12.90	2.65	0.26	0.87	4.55	
Initial Zero	-0.04	0.06	0.23	0.22	0.41	
Final Zero	-0.04	0.06	-0.12	0.38	0.31	
Avg. Zero	-0.04	0.06	0.06	0.30	0.36	
Initial UpScale	11.95	4.91	4.81	3.12	9.51	
Final UpScale	12.00	4.93	4.62	3.27	9.41	
Avg. UpScale	11.98	4.92	4.72	3.20	9.46	
Sys Resp (Zero)	-0.03	0.05	-0.05	0.03	0.08	
Sys Resp (Upscale)	11.92	5.21	4.96	2.92	9.47	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.05%	0.08%	2.31%	1.81%	1.71%	
Final Zero Bias	-0.05%	0.08%	-0.58%	3.33%	1.19%	
Zero Drift	0.00%	0.00%	2.89%	1.52%	0.52%	
Initial Upscale Bias	0.14%	-2.48%	-1.24%	1.90%	0.21%	
Final Upscale Bias	0.38%	-2.31%	-2.81%	3.33%	-0.31%	
Upscale Drift	0.24%	0.17%	1.57%	1.43%	0.52%	
Alternative Specification Abs Diff	Initial Zero	0.01	0.01	0.28	--	0.33
	Final Zero	0.01	0.01	0.07	--	0.23
	Initial Upscale	0.03	0.30	0.15	--	0.04
	Final Upscale	0.08	0.28	0.34	--	0.06
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/Db Load, Run - 2-1	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.08	2.97	2.72	0.73	5.44	
Corrected Average	12.00	2.92	2.86	0.79	5.11	
Initial Zero	-0.02	-0.06	-0.12	0.11	0.50	
Final Zero	-0.04	-0.02	-0.44	0.17	0.50	
Avg. Zero	-0.03	-0.04	-0.28	0.14	0.50	
Initial UpScale	12.07	5.10	4.98	2.80	9.35	
Final UpScale	12.10	5.12	4.85	2.67	9.33	
Avg. UpScale	12.09	5.11	4.92	2.74	9.34	
Sys Resp (Zero)	0.06	0.01	0.08	0.10	0.00	
Sys Resp (Upscale)	11.96	5.08	5.05	2.98	9.44	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.38%	-0.58%	-1.65%	0.10%	2.59%	
Final Zero Bias	-0.48%	-0.25%	-4.30%	0.67%	2.59%	
Zero Drift	0.10%	0.33%	2.64%	0.57%	0.00%	
Initial Upscale Bias	0.53%	0.17%	-0.58%	-1.71%	-0.47%	
Final Upscale Bias	0.67%	0.33%	-1.65%	-2.95%	-0.57%	
Upscale Drift	0.14%	0.17%	1.07%	1.24%	0.10%	
Alternative Specification Abs Diff	Initial Zero	0.08	0.07	0.20	--	0.50
	Final Zero	0.10	0.03	0.52	--	0.50
	Initial Upscale	0.11	0.02	0.07	--	0.09
	Final Upscale	0.14	0.04	0.20	--	0.11
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/Db Load, Run - 2-2	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.09	2.99	2.42	0.29	5.39	
Corrected Average	12.05	2.91	2.76	0.28	5.10	
Initial Zero	-0.04	-0.02	-0.44	0.17	0.50	
Final Zero	-0.05	-0.01	-0.39	0.00	0.42	
Avg. Zero	-0.05	-0.02	-0.42	0.09	0.46	
Initial UpScale	12.10	5.12	4.85	2.67	9.33	
Final UpScale	11.99	5.15	4.51	2.60	9.26	
Avg. UpScale	12.05	5.14	4.68	2.64	9.30	
Sys Resp (Zero)	0.06	0.01	0.08	0.10	0.00	
Sys Resp (Upscale)	11.96	5.08	5.05	2.98	9.44	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.48%	-0.25%	-4.30%	0.67%	2.59%	
Final Zero Bias	-0.53%	-0.17%	-3.88%	-0.95%	2.18%	
Zero Drift	0.05%	0.08%	0.41%	1.62%	0.41%	
Initial Upscale Bias	0.67%	0.33%	-1.65%	-2.95%	-0.57%	
Final Upscale Bias	0.14%	0.58%	-4.46%	-3.62%	-0.93%	
Upscale Drift	0.53%	0.25%	2.81%	0.67%	0.36%	
Alternative Specification Abs Diff	Initial Zero	0.10	0.03	0.52	--	0.50
	Final Zero	0.11	0.02	0.47	--	0.42
	Initial Upscale	0.14	0.04	0.20	--	0.11
	Final Upscale	0.03	0.07	0.54	--	0.18
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

DRIFT AND BIAS CHECK						
Base W/Db Load, Run - 2-3	O ₂	NOx	CO	VOC	CO ₂	
Raw Average	12.01	2.83	3.40	0.36	5.46	
Corrected Average	12.01	2.84	3.84	0.48	5.20	
Initial Zero	-0.05	-0.01	-0.39	0.00	0.42	
Final Zero	-0.03	-0.03	-0.45	0.00	0.45	
Avg. Zero	-0.04	-0.02	-0.42	0.00	0.44	
Initial UpScale	11.99	5.15	4.51	2.60	9.26	
Final UpScale	12.00	4.81	4.48	2.63	9.30	
Avg. UpScale	12.00	4.98	4.50	2.62	9.28	
Sys Resp (Zero)	0.06	0.01	0.08	0.10	0.00	
Sys Resp (Upscale)	11.97	5.08	5.00	2.98	9.42	
Upscale Cal Gas	12.00	4.99	4.95	3.00	9.15	
Initial Zero Bias	-0.53%	-0.17%	-3.88%	-0.95%	2.18%	
Final Zero Bias	-0.43%	-0.33%	-4.38%	-0.95%	2.33%	
Zero Drift	0.10%	0.17%	0.50%	0.00%	0.16%	
Initial Upscale Bias	0.10%	0.58%	-4.05%	-3.62%	-0.83%	
Final Upscale Bias	0.14%	-2.23%	-4.30%	-3.33%	-0.62%	
Upscale Drift	0.05%	2.81%	0.25%	0.29%	0.21%	
Alternative Specification Abs Diff	Initial Zero	0.11	0.02	0.47	--	0.42
	Final Zero	0.09	0.04	0.53	--	0.45
	Initial Upscale	0.02	0.07	0.49	--	0.16
	Final Upscale	0.03	0.27	0.52	--	0.12
Calibration Span	20.90	12.10	12.10	10.50	19.30	
3% of Cal. Span (drift)	0.63	0.36	0.36	0.32	0.58	
5% of Cal. Span (bias)	1.05	0.61	0.61	0.53	0.97	

METERING SYSTEM CALIBRATION SHEET
EPA Reference Method 5
Metering System Pre-Test Calibration
Air Hygiene Asset ID: samp-cp-0005

Filename: \\SERVER2\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.0\Current\{SAMP-CP-0005 Calibration 7-16-09.xls}Original (5 point)
 Make: ES Date: 07/16/09
 Model #: C-5000-XS Barometric Pressure: 29.12 (in. Hg)
 Serial #: 1418 Theoretical Critical Vacuum: 13.74 (in. Hg)

DRY GAS METER READINGS							
ΔH (in H ₂ O)	Time (min)	Volume			Initial Temps:		
		Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	
0.26	17.00	234.230	239.240	5.010	85.0	83.0	
0.57	12.00	239.240	244.490	5.250	85.0	84.0	
1.00	10.00	244.490	250.160	5.670	85.0	84.0	
1.80	10.00	250.160	257.480	7.320	87.0	85.0	
3.30	10.00	257.480	267.360	9.880	88.0	86.0	

Final Temps.		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature		
Inlet (deg F)	Outlet (deg F)				Initial (deg F)	Final (deg F)	Average (deg F)
85.0	83.0	40	0.2354	16.0	85.6	86.2	85.9
86.0	85.0	48	0.3491	16.0	86.4	86.5	86.5
87.0	85.0	55	0.4530	16.0	86.9	87.3	87.1
88.0	86.0	63	0.5840	16.0	87.3	87.8	87.6
89.0	86.0	73	0.7945	16.0	87.8	88.3	88.1

RESULTS				
DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
4.734	134.06	4.988	141.2	5.300
4.955	140.34	5.219	147.8	5.551
5.355	151.66	5.640	159.7	6.007
6.912	195.74	7.268	205.8	7.747
9.351	264.82	9.883	279.9	10.544

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR $\Delta H@$		
Variation (number)	Value (number)	Value (in H ₂ O)	Value (mm H ₂ O)	Variation (in H ₂ O)
0.000	1.054	1.608	40.84	-0.086
-0.001	1.053	1.600	40.64	-0.094
-0.001	1.053	1.669	42.39	-0.025
-0.002	1.052	1.806	45.87	0.111
0.003	1.057	1.789	45.43	0.094
AVERAGE:	1.054	1.694	43.04	PASSED

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor $\Delta H@$, the orifice differential pressure in inches of H₂O that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)³*(deg R)^{0.5}/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 07/16/09

METERING SYSTEM CALIBRATION SHEET

EPA Reference Method 5

Metering System Post-Test Calibration

Air Hygiene Asset ID: samp-cp-0005

Filename: \\SERVER2\public\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.0\Current\[SAMP-CP-0005 Calibration 7-16-09.xls]10-16-09 (3 point)

Make: ES Date: 10/16/09
 Model #: C-5000-XS Barometric Pressure: 29.15 (in. Hg)
 Serial #: 1418 Theoretical Critical Vacuum: 13.75 (in. Hg)

DRY GAS METER READINGS						
-H (in H2O)	Time (min)	Volume			Initial Temps.	
		Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)
3.20	10.00	477.110	487.020	9.910	65.0	60.0
3.20	10.00	487.020	496.930	9.910	63.0	60.0
3.20	10.00	496.930	506.860	9.930	64.0	61.0

Final Temps.		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature		
Inlet (deg F)	Outlet (deg F)				Initial (deg F)	Final (deg F)	Average (deg F)
63.0	60.0	73	0.7945	16.0	63.0	63.0	63.0
65.0	62.0	73	0.7945	16.0	63.0	63.0	63.0
65.0	61.0	73	0.7945	16.0	63.0	63.0	63.0

RESULTS				
DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
9.841	278.69	10.127	286.8	10.300
9.831	278.43	10.127	286.8	10.300
9.847	278.85	10.127	286.8	10.300

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR -H@		
Variation (number)	Value (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)
0.000	1.029	1.736	44.10	0.002
0.001	1.030	1.733	44.02	-0.001
-0.001	1.028	1.733	44.02	-0.001
AVERAGE:	1.029	1.734	44.04	PASSED

LAST 5-PT:	1.054	1.694	PASSED	5-PT Date:
% DIFF:	2.4%	2.3%		07/16/09

40 CFR - CHAPTER I - PART 60
 Appendix A, Method 5
 10.3.2 Calibration After Use
 After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single, intermediate orifice setting (based on the previous field test)...Calculate the average value of the DGM calibration factor. If the value has changed by more than 5 percent, recalibrate the meter over the full range of orifice settings, as detailed in Section 10.3.1.

10.3.3 Acceptable Variation in Calibration
 If the DGM coefficient values obtained before and after a test series differ by more than 5 percent, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H₂O that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)³*(deg R)^{0.5}/((in.Hg)*(min)).

SIGNATURE: Craig McCarty

DATE: 10/16/09

VISIBLE EMISSIONS EVALUATOR

This is to certify that

DARIN GRIMES

met the specifications of Federal Reference Method 9 and qualifies as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, NC. This certificate is valid for six months from date of issue.

374248

CERT NUMBER

4/22/2009

DATE OF SCHOOL

TULSA, OK

SCHOOL LOCATION

10/22/2009

CERTIFICATION EXP DATE

GRI748589

STUDENT ID NUMBER

Michael W. Sanford

MANAGER OF TRAINING SERVICES

APPENDIX E
FUEL ANALYSIS RECORDS

Client: Florida Power and Light
 Location: West County Energy Center
 Date: October 7, 2009
 Project #: bv-09-westcounty.fl-comp#1

Natural Gas - Fuel Analysis

Standardized to 68 deg F and 14.696 psia - EPA Standards

Gas Component		Mole (%)	Molecular ¹ Weight (lb/lb-mole)	Lbs Component per Lb-Mole of Gas	Wt. % of Component	Ideal Gross ^{1,3} Heating Value (Btu/ft ³)	Fuel Heat Value [HHV] (Btu/SCF)	Ideal Net ^{1,3} Heating Value (Btu/ft ³)	Fuel Heat Value [LHV] (Btu/SCF)
Methane	CH ₄	97.194	16.0430	15.59	94.04	994.85	966.93	895.75	870.62
Ethane	C ₂ H ₆	1.224	30.0700	0.37	2.22	1,743.15	21.34	1,594.41	19.52
Propane	C ₃ H ₈	0.104	44.0970	0.05	0.28	2,478.35	2.58	2,280.17	2.37
iso-Butane	iC ₄ H ₁₀	0.013	58.1230	0.01	0.05	3,203.11	0.42	2,955.38	0.38
n-Butane	nC ₄ H ₁₀	0.014	58.1230	0.01	0.05	3,213.35	0.45	2,965.62	0.42
Iso-Pentane	iC ₅ H ₁₂	0.000	72.1500	0.00	0.00	3,940.87	0.00	3,643.50	0.00
n-Pentane	nC ₅ H ₁₂	0.000	72.1500	0.00	0.00	3,948.75	0.00	3,648.32	0.00
Hexanes	C ₆ H ₁₄	0.009	86.1770	0.01	0.05	4,684.54	0.42	4,337.82	0.39
Heptanes	C ₇ H ₁₆	0.000	100.2040	0.00	0.00	5,419.94	0.00	5,023.77	0.00
Octanes	C ₈ H ₁₈	0.000	114.2310	0.00	0.00	6,155.14	0.00	5,709.23	0.00
Carbon Dioxide	CO ₂	0.915	44.0100	0.40	2.43	0.00	0.00	0.00	0.00
Nitrogen	N ₂	0.527	28.0134	0.15	0.89	0.00	0.00	0.00	0.00
Hydrogen Sulfide	H ₂ S	0.000	34.0800	0.00	0.00	627.54	0.00	578.00	0.00
Oxygen	O ₂	0.000	31.9988	0.00	0.00	0.00	0.00	0.00	0.00
Helium	He	0.000	4.0026	0.00	0.00	0.00	0.00	0.00	0.00
Hydrogen	H ₂	0.000	2.0159	0.00	0.00	319.34	0.00	269.82	0.00
Totals		100.000		16.58	100.00	dry	992.13	dry	893.70
						wet ^{2,5}	969.26	wet ^{2,5}	873.09

Characteristics of Fuel Gas	
Molecular Weight of gas =	16.581 lb/lb-mole
Btu per lb. of gas ⁴ =	23,051.064 gross (HHV)
Btu per lb. of gas ⁴ =	20,764.042 net (LHV)
Density of fuel gas ² =	0.0431 lb/cu. ft
Wt % VOC in fuel gas =	0.42 %
Specific Gravity ¹ =	0.5725

Component	Wt%
carbon	73.19
oxygen	1.77
hydrogen	24.16
nitrogen	0.89
helium	0.00
sulfur	0.00
Total	100.00

F-Factor (SCF dry exhaust per MMBtu [HHV]) = 8,642.48
 (Based on EPA RM-19) at 68 deg F and 14.696 psia

F-Factor Calculation:

$$F\text{-Factor} = 1,000,000 * ((3.64 * \%H) + (1.53 * \%C) + (0.57 * \%S) + (0.14 * \%N) - (0.46 * \%O)) / GCV$$

GCV = Gross Btu per lb. of gas (HHV)

%H, %C, %S, %N, & %O are percent weight values calculated from fuel analysis and have units of (scf/lb)/%

Density of natural gas based on specific gravity multiplied by density of air at 68 deg F and 14.696 psia.

References:

¹ ASTM D 3588

² Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg

³ Mark's Standard Handbook for Mechanical Engineers, 10th ed. - Eugene A. Avallone, Theodore Baumeister III

⁴ Introduction to Fluid Mechanics, 3rd ed. - William S. Janna

⁵ GPA Reference Bulletin 181-86, revised 1986, reprinted 1995



HOUSTON LABORATORIES
 8820 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis

Number: 1030-2009100200-003A

Mars Sharief
 Air Hygiene
 5634 S. 122nd East Ave.
 Suite F
 Tulsa OK 74146

October 14, 2009

Sample ID:		Sampled By:	
Station Name :	Unit 1B w/oDB and Unit 1A w/DB	Sample Of:	Gas Spot
Station Number :		Sample Date:	10/07/2009
Station Location :	Tulsa, Oklahoma	Sample Conditions:	N.G. Pres. , N.G. Temp.
Sample Point:		PO / Ref. No:	
		COC. No:	

ANALYTICAL DATA

Components	Mol %	Wt %	GPM at 14.696 psia	Method	Lab Tech.	Date Analyzed
				GPA-2261 M	PW	10/13/2009 2:16:48
Nitrogen	0.527	0.890				
Carbon Dioxide	0.915	2.429				
Methane	97.194	94.038				
Ethane	1.224	2.220	0.327			
Propane	0.104	0.277	0.029			
Iso Butane	0.013	0.046	0.004			
n-Butane	0.014	0.049	0.004			
Hexanes Plus	0.009	0.051	0.004			
	<u>100.000</u>	<u>100.000</u>	<u>0.368</u>			
	C2 +	C3 +	IC5 +			
GPM TOTAL :	0.368	0.041	0.004			
Relative Density	Real Gas			0.5735		
Calculated Molecular Weight				16.58		
Compressibility Factor				0.9979		
Calculated Gross BTU per ft ³ @14.696 psia & 60°F						
Real Gas	Dry Basis	1009				
	Saturated Basis	992				

Comments :

Cylinder Number 3764

Mars Sharief

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated



HOUSTON LABORATORIES

8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis

Number: 1030-2009100200-003A

Mars Sharief
Air Hygiene
5634 S. 122nd East Ave.
Suite F
Tulsa OK 74146

October 14, 2009

Sample ID:		Sampled By:	
Station Name:	Unit 1B w/oDB and Unit 1A w/DB	Sample Of:	Gas
Station Number :		Sample Date:	10/07/2009
Location:	Tulsa, Oklahoma	Sample Condition:	
Sample Point:		PO / Ref. No:	

ANALYTICAL DATA

Test	Method	Result	Unit	Detection Limit	Lab Tech.	Date Analyzed
Total Sulfur By UV	ASTM-D-6667	1.7	PPMW	1.0	EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	0.0002	Wt%.		EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	0.054	gr/100 cu.ft.		EM	10/14/09

Comments: Cylinder Number: 3764
Sample On: 10/07/2009

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated.



HOUSTON LABORATORIES

8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

October 19, 2009

Mars Sharief
Air Hygiene
5634 S. 122nd East Avenue, Ste F
Tulsa, OK 74146

Dear Sir or Madam:

The following sample was submitted to and received by our laboratory for analysis:

Analysis number:	2009100200-004A
Location:	Unit 1A w/o DB
Project #:	bv-09-westcounty.fl-comp#1
Sample #:	000152
Sample of:	Gas
Conditions:	psig @°F
Sampled by:	
Submitted by:	
Sample date:	10/07/09
Remarks:	

The above-mentioned sample could not be analyzed properly by our laboratory personnel due to:

- *Sample cylinder pressure was depleted, flat, due to improper sampling or accidental leakage.
- *Insufficient sample to perform test methods ASTM 6667 and GPA 2261.
- *Other: Both samples were all water.

We regret that an analysis could not be performed, and recommend that another sample be collected if appropriate. Please contact us if we can be of assistance in this matter.

Sincerely,

Chris Staley
Hydrocarbon Laboratory Manager



HOUSTON LABORATORIES

8820 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Certificate of Analysis

Number: 1030-2009100200-004A

Mars Sharief
Air Hygiene
5634 S. 122nd East Ave.
Suite F
Tulsa OK 74146

October 14, 2009

Sample ID:		Sampled By:	
Station Name:	Unit 1A w/o DB	Sample Of:	Gas
Station Number :		Sample Date:	10/08/2009
Location:	Tulsa, Oklahoma	Sample Condition:	
Sample Point:		PO / Ref. No:	

ANALYTICAL DATA

Test	Method	Result	Unit	Detection Limit	Lab Tech.	Date Analyzed
Total Sulfur By UV	ASTM-D-6667	NR	PPMW	1.0	EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	NR	Wt%.		EM	10/14/09
Total Sulfur By UV	ASTM-D-6667	NR	gr/100 cu.ft.		EM	10/14/09

Comments: Cylinder Number: 152
NR= No result (Insufficient sample)
Sample On: 10/08/2009

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated.

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD



Air Hygiene International, Inc.
 5634 S. 122nd East Ave, Suite F
 Tulsa, Oklahoma 74146
 (888) 461-8778
 www.airhygiene.com

Project Number:		bv-09-westcounty.fl-comp#1		Laboratory Analysis Requested:			
Person Taking Samples:		JRF		ASTM 6667 and GPA-2261 M			
Sample Number	Location	Date	Volume	Analysis Method			
				ASTM 6667	GPA 2261 M		
001175	Unit 1C w and w/o DB	10/5/2009		x	x		
000767	Unit 1C w/DB and Unit 1B w/DB	10/6/2009		x	x		
003764	Unit 1B w/oDB and Unit 1A w/DB	10/7/2009		x	x		
000152	Unit 1A w/o DB	10/8/2009		x	x		

	<u>10/12/09</u>	<u>12:30</u>		<u>10/13/09</u>	<u>12:00</u>
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
_____	_____	_____	_____	_____	_____
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

APPENDIX F

STRATIFICATION TEST DATA

Source Information	
Company	Florida Power and Light
Plant Name	West County Energy Center
Equipment	Mistubishi 501G
Location	Loxahatchee, Florida

Test Information	
Date	10/07/09
Project #	bv-09-westcounty.fl-comp#1
Unit Number	1A
Load	Base w/DB
Number of Ports Available	4
Number of Ports Used	4

Stack and Test Type	
<input type="radio"/> Isokinetic Traverse (Wet Chemistry Testing) <input type="radio"/> Velocity Traverse (Flow and Flow RATA Test) <input checked="" type="radio"/> Stratification Traverse (Compliance Test) <input checked="" type="checkbox"/> RM 20 <input type="radio"/> Stratification Traverse (RATA) <input type="checkbox"/> Part 60 <input type="checkbox"/> Part 75	Circular Stack

METHOD 1 - STRATIFICATION TEST FOR A CIRCULAR SOURCE

Company	Florida Power and Light	Date	10/07/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mitsubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

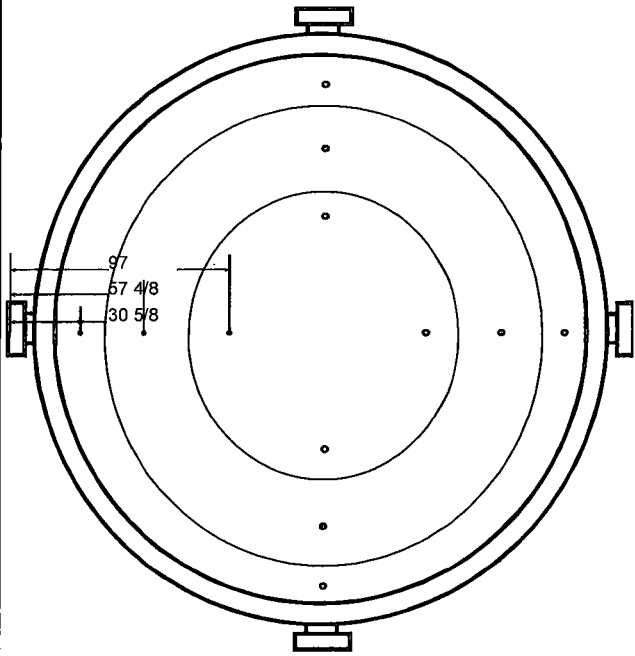
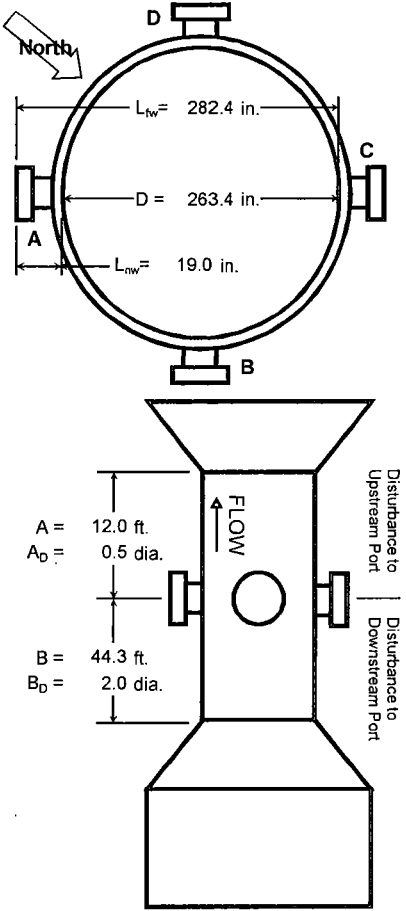
Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	282.38	in.
Distance to Near Wall of Stack	(L _{nw})	19.00	in.
Diameter of Stack	(D)	263.38	in.
Area of Stack	(A _s)	378.35	ft ²

Distance from Disturbances to Port			
Distance Upstream	(A)	144.00	in.
Diameters Upstream	(A _D)	0.55	diameters
Distance Downstream	(B)	531.75	in.
Diameters Downstream	(B _D)	2.02	diameters

Number of Traverse Points Required					
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points		Minimum Number of Traverse Points	
Down (B _D)	Up (A _D)	Particulate	Velocity	Comp Stratification	
Stream	Stream	Points	Points	Criteria	Points
2.00-4.99	0.50-1.24	24	16	RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	Alt 7E 8.1.2	3 points
6.00-6.99	1.50-1.74	16	12	12 points	
7.00-7.99	1.75-1.99	12	12	12 points	
>= 8.00	>=2.00	8 or 12 ²	8 or 12 ²	Minimum Number of Traverse Points	
Upstream Spec		24	16	RATA Stratification	
Downstream Spec		24	16	RATA Stratification	
Traverse Pts Required		24	16	Criteria	Points
¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.					
² 8 for Circular Stacks 12 to 24 inches 12 for Circular Stacks over 24 inches					
				Part 75/60	12 RM1 pts
				75 abrv (a)	3 points
				75 abrv (b)	6 points

Number of Traverse Points Used				
4	Ports by	3	Pts / port	Stratification Traverse Required (Compliance Test)
12	Pts Used	12	Required	

Traverse Point Locations			
Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
		in.	in.
1	4.4%	11 5/8	30 5/8
2	14.6%	38 4/8	57 4/8
3	29.6%	78	97
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			



STRATIFICATION TRAVERSE (COMPLIANCE TEST) RESULTS

Company	Florida Power and Light	Date	10/07/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mistubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

Stack Dimensions				Traverse Data			
Diameter or Length of Stack	(D)	263.38	in.	4	Ports by	3	Pts / port
Width of Stack	(W)		in.	12	Pts Used	12	Required
Area of Stack	(A _s)	378.35	ft ²	Run Start	14:50:38	Run End	15:26:38

Traverse Point	Time Per Point	Point Start Time	Point Stop Time (Reading)	O2	Percent Difference	NOx	Percent Difference
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm	%
D-3	2.00	14:50:38	14:52:38	12.01	0.06%	3.17	12.08%
D-2	2.00	14:52:38	14:54:38	11.90	0.85%	2.79	1.36%
D-1	2.00	14:54:38	14:56:38	11.86	1.19%	2.48	12.32%
C-3	8.00	14:56:38	15:04:38	11.96	0.35%	2.94	3.95%
C-2	2.00	15:04:38	15:06:38	11.92	0.69%	2.56	9.49%
C-1	2.00	15:06:38	15:08:38	11.91	0.77%	2.44	13.73%
B-3	5.00	15:08:38	15:13:38	12.09	0.73%	3.07	8.54%
B-2	2.00	15:13:38	15:15:38	12.08	0.65%	2.98	5.36%
B-1	2.00	15:15:38	15:17:38	12.09	0.73%	3.07	8.54%
A-3	5.00	15:17:38	15:22:38	12.09	0.73%	2.96	4.66%
A-2	2.00	15:22:38	15:24:38	12.03	0.23%	2.84	0.41%
A-1	2.00	15:24:38	15:26:38	12.09	0.73%	2.64	6.66%
Correct to	15	% O2	Average	12.00		2.83	

STRATIFICATION TRAVERSE (COMPLIANCE TEST) RESULTS

Company	Florida Power and Light	Date	10/07/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mistubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

Stack Dimensions				Traverse Data			
Diameter or Length of Stack	(D)	263.38	in.	4	Ports by	3	Pts / port
Width of Stack	(W)		in.	12	Pts Used	12	Required
Area of Stack	(A _s)	378.35	ft ²	Run Start	7:20:07	Run End	15:26:38

Traverse Point	Time Per Point	Point Start Time	Point Stop Time (Reading)	O2	Percent Difference	NOx	Percent Difference
	min.	hh:mm:ss	hh:mm:ss	%	%	ppm@15%O2	%
D-3	3.00	7:20:07	14:52:38	12.01	0.06%	2.10	12.11%
D-2	2.00	14:52:38	14:54:38	11.90	0.85%	1.83	2.54%
D-1	2.00	14:54:38	14:56:38	11.86	1.19%	1.62	13.75%
C-3	6.00	14:56:38	15:04:38	11.96	0.35%	1.94	3.39%
C-2	2.00	15:04:38	15:06:38	11.92	0.69%	1.68	10.37%
C-1	2.00	15:06:38	15:08:38	11.91	0.77%	1.60	14.67%
B-3	5.00	15:08:38	15:13:38	12.09	0.73%	2.06	9.56%
B-2	2.00	15:13:38	15:15:38	12.08	0.65%	1.99	6.22%
B-1	2.00	15:15:38	15:17:38	12.09	0.73%	2.06	9.56%
A-3	5.00	15:17:38	15:22:38	12.09	0.73%	1.98	5.63%
A-2	2.00	15:22:38	15:24:38	12.03	0.23%	1.89	0.66%
A-1	2.00	15:24:38	15:26:38	12.09	0.73%	1.77	5.79%
Average				12.00		1.88	

STRAT TEST DETERMINED SAMPLE POINTS FOR CIRCULAR STACK

Company	Florida Power and Light	Date	10/07/09
Plant Name	West County Energy Center	Project #	bv-09-westcounty.fl-comp#1
Equipment	Mistubishi 501G	# of Ports Available	4
Location	Loxahatchee, Florida	# of Ports Used	4

Stack Dimensions				Traverse Data			
Diameter or Length of Stack	(D)	263.38	in.	4	Ports by	3	Pts / port
Width of Stack	(W)		in.	12	Pts Used	12	Required
Area of Stack	(A _s)	378.35	ft ²	Run Start	14:50:38	Run End	15:26:38

40 CFR 60, Appendix A, Method 7E Criteria

Stratification Results		Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
Maximum Percent Difference	14.67 % for NOx				
Maximum Pollutant Conc. Diff.	0.28 ppm@15%O2 for NOx				
Maximum Diluent Conc. Diff.	0.14 % for O2				
Stack Diameter	263.38 in.		%	in.	in.
Stratification Conclusions		1			
Maximum % Diff.	Percent Diff. >10% Failed Stratification Test	2			
Maximum Conc. Diff.	Conc. Diff. ≤ 0.3% Passed 3A 8.1 Single Pt. Criteria	3			
Stack Diameter	D > 93.6 in.				
Passed Strat. Test Under RM 7E 8.1.2 Single Pt. Criteria Sample from the point that most closely matches the average		Test Type		Use 6.5.6.3(a) points? 6.5.6(b)(2) alt. points could apply	

