PERMIT APPLICATION FOR UNIT 5
C.D. MCINTOSH, JR. POWER PLANT
CITY OF LAKELAND
DEPARTMENT OF ELECTRIC UTILITIES

Prepared For:
Lakeland Electric
501 East Lemon Street
Lakeland, FL 33801-5079

Prepared By:
Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

February 2001
9937510Y/F4

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1Copy-- Golder Associates Inc.

Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **City of Lakeland, Department of Electric Utilities**	
2. Site Name: **C.D. McIntosh, Jr. Power Plant.**	
3. Facility Identification Number: **1050004** [ ] Unknown	
4. Facility Location: Street Address or Other Locator: **3030 East Lake Parker Drive** City: **Lakeland** County: **Polk** Zip Code: **33805**	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No

Application Contact

1. Name and Title of Application Contact: **Ms. Farzie Shelton, Manager of Environmental Affairs**
2. Application Contact Mailing Address: Organization/Firm: **Lakeland Electric** Street Address: **501 East Lemon Street** City: **Lakeland** State: **FL** Zip Code: **33801-5079**
3. Application Contact Telephone Numbers: Telephone: (**863**) **834 – 6603** Fax: (**863**) **834 - 6344**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Permit Number:	
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[ ] Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number:_____

[X] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: **1050004-004-AC/PSD-FL-245**

Operation permit number to be revised: **1050004-003-AV**

[ ] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected:_____

[ ] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised:_____

Reason for revision:_____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Air construction permit to construct or modify one or more emissions units.

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Roger D. Haar, City Manager
2. Owner/Authorized Representative or Responsible Official Mailing Address:
   Organization/Firm: **Lakeland Electric**
   Street Address: **501 East Lemon Street**
   City: **Lakeland** State: **FL** Zip Code: **33801-5079**
3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: (**863**) **834 - 6006** Fax: (**863**) **834 - 8402**
4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative(check here [ ], if so) or the responsible official (check here [ ], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

R. D. Haar — 2-15-01

Signature Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Kennard F. Kosky**
   Registration Number: **14996**
2. Professional Engineer Mailing Address:
   Organization/Firm: **Golder Associates Inc.**
   Street Address: **6241 NW 23rd Street, Suite 500**
   City: **Gainesville** State: **FL** Zip Code: **32653-1500**
3. Professional Engineer Telephone Numbers:
   Telephone: (**352**) **336 - 5600** Fax: (**352**) **336 - 6603**

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [X], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [ ], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature

Feb 12, 2001
Date

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
028	McIntosh Unit 5; W501G Combustion Turbine	ACM1/AFMM	

Application Processing Fee

Check one: [ ] Attached - Amount: $: _____ [X] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:

   See attached letters.

2. Projected or Actual Date of Commencement of Construction:

3. Projected Date of Completion of Construction:

Application Comment

This application is a revision to the PSD and Title V permit issued to the C.D. McIntosh Power Plant to increase the heat input for Unit 5 (simple cycle).

See attached letter from Golder Associates.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **409.0** North (km): **3106.2**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **26 / 4 / 50** Longitude (DD/MM/SS): **81 / 55 / 32**			
3. Governmental Facility Code: **4**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment (limit to 500 characters): **The McIntosh Power Plant consists of 3 fossil fuel fired-steam generators (FFFSG), 2 diesel powered generators, and 1 gas turbine. FFFSG Units 1 and 2 are fired with No. 6 fuel oil and natural gas (distillate oil is used as an ignitor). FFFSG Unit 3 is primarily fired with coal, refuse derived fuel and petroleum coke.**			

Facility Contact

1. Name and Title of Facility Contact: **Ms. Farzie Shelton, Manager of Environmental Affairs**
2. Facility Contact Mailing Address: Organization/Firm: **Lakeland Electric** Street Address: **501 East Lemon Street** City: **Lakeland** State: **FL** Zip Code: **33801-5079**
3. Facility Contact Telephone Numbers: Telephone: **(863) 834 – 6603** Fax: **(863) 603 - 6335**

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [X] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [X] One or More Emissions Units Subject to NSPS?	
7. [ ] One or More Emission Units Subject to NESHAP?	
8. [ ] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters): **Unit 5 is subject to NSPS Subpart GG.**	

List of Applicable Regulations

The facility regulations identified in the Title V permit (Final Permit No. 10150004-003-AV)	
will not change as a result of this application.	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location:
   [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested

2. Facility Plot Plan:
   [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested

3. Process Flow Diagram(s):
   [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested

4. Precautions to Prevent Emissions of Unconfined Particulate Matter:
   [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested

5. Fugitive Emissions Identification:
   [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested

6. Supplemental Information for Construction Permit Application:
   [ ] Attached, Document ID: _____ [X] Not Applicable

7. Supplemental Requirements Comment:

   Area map and facility plot plan submitted with Title V application.

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities:
   [ ] Attached, Document ID:_____ [X] Not Applicable

9. List of Equipment/Activities Regulated under Title VI:
   [ ] Attached, Document ID:_____
   [ ] Equipment/Activities On site but Not Required to be Individually Listed
   [X] Not Applicable

10. Alternative Methods of Operation:
    [ ] Attached, Document ID:_____ [X] Not Applicable

11. Alternative Modes of Operation (Emissions Trading):
    [ ] Attached, Document ID:_____ [X] Not Applicable

12. Identification of Additional Applicable Requirements:
    [ ] Attached, Document ID:_____ [X] Not Applicable

13. Risk Management Plan Verification:
    [ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:_____) or previously submitted to DEP (Date and DEP Office:_____)
    [ ] Plan to be submitted to CEPPO (Date required:_____)
    [X] Not Applicable

14. Compliance Report and Plan:
    [ ] Attached, Document ID:_____ [X] Not Applicable

15. Compliance Certification (Hard-copy Required):
    [ ] Attached, Document ID:_____ [X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):

McIntosh Unit 5

4. Emissions Unit Identification Number: [ ] No ID [ ] ID Unknown
ID: **028**

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit is a Westinghouse 501G combustion turbine currently operating in simple cycle on natural gas.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

   Dry Low NO_x combustion – Natural gas firing

   Water injection – distillate oil firing

2. Control Device or Method Code(s): **25, 28**

Emissions Unit Details

1. Package Unit:
   Manufacturer: **Westinghouse** Model Number: **501G**
2. Generator Nameplate Rating: **249** MW
3. Incinerator Information:
   Dwell Temperature: °F
   Dwell Time: seconds
   Incinerator Afterburner Temperature: °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:			**2,407**	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr			tons/day
3. Maximum Process or Throughput Rate:				
4. Maximum Production Rate:				
5. Requested Maximum Operating Schedule:				
	24	hours/day	**7**	days/week
	52	weeks/year	**8,760**	hours/year

6. Operating Capacity/Schedule Comment (limit to 200 characters):

Maximum heat input at ISO turbine inlet conditions and natural gas firing (LHV) maximum for oil firing is 2,236 mmBtu/hr (ISO-LHV). Heat input a function of turbine inlet temperature.

See attached letter from Golder Associates.

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment LMC-EU1-C for operational requirements

ATTACHMENT LMC-EU1-C

Applicable Requirements Listing

EMISSION UNIT ID: EU1 – McIntosh Plant

FDEP Rules:

Air Pollution Control-General Provisions:

62-204.800(7)(b)37. (State Only)	NSPS Subpart GG
62-204.800(7)(c) (State Only)	NSPS authority
62-204.800(7)(d) (State Only)	NSPS General Provisions
62-204.800(12) (State Only)	Acid Rain Program
62-204.800(13) (State Only)	Allowances
62-204.800(14) (State Only)	Acid Rain Program Monitoring
62-204.800(16) (State Only)	Excess Emissions (Potentially applicable over term of permit)

Stationary Sources-General:

62-210.650	Circumvention; EUs with control device
62-210.700(1)	Excess Emissions
62-210.700(4)	Excess Emissions; poor maintenance
62-210.700(6)	Excess Emissions; notification

Acid Rain:

62-214.300	All Acid Rain Units (Applicability)
62-214.320(1)(a),(2)	All Acid Rain Units (Application Shield)
62-214.330(1)(a)1.	Compliance Options (if 214.430)
62-214.340	Exemptions (new units, retired units)
62-214.350(2);(3);(6)	All Acid Rain Units (Certification)
62-214.370	All Acid Rain Units
(Revisions; correction; potentially applicable if a need arises)	
62-214.430	All Acid Rain Units (Compliance Options-if required)

Stationary Sources-Emission Standards

62-296.320(4)(b)(State Only)	CTs/Diesel Units

Stationary Sources-Emission Monitoring (where stack test is required):

62-297.310(1)	All Units (Test Runs-Mass Emission)
62-297.310(2)(b)	All Units (Operating Rate; other than CTs; no CT)
62-297.310(3)	All Units (Calculation of Emission)
62-297.310(4)(a)	All Units (Applicable Test Procedures; Sampling time)
62-297.310(4)(b)	All Units (Sample Volume)
62-297.310(4)(c)	All Units (Required Flow Rate Range-PM/H_2SO_4/F)
62-297.310(4)(d)	All Units (Calibration)
62-297.310(4)(e)	All Units (EPA Method 5-only)
62-297.310(5)	All Units (Determination of Process Variable)
62-297.310(6)(a)	All Units (Permanent Test Facilities-general)
62-297.310(6)(c)	All Units (Sampling Ports)
62-297.310(6)(d)	All Units (Work Platforms)

62-297.310(6)(e)	All Units (Access)
62-297.310(6)(f)	All Units (Electrical Power)
62-297.310(6)(g)	All Units (Equipment Support)
62-297.310(7)(a)1.	Applies mainly to CTs/Diesels
62-297.310(7)(a)2.	FFSG excess emissions
62-297.310(7)(a)3.	Permit Renewal Test Required
62-297.310(7)(a)4.a.	Annual Test
62-297.310(7)(a)5.	PM exemption if < 400 hrs/yr
62-297.310(7)(a)6.	PM FFSG semi annual test required if > 200 hrs/yr
62-297.310(7)(a)7.	PM quarterly monitoring if > 100hrs/yr
62-297.310(7)(a)9.	FDEP Notification – 15 days
62-297.310(7)(c)	Waiver of Compliance Tests (Fuel Sampling)
62-297.310(8)	Test Reports

Federal Rules:

NSPS Subpart GG:

40 CFR 60.332(a)(1)	NO_X for Electric Utility CTs
40 CFR 60.332(a)(3)	NO_X for Electric Utility CTs
40 CFR 60.333	SO_2 limits
40 CFR 60.334	Monitoring of Operations (Custom Monitoring for Gas)
40 CFR 60.335	Test Methods

NSPS General Requirements:

40 CFR 60.7(a)(1)	Notification of Construction
40 CFR 60.7(a)(2)	Notification of Initial Start-Up
40 CFR 60.7(a)(3)	Notification of Actual Start-Up
40 CFR 60.7(a)(4)	Notification of Recordkeeping (Physical/Operational Cycle)
40 CFR 60.7(a)(5)	Notification of CEM Demonstration
40 CFR 60.7(b)	Notification of Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(c)	Notification of Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(d)	Notification of Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(f)	Notification of Recordkeeping (maintain records-2yrs)
40 CFR 60.8(a)	Performance Test Requirements
40 CFR 60.8(b)	Performance Test Notification
40 CFR 60.8(c)	Performance Tests (representative conditions)
40 CFR 60.8(e)	Provide Stack Sampling Facilities
40 CFR 60.8(f)	Test Runs
40 CFR 60.11(a)	Compliance (ref. S. 60.8 or Subpart; other than opacity)
40 CFR 60.11(b)	Compliance (opacity determined by EPA Method 9)
40 CFR 60.11(c)	Compliance (opacity; excludes startup/shutdown/malfunction)
40 CFR 60.11(d)	Compliance (maintain air pollution control equipment)
40 CFR 60.11(e)(2)	Compliance (opacity; ref. S. 60.8)
40 CFR 60.12	Circumvention
40 CFR 60.13(a)	Monitoring (Appendix B; Appendix F)
40 CFR 60.13(c)	Monitoring (Opacity COMS)
40 CFR 60.13(d)(1)	Monitoring (CEMS; span, drift, etc.)
40 CFR 60.13(d)(2)	Monitoring (COMS; span, system check)
40 CFR 60.13(e)	Monitoring (frequency of operation)
40 CFR 60.13(f)	Monitoring (frequency of operation)
40 CFR 60.13(h)	Monitoring (COMS; data requirements)

Acid Rain-Permits:	
40 CFR 72.9(a)	Permit Requirements
40 CFR 72.9(b)	Monitoring Requirements
40 CFR 72.9(c)(1)	SO_2 Allowances-hold allowances
40 CFR 72.9(c)(2)	SO_2 Allowances-violation
40 CFR 72.9(c)(3)(iii)	SO_2 Allowances-Phase II Units (listed)
40 CFR 72.9(c)(4)	SO_2 Allowances-allowances held in ATS
40 CFR 72.9(c)(5)	SO_2 Allowances-no deduction for 72.9(c)(1)(i)
40 CFR 72.9(d)	NO_X Requirements
40 CFR 72.9(e)	Excess Emission Requirements
40 CFR 72.9(f)	Recordkeeping and Reporting
40 CFR 72.9(g)	Liability
40 CFR 72.20(a)	Designated Representative; required
40 CFR 72.20(b)	Designated Representative; legally binding
40 CFR 72.20(c)	Designated Representative; certification requirements
40 CFR 72.21	Submissions
40 CFR 72.22	Alternate Designated Representative
40 CFR 72.23	Changing representatives; owners
40 CFR 72.24	Certificate of representation
40 CFR 72.30(a)	Requirements to Apply (operate)
40 CFR 72.30(b)(2)	Requirements to Apply (Phase II-Complete)
40 CFR 72.30(c)	Requirements to Apply (reapply before expiration)
40 CFR 72.30(d)	Requirements to Apply (submittal requirements)
40 CFR 72.31	Information Requirements; Acid Rain Applications
40 CFR 72.32	Permit Application Shield
40 CFR 72.33(b)	Dispatch System ID; unit/system ID
40 CFR 72.33(c)	Dispatch System ID; ID requirements
40 CFR 72.33(d)	Dispatch System ID; ID change
40 CFR 72.40(a)	General; compliance plan
40 CFR 72.40(b)	General; multi-unit compliance options
40 CFR 72.40(c)	General; condition approval
40 CFR 72.40(d)	General; termination of compliance options
40 CFR 72.51	Permit Shield
40 CFR 72.90	Annual Compliance Certification
Allowances:	
40 CFR 73.33(a),(c)	Authorized account representative
40 CFR 73.35(c)(1)	Compliance: ID of allowances by serial number
Monitoring Part 75:	
40 CFR 75.4	Compliance Dates;
40 CFR 75.5	Prohibitions
40 CFR 75.10(a)(1)	Primary Measurement; SO_2
40 CFR 75.10(a)(2)	Primary Measurement; NO_X
40 CFR 75.10(a)(3)(iii)	Primary Measurement; CO_2; O_2 monitor
40 CFR 75.10(b)	Primary Measurement; Performance Requirements
40 CFR 75.10(c)	Primary Measurement; Heat Input; Appendix F
40 CFR 75.10(e)	Primary Measurement; Optional Backup Monitor
40 CFR 75.10(f)	Primary Measurement; Minimum Measurement
40 CFR 75.10(g)	Primary Measurement; Minimum Recording
40 CFR 75.11(d)	SO_2 Monitoring; Gas- and Oil fired units

40 CFR 75.11(e)	SO_2 Monitoring; Gaseous firing
40 CFR 75.12(a)	NO_x Monitoring; Coal; Non-peaking oil/gas units
40 CFR 75.12(b)	NO_x Monitoring; Determination of NOX emission rate; Appendix F
40 CFR 75.13(b)	CO_2 Monitoring; Appendix G
40 CFR 75.13(c)	CO_2 Monitoring; Appendix F
40 CFR 75.14(c)	Opacity Monitoring; Gas units; exemption
40 CFR 75.20(a)	Initial Certification Approval Process; Loss of Certification
40 CFR 75.20(b)	Recertification Procedures (if recertification necessary)
40 CFR 75.20(c)	Certification Procedures (if recertification necessary)
40 CFR 75.20(d)	Recertification Backup/portable monitor
40 CFR 75.20(f)	Alternate Monitoring system
40 CFR 75.21(a)	QA/QC; CEMS; Appendix B (Suspended 7/17/95-12/31/96)
40 CFR 75.21(c)	QA/QC; Calibration Gases
40 CFR 75.21(d)	QA/QC; Notification of RATA
40 CFR 75.21(e)	QA/QC; Audits
40 CFR 75.21(f)	QA/QC; CEMS (Effective 7/17/96-12/31/96)
40 CFR 75.22	Reference Methods
40 CFR 75.24	Out-of-Control Periods; CEMS
40 CFR 75.30(a)(3)	General Missing Data Procedures; NO_X
40 CFR 75.30(a)(4)	General Missing Data Procedures; SO_2
40 CFR 75.30(b)	General Missing Data Procedures; certified backup monitor
40 CFR 75.30(c)	General Missing Data Procedures; certified backup monitor
40 CFR 75.30(d)	General Missing Data Procedures; SO_2 (optional before 1/1/97)
40 CFR 75.30(e)	General Missing Data Procedures; bypass/multiple stacks
40 CFR 75.31	Initial Missing Data Procedures (new/re-certified CMS)
40 CFR 75.32	Monitoring Data Availability for Missing Data
40 CFR 75.33	Standard Missing Data Procedures
40 CFR 75.36	Missing Data for Heat Input
40 CFR 75.40	Alternate Monitoring Systems-General
40 CFR 75.41	Alternate Monitoring Systems-Precision Criteria
40 CFR 75.42	Alternate Monitoring Systems-Reliability Criteria
40 CFR 75.43	Alternate Monitoring Systems-Accessibility Criteria
40 CFR 75.44	Alternate Monitoring Systems-Timeliness Criteria
40 CFR 75.45	Alternate Monitoring Systems-Daily QA
40 CFR 75.46	Alternate Monitoring Systems-Missing data
40 CFR 75.47	Alternate Monitoring Systems-Criteria for Class
40 CFR 75.48	Alternate Monitoring Systems-Petition
40 CFR 75.53	Monitoring Plan; revisions
40 CFR 75.54(a)	Recordkeeping-general
40 CFR 75.54(b)	Recordkeeping-operating parameter
40 CFR 75.54(c)	Recordkeeping-SO_2
40 CFR 75.54(d)	Recordkeeping-NO_X
40 CFR 75.54(e)	Recordkeeping-CO_2
40 CFR 75.54(f)	Recordkeeping-Opacity
40 CFR 75.55(c)	General Recordkeeping (Specific Situations)
40 CFR 75.55(e)	General Recordkeeping (Specific Situations)
40 CFR 75.56	Certification; QA/QC Provisions
40 CFR 75.60	Reporting Requirements-General
40 CFR 75.61	Reporting Requirements-Notification cert/recertification

40 CFR 75.62	Reporting Requirements-Monitoring Plan
40 CFR 75.63	Reporting Requirements-Certification/Recertification
40 CFR 75.64(a)	Reporting Requirements-Quarterly reports; submission
40 CFR 75.64(b)	Reporting Requirements-Quarterly reports; DR statement
40 CFR 75.64(c)	Rep. Req.; Quarterly reports; Compliance Certification
40 CFR 75.64(d)	Rep. Req.; Quarterly reports; Electronic format
40 CFR 75.66	Petitions to the Administrator (if required)
Appendix A-1	Installation and Measurement Locations
Appendix A-2	Equipment Specifications
Appendix A-3	Performance Specifications
Appendix A-4	Data Handling and Acquisition Systems
Appendix A-5	Calibration Gases
Appendix A-6	Certification Tests and Procedures
Appendix A-7	Calculations
Appendix B	QA/QC Procedures
Appendix C-1	Missing Data; SO_2/NO_X for controlled sources
Appendix C-2	Missing Data; Load-Based Procedure; NO_X & flow
Appendix D	Optional SO_2; Oil-/gas-fired units
Appendix F	Conversion Procedures
Appendix H	Traceability Protocol

Acid Rain Program-Excess Emissions (these are future requirements):

40 CFR 77.3	Offset Plans (future)
40 CFR 77.5(b)	Deductions of Allowances (future)
40 CFR 77.6	Excess Emissions Penalties (SO_2 and NO_X; future)

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **N/A**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **Exhausts through a single stack.**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **85** feet	7. Exit Diameter: **28** feet
8. Exit Temperature: **1,095** °F	9. Actual Volumetric Flow Rate: **3,380,011** acfm	10. Water Vapor: **12.44** %
11. Maximum Dry Standard Flow Rate: **989,685** dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: **17** East (km): **408.79** North (km): **3106.66**		
14. Emission Point Comment (limit to 200 characters): **Stack parameters for ISO turbine inlet operating condition firing natural gas; for oil 1,051°F and 3,011,513 ACFM.**		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **2-01-001-01**	3. SCC Units: **1,000 gallons**	
4. Maximum Hourly Rate: **17.8**	5. Maximum Annual Rate: **4,251**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **mmBtu/SCC = 131.5 (rounded to 132). BASIS: Max. hourly = 30°F turbine inlet & 7.1 lb/gal; 18,500 Btu/lb LHV; Annual: 59°F, 250 hrs/yr operation. Max hourly; function of turbine inlet temp.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **2-01-002-01**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **2.737**	5. Maximum Annual Rate: **22,195**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **950**
10. Segment Comment (limit to 200 characters): **Max. based on 30°F; 950 Btu/CF LHV. Annual based on 59°F; 8,760 hrs/yr operation. Max. hourly a function of turbine inlet temperature. See attached chart of heat input.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_X	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **139.6** lb/hour **49** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference: **PSD-FL-245**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Tons/year (8,510 hours gas x 8.8 lb/hr + 250 hours oil x 92.8 lb/hour) / 2,000 hours/year = 49.0 Tons/Year.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, 50% load, 30°F; tons/year based on 8,510 hours/yr gas firing and 250 hrs/yr oil firing; 59°F conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **139.6** lb/hour **11.6** tons/year
5. Method of Compliance (limit to 60 characters): **Annual VE test; EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - 30°F; 50% load; annual based on 59°F; 100% load, 250 hrs/yr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **9.1** lb/hour **38.5** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test; EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - 30°F, 100% load; annual based on 59°F; 100% load, 8,760 hrs/yr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **127** lb/hour **48.5** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **See Comment** Reference: **PSD-FL-245**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Tons/year = (8,150 hours-gas x 8 lb/hr + 250 hours-oil x 127 lb/hour) / 2000 lb/ton = 48.5.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 1 grain S per 100 CF gas; 0.05% S oil. lb/hr based on oil firing. Tons/yr based on 8,510 hrs/yr gas firing and 250 hrs/yr oil firing.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **127** lb/hour **15.9** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; annual based on 250 hrs/yr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1 grain/100 CF**	4. Equivalent Allowable Emissions: **8** lb/hour **35** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing – annual based on 8,760 hrs/yr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_X**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **433** lb/hour **1,166** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference: **PSD-FL-245**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Tons/year = (8,510 hours-gas x 262 lb/hr + 250 hours-oil x 413 lb/hr) / 2,000 lb/ton = 1,166 tons/year.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, 100% load, 30°F; tons/yr based on 8,510 hrs/yr gas firing and 250 hrs/yr oil firing; 59°F conditions.**	

Allowable Emissions Allowable Emissions **1** of **2**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **413 lb/hr (3hr-avg)**	4. Equivalent Allowable Emissions: **431** lb/hour **51.6** tons/year
5. Method of Compliance (limit to 60 characters): **CEM-30 Day Rolling Average (corrected to 15% Oxygen)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; 30°F; 100% load; annual based on 250 hrs/year at 59°F (413 lb/hour).**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_X**	2. Total Percent Efficiency of Control:

3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]

5. Range of Estimated Fugitive Emissions:
[ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year

6. Emission Factor: Reference:	7. Emissions Method Code:

8. Calculation of Emissions (limit to 600 characters):

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **237 lb/hr (24hr-avg)**	4. Equivalent Allowable Emissions: **262** lb/hour **1,148** tons/year

5. Method of Compliance (limit to 60 characters):
CEM 24 hour block average

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):
Gas firing; 59°F; 100% load, annual based on 8,760 hr/yr at 59°F (262 lb/hr); see Attachments.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:

3. Potential Emissions: **568** lb/hour **752** tons/year	4. Synthetically Limited? [ ]

5. Range of Estimated Fugitive Emissions:
[ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year

6. Emission Factor: Reference: **PSD-FL-245**	7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

Tons/year = (8,510 hours-gas x 161 lb/hour + 250 hours-oil x 539 lb/hour) / 2,000 lb/ton = 752.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Lb/hr based on oil firing; 30°F tons/yr based on 8,510 hrs/yr gas firing and 250 hrs/yr oil firing; 59°F conditions.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **90 ppmvd @ 15% O_2**	4. Equivalent Allowable Emissions: **568** lb/hour **67.4** tons/year

5. Method of Compliance (limit to 60 characters):

EPA Method 10; annual compliance test > 400 hours/year

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Oil firing; 30°F; annual based on 250 hrs/yr at 59°F and 100% load, 539 lb/hr.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **25 ppmvd @ 15% O_2**	4. Equivalent Allowable Emissions: **161** lb/hour **705** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; annual compliance test**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 59°F; annual based on 8,760 hrs/yr at 59°F 100% load, 157 lb/hr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **25** lb/hour **49.9** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference: **PSD-FL-245**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Tons/year = (8,510 hours-gas x 11 lb/hr + 250 hours-oil x 25 lb/hr) / 2,000 lb/ton = 49.9).**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing. Tons/yr based on 8,510 hrs/yr gas firing and 250 hrs/yr oil firing.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 ppmvd**	4. Equivalent Allowable Emissions: **25** lb/hour **3.1** tons/year
5. Method of Compliance (limit to 60 characters): **Meeting CO emission limit**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; annual based on 250 hrs/yr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **4 ppmvd**	4. Equivalent Allowable Emissions: **11** lb/hour **48.2** tons/year
5. Method of Compliance (limit to 60 characters): **Meeting CO emission limit**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; annual based on 8,760 hrs/yr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **139.6** lb/hour **49** tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference: **PSD-FL-245**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **Tons/year (8,510 hours-gas x 8.8 lb/hr + 250 hours oil x 92.8 lb/hour) / 2,000 hours/year = 49.0 tons/year.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, 50% load, 30°F; tons/year based on 8,510 hrs/yr gas firing and 250 hrs/yr oil firing; 59°F conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **139.6** lb/hour **11.6** tons/year
5. Method of Compliance (limit to 60 characters): **Annual VE test; EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - 30°F; 50% load; annual based on 59°F; 100% load, 250 hrs/yr.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **9.1** lb/hour **38.5** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test, EPA Method 9**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - 30°F, 100% load; annual based on 59°F; 100% load, 8,760 hrs/yr.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **10** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_X**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: **various** Model Number: Serial Number: **various**	
5. Installation Date: **01 Jan 1999**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_X CEM proposed to meet requirements of 40 CFR Part 75, Monitoring Plan submitted to FDEP.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-210.700(1). Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_X**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: **Westinghouse** Model Number: Serial Number:	
5. Installation Date: **01 Jan 1999**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [X] Attached, Document ID: **Attachments** [ ] Previously submitted, Date: _____ [ ] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID: _____ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID: _____ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID: _____ [X] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[ ] Attached, Document ID:_____ [X] Not Applicable

12. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:_____ [X] Not Applicable

13. Identification of Additional Applicable Requirements
[ ] Attached, Document ID: _____ [X] Not Applicable

14. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID: _____ [X] Not Applicable

15. Acid Rain Part Application (Hard-copy Required)

[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:_____

[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:_____

[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:_____

[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:_____

[ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:_____

[ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:_____

[X] Not Applicable

ATTACHMENTS

Golder Associates Letter of February 12, 2001
Siemens Westinghouase Maximum Heat
Input Curve for McIntosh Unit 5
Compliance Test Results

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

February 12, 2001

9937510

Mr. Scott Sheplak, P.E., Administrator
Title V Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399

Attention: Mr. Edward J. Svec

RE: C.D. McIntosh, Jr. Power Plant, Unit No. 5
FDEP File No. 1050004-004-AC (PSD-FL-245)
Amendment to Heat Input and Emissions-Tested Performance for Unit 5
Request for Additional Information

Dear Ed:

This correspondence provides the additional information requested by the Department regarding the request for an increase in the heat input for McIntosh Unit 5 when firing natural gas.

I have reviewed the information in the compliance test report as well as additional performance test data taken by Siemens Westinghouse for the purpose of demonstrating the thermal efficiency of Unit 5. The later tests only became recently available and because they contain sensitive performance information, they are proprietary. My professional engineering certification was taken in mechanical engineering.

The heat-input curve supplied in Ms. Shelton's July 27, 2000 letter was prepared by Siemens Westinghouse to initially account for the results obtained from the emission rate compliance tests taken in March 2000. Attached is a complete copy of the emission rate compliance tests.

The results of compliance tests found a heat-input rate of 2,171 mmBtu/hr [low heating value (LHV) basis] at a turbine inlet temperature of 80°F. (Note: turbine inlet refers to compressor inlet temperature; with a unit equipped with an evaporative cooler, like McIntosh Unit 5, the ambient temperature and turbine inlet temperature will be different depending upon the relative humidity and operating conditions of the evaporative cooler.) The original air construction and PSD permit application submitted to the Department contained expected performance data for the Siemens Westinghouse Frame 501G combustion turbine. At the time, this model of combustion turbine had not been constructed nor operated, and therefore, performance was based on expectations of the technology from the engineering design. It should be noted that McIntosh Unit 5 is the first Siemens Westinghouse Frame 501G to be constructed and operated.

Since the compliance tests performed in March 2000, thermal performance tests were conducted in August 2000 and additional tuning has been performed. As a result of these activities Siemens Westinghouse has provided a final heat input curve which is attached. Siemens Westinghouse, in its guarantees, provides adjustment to account for various factors

including test methods, instrumentation, and tolerances. The heat input curve is linear with an equation of:

$$\text{Heat Input (mmBtu/hr)} = -6.667 \times (\text{Turbine Inlet Temperature °F}) + 2{,}800$$

Attached as Table 1 is a comparison of the data from the original permit application and the compliance and thermal performance tests. The table includes information on net power and heat input from the original air construction and PSD permit application for turbine inlet temperatures of 52.5°F and 87.5°F. These temperatures represent the operation of the evaporative cooler at ambient temperatures of 59°F and 90°F, respectively. The predicted performance at a turbine inlet temperature of 80°F under the original information provided by Siemens Westinghouse and included in the application was calculated based on the data for turbine inlet temperatures of 52.5 and 87.5°F. Since combustion turbine curves related to power and heat input are typically linear as shown by the current heat input curve, the information for 80°F was calculated as a proportional relationship from the data at turbine inlet temperatures of 52.5 and 87.5°F.

During the emission rate compliance tests in March 2000, the reported turbine inlet temperature was 80°F with a reported heat input of 2,171 mmBtu/hr. The expected maximum heat input is 2,048 mmBtu/hr for a turbine inlet temperature of 80°F. The test data indicate a heat input about 6 percent higher than what would be expected. The ratio of actual to expected is presented in the far right column. Note that 1.06 indicates a 6-percent difference. Note that power [in units of kilowatt (kW)] when multiplied by heat rate (in units of Btu/kW-hour), are heat input (i.e., kW x Btu/kW-hr = Btu/hr). The current Siemens Westinghouse curve for the unit has a maximum heat input of 2,288 mmBtu/hour for a turbine inlet temperature of 80°F.

The thermal performance tests were conducted in August 2000. During these tests the reported turbine inlet temperature was 76.8°F with a reported heat input of 2,145 mmBtu/hr. The expected maximum heat input for a turbine, based on the original Siemens Westinghouse data, is 2,063 mmBtu/hr for an inlet temperature of 76.8°F. The current maximum heat input based on the Siemens Westinghouse curve is 2,288 mmBtu/hr for a turbine inlet temperature of 76.8°F.

Thus, two independent tests indicate that the current heat-input curve supplied by Siemens Westinghouse envelopes the observed heat input during the tests and provides a margin necessary for the operation of the unit. The margin is necessary in establishing a heat input limit, since the City of Lakeland must rely on the terms of its contract with Siemens Westinghouse as the basis for turbine performance. The attached curve should be included as part of the permit and the maximum heat input when firing gas with a turbine inlet of 59°F, 60-percent relative humidity, and 100-percent load should be 2,407 mmBtu/hr (LHV).

The reason for the requested increase in mass emission rate was based directly on the maximum heat input curves developed by Siemens Westinghouse. With higher heat input, the turbine is capable of greater mass flow of air, which increases the power output. The increased power is a direct result of greater mass flow. Emissions are directly proportional to the mass flow. In addition, the maximum emission limits in the permit, which were listed at ISO, were actually for ambient air conditions at ISO and not for the turbine inlet conditions

noted in the Siemens Westinghouse performance sheets. These data included the operation of an evaporative cooler. For the ISO ambient condition, the evaporative cooling decreases the turbine inlet temperature to 52.5°F.

The requested emission rates and heat input based on the current Siemens Westinghouse heat input curve are shown in Table 2. For CO, the requested increase would account for higher emissions at lower loads. As noted from Table 3-2 in the compliance test report, the CO emissions at 70-percent load were about 61 lb/hour. The current conditions in the permit do not distinguish between the emission limits for high and low loads. An adjustment to the CO emission limit to 161 lb/hour would cover the operating range of the turbine.

Regarding the General Condition in Section II.7., this condition is applicable to the combined-cycle portion of the project as a phased construction project. The emission limits in the original PSD approval contemplated the conversion to combined-cycle operation. Indeed, this portion of the project has been approved this year under the Power Plant Siting Act with full Florida Department of Environmental Protection (FDEP) participation. Review of the original BACT determination was not required. The request for an increase in heat input is considered to not be a "modification" under the FDEP's definition in 62-210.200 Florida Administrative Code (F.A.C.). The request to increase the heat input is neither a "physical change" nor "change in the method of operation" of Unit 5. The performance basis, including heat input, for the McIntosh Unit 5 was based on data supplied by Siemens Westinghouse as the first frame 501G combustion turbine. The turbine actually constructed had better performance than expected. Moreover, there is no request to change the emission rates established as BACT, which were established as pollutant concentrations (e.g., ppmvd corrected to 15-percent oxygen). These are listed on Page BD-10 of FDEP's BACT Determination. Heat input and mass emissions were not the basis of the BACT determination.

If you have any questions or need any further information to complete your review, please call me at 352-336-5600.

Sincerely,

GOLDER ASSOCIATES INC.

Kennard F. Kosky, P.E.
Principal
Florida Professional Engineer No. 14996

SEAL

KFK/nav/nav

Enclosures

cc: Ronald Tomlin, Lakeland Electric
Farzie Shelton, Lakeland Electric

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Table 1. Comparison of Data from the PSD Permit Application and Recent Testing

Comparison of Expected Data from PSD Permit and March 2000 Emission Compliance Tests

	PSD Application Turbine Inlet Temperature[a]			Compliance Test	Ratio of
	52.5°F	80°F	87.5°F	80°F	Actual/Expected
Power (MW-Net)	249.09	229	223.68	238.2	1.040
Heat Input (MMBtu/hr-LHV)	2,174	2,048	2,014	2,171	1.060

Comparison of Expected Data from PSD Permit and August 2000 Thermal Performance Tests

	PSD Application Turbine Inlet Temperature[a]			Power Test	Ratio of
	52.5°F	76.8°F	87.5°F	76.8°F	Actual/Expected
Power (MW-Net)	249.09	231	223.68	236.629	1.022
Heat Input (mmBtu/hr-LHV)	2,174	2,063	2,014	2,145	1.040

[a] The turbine inlet temperatures of 52.5 and 87.5 °F are turbine inlet temperatures with evaporative cooling. The ambient air temperatures are 59 and 90 °F.

Table 2. Comparison of the Permitted and Current Turbine Data for City of Lakeland Unit 5 Simple Cycle (Siemens/Westinghouse 501G)

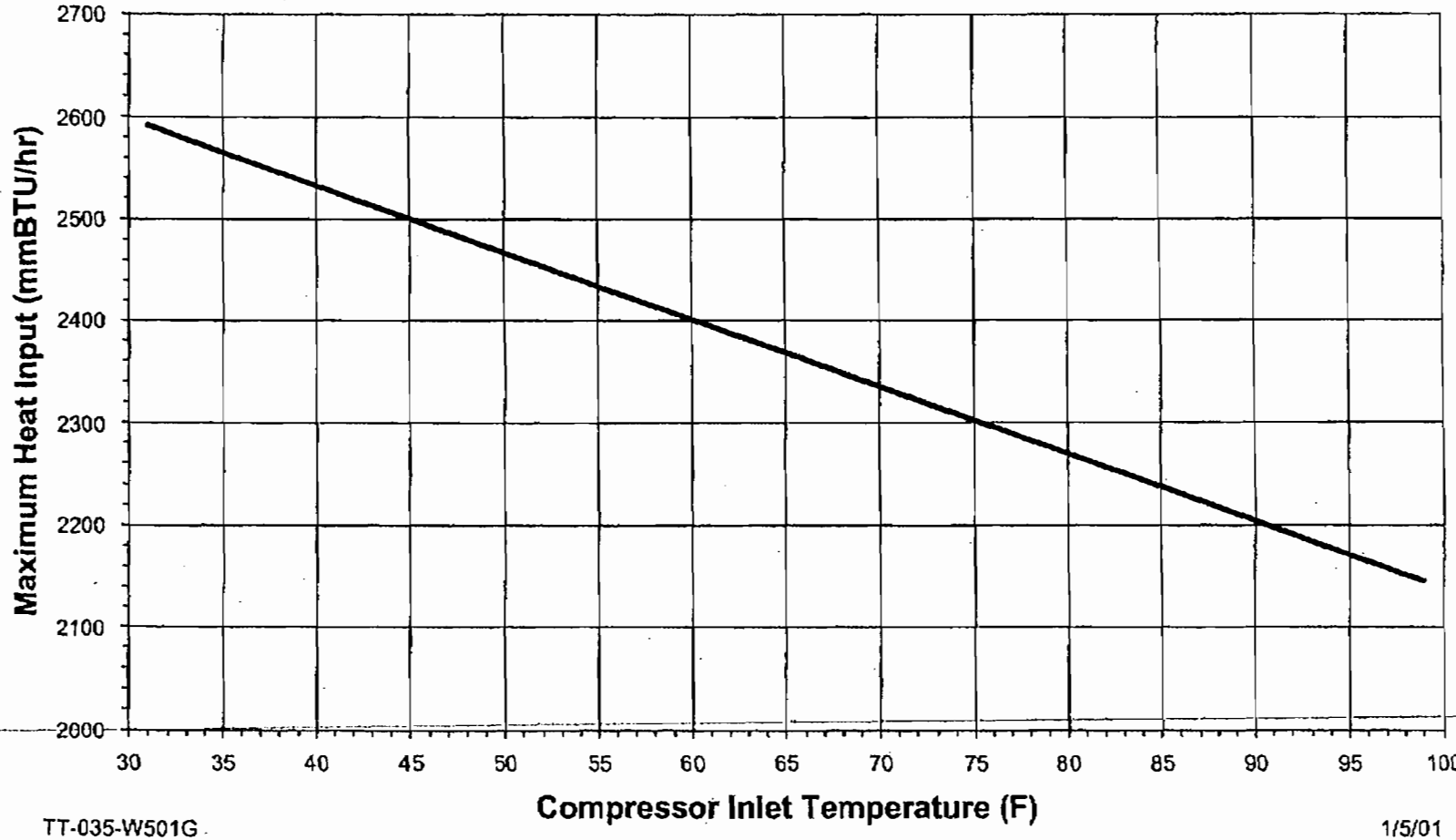
	Turbine Inlet Temperature (°F)[a]			
	87.5	59	52.5	30
Original Siemens Westinghouse Data				
Heat Input (mmBtu/hr-LHV)	2,014	2,144	2,174	2,279
Mass Flow (lb/hr)	4,166,368	4,452,616	4,518,595	4,725,245
Mass Flow/Heat Input	2,069	2,077	2,078	2,073
Delta (Heat Input/ °F)		4.61	4.61	4.63
Data based on New Heat Input	87.2	59	52.5	30
Heat Input (mmBtu/hr-LHV)	2,219	2,407	2,450	2,600
Mass Flow (lb/hr)	4,589,702	4,998,086	5,092,217	5,390,781
Delta (Heat Input/ °F)		6.67	6.67	6.67
Increase				
Heat Input	10.16%	12.25%	12.69%	14.08%
Mass Flow	10.16%	12.25%	12.69%	14.08%
Permited Emission Rates:				
NOx (lb/hr – ISO Ambient)			237	
CO (lb/hr – ISO Ambient)			145	
SO_2 (lb/hr - 30 °F)				7.2
VOC (lb/hr – ISO Ambient)			10	
Requested Changes:				
Heat Input (mmBtu/hr)		2,407		
NOx (lb/hr – ISO Turbine Inlet)		262		
CO (lb/hr – ISO Turbine Inlet)		161		
SO_2 (lb/hr - 30 °F)				8
VOC (lb/hr – ISO Turbine Inlet)		11		

[a] The turbine inlet temperatures of 52.5 and 87.5 °F are turbine inlet temperatures with evaporative cooling. The ambient air temperatures are 59 and 90 °F.

ATTACHMENTS

Siemens Westinghouse Maximum Heat
Input Curve for McIntosh Unit 5

W501G McIntosh #5, Lakeland, FL
Maximum Heat Input as a Function of Compressor Inlet Temperature



TT-035-W501G

1/5/01

EMISSIONS COMPLIANCE
TEST REPORT
FOR THE
LAKELAND UTILITIES
McINTOSH POWER PLANT
COMBUSTION TURBINE UNIT #5
LAKELAND, FLORIDA

FDEP PERMIT NO. PSD-FL-245/1050004-004-AC

Prepared for:

SIEMENS - WESTINGHOUSE POWER CORP.
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Prepared by:

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Gainesville, Florida 32607

TABLE OF CONTENTS

1.0 INTRODUCTION

Source Testing And Consulting Services, Inc. (STACS) is under contract to Siemens - Westinghouse Power Corporation (Siemens-Westinghouse) to conduct a series of emissions tests for Unit #5 at the McIntosh Power Plant in Lakeland, Florida. Unit #5 is a simple cycle Siemens-Westinghouse 501G combustion turbine and has recently completed construction. The facility is owned and operated by Lakeland Utilities.

Unit #5 is rated at a nominal electrical output capacity of 250 MW. The unit is the first of it's kind constructed in the United States. Emissions from the unit are controlled by good combustion practices and dry-low-NO_X burner technology. The unit is capable of firing natural gas or distillate fuel oil.

This document is the initial emissions compliance test report for the facility while firing natural gas. Emissions testing was conducted for visible emissions (VE), nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC) and for diluent oxygen as part of the permit compliance tests. Testing was conducted at two discrete load conditions (nominally 70% load and base load) for nitrogen oxides in order to comply with Federal Regulations contained in 40CFR60, Subpart GG. While Subpart GG requires testing at four load levels, it was only possible to conduct the sampling at two load conditions during this field effort due to an interruption in testing, caused by an equipment malfunction that prevented the test from being completed. The additional two load conditions (nominally 80% and 90% of base load) will be tested at a later date.

1.1 TEST DESCRIPTION AND PURPOSE

There are two phases to the scope of work for this project:

1) To demonstrate that the unit meets the emissions limits for VE, NO_X, CO and VOC as stated in the air permit for natural gas at base load; and,

2) to comply with the federal emissions regulations contained in the Code of Federal Regulations, Title 40, Part 60, Subpart GG (40CFR60, Subpart GG) for combustion turbines, which requires testing for NO_X at four discrete load points.

This document contains the results of the test program as completed to date. An addendum to this report will be issued when the additional two load point tests have been completed.

The following test procedures were conducted during the gas emissions performance and compliance testing:

EPA Method 9:	Determination of opacity as visible emissions by a qualified and certified observer.
EPA Method 10:	Continuous determination of CO using a gas filter correlation/nondispersive infrared analyzer (GFC/NDIR).
EPA Method 20:	Oxides of Nitrogen (NO_x) analysis with a chemiluminescent continuous emission monitor and continuous determination of oxygen content in the flue gas. A fuel cell analyzer was used for O_2 determination.
EPA Method 25A	Continuous determination of volatile organic compounds as total hydrocabons using a flame ionization detector. Analysis is on a wet basis.

All procedures and quality control guidelines specified in the appropriate methods and the EPA Quality Assurance Handbook for Air Pollution Measurement Systems - Volume III

were strictly followed during the test program, in addition to STACS' more stringent internal quality control standards.

1.2 TEST SCHEDULE

Emissions testing for the facility took place on March 2, 2000. The additional two load conditions will be tested as soon as possible after any necessary repairs are completed.

1.3 EXECUTIVE SUMMARY

Table 1-1 presents a summary of the emissions test results conducted for the unit on natural gas at 70% load. Table 1-2 provides a summary of the test results at base load. All pollutant data is presented in the units of the emissions standard as provided in the emissions limits (ppmV@15% oxygen) as well as emission rates in lb/MMBtu and as mass emission rates in lb/hr. The values provided are the average of three valid test runs for each pollutant. More detail is given for each test in Section 3.0 and supporting data is presented in the appendices.

1.4 TEST REPORT ORGANIZATION

Section 2.0 of this document provides a brief description of the processes and the sampling locations. Section 3.0 presents the emissions test results. Section 4.0 outlines the procedures and test methods used, and Section 5.0 discusses the quality assurance/quality control measures followed during sampling and analysis. Sample calculations, field data sheets, calibration and certification data, process data and a list of project participants are included in the appendices to this document.

Table 1-1. Summary of Emissions Test Results - Lakeland Utilities CT Unit #5
Natural Gas Firing - 70% Load Condition

Date: 02 March 2000

Parameter	Units	70% Load	Emiss. Limit
Operating Parameters:			
Load:	MW	163.0	
Load (%)	(%)	70.0	
Fuel Flow:	kpph	76.8	
Lower Heating Value:	Btu/lb	21034.0	
Heat Input (LHV):	MMBtu/hr	1616.1	2174 @ ISO
Volumetric Flow (Method 19 based)	dscfm	691100.2	(c)
Ambient Data:			
Ambient Temperature	degrees F	77.68	
Barometric Pressure:	"Hg	29.88	
Specific Humidity (Hobs):	# H2O/# DA	0.01101	
Emissions Data:			
Oxygen:	%V, dry	13.0	
Nitrogen Oxides:	ppmV, dry	36.3	
	lb/MMBtu	0.1002	
	ppmV@15% O2	27.2	
	ppmV@15% O2 & ISO Conditions	28.2	117.4 (b)
	lb/hr (c)	179.6	237 (a)
Carbon Monoxide:	ppmV, dry	20.2	(d)
	lb/MMBtu	0.0339	
	ppmV@15% O2	15.1	25 (a)
	lb/hr (c)	60.8	145 (a)

Notes:
Combustion Turbine Model: SWPC 501G - Simple Cycle
Fuel Factor (Fd) = 8710scf@0%O2/MMBtu from 40CFR60 Appendix A, Method 19
Y = 9.197 Kilojoules/Watt-Hour (8725 Btu/kwh) for Natural Gas for NSPS limit calculation
(a) - BACT/FDEP Permit Emissions Limit (value at 15% O2 is for base load only - lb/hr applies at all load conditions)
(b) - 40CFR60, Subpart GG - NSPS Emissions Limit. Note that the ratio of standard pressure to observed ambient pressure was used in the ISO correction since curves of combustor inlet pressure vs. unit load are not available for this type of unit. This ratio is known to closely track the ratio of reference combustor inlet pressure to observed combustor inlet pressure for combustion turbines.
(c) - Mass Emission Rates Calculated using the Volumetric Flowrate determined from the Method 19 approach.
(d) - CO emissions testing not required at this load point, but is presented for completeness. Testing at this load was conducted using the Method 20 test times.

Table 1-2. Summary of Emissions Test Results - Lakeland Utilities CT Unit #5
Natural Gas Firing - Base Load

Date: 02 March 2000

Parameter	Units	Base Load	Emiss. Limit
Operating Parameters:			
Load:	MW	238.2	
Load (%)	(%)	100.0	
Fuel Flow:	kpph	103.2	
Lower Heating Value:	Btu/lb	21034.0	
Heat Input (LHV):	MMBtu/hr	2171.1	2174 @ ISO
Volumetric Flow (Method 19 based)	dscfm	891459.4	(c)
Ambient Data:			
Ambient Temperature	degrees F	80.11	
Barometric Pressure:	"Hg	29.82	
Specific Humidity (Hobs):	# H2O/# DA	0.01006	
Emissions Data:			
Oxygen:	%V, dry	12.7	
Nitrogen Oxides:	ppmV, dry	31.4	
	lb/MMBtu	0.0832	
	ppmV@15% O2	22.6	25 (a)
	ppmV@15% O2 & ISO Conditions	22.8	117.4 (b)
	lb/hr (c)	200.3	237 (a)
Carbon Monoxide:	ppmV, dry	1.8	
	lb/MMBtu	0.0029	
	ppmV@15% O2	1.3	25 (a)
	lb/hr (c)	7.0	145 (a)
Volatile Organic Compounds (VOC): (as carbon)	ppmC,w	0.0	4
	lb/MMBtu	0.0000	
	lb/hr (c)	0.0	
Visible Emissions:	% Opacity	0.0	10

Notes:
Combustion Turbine Model: SWPC 501G - Simple Cycle
Fuel Factor (Fd) = 8710scf@0%O2/MMBtu from 40CFR60 Appendix A, Method 19
Y = 9.197 Kilojoules/Watt-Hour (8725 Btu/kwh) for Natural Gas for NSPS limit calculation
The first base load test was split between three periods with calibration checks between (14:12-14:36, 14:56-15:20, 15:35-15:59)
(a) - BACT/FDEP Permit Emissions Limit (value at 15% O2 is for base load only - lb/hr applies at all load conditions)
(b) - 40CFR60, Subpart GG - NSPS Emissions Limit. Note that the ratio of standard pressure to observed ambient pressure was used in the ISO correction since curves of combustor inlet pressure vs. unit load are not available for this type of unit. This ratio is known to closely track the ratio of reference combustor inlet pressure to observed combustor inlet pressure for combustion turbines.
(c) - Mass Emission Rates Calculated using the Volumetric Flowrate determined from the Method 19 approach.
(d) - Heat Input during the Base Load test was between 95% and 105% of the permitted rate.

2.0 PROCESS DESCRIPTION AND SAMPLING LOCATION

Unit #5 at the McIntosh Power Plant is a Siemens-Westinghouse 501G combustion turbine. The unit is rated at a nominal load electrical output of 250 MW. The unit is the first in it's class to be constructed in the United States. The unit is permitted to fire natural gas or No. 2 distillate fuel oil. All testing during this effort was conducted on natural gas.

2.1 PROCESS DESCRIPTION

Unit #5 includes a compressor, combustor, turbine and electric generator and has a nominal load capacity of 250 MW. The turbine is capable of firing natural gas or distillate fuel oil. The rated maximum heat input of the unit at ISO conditions (59 °F, 14.7 psi, 60%RH) is 2174 MMBtu/hr on natural gas and 2236 MMBtu/hr for distillate fuel. Exhaust gases from the turbine are discharged into the atmosphere through a circular stack approximately 70 feet above grade.

The combustion turbine utilizes good combustion practices as a preliminary control for NO_X , CO and VOC. The emissions of NO_X are further controlled by dry low NO_X technology while firing natural gas and by water injection in the combustion zone to lower flame temperature while firing distillate fuel. Sulfur emissions are limited by the use of low sulfur fuels: natural gas and distillate fuel oil.

Emissions from the units are restricted under the New Source Performance Standards (NSPS) of 40CFR60, Subpart GG, and the FDEP air quality permit (PSD-FL-245/1050004-004-AC).

The following parameters were monitored during the sampling the document the tested conditions: electrical load, exhaust temperature, inlet guide vane (IGV) position, fuel

flow, exhaust flow, ambient (barometric) pressure, ambient temperature, and ambient humidity.

Emissions testing was performed at two discrete load conditions (70% and base) during this mobilization. Two additional conditions will be tested during a subsequent mobilization. Minimally, triplicate tests were/will be performed at each of the following nominal load and operating conditions:

70% Load Condition (~164 MW)

80% Load Condition (~190 MW)**

90% Load Condition (~214 MW)**

100% (Base) Load Condition (~238 MW)

(* * to be tested at a later date)

The percentages above are expressed as a percent of base load. It is important to note that base load (100%) is a function of ambient temperature and may be different for different days.

2.2 REFERENCE METHOD SAMPLING LOCATIONS

The inside diameter of the circular stack is 22' 2" (266) inches. The nipple length is 16". Four sampling ports are located around the stack at 90° intervals. EPA Method 20 (40 CFR 60, Appendix A) requires that 48 sampling points be used for a preliminary oxygen traverse for this duct based on the geometry and cross sectional area. Twelve sampling points were used in each port for the preliminary oxygen traverse. The sampling points were determined according to EPA Method 1 (40 CFR 60, Appendix A) guidelines so that each sample point was located in the center of an equal area section of the duct. The following distances were used for the sampling points for a given port:

Point	Distance (inches)
1	18.93
2	24.51
3	30.63

4	37.01
5	43.91
6	51.11
7	58.83
8	67.60
9	77.18
10	88.35
11	101.91
12	121.86

(Note that the traverse point distances above include the nipple length.)

Eight (8) traverse points were used for all subsequent sampling (after the preliminary oxygen traverse) as described in EPA Method 20.

3.0 EMISSIONS TEST RESULTS

Emissions testing was performed for the Combustion Turbine (Unit #5) at Lakeland Utilities McIntosh Power Plant on March 2, 2000. The tests were conducted to demonstrate that the unit meets the emissions limits provided in the facility air permit and also meets the Federal New Source Performance Standard (NSPS) emission limits given in 40CFR60, Subpart GG. The air permit test requirements include sampling for visible emissions, nitrogen oxides, carbon monoxide, and volatile organic compounds at base load. The NSPS requirements also require testing for nitrogen oxides to be conducted at three additional reduced loads spaced over the normal operating range of the combustion turbine. As stated previously, it was not possible to complete the 80% and 90% load conditions during this test effort. These tests will be completed at a later date. This section presents the results of the 70% and base load test conditions.

Three test runs were performed for each parameter at each condition. Test run times were based on the Method 20 test time requirements (each run consists of sampling at each of eight traverse points for one minute plus the system response time) except for the base load tests which were one hour in duration for each run.

3.1 PRELIMINARY OXYGEN TRAVERSE

A preliminary oxygen traverse was performed for the combustion turbine prior to additional testing as prescribed in EPA Method 20 to determine the eight lowest points of oxygen concentration in the duct which would be used for subsequent emissions testing. The traverse was performed while firing natural gas at the lowest percent load tested (Approximately 164 MW while firing natural gas).

The emissions sampling location for the unit consists of a circular stack with an inside diameter of 266 inches with four ports located at 90° angles around the circumference of the stack. The cross sectional area of the stack at the sampling platform is 385.9 ft^2.

Method 20 requires that a minimum of 48 traverse points be used for the oxygen traverse in stacks of this size. The traverse points were located using EPA Method 1 criteria (40 CFR 60, Appendix A). Twelve points were sampled in each of the four ports for at least 1 minute plus the system response time (30 seconds) each during the oxygen traverse.

The results of the preliminary oxygen traverse for are presented in Table 3-1. Oxygen concentrations are presented as percent by volume on a dry basis (%V, dry). Because the oxygen concentration was consistent throughout the traverses (maximum deviation $\leq 0.4\%$ O_2), eight convenient sampling points were selected for the remainder of the test program. In addition, calibration drift checks for NO_X and O_2 were conducted after sampling in each port so that the data collected during the oxygen traverse could be used toward the demonstration of NSPS compliance at the 70% load condition.

3.2. NATURAL GAS EMISSIONS TEST RESULTS

Tables 3-2 through 3-3 summarize the test results for natural gas testing. The low load test results are given in Table 3-2. Table 3-3 presents the test results for the base load tests. NO_X and CO emissions are presented as measured native concentrations in parts per million by volume (ppmV) on a dry basis and as concentrations normalized to 15 percent oxygen (ppmV @ 15% O_2). Emissions are also presented as emission rates in pounds per million Btu (lb/MMBtu) and as pounds per hour (lb/hr). Mass emissions of nitrogen oxides are expressed as pounds of NO_2. VOC data is expressed as total hydrocarbons as carbon. Emission rates in pounds per million Btu (lb/MMBtu) are calculated using the published dry fuel factor (Fd = 8710 dscf@0%O_2/MMBtu for natural gas) from EPA Method 19 (40CFR60, Appendix A). Mass emission rates in pounds per hour (lb/hr) are calculated using the Method 19 approach and the heat input to the unit. Visible emissions are provided as percent opacity.

Example calculations and data summaries are provided in Appendix A. Raw field data and process data is included in Appendix B. Calibration data and certifications are included in Appendix C.

Table 3-1. Preliminary Oxygen Traverse - Test Results
Lakeland Utilities McIntosh Unit #5
Values in percent oxygen on a dry basis (%V,d)

Point	Port:	A	B	C	D
1		13.2	12.9	13.1	13.1
2		13.1	12.9	13.1	13.1
3		13.0	12.9	13.1	13.1
4		13.0	13.0	13.1	13.1
5		13.0	13.0	13.1	13.1
6		13.0	13.0	13.1	13.1
7		13.0	13.0	13.1	13.1
8		13.0	13.0	13.1	13.1
9		13.0	13.0	13.1	13.1
10		13.0	13.0	13.1	13.1
11		13.0	13.0	13.1	13.1
12		12.9	13.0	13.1	13.1
Average:		13.0	13.0	13.1	13.1
Maximum:		13.2	13.0	13.1	13.1
Minimum:		12.9	12.9	13.1	13.1
Difference:		0.3	0.1	0.0	0.0

Overall	Average:	13.0
	Maximum:	13.2
	Minimum:	12.9
	Difference:	0.3

Table 3-2. Emissions Test Results - Lakeland Utilities CT Unit #5
Natural Gas Firing
70% Load Test Point Data
Date: 02 March 2000

Parameter	Units	Run #1	Run #2	Run #3	Average	Emiss. Limit	
Start Time:		10:12	10:48	12:50			
Stop Time:		10:36	11:12	13:14			
Operating Parameters:							
Load:	MW	163.7	163.4	162.0	163.0		
Load (%)	(%)	70	70	70	70		
Fuel Flow:	kpph	76.83	77.08	76.60	76.83		
Lower Heating Value:	Btu/lb	21034	21034	21034	21034		
Heat Input (LHV):	MMBtu/hr	1616.0	1621.2	1611.2	1616.1	2174 @ ISO	
Turbine Exhaust Temperature:	degrees F	1157.6	1172.1	1155.7	1161.8		
Volumetric Flow (Method 19 based)	dscfm	689967.9	688003.6	695329.0	691100.2		(c)
Ambient Data:							
Ambient Temperature	degrees F	76.11	76.98	79.97	77.68		
Barometric Pressure:	"Hg	29.84	29.84	29.96	29.88		
Specific Humidity (Hobs):	# H2O/# DA	0.01192	0.01100	0.01012	0.01101		
Emissions Data:							
Oxygen:	%V, dry	13.0	13.0	13.1	13.0		
Nitrogen Oxides:	ppmV, dry	35.6	37.6	35.7	36.3		
	lb/MMBtu	0.0981	0.1029	0.0996	0.1002		
	ppmV@15% O2	26.6	27.9	27.0	27.2		
	ppmV@15% O2 ; ISO Conditions	28.2	29.0	27.3	28.2	117.4	(b)
	lb/hr (c)	175.8	185.1	178.1	179.6	237	(a)
Carbon Monoxide:	ppmV, dry	22.7	16.1	21.7	20.2	25	(d)
	lb/MMBtu	0.0380	0.0268	0.0368	0.0339	145	(a)
	ppmV@15% O2	17.0	12.0	16.4	15.1		
	lb/hr (c)	68.3	48.3	65.9	60.8		

Notes:
Combustion Turbine Model: SWPC 501G - Simple Cycle
Fuel Factor (Fd) = 8710scf@0%O2/MMBtu from 40CFR60 Appendix A, Method 19
Y = 9.197 Kilojoules/Watt-Hour (8725 Btu/kwh) for Natural Gas for NSPS limit calculation

(a) - BACT/FDEP Permit Emissions Limit
(b) - 40CFR60, Subpart GG - NSPS Emissions Limit. Note that the ratio of standard pressure to observed ambient pressure was used in the ISO correction since curves of combustor inlet pressure vs. unit load are not available for this type of unit. This ratio is known to closely track the ratio of reference combustor inlet pressure to observed combustor inlet pressure for combustion turbines.
(c) - Mass Emission Rates Calculated using the Volumetric Flowrate determined from the Method 19 approach.
(d) - CO emissions testing not required at this load point, but is presented for completeness. Testing at this load was conducted using the Method 20 test times.

Table 3-3. Emissions Test Results - Lakeland Utilities CT Unit #5
Natural Gas Firing
Base Load Test Point Data
Date: 02 March 2000

Parameter	Units	Run #5,5a, & 6	Run #7	Run #8	Average	Emiss. Limit	
Start Time:		14:12	16:17	17:37			
Stop Time:		15:59	17:17	18:37			
Operating Parameters:							
Load:	MW	237.3	237.5	239.9	238.2		
Load (%)	(%)	100	100	100	100		
Fuel Flow:	kpph	102.83	102.99	103.83	103.22		
Lower Heating Value:	Btu/lb	21034	21034	21034	21034		
Heat Input (LHV):	MMBtu/hr	2162.9	2166.4	2183.9	2171.1	2174 @ ISO	
Turbine Exhaust Temperature:	degrees F	1135.0	1135.0	1132.8	1134.3		
Volumetric Flow (Method 19 based)	dscfm	888184.3	889664.7	896529.2	891459.4		
Ambient Data:							
Ambient Temperature	degrees F	81.61	80.72	78.00	80.11		(c)
Barometric Pressure:	"Hg	29.75	29.74	29.96	29.82		
Specific Humidity (Hobs):	# H2O/# DA	0.00968	0.01020	0.01031	0.01006		
Emissions Data:							
Oxygen:	%V, dry	12.7	12.7	12.7	12.7		
Nitrogen Oxides:	ppmV, dry	31.9	31.1	31.1	31.4		
	lb/MMBtu	0.0845	0.0825	0.0825	0.0832		
	ppmV@15% O2	22.9	22.4	22.4	22.6	25	
	ppmV@15% O2 & ISO Conditions	23.0	22.7	22.8	22.8	117.4	(a)(d)
	lb/hr (c)	202.7	198.3	199.8	200.3		
Carbon Monoxide:	ppmV, dry	1.7	1.8	1.9	1.8		
	lb/MMBtu	0.0027	0.0030	0.0030	0.0029		
	ppmV@15% O2	1.2	1.3	1.3	1.3	25	(a)
	lb/hr (c)	6.5	7.1	7.3	7.0	145	(a)
Volatile Organic Compounds (VOC): (as carbon)	ppmC,w	0.0	0.0	0.0	0.0	4	
	lb/MMBtu	0.0000	0.0000	0.0000	0.0000		
	lb/hr (c)	0.0	0.0	0.0	0.0		
Visible Emissions:	% Opacity	0.0	0.0	0.0	0.0	10	

Notes:
Combustion Turbine Model: SWPC 501G - Simple Cycle
Fuel Factor (Fd) = 8710scf@0%O2/MMBtu from 40CFR60 Appendix A, Method 19
Y = 9.197 Kilojoules/Watt-Hour (8725 Btu/kwh) for Natural Gas for NSPS limit calculation
The first base load test was split between three periods with calibration checks between (14:12-14:36, 14:56-15:20, 15:35-15:59)
(a) - BACT/FDEP Permit Emissions Limit
(b) - 40CFR60, Subpart GG - NSPS Emissions Limit. Note that the ratio of standard pressure to observed ambient pressure was used in the ISO correction since curves of combustor inlet pressure vs. unit load are not available for this type of unit. This ratio is known to closely track the ratio of reference combustor inlet pressure to observed combustor inlet pressure for combustion turbines.
(c) - Mass Emission Rates Calculated using the Volumetric Flowrate determined from the Method 19 approach.
(d) - Heat Input during the Base Load test was between 95% and 105% of the permitted rate.

4.0 EPA TEST PROCEDURES

This section includes a brief description of the test methods used for sampling and analysis at the Lakeland Utilities McIntosh Unit #5 facility. Any deviations from standard procedures are clearly noted below.

4.1 METHOD 1: LOCATION OF SAMPLING POINTS

The locations of the traverse points used for the preliminary oxygen traverse were determined using the criteria of EPA Method 1, Appendix A, 40 CFR 60. For this test program, twelve sampling points were tested in each of four test ports located at 90° angles around the circumference of the circular stack. The sampling points are located at equal area sections of the duct.

4.2 INSTRUMENTAL SAMPLING PROCEDURES

Stack gas emissions of oxides of nitrogen (NO_X), carbon monoxide (CO), and volatile organic compounds (VOC) were measured using continuous instrumental techniques. Diluent oxygen concentration was also measured using continuous instrumental techniques. These tests were performed in accordance with EPA Methods 20 for oxygen, 10 for CO, 20 for NO_x and 25A for VOC as outlined in Title 40, Part 60, Appendix A of the Code of Federal Regulations. Copies of all on-line instrumental reference method data collected during the testing are included in Appendix B of this document. Calibration records are provided in Appendix C.

Flue gas sample is withdrawn from the stack at a constant rate via a heated stainless steel sample probe. The sample probe was equipped with an additional stainless steel line to enable probe tip calibrations. The probe was of sufficient length to allow traversing the duct as required by the applicable test methods. Extracted sample was passed from the probe through a filter and a heated teflon sample line to the moisture removal system. The moisture removal system (gas conditioner) was designed for minimal contact

between condensate and sample gas in order to prevent any reaction between the moisture and the measured pollutants. All components of the sampling and gas conditioning system were fabricated from glass, teflon, or stainless steel. The gas conditioning system consisted of Baldwin two stage thermoelectric chiller. Moisture was continuously removed from the traps by an external peristaltic pump. Dry gas sample from the gas conditioner then passed through an unheated 1/4-inch O.D. teflon tube to a teflon-lined diaphragm pump which delivered positive pressure sample to the instrument system. The sample for the Method 25A analyzer bypassed the gas conditioner and was injected to the instrument on a hot wet basis. Flow control valves were used to deliver the gas sample at a regulated positive pressure to the reference method analytical instruments through a teflon and stainless steel manifold delivery network. Flow and pressure to all monitors was held constant by monitoring sample and bypass rotameters. A diagram of the instrumental reference method sampling and analysis system used for the test program is given in Figure 4-1.

The sampling system was leak checked by passing known calibration gas standards up through a calibration line to the end of the probe. The gas standards are then pulled back through the sampling probe at stack pressure and subsequently through the entire sampling system to the instrument system. An oxygen analyzer response of less than or equal to 0.5% V to a zero oxygen standard was considered an acceptable leak check. Analyzer calibration error was calculated by the difference between the known calibration gas concentration and the concentration exhibited by the analyzer. Bias checks were performed by comparing calibration responses through the entire sampling system to these exhibited at the analyzer. EPA Protocol #1, NIST traceable standard calibration gases were used to calibrate the analyzers.

Acceptable system performance checks did not exceed +/-2% of scale initial calibration error (+/-5% of the gas value for Method 25A), +/-5% of scale system bias check, or the

method specific drift requirements (+/-2% of scale for Method 20, +/-10% of scale in 8 hours for Method 10, and +/- 3% of scale for Method 25A).

Instrument response time was found by alternating zero nitrogen and upscale span gases through the bias check line and recording the upscale and down scale time for a 95% response. The response time of the CEM sampling system was performed to determine the length of time for the reference method system to respond to changes in the stack gas exhaust stream. Known, Protocol 1 reference gases and zero nitrogen were passed through the heated sample line, sample conditioning system and the manifold delivery network to the continuous emission monitors.

4.3 STRATIFICATION TESTS

A preliminary oxygen traverse was performed on each turbine exhaust for the purpose of selecting the eight points of lowest oxygen concentration which were subsequently used for emissions sampling. The traverse was performed at the lowest load to be tested. For the preliminary oxygen traverse, the minimum number of traverse points are:

- 8 for stacks with area less than 16.1 ft^2;
- 8 + (Area of Stack (ft^2))/2.2, for stacks with areas between 16.1 to 107.6 ft^2; or
- 48 or 49 for stacks greater than 107.6 ft^2.

The minimum sampling time at each point is one minute plus the average system response time. Based on the results of the traverses, if all of the points were within 0.4% oxygen of each other (i.e. no significant stratification exists), then 8 convenient sample points were used for the subsequent testing.

All instrumental sampling runs at the base load conditions were conducted for a minimum of 1 hour. Test runs at the reduced load conditions are required for O_2 and NO_X

only by Method 20 and were conducted for the test durations prescribed in EPA Method 20, which is 1 minute plus the system response time (30 seconds) at each of the eight points of lowest oxygen concentration.

4.4 DATA ACQUISITION

The data system used for this test program is a PLC based data acquisition system which interfaces with an Enertec software package designed for emissions testing. The system includes automatic calibration capabilities. The system operates in a Windows NT PC environment.

4.5 REFERENCE METHOD ANALYZER PRINCIPLES OF OPERATION

4.5.1 METHOD 3A: OXYGEN ANALYSIS

Flue gas sample is continuously analyzed for oxygen by a Servomex Model 1400A paramagnetic instrument. The Servomex 1400A analyzer uses electron paramagnetic resonance to detect the presence of oxygen molecules. Unlike most substances, oxygen has a triplet electron ground state which leaves one electron unpaired, making it a paramagnetic molecule. This electron may have one of two quantum spin states (m_s = +/- ½). By applying an alternating electromagnetic field of the proper frequency, the Servomex 1400A O_2 analyzer induces resonance between the two spin quantum states. In effect, the O_2 analyzer measures the electromagnetic energy absorbed by O_2 molecules at the resonant frequency.

4.5.3 METHOD 20: OXIDES OF NITROGEN ANALYSIS

A Thermo Electron Model 42H instrument was used to analyze NO_X. The principle of operation of this instrument is a chemiluminescent reaction in which ozone (O_3) reacts with nitric oxide (NO) to form oxygen (O_2) and nitrogen dioxide (NO_2). During this reaction, a photon with a specific ultraviolet wavelength is emitted which is detected by a photomultiplier tube. The instrument is capable of analyzing total oxides of nitrogen (NO + NO_2) by thermally converting NO_2 to NO in a separate reaction chamber prior to the

photomultiplier tube, if desired. The analyzer is operated in the NO_X mode during sampling.

A convertor efficiency test is performed on the Thermoelectron Model 42H during the test series. (See Section 5.2 for a description of the converter efficiency test.)

4.5.4 METHOD 10: CARBON MONOXIDE ANALYSIS

A TECO 48 Gas Filter Correlation Non-Dispersive Infrared (GFC/NDIR) analyzer was used for continuous CO analysis. The principle of operation of this analyzer is similar to traditional NDIR analyzers in that it relies on selective absorption; whereby, particular band widths of infrared energy are absorbed by a species based on its molecular orbital structure. Gas filter correlation NDIR differs from NDIR in the detection mechanism and because the GFC/NDIR does not require a reference cell. Infrared radiation passes through a rotating filter, through the sample cell and to the detector. The chopper wheel of the GFC/NDIR is a rotating disk separated into two chambers where one half is filled with nitrogen and the other half is filled with pure CO. These gas filled partitions act as alternating optical filters for the incident IR radiation from the IR source. The CO gas filter side acts to produce a signal which cannot be further attenuated by CO in the sample cell and is used as a reference signal. The nitrogen filter allows all incident radiation to pass. Carbon monoxide in the sample cell, therefore, attenuates the signal proportionally to concentration. This is considered the measurement cycle. Any other gases which absorb infrared radiation are absorbed equally during both the measurement and reference cycles, providing a real-time reference and minimal interferences. The detector for this analyzer is a lead-selenium photo detector.

It should be noted that EPA Method 10 prescribes the use of an ascarite trap to absorb carbon dioxide and excess moisture prior to introduction of the sample gas into the analyzer. The ascarite trap is prescribed since older technology dual cell NDIR carbon monoxide analyzers were subject to positive biases from carbon dioxide and water vapor.

The single cell, gas filter correlation technology of the Teco Model 48, however, virtually eliminates this phenomenon since the sample gas itself is used as an optical attenuator during the reference cycle. Therefore, the ascarite traps were not be used for this test effort. Interference tests were conducted prior to and during the testing to demonstrate that carbon dioxide at stack concentrations and water vapor at the levels introduced to the analyzer do not generate a signal that represents a CO value of more than 10% of the CO emission limit. Interference test results are provided in Appendix C.

4.5.5 METHOD 25A: TOTAL HYDROCARBONS

EPA Method 25A is used to measure VOC expressed as total hydrocarbons on a hot, wet basis. The results are reported as parts per million by volume as methane basis (ppmC). Methane in air is the calibration standard. A gas sample is extracted from the source through a heated sample line and a glass fiber filter, directly into a hydrocarbon analyzer. The analyzer uses the flame ionization detector (FID) principle to detect hydrocarbons on a continuous basis. A TECO Model 51 FID analyzer was used for this test program.

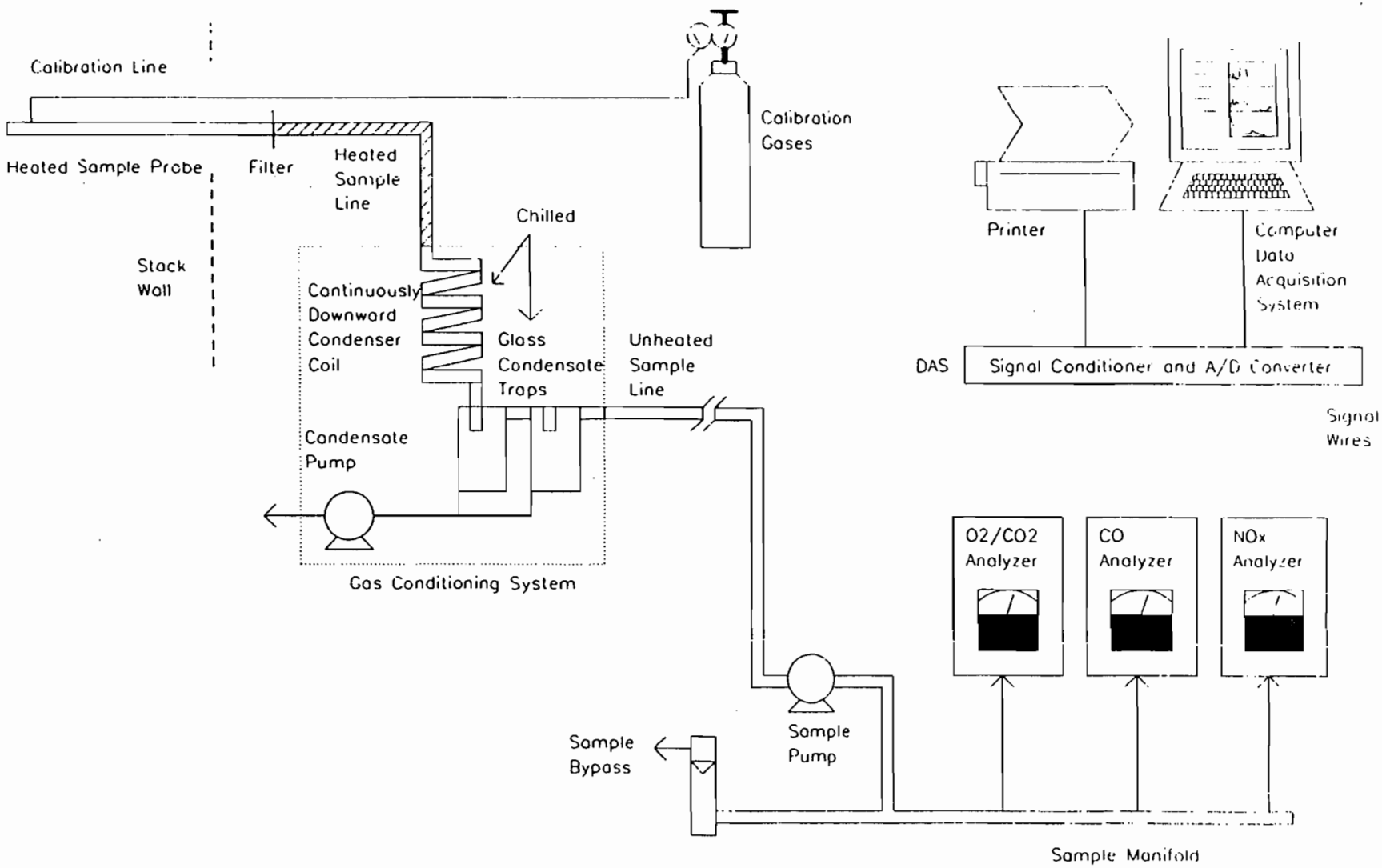


Figure 4-1. Schematic Diagram of STACS Reference Method System.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

Strict Quality Assurance/Quality Control (QA/QC) measures were observed for all sampling and analysis performed for the Lakeland McIntosh Unit #5 Combustion Turbine emissions test program. The STACS QA/QC program is designed to provide the highest quality data in terms of the accuracy and precision of the measurements as well as the completeness, representativeness and comparability of the results.

Accuracy is the degree to which a measurement agrees to the true value or to an accepted reference value. Precision is the degree of reproducibility (or agreement) of a set of individual measurements of an identical property.

The objective of the overall QA/QC program is to provide guidelines in terms of accuracy and precision which can be used to assess the uncertainty in the results and to substantiate the data in terms of the use of accepted procedures. Quality Control can be defined as the use of operational techniques and activities which sustain good quality data. Adherence to accepted sampling and analytical methods and procedures (and specifically noting any aberrations or exceptions to these procedures) is an example of quality control. Quality Assurance includes all those planned and systematic activities necessary to ensure that the accuracy and precision of the results meets the needs of the testing program. Quality Assurance programs can be internal or external.

Both internal and external programs are important to the overall integrity of the data. The internal QA program includes the activities planned by routine operators and analysts to provide an assessment of test data precision (and accuracy). Examples of implementation of an internal QA measure is routine calibration checks to assess the bias and drift of an analyzer after each test run. The measurement system bias is an indicator of the accuracy of the system and the drift is an indication of the precision of the measurements. External QA programs are those activities planned or conducted by an outside party or agency

(such as FDEP, Siemens-Westinghouse, Lakeland Utilities or independent consultants) which ensure that QC guidelines are followed and provide an indicator of the accuracy of the data. Examples of external QA procedures implemented by an outside entity would include review of the test matrix, observation of selected testing to ensure proper techniques are followed, submission of independent performance audits, and review of the final testing data.

The quality assurance/quality control measures for sampling and analysis included in the following documents were strictly followed during the emissions test program, except as noted below and elsewhere in this document. The procedures are incorporated by reference into the quality assurance program for this effort as they apply to the collection, analysis, and calculation of pollutant concentrations and mass emission rates from the unit.

> The Code of Federal Regulations, Title 40, Part 60, Appendix A., EPA Methods 3A, 6C, 7E, and 10.
>
> The Quality Assurance Handbook for Air Pollution Measurement Systems - Volume III - Stationary Source Specific Methods (EPA-600/4-77-027b) Sections 3.0-3.4.

The following sections provide a brief synopsis of the internal QA program that was used for this test effort.

Experienced air quality personnel conducted the emissions testing project. Mr. Bill Mayhew of STACS was the project director and principal coordinator for the program. Mr. Mayhew has a B.S. in Chemical Engineering and is a Senior Project Engineer with over 15 years experience in emissions testing. Mr. Mayhew reviewed all data collected and calculations performed and participated in the production of the final report. Mr. Jamie Clark conducted the tests and reviewed the data and test report prior to submission.

Mr.Clark has over 12 years experience in emissions testing and has a background in Mechanical Engineering. Mr. Clark was assisted on site by Mr. Charles Reshard., a chief technician with approximately 20 years experience in emissions testing and a current visible emissions certification. Mr. Ramesh Kagolanu and Mr. Jason Kraus of SWPC environmental engineering staff also observed and participated in the testing.

5.1 CALIBRATIONS AND DRIFT ASSESSMENTS

At the beginning of each test day, the EPA Reference Method 20, 10 and 25A test equipment is calibrated, and adjusted as required, on a two-point basis. EPA Protocol #1, NIST traceable standard calibration gases are used to calibrate the analyzers. Subsequently, additional calibration standards are introduced to the analyzers to check the linearity of the instrument response. If the linearity of the instrument is within +/-2% of full scale of the calibration standard value, the calibration is accepted (5% absolute of the gas value for Method 25A). Otherwise, corrective maintenance is performed, and the instrument is re-calibrated. During this time, bias checks are also performed by introducing calibration standards directly to the instrument manifold and through the entire sampling system and comparing the results.

Calibration checks are performed through the entire sampling system at the conclusion of each test run to determine calibration drift and any change in sample system bias.

Sampling system bias is assessed by introducing a mid-range or high-range gas through the sampling system and back to the analyzers. The maximum allowable bias is 5% of the value the analyzer read for the same gas when introduced to the probe tip as a percent of the span of the analyzer.

Sampling system drift checks are subsequently performed at the conclusion of each test run. Corrective actions are taken if the drift checks exceeds the method specific drift

requirements after any test run (see section 4.2 for the requirements). All calibration gases were EPA Protocol 1, NIST traceable standards with a rated accuracy of +/- 1%.

5.2. NO_2 CONVERTER EFFICIENCY

An NO_2 to NO converter efficiency test is performed prior to sampling as prescribed in EPA Methods 7E and 20. The procedure used for testing the converter efficiency is given below:

- Fill a leak-free Tedlar bag approximately half full with an NO in N_2 blend.
- Fill the remainder of the bag with 0.1 UHP grade air.
- Immediately attach the NO/Air mixture to the inlet of the NO_X monitor being used.
- Allow the monitor to sample the gas in the bag for 30 minutes.

As the O_2 and NO in the bag are exposed to each other a reaction occurs which changes the NO to NO_2. An attenuation in response over time of less than two percent absolute indicates that the converter efficiency is acceptable. Appendix C contains the NO_x convertor efficiency test results.

5.3 INSTRUMENT RESPONSE TIME

Maximum instrument system response time is determined by alternately passing zero and span gas through the entire sampling system and noting the time required for the monitors to achieve a change of 95% of the final concentrations. Both upscale and down scale response times are recorded. The instrument response time for this test program was determined to be 60 seconds.

5.4 LEAK CHECKS

Since all calibrations are performed through the entire sampling system, leak-checks are incorporated in each calibration. The criterion used for this test is an oxygen response to a zero gas of less than 0.5% O_2. Leak checks are also incorporated into the zero and span drift checks at the end of each run since the calibration gas is passed through the entire sampling system for each post test drift check. STACS also conducts a vacuum leak check of the system prior to sampling.

SAMPLE CALCULATIONS

NO_x Emissions Corrected to 15% Oxygen

NO_x @ 15% O_2 = NO_x * ((20.9-15)/(20.9-O_2))

Where:

NO_x = NO_x concentration as measured in the sample gas in parts per million by volume (ppmV).

O_2 = Oxygen concentration as measured in the sample gas by volume (%V).

NO_x @ 15% O_2 = NO_x concentration (ppmV) corrected to 15% oxygen.

NO_x Emissions at 15% Oxygen and ISO Conditions

$NO_{xISO} = NO_x$ @15% O_2 * $(Pref/Pobs)^{0.5}$ * $e^{19(Hobs-0.00633)}$ * $(288/Tamb)^{1.53}$

Where:

NO_x @ 15% O_2 = NO_x concentration (ppmV) corrected to 15% oxygen.
NO_{xISO} = NO_x concentration (ppmV) at 15% oxygen and ISO conditions.
Pref = Reference compressor discharge pressure (PSIA).
Pobs = Observed compressor discharge pressure (PSIA).
Hobs = Specific humidity of ambient air (lb H_2O/lb Dry) air determined from the wet bulb and dry bulb readings and psychometric chart.
Tamb = Ambient temperature (K).

SAMPLE CALCULATIONS

Volumetric Flow Rate by EPA Method 19 Approach

Q_{std} = H (MMBtu/hr) x F_d (scf @ 0% O_2/MMBtu) x 1hr/60min x 20.9/(20.9-O_2)

Where:

Q_{std} = Volumetric Flow Rate (dry standard cubic feet per minute or dscfm)

H = Heat Input Rate (MMBtu/hr)

F_d = Dry Oxygen based F-factor (scf @ 0% O_2/MMBtu)

O_2 = Measured Oxygen concentration (%V)

SAMPLE CALCULATIONS

Heat input rate:

$$H = HHV \times Q_{fuel} \times 3600 / 10^6$$

Where:

H = Heat Input Rate (Gross) to unit in MMBtu/hr.

HHV = Higher Heating Value of the fuel in Btu/lb (aka Gross Calorific Value).

Q_{fuel} = Flow rate of fuel in lb/sec.

10^6 = Conversion factor (Btu/MMBtu)

3600 = Conversion factor (seconds/hours).

	Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb. Temp. (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 1: 10:12 - 10:36																					
1	10:12	39.3	32.0	13.2	0	4.24	30.1	24.5	160.9	120.3	163.7	68%	1139	28.2	76.45	42110124	966.8	14.65	74	64.83	.0117
	10:13	41.3	31.6	13.2	0	4.23	31.6	24.2	158.9	126.4	163.8	68%	1137	28.1	76.47	42123539	966.4	14.65	75	65.37	.0119
2	10:14	40.4	31.4	13.2	0	4.24	31.0	24.1	157.8	123.6	163.7	68%	1137	28.1	76.42	42092893	966.6	14.66	75	65.49	.0121
	10:15	37.5	31.4	13.1	0	4.26	28.4	23.8	156.0	113.4	163.8	68%	1139	28.1	76.51	41606108	964.3	14.66	75	64.89	.0121
3	10:16	24.2	32.4	13.0	0	4.33	18.1	24.2	159.7	72.6	164.4	69%	1149	28.5	76.69	41281872	963.6	14.66	78	64.74	.0123
	10:17	21.6	35.7	13.0	0	4.32	16.1	26.7	175.7	64.7	162.9	68%	1153	28.5	76.79	41227699	954.1	14.66	77	64.02	.0125
4	10:18	22.6	35.7	13.0	0	4.33	16.9	26.7	175.7	67.7	164.1	68%	1155	28.6	76.76	41211155	953.2	14.66	76	63.21	.0122
	10:19	21.9	35.4	13.0	0	4.34	16.4	26.4	174.6	65.7	163.6	68%	1156	28.5	76.92	41300964	956.5	14.66	76	62.17	.0120
5	10:20	21.6	35.7	13.0	0	4.34	16.1	26.7	175.7	64.7	164.0	68%	1157	28.5	76.76	41214669	957.4	14.66	76	61.77	.0120
	10:21	21.5	35.8	13.0	0	4.34	16.1	26.7	176.1	64.4	163.9	68%	1158	28.5	76.75	41206157	954.1	14.66	76	61.22	.0119
6	10:22	21.4	35.8	13.0	0	4.34	16.0	26.7	176.5	64.2	162.9	68%	1159	28.5	76.92	41296860	952.1	14.66	76	61.33	.0116
	10:23	20.9	35.8	13.0	0	4.35	15.6	26.7	176.5	62.7	163.8	68%	1160	28.8	76.91	41294983	952.5	14.66	76	61.78	.0119
	10:24	20.6	35.9	13.0	0	4.35	15.4	26.8	176.7	61.7	164.0	68%	1160	28.6	76.76	41215079		14.66			
7	10:25	19.7	36.0	13.0	0	4.36	14.7	26.9	177.4	59.1	163.4	68%	1161	28.5	76.87	41272843		14.66			
	10:26	19.2	36.4	13.0	0	4.35	14.3	27.2	179.5	57.6	163.4	68%	1162	28.5	76.94	41309189		14.66			
8	10:27	18.6	36.5	13.0	0	4.36	13.9	27.3	180.1	55.9	164.2	68%	1162	28.5	76.97	41326377		14.66			
9	10:28	18.6	36.9	13.0	0	4.36	13.9	27.6	182.1	55.9	163.6	68%	1162	28.6	76.98	41332644		14.66			
	10:29	17.8	36.6	13.0	0	4.37	13.3	27.5	181.4	53.4	163.7	68%	1163	28.5	76.88	41276903	947.2	14.66	77	60.47	.0119
10	10:30	17.7	37.1	13.0	0	4.38	13.2	27.7	183.0	53.1	163.5	68%	1164	28.6	76.95	41316247	948.3	14.66	77	59.83	.0118
	10:31	17.7	37.2	13.0	0	4.37	13.2	27.8	183.5	53.1	164.0	68%	1165	28.5	76.94	41306625	949.6	14.68	77	59.50	.0117
11	10:32	17.6	37.4	13.0	0	4.37	13.1	27.9	184.4	52.8	163.6	68%	1166	28.5	76.93	41304827	950.0	14.66	77	59.42	.0117
	10:33	17.4	37.1	13.0	0	4.38	13.0	27.7	183.1	52.3	163.3	68%	1167	28.6	77.01	41344487	948.6	14.66	77	59.67	.0117
12	10:34	16.5	37.5	12.9	0	4.38	12.2	27.7	182.7	48.9	163.3	68%	1167	28.5	76.98	40814769	948.0	14.68	76	59.57	.0113
	10:35	16.4	37.7	12.9	0	4.39	12.1	27.8	183.6	48.6	163.6	68%	1168	28.6	76.92	40779589	941.1	14.65	77	60.45	.0119
	10:36	15.4	38.0	12.9	0	4.39	11.4	28.0	185.2	45.7	164.2	68%	1169	28.6	77.00	40826819	943.3	14.66	77	60.42	.0119
Averages:		22.7	35.6	13.0	0.0	4.3	17.0	26.6	175.5	68.3	163.7	68%	1157.6	28.5	76.8	41335736	954.1	14.7	76	62.01	0.012

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb. Temp. (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 2 10:48 - 11:12																				
10:48	14.4	38.5	12.9	0	4.36	10.6	28.4	187.7	42.7	163.5	68%	1174	28.7	77.03	40839124	939.0	14.66	78	57.08	.0115
10:49	14.6	38.0	12.9	0	4.36	10.8	28.0	185.7	43.4	163.2	68%	1174	28.7	77.21	40938137	943.0	14.66	78	56.67	.0116
10:50	14.3	38.0	12.9	0	4.36	10.5	28.0	185.4	42.5	164.3	68%	1173	28.6	77.06	40853892	940.1	14.66	78	56.23	.0113
10:51	15.1	37.8	12.9	0	4.37	11.1	27.9	184.4	44.8	163.8	68%	1173	28.7	77.06	40854050	940.7	14.66	77	56.59	.0110
10:52	14.8	38.0	12.9	0	4.36	10.9	28.0	185.5	44.0	163.9	68%	1173	28.7	77.09	40873458	943.5	14.66	77	57.43	.0114
10:53	14.8	37.9	12.9	0	4.37	10.9	28.0	184.8	43.9	163.4	68%	1173	28.7	77.03	40838011	943.7	14.66	77	57.15	.0113
10:54	15.0	37.9	13.0	0	4.37	11.2	28.3	187.3	45.1	162.8	68%	1173	28.7	77.09	41387009	944.3	14.66	77	57.01	.0111
10:55	14.5	38.1	12.9	0	4.37	10.7	28.1	185.9	43.1	163.5	68%	1173	28.6	77.06	40854208	940.8	14.66	77	56.38	.0112
10:56	14.4	38.1	13.0	0	4.37	10.8	28.5	188.2	43.3	163.3	68%	1173	28.6	77.05	41366311	942.6	14.66	77	55.24	.0110
10:57	15.1	38.1	13.0	0	4.37	11.3	28.5	188.4	45.5	162.6	68%	1174	28.7	77.14	41417805	942.0	14.66	78	55.45	.0112
10:58	15.5	37.8	13.0	0	4.37	11.6	28.2	186.9	46.7	164.0	68%	1173	28.7	77.15	41421409	942.5	14.66	77	55.36	.0110
10:59	15.6	37.9	12.9	0	4.37	11.5	28.0	184.9	46.3	163.6	68%	1172	28.6	77.08	40869291	943.0	14.66	76	54.90	.0105
11:00	15.5	37.7	13.0	0	4.37	11.6	28.2	186.4	46.7	163.2	68%	1172	28.7	77.13	41412467	943.6	14.66	77	55.49	.0109
11:01	14.5	38.0	13.0	0	4.37	10.8	28.4	187.7	43.6	164.3	68%	1173	28.6	77.04	41361269	945.5	14.66	78	55.61	.0114
11:02	16.2	38.2	13.0	0	4.36	12.1	28.5	188.7	48.7	163.4	68%	1172	28.7	77.06	41373869	944.8	14.66	78	53.31	.0110
11:03	17.4	37.5	13.0	0	4.35	13.0	28.0	185.2	52.3	162.0	67%	1174	28.7	77.04	41365332	947.2	14.65	78	52.94	.0109
11:04	16.1	37.0	13.0	0	4.35	13.5	27.6	182.7	54.4	163.4	68%	1172	28.7	77.03	41357611	945.3	14.66	77	53.63	.0106
11:05	18.5	36.6	13.0	0	4.35	13.8	27.3	180.8	55.6	163.1	68%	1171	28.7	77.06	41373242	941.4	14.66	75	54.71	.0102
11:06	18.1	36.4	13.0	0	4.36	13.5	27.2	179.9	54.4	163.3	68%	1170	28.7	77.09	41388025	945.9	14.65	75	55.50	.0103
11:07	17.8	36.9	13.0	0	4.36	13.3	27.6	182.1	53.5	163.3	68%	1170	28.7	77.00	41341496	943.7	14.66	75	56.46	.0106
11:08	17.7	36.9	13.0	0	4.36	13.2	27.6	182.3	53.2	163.5	68%	1170	28.7	77.04	41365431	945.4	14.65	76	56.70	.0110
11:09	17.7	37.0	13.0	0	4.36	13.2	27.6	182.8	53.2	163.5	68%	1170	28.7	77.06	41376109	946.8	14.66	78	56.27	.0114
11:10	17.7	36.8	13.0	0	4.36	13.2	27.5	181.9	53.3	163.9	68%	1171	28.7	77.12	41405299	944.3	14.65	77	54.97	.0110
11:11	17.7	36.8	13.0	0	4.36	13.2	27.5	181.8	53.2	163.3	68%	1170	28.7	77.06	41375691	946.1	14.65	76	55.57	.0108
11:12	17.6	36.9	13.0	0	4.36	13.1	27.6	182.4	53.0	163.8	68%	1170	28.7	77.10	41396001	943.8	14.66	76	55.24	.0107
Averages:	16.1	37.6	13.0	0.0	4.4	12.0	27.9	184.8	48.3	163.4	68%	1172.1	28.7	77.1	41216182	943.6	14.7	77	55.68	0.011

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb Temp. (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 3: 12:50 - 13:14																				
12:50	19.4	38.8	13.1	0	4.28	14.7	29.3	189.8	57.8	157.5	66%	1156	30.0	75.3	40962477	942.5	14.64	80	46.87	.0102
12:51	21.1	36.7	13.1	0	4.28	16.0	27.8	181.7	63.6	160.5	67%	1161	29.7	76.3	41466279	943.6	14.64	80	47.47	.0102
12:52	21.8	36.3	13.1	0	4.28	16.3	27.5	181.5	65.7	163.8	68%	1155	28.6	77.0	41868786	954.7	14.64	79	47.34	.0100
12:53	21.3	36.0	13.1	0	4.28	16.1	27.2	179.8	64.8	163.9	68%	1154	28.6	76.9	41827999	955.0	14.64	79	47.83	0101
12:54	21.3	36.0	13.1	0	4.28	16.1	27.2	180.0	64.8	162.8	68%	1153	28.5	77.0	41864658	954.2	14.64	79	48.20	.0103
12:55	20.8	36.0	13.1	0	4.27	15.7	27.2	180.0	63.3	164.0	68%	1154	28.5	77.0	41883497	952.7	14.64	80	48.52	.0104
12:56	24.1	35.5	13.1	0	4.26	18.2	26.9	177.4	73.3	163.1	68%	1154	28.5	77.0	41859372	954.6	14.64	79	48.05	.0102
12:57	23.4	34.6	13.1	0	4.26	17.7	26.2	172.9	71.2	162.6	68%	1154	28.5	77.0	41852431	954.0	14.64	80	47.75	.0103
12:58	23.7	34.9	13.1	0	4.26	17.9	26.4	173.7	71.8	161.9	67%	1153	28.5	76.7	41690647	948.2	14.64	80	48.29	.0106
12:59	23.4	34.8	13.1	0	4.26	17.7	26.3	172.8	70.7	161.5	67%	1153	28.5	76.5	41598653	947.5	14.64	81	47.16	.0105
13:00	23.6	34.9	13.1	0	4.25	17.9	26.4	173.4	71.4	162.0	67%	1154	28.5	76.5	41609245	949.0	14.64	81	46.75	.0104
13:01	23.9	34.7	13.1	0	4.26	18.1	26.2	172.8	72.4	161.6	67%	1155	28.5	76.6	41655354	946.8	14.64	81	46.12	.0104
13:02	23.5	34.8	13.1	0	4.26	17.8	26.3	172.9	71.1	161.5	67%	1155	28.5	76.5	41611967	948.5	14.64	80	45.95	.0101
13:03	23.0	35.0	13.1	0	4.26	17.4	26.5	173.6	69.5	162.0	67%	1155	28.5	76.5	41588082	947.9	14.63	80	46.45	.0101
13:04	22.8	35.2	13.1	0	4.26	17.2	26.6	175.0	69.0	161.6	67%	1155	28.5	76.8	41837216	949.6	14.64	80	45.08	.0100
13:05	23.6	35.1	13.1	0	4.26	17.9	26.6	174.5	71.4	161.6	67%	1155	28.5	76.6	41633469	950.1	14.63	80	44.96	0099
13:06	22.9	34.8	13.1	0	4.26	17.3	26.3	173.0	69.3	161.7	67%	1156	28.5	76.5	41624027	947.3	14.63	80	45.01	.0097
13:07	22.1	35.2	13.1	0	4.28	16.7	26.6	174.9	66.6	161.9	67%	1155	28.5	76.5	41606328	946.7	14.63	78	45.27	.0094
13:08	21.5	35.4	13.1	0	4.27	16.3	26.8	176.2	65.1	161.9	67%	1155	28.4	76.7	41687602	949.0	14.63	79	45.36	.0096
13:09	20.5	35.8	13.1	0	4.27	15.5	27.1	178.1	62.1	161.9	67%	1156	28.5	76.6	41687658	946.3	14.63	79	45.35	.0096
13:10	20.6	36.0	13.1	0	4.27	15.6	27.2	178.9	62.3	161.9	67%	1157	28.5	76.6	41630391	946.9	14.63	80	45.64	.0099
13:11	19.9	36.1	13.1	0	4.29	15.1	27.3	179.5	60.2	161.8	67%	1158	28.5	76.6	41649973	948.0	14.63	79	45.89	.0098
13:12	18.0	36.7	13.1	0	4.29	13.8	27.8	182.5	54.5	162.5	68%	1159	28.5	76.8	41650015	949.0	14.63	80	45.90	.0100
13:13	18.4	37.3	13.1	0	4.28	13.9	28.2	185.4	55.7	162.1	68%	1160	28.5	76.6	41633951	948.5	14.63	82	46.25	.0107
13:14	18.7	37.1	13.1	0	4.28	14.1	28.1	184.2	56.5	161.2	67%	1162	28.5	76.5	41581847	948.8	14.63	83	43.82	.0105
Averages:	21.7	35.7	13.1	0.0	4.3	16.4	27.0	177.8	65.8	162.0	67%	1155.7	28.6	76.6	41653597	949.2	14.6	80	46.45	0.010

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb. Temp (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 4: 13:26 - 13:49																				
13:25	21.5	36.1	13.1	0	4.23	16.3	27.3	179.2	65.0	162.4	68%	1161	28.5	76.5	41584236	948.2	14.63	82	40.15	.0094
13:26	21.4	35.1	13.1	0	4.24	16.2	26.6	174.3	64.7	161.6	67%	1160	28.4	76.5	41582207	948.4	14.63	82	40.81	.0095
13:27	21.6	35.0	13.1	0	4.24	16.3	26.5	173.8	65.3	161.8	67%	1161	28.4	76.5	41596844	947.5	14.63	82	41.24	.0097
13:28	22.5	34.9	13.1	0	4.24	17.0	26.4	173.4	68.0	161.8	67%	1159	28.2	76.5	41600416	951.1	14.63	82	41.85	.0098
13:29	23.4	34.5	13.1	0	4.24	17.7	26.1	171.2	70.7	161.3	67%	1158	28.2	76.4	41554228	953.2	14.63	82	42.89	.0098
13:30	24.4	34.2	13.1	0	4.24	18.5	25.9	170.0	73.8	161.9	67%	1158	28.2	76.6	41631216	952.7	14.63	83	43.08	.0102
13:31	23.5	34.0	13.1	0	4.24	17.8	25.7	169.0	71.1	161.9	67%	1158	28.2	76.6	41835635	945.0	14.63	82	44.01	.0101
13:32	22.4	34.3	13.1	0	4.25	16.9	25.9	170.3	67.7	161.8	67%	1157	28.2	76.5	41577308	950.1	14.63	81	44.21	.0098
13:33	23.5	34.6	13.1	0	4.24	17.8	26.2	172.1	71.1	162.6	68%	1156	28.2	76.6	41647484	951.4	14.62	80	44.64	.0098
13:34	22.1	34.5	13.1	0	4.25	16.7	26.1	171.4	66.8	161.5	67%	1154	28.2	76.5	41603101	951.5	14.63	79	44.91	.0096
13:35	21.5	34.9	13.1	0	4.25	16.3	26.4	173.2	64.9	161.7	67%	1155	28.2	76.4	41555241	950.3	14.62	80	45.11	.0099
13:38	20.8	35.3	13.1	0	4.26	15.7	26.7	175.2	62.8	161.8	67%	1156	28.2	76.4	41559688	950.0	14.63	81	45.63	.0104
13:37	19.4	35.7	13.1	0	4.26	14.7	27.0	177.3	58.7	161.6	67%	1156	28.2	76.5	41605755	950.5	14.62	80	44.47	.0096
13:38	19.5	36.0	13.1	0	4.26	14.8	27.2	178.7	58.9	162.8	66%	1157	28.2	76.4	41570246	951.7	14.63	81	44.10	.0100
13:39	19.6	36.0	13.1	0	4.26	14.8	27.2	178.7	59.2	161.9	67%	1158	28.2	76.5	41573474	948.0	14.62	81	43.52	.0097
13:40	19.7	35.8	13.1	0	4.27	14.9	27.1	177.9	59.6	161.8	67%	1159	28.2	76.5	41623433	951.7	14.62	82	43.49	.0101
13:41	19.2	36.2	13.1	0	4.27	14.5	27.4	180.0	58.1	162.0	67%	1161	28.2	76.6	41634142	949.9	14.62	82	41.34	.0098
13:42	19.4	36.2	13.1	0	4.27	14.7	27.4	180.1	58.7	161.9	67%	1161	28.2	76.6	41665165	951.0	14.62	82	41.67	.0098
13:43	19.5	36.1	13.1	0	4.27	14.8	27.3	179.4	59.0	161.9	67%	1161	28.2	76.5	41618583	949.3	14.62	82	41.52	.0096
13:44	19.6	35.9	13.1	0	4.27	14.8	27.2	178.5	59.3	162.1	68%	1162	28.2	76.6	41654246	948.6	14.62	83	41.32	.0100
13:45	20.5	36.1	13.1	0	4.26	15.5	27.3	179.9	62.2	162.8	68%	1162	28.2	76.8	41747277	951.5	14.62	83	40.59	.0097
13:46	21.3	35.7	13.1	0	4.26	16.1	27.0	177.7	64.5	161.7	67%	1162	28.2	76.7	41690166	952.0	14.62	82	41.43	.0098
13:47	21.7	35.3	13.1	0	4.26	16.4	26.7	175.7	65.7	161.7	67%	1162	28.2	76.7	41681985	948.9	14.62	82	42.17	.0099
13:48	21.2	35.5	13.1	0	4.26	16.0	26.9	176.9	64.3	162.2	68%	1163	28.2	76.8	41743672	947.6	14.62	82	42.25	.0099
13:49	20.3	35.8	13.1	0	4.27	15.4	27.1	178.1	61.5	162.2	68%	1162	28.2	76.6	41662427	945.4	14.62	81	42.75	.0096
Averages:	21.2	35.3	13.1	0.0	4.3	16.0	26.7	175.7	64.1	161.9	67%	1159.2	28.2	76.5	41623927	949.8	14.6	82	42.77	0.010

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb. Temp. (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 5: 14:12 - 14:36																				
14:12	1.6	31.3	12.8	0	4.43	1.2	22.8	200.0	6.2	236.4	99%	1128	0.8	102.2	53516518	1236.6	14.62	82	41.70	.0098
14:13	1.5	31.4	12.8	0	4.43	1.1	22.9	200.2	5.8	235.3	98%	1128	0.8	102.0	53409178	1227.3	14.62	82	41.76	.0098
14:14	1.3	31.8	12.7	0	4.45	0.9	22.9	200.5	5.0	236.1	98%	1130	0.8	102.1	52818190	1227.0	14.62	82	41.56	.0097
14:15	1.1	32.4	12.7	0	4.45	0.8	23.3	204.5	4.2	236.9	99%	1131	0.8	102.2	52863187	1227.5	14.62	82	40.70	.0094
14:16	0.8	32.6	12.7	0	4.46	0.6	23.5	206.2	3.1	236.4	99%	1131	0.8	102.4	52985571		14.61			
14:17	0.9	32.5	12.7	0	4.45	0.6	23.4	206.5	3.5	237.9	99%	1130	0.8	102.9	53205881		14.62			
14:18	1.2	32.5	12.7	0	4.46	0.9	23.4	207.1	4.7	238.9	100%	1132	0.8	103.2	53363214		14.62			
14:19	1.2	32.2	12.7	0	4.46	0.9	23.2	205.1	4.7	238.6	99%	1133	0.8	103.1	53340274		14.61			
14:20	1.4	32.0	12.7	0	4.46	1.0	23.0	203.9	5.4	239.3	100%	1133	0.8	103.2	53360641	1226.7	14.61	81	40.76	.0091
14:21	1.6	32.0	12.7	0	4.45	1.2	23.0	203.5	6.2	238.2	99%	1134	0.8	103.0	53269804	1226.4	14.62	81	40.94	.0092
14:22	0.8	31.8	12.7	0	4.46	0.6	22.9	202.1	3.1	238.3	99%	1135	0.8	102.9	53239457	1228.3	14.62	81	41.04	.0093
14:23	1.7	31.7	12.7	0	4.45	1.2	22.8	201.7	6.6	238.5	99%	1134	0.8	103.0	53292341	1226.2	14.62	80	41.87	.0092
14:24	1.3	31.8	12.7	0	4.46	0.9	22.9	202.3	5.0	237.6	99%	1135	0.8	103.0	53286288	1226.0	14.62	81	43.19	.0096
14:25	1.7	32.2	12.7	0	4.46	1.2	23.2	204.5	6.6	237.6	99%	1135	0.8	102.8	53177514	1223.7	14.61	81	43.94	.0099
14:26	1.6	32.3	12.7	0	4.46	1.2	23.2	205.3	6.2	236.8	99%	1135	0.8	102.9	53232692	1221.7	14.61	81	43.99	.0098
14:27	1.7	32.3	12.7	0	4.46	1.2	23.2	205.4	6.6	238.8	100%	1135	0.8	103.0	53261141	1218.8	14.61	80	43.74	.0096
14:28	1.7	32.4	12.7	0	4.47	1.2	23.3	206.2	6.6	238.3	99%	1135	0.8	103.1	53308600	1225.7	14.62	81	43.92	.0098
14:29	1.4	32.7	12.7	0	4.46	1.0	23.5	208.2	5.4	238.9	100%	1135	0.8	103.1	53326079	1222.4	14.62	81	43.81	.0097
14:30	1.4	32.7	12.7	0	4.47	1.0	23.5	208.3	5.4	238.7	99%	1135	0.8	103.1	53338076	1225.1	14.61	80	44.30	.0097
14:31	1.6	32.7	12.7	0	4.46	1.2	23.5	208.6	8.2	238.2	99%	1135	0.8	103.3	53439797	1220.6	14.62	80	44.68	.0096
14:32	1.7	32.7	12.7	0	4.46	1.2	23.5	208.6	6.6	237.5	99%	1135	0.6	103.3	53436176	1224.2	14.61	80	44.94	.0099
14:33	1.6	32.5	12.7	0	4.46	1.2	23.4	207.2	6.2	238.6	99%	1138	0.6	103.2	53397962		14.61			
14:34	1.7	32.5	12.7	0	4.46	1.2	23.4	207.0	6.6	237.8	99%	1136	0.8	103.1	53331635		14.62			
14:35	1.7	32.5	12.7	0	4.46	1.2	23.4	206.9	6.6	237.4	99%	1136	0.8	103.1	53322456	1224.0	14.62	82	42.05	.0096
14:36	1.7	32.3	12.7	0	4.45	1.2	23.2	205.2	6.6	237.3	99%	1136	0.8	102.9	53214969	1222.8	14.62	81	42.28	.0096
Averages:	1.4	32.2	12.7	0.0	4.5	1.0	23.2	205.0	5.6	237.8	99%	1133.5	0.8	102.9	53269506	1225.4	14.6	81	42.69	0.010

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press (psia)	Amb. Temp. (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 6a: 14:56 - 15:20																				
14:56	1.7	32.0	12.7	0	4.43	1.2	23.0	203.1	6.6	237.0	99%	1136	0.1	102.8	53158335	1220.4	14.61	82	41.50	.0097
14:57	1.8	31.7	12.7	0	4.44	1.3	22.8	201.0	6.9	236.4	99%	1136	0.2	102.7	53104278	1225.0	14.61	82	41.78	.0096
14:58	1.8	31.8	12.7	0	4.45	1.3	22.9	201.5	6.9	236.9	99%	1137	0.1	102.6	53067328	1228.3	14.61	83	41.41	.0100
14:59	1.8	32.1	12.7	0	4.45	1.3	23.1	203.2	6.9	235.4	98%	1136	0.1	102.5	53014273	1223.5	14.61	83	40.73	.0097
15:00	1.8	32.1	12.7	0	4.45	1.3	23.1	203.4	6.9	237.1	99%	1135	0.1	102.6	53064605	1225.3	14.61	82	40.31	.0093
15:01	1.6	32.1	12.7	0	4.45	1.2	23.1	203.8	6.2	237.5	99%	1135	0.1	102.8	53161737	1222.0	14.61	82	40.65	.0093
15:02	1.7	32.0	12.7	0	4.45	1.2	23.0	203.6	6.6	237.7	99%	1135	0.1	103.0	53280558	1224.2	14.61	81	40.98	.0093
15:03	1.8	32.0	12.7	0	4.45	1.3	23.0	203.6	7.0	237.8	99%	1135	0.1	103.0	53276875	1223.1	14.61	81	41.45	.0094
15:04	1.7	32.0	12.7	0	4.45	1.2	23.0	203.5	6.6	236.9	99%	1135	0.1	103.0	53256579	1227.0	14.61	82	41.77	.0096
15:05	1.9	31.7	12.7	0	4.45	1.4	22.8	201.7	7.4	237.6	99%	1135	0.1	103.0	53277456	1225.3	14.61	81	42.16	.0096
15:06	1.8	31.4	12.7	0	4.45	1.3	22.6	199.8	7.0	237.4	99%	1135	0.1	103.0	53291059	1228.3	14.61	82	43.07	.0099
15:07	1.8	31.7	12.7	0	4.45	1.3	22.8	201.5	7.0	237.7	99%	1136	0.1	102.9	53244117	1227.4	14.61	82	42.70	.0098
15:08	1.8	31.7	12.7	0	4.46	1.3	22.8	201.1	7.0	236.6	99%	1136	0.1	102.7	53130257	1221.9	14.61	82	42.42	.0098
15:09	1.7	32.0	12.7	0	4.46	1.2	23.0	203.1	6.8	237.5	99%	1135	0.1	102.8	53148185	1222.8	14.61	81	41.83	.0093
15:10	1.8	31.9	12.7	0	4.45	1.3	23.0	202.9	7.0	237.5	99%	1135	0.2	103.0	53276931	1228.4	14.61	81	42.56	.0094
15:11	1.9	31.8	12.7	0	4.46	1.4	22.9	202.2	7.4	237.6	99%	1135	0.1	103.0	53255096	1224.8	14.61	81	42.70	.0096
15:12	1.7	32.1	12.7	0	4.46	1.2	23.1	204.2	6.6	237.8	99%	1136	0.1	103.0	53288040	1229.0	14.61	82	42.69	.0098
15:13	1.8	32.0	12.7	0	4.46	1.3	23.0	203.2	7.0	236.6	99%	1135	0.1	102.6	53161531	1226.5	14.61	82	41.94	.0096
15:14	1.7	31.9	12.7	0	4.45	1.2	23.0	202.8	6.6	238.4	99%	1135	0.1	102.9	53240131	1225.9	14.61	81	42.15	.0094
15:15	1.7	31.7	12.7	0	4.46	1.2	22.8	201.5	6.6	236.7	99%	1136	0.1	102.9	53236536	1224.6	14.61	83	43.05	.0101
15:16	1.9	32.1	12.7	0	4.45	1.4	23.1	203.9	7.3	236.8	99%	1136	0.1	102.8	53194989	1220.6	14.61	83	42.48	.0101
15:17	1.8	31.7	12.7	0	4.45	1.3	22.8	200.8	6.9	236.0	98%	1136	0.1	102.6	53052064	1226.8	14.61	83	39.95	.0095
15:18	1.8	31.5	12.7	0	4.45	1.3	22.7	199.5	6.9	236.8	99%	1136	0.1	102.5	53044155	1221.9	14.61	82	39.61	.0092
15:19	1.8	31.8	12.7	0	4.45	1.3	22.9	201.8	6.9	237.0	99%	1137	0.2	102.6	53091823	1222.9	14.61	84	40.27	.0101
15:20	1.9	31.9	12.7	0	4.45	1.4	23.0	201.7	7.3	236.3	98%	1137	0.1	102.4	52948314	1220.8	14.61	83	39.08	.0093
Averages:	1.8	31.9	12.7	0.0	4.5	1.3	22.9	202.3	6.9	237.0	99%	1135.7	0.1	102.8	53171410	1224.7	14.6	82	41.57	0.010

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb. Temp. (F)	Rel Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 6: 15:35 - 15:59																				
15:35	1.8	31.7	12.7	0	4.45	1.3	22.8	201.6	7.0	237.0	99%	1135	0.1	103.0	53251958	1227.2	14.61	82	43.36	0099
15:36	1.9	31.7	12.7	0	4.45	1.4	22.8	201.6	7.4	237.0	99%	1135	0.1	103.0	53262846	1226.7	14.61	82	43.16	.0099
15:37	1.8	31.6	12.7	0	4.45	1.3	22.7	200.9	7.0	236.5	99%	1135	0.1	102.9	53240214	1221.9	14.61	82	43.43	.0100
15:38	1.8	31.7	12.7	0	4.45	1.3	22.8	201.5	7.0	237.0	99%	1135	0.2	102.9	53230881	1224.9	14.61	81	43.06	.0097
15:39	1.8	31.8	12.7	0	4.46	1.3	22.9	202.3	7.0	237.1	99%	1136	0.1	103.0	53285100	1225.8	14.61	81	43.45	0099
15:40	1.8	31.6	12.7	0	4.45	1.3	22.7	200.8	7.0	236.2	98%	1136	0.1	102.9	53209389	1224.1	14.61	83	43.35	.0103
15:41	1.8	31.0	12.7	0	4.45	1.3	22.3	196.5	6.9	235.5	98%	1138	0.1	102.6	53075615	1228.1	14.61	84	42.88	.0107
15:42	1.8	31.1	12.7	0	4.45	1.3	22.4	196.7	6.9	235.4	98%	1136	0.1	102.4	52974561	1216.2	14.61	83	40.77	.0097
15:43	1.7	31.4	12.7	0	4.45	1.2	22.6	199.2	6.6	236.9	99%	1136	0.1	102.7	53141515	1221.1	14.61	82	41.65	.0098
15:44	1.8	31.4	12.7	0	4.45	1.3	22.6	199.2	7.0	237.0	99%	1136	0.1	102.7	53133177	1222.2	14.61	82	41.64	.0097
15:45	1.8	31.3	12.7	0	4.45	1.3	22.5	198.5	8.9	236.6	99%	1136	0.1	102.7	53109613		14.61			
15:46	1.8	31.4	12.7	0	4.45	1.3	22.6	199.0	6.9	237.9	99%	1136	0.2	102.8	53085035	1225.3	14.61	82	41.68	.0096
15:47	1.8	31.6	12.7	0	4.46	1.3	22.7	200.8	7.0	237.1	99%	1135	0.1	102.9	53220798		14.61			
15:48	1.8	31.6	12.7	0	4.46	1.3	22.7	201.0	7.0	236.9	99%	1135	0.2	103.0	53278423		14.61			
15:49	1.8	31.4	12.7	0	4.45	1.3	22.6	199.5	7.0	237.0	99%	1136	0.2	102.9	53202719		14.61			
15:50	1.8	31.3	12.7	0	4.45	1.3	22.5	199.0	7.0	237.0	99%	1136	0.1	102.9	53246832		14.61			
15:51	1.8	31.3	12.7	0	4.45	1.3	22.5	198.6	7.0	237.2	99%	1136	0.2	102.7	53140971		14.61			
15:52	1.8	31.2	12.7	0	4.45	1.3	22.4	198.2	7.0	237.7	99%	1136	0.2	102.9	53214973		14.61			
15:53	1.8	31.4	12.7	0	4.45	1.3	22.8	199.3	7.0	236.9	99%	1136	0.2	102.8	53162159		14.61			
15:54	1.8	31.4	12.7	0	4.46	1.3	22.6	199.5	7.0	236.9	99%	1136	0.1	102.9	53206571		14.61			
15:55	1.8	31.6	12.7	0	4.46	1.3	22.7	200.4	6.9	236.1	98%	1136	0.1	102.7	53120580		14.61			
15:56	1.8	31.5	12.7	0	4.45	1.3	22.7	200.1	7.0	236.8	99%	1136	0.1	102.9	53200292	1230.3	14.61	82	42.50	.0097
15:57	1.9	31.5	12.7	0	4.45	1.4	22.7	199.9	7.3	237.4	99%	1136	0.2	102.7	53144692	1226.7	14.61	82	42.73	.0098
15:58	1.8	31.7	12.7	0	4.46	1.3	22.8	201.1	7.0	237.5	99%	1135	0.2	102.7	53138027	1225.4	14.61	81	42.59	.0096
15:59	1.8	31.7	12.7	0	4.46	1.3	22.8	201.4	7.0	237.6	99%	1135	0.1	102.8	53198824	1225.7	14.61	81	43.11	.0096
Averages:	1.8	31.5	12.7	0.0	4.5	1.3	22.6	199.9	7.0	237.0	99%	1135.7	0.1	102.8	53179031	1224.8	14.6	82	42.62	0.010

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press (psia)	Amb. Temp (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 7: 16:17 - 17:17																				
16:17	1.8	30.9	12.8	0	4.44	1.3	22.5	198.9	7.1	236.4	99%	1136	0.1	103.0	53915131		14.61			
16:18	1.8	31.0	12.8	0	4.44	1.3	22.6	199.6	7.1	237.7	99%	1136	0.1	103.0	53919785	1225.1	14.61	81	46.34	.0104
16:19	1.8	30.8	12.7	0	4.45	1.3	22.2	195.6	7.0	236.7	99%	1135	0.2	102.8	53190008	1223.7	14.61	81	45.37	.0103
16:20	1.9	30.9	12.7	0	4.45	1.4	22.2	196.2	7.3	236.8	99%	1135	0.1	102.8	53169014	1223.6	14.61	81	45.10	.0103
16:21	1.8	31.1	12.7	0	4.45	1.3	22.4	197.4	7.0	237.2	99%	1135	0.1	102.8	53159242	1224.6	14.61	81	45.13	.0101
16:22	1.8	31.1	12.7	0	4.45	1.3	22.4	197.5	7.0	237.7	99%	1135	0.1	102.8	53176930	1226.2	14.61	81	45.20	.0101
16:23	1.9	31.2	12.7	0	4.45	1.4	22.4	198.3	7.3	237.0	99%	1135	0.2	102.9	53221031	1226.2	14.61	81	45.20	.0101
16:24	1.8	31.3	12.7	0	4.45	1.3	22.5	198.8	7.0	237.0	99%	1135	0.2	102.9	53206634	1224.4	14.61	81	45.59	.0103
16:25	1.8	31.2	12.7	0	4.45	1.3	22.4	198.3	7.0	235.9	98%	1136	0.2	102.9	53220525	1225.9	14.61	81	45.16	.0103
16:26	1.8	31.1	12.7	0	4.45	1.3	22.4	197.3	7.0	236.9	99%	1135	0.2	102.7	53138441		14.61			
16:27	1.8	31.3	12.7	0	4.46	1.3	22.5	199.2	7.0	237.2	99%	1135	0.2	103.0	53292763		14.61			
16:28	1.8	31.1	12.7	0	4.45	1.3	22.4	197.6	7.0	238.0	99%	1135	0.1	102.9	53219725	1226.6	14.61	81	45.15	.0100
16:29	1.9	31.1	12.7	0	4.45	1.4	22.4	198.1	7.4	238.3	99%	1135	0.1	103.1	53336067	1223.3	14.61	81	45.36	.0100
16:30	1.9	31.1	12.7	0	4.45	1.4	22.4	198.3	7.4	238.3	99%	1135	0.1	103.2	53405653	1230.0	14.61	81	45.61	.0102
16:31	1.8	31.0	12.7	0	4.45	1.3	22.3	197.4	7.0	237.5	99%	1135	0.2	103.1	53323013	1229.2	14.61	81	45.53	.0101
16:32	1.8	31.2	12.7	0	4.46	1.3	22.4	198.3	7.0	237.9	99%	1135	0.1	102.9	53238892	1226.7	14.61	81	46.05	.0102
16:33	1.9	31.1	12.7	0	4.46	1.4	22.4	197.5	7.3	237.7	99%	1135	0.1	102.8	53194014	1226.5	14.61	81	46.28	.0102
16:34	1.8	31.1	12.7	0	4.46	1.3	22.4	197.5	7.0	237.8	99%	1135	0.1	102.8	53190589	1225.1	14.61	80	46.33	.0103
16:35	1.8	31.3	12.7	0	4.46	1.3	22.5	199.0	7.0	238.3	99%	1135	0.1	102.9	53236011	1226.8	14.61	80	46.30	.0102
16:36	1.9	31.2	12.7	0	4.46	1.4	22.4	198.5	7.4	237.8	99%	1134	0.1	103.0	53294386	1227.6	14.61	80	46.14	.0101
16:37	1.9	31.3	12.7	0	4.46	1.4	22.5	199.4	7.4	238.0	99%	1134	0.2	103.2	53356355	1229.5	14.60	80	47.08	.0101
16:38		31.2	12.7	0	4.46		22.4	199.0		238.6	99%	1134	0.2	103.3	53411174	1228.6	14.61	80	47.81	.0104
16:39	1.7	31.0	12.7	0	4.46	1.2	22.3	197.7	8.6	238.3	99%	1135	0.2	103.3	53417713	1228.1	14.61	80	47.90	.0105
16:40	1.9	31.0	12.7	0	4.45	1.4	22.3	197.6	7.4	237.8	99%	1135	0.2	103.2	53379197	1227.7	14.61	80	47.94	.0105
16:41	1.9	30.9	12.7	0	4.46	1.4	22.2	196.9	7.4	238.6	99%	1135	0.1	103.2	53366588	1224.7	14.61	80	47.83	.0105
16:42	1.8	30.9	12.7	0	4.46	1.3	22.2	196.6	7.0	238.1	99%	1135	0.2	103.0	53296730	1226.2	14.61	80	47.58	.0104
16:43	1.9	31.0	12.7	0	4.46	1.4	22.3	197.5	7.4	237.9	99%	1135	0.1	103.2	53364232	1226.4	14.61	80	47.52	.0103
16:44	1.8	31.1	12.7	0	4.46	1.3	22.4	198.2	7.0	238.1	99%	1135	0.2	103.2	53365546	1226.4	14.61	80	47.52	.0103
16:45	1.8	31.2	12.7	0	4.46	1.3	22.4	198.7	7.0	238.5	99%	1135	0.1	103.1	53336517	1226.4	14.61	80	47.52	.0103
16:46	1.8	31.1	12.7	0	4.46	1.3	22.4	197.8	7.0	238.2	99%	1135	0.2	103.0	53277239	1228.3	14.61	80	47.71	.0104
16:47	1.8	31.1	12.7	0	4.46	1.3	22.4	198.1	7.0	238.1	99%	1135	0.1	103.1	53342965	1227.0	14.61	80	47.99	.0105
16:48	1.9	31.2	12.7	0	4.46	1.4	22.4	198.8	7.4	238.7	99%	1134	0.1	103.1	53352160	1226.0	14.61	80	48.38	.0104
16:49	1.9	31.3	12.7	0	4.46	1.4	22.5	199.4	7.4	238.3	99%	1135	0.2	103.1	53349074	1227.1	14.61	80	46.64	.0106
16:50	1.8	31.1	12.7	0	4.46	1.3	22.4	198.3	7.0	237.7	99%	1134	0.2	103.2	53398850	1228.8	14.61	80	47.88	.0105
16:51	1.8	30.9	12.7	0	4.46	1.3	22.2	196.9	7.0	237.4	99%	1134	0.1	103.2	53377018	1228.4	14.61	80	48.04	.0103
16:52	1.8	30.9	12.7	0	4.46	1.3	22.2	197.1	7.0	238.2	99%	1134	0.2	103.3	53433826	1230.4	14.61	80	48.47	.0105
16:53	1.8	30.9	12.7	0	4.46	1.3	22.2	197.2	7.0	238.6	99%	1134	0.2	103.3	53442327	1230.0	14.61	80	48.28	.0104
16:54	1.8	31.1	12.7	0	4.46	1.3	22.4	198.2	7.0	237.2	99%	1135	0.2	103.2	53370854	1229.9	14.61	81	47.63	.0106
16:55	2.0	31.3	12.7	0	4.46	1.4	22.5	199.3	7.8	237.8	99%	1135	0.2	103.1	53318865	1226.1	14.60	81	46.40	.0103
16:56	1.9	31.2	12.7	0	4.45	1.4	22.4	198.6	7.4	238.0	99%	1135	0.1	103.0	53301312	1227.2	14.61	81	45.12	.0102
16:57	1.8	30.8	12.7	0	4.45	1.3	22.2	195.6	7.0	238.0	99%	1135	0.1	102.8	53198805		14.61			
16:58	1.8	31.0	12.7	0	4.46	1.3	22.3	197.0	7.0	237.4	99%	1135	0.1	102.9	53228513		14.61			
16:59	1.8	31.1	12.7	0	4.47	1.3	22.4	197.6	7.0	236.7	99%	1136	0.2	102.9	53212581		14.61			
17:00	1.8	31.7	12.7	0	4.45	1.3	22.8	201.0	6.9	236.5	99%	1136	0.2	102.7	53117368	1223.6	14.61	83	43.59	.0105
17:01	1.7	31.1	12.7	0	4.45	1.2	22.4	196.5	6.5	234.9	98%	1138	0.2	102.3	52906162	1219.8	14.60	85	41.49	.0104
17:02	1.9	31.0	12.7	0	4.45	1.4	22.3	196.0	7.3	234.9	98%	1136	0.1	102.4	52957915	1215.3	14.60	83	40.05	.0095
17:03	1.8	31.0	12.7	0	4.46	1.3	22.3	196.4	6.9	235.8	98%	1135	0.1	102.6	53070240	1223.9	14.60	82	41.81	.0096
17:04	1.9	30.9	12.7	0	4.46	1.4	22.2	196.6	7.4	237.1	99%	1135	0.1	103.0	53279970	1226.5	14.61	80	43.36	.0095
17:05	1.8	31.0	12.7	0	4.45	1.3	22.3	197.2	7.0	238.0	99%	1136	0.1	103.0	53289449	1224.9	14.60	82	44.73	.0104
17:06	1.9	30.8	12.7	0	4.46	1.4	22.2	195.0	7.3	235.0	98%	1137	0.2	102.5	53015792	1221.1	14.61	83	43.03	0104
17:07	1.9	31.0	12.7	0	4.45	1.4	22.3	196.3	7.3	236.9	99%	1136	0.2	102.5	53036953	1219.6	14.61	81	42.56	.0097
17:08	1.9	31.1	12.7	0	4.46	1.4	22.4	197.1	7.3	236.2	98%	1136	0.1	102.6	53080130	1221.2	14.61	82	42.87	.0098
17:09	1.9	31.6	12.7	0	4.46	1.4	22.7	200.5	7.3	237.3	99%	1135	0.1	102.7	53143228	1226.1	14.61	80	43.56	.0096
17:10	1.8	31.3	12.7	0	4.46	1.3	22.5	198.8	7.0	236.2	98%	1136	0.2	102.9	53202065	1224.6	14.61	81	45.07	.0101
17:11	1.8	31.5	12.7	0	4.46	1.3	22.7	200.3	7.0	238.0	99%	1135	0.2	102.9	53250348	1224.7	14.61	80	44.59	.0098
17:12	1.8	31.5	12.7	0	4.46	1.3	22.7	200.7	7.0	238.1	99%	1135	0.2	103.2	53361785	1226.8	14.60	80	45.21	.0100
17:13	1.9	31.4	12.7	0	4.46	1.4	22.6	200.3	7.4	238.2	99%	1134	0.2	103.3	53413116	1229.2	14.60	79	46.80	.0099
17:14	1.8	31.3	12.7	0	4.46	1.3	22.5	200.0	7.0	238.8	100%	1134	0.1	103.5	53516530	1232.7	14.60	80	47.46	.0103
17:15	1.8	31.2	12.7	0	4.46	1.3	22.4	199.2	7.0	238.4	99%	1134	0.2	103.4	53469008	1226.2	14.61	80	46.38	.0100
17:16	1.8	31.1	12.7	0	4.46	1.3	22.4	198.5	7.0	237.5	99%	1134	0.2	103.3	53454971	1229.0	14.60	80	46.27	.0100
17:17	1.9	31.0	12.7	0	4.46	1.4	22.3	198.1	7.4	238.9	100%	1134	0.2	103.5	53514217	1229.1	14.61	79	46.91	.0100
Averages:	1.8	31.1	12.7	0.0	4.5	1.3	22.4	198.0	7.1	237.5	1.0	1135.0	0.2	103.0	53295500.7	1226.2	14.6	81	45.91	0.010

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Load (%)	Exh. Temp (F)	IGV Pos. (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb. Temp. (F)	Rel Humidity (%)	Specific Humidity (lb h2o/lb air)
Run 8: 17:37 - 18:37																				
17:37	1.9	31.1	12.7	0	4.45	1.4	22.4	198.7	7.4	239.9	100%	1133	0.1	103.4	53503925		14.61			
17:38	1.8	31.0	12.7	0	4.45	1.3	22.3	198.0	7.0	238.4	99%	1134	0.2	103.4	53494438		14.61			
17:39	1.9	30.9	12.7	0	4.45	1.4	22.2	197.7	7.4	238.6	99%	1133	0.2	103.6	53594881		14.60			
17:40	1.9	30.9	12.7	0	4.46	1.4	22.2	197.7	7.4	239.2	100%	1133	0.1	103.6	53571653	1230.2	14.60	79	48.90	.0102
17:41	1.8	31.0	12.7	0	4.46	1.3	22.3	198.4	7.0	240.0	100%	1134	0.1	103.6	53610327	1230.9	14.60	79	49.10	.0103
17:42	2.0	31.0	12.7	0	4.46	1.4	22.3	198.5	7.8	239.8	100%	1133	0.1	103.7	53636373	1233.7	14.60	79	49.18	.0103
17:43	1.8	31.0	12.7	0	4.46	1.3	22.3	198.3	7.0	239.5	100%	1134	0.1	103.6	53568527	1235.5	14.60	79	49.25	.0103
17:44	1.9	31.1	12.7	0	4.46	1.4	22.4	199.3	7.4	238.1	99%	1134	0.2	103.8	53669996	1235.5	14.60	79	49.25	.0103
17:45	1.9	31.2	12.7	0	4.46	1.4	22.4	199.6	7.4	239.6	100%	1134	0.2	103.6	53590375	1235.5	14.60	79	49.25	.0103
17:46	1.9	31.1	12.7	0	4.46	1.4	22.4	199.0	7.4	238.8	100%	1134	0.2	103.6	53603993	1232.7	14.60	79	49.21	.0102
17:47	1.8	31.3	12.7	0	4.46	1.3	22.5	200.2	7.0	239.0	100%	1133	0.2	103.6	53571736	1232.9	14.60	78	49.26	.0102
17:48	1.8	31.1	12.7	0	4.46	1.3	22.4	198.9	7.0	239.4	100%	1133	0.1	103.6	53566625	1235.9	14.60	79	49.79	.0104
17:49	1.9	31.0	12.7	0	4.46	1.4	22.3	198.2	7.4	238.5	99%	1133	0.1	103.5	53544028	1233.0	14.60	79	49.80	.0104
17:50	1.9	31.0	12.7	0	4.46	1.4	22.3	198.2	7.4	238.5	99%	1133	0.1	103.5	53544028	1233.0	14.60	79	49.80	.0104
17:51	1.9	31.1	12.7	0	4.46	1.4	22.4	199.1	7.4	239.3	100%	1133	0.2	103.6	53608879	1234.6	14.60	79	49.85	.0104
17:52	1.8	31.1	12.7	0	4.46	1.3	22.4	199.2	7.0	239.3	100%	1133	0.2	103.7	53641405	1232.4	14.60	79	49.99	.0104
17:53	1.9	31.0	12.7	0	4.46	1.4	22.3	198.7	7.4	239.8	100%	1133	0.2	103.8	53679768	1235.1	14.60	78	49.94	.0103
17:54	1.9	31.0	12.7	0	4.47	1.4	22.3	198.6	7.4	239.7	100%	1133	0.1	103.7	53661626		14.60			
17:55	1.9	31.1	12.7	0	4.47	1.4	22.4	199.2	7.4	239.5	100%	1133	0.1	103.7	53654783	1233.8	14.60	79	49.18	.0102
17:56	1.8	31.1	12.7	0	4.46	1.3	22.4	199.4	7.0	239.4	100%	1133	0.2	103.8	53694582	1235.6	14.60	79	48.71	.0101
17:57	1.9	31.2	12.7	0	4.46	1.4	22.4	200.1	7.4	238.7	99%	1133	0.2	103.8	53703513	1232.2	14.60	79	49.32	.0102
17:58	1.8	31.3	12.7	0	4.47	1.3	22.5	200.6	7.0	239.4	100%	1133	0.2	103.9	53718145	1234.0	14.60	78	49.86	.0102
17:59	1.8	31.3	12.7	0	4.47	1.3	22.5	200.7	7.0	239.8	100%	1133	0.1	103.8	53698074		14.60			
18:00	1.8	31.1	12.7	0	4.46	1.3	22.4	199.3	7.0	239.7	100%	1134	0.1	103.8	53665517		14.60			
18:01	1.8	31.1	12.7	0	4.46	1.3	22.4	199.3	7.0	239.6	100%	1133	0.2	103.7	53657917		14.60			
18:02	1.8	31.2	12.7	0	4.47	1.3	22.4	199.7	7.0	239.2	100%	1133	0.2	103.6	53608780		14.60			
18:03	1.9	31.2	12.7	0	4.46	1.4	22.4	199.8	7.4	239.7	100%	1133	0.1	103.7	53644613		14.60			
18:04	1.9	31.1	12.7	0	4.46	1.4	22.4	199.4	7.4	240.2	100%	1133	0.1	103.8	53693678		14.60			
18:05	1.8	31.1	12.7	0	4.47	1.3	22.4	199.4	7.0	240.0	100%	1133	0.2	103.8	53698398	1234.5	14.60	78	50.89	.0104
18:06	1.9	31.2	12.7	0	4.47	1.4	22.4	200.1	7.4	239.5	100%	1133	0.2	103.8	53716607	1233.7	14.60	78	51.01	.0104
18:07	1.8	31.2	12.7	0	4.47	1.3	22.4	200.3	7.0	239.9	100%	1133	0.1	104.0	53771086		14.60			
18:08	1.9	31.2	12.7	0	4.47	1.4	22.4	200.4	7.4	240.0	100%	1133	0.2	104.0	53798695	1231.0	14.60	78	51.48	.0103
18:09	1.8	31.4	12.7	0	4.46	1.3	22.6	201.8	7.0	240.3	100%	1133	0.1	104.1	53827724	1231.3	14.60	78	51.25	.0103
18:10	1.9	31.2	12.7	0	4.47	1.4	22.4	200.2	7.4	240.5	100%	1133	0.1	103.9	53741248	1232.8	14.60	78	51.23	.0103
18:11	1.9	31.1	12.7	0	4.47	1.4	22.4	199.9	7.4	240.4	100%	1132	0.1	104.1	53825344		14.60			
18:12	1.9	31.1	12.7	0	4.47	1.4	22.4	199.2	7.4	239.8	100%	1133	0.1	103.7	53656022		14.60			
18:13	1.8	31.0	12.7	0	4.47	1.3	22.3	198.5	7.0	240.2	100%	1132	0.2	103.7	53639037	1233.7	14.60	78	50.63	.0102
18:14	1.9	31.0	12.7	0	4.47	1.4	22.3	198.8	7.4	240.4	100%	1132	0.1	103.8	53712858	1233.4	14.60	78	51.17	.0103
18:15	1.9	31.2	12.7	0	4.47	1.4	22.4	200.3	7.4	240.7	100%	1132	0.1	103.9	53766114	1233.2	14.60	78	51.79	.0104
18:16	2.0	31.0	12.7	0	4.46	1.4	22.3	199.1	7.8	240.9	100%	1132	0.1	104.0	53799176	1235.0	14.60	77	51.59	.0103
18:17	1.9	30.7	12.7	0	4.47	1.4	22.1	197.5	7.4	240.6	100%	1132	0.2	104.2	53891576	1234.8	14.60	77	51.95	.0103
18:18	1.9	31.1	12.7	0	4.47	1.4	22.4	199.8	7.4	240.4	100%	1132	0.2	104.0	53815743	1238.3	14.60	78	52.62	.0107
18:19	1.9	31.0	12.7	0	4.47	1.4	22.3	199.0	7.4	240.4	100%	1132	0.1	104.0	53769938	1234.4	14.60	77	51.09	.0102
18:20	1.9	31.1	12.7	0	4.47	1.4	22.4	200.1	7.4	240.7	100%	1132	0.2	104.2	53875049	1235.9	14.60	77	51.91	.0104
18:21	1.9	31.3	12.7	0	4.47	1.4	22.5	201.1	7.4	240.3	100%	1132	0.2	104.0	53808454	1235.9	14.60	77	51.89	.0103
18:22	1.9	31.1	12.7	0	4.47	1.4	22.4	199.6	7.4	240.4	100%	1132	0.1	103.9	53764385	1237.9	14.60	77	51.96	.0103
18:23	1.9	31.2	12.7	0	4.47	1.4	22.4	200.4	7.4	240.4	100%	1132	0.1	104.0	53803320	1234.9	14.60	77	52.56	.0104
18:24	1.8	31.1	12.7	0	4.47	1.3	22.4	199.0	7.0	239.5	100%	1134	0.2	103.6	53592793	1234.1	14.60	79	51.24	.0109
18:25	1.8	31.0	12.7	0	4.46	1.3	22.3	198.0	7.0	238.5	99%	1134	0.2	103.4	53496253	1234.0	14.60	80	49.24	.0108
18:26	1.8	31.2	12.7	0	4.47	1.3	22.4	199.6	7.0	239.1	100%	1132	0.1	103.6	53575287	1231.2	14.60	78	47.99	.0097
18:27	1.8	31.2	12.7	0	4.47	1.3	22.4	200.5	7.0	240.0	100%	1132	0.2	104.0	53809610	1236.1	14.60	77	50.09	.0099
18:28	1.9	31.1	12.7	0	4.47	1.4	22.4	199.9	7.4	240.3	100%	1132	0.2	104.1	53825140	1233.6	14.60	77	51.28	.0101
18:29	1.9	31.3	12.7	0	4.47	1.4	22.5	201.3	7.4	240.9	100%	1132	0.1	104.1	53867069	1237.8	14.60	77	52.03	.0102
18:30	1.9	31.4	12.7	0	4.47	1.4	22.6	202.1	7.4	240.5	100%	1133	0.1	104.2	53900550	1231.3	14.60	77	52.72	.0103
18:31	2.0	31.3	12.7	0	4.47	1.4	22.5	201.5	7.8	241.1	100%	1132	0.2	104.2	53911592	1233.5	14.60	77	53.28	.0104
18:32	1.9	31.2	12.7	0	4.48	1.4	22.4	200.6	7.4	240.4	100%	1133	0.1	104.1	53854824		14.60			
18:33	1.9	31.3	12.7	0	4.47	1.4	22.5	201.0	7.4	240.4	100%	1133	0.2	103.99	53788205	1235.3	14.60	77	53.44	0104
18:34	1.9	31.1	12.7	0	4.47	1.4	22.4	199.9	7.4	240.7	100%	1132	0.2	104.07	53831919		14.60			
18:35	1.9	31.1	12.7	0	4.47	1.4	22.4	199.8	7.4	240.5	100%	1133	0.2	104.03	53811651		14.60			
18:36	1.8	31.1	12.7	0	4.47	1.3	22.4	200.1	7.0	241.1	100%	1132	0.2	104.18	53885302		14.60			
18:37	1.9	31.0	12.7	0	4.47	1.4	22.3	199.4	7.4	241.1	100%	1132	0.1	104.13	53861229	1235.6	14.60	76	53.60	.0103
Averages:	1.9	31.1	12.7	0.0	4.5	1.3	22.4	199.5	7.3	239.9	1.0	1132.8	0.2	103.8	53706465.4	1234.1	14.6	78	50.67	0.010

RAW Field Data

Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO@15%O2 ppm	NOx@15%O2 ppm	NOx (lb/hr)	CO (lb/hr)	Load (MW)	Exh. Temp (F)	IGV Pos (degrees)	Fuel Flow (KPPH)	Exh. Flow M-19 (dscfh)	Exh. Flow CT (lb/sec)	Amb. Press. (psia)	Amb. Temp (F)	Rel. Humidity (%)	Specific Humidity (lb h2o/lb air)
9:00	0.7	0.0	20.8	2	-0.02	41.3	0.0	0.0	0.0	0	93	45.0	0.00	424.15	1.0	14.66	76	64.96	.0128
9:01	0.6	0.0	20.8	2	-0.02	35.4	0.0	0.0	0.0	0	93	45.0	0.00	424.15	1.0	14.65	78	64.58	.0126
9:02	0.6	0.0	20.8	2	-0.02	35.4	0.0	0.0	0.0	0	94	45.0	0.00	424.15	1.0	14.65	78	63.92	.0124
9:03	0.6	0.0	20.8	2	-0.02	35.4	0.0	0.0	0.0	0	101	45.0	0.00	424.15	1.0	14.65	77	63.49	.0121
9:04	2.1	0.0	20.4	51	0.12	24.8	0.0	0.0	7.8	0	112	45.0	6.04	51248444.54	1.0	14.65	76	63.17	.0118
9:05	119.3	0.7	18.7	99	1.03	319.9	1.9	0.5	56.6	0	203	45.0	3.39	8529336.08	1.0	14.65	76	63.43	.0117
:06	210.7	5.1	16.1	99	1.39	444.0	10.7	5.2	129.8	0	308	45.0	5.60	8477130.79	2.5	14.65	75	63.72	.0116
:7	292.8	8.2	18.4	99	1.25	691.0	19.4	12.5	272.6	0	418	45.0	7.55	12809607.37	473.5	14.66	75	64.36	.0115
:8	337.4	7.9	18.6	99	1.08	865.5	20.3	15.4	400.3	0	465	45.0	8.85	16324615.41	473.0	14.66	74	65.49	.0116
9:09	330.2	8.1	18.3	99	1.26	749.3	18.4	20.3	502.8	0	536	45.0	12.84	20949437.91	571.8	14.66	74	66.70	.0115
9:10	231.7	11.8	19.1	34	0.5	756.5	38.0	53.2	646.8	0.0	593	45.0	16.30	38406726.96	665.4	14.66	73	66.62	.0115
9:11	2.8	8.5	19.8	0	-0.06	15.0	34.9	67.3	17.7	0.0	674	45.0	22.49	86738018.18	770.6	14.66	73	67.47	.0115
9:12	0.7	0.9	19.8	0	-0.06	3.8	4.6	11.8	5.8	0.0	690	30.4	28.40	109500481.35	911.4	14.66	73	67.28	.0115
9:13	0.7	0.1	19.8	1	-0.05	3.8	0.5	1.4	5.8	0.3	625	30.3	29.58	114074852.08	1085.2	14.66	72	67.41	.0114
9:14	0.6	-0.3	19.8	0	-0.06	3.2	-1.8	-4.0	4.9	0.2	812	30.2	29.08	112146781.76	1099.9	14.66	72	68.49	.0115
9:15	0.6	-0.1	19.8	0	-0.06	3.2	-0.5	-1.3	4.8	0.2	606	30.2	28.62	110348567.18	1097.3	14.66	72	68.76	.0114
9:16	176.4	0.1	11.1	70	0.52	106.2	0.1	0.1	157.3	0.2	601	30.1	28.35	12268825.76	1101.5	14.66	72	69.52	.0116
9:17	20.9	8.4	0.1	34	-0.05	5.9	2.4	5.7	8.7	0.1	598	30.1	28.07	5723463.50	1102.9	14.66	72	69.87	.0116
9:18	0.5	0.3	0.0	34	-0.06	0.1	0.1	0.2	0.2	0.3	596	30.1	28.22	5727763.59	1104.6	14.66	72	69.75	.0116
9:19	0.5	0.0	0.0	27	-0.06	0.1	0.0	0.0	0.2	0.3	594	30.1	27.75	5632057.29	1080.8	14.66	72	69.97	.0117
9:20	40.9	-0.2	8.0	55	0.43	18.7	-0.1	-0.2	30.3	3.9	570	14.7	30.96	10179270.06	1253.1	14.66	72	69.58	.0116
9:21	77.2	10.3	0.1	0	-0.05	21.9	2.9	7.8	35.7	4.5	544	10.9	31.19	6361134.97	1329.6	14.66	71	69.55	.0114
9:22	0.6	81.8	0.0	0	-0.06	0.2	23.0	62.7	0.3	7.0	540	10.8	31.71	6435345.67	1346.9	14.67	72	70.31	.0116
9:23	0.7	72.5	0.0	0	-0.06	0.2	20.5	58.0	0.3	11.4	543	10.7	33.02	6701787.82		14.67			
9:24	0.6	72.0	0.0	0	-0.06	0.2	20.3	59.8	0.3	16.3	550	10.7	34.28	6957176.86		14.67			
9:25	0.6	86.3	0.0	0	-0.06	0.2	24.4	75.0	0.3	21.6	559	10.6	35.85	7276137.91	1357.3	14.67	72	69.82	.0118
9:26	0.7	89.2	0.0	0	-0.06	0.2	25.2	80.4	0.4	25.8	568	10.6	37.19	7547202.99	1365.4	14.67	73	69.45	.0119
9:27	0.5	89.3	1.2	17	-0.06	0.1	26.7	89.3	0.3	30.7	579	10.5	38.91	6377434.19	1376.6	14.67	73	69.49	.0120
9:28	289.5	86.6	8.6	50	0.65	138.9	41.5	146.5	298.1	36.3	591	10.5	41.08	14166832.51	1413.5	14.66	73	68.86	.0120
9:29	99.5	30.2	0.0	0	-0.06	28.1	8.5	31.8	63.7	41.4	602	10.4	43.42	8810852.54		14.67			
9:30	87.4	2.0	0.0	0	-0.06	24.7	0.6	2.2	58.3	46.2	614	10.4	45.20	9172632.12		14.66			
9:31	88.9	0.3	0.0	0	-0.06	25.1	0.1	0.3	59.6	47.0	620	10.4	45.47	9227494.11		14.67			
9:32	89.0	0.0	0.0	0	-0.06	25.1	0.0	0.0	59.6	47.3	624	10.3	45.42	9218581.87	1407.1	14.67	73	68.32	.0119
9:33	278.1	0.0	11.8	83	0.92	180.3	0.0	0.0	425.6	47.4	624	10.3	45.16	21057660.70	1405.1	14.66	73	68.29	.0119
9:34	237.9	17.7	0.1	0	-0.04	67.5	5.0	19.5	159.5	47.8	626	10.3	45.24	9225082.60	1401.4	14.67	74	68.90	.0121
9:35	21.5	18.3	0.0	0	-0.06	6.1	5.2	20.0	14.3	47.4	627	10.2	45.16	9165363.31	1406.5	14.67	73	68.29	.0120
9:36	21.7	19.5	0.0	0	-0.06	6.1	5.5	21.3	14.4	47.2	627	10.2	45.04	9140937.70	1409.8	14.66	74	67.96	.0121
9:37	21.7	19.5	1.9	17	-0.06	6.7	6.1	23.3	15.8	46.8	631	11.5	44.74	9987591.26	1397.6	14.66	73	67.84	.0119
9:38	263.7	19.8	3.7	18	0.42	90.5	8.8	26.0	210.4	47.0	643	18.3	44.52	10977756.15	1357.8	14.68	74	68.01	.0120
9:39	47.7	37.5	0.0	0	-0.06	13.5	10.8	40.0	31.0	47.5	663	21.3	44.04	8937059.54	1301.5	14.66	74	68.65	.0122
9:40	46.2	44.3	0.0	0	-0.06	13.0	12.5	46.2	30.6	53.0	699	26.5	44.90	9111960.69		14.66			
9:41	46.3	44.7	0.0	0	-0.06	13.1	12.6	49.8	31.4	57.2	735	28.3	45.97	9329769.26	1170.8	14.67	74	68.65	.0122
9:42	254.1	44.9	9.9	63	1.34	136.3	24.1	94.3	324.7	62.1	759	28.7	45.60	17582832.30	1132.3	14.66	74	68.93	.0122
9:43	120.7	38.8	13.8	0	4.64	100.3	32.2	128.0	242.3	64.8	779	29.0	45.23	27619425.63	1104.8	14.66	74	68.06	.0122
9:44	-0.1	2.8	13.8	0	4.88	-0.1	2.2	8.8	-0.2	69.6	800	29.2	47.49	28373221.18	1063.0	14.66	74	67.40	.0120
9:45	-0.4	0.2	13.9	0	4.9	-0.3	0.2	0.7	-0.9	71.8	817	29.4	49.99	30292660.63	1131.4	14.66	74	68.14	.0124
9:46	-0.4	-0.1	13.9	0	4.93	-0.3	-0.1	-0.4	-0.9	74.1	831	29.5	50.45	30569628.73	1081.4	14.66	74	67.92	.0122
9:47	172.9	-0.1	5.5	18	1.53	66.2	0.0	-0.2	179.5	78.8	850	29.7	51.85	14281384.26	1065.8	14.66	74	68.12	.0123
9:48	55.3	28.8	0.0	0	-0.04	15.6	8.1	37.1	43.4	82.7	869	29.8	53.22	10600707.23	1058.7	14.66	74	67.90	.0124
9:49	46.7	44.7	2.0	17	-0.04	14.5	14.0	65.0	41.3	88.9	889	29.8	54.25	12174082.85	1044.0	14.66	74	67.33	.0119
9:50	440.1	45.3	15.2	99	2.86	456.5	46.9	225.3	1332.4	93.3	907	29.8	56.96	41655666.71	1042.5	14.66	74	67.63	.0120
9:51	517.0	54.9	15.1	99	2.99	525.9	55.8	275.0	1576.1	98.5	928	29.8	57.36	41946300.10	1026.6	14.66	74	67.85	.0123
9:52	488.0	50.0	14.9	99	3.11	479.9	49.2	247.1	1468.1	103.7	946	29.9	58.55	41393268.47	1022.6	14.66	74	67.50	.0122
9:53	469.8	45.3	14.8	99	3.21	454.2	43.8	224.8	1418.2	109.5	966	29.9	59.78	41554572.50	1008.6	14.66	75	67.45	.0124
9:54	424.4	38.3	14.6	99	3.36	397.5	35.9	187.8	1266.7	114.3	983	29.9	61.00	41068563.41	993.7	14.66	74	66.78	.0121
9:55	381.6	33.7	14.4	99	3.47	346.4	30.6	163.6	1127.4	118.5	1000	29.9	62.30	40661981.88	974.8	14.66	74	67.16	.0121
9:56	341.4	31.9	14.3	99	3.59	305.2	28.5	155.9	1015.8	123.6	1017	29.9	63.70	40940156.89	975.1	14.66	75	67.35	.0123
9:57	297.5	31.9	14.1	85	3.7	258.1	27.7	155.3	881.6	129.3	1038	30.0	65.37	40774879.99	965.3	14.66	74	67.17	.0121
9:58	244.3	31.4	13.9	51	3.81	205.9	26.5	151.5	717.4	133.2	1052	30.0	66.68	40405892.21	961.8	14.66	74	67.35	.0122
:59	191.6	31.2	13.7	27	3.92	157.0	25.6	150.1	560.9	138.6	1070	30.0	68.38	40281744.79	961.1	14.66	74	66.85	.0119
3:00	145.1	31.4	13.5	12	4.03	115.7	25.0	150.3	422.6	142.8	1088	30.0	69.95	40084300.81	956.4	14.66	74	67.47	.0122
10:01	99.2	32.2	13.4	4	4.14	78.0	25.3	156.5	291.6	147.5	1104	30.0	71.53	40450580.22	955.8	14.66	74	67.40	.0121
10:02	56.1	34.3	13.1	0	4.24	42.4	25.9	162.9	162.2	153.8	1120	30.0	73.15	39775268.60	956.0	14.66	74	67.00	.0121
10:03	30.8	37.4	13.0	0	4.32	23.0	27.9	179.2	89.8	158.1	1137	30.0	74.74	40130206.67	959.0	14.66	75	66.73	.0124
10:04	25.4	39.5	13.0	0	4.33	19.0	29.5	190.8	74.7	160.0	1144	30.0	75.37	40464925.59	949.8	14.66	75	65.80	.0123
10:05	24.6	38.9	13.1	0	4.32	18.6	29.4	193.7	74.5	164.7	1145	29.2	76.66	41695036.52	965.6	14.66	75	65.43	.0121
10:06	28.6	36.3	13.1	0	4.29	21.6	27.5	180.4	86.5	163.5	1143	28.9	76.52	41812186.26	963.0	14.66	75	64.92	.0119
10:07	32.0	34.8	13.1	0	4.27	24.2	26.3	172.6	96.6	164.7	1142	28.8	76.41	41548318.21	961.5	14.66	74	64.75	.0116
10:08	34.2	33.7	13.1	0	4.26	25.9	25.5	167.4	103.4	163.9	1142	28.6	76.49	41593360.06	968.5	14.66	74	65.70	.0119
10:09	35.8	33.2	13.2	0	4.25	27.3	25.4	167.1	109.1	162.7	1141	28.4	76.53	42157706.19	963.1	14.66	74	65.64	.0118
10:10	38.4	32.6	13.2	0	4.25	29.4	25.0	163.6	117.3	164.1	1140	28.3	76.30	42031858.98	963.9	14.66	75	66.04	.0123
10:11	37.9	32.1	13.2	0	4.25	29.0	24.6	161.4	118.0	163.5	1140	28.3	76.47	42121168.62	963.2	14.68	75	65.13	.0120
10:12	39.3	32.0	13.2	0	4.24	30.1	24.5	160.9	120.3	163.7	1139	28.2	76.45	42110124.18	966.8	14.65	74	64.83	.0117
10:13	41.3	31.6	13.2	0	4.23	31.6	24.2	158.9	126.4	163.8	1137	28.1	76.47	42123538.91	968.4	14.65	75	65.37	.0119
10:14	40.4	31.4	13.2	0	4.24	31.0	24.1	157.8	123.6	163.7	1137	28.1	76.42	42092893.19	966.6	14.66	75	65.49	.0121
10:15	37.5	31.4	13.1	0	4.26	28.4	23.8	156.0	113.4	163.8	1139	28.1	76.51	41606108.40	964.3	14.66	75	64.89	.0121
10:16	24.2	32.4	13.0	0	4.33	16.1	24.2	159.7	72.6	164.4	1149	28.5	76.89	41281871.85	963.8	14.66	76	64.74	.0123
10:17	21.6	35.7	13.0	0	4.32	16.1	26.7	175.7	64.7	162.9	1153	28.5	76.79	41227699.19	954.1	14.66	77	64.02	.0125
10:18	22.6	35.7	13.0	0	4.33	16.9	26.7	175.7	67.7	164.1	1156	28.6	76.76	41211154.62	953.2	14.66	76	63.21	.0122
10:19	21.9	35.4	13.0	0	4.34	16.4	26.4	174.8	65.7	163.6	1156	28.5	76.92	41300964.00	956.5	14.66	78	62.17	.0120
10:20	21.6	35.7	13.0	0	4.34	16.1	26.7	175.7	64.7	164.0	1157	28.5	76.78	41214669.17	957.4	14.66	78	61.77	.0120
10:21	21.5	35.8	13.0	0	4.34	16.1	26.7	176.1	64.4	163.9	1158	28.5	76.75	41206157.18	954.1	14.66	76	61.22	.0119
10:22	21.4	35.8	13.0	0	4.34	16.0	26.7	176.5	64.2	162.9	1159	28.5	76.92	41296859.94	952.1	14.66	76	61.33	.0118
10:23	20.9	35.8	13.0	0	4.35	15.6	26.7	176.5	62.7	163.8	1160	28.6	76.91	41294963.48	952.5	14.66	76	61.78	.0119
10:24	20.6	35.9	13.0	0	4.35	15.4	26.8	176.7	61.7	164.0	1160	28.6	76.76	41215078.82		14.66			
10:25	19.7	36.0	13.0	0	4.36	14.7	26.9	177.4	59.1	163.4	1161	28.5	76.87	41272843.34		14.66			
10:26	19.2	36.4	13.0	0	4.35	14.3	27.2	179.5	57.6	163.4	1162	28.5	76.94	41309189.31		14.66			
10:27	18.6	36.5	13.0	0	4.36	13.9	27.3	180.1	56.9	164.2	1162	28.5	76.97	41326377.08		14.66			
10:28	18.6	36.9	13.0	0	4.36	13.9	27.6	182.1	56.9	163.6	1162	28.6	76.98	41332644.32		14.66			
10:29	17.8	36.8	13.0	0	4.37	13.3	27.5	181.4	53.4	163.7	1163	28.5	76.88	41276902.84	947.2	14.66	77	60.47	.0119
10:30	17.7	37.1	13.0	0	4.38	13.2	27.7	183.0	53.1	163.5	1164	28.6	76.95	41316247.39	948.3	14.66	77	59.83	.0118
10:31	17.7	37.2	13.0	0	4.37	13.2	27.8	183.5	53.1	164.0	1165	28.5	76.94	41306625.08	949.8	14.66	77	59.50	.0117
10:32	17.6	37.4	13.0	0	4.37	13.1	27.9	184.4	52.8	163.6	1166	28.5	76.93	41304827.00	950.0	14.66	77	59.42	.0117
10:33	17.4	37.1	13.0	0	4.38	13.0	27.7	183.1	52.3	163.3	1167	28.6	77.01	41344486.72	946.8	14.66	77	59.57	.0117
10:34	16.5	37.5	12.9	0	4.38	12.2	27.7	182.7	48.9	163.3	1167	28.5	76.98	40814768.95	948.0	14.66	78	59.57	.0113
10:35	16.4	37.7	12.9	0	4.39	12.1	27.8	183.8	48.6	163.6	1168	28.8	76.92	40779569.20	941.1	14.65	77	60.45	.0119
10:36	15.4	38.0	12.9	0	4.39	11.4	28.0	185.2	45.7	164.2	1169	28.6	77.00	40826818.54	943.3	14.66	77	60.42	.0119
10:37	18.6	38.5	13.3	0	4.42	12.9	29.9	197.4	51.8	162.9	1169	28.6	76.96	42952759.06	943.6	14.66	76	59.53	.0118
10:38	4.3	33.6	13.8	0	4.9	3.6	27.9	184.5	14.4	163.1	1171	28.6	76.99	45990796.52	944.7	14.66	78	60.02	.0121
10:39	-0.3	2.9	13.8	0	4.91	-0.2	2.4	15.9	-1.0	163.3	1171	28.7	77.04	46020708.72	944.0	14.66	77	57.63	.0115
10:40	-0.5	1.3	13.8	0	4.91	-0.4	1.1	7.1	-1.7	163.7	1171	28.6	76.96	45974625.02	942.2	14.66	77	56.20	.0111
10:41	0.5	1.0	10.3	0	4.1	0.3	0.6	3.7	1.1	164.3	1171	28.7	77.06	30836466.10	944.8	14.66	77	56.40	.0111
10:42	38.9	11.3	0.0	0	0	11.0	3.2	21.1	44.2	164.4	1172	28.7	77.07	15640886.62	944.0	14.66	76	57.04	.0110
10:43	48.3	43.5	0.0	0	-0.02	13.1	12.3	81.1	52.6	163.2	1173	28.7	76.96	15617725.14	942.7	14.66	77	57.95	.0115
10:44	46.4	45.1	0.0	0	-0.03	13.1	12.7	84.1	52.7	164.1	1173	28.7	76.98	15622591.51	943.5	14.66	78	56.96	.0115
10:45	44.9	45.3	4.0	0	0.74	15.7	15.8	104.8	63.2	163.7	1174	28.7	77.18	19370234.12	940.9	14.66	78	57.03	.0116
10:46	16.8	41.3	12.9	0	4.34	12.4	30.5	201.2	49.8	163.5	1174	28.8	76.96	40801942.10	940.9	14.66	78	56.67	.0115
10:47	13.8	38.6	12.9	0	4.36	10.2	28.5	188.1	40.9	164.3	1174	28.7	76.98	40813324.71	940.9	14.66	78	56.65	.0114
10:48	14.4	38.5	12.9	0	4.36	10.6	28.4	187.7	42.7	163.5	1174	28.7	77.03	40839123.69	939.0	14.66	78	57.08	.0115
10:49	14.6	38.0	12.9	0	4.36	10.8	28.0	185.7	43.4	163.2	1174	28.7	77.21	40938137.47	943.0	14.66	78	56.67	.0116
10:50	14.3	38.0	12.9	0	4.36	10.5	28.0	185.4	42.5	164.3	1173	28.8	77.06	40853892.09	940.1	14.66	78	56.23	.0113
10:51	15.1	37.6	12.9	0	4.37	11.1	27.9	184.4	44.8	163.8	1173	28.7	77.06	40854050.09	940.7	14.66	77	56.59	.0110
10:52	14.8	38.0	12.9	0	4.36	10.9	28.0	185.5	44.0	163.9	1173	28.7	77.09	40873457.64	943.5	14.66	77	57.43	.0114
0:53	14.8	37.9	12.9	0	4.37	10.9	28.0	184.8	43.9	163.4	1173	28.7	77.03	40838011.36	943.7	14.66	77	57.15	.0113
10:54	15.0	37.9	13.0	0	4.37	11.2	28.3	187.3	45.1	162.6	1173	28.7	77.09	41387009.18	944.3	14.66	77	57.01	.0111
10:55	14.5	38.1	12.9	0	4.37	10.7	28.1	185.9	43.1	163.5	1173	28.6	77.06	40854207.56	940.6	14.66	77	56.38	.0112
10:56	14.4	38.1	13.0	0	4.37	10.6	28.5	188.2	43.3	163.3	1173	28.6	77.05	41366311.16	942.8	14.66	77	56.24	.0110
10:57	16.1	38.1	13.0	0	4.37	11.3	28.5	188.4	46.6	162.8	1174	28.7	77.14	41417804.88	942.0	14.66	78	55.45	.0112
10:58	15.5	37.8	13.0	0	4.37	11.6	28.2	186.9	46.7	164.0	1173	28.7	77.15	41421409.43	942.5	14.66	77	55.36	.0110
10:59	15.6	37.9	12.9	0	4.37	11.5	28.0	184.9	46.3	163.6	1172	28.8	77.08	40669291.42	943.0	14.66	76	54.90	.0105

Time	CO	NOx	O2	THC	CO2	CO@15%O2	NOx@15%O2	NOx	CO	Load	Exh. Temp	IGV Pos.	Fuel Flow	Exh. Flow	Exh. Flow	Amb. Press.	Amb. Temp	Rel. Humidity	Specific Humidity
	ppm	ppm	%	ppm	%	ppm	ppm	(lb/hr)	(lb/hr)	(MW)	(F)	(degrees)	(KPPH)	M-19 (dscfh)	CT (lb/sec)	(psia)	(F)	(%)	(lb H2o/lb air)
11:00	15.5	37.7	13.0	0	4.37	11.6	28.2	186.4	46.7	183.2	1172	28.7	77.13	41412487.36	943.6	14.66	77	55.49	0109
11:01	14.5	38.0	13.0	0	4.37	10.8	28.4	187.7	43.6	184.3	1173	28.8	77.04	41361268.59	945.5	14.66	78	55.61	0114
11:02	16.2	38.2	13.0	0	4.36	12.1	28.5	188.7	48.7	183.4	1172	28.7	77.06	41373868.56	944.8	14.66	78	53.31	0110
11:03	17.4	37.5	13.0	0	4.35	13.0	28.0	185.2	52.3	182.0	1174	28.7	77.04	41365332.39	947.2	14.65	78	52.94	0109
11:04	18.1	37.0	13.0	0	4.35	13.5	27.6	182.7	54.4	183.4	1172	28.7	77.03	41357810.69	945.3	14.66	77	53.63	0106
11:05	18.5	36.8	13.0	0	4.35	13.8	27.3	180.8	55.6	183.1	1171	28.7	77.06	41373242.00	941.4	14.66	75	54.71	0102
11:06	18.1	36.4	13.0	0	4.36	13.5	27.2	179.9	54.4	183.3	1170	28.7	77.09	41388025.00	945.9	14.65	75	55.50	0103
1:07	17.8	36.9	13.0	0	4.36	13.3	27.6	182.1	53.5	183.3	1170	28.7	77.00	41341496.18	943.7	14.66	75	56.46	0106
11:08	17.7	36.9	13.0	0	4.36	13.2	27.6	182.3	53.2	183.5	1170	28.7	77.04	41365430.64	945.4	14.65	78	56.70	0110
11:09	17.7	37.0	13.0	0	4.36	13.2	27.8	182.8	53.2	183.5	1170	28.7	77.06	41376109.04	946.8	14.66	78	56.27	0114
11:10	17.7	36.8	13.0	0	4.36	13.2	27.5	181.9	53.3	183.9	1171	28.7	77.12	41406299.21	944.3	14.65	77	54.97	0110
11:11	17.7	36.8	13.0	0	4.36	13.2	27.5	181.8	53.2	183.3	1170	28.7	77.06	41375691.33	946.1	14.65	78	56.57	0108
11:12	17.6	36.9	13.0	0	4.36	13.1	27.6	182.4	53.0	183.8	1170	28.7	77.10	41396000.64	943.8	14.66	78	56.24	0107
11:13	16.9	37.3	9.2	6	3.26	8.5	18.8	124.4	34.3	183.2	1170	28.7	77.04	27928222.37	943.4	14.65	78	54.44	0110
11:14	40.5	39.2	0.1	0	0	11.5	11.1	73.6	46.3	183.7	1170	28.7	77.10	15722569.23	945.4	14.65	78	53.09	0110
11:15	46.3	45.6	0.0	0	-0.03	13.1	12.9	85.2	52.7	183.8	1171	28.7	77.12	15651139.71	945.3	14.65	77	52.06	0103
11:16	46.4	46.0	1.7	0	0.13	14.3	14.1	93.4	57.4	184.0	1170	28.6	77.01	17011420.49	946.3	14.65	78	52.64	0100
11:17	15.8	37.3	13.7	0	4.83	12.9	30.8	202.4	52.2	184.2	1170	28.7	77.15	45449371.80	943.0	14.66	76	54.40	0104
11:18	-0.3	3.8	13.8	0	4.89	-0.2	3.2	20.9	-1.0	183.8	1171	28.6	77.09	46052987.19	944.2	14.65	77	54.88	0109
11:19	-0.2	1.0	13.8	0	4.9	-0.2	0.8	5.5	-0.7	183.0	1171	28.7	77.05	46027878.42	947.8	14.65	77	53.77	0108
11:20	1.8	0.5	13.5	0	4.73	1.4	0.4	2.8	5.8	183.7	1171	28.7	77.00	44134490.88	947.8	14.65	78	53.82	0110
11:21	18.5	14.1	13.0	0	4.33	13.8	10.5	69.6	55.8	183.9	1170	28.7	76.96	41320146.90	944.1	14.65	78	53.26	0110
11:22	20.4	34.1	13.0	0	4.32	15.2	25.5	168.6	81.4	182.4	1170	28.7	77.13	41409736.08	945.0	14.65	79	53.35	0111
11:23	21.8	34.7	13.1	0	4.31	16.5	26.2	173.8	68.5	183.8	1171	28.7	77.15	41961801.69	950.9	14.65	79	53.26	0111
11:24	21.8	34.5	13.1	0	4.31	16.5	26.1	172.7	66.4	183.2	1170	28.8	77.09	41919006.12	943.6	14.66	79	52.13	0109
11:25	24.7	34.2	13.1	0	4.3	18.7	25.9	171.0	75.2	183.8	1167	28.7	77.02	41883808.13	949.4	14.66	79	52.21	0110
11:26	48.4	33.7	18.0	66	1.64	94.4	68.8	452.7	379.4	183.3	1167	28.7	76.92	112508160.96	948.5	14.65	79	51.56	0108
11:27	3.6	12.2	20.7	99	0.01	106.2	359.9	2378.3	427.2	183.4	1165	28.7	76.99	1632681844.34	949.8	14.65	79	52.30	0109
11:28	0.7	1.1	20.7	98	0	20.7	32.5	214.8	83.1	183.9	1164	28.6	77.04	1633851334.33	950.8	14.65	78	52.23	0107
11:29	0.8	0.5	20.7	81	0	17.7	14.8	97.4	71.1	183.2	1161	28.5	76.92	1631239392.07	951.2	14.65	77	53.09	0104
11:30	0.8	0.3	20.7	73	0	17.7	8.9	58.4	71.1	183.5	1161	28.5	76.86	1629983481.34	950.7	14.65	78	53.37	0110
11:31	0.8	0.3	20.7	64	0	17.7	8.9	0.0	0.0	0.0	979	46.0	0.00	212.08	2.2	14.65	78	52.97	0108
11:32	0.6	0.1	20.7	48	0	17.7	3.0	0.0	0.0	0.0	964	45.6	0.00	212.08	1.3	14.65	78	53.01	0110
11:33	0.7	0.1	20.7	36	0	20.7	3.0	0.0	0.0	0.0	951	45.4	0.00	212.08	1.3	14.65	79	52.35	0110
11:34	0.6	0.1	20.7	29	0	17.7	3.0	0.0	0.0	0.0	938	45.2	0.00	212.08	1.3	14.65	79	52.03	0110
12:00	0.6	-0.2	20.8	15	-0.02	35.4	-11.8	0.0	0.0	0	765	45.0	0.0	424.15	1.3	14.66	81	47.74	0107
12:01	18.9	-0.2	19.3	96	0.65	69.7	-0.7	-0.2	11.1	0	758	45.0	3.0	8067023.46	1.0	14.66	81	48.15	0107
12:02	202.9	5.0	18.2	59	1.29	443.4	10.9	3.6	89.9	0	784	45.0	3.9	6096692.76	1.8	14.66	81	48.42	0107
12:03	288.1	9.4	18.3	99	1.27	653.8	21.3	9.5	177.0	0	832	44.9	5.2	8454972.87	2.5	14.65	80	48.83	0106
12:04	371.6	9.3	18.6	99	1.11	953.2	23.9	15.6	376.4	0	864	44.8	7.8	14009297.53	211.0	14.65	79	48.95	0104
12:05	349.9	8.5	18.4	99	1.18	825.6	20.1	18.2	406.9	0	882	44.8	9.4	15999970.12	239.5	14.65	79	49.62	0104
12:06	320.9	11.0	18.2	99	1.31	701.2	24.0	28.2	500.1	0	923	44.8	13.7	21443819.10	476.5	14.65	78	49.98	0103
12:07	304.9	15.4	18.1	99	1.35	642.5	32.5	47.0	566.0	0	927	44.8	16.9	25541124.75	473.3	14.65	78	50.71	0103
12:08	369.0	20.0	17.7	99	1.54	660.3	36.9	71.3	800.4	0	945	44.8	22.5	29844214.85	489.3	14.64	78	51.36	0105
12:09	420.5	21.6	18.2	99	1.24	818.9	47.2	124.8	1479.2	0	923	29.7	30.8	48401715.78	770.2	14.64	78	51.45	0105
12:10	403.7	23.5	18.4	99	1.16	952.7	55.6	138.9	1452.5	0.2	739	29.7	29.2	49506547.53	924.2	14.65	78	51.50	0105
12:11	402.8	26.2	18.4	99	1.15	950.8	61.8	149.5	1398.8	0.2	699	29.7	28.2	47774014.38	951.7	14.65	78	51.44	0104
12:12	402.4	28.4	18.4	99	1.17	949.7	62.3	148.4	1378.9	0.3	678	29.7	27.7	47079552.18	978.1	14.65	78	51.09	0105
12:13	395.7	27.0	18.6	99	1.06	1015.1	69.3	162.5	1627.8	3.8	634	14.3	30.7	56602277.09	1119.4	14.65	78	51.16	0106
12:14	387.6	26.5	18.6	99	1.05	994.8	68.0	160.5	1608.1	4.8	600	10.7	30.9	57064770.46	1233.7	14.65	78	51.03	0106
12:15	398.8	26.3	18.5	99	1.1	980.4	64.7	171.4	1581.6	4.8	599	10.7	30.9	54568366.71	1233.7	14.65	78	51.03	0106
12:16	418.3	28.2	18.3	99	1.18	944.7	64.0	169.7	1524.5	4.7	598	10.7	30.9	50388069.50	1231.4	14.65	79	50.88	0106
12:17	435.8	31.3	18.2	99	1.26	952.3	68.4	169.0	1602.1	9.9	591	10.6	32.2	50561510.34	1270.5	14.64	78	50.15	0104
12:18	463.1	34.7	18.0	99	1.34	942.2	70.6	208.1	1690.5	17.7	595	10.6	34.3	50227802.69	1295.8	14.64	79	49.37	0105
12:19	379.8	36.7	6.6	56	0.67	156.7	16.1	47.1	297.0	23.7	602	10.5	36.3	10759646.16	1301.4	14.64	79	48.66	0103
12:20	5.0	19.5	0.1	32	-0.04	1.4	5.5	18.2	2.8	29.6	810	10.5	38.3	7809213.57	1324.4	14.65	78	48.58	0101
12:21	0.7	5.8	0.0	24	-0.05	0.2	1.8	5.8	0.4	36.8	622	10.4	41.4	8407043.66	1370.3	14.64	80	46.72	0100
12:22	0.6	3.6	0.0	24	-0.05	0.2	1.1	4.1	0.4	45.4	837	10.3	44.5	9030815.55	1408.9	14.64	80	45.47	0100
12:23	0.4	2.6	0.0	24	-0.05	0.1	0.8	3.1	0.3	46.6	646	10.3	45.2	9156736.02	1389.5	14.64	80	45.37	0100
12:24	0.5	2.2	0.0	24	-0.05	0.1	0.8	2.4	0.3	47.1	653	10.6	45.0	9140521.26	1369.7	14.64	81	45.81	0101
12:25	0.7	1.8	0.0	40	-0.05	0.2	0.5	1.9	0.5	47.8	666	16.1	44.4	9005066.96	1309.8	14.64	80	46.25	0102
12:26	0.8	1.4	0.0	45	-0.05	0.2	0.4	1.5	0.4	47.2	681	20.3	43.9	8910493.29	1285.4	14.64	80	46.11	0102
12:27	0.6	1.2	0.0	45	-0.05	0.2	0.3	1.3	0.4	46.9	711	25.8	43.3	8787288.62	1187.3	14.64	81	45.81	0101
12:28	99.8	0.7	15.1	35	0.21	101.5	0.7	2.6	227.4	47.4	739	29.0	42.9	31356807.20	1120.5	14.64	81	46.28	0105
12:29	4.0	7.4	20.6	14	-0.06	78.7	145.5	533.5	175.5	47.5	750	29.3	42.7	6037999659.94	1098.9	14.64	81	45.52	0102
12:30	72.5	0.8	19.5	46	0.6	308.5	3.4	12.4	682.0	46.5	756	29.5	42.7	129428577.80	1088.8	14.64	80	45.66	0098
12:31	129.8	11.2	20.7	33	-0.06	3829.1	330.4	1211.3	8545.1	46.9	763	29.7	42.7	905808708.77	1075.5	14.64	80	46.88	0102
12:32	0.7	1.7	20.7	33	-0.06	20.7	50.2	190.9	47.9	52.9	778	29.7	44.4	940702010.27	1071.1	14.64	80	47.41	0105
12:33	0.6	0.8	20.7	24	-0.06	17.7	17.7	70.5	42.9	60.1	796	29.8	46.4	963525639.39	1071.2	14.64	80	47.20	0104
12:34	0.8	0.5	20.7	37	-0.06	23.6	14.6	58.8	57.2	66.3	817	29.8	46.4	984283344.24	1036.8	14.64	80	47.29	0102
12:35	418.1	4.0	16.1	88	2.42	513.9	4.9	20.8	1311.0	69.0	834	29.9	48.8	43142964.36	1140.3	14.64	80	47.25	0102
12:36	233.1	44.4	20.7	10	-0.03	6876.5	1309.8	5720.0	18279.1	78.2	857	29.9	50.9	1078963784.24	1057.3	14.64	79	47.39	0101
12:37	0.6	5.0	20.7	10	-0.06	17.7	147.5	677.2	49.5	85.0	879	29.9	53.5	113433081.96	1081.2	14.65	79	47.64	0101
12:38	1.0	1.0	19.8	40	0.27	5.4	5.4	25.3	15.4	91.8	903	29.9	56.0	211925385.85	1034.2	14.64	80	47.18	0102
12:39	368.5	6.5	14.6	99	3.32	345.1	8.1	29.8	1029.8	99.2	928	30.0	57.1	38451966.02	1030.3	14.64	80	45.88	0100
12:40	349.0	31.8	14.3	99	3.51	312.0	28.4	144.0	961.9	106.2	955	30.0	59.0	37921883.32	1007.8	14.64	80	45.19	0100
12:41	287.2	33.1	14.1	70	3.67	249.2	28.7	149.8	791.1	112.8	980	30.0	60.8	37900618.21	994.8	14.64	81	44.69	0101
12:42	210.3	32.7	13.8	30	3.64	174.8	27.2	146.1	572.1	119.3	1004	30.0	62.7	37428345.82	979.7	14.64	81	43.84	0097
12:43	137.1	32.2	13.6	10	4	110.8	26.0	145.0	375.9	127.2	1031	30.0	64.9	37720578.78	970.2	14.64	81	44.10	0099
12:44	76.1	33.2	13.3	1	4.14	59.1	25.8	148.7	207.5	134.8	1055	30.0	67.2	37509063.36	965.7	14.64	81	44.07	0098
12:45	33.5	36.1	13.1	0	4.27	25.3	27.3	162.4	91.7	140.2	1078	30.0	69.3	37689206.36	982.3	14.64	81	44.33	0099
12:46	23.5	39.4	13.1	0	4.29	17.8	29.8	183.2	66.5	147.4	1103	30.0	71.8	38945553.00	962.7	14.65	81	44.42	0099
12:47	21.1	39.5	13.0	0	4.3	15.8	29.5	187.4	60.9	154.3	1126	30.0	74.0	39742167.88	963.8	14.64	80	44.49	0097
12:48	18.0	39.5	13.0	0	4.32	13.4	29.5	188.7	52.3	155.3	1141	30.0	74.5	40012793.11	946.3	14.64	81	45.52	0101
12:49	15.9	39.4	13.0	0	4.34	11.9	29.4	188.7	48.4	156.7	1149	30.0	74.7	40112158.78	940.0	14.64	80	46.04	0101
12:50	19.4	38.8	13.1	0	4.28	14.7	29.3	188.8	57.8	157.5	1156	30.0	75.3	40962477.40	942.5	14.64	80	46.87	0102
12:51	21.1	36.7	13.1	0	4.28	16.0	27.8	181.7	63.6	180.5	1161	29.7	76.3	41466279.45	943.6	14.64	80	47.47	0102
12:52	21.6	36.3	13.1	0	4.28	16.3	27.5	181.5	65.7	163.8	1156	28.6	77.0	41866786.08	954.7	14.64	79	47.34	0100
12:53	21.3	36.0	13.1	0	4.28	16.1	27.2	179.8	64.8	163.9	1154	28.6	76.9	41827999.12	955.0	14.64	79	47.83	0101
12:54	21.3	36.0	13.1	0	4.28	16.1	27.2	180.0	64.6	162.8	1153	28.5	77.0	41864657.72	954.2	14.64	79	48.20	0103
12:55	20.8	36.0	13.1	0	4.27	15.7	27.2	180.0	63.3	164.0	1154	28.5	77.0	41883497.08	952.7	14.64	80	48.52	0104
12:56	24.1	36.5	13.1	0	4.26	18.2	26.9	177.4	73.3	163.1	1154	28.5	77.0	41859372.14	954.6	14.64	79	48.06	0102
12:57	23.4	34.8	13.1	0	4.26	17.7	26.2	172.9	71.2	162.8	1154	28.5	77.0	41852431.29	954.0	14.64	80	47.75	0103
12:58	23.7	34.9	13.1	0	4.26	17.9	26.4	173.7	71.8	161.9	1153	28.5	76.7	41690647.10	948.2	14.64	80	48.29	0106
12:59	23.4	34.6	13.1	0	4.26	17.7	26.3	172.6	70.7	161.5	1153	26.5	76.5	41598653.13	947.5	14.64	81	47.18	0106
13:00	23.8	34.9	13.1	0	4.25	17.9	26.4	173.4	71.4	162.0	1154	28.5	76.5	41609244.94	949.0	14.64	81	46.75	0104
13:01	23.9	34.7	13.1	0	4.26	18.1	26.2	172.6	72.4	161.6	1156	28.5	76.6	41655353.94	946.6	14.64	81	46.12	0104
13:02	23.5	34.8	13.1	0	4.26	17.6	26.3	172.9	71.1	161.5	1156	28.5	76.5	41611966.57	946.5	14.64	80	45.95	0101
13:03	23.0	35.0	13.1	0	4.26	17.4	26.5	173.8	69.5	162.0	1156	28.5	76.5	41588081.98	947.9	14.63	80	46.45	0101
13:04	22.8	35.2	13.1	0	4.26	17.2	26.6	175.0	69.0	161.8	1156	28.5	76.8	41637215.51	949.6	14.64	80	45.08	0100
13:05	23.6	35.1	13.1	0	4.26	17.9	26.6	174.5	71.4	161.6	1156	28.5	76.6	41633469.39	950.1	14.63	80	44.96	0099
13:06	22.9	34.6	13.1	0	4.26	17.3	26.3	173.0	69.3	161.7	1156	28.5	76.5	41624026.60	947.3	14.63	80	45.01	0097
13:07	22.1	35.2	13.1	0	4.26	16.7	26.6	174.9	68.8	161.9	1155	28.5	76.5	41606328.08	946.7	14.63	78	45.27	0094
13:08	21.5	35.4	13.1	0	4.27	16.3	26.8	176.2	65.1	161.9	1155	28.4	76.7	41687601.92	949.0	14.63	79	45.38	0096
13:09	20.5	35.8	13.1	0	4.27	15.5	27.1	178.1	62.1	161.9	1156	28.5	76.6	41667858.24	946.3	14.63	79	45.35	0096
13:10	20.6	36.0	13.1	0	4.27	15.6	27.2	178.9	62.3	161.9	1157	28.5	76.6	41630391.03	946.9	14.63	80	45.64	0099
13:11	19.9	36.1	13.1	0	4.29	15.1	27.3	179.5	60.2	161.6	1156	28.5	76.6	41649972.67	948.0	14.63	79	45.89	0098
13:12	16.0	36.7	13.1	0	4.29	13.6	27.6	182.5	54.5	162.5	1159	28.5	76.6	41650014.54	949.0	14.63	80	45.90	0100
13:13	16.4	37.3	13.1	0	4.26	13.9	28.2	185.4	56.7	162.1	1160	28.5	76.6	41633950.64	948.5	14.63	82	46.25	0107
13:14	18.7	37.1	13.1	0	4.28	14.1	28.1	184.2	66.5	161.2	1162	28.5	76.5	41561647.40	946.6	14.63	83	43.82	0105
13:15	13.0	37.1	14.1	1	4.48	11.3	32.2	211.4	45.1	161.4	1162	28.5	76.5	47733942.65	949.0	14.63	82	41.34	0095
13:16	-0.1	11.5	13.6	0	4.89	-0.1	9.6	62.8	-0.3	162.2	1162	28.5	76.6	45731773.56	946.4	14.63	82	41.85	0097
13:17	-0.5	2.0	13.8	0	4.89	-0.4	1.7	10.9	-1.7	162.5	1162	28.5	76.8	45764927.22	947.6	14.63	82	40.79	0096
13:18	-0.3	1.3	13.8	0	4.89	-0.2	1.1	7.1	-1.0	161.4	1162	28.5	76.5	45678283.27	949.1	14.63	82	39.96	0093
13:19	-0.3	1.0	13.8	0	4.9	-0.2	0.8	6.5	-1.0	161.7	1161	28.5	76.5	45686282.48	946.0	14.63	81	39.93	0091
13:20	26.6	0.9	1.5	0	0.83	8.2	0.3	1.8	32.6	161.9	1161	28.5	76.5	16733405.10	948.9	14.63	82	40.65	0095
13:21	46.3	37.3	0.0	0	-0.01	13.1	10.5	69.2	52.3	162.2	1162	28.5	76.8	15639868.70	950.0	14.63	82	39.91	0094
13:22	46.3	44.7	0.0	0	-0.03	13.1	12.6	82.9	52.3	162.2	1162	28.5	76.5	15629445.34	950.0	14.63	82	39.91	0094
13:23	46.3	45.3	1.1	0	-0.03	13.8	13.5	88.7	56.2	162.1	1162	28.5	76.6	16406538.49	947.7	14.63	82	39.85	0094
13:24	28.4	43.5	13.0	0	4.15	21.2	32.5	213.8	84.9	161.6	1161	28.5	76.6	41129926.51	948.1	14.63	82	39.53	0092

Time	CO	NOx	O2	THC	CO2	CO@15%O2	NOx@15%O2	NOx	CO	Load	Exh. Temp	IGV Pos.	Fuel Flow	Exh. Flow	Exh. Flow	Amb. Press.	Amb Temp	Rel. Humidity	Specific Humidity
	ppm	ppm	%	ppm	%	ppm	ppm	(lb/hr)	(lb/hr)	(MW)	(F)	(degrees)	(KPPH)	M-19 (dscfh)	CT (lb/sec)	(psia)	(F)	(%)	(lb h2o/lb air)
:3 25	21.5	36 1	13 1	0	4.23	16 3	27 3	179.2	65.0	162.4	1161	28.5	76.5	41564236.35	948.2	14.63	82	40.15	.0094
:3 26	21.4	35 1	13 1	0	4 24	16.2	26.6	174.3	64.7	161.6	1160	28.4	76.5	41582207.49	948.4	14.63	82	40 81	.0095
:3 27	21 6	35 0	13 1	0	4 24	16.3	26.5	173.8	65.3	161.8	1161	28.4	76.5	41596843.96	947.5	14.63	82	41.24	.0097
:3 28	22.5	34 9	13 1	0	4.24	17.0	26.4	173.4	68.0	161.8	1159	28.2	76.5	41600418.07	951.1	14.63	82	41.85	.0098
:3 29	23.4	34.5	13 1	0	4.24	17.7	26.1	171.2	70.7	161.3	1158	28.2	76.4	41564228.22	953.2	14.63	82	42.89	.0098
:3 30	24.4	34 2	13 1	0	4.24	18.5	25.9	170.0	73.8	161.9	1158	28.2	76.6	41631216.50	952.7	14.63	83	43.08	.0102
:3 31	23.5	34 0	13.1	0	4.24	17.8	25.7	169.0	71.1	161.9	1158	28.2	76.6	41635634.73	945.0	14.63	82	44.01	.0101
:3 32	22.4	34 3	13 1	0	4.25	16.9	25.9	170.3	67.7	161.8	1157	28.2	76.5	41577308.01	950.1	14.63	81	44.21	.0098
:33	23.5	34 6	13 1	0	4.24	17.8	26.2	172.1	71.1	162.6	1156	28.2	76.8	41647483.77	951.4	14.62	80	44.64	.0098
:3 34	22 1	34 5	13 1	0	4 25	16.7	26.1	171.4	66.8	161.5	1154	28.2	76.5	41603100.73	951.5	14.63	79	44.91	.0096
:3 35	21.5	34.9	13 1	0	4.25	16.3	26.4	173.2	64.9	161.7	1155	28.2	76.4	41555240.74	950.3	14.62	80	45.11	.0099
:3 36	20.8	35 3	13 1	0	4.26	15.7	26.7	175.2	62.8	161.8	1158	28.2	76.4	41559688.35	950.0	14.63	81	45.63	.0104
:3 37	19.4	35.7	13.1	0	4.26	14.7	27.0	177.3	58.7	161.6	1156	28.2	76.5	41605756.48	950.5	14.62	80	44 47	.0096
:3 38	19.5	36.0	13 1	0	4.26	14.8	27.2	178.7	58.9	162.8	1157	28.2	76.4	41570246.44	951.7	14.63	81	44.10	.0100
:3 39	19.6	36 0	13.1	0	4.26	14.8	27.2	178.7	59.2	161.9	1158	28.2	76.5	41573474.34	948.0	14.62	81	43.52	.0097
:3 40	19.7	35.8	13 1	0	4.27	14.9	27.1	177.9	59.8	161.8	1159	28.2	76.5	41623433.33	951.7	14.62	82	43.49	.0101
:3 41	19.2	36.2	13.1	0	4.27	14.5	27.4	180.0	58.1	162.0	1161	28.2	76.6	41634141.51	949.9	14.62	82	41.34	.0098
:3 42	19.4	36.2	13.1	0	4.27	14.7	27.4	180.1	58.7	161.9	1161	28.2	76.8	41565165.42	951.0	14.62	82	41.67	.0098
:3 43	19.5	36.1	13.1	0	4.27	14.8	27.3	179.4	59.0	161.9	1161	28.2	76.5	41618583.33	949.3	14.62	82	41.52	.0096
:3 44	19.8	35.9	13 1	0	4.27	14.8	27.2	178.5	59.3	162.1	1162	28.2	76.6	41654246.26	948.8	14.62	83	41.32	.0100
:3 45	20 5	36 1	13.1	0	4.26	15.5	27.3	179.9	62.2	162.8	1162	28.2	76.8	41747277.22	951.5	14.62	83	40.59	.0097
:3 46	21.3	35.7	13.1	0	4.26	16.1	27.0	177.7	64.5	161.7	1162	28.2	76.7	41690165.85	952.0	14.62	82	41.43	.0098
:3 47	21.7	35.3	13 1	0	4.26	16.4	26.7	175.7	65.7	161.7	1162	28.2	76.7	41681984.64	948.9	14.62	82	42.17	.0099
:3 48	21.2	35.5	13.1	0	4.26	16.0	26.9	176.9	64.3	162.2	1163	28.2	76.8	41743671.94	947.6	14.62	82	42.25	.0099
:3 49	20.3	35.8	13.1	0	4.27	15.4	27.1	178.1	61.5	162.2	1162	28.2	76.6	41662427.47	945.4	14.62	81	42.75	.0096
:3 50	19.5	36.3	13.1	3	4.28	14.8	27.5	180.6	59.0	162.0	1162	28.2	76.6	41659846.68	947.9	14.62	80	43.23	.0095
:3 51	38.4	36.0	0.3	0	0.42	11.0	10.3	67.8	44.0	161.4	1161	28.2	76.6	15765404.73	947.4	14.62	81	44.16	.0098
:3 52	46.3	44.0	0.0	0	-0.03	13.1	12.4	81.8	52.3	162.0	1161	28.2	76.5	15534743.78	950.2	14.62	81	44.15	.0099
:3 53	48.4	45.7	0.0	0	-0.04	13.1	12.9	85.0	52.5	162.0	1162	28.2	76.7	15571906.28	948.2	14.62	82	43.79	.0101
:3 54	48.3	45.7	0.0	0	-0.04	13.1	12.9	84.9	52.3	161.9	1163	28.2	76.8	15552188.96	947.5	14.62	82	42.82	.0099
:3 55	22.9	46.6	12.8	0	3.47	16.7	33.2	218.8	66.9	161.7	1163	28.2	76.8	40190734.59	950.3	14.62	82	42.15	.0098
:3 56	-0.5	8.8	13.8	0	4.86	-0.4	7.3	48.1	-1.7	162.4	1163	28.2	76.7	45795218.17	946.7	14.62	82	42.09	.0097
:3 57	-0.3	1.2	13.8	0	4.87	-0.2	1.0	6.6	-1.0	162.0	1164	28.2	76.7	45815021.23	947.5	14.62	82	41.82	.0096
:3 58	-0 5	0.6	13.8	0	4.87	-0.4	0.5	3.3	-1.7	161.8	1164	28.2	76.8	45852909.85	949.4	14.62	81	41.52	.0094
:3 59	-0 3	0.4	13.8	0	4.88	-0.2	0.3	2.2	-1.0	162.8	1165	28.2	76.8	45898346.57	947.0	14.62	82	41.56	.0095
:4 00	9.4	0.1	13.2	0	4.45	7.2	0.1	0.5	28.9	163.1	1166	28.2	76.9	42366374.65	946.2	14.62	82	41.79	.0096
:4 01	17.6	25.8	15.4	8	3.54	16.9	27.7	183.2	78.1	163.5	1168	28.2	77.1	59482697.45	947.6	14.62	82	40.98	.0095
:4 02	2.4	22.0	20.6	25	-0.01	47.2	432.7	2917.7	193.7	168.0	1166	27.5	78.6	1110781816.50	968.1	14.62	82	40.85	.0095
:4 03	0.5	1.5	20.7	25	-0.03	14.6	44.3	305.7	62.0	174.0	1159	25.3	80.5	1707005652.84	982.9	14.62	82	40.42	.0093
:4 04	0.6	0.4	20.7	24	-0.04	17.7	11.8	83.9	78.6	181.9	1150	22.8	82.6	1756602419.96	1018.3	14.62	82	40.48	.0094
:4 05	0.9	0.3	18.4	24	-0.04	2.1	0.7	5.2	9.4	187.5	1142	20.6	84.7	143774601.94	1034.2	14.61	81	40.51	.0092
:4 06	3.9	6.7	13 1	0	4.27	3.0	5.1	37.9	13.4	194.3	1135	18.3	87.2	47393467.02	1065.8	14.61	81	41.21	.0091
:4 07	2.4	23 4	12.9	0	4.36	1.8	17.3	132.8	8.3	202.1	1130	15.5	89.7	47548283.30	1099.4	14.61	81	42.90	.0095
:4 08	1.6	28 4	12.8	0	4.42	1.2	20.7	164.7	5.6	210.2	1124	11.4	92.7	48561915.97	1131.8	14.62	80	43.82	.0095
:4 09	1.4	31 2	12.8	0	4.42	1.0	22.7	185.8	5.1	216.5	1120	8.3	95.3	49885969.41	1162.7	14.62	81	43.72	.0099
:4 10	1.5	30 5	12.8	0	4.43	1.1	22.2	185.5	5.6	223.3	1115	4.1	97.3	50934562.00	1183.1	14.62	82	43.16	.0100
:4 11	1.4	31.2	12.8	0	4.44	1.0	22.7	195.6	5.3	231.6	1116	0.8	100.4	52555665.05	1227.9	14.62	82	42.36	.0098
:4 12	1.6	31.3	12.8	0	4.43	1.2	22.8	200.0	6.2	236.4	1128	0.6	102.2	53516517.58	1236.6	14.62	82	41.70	.0098
:4 13	1.5	31 4	12.8	0	4.43	1.1	22.9	200.2	5.8	235.3	1128	0.8	102.0	53409178.09	1227.3	14.62	82	41.78	.0098
:4 14	1.3	31 6	12.7	0	4.45	0.9	22.9	200.5	5.0	236.1	1130	0.6	102.1	52818190.39	1227.0	14.62	82	41.56	.0097
:4 15	1.1	32.4	12.7	0	4.45	0.8	23.3	204.5	4.2	236.9	1131	0.6	102.2	52863186.59	1227.5	14.62	82	40.70	.0094
:4 16	0.8	32.6	12.7	0	4.46	0.6	23.5	206.2	3.1	236.4	1131	0.6	102.4	52965571.16		14.61			
:4 17	0.9	32.5	12.7	0	4.45	0.6	23.4	206.5	3.5	237.9	1130	0.6	102.9	53205880.83		14.62			
:4 18	1.2	32.5	12.7	0	4.46	0.9	23.4	207.1	4.7	238.9	1132	0.8	103.2	53363213.91		14.62			
:4 19	1.2	32.2	12.7	0	4.46	0.9	23.2	206.1	4.7	238.6	1133	0.8	103.1	53340274.07		14.61			
:4 20	1.4	32.0	12.7	0	4.46	1.0	23.0	203.9	5.4	239.3	1133	0.6	103.2	53360641.07	1226.7	14.61	81	40.76	.0091
:4 21	1.6	32.0	12.7	0	4.45	1.2	23.0	203.5	6.2	238.2	1134	0.8	103.0	53269803.99	1226.4	14.62	81	40.94	.0092
:4 22	0.8	31.8	12.7	0	4.46	0.6	22.9	202.1	3.1	238.3	1135	0.8	102.9	53239456.51	1228.3	14.62	81	41.04	.0093
:4 23	1.7	31.7	12.7	0	4.45	1.2	22.8	201.7	6.6	238.5	1134	0.8	103.0	53297341.40	1226.2	14.62	80	41.67	.0092
:4 24	1.3	31.8	12.7	0	4.46	0.9	22.9	202.3	5.0	237.6	1135	0.8	103.0	53288287.94	1228.0	14.62	81	43.19	.0096
:25	1.7	32.2	12.7	0	4.46	1.2	23.2	204.5	6.6	237.6	1135	0.6	102.8	53177514.45	1223.7	14.61	81	43.94	.0099
:26	1.6	32.3	12.7	0	4.46	1.2	23.2	205.3	6.2	236.8	1136	0.8	102.9	53232692.34	1221.7	14.61	81	43.99	.0098
:27	1.7	32.3	12.7	0	4.46	1.2	23.2	205.4	6.6	238.8	1135	0.8	103.0	53251141.49	1216.8	14.61	80	43.74	.0096
:28	1.7	32.4	12.7	0	4.47	1.2	23.3	206.2	6.6	238.3	1135	0.6	103.1	53308600.35	1225.7	14.62	81	43.92	.0098
:29	1.4	32.7	12.7	0	4.46	1.0	23.5	208.2	5.4	238.9	1135	0.8	103.1	53326078.98	1222.4	14.62	81	43.81	.0097
:30	1.4	32.7	12.7	0	4.47	1.0	23.5	208.3	5.4	238.7	1135	0.8	103.1	53336075.73	1225.1	14.61	80	44.30	.0097
:31	1.6	32.7	12.7	0	4.46	1.2	23.5	208.6	6.2	238.2	1135	0.8	103.3	53439796.94	1220.6	14.62	80	44.66	.0096
:32	1.7	32.7	12.7	0	4.46	1.2	23.5	208.6	6.6	237.5	1135	0.8	103.3	53436178.20	1224.2	14.61	80	44.94	.0099
:33	1.6	32.5	12.7	0	4.46	1.2	23.4	207.2	6.2	238.6	1136	0.8	103.2	53397961.69		14.61			
:34	1.7	32.5	12.7	0	4.46	1.2	23.4	207.0	6.6	237.8	1136	0.6	103.1	53331636.36		14.62			
:35	1.7	32.5	12.7	0	4.46	1.2	23.4	206.9	6.6	237.4	1136	0.6	103.1	53322456.11	1224.0	14.62	82	42.05	.0096
:36	1.7	32.3	12.7	0	4.45	1.2	23.2	205.2	6.6	237.3	1136	0.6	102.9	53214969.04	1222.6	14.62	81	42.28	.0096
:37	1.7	32.3	12.7	0	4.46	1.2	23.2	205.5	6.6	237.8	1136	0.6	103.0	53264350.30	1217.2	14.62	81	42.78	.0096
:38	1.7	32.4	12.7	0	4.46	1.2	23.3	206.1	6.6	237.6	1136	0.8	103.0	53264810.21	1222.6	14.61	81	43.21	.0096
:39	1.7	32.4	12.7	0	4.46	1.2	23.3	206.2	6.8	237.7	1138	0.8	103.0	53302518.95	1225.5	14.61	81	43.67	.0098
:40	1.6	32.1	12.7	0	4.46	1.3	23.1	204.3	7.0	238.0	1135	0.6	103.1	53305766.81		14.61			
:41	2.0	32.3	13.6	1	4.44	1.6	26.1	230.8	8.7	237.2	1136	0.8	103.0	59843031.97	1226.4	14.61	81	43.80	.0097
:42	1.7	23.0	13.6	0	4.67	1.4	19.1	168.9	7.6	237.0	1137	0.8	102.9	81500146.69	1226.8	14.62	81	43.52	.0099
:43	-0.3	1.7	13.6	0	4.86	-0.2	1.4	12.5	-1.3	237.3	1136	0.8	102.6	81392786.03	1224.1	14.61	81	43.71	.0099
:44	-0.2	0.5	13.8	0	4.89	-0.2	0.4	3.7	-0.9	237.0	1136	0.8	102.8	81426723.15	1222.8	14.61	81	43.56	.0099
:45	-0.3	0.3	13.8	0	4.89	-0.2	0.2	2.2	-1.3	236.7	1136	0.8	102.8	81409041.47	1224.6	14.62	82	43.16	.0098
:46	-0.1	0.1	12.3	0	4.84	-0.1	0.1	0.6	-0.4	238.3	1135	0.5	102.9	50739297.38	1225.9	14.61	81	43.11	.0098
:47	36.1	1.2	0.1	0	0.03	10.2	0.3	3.0	55.0	236.5	1135	0.1	102.6	20958299.37	1226.8	14.61	81	43.14	.0097
:48	46.7	18.7	0.0	0	-0.02	13.2	5.3	46.7	71.0	239.1	1135	0.1	103.0	20907657.88	1226.1	14.61	81	43.74	.0098
:49	48.6	44.5	0.0	0	-0.03	13.2	12.6	111.2	71.2	237.7	1135	0.1	103.2	20934114.13	1226.5	14.61	81	43.76	.0097
:50	47.0	45.0	0.0	0	-0.03	13.3	12.7	112.8	71.7	239.2	1134	0.1	103.5	21001177.05	1229.2	14.61	80	43.33	.0094
:51	47.0	45.1	0.0	0	-0.04	13.3	12.7	113.0	71.7	238.8	1135	0.1	103.4	20990568.78	1232.4	14.61	80	43.47	.0094
:52	48.2	45.0	1.9	0	0.1	14.3	14.0	124.1	77.6	238.3	1135	0.1	103.5	23098731.55	1231.1	14.61	81	43.87	.0098
:53	11.5	43.4	12.7	0	4.36	8.3	31.2	278.4	44.6	237.6	1135	0.1	103.1	53339393.70	1229.8	14.61	81	43.09	.0096
:54	1.8	32.4	12.7	0	4.43	1.3	23.3	206.1	7.0	237.6	1135	0.1	103.0	53277096.80	1226.0	14.61	81	42.82	.0097
:55	1.6	32.0	12.7	0	4.43	1.3	23.0	203.7	7.0	237.8	1136	0.1	103.1	53321907.31	1224.7	14.61	82	42.22	.0099
:56	1.7	32.0	12.7	0	4.43	1.2	23.0	203.1	6.6	237.0	1136	0.1	102.6	53158336.07	1220.4	14.61	82	41.50	.0097
:57	1.8	31.7	12.7	0	4.44	1.3	22.8	201.0	6.9	236.4	1136	0.2	102.7	53104277.56	1225.0	14.61	82	41.78	.0096
:58	1.8	31.8	12.7	0	4.45	1.3	22.9	201.5	8.9	238.9	1137	0.1	102.6	53067327.81	1228.3	14.61	83	41.41	.0100
:59	1.8	32.1	12.7	0	4.45	1.3	23.1	203.2	8.9	236.4	1136	0.1	102.5	53014273.27	1223.5	14.61	83	40.73	.0097
:00	1.8	32.1	12.7	0	4.45	1.3	23.1	203.4	8.9	237.1	1135	0.1	102.6	53064604.97	1225.3	14.61	82	40.31	.0093
:01	1.6	32.1	12.7	0	4.45	1.2	23.1	203.6	8.2	237.5	1135	0.1	102.8	53161736.56	1222.0	14.61	82	40.65	.0093
:02	1.7	32.0	12.7	0	4.45	1.2	23.0	203.6	8.6	237.7	1135	0.1	103.0	53280567.77	1224.2	14.61	81	40.98	.0093
:03	1.8	32.0	12.7	0	4.45	1.3	23.0	203.6	7.0	237.8	1135	0.1	103.0	53276875.41	1223.1	14.61	81	41.45	.0094
:04	1.7	32.0	12.7	0	4.45	1.2	23.0	203.5	8.6	236.9	1135	0.1	103.0	53256579.26	1227.0	14.61	82	41.77	.0096
:05	1.9	31.7	12.7	0	4.45	1.4	22.8	201.7	7.4	237.6	1135	0.1	103.0	53277455.76	1225.3	14.61	81	42.16	.0096
:06	1.8	31.4	12.7	0	4.45	1.3	22.6	199.8	7.0	237.4	1135	0.1	103.0	53291058.81	1228.3	14.61	82	43.07	.0099
:07	1.8	31.7	12.7	0	4.45	1.3	22.8	201.5	7.0	237.7	1136	0.1	102.9	53244117.00	1227.4	14.61	82	42.70	.0098
:08	1.8	31.7	12.7	0	4.46	1.3	22.8	201.1	7.0	238.8	1136	0.1	102.7	53130256.80	1221.9	14.61	82	42.42	.0096
:09	1.7	32.0	12.7	0	4.46	1.2	23.0	203.1	8.6	237.5	1135	0.1	102.8	53148184.94	1222.6	14.61	81	41.63	.0093
:10	1.8	31.9	12.7	0	4.45	1.3	23.0	202.9	7.0	237.5	1135	0.2	103.0	53276930.78	1228.4	14.61	81	42.56	.0094
:11	1.9	31.8	12.7	0	4.46	1.4	22.9	202.2	7.4	237.6	1135	0.1	103.0	53255095.78	1224.6	14.61	81	42.70	.0096
:12	1.7	32.1	12.7	0	4.46	1.2	23.1	204.2	6.6	237.6	1136	0.1	103.0	53288039.89	1229.0	14.61	82	42.69	.0098
:13	1.8	32.0	12.7	0	4.46	1.3	23.0	203.2	7.0	236.6	1135	0.1	102.8	53181531.47	1226.5	14.61	82	41.94	.0096
:14	1.7	31.9	12.7	0	4.45	1.2	23.0	202.6	6.6	238.4	1135	0.1	102.9	53240131.02	1225.9	14.61	81	42.15	.0094
:15	1.7	31.7	12.7	0	4.46	1.2	22.8	201.5	8.6	236.7	1136	0.1	102.9	53236536.08	1224.8	14.61	83	43.05	.0101
:16	1.9	32.1	12.7	0	4.45	1.4	23.1	203.9	7.3	236.8	1136	0.1	102.8	53194988.95	1220.6	14.61	83	42.48	.0101
:17	1.8	31.7	12.7	0	4.45	1.3	22.8	200.8	8.9	236.0	1136	0.1	102.6	53052063.56	1226.8	14.61	83	39.95	.0095
:8	1.8	31.5	12.7	0	4.45	1.3	22.7	199.5	8.9	236.6	1136	0.1	102.5	53044154.69	1221.9	14.61	82	39.61	.0092
:9	1.8	31.8	12.7	0	4.45	1.3	22.9	201.8	8.9	237.0	1137	0.2	102.6	53091823.04	1222.9	14.61	84	40.27	.0101
:20	1.9	31.9	12.7	0	4.45	1.4	23.0	201.7	7.3	236.3	1137	0.1	102.4	52948313.67	1220.8	14.61	83	39.08	.0093
21	1.5	31.7	12.7	0	4.46	1.1	22.8	201.3	5.6	238.9	1135	0.1	102.8	53177719.29	1221.1	14.61	74	38.42	.0068
22	3.9	31.5	13.6	1	4.33	3.1	26.1	221.5	18.7	237.1	1135	0.1	102.7	56890480.12	1222.2	14.61	81	41.77	.0094
23	0.5	9.9	13.8	0	4.89	0.4	8.2	72.7	2.2	238.6	1136	0.1	102.9	61492713.30	1224.6	14.61	81	41.92	.0094
24	0.4	0.8	13.6	0	4.89	0.3	0.7	5.9	1.8	237.4	1135	0.1	102.9	61497758.90	1224.5	14.61	81	42.19	.0095

me	CO	NOx	O2	THC	CO2	CO@15%O2	NOx@15%O2	NOx	CO	Load	Exh. Temp	IGV Pos.	Fuel Flow	Exh. Flow	Exh. Flow	Amb. Press.	Amb. Temp.	Rel. Humidity	Specific Humidity	
	ppm	ppm	%	ppm	%	ppm	ppm	(lb/hr)	(lb/hr)	(MW)	(F)	(degrees)	(KPPH)	M-19 (dscfh)	CT (lb/sec)	(psia)	(F)	(%)	(lb h2o/lb air)	
5:25	0.6	0.4	13.8	0	4.9	0.5	0.3	2.9	2.7	238.1	1135	0.1	103.0	61558121.54	1229.3	14.61	81	42.94	.0095	
5:26	18.7	1.1	4.6	0	1.71	6.8	0.4	3.5	36.4	237.8	1135	0.1	103.0	26815081.56	1225.4	14.61	81	43.69	.0097	
5:27	47.7	31.7	0.0	0	0	13.5	8.9	79.2	72.5	237.7	1135	0.1	103.1	20920999.75	1226.2	14.61	81	44.16	.0099	
5:28	47.6	44.4	0.0	0	-0.02	13.4	12.5	110.8	72.3	238.0	1135	0.1	103.0	20907750.82	1222.2	14.61	80	44.14	.0097	
5:29	47.7	45.1	0.0	0	-0.02	13.5	12.7	112.8	72.6	237.8	1135	0.2	103.2	20944470.92	1226.7	14.61	81	44.85	.0099	
5:30	47.6	45.3	0.0	0	-0.03	13.4	12.8	113.0	72.3	237.2	1136	0.1	102.9	20889977.48	1227.0	14.61	82	44.33	.0103	
31	38.9	45.2	8.5	0	1.41	14.9	17.3	152.8	80.0	237.2	1135	0.1	102.8	28309710.20	1226.7	14.61	81	43.11	.0098	
32	3.2	39.6	12.7	0	4.42	2.3	26.8	252.8	12.4	237.6	1135	0.1	102.9	53200229.28	1228.5	14.61	82	43.28	.0099	
5:33	1.8	31.9	12.7	0	4.44	1.3	23.0	202.5	7.0	238.0	1135	0.1	102.8	53165656.30		14.61				
5:34	1.8	31.6	12.7	0	4.44	1.3	22.7	200.9	7.0	238.0	1135	0.2	102.9	53247495.21		14.61				
5:35	1.8	31.7	12.7	0	4.45	1.3	22.8	201.6	7.0	237.0	1135	0.1	103.0	53251958.10	1227.2	14.61	82	43.36	.0099	
5:36	1.9	31.7	12.7	0	4.45	1.4	22.8	201.6	7.4	237.0	1135	0.1	103.0	53262846.37	1226.7	14.61	82	43.16	.0099	
5:37	1.8	31.6	12.7	0	4.45	1.3	22.7	200.9	7.0	238.5	1135	0.1	102.9	53240213.76	1221.9	14.61	82	43.43	.0100	
5:38	1.8	31.7	12.7	0	4.45	1.3	22.8	201.5	7.0	237.0	1135	0.2	102.9	53230880.91	1224.9	14.61	81	43.06	.0097	
5:39	1.8	31.8	12.7	0	4.46	1.3	22.9	202.3	7.0	237.1	1136	0.1	103.0	53285099.80	1225.8	14.61	81	43.45	.0099	
5:40	1.8	31.6	12.7	0	4.45	1.3	22.7	200.8	7.0	236.2	1136	0.1	102.9	53209388.87	1224.1	14.61	83	43.35	.0103	
5:41	1.8	31.0	12.7	0	4.45	1.3	22.3	196.5	6.9	235.5	1138	0.1	102.6	53075615.31	1226.1	14.61	84	42.88	.0107	
5:42	1.8	31.1	12.7	0	4.45	1.3	22.4	196.7	6.9	235.4	1138	0.1	102.4	52974560.85	1216.2	14.61	83	40.77	.0097	
5:43	1.7	31.4	12.7	0	4.45	1.2	22.6	199.2	6.6	236.9	1138	0.1	102.7	53141515.42	1221.1	14.61	82	41.65	.0096	
5:44	1.8	31.4	12.7	0	4.45	1.3	22.6	199.2	7.0	237.0	1136	0.1	102.7	53133176.72	1222.2	14.61	82	41.64	.0097	
5:45	1.8	31.3	12.7	0	4.45	1.3	22.5	198.5	6.9	236.8	1138	0.1	102.7	53109613.07		14.61				
5:46	1.8	31.4	12.7	0	4.45	1.3	22.6	199.0	6.9	237.9	1136	0.2	102.6	53085035.08	1225.3	14.61	82	41.68	.0096	
5:47	1.8	31.6	12.7	0	4.46	1.3	22.7	200.8	7.0	237.1	1135	0.1	102.9	53220798.01		14.61				
5:48	1.8	31.6	12.7	0	4.46	1.3	22.7	201.0	7.0	236.9	1135	0.2	103.0	53278422.53		14.61				
5:49	1.8	31.4	12.7	0	4.45	1.3	22.6	199.5	7.0	237.0	1136	0.2	102.9	53202719.36		14.61				
5:50	1.8	31.3	12.7	0	4.45	1.3	22.5	199.0	7.0	237.0	1136	0.1	102.9	53246832.08		14.61				
5:51	1.8	31.3	12.7	0	4.45	1.3	22.5	198.6	7.0	237.2	1136	0.2	102.7	53140970.75		14.61				
5:52	1.8	31.2	12.7	0	4.45	1.3	22.4	198.2	7.0	237.7	1136	0.2	102.9	53214973.18		14.61				
5:53	1.8	31.4	12.7	0	4.45	1.3	22.6	199.3	7.0	238.9	1136	0.2	102.8	53162159.16		14.61				
5:54	1.8	31.4	12.7	0	4.46	1.3	22.6	199.5	7.0	236.9	1136	0.1	102.9	53206571.37		14.61				
5:55	1.8	31.6	12.7	0	4.46	1.3	22.7	200.4	6.9	236.1	1136	0.1	102.7	53120579.96		14.61				
5:56	1.8	31.5	12.7	0	4.45	1.3	22.7	200.1	7.0	236.8	1136	0.1	102.9	53200292.39	1230.3	14.61	82	42.50	.0097	
5:57	1.9	31.5	12.7	0	4.45	1.4	22.7	199.9	7.3	237.4	1136	0.2	102.7	53144692.42	1226.7	14.61	82	42.73	.0098	
5:58	1.8	31.7	12.7	0	4.46	1.3	22.8	201.1	7.0	237.5	1135	0.2	102.7	53138027.04	1225.4	14.61	81	42.59	.0096	
5:59	1.8	31.7	12.7	0	4.46	1.3	22.8	201.4	7.0	237.8	1135	0.1	102.8	53158824.41	1225.7	14.61	81	43.11	.0096	
6:00	1.6	31.6	11.9	1	4.46	1.2	20.7	182.8	6.3	238.1	1135	0.1	102.8	48441681.76	1225.7	14.61	81	43.75	.0098	
6:01	34.3	31.5	0.2	0	0.3	9.8	9.0	79.3	52.6	238.2	1135	0.1	102.9	21086221.19	1225.5	14.61	81	43.81	.0098	
6:02	47.6	43.2	0.0	0	-0.01	13.4	12.2	107.7	72.2	237.1	1135	0.2	102.9	20883390.76	1223.3	14.61	81	44.06	.0098	
6:03	47.6	45.4	0.0	0	-0.02	13.4	12.8	113.4	72.4	236.9	1136	0.1	103.1	20921168.60		14.61				
6:04	47.5	45.5	0.0	0	-0.03	13.4	12.8	113.5	72.1	237.1	1136	0.1	103.0	20899179.12		14.61				
6:05	19.6	45.4	12.8	0	3.48	14.2	33.1	292.2	76.4	236.8	1136	0.1	103.0	53912797.55		14.61				
6:06	0.8	8.4	13.7	0	4.87	0.7	8.9	80.8	3.5	236.8	1135	0.2	103.0	60653411.82		14.61				
6:07	0.7	0.9	13.7	0	4.88	0.6	0.7	6.5	3.1	237.2	1135	0.2	102.6	60556729.28		14.61				
6:08	0.8	0.3	13.6	0	4.89	0.7	0.2	2.2	3.6	237.4	1135	0.1	103.0	61524330.46		14.61				
6:09	0.8	0.1	13.2	0	4.68	0.6	0.1	0.7	3.3	237.9	1135	0.2	103.1	56792164.93		14.61				
6:10	1.7	14.5	12.7	0	4.46	1.2	10.4	92.3	6.6	236.4	1135	0.2	103.1	53310561.44		14.61				
6:11	1.0	30.8	19.3	22	0.86	3.7	113.8	1004.4	19.8	237.7	1135	0.2	103.0	273121309.20	1223.8	14.61	80	45.96	.0101	
6:12	0.9	5.8	20.8	24	-0.01	17.7	114.1	1010.5	95.4	237.4	1135	0.1	103.2	1459213024.47	1226.1	14.61	80	46.19	.0101	
6:13	1.0	0.5	20.6	24	-0.02	19.7	9.8	87.1	106.0	238.5	1135	0.2	103.1	1458212452.57	1223.3	14.61	81	46.18	.0102	
6:14	1.1	0.2	16.4	8	2.11	1.4	0.3	2.3	7.6	237.9	1135	0.1	103.2	97229580.92	1230.9	14.60	81	48.16	.0103	
6:15	1.8	14.5	12.8	0	4.42	1.3	10.8	93.5	7.1	238.1	1134	0.1	103.1	54000829.77	1225.8	14.61	80	46.69	.0102	
6:16	1.8	30.0	12.8	0	4.44	1.3	21.9	193.4	7.1	236.1	1135	0.1	103.1	54000477.92		14.61				
6:17	1.8	30.9	12.6	0	4.44	1.3	22.5	198.9	7.1	238.4	1136	0.1	103.0	53915130.91		14.61				
6:18	1.8	31.0	12.8	0	4.44	1.3	22.6	199.6	7.1	237.7	1136	0.1	103.0	53919785.05	1225.1	14.61	81	46.34	.0104	
6:19	1.8	30.8	12.7	0	4.45	1.3	22.2	196.6	7.0	236.7	1136	0.2	102.8	53190008.28	1223.7	14.61	81	45.37	.0103	
6:20	1.9	30.9	12.7	0	4.45	1.4	22.2	196.2	7.3	236.8	1135	0.1	102.8	53169013.85	1223.6	14.61	81	45.10	.0103	
6:21	1.8	31.1	12.7	0	4.45	1.3	22.4	197.4	7.0	237.2	1135	0.1	102.8	53159242.34	1224.6	14.61	81	45.13	.0101	
6:22	1.8	31.1	12.7	0	4.45	1.3	22.4	197.5	7.0	237.7	1135	0.1	102.6	53176929.95	1226.2	14.61	81	45.20	.0101	
6:23	1.9	31.2	12.7	0	4.45	1.4	22.4	198.3	7.3	237.0	1135	0.2	102.9	53221030.76	1226.2	14.61	81	45.20	.0101	
6:24	1.8	31.3	12.7	0	4.45	1.3	22.5	198.8	7.0	237.0	1136	0.2	102.9	53206634.48	1224.4	14.61	81	45.59	.0103	
6:25	1.8	31.2	12.7	0	4.45	1.3	22.4	198.3	7.0	235.9	1136	0.2	102.9	53220525.42	1225.9	14.61	81	45.16	.0103	
6:26	1.8	31.1	12.7	0	4.45	1.3	22.4	197.3	7.0	236.9	1136	0.2	102.7	53138441.36		14.61				
6:27	1.6	31.3	12.7	0	4.46	1.3	22.5	199.2	7.0	237.2	1135	0.2	103.0	53292763.48		14.61				
6:28	1.6	31.1	12.7	0	4.45	1.3	22.4	197.6	7.0	234.0	1135	0.1	102.9	53219724.71	1226.6	14.61	81	45.15	.0100	
6:29	1.9	31.1	12.7	0	4.45	1.4	22.4	198.1	7.4	236.3	1135	0.1	103.1	53336067.22	1223.3	14.61	81	45.36	.0100	
6:30	1.9	31.1	12.7	0	4.45	1.4	22.4	198.3	7.4	234.3	1135	0.1	103.2	53405653.31	1230.0	14.61	81	45.61	.0102	
6:31	1.8	31.0	12.7	0	4.45	1.3	22.3	197.4	7.0	237.5	1135	0.2	103.1	53323012.68	1229.2	14.61	81	45.53	.0101	
6:32	1.8	31.2	12.7	0	4.46	1.3	22.4	198.3	7.0	237.9	1136	0.1	102.9	53238892.19	1226.7	14.61	81	46.05	.0102	
6:33	1.9	31.1	12.7	0	4.46	1.4	22.4	197.5	7.3	237.7	1136	0.1	102.8	53194013.92	1226.5	14.61	81	46.28	.0102	
6:34	1.8	31.1	12.7	0	4.46	1.3	22.4	197.5	7.0	237.8	1135	0.1	102.8	53190588.64	1225.1	14.61	80	46.33	.0103	
6:35	1.8	31.3	12.7	0	4.46	1.3	22.5	199.0	7.0	238.3	1135	0.1	102.9	53236011.06	1226.8	14.61	80	46.30	.0102	
6:36	1.9	31.2	12.7	0	4.46	1.4	22.4	198.5	7.4	237.8	1134	0.1	103.0	53294385.60	1227.6	14.61	80	46.14	.0101	
6:37	1.9	31.3	12.7	0	4.46	1.4	22.5	199.4	7.4	236.0	1134	0.2	103.2	53356356.08	1229.5	14.60	80	47.08	.0101	
6:38	BAD	31.2	12.7	0	4.46		22.4	199.0		238.6	1134	0.2	103.3	53411173.99	1228.6	14.61	80	47.81	.0104	Radio
6:39	1.7	31.0	12.7	0	4.46	1.2	22.3	197.7	6.6	238.3	1136	0.2	103.3	53417713.18	1228.1	14.61	80	47.90	.0105	Interferance
6:40	1.9	31.0	12.7	0	4.45	1.4	22.3	197.6	7.4	237.8	1135	0.2	103.2	53379198.64	1227.7	14.61	80	47.94	.0105	on CO
6:41	1.9	30.9	12.7	0	4.46	1.4	22.2	196.9	7.4	238.8	1135	0.1	103.2	53366587.98	1224.7	14.61	80	47.83	.0105	channel
6:42	1.8	30.9	12.7	0	4.46	1.3	22.2	196.6	7.0	238.1	1135	0.2	103.0	53296729.81	1226.2	14.61	80	47.58	.0104	@ 16:38
6:43	1.9	31.0	12.7	0	4.46	1.4	22.3	197.5	7.4	237.9	1135	0.1	103.2	53364232.39	1226.4	14.61	80	47.52	.0103	
6:44	1.8	31.1	12.7	0	4.46	1.3	22.4	198.2	7.0	238.1	1135	0.2	103.2	53365546.22	1226.4	14.61	80	47.52	.0103	
6:45	1.8	31.2	12.7	0	4.46	1.3	22.4	198.7	7.0	238.5	1135	0.1	103.1	53336518.72	1226.4	14.61	80	47.52	.0103	
6:46	1.8	31.1	12.7	0	4.46	1.3	22.4	197.8	7.0	238.2	1135	0.2	103.0	53277238.53	1225.3	14.61	80	47.71	.0104	
6:47	1.8	31.1	12.7	0	4.46	1.3	22.4	198.1	7.0	236.1	1135	0.1	103.1	53342966.36	1227.0	14.61	80	47.99	.0105	
6:48	1.9	31.2	12.7	0	4.46	1.4	22.4	198.8	7.4	234.7	1134	0.1	103.1	53352160.12	1226.0	14.61	80	48.38	.0104	
6:49	1.9	31.3	12.7	0	4.46	1.4	22.5	199.4	7.4	238.3	1135	0.2	103.1	53349074.17	1227.1	14.61	80	48.64	.0106	
6:50	1.8	31.1	12.7	0	4.46	1.3	22.4	198.3	7.0	237.7	1134	0.2	103.2	53398849.82	1228.8	14.61	80	47.88	.0105	
6:51	1.8	30.9	12.7	0	4.46	1.3	22.2	196.9	7.0	237.4	1134	0.1	103.2	53377018.47	1228.4	14.61	80	48.04	.0103	
6:52	1.8	30.9	12.7	0	4.46	1.3	22.2	197.1	7.0	238.2	1134	0.2	103.3	53433826.24	1230.4	14.61	80	48.47	.0105	
6:53	1.8	30.9	12.7	0	4.46	1.3	22.2	197.2	7.0	238.6	1134	0.2	103.3	53442326.84	1230.0	14.61	80	48.28	.0104	
6:54	1.8	31.1	12.7	0	4.46	1.3	22.4	198.2	7.0	237.2	1136	0.2	103.2	53370854.32	1229.9	14.61	81	47.63	.0106	
6:55	2.0	31.3	12.7	0	4.46	1.4	22.6	199.3	7.8	237.8	1136	0.2	103.1	53318864.60	1226.1	14.60	81	46.40	.0103	
6:56	1.9	31.2	12.7	0	4.45	1.4	22.4	198.6	7.4	238.0	1135	0.1	103.0	53301311.58	1227.2	14.61	81	45.12	.0102	
6:57	1.8	30.8	12.7	0	4.45	1.3	22.2	196.6	7.0	238.0	1136	0.1	102.8	53196804.76		14.61				
6:58	1.8	31.0	12.7	0	4.46	1.3	22.3	197.0	7.0	237.4	1135	0.1	102.9	53228512.90		14.61				
6:59	1.8	31.1	12.7	0	4.47	1.3	22.4	197.8	7.0	236.7	1136	0.2	102.9	53212581.38		14.61				
7:00	1.8	31.7	12.7	0	4.45	1.3	22.8	201.0	6.9	236.5	1136	0.2	102.7	53117367.79	1223.6	14.61	83	43.59	.0105	
7:01	1.7	31.1	12.7	0	4.45	1.2	22.4	196.5	6.5	234.9	1138	0.2	102.3	52906182.38	1219.6	14.60	85	41.49	.0104	
7:02	1.9	31.0	12.7	0	4.45	1.4	22.3	196.0	7.3	234.9	1136	0.1	102.4	52957914.99	1215.3	14.60	83	40.05	.0095	
7:03	1.8	31.0	12.7	0	4.46	1.3	22.3	196.4	6.9	235.8	1136	0.1	102.6	53070240.49	1223.9	14.60	82	41.61	.0096	
7:04	1.9	30.9	12.7	0	4.46	1.4	22.2	196.6	7.4	237.1	1135	0.1	103.0	53279969.65	1226.5	14.61	80	43.36	.0096	
7:05	1.8	31.0	12.7	0	4.45	1.3	22.3	197.2	7.0	238.0	1136	0.1	103.0	53289448.90	1224.9	14.60	82	44.73	.0104	
7:06	1.9	30.6	12.7	0	4.46	1.4	22.2	196.0	7.3	235.0	1137	0.2	102.5	53015792.45	1221.1	14.61	83	43.03	.0104	
7:07	1.9	31.0	12.7	0	4.45	1.4	22.3	196.3	7.3	236.9	1136	0.2	102.5	53036952.92	1219.6	14.61	81	42.56	.0097	
7:08	1.9	31.1	12.7	0	4.46	1.4	22.4	197.1	7.3	236.2	1136	0.1	102.6	53060129.93	1221.2	14.61	82	42.87	.0098	
7:09	1.9	31.6	12.7	0	4.46	1.4	22.7	200.5	7.3	237.3	1135	0.1	102.7	53143228.06	1226.1	14.61	80	43.56	.0096	
7:10	1.6	31.3	12.7	0	4.46	1.3	22.5	198.8	7.0	238.2	1136	0.2	102.9	53202064.51	1224.8	14.61	81	45.07	.0101	
7:11	1.8	31.5	12.7	0	4.46	1.3	22.7	200.3	7.0	238.0	1135	0.2	102.9	53250348.40	1224.7	14.61	80	44.59	.0098	
7:12	1.8	31.5	12.7	0	4.46	1.3	22.7	200.7	7.0	238.1	1136	0.2	103.2	53361785.25	1226.8	14.60	80	45.21	.0100	
7:13	1.9	31.4	12.7	0	4.46	1.4	22.6	200.3	7.4	238.2	1134	0.2	103.3	53413115.78	1229.2	14.60	79	46.80	.0099	
7:14	1.8	31.3	12.7	0	4.46	1.3	22.5	200.0	7.0	238.8	1134	0.1	103.5	53516529.97	1232.7	14.60	80	47.46	.0103	
7:15	1.8	31.2	12.7	0	4.46	1.3	22.4	199.2	7.0	238.4	1134	0.2	103.4	53469006.00	1226.2	14.61	80	46.38	.0100	
7:16	1.8	31.1	12.7	0	4.46	1.3	22.4	198.5	7.0	237.5	1134	0.2	103.3	53454970.67	1229.0	14.60	80	46.27	.0100	
7:17	1.9	31.0	12.7	0	4.46	1.4	22.3	198.1	7.4	238.9	1134	0.2	103.5	53514217.31	1229.1	14.61	79	46.91	.0100	
7:18	1.9	31.1	12.7	0	4.46	1.4	22.4	199.0	7.4	239.1	1134	0.1	103.6	53587466.10	1227.9	14.60	79	47.53	.0101	
7:19	3.7	31.3	18.1	18	1.55	7.8	66.0	585.3	42.1	238.6	1134	0.1	103.4	156602440.83	1226.5	14.60	79	47.61	.0101	
7:20	0.8	12.3	20.6	23	-0.01	15.7	241.9	2148.7	85.0	238.3	1134	0.2	103.4	1461726706.70	1226.7	14.60	80	48.69	.0101	
7:21	1.0	1.1	20.6	23	-0.02	19.7	21.6	191.4	105.9	238.5	1134	0.2	103.1	1457398803.96	1229.2	14.60	80	48.64	.0100	
7:22	0.8	0.4	20.8	24	-0.03	15.7	7.9	69.8	84.7	237.9	1135	0.1	103.1	1457127966.38	1228.2	14.60	80	47.31	.0102	
7:23	0.8	0.3	15.1	3	3.56	0.8	0.3	2.7	4.4	239.4	1134	0.1	103.3	75556259.29	1224.5	14.60	79	47.54	.0101	
7:24	0.8	0.3	13.8	0	4.87	0.7	0.2	2.2	3.6	237.6	1134	0.1	103.3	61583843.44	1231.2	14.60	80	47.75	.0102	

e	CO	NOx	O2	THC	CO2	CO@15%O2	NOx@15%O2	NOx	CO	Load	Exh. Temp	IGV Pos.	Fuel Flow	Exh. Flow	Exh. Flow	Amb. Press.	Amb. Temp	Rel. Humidity	Specific Humidity
	ppm	ppm	%	ppm	%	ppm	ppm	(lb/hr)	(lb/hr)	(MW)	(F)	(degrees)	(KPPH)	M-19 (dscfh)	CT (lb/sec)	(psia)	(F)	(%)	(lb h2o/lb air)
35	0.9	0.1	13.8	0	4.88	0.7	0.1	0.7	4.0	237.7	1134	0.1	103.4	61783686.30	1225.4	14.60	79	47.78	.0101
36	0.9	0.1	11.9	0	4.84	0.6	0.1	0.6	3.2	238.8	1134	0.1	103.4	48748895.55	1227.4	14.60	80	48.31	.0104
37	35.2	6.0	0.1	0	0.02	10.0	1.7	15.1	53.9	238.5	1134	0.2	103.3	21071618.44	1228.2	14.60	79	47.27	.0101
38	47.8	41.2	0.0	0	-0.01	13.5	11.6	103.1	72.8	238.6	1133	0.1	103.3	20961956.29		14.60			
39	47.7	44.9	0.0	0	-0.02	13.5	12.7	112.6	72.8	238.5	1134	0.1	103.5	21008742.38	1229.3	14.61	79	47.50	.0100
40	48.1	45.4	0.0	0	-0.03	13.6	12.8	113.8	73.4	238.1	1134	0.1	103.5	21002380.10	1227.2	14.61	79	47.23	.0100
41	47.6	45.5	0.0	0	-0.03	13.4	12.8	114.0	72.6	238.1	1134	0.1	103.4	20991133.20	1231.4	14.60	79	47.95	.0102
42	22.3	45.7	11.3	0	3.58	13.7	28.1	249.0	74.0	238.2	1134	0.1	103.3	45639967.48	1230.4	14.60	79	47.65	.0101
43	1.9	33.9	12.7	0	4.44	1.4	24.4	216.3	7.4	238.5	1134	0.1	103.3	53426998.96	1226.8	14.60	79	48.13	.0101
44	1.8	31.3	12.7	0	4.45	1.3	22.5	199.9	7.0	238.7	1133	0.2	103.4	53479710.57	1229.8	14.61	79	48.68	.0102
45	2.0	31.1	12.7	0	4.45	1.4	22.4	198.9	7.8	239.7	1133	0.2	103.5	53564620.27	1231.7	14.61	79	49.11	.0103
46	1.9	31.0	12.7	0	4.45	1.4	22.3	197.9	7.4	239.6	1133	0.1	103.4	53477220.49	1231.1	14.61	79	49.26	.0104
47	1.9	31.1	12.7	0	4.45	1.4	22.4	198.7	7.4	239.9	1133	0.1	103.4	53503925.44		14.61			
48	1.8	31.0	12.7	0	4.45	1.3	22.3	198.0	7.0	238.4	1134	0.2	103.4	53494438.43		14.61			
49	1.9	30.9	12.7	0	4.45	1.4	22.2	197.7	7.4	236.6	1133	0.2	103.6	53594880.98		14.60			
50	1.9	30.9	12.7	0	4.46	1.4	22.2	197.7	7.4	239.2	1133	0.1	103.6	53571653.03	1230.2	14.60	79	48.90	.0102
51	1.8	31.0	12.7	0	4.46	1.3	22.3	198.4	7.0	240.0	1134	0.1	103.6	53610327.31	1230.9	14.60	79	49.10	.0103
52	2.0	31.0	12.7	0	4.46	1.4	22.3	198.5	7.8	239.8	1133	0.1	103.7	53636373.28	1233.7	14.60	79	49.18	.0103
53	1.8	31.0	12.7	0	4.46	1.3	22.3	198.3	7.0	239.5	1134	0.1	103.6	53568527.24	1235.5	14.60	79	49.25	.0103
54	1.9	31.1	12.7	0	4.46	1.4	22.4	199.3	7.4	238.1	1134	0.2	103.8	53669996.03	1235.5	14.60	79	49.25	.0103
55	1.9	31.2	12.7	0	4.46	1.4	22.4	199.6	7.4	239.6	1134	0.2	103.5	53590374.63	1235.5	14.60	79	49.25	.0103
56	1.9	31.1	12.7	0	4.46	1.4	22.4	199.0	7.4	238.8	1134	0.2	103.6	53603993.50	1232.7	14.60	79	49.21	.0102
57	1.8	31.3	12.7	0	4.46	1.3	22.5	200.2	7.0	239.0	1133	0.2	103.6	53571735.79	1232.9	14.60	78	49.26	.0102
58	1.8	31.1	12.7	0	4.48	1.3	22.4	198.9	7.0	239.4	1133	0.1	103.6	53566625.29	1235.9	14.60	79	49.79	.0104
59	1.9	31.0	12.7	0	4.48	1.4	22.3	198.2	7.4	238.5	1133	0.1	103.5	53544028.39	1233.0	14.60	79	49.80	.0104
60	1.9	31.0	12.7	0	4.46	1.4	22.3	198.2	7.4	238.5	1133	0.1	103.5	53544028.39	1233.0	14.60	79	49.80	.0104
61	1.9	31.1	12.7	0	4.46	1.4	22.4	199.1	7.4	239.3	1133	0.2	103.6	53606878.99	1234.6	14.60	79	49.85	.0104
62	1.8	31.1	12.7	0	4.46	1.3	22.4	199.2	7.0	239.3	1133	0.2	103.7	53641404.64	1232.4	14.60	79	49.99	.0104
63	1.9	31.0	12.7	0	4.46	1.4	22.3	196.7	7.4	239.8	1133	0.2	103.8	53679787.53	1235.1	14.60	78	49.94	.0103
64	1.9	31.0	12.7	0	4.47	1.4	22.3	198.8	7.4	239.7	1133	0.1	103.7	53661625.77		14.60			
65	1.9	31.1	12.7	0	4.47	1.4	22.4	199.2	7.4	239.5	1133	0.1	103.7	53654782.98	1233.8	14.60	79	49.18	.0102
66	1.8	31.1	12.7	0	4.46	1.3	22.4	199.4	7.0	239.4	1133	0.2	103.8	53694581.78	1235.6	14.60	79	48.71	.0101
67	1.9	31.2	12.7	0	4.46	1.4	22.4	200.1	7.4	238.7	1133	0.2	103.8	53703512.74	1232.2	14.60	79	49.32	.0102
68	1.8	31.3	12.7	0	4.47	1.3	22.5	200.8	7.0	239.4	1133	0.2	103.9	53718145.43	1234.0	14.60	78	49.86	.0102
69	1.8	31.3	12.7	0	4.47	1.3	22.5	200.7	7.0	239.6	1133	0.1	103.8	53698074.30		14.60			
00	1.8	31.1	12.7	0	4.46	1.3	22.4	199.3	7.0	239.7	1134	0.1	103.8	53665517.10		14.60			
01	1.8	31.1	12.7	0	4.48	1.3	22.4	199.3	7.0	239.6	1133	0.2	103.7	53657916.52		14.60			
02	1.8	31.2	12.7	0	4.47	1.3	22.4	199.7	7.0	239.2	1133	0.2	103.8	53608780.19		14.60			
03	1.9	31.2	12.7	0	4.46	1.4	22.4	199.8	7.4	239.7	1133	0.1	103.7	53644613.18		14.60			
04	1.9	31.1	12.7	0	4.46	1.4	22.4	199.4	7.4	240.2	1133	0.1	103.8	53693678.13		14.60			
05	1.8	31.1	12.7	0	4.47	1.3	22.4	199.4	7.0	240.0	1133	0.2	103.8	53696398.10	1234.5	14.60	78	50.89	.0104
06	1.9	31.2	12.7	0	4.47	1.4	22.4	200.1	7.4	239.5	1133	0.2	103.8	53718606.59	1233.7	14.60	78	51.01	.0104
07	1.8	31.2	12.7	0	4.47	1.3	22.4	200.3	7.0	239.9	1133	0.1	104.0	53771086.18		14.60			
08	1.9	31.2	12.7	0	4.47	1.4	22.4	200.4	7.4	240.0	1133	0.2	104.0	53798694.78	1231.0	14.60	78	51.48	.0103
09	1.8	31.4	12.7	0	4.48	1.3	22.6	201.8	7.0	240.3	1133	0.1	104.1	53827724.29	1231.3	14.60	78	51.25	.0103
10	1.9	31.2	12.7	0	4.47	1.4	22.4	200.2	7.4	240.5	1133	0.1	103.9	53741247.68	1232.8	14.60	78	51.23	.0103
11	1.9	31.1	12.7	0	4.47	1.4	22.4	199.9	7.4	240.4	1132	0.1	104.1	53825344.39		14.60			
12	1.9	31.1	12.7	0	4.47	1.4	22.4	199.2	7.4	239.8	1133	0.1	103.7	53656022.32		14.60			
13	1.8	31.0	12.7	0	4.47	1.3	22.3	198.5	7.0	240.2	1132	0.2	103.7	53639037.15	1233.7	14.60	78	50.63	.0102
14	1.9	31.0	12.7	0	4.47	1.4	22.3	198.8	7.4	240.4	1132	0.1	103.8	53712857.51	1233.4	14.60	78	51.17	.0103
15	1.9	31.2	12.7	0	4.47	1.4	22.4	200.3	7.4	240.7	1132	0.1	103.9	53766113.79	1233.2	14.60	78	51.79	.0104
16	2.0	31.0	12.7	0	4.48	1.4	22.3	199.1	7.8	240.9	1132	0.1	104.0	53799176.35	1235.0	14.60	77	51.59	.0103
17	1.9	30.7	12.7	0	4.47	1.4	22.1	197.5	7.4	240.6	1132	0.2	104.2	53691576.06	1234.8	14.60	77	51.95	.0103
18	1.9	31.1	12.7	0	4.47	1.4	22.4	199.8	7.4	240.4	1132	0.2	104.0	53615743.06	1236.3	14.60	78	52.62	.0107
19	1.9	31.0	12.7	0	4.47	1.4	22.3	199.0	7.4	240.4	1132	0.1	104.0	53769937.87	1234.4	14.60	77	51.09	.0102
20	1.9	31.1	12.7	0	4.47	1.4	22.4	200.1	7.4	240.7	1132	0.2	104.2	53875049.18	1235.9	14.60	77	51.91	.0104
21	1.9	31.3	12.7	0	4.47	1.4	22.5	201.1	7.4	240.3	1132	0.2	104.0	53808454.39	1235.9	14.60	77	51.89	.0103
22	1.9	31.1	12.7	0	4.47	1.4	22.4	199.6	7.4	240.4	1132	0.1	103.9	53784385.11	1237.9	14.60	77	51.96	.0103
23	1.9	31.2	12.7	0	4.47	1.4	22.4	200.4	7.4	240.4	1132	0.1	104.0	53803320.09	1234.9	14.60	77	52.56	.0104
24	1.8	31.1	12.7	0	4.47	1.3	22.4	199.0	7.0	239.5	1134	0.2	103.8	53592793.33	1234.1	14.60	79	51.24	.0109
25	1.8	31.0	12.7	0	4.46	1.3	22.3	198.0	7.0	238.5	1134	0.2	103.4	53496253.49	1234.0	14.60	80	49.24	.0108
26	1.8	31.2	12.7	0	4.47	1.3	22.4	199.6	7.0	239.1	1132	0.1	103.6	53575287.26	1231.2	14.60	78	47.99	.0097
27	1.8	31.2	12.7	0	4.47	1.3	22.4	200.5	7.0	240.0	1132	0.2	104.0	53809610.46	1236.1	14.60	77	50.09	.0099
28	1.9	31.1	12.7	0	4.47	1.4	22.4	199.9	7.4	240.3	1132	0.2	104.1	53825139.56	1233.6	14.60	77	51.28	.0101
29	1.9	31.3	12.7	0	4.47	1.4	22.5	201.3	7.4	240.9	1132	0.1	104.1	53867069.45	1237.8	14.60	77	52.03	.0102
30	1.9	31.4	12.7	0	4.47	1.4	22.6	202.1	7.4	240.5	1133	0.1	104.2	53900550.47	1231.3	14.60	77	52.72	.0103
31	2.0	31.3	12.7	0	4.47	1.4	22.5	201.5	7.8	241.1	1132	0.2	104.2	53911592.36	1233.5	14.60	77	53.26	.0104
32	1.9	31.2	12.7	0	4.48	1.4	22.4	200.6	7.4	240.4	1133	0.1	104.1	53854823.91		14.60			
33	1.9	31.3	12.7	0	4.47	1.4	22.5	201.0	7.4	240.4	1133	0.2	103.99	53768206.32	1236.3	14.60	77	53.44	.0104
34	1.9	31.1	12.7	0	4.47	1.4	22.4	199.9	7.4	240.7	1132	0.2	104.07	53831919.24		14.60			
35	1.9	31.1	12.7	0	4.47	1.4	22.4	199.8	7.4	240.5	1133	0.2	104.03	53811650.52		14.60			
36	1.8	31.1	12.7	0	4.47	1.3	22.4	200.1	7.0	241.1	1132	0.2	104.18	53885301.73		14.60			
37	1.9	31.0	12.7	0	4.47	1.4	22.3	199.4	7.4	241.1	1132	0.1	104.13	53861228.58	1235.8	14.60	76	53.60	.0103
38	1.8	31.1	12.5	0	4.48	1.3	21.8	195.2	6.9	241.2	1132	0.2	104.13	52577312.14		14.60			
39	33.7	32.5	0.2	0	0.03	9.6	9.3	82.9	52.3	241.7	1131	0.1	104.24	21359797.27	1238.6	14.60	76	54.33	.0103
40	47.8	44.4	0.0	0	-0.01	13.5	12.5	112.2	73.6	241.3	1131	0.1	104.33	21173569.07	1239.2	14.60	76	55.01	.0105
41	47.6	45.6	1.9	0	0.43	14.8	14.2	127.5	80.7	241.2	1132	0.1	104.47	23321279.05	1238.3	14.60	76	55.41	.0106
42	13.8	45.5	18.8	22	0.75	35.4	118.7	1045.8	193.0	241.7	1132	0.1	104.36	192458715.44	1239.3	14.60	76	55.79	.0107
43	0.9	12.6	20.6	24	-0.02	17.7	247.8	2221.7	96.6	241.7	1132	0.1	104.45	1476747265.92	1238.0	14.60	75	56.20	.0105
44	0.9	1.0	20.6	24	-0.03	17.7	19.7	178.5	96.7	241.6	1132	0.1	104.56	1478340786.80	1239.7	14.60	76	56.47	.0108
45	1.2	0.5	20.6	24	-0.04	23.6	9.8	88.0	128.5	241.3	1132	0.2	104.24	1473798336.67	1237.6	14.60	76	56.34	.0107
46	0.8	0.3	20.8	24	-0.04	15.7	5.9	52.8	85.8	241.6	1132	0.1	104.32	1474679333.76	1237.2	14.60	76	56.89	.0107
47	1.0	0.2	17.4	12	2.14	1.7	0.3	3.0	9.2	241.3	1132	0.1	104.29	126384582.54	0.0	14.60	0	0.00	.0000
48	1.0	0.1	13.8	1	4.86	0.8	0.1	0.7	4.5	242.0	1131	0.2	104.39	62361888.64	1237.1	14.60	76	57.16	.0107
49	0.8	0.1	13.8	0	4.87	0.7	0.1	0.7	3.8	242.0	1131	0.2	104.46	62406291.82	1238.7	14.60	76	57.01	.0107
50	18.2	0.3	4.1	0	1.61	6.4	0.1	0.9	34.9	241.9	1131	0.1	104.47	26374824.59	1239.8	14.60	76	57.09	.0108
51	45.9	29.9	0.1	0	-0.01	13.0	8.5	76.1	71.1	242.3	1131	0.1	104.48	21305428.34	1239.7	14.60	76	57.22	.0108
52	45.9	44.6	0.0	0	-0.02	13.0	12.6	112.9	70.7	242.2	1131	0.2	104.43	21193777.27	0.0	14.60	0	0.00	.0000
53	45.7	45.3	0.0	0	-0.03	12.9	12.8	114.9	70.6	242.5	1131	0.2	104.87	21242510.98	0.0	14.60	0	0.00	.0000
54	45.7	45.5	1.1	17	-0.03	13.6	13.6	121.8	74.4	242.2	1132	0.2	104.83	22414560.70	1239.2	14.60	76	57.58	.0108
55	16.3	43.0	20.3	99	0.00	180.0	422.8	3774.5	977.6	240.4	1130	0.1	104.00	7361603222.52	1238.1	14.60	76	57.27	.0108
56	2.8	4.9	20.6	99	0.00	56.1	96.4	832.9	289.7	231.8	1114	0.1	100.70	1423684832.74	1222.6	14.60	75	57.31	.0106
57	2.8	0.8	20.6	99	0.00	56.1	15.7	132.5	282.2	225.2	1105	1.5	98.10	1368958117.88	1200.4	14.61	75	57.39	.0107
58	3.0	0.3	20.6	99	0.00	59.0	5.9	48.0	292.4	217.9	1103	6.4	94.86	1341149739.09	1172.2	14.61	75	57.53	.0107
59	3.9	0.1	20.6	99	0.00	76.7	2.0	15.6	371.4	211.1	1104	10.2	92.67	1310260584.39	0.0	14.61	0	0.00	.0000

AIR CONSULTING & ENGINEERING, INC.

VISIBLE EMISSION OBSERVATION FORM

START TIME: 1410 END TIME: 1510

OBSERVATION DATE 3-2-00 TIME ZONE EST PAGE 1 OF 1

COMPANY NAME LAKELAND ELECTRIC

SOURCE

ADDRESS

CITY LAKELAND STATE FL. ZIP

PHONE SOURCE ID NO.

PROCESS GAS TURBINE | OPERATING MODE BASELOAD

CONTROL EQUIPMENT | OPERATING MODE

DESCRIBE EMISSION POINT
278" dia. Metal Stack

HEIGHT OF EMISSION POINT START ~80' END SAME | HEIGHT RELATIVE TO OBSERVER START ~80' END SAME

DISTANCE TO EMISSION POINT START ~250' END SAME | DIRECTION TO EM. PT. (DEGREES) START ~48° END SAME

VERTICAL ANGLE TO OBS. PT. START ~20° END SAME | DIRECTION TO OBS. PT. (DEGREES) START ~48° END SAME

DISTANCE AND DIRECTION TO OBS. PT. FROM EM. PT.
START ~6' ABOVE STK EXIT END SAME

DESCRIBE EMISSIONS
START NONE END SAME

EMISSION COLOR START NONE END SAME | WATER DROPLET PLUME (NONE) ATTACHED DETACHED

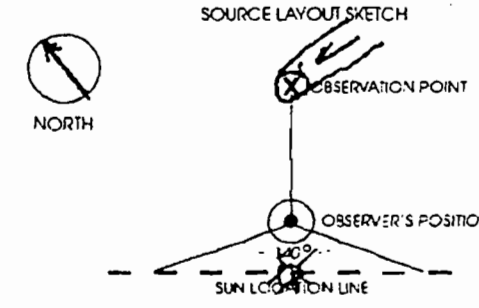
DESCRIBE PLUME BACKGROUND
START Sky / Clouds END SAME

BACKGROUND COLOR START GRAY END SAME | SKY CONDITIONS START Sc. Cld END SAME

WIND SPEED START 5-8 END SAME | WIND DIRECTION START W END SAME

AMBIENT TEMPERATURE START 84 END 85 | WET BULB TEMP. 72 | %RH 56

SOURCE LAYOUT SKETCH



= SOURCE WITH PLUME = SUN = WIND

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
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2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

OBSERVER'S NAME (PRINT) CHARLES RESHARD

OBSERVER'S SIGNATURE Charles Reshard DATE 3-2-00

ORGANIZATION AIR Consulting + Eng.

CERTIFIED BY E.T.A. DATE 12-99

COMMENTS

ACE AIR CONSULTING & ENGINEERING, INC

VISIBLE EMISSION OBSERVATION FORM

COMPANY NAME LAKELAND ELECTRIC

SOURCE

ADDRESS

CITY LAKELAND STATE FL. ZIP

PHONE SOURCE ID NO.

PROCESS	OPERATING MODE
GAS Turbine	BASELOAD
CONTROL EQUIPMENT	OPERATING MODE

DESCRIBE EMISSION POINT

278" dia. Metal Stack

HEIGHT OF EMISSION POINT	HEIGHT RELATIVE TO OBSERVER
START ~80' END SAME	START ~80' END SAME
DISTANCE TO EMISSION POINT	DIRECTION TO EM. PT. (DEGREES)
START ~250' END	START ~48° END SAME
VERTICAL ANGLE TO OBS. PT.	DIRECTION TO OBS. PT. (DEGREES)
START ~20° END SAME	START ~48° END SAME

DISTANCE AND DIRECTION TO OBS. PT. FROM EM. PT.

START ~6' ABOVE STACK EXIT END SAME

DESCRIBE EMISSIONS

START NONE END SAME

EMISSION COLOR	WATER DROPLET PLUME (NONE)
START NONE END	ATTACHED DETACHED

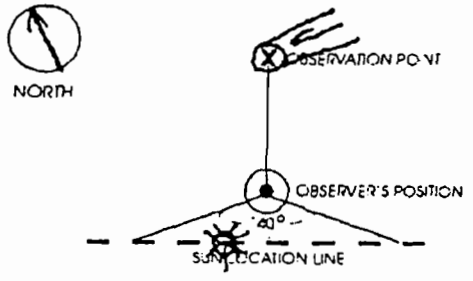
DESCRIBE PLUME BACKGROUND

START Sky/clouds END SAME

BACKGROUND COLOR	SKY CONDITIONS
START GRAY END SAME	START Sc, Cu END SAME
WIND SPEED	WIND DIRECTION
START 5-8 END SAME	START W END SAME

AMBIENT TEMPERATURE	WET BULB TEMP.	%RH
START 85 END 83	74	60

SOURCE LAYOUT SKETCH



= SOURCE WITH PLUME = SUN = WIND

START TIME: 1512 END TIME: 1612

OBSERVATION DATE 3-2-00 TIME ZONE EST PAGE 1 OF 1

SEC/MIN	0	15	30	45	SEC/MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
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19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
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23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
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27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

OBSERVER'S NAME (PRINT) CHARLES RESHARD

OBSERVER'S SIGNATURE Charles Reshard DATE 3-2-00

ORGANIZATION AIR CONSULTING & ENG

CERTIFIED BY E.T.A. DATE 12-99

COMMENTS

AIR CONSULTING & ENGINEERING, INC

VISIBLE EMISSION OBSERVATION FORM

START TIME: 1614 END TIME: 1714

OBSERVATION DATE 3-2-00 TIME ZONE EST PAGE 1 OF 1

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

COMPANY NAME LAKELAND ELECTRIC

SOURCE

ADDRESS

CITY LAKELAND STATE FL. ZIP

PHONE SOURCE ID NO.

PROCESS GAS Turbine | OPERATING MODE Baseload

CONTROL EQUIPMENT | OPERATING MODE

DESCRIBE EMISSION POINT
278" dia. Metal Stack

HEIGHT OF EMISSION POINT START ~ 80' END SAME | HEIGHT RELATIVE TO OBSERVER START ~ 80' END SAME

DISTANCE TO EMISSION POINT START ~ 250' END SAME | DIRECTION TO EM. PT. (DEGREES) START ~ 48° END SAME

VERTICAL ANGLE TO OBS. PT. START ~ 20° END SAME | DIRECTION TO OBS. PT. (DEGREES) START ~ 48° END SAME

DISTANCE AND DIRECTION TO OBS. PT. FROM EM. PT.
START 26' about Stack Exit END SAME

DESCRIBE EMISSIONS
START NONE END SAME

EMISSION COLOR START NONE END SAME | WATER DROPLET PLUME (NONE) ATTACHED DETACHED

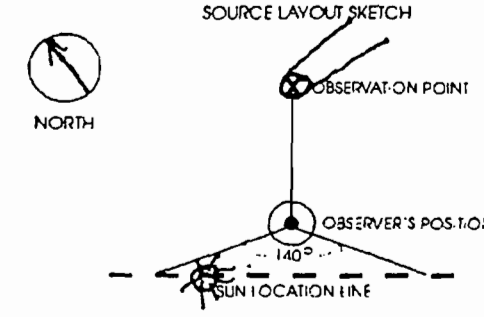
DESCRIBE PLUME BACKGROUND
START Sky/clouds END SAME

BACKGROUND COLOR START GRAY END SAME | SKY CONDITIONS START Sc clds END SAME

WIND SPEED START 5-8 END SAME | WIND DIRECTION START W END SAME

AMBIENT TEMPERATURE START 83 END 81 | WET BULB TEMP. 72 | %RH 59

SOURCE LAYOUT SKETCH



= SOURCE WITH PLUME = SUN = WIND

OBSERVER'S NAME (PRINT) CHARLES RESHARD

OBSERVER'S SIGNATURE Charles Reshard DATE 3-2-00

ORGANIZATION AIR CONSULTING + ENG.

CERTIFIED BY E.T.A. DATE 12-99

COMMENTS

McIntosh Unit #5 - SWPC 501G
Calibration Record

Measured Values						Certified Concentrations					Difference (% of Scale)					
Time	CO	NOx	O2	THC	CO2	CO	NOx	O2	THC	CO2	CO	NOx	O2	THC	CO2	
	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	%	100	100	25	50	20	
9:12	0.7	0.9	19.8	0	-0.06											
9:13	0.7	0.1	19.8	1	-0.05			20					-0.8%			Initial Cal/Cal Error
9:14	0.6	-0.3	19.8	0	-0.06											
9:26	0.7	89.2	0.0	0	-0.06											
9:27	0.5	89.3	1.2	17	-0.06		88.7					0.6%				Initial Cal/Cal Error
9:28	289.5	86.6	8.6	50	0.65											
9:31	88.9	0.3	0.0	0	-0.06											
9:32	89.0	0.0	0.0	0	-0.06	91					-2.0%					Initial Cal/Cal Error
9:33	278.1	0.0	11.8	83	0.92											
9:34	237.9	17.7	0.1	0	-0.04											
9:35	21.5	18.3	0.0	0	-0.06	20	20.3				1.5%	-2.0%	0.0%		-0.3%	Initial Cal/Cal Error
9:36	21.7	19.5	0.0	0	-0.06											
9:39	47.7	37.5	0.0	0	-0.06											
9:40	46.2	44.3	0.0	0	-0.06	45.3	46				0.9%	-1.7%	0.0%		-0.3%	Initial Cal/Cal Error
9:41	46.3	44.7	0.0	0	-0.06											
9:44	-0.1	2.6	13.8	0	4.88											
9:45	-0.4	0.2	13.9	0	4.9	0	0	13.9		5.06	-0.4%	0.2%	0.0%		-0.8%	Initial Cal/Cal Error
9:46	-0.4	-0.1	13.9	0	4.93											
9:48	55.3	28.8	0.0	0	-0.04											
9:49	46.7	44.7	2.0	17	-0.04	45.3	46				1.4%	-1.3%				Bias
9:50	440.1	45.3	15.2	99	2.86											
10:39	-0.3	2.9	13.8	0	4.91											
10:40	-0.5	1.3	13.8	0	4.91	0	0	13.9		5.06	-0.5%	1.3%	-0.4%		-0.7%	Bias
10:41	0.5	1.0	10.3	0	4.1											
10:42	38.9	11.3	0.0	0	0											
10:43	46.3	43.5	0.0	0	-0.02	45.3	46	0		0	1.0%	-2.5%	0.0%		-0.1%	Drift/Bias
10:44	46.4	45.1	0.0	0	-0.03											
11:14	40.5	39.2	0.1	0	0											
11:15	46.3	45.6	0.0	0	-0.03	45.3	46	0		0	1.0%	-0.4%	0.0%		-0.2%	Drift/Bias
11:16	46.4	46.0	1.7	0	0.13											
11:18	-0.3	3.8	13.8	0	4.89											
11:19	-0.2	1.0	13.8	0	4.9	0	0	13.9	0	5.06	-0.2%	1.0%	-0.4%	0.0%	-0.8%	Drift/Bias
11:20	1.8	0.5	13.5	0	4.73											
12:26	0.6	1.4	0.0	45	-0.05											
12:27	0.6	1.2	0.0	45	-0.05				45.1					-0.2%		THC Initial Cal/Cal Error
12:28	99.8	0.7	15.1	35	0.21											% Absolute
12:32	0.7	1.7	20.7	33	-0.05											
12:33	0.6	0.6	20.7	24	-0.05				24.8					-3.2%		THC Initial Cal/Cal Error
12:34	0.8	0.5	20.7	37	-0.06											% Absolute
12:36	233.1	44.4	20.7	10	-0.03											
12:37	0.6	5.0	20.7	10	-0.05				10					0.0%		THC Initial Cal/Cal Error
12:38	1.0	1.0	19.8	40	0.27											% Absolute
13:18	-0.3	1.3	13.8	0	4.89											
13:19	-0.3	1.0	13.8	0	4.9	0	0	13.9	0	5.06	-0.3%	1.0%	-0.4%	0.0%	-0.8%	Drift/Bias
13:20	26.8	0.9	1.5	0	0.83											
13:21	46.3	37.3	0.0	0	-0.01											
13:22	46.3	44.7	0.0	0	-0.03	45.3	46	0	0	0	1.0%	-1.3%	0.0%	0.0%	-0.2%	Drift/Bias
13:23	46.3	45.3	1.1	0	-0.03											
13:53	46.4	45.7	0.0	0	-0.04											
13:54	46.3	45.7	0.0	0	-0.04	45.3	46	0	0	0	1.0%	-0.3%	0.0%	0.0%	-0.2%	Drift/Bias
13:55	22.9	45.6	12.8	0	3.47											
13:58	-0.5	0.6	13.8	0	4.87											
13:59	-0.3	0.4	13.8	0	4.88	0	0	13.9	0	5.06	-0.3%	0.4%	-0.4%	0.0%	-0.9%	Drift/Bias
14:00	9.4	0.1	13.2	0	4.45											
14:44	-0.2	0.5	13.8	0	4.89											
14:45	-0.3	0.3	13.8	0	4.89	0	0	13.9	0	5.06	-0.3%	0.3%	-0.4%	0.0%	-0.9%	Drift/Bias
14:46	-0.1	0.1	12.3	0	4.84											
14:48	46.7	18.7	0.0	0	-0.02											
14:49	46.8	44.5	0.0	0	-0.03	45.3	46	0	0	0	1.5%	-1.5%	0.0%	0.0%	-0.2%	Drift/Bias

McIntosh Unit #5 - SWPC 501G
Calibration Record

	Measured Values					Certified Concentrations					Difference (% of Scale)					
Time	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO ppm	NOx ppm	O2 %	THC ppm	CO2 %	CO 100	NOx 100	O2 25	THC 50	CO2 20	
14:50	47.0	45.0	0.0	0	-0.03											
15:24	0.4	0.8	13.8	0	4.89											
15:25	0.6	0.4	13.8	0	4.9	0	0	13.9	0	5.06	0.6%	0.4%	-0.4%	0.0%	-0.8%	Drift/Bias
15:26	18.7	1.1	4.6	0	1.71											
15:29	47.7	45.1	0.0	0	-0.02											
15:30	47.6	45.3	0.0	0	-0.03	45.3	46	0	0	0	2.3%	-0.7%	0.0%	0.0%	-0.2%	Drift/Bias
15:31	38.9	45.2	5.5	0	1.41											
16:03	47.6	45.4	0.0	0	-0.02											
16:04	47.5	45.5	0.0	0	-0.03	45.3	46	0	0	0	2.2%	-0.5%	0.0%	0.0%	-0.2%	Drift/Bias
16:05	19.5	45.4	12.8	0	3.48											
16:07	0.7	0.9	13.7	0	4.88											
16:08	0.8	0.3	13.8	0	4.89	0	0	13.9	0	5.06	0.8%	0.3%	-0.4%	0.0%	-0.9%	Drift/Bias
16:09	0.8	0.1	13.2	0	4.68											
16:12	0.9	5.8	20.6	24	-0.01											
16:13	1.0	0.5	20.6	24	-0.02				24.8					-1.6%		Drift/Bias
16:14	1.1	0.2	16.4	8	2.11											
17:21	1.0	1.1	20.6	23	-0.02											
17:22	0.8	0.4	20.6	24	-0.03				24.8					-1.6%		Drift/Bias
17:23	0.8	0.3	15.1	3	3.56											
17:24	0.8	0.3	13.8	0	4.87											
17:25	0.9	0.1	13.8	0	4.88	0	0	13.9	0	5.06	0.9%	0.1%	-0.4%	0.0%	-0.9%	Drift/Bias
17:26	0.9	0.1	11.9	0	4.84											
17:28	47.8	41.2	0.0	0	-0.01											
17:29	47.7	44.9	0.0	0	-0.02	45.3	46	0	0	0	2.4%	-1.1%	0.0%	0.0%	-0.1%	Drift/Bias
17:30	48.1	45.4	0.0	0	-0.03											
18:39	33.7	32.5	0.2	0	0.03											
18:40	47.8	44.4	0.0	0	-0.01	45.3	46	0	0	0	2.5%	-1.6%	0.0%	0.0%	-0.1%	Drift/Bias
18:41	47.6	45.8	1.9	0	0.43											
18:46	0.8	0.3	20.6	24	-0.04				24.8					-1.6%		Drift/Bias
18:47	1.0	0.2	17.4	12	2.14											
18:48	1.0	0.1	13.8	1	4.86											
18:49	0.8	0.1	13.8	0	4.87	0	0	13.9	0	5.06	0.8%	0.1%	-0.4%	0.0%	-0.9%	Drift/Bias
18:50	18.2	0.3	4.1	0	1.61											
18:52	45.9	44.6	0.0	0	-0.02											
18:53	45.7	45.3	0.0	0	-0.03	45.3	46	0	0	0	0.4%	-0.7%	0.0%	0.0%	-0.2%	Reset CO
18:54	45.7	45.5	1.1	17	-0.03											

Calibration Error and Drift Requirements:	Initial Cal Error	Drift
EPA Method 20 (O2, CO2, & Nox)	2% of Span	2% of Span
EPA Method 10 (CO)	2% of Span	<10% in 8 hours
EPA Method 25A (THC)	5% Absolute	3% of Span

,,,,Enertec NTDAHS®
,,,,Average Values Report
,,,,"03/23/00 17:03"

Converter Efficiency Test
Thermo Environmental 42C HL
SN 42H-53090-294

"Company: McIntosh Unit 5",,,,,,"Period Start: 03/23/00 16:16"
" Plant: ",,,,,,"Period End: 03/23/00 16:59"
"City/St: Lakeland, Florida",,,,,,"Validation Type: 1/1 min"
" Source: STACK",,,,,,"Averaging Period: 1 min"
,,,,,,Type: Block Avg

Period Start	Average NOx ppm	Average NOx Corr ppm	Average CO ppm	Average CO Corr ppm	Average THC ppm	Average THC Corr ppm	Average O2 %	Average CO2 %
"03/23/00 16:16",	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
"03/23/00 16:17",	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
"03/23/00 16:18",	42.3	988.6	999.9	N/A	N/A	N/A	20.6	-0.01
"03/23/00 16:19",	42.1	985.1	999.9	N/A	N/A	N/A	20.6	-0.02
"03/23/00 16:20",	42.1	985.9	1000.0	N/A	N/A	N/A	20.6	-0.01
"03/23/00 16:21",	42.1	985.1	1000.0	N/A	N/A	N/A	20.6	-0.02
"03/23/00 16:22",	42.2	1424.9	999.9	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:23",	42.3	1649.7	999.9	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:24",	42.5	1656.2	999.9	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:25",	42.7	1664.0	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:26",	42.9	1671.2	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:27",	43.1	1679.0	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:28",	43.1	1680.9	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:29",	43.3	1690.0	999.9	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:30",	43.3	1690.0	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:31",	43.1	1682.2	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:32",	43.4	1692.0	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:33",	43.6	1698.5	999.9	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:34",	43.8	1706.3	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:35",	43.8	1708.9	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:36",	44.0	1716.0	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:37",	44.0	1716.0	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:38",	44.0	1716.0	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:39",	43.8	1707.5	1000.0	N/A	N/A	N/A	20.7	-0.01
"03/23/00 16:40",	43.7	1702.4	1000.0	N/A	N/A	N/A		

CONV. EFF. cont'd.

20.7 , -0.01
"03/23/00 16:41", 43.6 , 1699.8 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:42", 43.7 , 1704.3 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:43", 43.4 , 1691.3 , 999.9 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:44", 43.6 , 1699.1 , 999.9 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:45", 43.6 , 1699.8 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:46", 43.6 , 1700.4 , 999.9 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:47", 43.6 , 1698.5 , 999.9 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:48", 43.6 , 1702.4 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:49", 43.8 , 1705.6 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:50", 43.8 , 1708.9 , 999.9 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:51", 43.7 , 1704.3 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:52", 43.8 , 1706.3 , 999.9 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:53", 43.7 , 1704.9 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:54", 14.9 , 581.1 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:55", 0.3 , 12.3 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:56", 0.3 , 11.7 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:57", 0.3 , 13.0 , 999.9 , N/A , N/A , N/A ,
20.7 , -0.01
"03/23/00 16:58", 0.3 , 12.3 , 1000.0 , N/A , N/A , N/A ,
20.7 , -0.01
"Final Average*", 38.4 , 1428.1 , 1000.0 ,N/A,N/A,N/A, 20.7 , -0.01
" Maximum*", 44.0 , 1716.0 , 1000.0 , 0.0 , 0 , 0 ,
20.7 , 0.00
" Minimum*", 0.3 , 11.7 , 999.9 ,0000000.0 ,00000000 ,00000000 ,
20.6 , -0.02

"*Does not include Invalid Averaging Periods ("N/A")"

Peak = 44.0
Final = 43.6 $\Delta\% = 0.9\%$ pass

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SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: McIntosh Power Station (Gate 8)
3030 East Lake Parker Drive
Lakeland, FL 33805
Attn: Bill Barclay/Jason Kraus

CERTIFICATE OF ANALYSIS

SGI ORDER #:	141693		
ITEM#:	7	**CYLINDER #:**	CC106855
CERTIFICATION DATE:	4/8/99	**CYLINDER PRES:**	2000 psig
P.O.#:	4500158527	**CYLINDER VALVE:**	CGA 660
BLEND TYPE	CERTIFIED		

ANALYTICAL ACCURACY: + / - 2%

COMPONENT	REQUESTED GAS CONC	ANALYSIS
Carbon Monoxide	45.0 ppm	45.3 ppm
Nitric Oxide	45.0 ppm	46.0 ppm
NOX	Reference Value Only	46.0 ppm
Nitrogen	Balance	Balance

ANALYST: Fred Pikula

DATE: 4/8/99

SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: Mcintosh Power Station (Gate 8)
3030 East Lake Parker Drive
Lakeland, FL 33805
Attn: Bill Barclay/Jason Kraus

CERTIFICATE OF ANALYSIS

SGI ORDER # :	141693		
ITEM# :	1	**CYLINDER # :**	CC106729
CERTIFICATION DATE:	4/13/99	**CYLINDER PRES:**	2000 psig
P.O.# :	4500158527	**CYLINDER VALVE:**	CGA 590
BLEND TYPE:	CERTIFIED		

ANALYTICAL ACCURACY: + / - 2%

COMPONENT	REQUESTED GAS CONC	ANALYSIS
Oxygen	20.0 %	20.0 %
Nitrogen	Balance	Balance

ANALYST: Fred Pikula

DATE: 4/13/99

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SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: McIntosh Power Station (Gate 8)
3030 East Lake Parker Drive
Lakeland, FL 33805
Attn: Bill Barclay/Jason Kraus

CERTIFICATE OF ANALYSIS

SGI ORDER # :	141693		
ITEM# :	8	**CYLINDER # :**	CC106965
CERTIFICATION DATE:	4/8/99	**CYLINDER PRES:**	2000 psig
P.O.# :	4500158527	**CYLINDER VALVE:**	CGA 660
BLEND TYPE	CERTIFIED		

ANALYTICAL ACCURACY: + / - 2%

COMPONENT	REQUESTED GAS CONC	ANALYSIS
Carbon Monoxide	20.0 ppm	20.0 ppm
Nitric Oxide	20.0 ppm	20.3 ppm
NOX	Reference Value Only	20.3 ppm
Nitrogen	Balance	Balance

ANALYST: Fred Pikula

DATE: 4/8/99

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SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: Mcintosh Power Station (Gate 8)
3030 East Lake Parker Drive
Lakeland, FL 33805
Attn: Bill Barclay/Jason Kraus

CERTIFICATE OF ANALYSIS

SGI ORDER # : 141693
ITEM# : 9
CERTIFICATION DATE: 4/13/99
P.O.# : 4500158527
BLEND TYPE: CERTIFIED

CYLINDER # : CC107045
CYLINDER PRES: 2000 psig
CYLINDER VALVE: CGA 590

ANALYTICAL ACCURACY: +/- 2%

COMPONENT	REQUESTED GAS CONC	ANALYSIS
Oxygen	14.0 %	13.9 %
Carbon Dioxide	5.00 %	5.06 %
Nitrogen	Balance	Balance

ANALYST: Fred Pikula

DATE: 4/13/99

SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: CEM Services
247 Oakland Street
Mansfield, MA 02048

CERTIFICATE OF ANALYSIS

SGI ORDER #:	141242		
ITEM#:	1	**CYLINDER #:**	CC106652
CERTIFICATION DATE:	4/1/99	**CYLINDER PRES:**	2000 psig
P.O.#:	1141B	**CYLINDER VALVE:**	CGA 580
GRADE:	ZERO NITROGEN		

COMPONENT	REQUESTED GAS GRADE
NITROGEN	99.998 %

THC < 0.1 ppm

ANALYST: Ted Neeme

DATE: 4/1/99

SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: Mcintosh Power Station (Gate 8)
3030 East Lake Parker Drive
Lakeland, FL 33805
Attn: Bill Barclay/Jason Kraus

CERTIFICATE OF ANALYSIS

SGI ORDER #: 141693
ITEM#: 2
CERTIFICATION DATE: 4/8/99
P.O.#: 450015 8527
BLEND TYPE: CERTIFIED

CYLINDER #: CC107087
CYLINDER PRES: 2000 psig
CYLINDER VALVE: CGA 350

ANALYTICAL ACCURACY: +/- 2%

COMPONENT	REQUESTED GAS CONC	ANALYSIS
Carbon Monoxide	90.0 ppm	91.0 ppm
Nitrogen	Balance	Balance

DATE: 4/8/99

ANALYST: Fred Picula

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SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: Mcintosh Power Station (Gate 8)
3030 East Lake Parker Drive
Lakeland, FL 33805
Attn: Bill Barclay/Jason Kraus

CERTIFICATE OF ANALYSIS

SGI ORDER # :	141693		
ITEM# :	10	**CYLINDER # :**	CC106736
CERTIFICATION DATE:	4/13/99	**CYLINDER PRES:**	2000 psig
P.O.# :	4500158527	**CYLINDER VALVE:**	CGA 590
BLEND TYPE:	CERTIFIED		

ANALYTICAL ACCURACY: + / - 2%

COMPONENT	REQUESTED GAS CONC	ANALYSIS
Methane	10.0 ppm	10.0 ppm
Air	Balance	Balance

ANALYST: Ted Neeme

DATE: 4/13/99

SHIPPED FROM: 80 INDUSTRIAL DRIVE ALPHA, NJ. 08865 TEL: (908) 454-7455

SHIPPED TO: Mcintosh Power Station (Gate 8)
3030 East Lake Parker Drive
Lakeland, FL. 33805
Attn: Bill Barclay/Jason Kraus

CERTIFICATE OF ANALYSIS

SGI ORDER #:	141693		
ITEM#:	6	**CYLINDER #:**	CC107069
CERTIFICATION DATE:	4/13/99	**CYLINDER PRES:**	2000 psig
P.O.#:	4500158527	**CYLINDER VALVE:**	CGA 350
BLEND TYPE:	CERTIFIED		

ANALYTICAL ACCURACY: + / - 2%

COMPONENT	REQUESTED GAS CONC	ANALYSIS
Methane	45.0 ppm	45.1 ppm
Nitrogen	Balance	Balance

ANALYST: Ted Neeme

DATE: 4/13/99

State of Florida

Department of Environmental Protection

This is to Certify That

CHARLES RESHARD

has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

This Certificate Expires

Jun 9, 2000

M D Harley
Certificate Officer

Charles Reshard
Bearer's Signature

Your certificate is valid for six (6) months. To keep your certification current, you must recertify on or before the expiration date on the card. Please mark your calendar accordingly.

Provided field certification is continuous the classroom certificate expires:

Nov 30, 2001

If field certification is not continous classroom certification must be obtained prior to your next field certification attempt.

If you have any questions about your certification, please contact M.D. Harley at 850/921-9509.

VISIBLE EMISSIONS EVALUATOR

This is to certify that

Charles Reshard

met the specifications of Federal Reference Method 9 and qualified 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, North Carolina. This certificate is valid for six months from date of issue.

274956	Jacksonville, Florida	December 9, 1999
Certificate Number	Location	Date of Issue

President

Director of Training

AIR CONSTRUCTION PERMIT PSD-FL-245 (1050004-004-AC)

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 60, 72, 73, and 75.
2. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]
3. These emission units shall comply with all applicable requirements of 40CFR60, Subpart A, General Provisions including:
   - 40CFR60.7, Notification and Recordkeeping
   - 40CFR60.8, Performance Tests
   - 40CFR60.11, Compliance with Standards and Maintenance Requirements
   - 40CFR60.12, Circumvention
   - 40CFR60.13, Monitoring Requirements
   - 40CFR60.19, General Notification and Reporting requirements
4. ARMS Emission Unit 028, Power Generation, consisting of a 250 megawatt combustion turbine with a once-through steam generator shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not used for compliance determinations with the BACT standard(s). ?
5. ARMS Emission Unit 029, Fuel Storage, consisting of a 1.05 million gallon distillate fuel oil storage tank shall comply with all applicable provisions of 40CFR60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels, adopted by reference in Rule 62-204.800, F.A.C.
6. All notifications and reports required by the above specific conditions shall be submitted to the DEP's Southwest District office.

GENERAL OPERATION REQUIREMENTS

7. Fuels: Only pipeline natural gas or maximum 0.05 percent sulfur fuel oil No. 2 or superior grade of distillate fuel oil shall be fired in this unit. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)] ✓

AIR CONSTRUCTION PERMIT PSD-FL-245 (1050004-004-AC)

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

8. Capacity: The maximum heat input rates, based on the lower heating value (LHV) of each fuel to Unit 5 at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 2,174 million Btu per hour (mmBtu/hr) when firing natural gas, nor 2,236 mmBtu/hr when firing No. 2 or superior grade of distillate fuel oil. These maximum heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing. [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

9. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary.

10. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Southwest District office as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]

11. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]

12. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]

13. Maximum allowable hours of operation for the stationary gas turbine and once-through steam generator are 8760. Fuel usage as heat input, while burning natural gas in the stationary gas turbine, shall not exceed 15.639×10^{12} BTU (LHV) per year (rolled monthly) until the unit achieves the NO_X emission limits (other than the initial ones) given in Specific Condition 21. Thereafter, only the hourly heat input limits given in Specific Condition 8 apply. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

14. Fuel usage as heat input, while burning fuel oil in the stationary gas turbine, shall not exceed 559×10^{9} BTU (LHV) per year (rolled monthly). [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

AIR CONSTRUCTION PERMIT PSD-FL-245 (1050004-004-AC)

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

Control Technology

15. Westinghouse Dry Low NO_X (DLN) combustors shall be installed on the stationary combustion turbine to control nitrogen oxides (NO_X) emissions while firing natural gas. [Design, Rule 62-4.070, F.A.C.]

16. The Dry Low NO_X (DLN) combustors shall be replaced with Westinghouse Ultra Low NO_X (ULN) combustors to accomplish further NO_X control in order to achieve the emission limits specified in Specific Condition 20 and 21. A high temperature selective catalytic reduction (Hot SCR) system or a low temperature SCR system shall be installed and in operation (together with DLN or ULN combustors) not later than May 1, 2002 if the emission limits specified in Specific Condition No 20 and 21 are not achievable by ULN combustors by this date. [Design, Rules 62-4.070 and 62-212.400, F.A.C.]

17. The permittee shall design the stationary gas turbine, ducting, possible future heat recovery steam generator, and stack(s) to accommodate installation of SCR equipment and/or oxidation catalyst in the event that the ULN technology fails to achieve the NO_X limits given in Specific Condition No. 20 and 21 or the carbon monoxide (CO) limits given in Specific Condition 22 are not met. [Rule 62-4.070, F.A.C.]

18. A water injection system shall be installed for use when firing No. 2 or superior grade distillate fuel oil for control of NO_X emissions. [Design, Rules 62-4.070 and 62-212.400, F.A.C.]

19. The permittee shall provide manufacturer's emissions performance versus load diagrams for the DLN and ULN systems prior to their installation. DLN and ULN systems shall each be tuned upon initial operation to optimize emissions reductions and shall be maintained to minimize NO_X emissions and CO emissions. Operation of the DLN or ULN systems in the diffusion firing mode shall be minimized when firing natural gas. [Rule 62-4.070, and 62-210.650 F.A.C.]

EMISSION LIMITS AND STANDARDS

20. The following table is a summary of the BACT determination and is followed by the applicable specific conditions. Values for NO_X are corrected to 15% O_2. Values for CO are corrected to 15% O_2 only until May 1, 2002. [Rule 62-212.400, F.A.C.]

Operational Mode	NO_X (ppm)	CO (ppm)	VOC (ppm)	PM/Visibility (% Opacity)	Technology and Comments
Simple Cycle	25 - NG (basis) 237 lb/hr (24-hr avg) 42 - FO (3 hr avg)	25 - NG or 10 - Ox Cat 90 - FO	4 - NG 10 - FO	10	DLN on gas, WI on oil. Applies until 05/1/2002 . Clean fuels, good combustion
Simple Cycle	9 - NG (basis) 85 lb/hr (24-hr avg) 42 - FO (3 hr avg)	25 - NG or 10 - Ox Cat 90 - FO	4 - NG 10 - FO	10	ULN on gas, WI on oil. Applies after 05/1/2002 Clean fuels, good combustion
Simple Cycle	9 - NG (3 hr avg) 15 - FO (3-hr avg)	25 - NG or 10 - Ox Cat 90 - FO	4 - NG 10 - FO	10	Hot SCR. Applies not later than 05/1/2002 if 9 ppm NO_X not achievable by ULN. Clean fuels, good combustion.
Combined Cycle	7.5 - NG (3 hr avg) 15 - FO (3-hr avg)	25 - NG or 10 - Ox Cat 90 - FO	4 - NG 10 - FO	10	Conventional SCR unless simple cycle limits are achieved on or before 05/01/2002. Clean fuels, good combustion

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

21. Nitrogen Oxides (NO_X) Emissions:

- When NO_X monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate any specified average time.
- Until May 1, 2002, the concentration of NO_X in the exhaust gas shall not exceed 237 lb/hr (at ISO conditions) on a 24 hr block average (basis 25 ppm @ 15% O_2, full load) when firing natural gas and 42 ppmvd at 15% O_2 when firing fuel oil on the basis of a 3 hr average as measured by the continuous emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall exceed neither 25 ppm @15% O_2 nor 237 lb/hr (when firing natural gas) and shall exceed neither 42 ppm @15% O_2 nor 413 lb/hr (when firing fuel oil) to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]
- Not later than May 1, 2002, the concentration of NO_X concentrations in the exhaust gas shall not exceed 85 lb/hr (at ISO conditions) on a 24 hr block average (basis 9 ppm @ 15% O_2) when firing natural gas and 42 ppmvd at 15% O_2 when firing fuel oil on the basis of a 3 hr average as measured by the CEMS. In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall exceed neither 9 ppm @15% O_2 nor 85 lb/hr (when firing natural gas) and shall exceed neither 42 ppm @15% O_2 nor 413 lb/hr (when firing fuel oil) to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]
- If Hot SCR is installed, achievable short-term NO_X concentrations in the exhaust gas shall be demonstrated at baseload during the first compliance test following installation not to exceed 9 ppmvd at 15% O_2 when firing natural gas. NO_X emissions shall not exceed 9 ppmvd at 15% O_2 when firing natural gas and 15 ppmvd at 15% O_2 when firing fuel oil on the basis of a 3-hr average, as measured by the CEMS. In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall not exceed 85 lb/hr (when firing natural gas) and 148 lb/hr (when firing fuel oil) to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]
- If conventional SCR is installed in conjunction with conversion to combined cycle operation, achievable short-term NO_X concentrations in the exhaust gas shall be demonstrated at baseload during the first compliance test following installation not to exceed 7.5 ppmvd at 15% O_2 when firing natural gas. If conventional SCR catalyst is installed, NO_X emissions shall not exceed 7.5 ppmvd at 15% O_2 when firing natural gas and 15 ppmvd at 15% O_2 when firing fuel oil on the basis of 3-hr average, as measured by the CEMS. In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall not exceed 71.1 lb/hr (when firing natural gas) and 148 lb/hr (when firing fuel oil) to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]

AIR CONSTRUCTION PERMIT PSD-FL-245 (1050004-004-AC)

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

22. Carbon Monoxide (CO) emissions: Prior to May 1, 2002, the concentration of CO (@15% O_2 in the exhaust gas when firing natural gas shall not exceed 25 ppmvd when firing natural gas and 90 ppmvd when firing fuel oil as measured by EPA Method 10. CO emissions (at ISO conditions) shall not exceed 145 lb/hr (when firing natural gas) and 539 lb/hr (when firing fuel oil). [Rule 62-212.400, F.A.C.]

    After May 1, 2002, the concentration of CO in the exhaust gas when firing natural gas shall not exceed 25 ppmvd when firing natural gas and 90 ppmvd when firing fuel oil as measured by EPA Method 10. CO emissions (at ISO conditions) shall not exceed 106 lb/hr (when firing natural gas) and 386 lb/hr (when firing fuel oil). [Rule 62-212.400, F.A.C.]

23. Sulfur Dioxide (SO_2) emissions: SO_2 emissions (at ISO conditions) shall not exceed 7.2 pounds per hour when firing pipeline natural gas and 127 pounds per hour when firing maximum 0.05 percent sulfur No. 2 or superior grade distillate fuel oil as measured by applicable compliance methods described below. Emissions of SO_2 shall not exceed 38.4 tons per year. [Rules 62-4.070 and 62-212.400, F.A.C. to avoid PSD Review]

24. Visible emissions (VE): VE emissions shall not exceed 10 percent opacity when firing natural gas or No. 2 or superior grade of fuel oil.

25. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the exhaust gas when firing natural gas shall not exceed 4 ppmvd when firing natural gas and 10 ppmvd when firing fuel oil as assured by EPA Methods 18, and/or 25 A. VOC emissions (at ISO conditions) shall not exceed 10 lb/hr (when firing natural gas) and 25 lb/hr (when firing fuel oil). [Rule 62-212.400, F.A.C.]

EXCESS EMISSIONS

26. Excess emissions resulting from startup, shutdown, malfunction or fuel switching shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed four hours in any 24-hour period for cold startup or two hours in any 24-hour period for other reasons unless specifically authorized by DEP for longer duration.

27. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C.

28. Excess Emissions Report: If excess emissions occur due to malfunction, the owner or operator shall notify DEP's Southwest District office within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. [Rules 62-4.130 and 62-210.700(6), F.A.C.]

PROJECT PARTICIPANTS

STACS

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