APPENDIX B

QUALITY ASSURANCE

Appendix B.1

Quality Assurance Program Summary, Accreditation, and Certification

QUALITY ASSURANCE PROGRAM SUMMARY AND CERTIFICATIONS

The Avogadro Group, LLC (Avogadro) ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA Officer and encompasses seven major areas:

1. Development and use of an internal QA manual.
2. QA reviews of reports, laboratory work, and field testing.
3. Equipment calibration and maintenance.
4. Chain of custody.
5. Continuous training.
6. Knowledge of current test methods.
7. Agency certification.

Each of these areas is discussed individually below.

Quality Assurance Manual. Avogadro has prepared a QA Manual according to EPA guidelines. The manual serves to document and formalize all of Avogadro's QA efforts. The manual is constantly updated, and each employee involved in technical services for emission measurements is required to read and understand its contents. The manual includes details on the other six QA areas discussed below.

QA Reviews. Avogadro's review procedure includes review of each source test report by a project QA Officer, including reviews of laboratory and field work, data sheets, data input, calculations and averages, and report text.

The most important review is the one that takes place before a test program begins. The QA Officer works closely with testing personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of any interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance. The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the California Air Resources Board (CARB). The schedules for maintenance and calibrations are given in Tables B-1 and B-2.

Quality control checks are also conducted in the field for each test program. A partial list of checks made as part of each CEM system test series is included below as an example of the field QA procedures.

- Sample acquisition and conditioning system leak check.
- 2-point analyzer calibrations (all analyzers)
- 3-point analyzer calibrations (analyzers with potential for linearity errors).
- Complete system calibration check ("dynamic calibration" through entire sample system).
- Periodic analyzer calibration checks (once per hour) are conducted at the start and end of each test run. Any change between pre- and post-test readings are recorded.
- All calibrations are conducted using gases certified by the manufacturer to be + 1% of label value (NBS traceable).
- Calibration and CEM performance data are fully documented, and are included in each source test report.

Chain of Custody. AG maintains full chain of custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, AG documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.).

Samples are stored in a locked area to which only laboratory personnel have access. Neither other AG employees nor cleaning crews have keys to this area.

Data sheets are copied immediately upon return from the field, and this first generation copy is placed in locked storage. Any notes made on original sheets are initialed and dated.

Training. Personnel training is essential to ensure quality testing. AG has formal and informal training programs which include:

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

Knowledge of Current Test Methods. With the constant updating of standard test methods and the wide variety of emerging test methods, it is essential that any qualified source tester keep abreast of new developments. AG subscribes to services which provide updates on EPA and CARB reference methods, and on EPA, CARB and local District rules and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. AG personnel maintain membership in the Air and Waste Management Association and in the Source Evaluation Society.

AGENCY CERTIFICATION

AG is certified by the CARB as an independent source test contractor for gaseous and particulate measurements. AG also participates in EPA QA audit programs for Methods 5, 6 and 7.

TABLE B-1
SAMPLING INSTRUMENTS AND EQUIPMENT CALIBRATION SCHEDULE
As Specified by the CARB

Instrument Type	Frequency of Calibration	Standard of Comparison or Method of Calibration	Acceptance Limits
Orifice Meter (large)	12 months	Calibrated dry test meter	± 2% of volume measured
Dry Gas Meter	6 months or when repaired	Calibrated dry test meter	± 2% of volume measured
S-Type Pitot (for use with EPA-type sampling train	6 months	EPA Method 2	Cp constant (+5%) over working range; difference between average Cp for each leg must be less than 2%
Vacuum Gauges Pressure Gauges	6 months	Manometer	± 3%
Field Barometer	2 weeks (or on site)	Mercury barometer	± 0.2" Hg
Temperature Measurement (thermocouples)	6 months	NBS mercury thermometer or NBS calibrated platinum RTD	± 4 F for <400 F ± 1.5% for >400 F
Temperature Readout Devices	6 months	Precision potentiometer	± 2% full scale reading
Analytical Balance	12 months (check prior to each use)	Should be performed by manufacturer or qualified laboratory	± 0.3 mg of stated weight
Probe Nozzles	Each field day	Nozzle diameter check micrometer	Range <± 0.10 mm for three measurements
Continuous Analyzers	Every field day, Depends upon use, frequency and performance	As specified by manufacturers operating manuals, EPA NBS gases and/or reference methods	Satisfy all limits specified in operating specifications

TABLE B-2
EQUIPMENT MAINTENANCE SCHEDULE
Based on Manufacturer's Specifications and Avogadro's Experience

Equipment	Performance Requirement	Maintenance Interval	Corrective Action
Pumps	1. Absence of leaks 2. Ability to draw manufacturer required vacuum and flow	Every 300 hours of operation or 6 months, whichever is less	1. Visual inspection 2. Clean 3. Replace worn parts 4. Leak check
Flow Measuring Device	1. Free mechanical movement 2. Absence of malfunction	Every 300 hours of operation or 6 months, whichever is less After each test, if used in sampling of corrosive atmospheres (e.g. H_2S)	1. Visual inspection 2. Clean 3. Calibrate
Sampling Instruments	1. Absence of malfunction 2. Proper response to zero, span gas	As required by the manufacturer	As recommended by manufacturer
Integrated Sampling Tanks	Absence of leaks	Depends on nature of use	1. Steam clean 2. Leak check
Mobile Van Sampling Systems	Absence of leaks	Depends on nature of use	1. Change filters 2. Change gas dryer 3. Leak check 4. Check for system contamination
Sampling Lines	Sample degradation less than 2%	After each test or test series	Blow filtered air through line until dry

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER I-12-023

Relating to Independent Contractor Approval Under
California Code of Regulations, Title 17, Section 91207

The Avogadro Group, LLC

WHEREAS, the Air Resources Board (ARB), pursuant to California Health and Safety Code, section 41512, has established the procedures contained in California Code of Regulations, title 17, section 91200 and following, to allow the use of independent testers for compliance tests required by ARB;

WHEREAS, it has been determined that The Avogadro Group, LLC, meets the requirements of ARB for conducting ARB Test Methods 1, 2, 3, 4, 5, 8, 17, 100 (CO, CO_2, NO_X, O_2, SO_2, THC), Visible Emissions Evaluation (VEE), United States Environmental Protection Agency (U.S. EPA) Test Method 201A (1991 version) determining the condensable using back-half as specified in ARB Test Method 5, and U.S. EPA Test Methods 18, and 202 (1991 version), pursuant to Cal. Code Regs., title 17, section 91200 and following, when the following conditions are met:

1. The Avogadro Group, LLC permanently marks or engraves an identification number on the body of each of its pitot tubes;

2. The Avogadro Group, LLC calibrates its differential pressure gauges after each test series in accordance with section 2.2 of ARB Test Method 2, and establishes and maintains a log of the calibrations;

3. The Avogadro Group, LLC calibrates and repairs its nozzles used in isokinetic testing as required by section 5.1 of ARB Test Method 5, and establishes and maintains a log of the calibrations which shall include notes on the repairs on each nozzle;

4. The Avogadro Group, LLC uses a filter holder, and filter support as required by section 2.1.5 of ARB Test Method 5;

5. The Avogadro Group, LLC permanently and uniquely identifies its isokinetic nozzles;

6. The Avogadro Group, LLC installs a temperature gauge to determine the temperature of the condenser outlet as required by ARB Test Method 100;

7. The person performing VEE passed ARB's Compliance Training Course #100: Fundamentals of Enforcement (FOE or Smoke School) and is currently certified to conduct VEE. Any recertification for VEE, following the initial passage of

ARB's FOE, must be by a certifying body recognized by ARB at the time VEE is performed; and

WHEREAS, ARB's Executive Officer, pursuant to California Health and Safety Code, section 39516, issued Executive Order G-02-008 delegating to the Chief of ARB's Monitoring and Laboratory Division (MLD) the authority to approve independent testers in accordance with Cal. Code Regs., title 17, section 91200 and following.

NOW, THEREFORE, I, Alberto Ayala, Chief of ARB's MLD, order that The Avogadro Group, LLC is granted an approval, from the date of execution of this order, until June 30, 2013, to conduct the tests listed above, subject to compliance with Cal. Code Regs., title 17, section 91200 and following.

BE IT FURTHER ORDERED that during the approved period, the Executive Officer or his authorized representative may field audit one or more tests conducted pursuant to this order for each type of testing listed above.

Executed at Sacramento, California, this 6th day of July 2012.

Alberto Ayala, Ph.D., M.S.E.
Chief, Monitoring and Laboratory Division

State of California

Air Resources Board

Approved Independent Contractor

The Avogadro Group, LLC

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2013, for those test methods listed below:

ARB Source Test Methods:
1, 2, 3, 4, 5, 8, 17
100 (CO, CO_2, NO_x, O_2, SO_2, THC)

Alberto Ayala, Ph.D., M.S.E.
Chief, Monitoring and Laboratory Division

State of California

Air Resources Board

Approved Independent Contractor

The Avogadro Group, LLC

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2013, for those test methods listed below:

Visible Emissions Evaluation
U.S. EPA Test Methods 18, 202 (1991 version)

Alberto Ayala, Ph.D., M.S.E.
Chief, Monitoring and Laboratory Division

State of California

Air Resources Board

Approved Independent Contractor

The Avogadro Group, LLC

This is to certify that the company listed above has been approved by the Air Resources Board to conduct compliance testing pursuant to California Code of Regulations, title 17, section 91207, until June 30, 2013, for those test methods listed below:

U. S. EPA Test Method 201A (1991 version)
determining the condensible particulate matter using back half as specified in ARB Test Method 5

Alberto Ayala, Ph.D., M.S.E.
Chief, Monitoring and Laboratory Division

STACK TESTING ACCREDITATION COUNCIL 500 W. Wood St., Palatine, IL 60067, director@betterdata.org

March 16, 2012

Mr. Kevin Crosby
Avogadro Group
2825 Verne Roberts Circle
Antioch, California 94509

VIA E-mail

Dear Mr. Crosby,

On behalf of the STAC Board of Directors, I am pleased to inform you that the Avogadro Group has been granted interim accreditation by the Stack Testing Accreditation Council (STAC). After careful review of your Quality System documentation and procedures, STAC has determined that they are in conformance with ASTM D7036-04 "Standard Practice for the Competency of Air Emission Testing Bodies". Final accreditation is contingent upon successful completion of your field audit. Please see Module 3 of STAC policy documentation for scheduling requirements.

During this period of interim accreditation, the Avogadro Group may not claim to be a STAC accredited organization although you may refer to your interim status. To achieve final accreditation requires evidence that your Quality System is effectively implemented in your organization as determined by the field assessment. You may claim that your Quality System meets ASTM D7036 requirements.

Please note that the Attestation of Compliance you signed as part of your application for accreditation requires the Avogadro Group to be in continuous compliance with the provisions of ASTM D7036. You are also required to comply with all relevant STAC policies and procedures. I encourage you to review this information.

If you have any questions, please feel free to contact me at 847-654-4569. Thank you for your participation in the STAC process and congratulations.

Yours truly,

Scott Evans
Stack Testing Accreditation Council

Air Emission Testing Body (AETB) data

Test Date	January 28 - 30, 2013
Project Name	Marsh Landing
Project Number	12213.0

For EPA's ECMPS

Entry to ECMPS (EDR) software:	
QI Last Name	*DeVivi*
QI First Name	*Ian*
QI Middle Initial	*T.*
AETB Name	The Avogadro Group, LLC
AETB Phone Number	925.680.4300
AETB Email	info@avogadrogroup.com
Exam Date	*January 4, 2007*
Provider Name	Source Evaluation Society
Provider Email	qstiprogram@gmail.com

Attachments:

- STAC interim accreditation certification letter
- Copies of your QSTI certificates

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

IAN T. DeVIVI

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GAS VOLUME MEASUREMENTS AND ISOKINETIC PARTICULATE SAMPLING METHODS

ISSUED THIS 4TH DAY OF JANUARY 2013 AND EFFECTIVE UNTIL JANUARY 3RD, 2018

Peter R. Westlin, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

LeRoy Owens, QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2007-101

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

IAN T. DeVIVI

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

MANUAL GASEOUS POLLUTANTS SOURCE SAMPLING METHODS

ISSUED THIS 4TH DAY OF JANUARY 2013 AND EFFECTIVE UNTIL JANUARY 3RD, 2018

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

LeRoy Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2007-101

SOURCE EVALUATION SOCIETY

Qualified Source Testing Individual

LET IT BE KNOWN THAT

IAN T. DeVIVI

HAS SUCCESSFULLY PASSED A COMPREHENSIVE EXAMINATION AND SATISFIED EXPERIENCE REQUIREMENTS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY THE SES QUALIFIED SOURCE TEST INDIVIDUAL REVIEW BOARD FOR

GASEOUS POLLUTANTS INSTRUMENTAL SAMPLING METHODS

ISSUED THIS 4TH DAY OF JANUARY 2013 AND EFFECTIVE UNTIL JANUARY 3RD, 2018

Peter R. Westlin, QSTI/QSTO Review Board

Peter S. Pakalnis, QSTI/QSTO Review Board

LeRoy Owens, QSTI/QSTO Review Board

C. David Bagwell, QSTI/QSTO Review Board

Karen D. Kajiya-Mills , QSTI/QSTO Review Board

Glenn C. England, QSTI/QSTO Review Board

APPLICATION NO. 2007-101

Appendix B.2

CEMS Performance and Calibration Data

AVOGADRO CEMS PERFORMANCE DATA

(circle or enter applicable data)

CLIENT / LOCATION: Marsh Landing **JOB #:** 12213.0

OPERATOR: Ian DeVivi **DATE:** 1/28/13

ANALYZERS IN SERVICE								
Analyzers:	(O2)	(CO2)	(CO)	(NOx)	SO2	THC	Other:	_____
FILTRATION (ON STACK)								
Filter Type:	In-Stack		Out-of-Stack		Sintered		Other:	_____
Filter Material:	Glass	Quartz	Steel	N/A	--	--	Other:	_____
Filter Holder Material:	Steel	Teflon	Glass	N/A	--	--	Other:	_____
Oven Box (Y/N):	Yes	(No)	--	--	--	--	--	--
Oven Temperature:	_____ °F	(N/A)	--	--	--	--	--	--
SAMPLING PROBE								
Length:	4'	6'	8'	10'	12'	14'	Other:	15'
Material:	Steel	Glass	Teflon	(Titanium)	Quartz	Inconel	Other:	_____
Heated (Y/N):	Yes	(No)	--	--	--	--	--	--
Probe Temperature:	_____ °F	(N/A)	--	--	--	--	--	--
HEATED LINE								
In use (Y/N):	(Yes)	No	--	--	--	--	--	--
Length:	15'	25'	50'	75'	(100')	150'	Other:	_____
Line Temperature:	260 °F	N/A	--	--	--	--	--	--
CEMS SAMPLE LINE								
Length:	25'	50'	75'	100'	150'	(200')	Other:	_____
Material:	(Teflon)	Plastic	Not Used	--	--	--	Other:	_____
CONDITIONER (MOISTURE KNOCKOUT)								
In Service (Y/N):	(Yes)	No	--	--	--	--	--	--
Coolant:	Ice and Water		Anti-Freeze		(Electric)		Other:	_____
Trap Material:	(Steel)		Glass		Teflon		Other:	_____

LEAK CHECK

Pre-Test: 0 cfh @ _____ inches Hg vacuum

Post-Test: 0 cfh @ _____ inches Hg vacuum

System Flow Rate: 12 cfh

Leak Rate: $\frac{\text{Post-Test (cfh)}}{\text{System Flow Rate (cfh)}} * 100 =$ _____ %

SYSTEM RESPONSE	Run 1	Run 2	Run 3	Average
Upscale (seconds):	115	115	115	115
Downscale (seconds):	_____	_____	_____	_____

NO_X CONVERTER CHECK (1) Fill Tedlar bag with NO_2 and air. (2) Run contents of bag through NO_X analyzer.

$C = NO_X$ (as found): _____ ppm

$\% O_2 = O_2$ in air (as found): _____ ppm

$C_{NO2} = NO_2$ (actual): _____ ppm

$C_{NO} = NO$ (actual): _____ %

NO_X Converter Efficiency: _____ %

$$C_0 = \left[\frac{20.9}{(20.9 - \% O_2)}\right] * C = \_\_\_\_\_$$

$$Eff = \left[\frac{(C_0 - C_{NO})}{C_{NO2}}\right] * 100 = \_\_\_\_\_ \%$$

MoleDAQ Project Marsh Landing
Jan 28 2013
Unit: Unit 1 ~~HRSG~~

9:07:26
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:5.00 volts
  Offset:0.00 volts
  Range:100.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:100.000
Channel 5 is: THC
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:100.000

O2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 11.72 (CC140197)
  High: 20.08 (CC248733)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 4.129 (CC140197)
  High: 8.6 (CC248733)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 55.51 (CC317394)
  High: 94.4 (CC101428)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 54.48 (CC317394)
  High: 94.2 (CC101428)
  Biasing with: Mid
THC cylinders utilized:
  Zero: 0 (CC311091)
  Low: 31.2 (CC77754)
  Mid: 51.8 (CC149439)
  High: 84.94 (SG9162961BAL)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Jan 28 2013
Unit: Unit 1 HRSG

9:07:29
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.025
Mid Reference: 11.72	Mid Reading: 11.76	Mid %Error: 0.199
High Reference: 20.08	High Reading: 20.1	High %Error: 0.100

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.047
Mid Reference: 4.129	Mid Reading: 4.202	Mid %Error: 0.849
High Reference: 8.600	High Reading: 8.609	High %Error: 0.105

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.036	Zero %Error: -0.038
Mid Reference: 55.51	Mid Reading: 55.89	Mid %Error: 0.403
High Reference: 94.40	High Reading: 94.76	High %Error: 0.381

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.024	Zero %Error: -0.025
Mid Reference: 54.48	Mid Reading: 53.97	Mid %Error: -0.541
High Reference: 94.20	High Reading: 93.88	High %Error: -0.340

Analyzer: THC

Zero Reference: 0.000	Zero Reading: 0.021	Zero %Error: 0.025
Low Reference: 31.20	Low Reading: 32.18	Low %Error: 1.154
Mid Reference: 51.80	Mid Reading: 51.23	Mid %Error: -0.671
High Reference: 84.94	High Reading: 84.81	High %Error: -0.153

MoleDAQ Project Marsh Landing
Jan 28 2013
Unit: Unit 1 HRSG

9:48:56
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley

Initial **Bias**

Analyzer: O2		
Zero Bias Ref: 0.000	Bias Reading: -0.032	Bias %Error: -0.184
Span Bias Ref: 11.72	Bias Reading: 11.58	Bias %Error: -0.896
Analyzer: CO2		
Zero Bias Ref: 0.000	Bias Reading: -0.007	Bias %Error: -0.128
Span Bias Ref: 4.129	Bias Reading: 4.222	Bias %Error: 0.233
Analyzer: CO		
Zero Bias Ref: 0.000	Bias Reading: 0.116	Bias %Error: 0.161
Span Bias Ref: 55.51	Bias Reading: 55.05	Bias %Error: -0.890
Analyzer: NOx		
Zero Bias Ref: 0.000	Bias Reading: 0.003	Bias %Error: 0.029
Span Bias Ref: 54.48	Bias Reading: 52.08	Bias %Error: -2.006
Analyzer: THC		
Zero Bias Ref: 0.000	Bias Reading: -0.339	Bias %Error: -0.424
Span Bias Ref: 31.20	Bias Reading: 31.55	Bias %Error: -0.742

MoleDAQ Project Marsh Landing
Jan 28 2013
Unit: Unit 1 HRSG

11:55:48
Project name: Marsh Landing Project number:
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: -0.002	Zero %Error: -0.011
Mid Reference: 11.72	Mid Reading: 11.74	Mid %Error: 0.085
High Reference: 20.08	High Reading: 20.07	High %Error: -0.035

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.000	Zero %Error: 0.000
Mid Reference: 4.129	Mid Reading: 4.224	Mid %Error: 1.103
High Reference: 8.600	High Reading: 8.608	High %Error: 0.091

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.038
Mid Reference: 4.746	Mid Reading: 4.757	Mid %Error: 0.116
High Reference: 9.519	High Reading: 9.549	High %Error: 0.315

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: 0.000	Zero %Error: 0.000
Mid Reference: 2.516	Mid Reading: 2.556	Mid %Error: 0.699
High Reference: 5.696	High Reading: 5.692	High %Error: -0.075

MoleDAQ Project Marsh Landing
Jan 28 2013
Unit: Unit 1 HRSG

12:30:32
Project name: Marsh Landing Project number:
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: -0.002	Zero %Error: -0.011
Mid Reference: 11.72	Mid Reading: 11.74	Mid %Error: 0.085
High Reference: 20.08	High Reading: 20.07	High %Error: -0.035

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.000	Zero %Error: 0.000
Mid Reference: 4.129	Mid Reading: 4.224	Mid %Error: 1.103
High Reference: 8.600	High Reading: 8.608	High %Error: 0.091

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.003	Zero %Error: 0.032
Mid Reference: 4.746	Mid Reading: 4.927	Mid %Error: 1.899
High Reference: 9.519	High Reading: 9.537	High %Error: 0.187

MoleDAQ Project Marsh Landing
Jan 28 2013
Unit: Unit 1 HRSG

15:06:04
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley
Run Time: 60
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:5.00 volts
  Offset:0.00 volts
  Range:3000.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:100.000
Channel 5 is: THC
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10000.000

O2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 11.72 (CC140197)
  High: 20.08 (CC248733)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 4.129 (CC140197)
  High: 8.6 (CC248733)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 950 (SGAL2238)
  High: 2228 (CC195373)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 54.48 (CC317394)
  High: 94.2 (CC101428)
  Biasing with: Mid
THC cylinders utilized:
  Zero: 0 (CC311091)
  Low: 844.3 (CC317126)
  Mid: 1497 (CC406220)
  High: 2262 (XC002743B)
  Biasing with: Low

MoleDAQ Project Marsh Landing
Jan 28 2013
Unit: Unit 1 HRSG

15:06:07
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.02	Zero %Error: 0.100
Mid Reference: 11.72	Mid Reading: 11.77	Mid %Error: 0.249
High Reference: 20.08	High Reading: 20.07	High %Error: -0.050

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: -0.001	Zero %Error: -0.012
Mid Reference: 4.129	Mid Reading: 4.238	Mid %Error: 1.267
High Reference: 8.600	High Reading: 8.599	High %Error: -0.012

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.18	Zero %Error: 0.008
Mid Reference: 950.0	Mid Reading: 930.7	Mid %Error: -0.866
High Reference: 2228	High Reading: 2231	High %Error: 0.135

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.031	Zero %Error: -0.033
Mid Reference: 54.48	Mid Reading: 53.74	Mid %Error: -0.786
High Reference: 94.20	High Reading: 94.5	High %Error: 0.318

Analyzer: THC

Zero Reference: 0.000	Zero Reading: -0.6	Zero %Error: -0.027
Low Reference: 844.3	Low Reading: 837.4	Low %Error: -0.305
Mid Reference: 1497	Mid Reading: 1485	Mid %Error: -0.531
High Reference: 2262	High Reading: 2261	High %Error: -0.044

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 HRSG Max. Load

7:57:50
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
Voltage:10.00 volts
Offset:0.00 volts
Range:25.000
Channel 2 is: CO2
Voltage:10.00 volts
Offset:0.00 volts
Range:10.000
Channel 3 is: CO
Voltage:5.00 volts
Offset:0.00 volts
Range:10.000
Channel 4 is: NOx
Voltage:10.00 volts
Offset:0.00 volts
Range:6.000

O2 cylinders utilized:
Zero: 0 (CC43503)
Mid: 11.72 (CC140197)
High: 20.08 (CC248733)
Biasing with: Mid
CO2 cylinders utilized:
Zero: 0 (CC43503)
Mid: 4.129 (CC140197)
High: 8.6 (CC248733)
Biasing with: Mid
CO cylinders utilized:
Zero: 0 (CC43503)
Mid: 4.746 (CC1562)
High: 9.519 (CC284994)
Biasing with: Mid
NOx cylinders utilized:
Zero: 0 (CC43503)
Mid: 2.516 (CC1562)
High: 5.696 (CC284994)
Biasing with: Mid

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 HRSG Max. Load

7:57:52
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.020
Mid Reference: 11.72	Mid Reading: 11.78	Mid %Error: 0.299
High Reference: 20.08	High Reading: 20.08	High %Error: 0.000

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.058
Mid Reference: 4.129	Mid Reading: 4.264	Mid %Error: 1.570
High Reference: 8.600	High Reading: 8.606	High %Error: 0.070

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.005	Zero %Error: -0.053
Mid Reference: 4.746	Mid Reading: 4.897	Mid %Error: 1.586
High Reference: 9.519	High Reading: 9.549	High %Error: 0.315

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.001	Zero %Error: -0.018
Mid Reference: 2.516	Mid Reading: 2.54	Mid %Error: 0.421
High Reference: 5.696	High Reading: 5.646	High %Error: -0.878

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 Max. Load

11:46:18
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.020
Mid Reference: 11.72	Mid Reading: 11.78	Mid %Error: 0.299
High Reference: 20.08	High Reading: 20.08	High %Error: 0.000

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.058
Mid Reference: 4.129	Mid Reading: 4.264	Mid %Error: 1.570
High Reference: 8.600	High Reading: 8.606	High %Error: 0.070

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.005	Zero %Error: -0.053
Mid Reference: 4.746	Mid Reading: 4.897	Mid %Error: 1.586
High Reference: 9.519	High Reading: 9.549	High %Error: 0.315

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.001	Zero %Error: -0.023
Mid Reference: 2.516	Mid Reading: 2.573	Mid %Error: 1.006
High Reference: 5.696	High Reading: 5.683	High %Error: -0.228

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 Max. Load

13:47:34
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.020
Mid Reference: 11.72	Mid Reading: 11.78	Mid %Error: 0.299
High Reference: 20.08	High Reading: 20.08	High %Error: 0.000

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.058
Mid Reference: 4.129	Mid Reading: 4.264	Mid %Error: 1.570
High Reference: 8.600	High Reading: 8.606	High %Error: 0.070

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.005	Zero %Error: -0.053
Mid Reference: 4.746	Mid Reading: 4.897	Mid %Error: 1.586
High Reference: 9.519	High Reading: 9.549	High %Error: 0.315

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: 0.001	Zero %Error: 0.025
Mid Reference: 2.516	Mid Reading: 2.532	Mid %Error: 0.288
High Reference: 5.696	High Reading: 5.704	High %Error: 0.139

MoleDAQ Project Marsh Landing
Jan 30 2013
Unit: Unit 1 Max. Load

7:50:08
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:5.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 11.72 (CC140197)
  High: 20.08 (CC248733)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 4.129 (CC140197)
  High: 8.6 (CC248733)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 4.746 (CC1562)
  High: 9.519 (CC284994)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 2.516 (CC1562)
  High: 5.696 (CC284994)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Jan 30 2013
Unit: Unit 1 Max. Load

7:50:11
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 11.72 Mid Reading: 11.77 Mid %Error: 0.249
High Reference: 20.08 High Reading: 20.08 High %Error: 0.000

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: 0.007 Zero %Error: 0.081
Mid Reference: 4.129 Mid Reading: 4.208 Mid %Error: 0.919
High Reference: 8.600 High Reading: 8.606 High %Error: 0.070

Analyzer: CO
Zero Reference: 0.000 Zero Reading: -0.004 Zero %Error: -0.042
Mid Reference: 4.746 Mid Reading: 4.841 Mid %Error: 0.998
High Reference: 9.519 High Reading: 9.526 High %Error: 0.074

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: 0.001 Zero %Error: 0.018
Mid Reference: 2.516 Mid Reading: 2.58 Mid %Error: 1.124
High Reference: 5.696 High Reading: 5.7 High %Error: 0.070

MoleDAQ Project Marsh Landing
Jan 30 2013
Unit: Unit 1 Max. Load

7:55:54
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley

Initial Bias

Analyzer: O2
Zero Bias Ref: 0.000 Bias Reading: -0.069 Bias %Error: -0.344
Span Bias Ref: 11.72 Bias Reading: 11.58 Bias %Error: -0.946

Analyzer: CO2
Zero Bias Ref: 0.000 Bias Reading: 0.092 Bias %Error: 0.988
Span Bias Ref: 4.129 Bias Reading: 4.131 Bias %Error: -0.895

Analyzer: CO
Zero Bias Ref: 0.000 Bias Reading: 0.009 Bias %Error: 0.137
Span Bias Ref: 4.746 Bias Reading: 4.908 Bias %Error: 0.704

Analyzer: NOx
Zero Bias Ref: 0.000 Bias Reading: 0.001 Bias %Error: 0.000
Span Bias Ref: 2.516 Bias Reading: 2.431 Bias %Error: -2.616

MoleDAQ Project Marsh Landing
Jan 30 2013
Unit: Unit 1 Max. Load

10:32:40
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 11.72 Mid Reading: 11.77 Mid %Error: 0.249
High Reference: 20.08 High Reading: 20.08 High %Error: 0.000

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: 0.007 Zero %Error: 0.081
Mid Reference: 4.129 Mid Reading: 4.208 Mid %Error: 0.919
High Reference: 8.600 High Reading: 8.606 High %Error: 0.070

Analyzer: CO
Zero Reference: 0.000 Zero Reading: 0.002 Zero %Error: 0.025
Mid Reference: 4.746 Mid Reading: 4.839 Mid %Error: 0.975
High Reference: 9.519 High Reading: 9.532 High %Error: 0.141

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: 0.002 Zero %Error: 0.039
Mid Reference: 2.516 Mid Reading: 2.541 Mid %Error: 0.444
High Reference: 5.696 High Reading: 5.707 High %Error: 0.197

MoleDAQ Project Marsh Landing
Jan 30 2013
Unit: Unit 1 Startup/Shutdown

13:11:06
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley
Run Time: 60
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:5.00 volts
  Offset:0.00 volts
  Range:100.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:100.000
Channel 5 is: THC
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10000.000

O2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 11.72 (CC140197)
  High: 20.08 (CC248733)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 4.129 (CC140197)
  High: 8.60 (CC248733)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 55.14 (CC317394)
  High: 94.4 (CC101428)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (CC43503)
  Mid: 54.48 (CC317394)
  High: 94.2 (CC101428)
  Biasing with: Mid
THC cylinders utilized:
  Zero: 0 (CC311091)
  Low: 844.3 (CC317126)
  Mid: 1497 (CC406220)
  High: 2262 (XC002743B)
  Biasing with: Low

MoleDAQ Project Marsh Landing
Jan 30 2013
Unit: Unit 1 Startup/Shutdown

13:11:09
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.020
Mid Reference: 11.72	Mid Reading: 11.76	Mid %Error: 0.199
High Reference: 20.08	High Reading: 20.08	High %Error: 0.000

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.001	Zero %Error: 0.012
Mid Reference: 4.129	Mid Reading: 4.234	Mid %Error: 1.221
High Reference: 8.600	High Reading: 8.602	High %Error: 0.023

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.018	Zero %Error: -0.019
Mid Reference: 55.14	Mid Reading: 56.04	Mid %Error: 0.953
High Reference: 94.40	High Reading: 94.65	High %Error: 0.265

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.015	Zero %Error: -0.016
Mid Reference: 54.48	Mid Reading: 54.05	Mid %Error: -0.456
High Reference: 94.20	High Reading: 94.27	High %Error: 0.074

Analyzer: THC

Zero Reference: 0.000	Zero Reading: 2.7	Zero %Error: 0.119
Low Reference: 844.3	Low Reading: 849.6	Low %Error: 0.234
Mid Reference: 1497	Mid Reading: 1468	Mid %Error: -1.282
High Reference: 2262	High Reading: 2260	High %Error: -0.088

MoleDAQ Project Marsh Landing
Jan 30 2013
Unit: Unit 1 Startup/Shutdown

13:22:01
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley

Initial Bias

Analyzer: O2
Zero Bias Ref: 0.000 Bias Reading: -0.072 Bias %Error: -0.378
Span Bias Ref: 11.72 Bias Reading: 11.49 Bias %Error: -1.345

Analyzer: CO2
Zero Bias Ref: 0.000 Bias Reading: 0.024 Bias %Error: 0.267
Span Bias Ref: 4.129 Bias Reading: 4.258 Bias %Error: 0.279

Analyzer: CO
Zero Bias Ref: 0.000 Bias Reading: 0.14 Bias %Error: 0.167
Span Bias Ref: 55.14 Bias Reading: 55.26 Bias %Error: -0.826

Analyzer: NOx
Zero Bias Ref: 0.000 Bias Reading: -0.009 Bias %Error: 0.006
Span Bias Ref: 54.48 Bias Reading: 50.96 Bias %Error: -3.280

Analyzer: THC
Zero Bias Ref: 0.000 Bias Reading: 0.9 Bias %Error: -0.080
Span Bias Ref: 844.3 Bias Reading: 832.8 Bias %Error: -0.743

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 Max. Load

7:57:50
Project name: Marsh Landing, Project number: 12213.0
Operator name: C. Crowley
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
Voltage:10.00 volts
Offset:0.00 volts
Range:25.000
Channel 2 is: CO2
Voltage:10.00 volts
Offset:0.00 volts
Range:10.000
Channel 3 is: CO
Voltage:5.00 volts
Offset:0.00 volts
Range:10.000
Channel 4 is: NOx
Voltage:10.00 volts
Offset:0.00 volts
Range:6.000

O2 cylinders utilized:
Zero: 0 (CC43503)
Mid: 11.72 (CC140197)
High: 20.08 (CC248733)
Biasing with: Mid
CO2 cylinders utilized:
Zero: 0 (CC43503)
Mid: 4.129 (CC140197)
High: 8.6 (CC248733)
Biasing with: Mid
CO cylinders utilized:
Zero: 0 (CC43503)
Mid: 4.746 (CC1562)
High: 9.519 (CC284994)
Biasing with: Mid
NOx cylinders utilized:
Zero: 0 (CC43503)
Mid: 2.516 (CC1562)
High: 5.696 (CC284994)
Biasing with: Mid

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 Max. Load

7:57:52
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.020
Mid Reference: 11.72	Mid Reading: 11.78	Mid %Error: 0.299
High Reference: 20.08	High Reading: 20.08	High %Error: 0.000

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.058
Mid Reference: 4.129	Mid Reading: 4.264	Mid %Error: 1.570
High Reference: 8.600	High Reading: 8.606	High %Error: 0.070

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.005	Zero %Error: -0.053
Mid Reference: 4.746	Mid Reading: 4.897	Mid %Error: 1.586
High Reference: 9.519	High Reading: 9.549	High %Error: 0.315

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.001	Zero %Error: -0.018
Mid Reference: 2.516	Mid Reading: 2.54	Mid %Error: 0.421
High Reference: 5.696	High Reading: 5.646	High %Error: -0.878

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 Max. Load

11:46:18
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: 0.004 Zero %Error: 0.020
Mid Reference: 11.72 Mid Reading: 11.78 Mid %Error: 0.299
High Reference: 20.08 High Reading: 20.08 High %Error: 0.000

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: 0.005 Zero %Error: 0.058
Mid Reference: 4.129 Mid Reading: 4.264 Mid %Error: 1.570
High Reference: 8.600 High Reading: 8.606 High %Error: 0.070

Analyzer: CO
Zero Reference: 0.000 Zero Reading: -0.005 Zero %Error: -0.053
Mid Reference: 4.746 Mid Reading: 4.897 Mid %Error: 1.586
High Reference: 9.519 High Reading: 9.549 High %Error: 0.315

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: -0.001 Zero %Error: -0.023
Mid Reference: 2.516 Mid Reading: 2.573 Mid %Error: 1.006
High Reference: 5.696 High Reading: 5.683 High %Error: -0.228

MoleDAQ Project Marsh Landing
Jan 29 2013
Unit: Unit 1 Max. Load

13:47:34
Project name: Marsh Landing Project number: 12213.0
Operator name: C. Crowley

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.020
Mid Reference: 11.72	Mid Reading: 11.78	Mid %Error: 0.299
High Reference: 20.08	High Reading: 20.08	High %Error: 0.000

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.058
Mid Reference: 4.129	Mid Reading: 4.264	Mid %Error: 1.570
High Reference: 8.600	High Reading: 8.606	High %Error: 0.070

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.005	Zero %Error: -0.053
Mid Reference: 4.746	Mid Reading: 4.897	Mid %Error: 1.586
High Reference: 9.519	High Reading: 9.549	High %Error: 0.315

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: 0.001	Zero %Error: 0.025
Mid Reference: 2.516	Mid Reading: 2.532	Mid %Error: 0.288
High Reference: 5.696	High Reading: 5.704	High %Error: 0.139

MoleDAQ Project Marsh Landing
Feb 28 2013
Unit: 2

11:27:00
Project name: Marsh Landing, Project number:
Operator name:
Run Time: 21
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (890626)
  Mid: 2.467 (CC406701)
  High: 5.449 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Feb 28 2013
Unit:

11:27:03
Project name: Marsh Landing Project number:
Operator name:

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: -0.002	Zero %Error: -0.010
Mid Reference: 11.46	Mid Reading: 11.48	Mid %Error: 0.099
High Reference: 20.12	High Reading: 20.14	High %Error: 0.099

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.008	Zero %Error: 0.092
Mid Reference: 3.999	Mid Reading: 4.103	Mid %Error: 1.200
High Reference: 8.670	High Reading: 8.69	High %Error: 0.231

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.013	Zero %Error: 0.136
Mid Reference: 4.858	Mid Reading: 4.921	Mid %Error: 0.658
High Reference: 9.570	High Reading: 9.52	High %Error: -0.522

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.001	Zero %Error: -0.018
Mid Reference: 2.467	Mid Reading: 2.368	Mid %Error: -1.817
High Reference: 5.449	High Reading: 5.484	High %Error: 0.642

MoleDAQ Project Marsh Landing
Feb 28 2013
Unit:

13:02:08
Project name: Marsh Landing Project number:
Operator name:

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: 0.009 Zero %Error: 0.042
Mid Reference: 11.46 Mid Reading: 11.48 Mid %Error: 0.109
High Reference: 20.12 High Reading: 20.14 High %Error: 0.080

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: 0.005 Zero %Error: 0.060
Mid Reference: 3.999 Mid Reading: 4.081 Mid %Error: 0.947
High Reference: 8.670 High Reading: 8.653 High %Error: -0.196

Analyzer: CO
Zero Reference: 0.000 Zero Reading: 0.012 Zero %Error: 0.127
Mid Reference: 4.858 Mid Reading: 5.011 Mid %Error: 1.602
High Reference: 9.570 High Reading: 9.572 High %Error: 0.016

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: 0.000 Zero %Error: 0.000
Mid Reference: 2.467 Mid Reading: 2.379 Mid %Error: -1.624
High Reference: 5.449 High Reading: 5.501 High %Error: 0.958

MoleDAQ Project Marsh Landing
Mar 6 2013
Unit: Unit 2 Max Load

9:18:49
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 21
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are traversing the stack over 1 ports for 21.00 minutes per port.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (890626)
  Mid: 2.467 (CC406701)
  High: 5.449 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Mar 6 2013
Unit: Unit 2 Max Load

9:18:51
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.011	Zero %Error: 0.055
Mid Reference: 11.46	Mid Reading: 11.46	Mid %Error: 0.000
High Reference: 20.12	High Reading: 20.12	High %Error: 0.000

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.002	Zero %Error: 0.023
Mid Reference: 3.999	Mid Reading: 4.088	Mid %Error: 1.027
High Reference: 8.670	High Reading: 8.676	High %Error: 0.069

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.003	Zero %Error: 0.031
Mid Reference: 4.858	Mid Reading: 5.042	Mid %Error: 1.923
High Reference: 9.570	High Reading: 9.579	High %Error: 0.094

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: 0.001	Zero %Error: 0.018
Mid Reference: 2.467	Mid Reading: 2.38	Mid %Error: -1.597
High Reference: 5.449	High Reading: 5.528	High %Error: 1.450

MoleDAQ Project Marsh Landing
Feb 26 2013
Unit: Unit 2 Min Load

12:35:17
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Feb 26 2013
Unit: Unit 2 Min Load

12:35:20
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: -0.007	Zero %Error: -0.035
Mid Reference: 11.46	Mid Reading: 11.49	Mid %Error: 0.149
High Reference: 20.12	High Reading: 20.13	High %Error: 0.050

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.003	Zero %Error: 0.035
Mid Reference: 3.999	Mid Reading: 4.095	Mid %Error: 1.107
High Reference: 8.670	High Reading: 8.694	High %Error: 0.277

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.002	Zero %Error: -0.021
Mid Reference: 4.858	Mid Reading: 5.029	Mid %Error: 1.787
High Reference: 9.570	High Reading: 9.392	High %Error: -1.860

MoleDAQ Project Marsh Landing
Feb 27 2013
Unit: Unit 2 Min Load

8:14:42
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Feb 27 2013
Unit: Unit 2 Min Load

8:14:45
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.007	Zero %Error: 0.035
Mid Reference: 11.46	Mid Reading: 11.48	Mid %Error: 0.099
High Reference: 20.12	High Reading: 20.13	High %Error: 0.050

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.002	Zero %Error: 0.023
Mid Reference: 3.999	Mid Reading: 4.091	Mid %Error: 1.061
High Reference: 8.670	High Reading: 8.677	High %Error: 0.081

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.038	Zero %Error: 0.397
Mid Reference: 4.858	Mid Reading: 5.042	Mid %Error: 1.923
High Reference: 9.570	High Reading: 9.403	High %Error: -1.745

MoleDAQ Project Marsh Landing
Mar 6 2013
Unit: Unit 2 Max Load

15:14:01
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 21
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
Voltage:10.00 volts
Offset:0.00 volts
Range:25.000
Channel 2 is: CO2
Voltage:10.00 volts
Offset:0.00 volts
Range:10.000
Channel 3 is: CO
Voltage:10.00 volts
Offset:0.00 volts
Range:10.000
Channel 4 is: NOx
Voltage:10.00 volts
Offset:0.00 volts
Range:6.000

O2 cylinders utilized:
Zero: 0 (890626)
Mid: 11.46 (CC241527)
High: 20.12 (CC272451)
Biasing with: Mid
CO2 cylinders utilized:
Zero: 0 (890626)
Mid: 3.999 (CC241527)
High: 8.67 (CC272451)
Biasing with: Mid
CO cylinders utilized:
Zero: 0 (890626)
Mid: 4.858 (CC406701)
High: 9.570 (CC280082)
Biasing with: Mid
NOx cylinders utilized:
Zero: 0 (890626)
Mid: 2.467 (CC406701)
High: 5.449 (CC280082)
Biasing with: Mid

MoleDAQ Project Marsh Landing
Mar 6 2013
Unit: Unit 2 Max Load

15:14:04
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: 0.003 Zero %Error: 0.015
Mid Reference: 11.46 Mid Reading: 11.48 Mid %Error: 0.099
High Reference: 20.12 High Reading: 20.12 High %Error: 0.000

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 3.999 Mid Reading: 4.092 Mid %Error: 1.073
High Reference: 8.670 High Reading: 8.682 High %Error: 0.138

Analyzer: CO
Zero Reference: 0.000 Zero Reading: 0.024 Zero %Error: 0.251
Mid Reference: 4.858 Mid Reading: 5.033 Mid %Error: 1.829
High Reference: 9.570 High Reading: 9.582 High %Error: 0.125

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 2.467 Mid Reading: 2.368 Mid %Error: -1.817
High Reference: 5.449 High Reading: 5.502 High %Error: 0.973

MoleDAQ Project Marsh Landing
Mar 19 2013
Unit: Unit 2 Min Load

8:09:19
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Mar 19 2013
Unit: Unit 2 Min Load

8:09:22
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 11.46 Mid Reading: 11.47 Mid %Error: 0.050
High Reference: 20.12 High Reading: 20.13 High %Error: 0.050

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: 0.002 Zero %Error: 0.023
Mid Reference: 3.999 Mid Reading: 4.075 Mid %Error: 0.877
High Reference: 8.670 High Reading: 8.68 High %Error: 0.115

Analyzer: CO
Zero Reference: 0.000 Zero Reading: 0.01 Zero %Error: 0.104
Mid Reference: 4.858 Mid Reading: 5.03 Mid %Error: 1.797
High Reference: 9.570 High Reading: 9.569 High %Error: -0.010

MoleDAQ Project Marsh Landing
Mar 27 2013
Unit: Unit 3 Max Load

6:50:29
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 21
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (890626)
  Mid: 2.467 (CC406701)
  High: 5.449 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Mar 27 2013
Unit: Unit 3 Max Load

6:50:31
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: -0.002 Zero %Error: -0.010
Mid Reference: 11.46 Mid Reading: 11.47 Mid %Error: 0.050
High Reference: 20.12 High Reading: 20.13 High %Error: 0.050

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: 0.005 Zero %Error: 0.058
Mid Reference: 3.999 Mid Reading: 4.084 Mid %Error: 0.980
High Reference: 8.670 High Reading: 8.673 High %Error: 0.035

Analyzer: CO
Zero Reference: 0.000 Zero Reading: 0.013 Zero %Error: 0.136
Mid Reference: 4.858 Mid Reading: 5.002 Mid %Error: 1.505
High Reference: 9.570 High Reading: 9.502 High %Error: -0.711

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 2.467 Mid Reading: 2.38 Mid %Error: -1.597
High Reference: 5.449 High Reading: 5.474 High %Error: 0.459

MoleDAQ Project Marsh Landing
Mar 26 2013
Unit: Unit 3 Min Load

6:56:37
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are not traversing the stack.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid
 NOx cylinders utilized:
  Zero: 0 (890626)
  Mid: 2.467 (CC406701)
  High: 5.449 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Mar 26 2013
Unit: Unit 3 Min Load

6:56:40
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.025
Mid Reference: 11.46	Mid Reading: 11.53	Mid %Error: 0.348
High Reference: 20.12	High Reading: 20.13	High %Error: 0.050

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.007	Zero %Error: 0.081
Mid Reference: 3.999	Mid Reading: 4.112	Mid %Error: 1.303
High Reference: 8.670	High Reading: 8.687	High %Error: 0.196

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.042
Mid Reference: 4.858	Mid Reading: 5.022	Mid %Error: 1.714
High Reference: 9.570	High Reading: 9.568	High %Error: -0.021

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.002	Zero %Error: -0.037
Mid Reference: 2.467	Mid Reading: 2.393	Mid %Error: -1.358
High Reference: 5.449	High Reading: 5.455	High %Error: 0.110

MoleDAQ Project Marsh Landing
Mar 19 2013
Unit: Unit 3 Max Load

13:05:18
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 48
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are traversing the stack over 4 ports for 12.00 minutes per port.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 11.46 (CC241527)
  High: 20.12 (CC272451)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (890626)
  Mid: 3.999 (CC241527)
  High: 8.67 (CC272451)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (890626)
  Mid: 4.858 (CC406701)
  High: 9.570 (CC280082)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (890626)
  Mid: 2.467 (CC406701)
  High: 5.449 (CC280082)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Mar 19 2013
Unit: Unit 3 Max Load

13:05:21
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.025
Mid Reference: 11.46	Mid Reading: 11.46	Mid %Error: 0.000
High Reference: 20.12	High Reading: 20.13	High %Error: 0.050

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.004	Zero %Error: 0.046
Mid Reference: 3.999	Mid Reading: 4.075	Mid %Error: 0.877
High Reference: 8.670	High Reading: 8.701	High %Error: 0.358

Analyzer: CO

Zero Reference: 0.000	Zero Reading: 0.072	Zero %Error: 0.752
Mid Reference: 4.858	Mid Reading: 5.031	Mid %Error: 1.808
High Reference: 9.570	High Reading: 9.559	High %Error: -0.115

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: -0.001	Zero %Error: -0.018
Mid Reference: 2.467	Mid Reading: 2.369	Mid %Error: -1.798
High Reference: 5.449	High Reading: 5.437	High %Error: -0.220

MoleDAQ Project Marsh Landing
Mar 19 2013
Unit: Unit 3 Max Load

13:12:16
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi

Initial Bias

Analyzer: O2
Zero Bias Ref: 0.000 Bias Reading: 0.054 Bias %Error: 0.244
Span Bias Ref: 11.46 Bias Reading: 11.36 Bias %Error: -0.497

Analyzer: CO2
Zero Bias Ref: 0.000 Bias Reading: 0.067 Bias %Error: 0.727
Span Bias Ref: 3.999 Bias Reading: 4.071 Bias %Error: -0.046

Analyzer: CO
Zero Bias Ref: 0.000 Bias Reading: 0.123 Bias %Error: 0.533
Span Bias Ref: 4.858 Bias Reading: 5.041 Bias %Error: 0.104

Analyzer: NOx
Zero Bias Ref: 0.000 Bias Reading: 0.016 Bias %Error: 0.312
Span Bias Ref: 2.467 Bias Reading: 2.245 Bias %Error: -2.276

MoleDAQ Project Marsh Landing
Apr 13 2013
Unit: Unit 3

16:52:02
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 24
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are traversing the stack over 4 ports for 6.00 minutes per port.

Channel 1 is: O2
Voltage:10.00 volts
Offset:0.00 volts
Range:25.000
Channel 2 is: CO2
Voltage:10.00 volts
Offset:0.00 volts
Range:10.000
Channel 3 is: CO
Voltage:5.00 volts
Offset:-0.30 volts
Range:10.000
Channel 4 is: NOx
Voltage:10.00 volts
Offset:0.00 volts
Range:6.000

O2 cylinders utilized:
Zero: 0 () CC306610
Mid: 11.52 (CC 284939)
High: 20.12 (CC 27245)
Biasing with: Mid
CO2 cylinders utilized:
Zero: 0 ()
Mid: 3.91 (CC 284939)
High: 8.67 (CC 27245)
Biasing with: Mid
CO cylinders utilized:
Zero: 0 ()
Mid: 4.781 () CC415562
High: 9.515 () CC1589
Biasing with: Mid
NOx cylinders utilized:
Zero: 0 () CC306610
Mid: 2.487 () CC415562
High: 5.383 () CC1589
Biasing with: Mid

MoleDAQ Project Marsh Landing
Apr 13 2013
Unit: Unit 3

16:52:04
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: -0.001 Zero %Error: -0.005
Mid Reference: 11.52 Mid Reading: 11.62 Mid %Error: 0.497
High Reference: 20.12 High Reading: 20.07 High %Error: -0.249

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: -0.012 Zero %Error: -0.138
Mid Reference: 3.910 Mid Reading: 3.989 Mid %Error: 0.911
High Reference: 8.670 High Reading: 8.664 High %Error: -0.069

Analyzer: CO
Zero Reference: 0.000 Zero Reading: -0.09 Zero %Error: -0.946
Mid Reference: 4.781 Mid Reading: 4.913 Mid %Error: 1.387
High Reference: 9.515 High Reading: 9.402 High %Error: -1.188

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: 0.001 Zero %Error: 0.019
Mid Reference: 2.487 Mid Reading: 2.478 Mid %Error: -0.167
High Reference: 5.383 High Reading: 5.368 High %Error: -0.279

MoleDAQ Project Marsh Landing
Apr 13 2013
Unit: Unit **3**

17:01:15
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi

Initial Bias

Analyzer: O2		
Zero Bias Ref: 0.000	Bias Reading: -0.004	Bias %Error: -0.015
Span Bias Ref: 11.52	Bias Reading: 11.48	Bias %Error: -0.696
Analyzer: CO2		
Zero Bias Ref: 0.000	Bias Reading: -0.002	Bias %Error: 0.115
Span Bias Ref: 3.910	Bias Reading: 3.968	Bias %Error: -0.242
Analyzer: CO		
Zero Bias Ref: 0.000	Bias Reading: -0.165	Bias %Error: -0.788
Span Bias Ref: 4.781	Bias Reading: 4.83	Bias %Error: -0.872
Analyzer: NOx		
Zero Bias Ref: 0.000	Bias Reading: 0.002	Bias %Error: 0.019
Span Bias Ref: 2.487	Bias Reading: 2.472	Bias %Error: -0.111

MoleDAQ Project Marsh Landing
Apr 14 2013
Unit: Unit 3

5:38:38
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: -0.002	Zero %Error: -0.007
Mid Reference: 11.52	Mid Reading: 11.51	Mid %Error: -0.050
High Reference: 20.12	High Reading: 20.07	High %Error: -0.249

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: -0.017	Zero %Error: -0.194
Mid Reference: 3.910	Mid Reading: 3.982	Mid %Error: 0.833
High Reference: 8.670	High Reading: 8.657	High %Error: -0.155

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.079	Zero %Error: -0.830
Mid Reference: 4.781	Mid Reading: 4.891	Mid %Error: 1.156
High Reference: 9.515	High Reading: 9.449	High %Error: -0.698

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: 0.000	Zero %Error: 0.007
Mid Reference: 2.487	Mid Reading: 2.490	Mid %Error: 0.054
High Reference: 5.383	High Reading: 5.387	High %Error: 0.074

AVOGADRO CEMS PERFORMANCE DATA

(circle or input applicable data)

CLIENT / LOCATION: Marsh Landing **JOB #:** 12213.0

OPERATOR: Kris Huckabay **DATE:** 4/12/13

ANALYZERS IN SERVICE								
Analyzers:	(O2)	(CO2)	(CO)	(NOx)	SO2	THC	Other:	_____
FILTRATION (ON STACK)								
Filter Type:	In-Stack		Out-of-Stack		Sintered		Other:	_____
Filter Material:	Glass	Quartz	Steel	(N/A)	--	--	Other:	_____
Filter Holder Material:	Steel	Teflon	Glass	(N/A)	--	--	Other:	_____
Oven Box (Y/N):	Yes	(No)	--	--	--	--	--	--
Oven Temperature:	_____ °F	(N/A)	--	--	--	--	--	--
SAMPLING PROBE								
Length:	4'	6'	8'	10'	(12')	14'	Other:	_____
Material:	Steel	Glass	Teflon	(Titanium)	Quartz	Inconel	Other:	_____
Heated (Y/N):	Yes	(No)	--	--	--	--	--	--
Probe Temperature:	_____ °F	N/A	--	--	--	--	--	--
HEATED LINE								
In use (Y/N):	Yes	No	--	--	--	--	--	--
Length:	15'	25'	50'	(100')	125'	150'	Other:	_____
Line Temperature:	250 °F	N/A	--	--	--	--	--	--
CEMS SAMPLE LINE								
Length:	25'	50'	100'	125'	150'	(175')	Other:	_____
Material:	(Teflon)	Steel	Plastic	Titanium	--	--	Other:	_____
CONDITIONER (MOISTURE KNOCKOUT)								
In Service (Y/N):	(Yes)	No	--	--	--	--	--	--
Coolant:	Ice and Water		Anti-Freeze		(Electric)		Other:	_____
Trap Material:	(Steel)		Glass		Teflon		Other:	_____

LEAK CHECK

Pre-Test: 0.01 cfh @ 15 inches Hg vacuum

Post-Test: 0.01 cfh @ 15 inches Hg vacuum

System Flow Rate: 12 cfh

Leak Rate: $\frac{\text{Post-Test (cfh)}}{\text{System Flow Rate (cfh)}} * 100 =$ _____ %

SYSTEM RESPONSE	Run 1	Run 2	Run 3	Average
Upscale (seconds):	45	46	45	45
Downscale (seconds):	46	46	46	46

NO_X CONVERTER CHECK (1) Fill Tedlar bag with NO_2 and air. (2) Run contents of bag through NO_X analyzer.

C = NO_X (as found): 4.534 ppm

% O_2 = O_2 in air (as found): — ppm

C_{NO2} = NO_2 (actual): 5.02 ppm

C_{NO} = NO (actual): — %

NO_X Converter Efficiency: 90.31 %

$$C_0 = \left[\frac{20.9}{(20.9 - \%\ O_2)}\right] * C = \text{_____}$$

$$\text{Eff} = \left[\frac{(C_0 - C_{NO})}{C_{NO2}}\right] * 100 = 90.31\ \%$$

NOx converter check for Marsh Landing
4/14/2013 9:00:53 AM

Measured Concentration, ppm: 4.534
Certified Concentration, ppm: 5.02
NOx converter efficiency: 90.319%

Time	Measured concentration
9:00:43	4.534
9:00:44	4.535
9:00:45	4.533
9:00:46	4.532
9:00:47	4.532
9:00:48	4.533
9:00:49	4.535
9:00:50	4.536
9:00:51	4.527
9:00:52	4.534

NO_2
CC16104
5.02 ppm

MoleDAQ Project Marsh Landing
Apr 13 2013
Unit: Unit 3

7:12:04
Project name: Marsh Landing, Project number: 12213.0
Operator name: Ian DeVivi
Run Time: 36
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are traversing the stack over 4 ports for 9.00 minutes per port.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:5.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 () CC306610
  Mid: 11.52 (CC 284939)
  High: 20.12 (CC 27245)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 ()
  Mid: 3.91 (CC 284939)
  High: 8.67 (CC 27245)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 ()
  Mid: 4.781 ()CC415562
  High: 9.515 () CC 1589
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 ()
  Mid: 2.487 () CC415562
  High: 5.383 () CC 1589
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Apr 13 2013
Unit: Unit 3

7:12:06
Project name: Marsh Landing Project number: 12213.0
Operator name: Ian DeVivi

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: -0.004	Zero %Error: -0.020
Mid Reference: 11.52	Mid Reading: 11.46	Mid %Error: -0.298
High Reference: 20.12	High Reading: 20.07	High %Error: -0.249

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: -0.013	Zero %Error: -0.150
Mid Reference: 3.910	Mid Reading: 3.993	Mid %Error: 0.957
High Reference: 8.670	High Reading: 8.666	High %Error: -0.046

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.132	Zero %Error: -1.387
Mid Reference: 4.781	Mid Reading: 4.958	Mid %Error: 1.860
High Reference: 9.515	High Reading: 9.465	High %Error: -0.525

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: 0.001	Zero %Error: 0.019
Mid Reference: 2.487	Mid Reading: 2.479	Mid %Error: -0.149
High Reference: 5.383	High Reading: 5.366	High %Error: -0.316

AVOGADRO CEMS PERFORMANCE DATA

(circle or enter applicable data)

CLIENT / LOCATION: Marsh Landing **JOB #:** 12213.0

OPERATOR: Kris Huckaby **DATE:** 4/17/13

ANALYZERS IN SERVICE								
Analyzers:	(O2)	(CO2)	(CO)	(NOx)	SO2	THC	Other:	____
FILTRATION (ON STACK)								
Filter Type:	In-Stack		Out-of-Stack		Sintered		Other:	NA
Filter Material:	Glass	Quartz	Steel	(N/A)	--	--	Other:	____
Filter Holder Material:	Steel	Teflon	Glass	(N/A)	--	--	Other:	____
Oven Box (Y/N):	Yes	(No)	--	--	--	--	--	--
Oven Temperature:	____ °F	(N/A)	--	--	--	--	--	--
SAMPLING PROBE								
Length:	4'	6'	8'	10'	(12')	14'	Other:	____
Material:	Steel	Glass	Teflon	(Titanium)	Quartz	Inconel	Other:	____
Heated (Y/N):	Yes	(No)	--	--	--	--	--	--
Probe Temperature:	____ °F	(N/A)	--	--	--	--	--	--
HEATED LINE								
In use (Y/N):	(Yes)	No	--	--	--	--	--	--
Length:	15'	25'	50'	75'	(100')	150'	Other:	____
Line Temperature:	250 °F	N/A	--	--	--	--	--	--
CEMS SAMPLE LINE								
Length:	25'	50'	75'	100'	150'	(200')	Other:	____
Material:	(Teflon)	Plastic	Not Used	--	--	--	Other:	____
CONDITIONER (MOISTURE KNOCKOUT)								
In Service (Y/N):	(Yes)	No	--	--	--	--	--	--
Coolant:	Ice and Water		Anti-Freeze		(Electric)		Other:	____
Trap Material:	(Steel)		Glass		Teflon		Other:	____

LEAK CHECK

Pre-Test: 0.01 cfh @ 15 inches Hg vacuum

Post-Test: 0.01 cfh @ 15 inches Hg vacuum

System Flow Rate: 12 cfh

Leak Rate: $\frac{\text{Post-Test (cfh)}}{\text{System Flow Rate (cfh)}} * 100 =$ ____ %

SYSTEM RESPONSE	Run 1	Run 2	Run 3	Average
Upscale (seconds):	46	46	46	46
Downscale (seconds):	47	47	47	47

NO_X CONVERTER CHECK (1) Fill Tedlar bag with NO_2 and air. (2) Run contents of bag through NO_X analyzer.

$C = NO_X$ (as found): 4.533 ppm

$\%\ O_2 = O_2$ in air (as found): — ppm

$C_{NO2} = NO_2$ (actual): 5.02 ppm

$C_{NO} = NO$ (actual): ____ %

NO_X Converter Efficiency: 90.393 %

$$C_0 = \left[\frac{20.9}{(20.9 - \%\ O_2)}\right] * C = \text{____}$$

$$\text{Eff} = \left[\frac{(C_0 - C_{NO})}{C_{NO2}}\right] * 100 = 90.393\%$$

MoleDAQ Project Marsh Landing
Apr 16 2013
Unit: Unit 4/ Base Load

21:52:23
Project name: Marsh Landing, Project number: 12213.0
Operator name: Kris Huckabay
Run Time: 24
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are traversing the stack over 4 ports for 6.00 minutes per port.

Channel 1 is: O2
Voltage:10.00 volts
Offset:0.00 volts
Range:25.000
Channel 2 is: CO2
Voltage:10.00 volts
Offset:0.00 volts
Range:10.000
Channel 3 is: CO
Voltage:5.00 volts
Offset:-0.30 volts
Range:10.000
Channel 4 is: NOx
Voltage:10.00 volts
Offset:0.00 volts
Range:6.000

O2 cylinders utilized:
Zero: 0 (CC306610)
Mid: 11.52 (CC 284939)
High: 20.12 (CC 27245)
Biasing with: Mid
CO2 cylinders utilized:
Zero: 0 (CC306610)
Mid: 3.91 (CC 284939)
High: 8.67 (CC 27245)
Biasing with: Mid
CO cylinders utilized:
Zero: 0 (CC306610)
Mid: 4.781 (CC415562)
High: 9.515 (CC1589)
Biasing with: Mid
NOx cylinders utilized:
Zero: 0 (CC306610)
Mid: 2.487 (CC416662)
High: 5.383 (CC1589)
Biasing with: Mid

MoleDAQ Project Marsh Landing
Apr 16 2013
Unit: Unit 4/ Base Load

21:52:25
Project name: Marsh Landing Project number: 12213.0
Operator name: Kris Huckabay

Calibration

Analyzer: O2

Zero Reference: 0.000	Zero Reading: 0.012	Zero %Error: 0.060
Mid Reference: 11.52	Mid Reading: 11.53	Mid %Error: 0.050
High Reference: 20.12	High Reading: 20.08	High %Error: -0.199

Analyzer: CO2

Zero Reference: 0.000	Zero Reading: 0.005	Zero %Error: 0.058
Mid Reference: 3.910	Mid Reading: 4.039	Mid %Error: 1.488
High Reference: 8.670	High Reading: 8.755	High %Error: 0.980

Analyzer: CO

Zero Reference: 0.000	Zero Reading: -0.126	Zero %Error: -1.324
Mid Reference: 4.781	Mid Reading: 4.763	Mid %Error: -0.189
High Reference: 9.515	High Reading: 9.34	High %Error: -1.839

Analyzer: NOx

Zero Reference: 0.000	Zero Reading: 0.001	Zero %Error: 0.019
Mid Reference: 2.487	Mid Reading: 2.495	Mid %Error: 0.149
High Reference: 5.383	High Reading: 5.397	High %Error: 0.260

NOx converter check for Marsh Landing
4/17/2013 11:56:19 AM

NO_2
5.02

CC1G104

Measured Concentration, ppm: 4.538
Certified Concentration, ppm: 5.02
NOx converter efficiency: 90.398%

Time	Measured concentration
11:56:08	4.545
11:56:09	4.540
11:56:10	4.538
11:56:11	4.538
11:56:12	4.538
11:56:13	4.538
11:56:14	4.541
11:56:15	4.542
11:56:16	4.540
11:56:17	4.540
11:56:18	4.539
11:56:19	4.538

MoleDAQ Project Marsh Landing
Apr 16 2013
Unit: Unit 4 / Mm Load

18:23:57
Project name: Marsh Landing, Project number: 12213.0
Operator name: ~~Ian DeVivi~~ Kris Nuckolls
Run Time: 30
Recording data every: 6 second(s)
Averaging those data every: 60 seconds
We are traversing the stack over 1 ports for 30.00 minutes per port.

Channel 1 is: O2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:25.000
Channel 2 is: CO2
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:10.000
Channel 3 is: CO
  Voltage:5.00 volts
  Offset:-0.30 volts
  Range:10.000
Channel 4 is: NOx
  Voltage:10.00 volts
  Offset:0.00 volts
  Range:6.000

O2 cylinders utilized:
  Zero: 0 (CC306610)
  Mid: 11.52 (CC 284939)
  High: 20.12 (CC 27245)
  Biasing with: Mid
CO2 cylinders utilized:
  Zero: 0 (CC306610)
  Mid: 3.91 (CC 284939)
  High: 8.67 (CC 27245)
  Biasing with: Mid
CO cylinders utilized:
  Zero: 0 (CC306610)
  Mid: 4.781 (CC415562)
  High: 9.515 (CC1589)
  Biasing with: Mid
NOx cylinders utilized:
  Zero: 0 (CC306610)
  Mid: 2.487 (~~CC416662~~) CC415562
  High: 5.383 (CC1589)
  Biasing with: Mid

MoleDAQ Project Marsh Landing
Apr 16 2013
Unit: Unit 4 / mm Loud

18:23:59
Project name: Marsh Landing Project number: 12213.0
Operator name: ~~Ian DeVivt~~ Ross Huckabay

Calibration

Analyzer: O2
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 11.52 Mid Reading: 11.59 Mid %Error: 0.348
High Reference: 20.12 High Reading: 20.21 High %Error: 0.447

Analyzer: CO2
Zero Reference: 0.000 Zero Reading: -0.001 Zero %Error: -0.012
Mid Reference: 3.910 Mid Reading: 4.02 Mid %Error: 1.269
High Reference: 8.670 High Reading: 8.718 High %Error: 0.554

Analyzer: CO
Zero Reference: 0.000 Zero Reading: -0.149 Zero %Error: -1.566
Mid Reference: 4.781 Mid Reading: 4.794 Mid %Error: 0.137
High Reference: 9.515 High Reading: 9.348 High %Error: -1.755

Analyzer: NOx
Zero Reference: 0.000 Zero Reading: 0 Zero %Error: 0.000
Mid Reference: 2.487 Mid Reading: 2.493 Mid %Error: 0.111
High Reference: 5.383 High Reading: 5.415 High %Error: 0.594

Appendix B.3

Test Equipment Calibration Data

The Avogadro Group, LLC

EPA Method 5

522 Series Meter Box Calibration

6 mo. Orifice Calibration

English Meter Box Units, English K' Factor

Average Yd: 0.975
Average dH@: 1.948
Variation of Yd's: PASS
Variation of ΔH @: PASS
Vacuum Criteria: PASS

Meter #—— CB15
Calibrated by—— B. Do
Date: —— 01/02/13
Barometric Pressure: —— 30.09 (in. Hg)
Theoretical Critical Vacuur 14.19 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

—— DRY GAS METER READINGS —— -CRITICAL ORIFICE READINGS-

		Volume			Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual – Ambient Temperature –			
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.32	17.00	546.678	552.075	5.197	68.0	68.0	69.0	69.0	RG 40	0.2327	16.0	71.0	72.0	71.5
0.68	11.00	552.075	557.135	5.060	67.0	67.0	67.0	67.0	RG 48	0.3444	16.0	72.0	73.0	72.5
1.20	10.00	568.512	574.415	5.903	70.0	70.0	70.0	70.0	RG 55	0.4359	16.0	70.0	70.0	70.0
2.10	7.00	552.075	557.595	5.520	68.0	68.0	68.0	68.0	RG 63	0.5916	16.0	72.0	72.0	72.0
3.30	5.00	535.812	540.912	5.100	68.0	68.0	68.0	68.0	RG 73	0.7805	16.0	70.0	70.0	70.0

********** RESULTS **********

— DRY GAS METER —

VOLUME CORRECTED Vm(std) (cu ft)
5.224
5.105
5.929
5.578
5.168

——— ORIFICE ———

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME NOMINAL Vcr (cu ft)
5.163	5.170
4.940	4.956
5.697	5.689
5.404	5.417
5.101	5.093

– DRY GAS METER –

CALIBRATION FACTOR Yd Value (number)	Variation (number)
0.988	0.014
0.968	-0.007
0.981	-0.014
0.989	-0.006
0.987	0.012

——— ORIFICE ———

CALIBRATION FACTOR dH@ Value (in H2O)	Variation (in H2O)
1.961	0.012
1.911	-0.037
2.083	0.135
1.993	0.045
1.794	-0.155

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/-0.2.

SIGNED: B. Do

Date: 1/3/13

The Avogadro Group, LLC

EPA Method 5

522 Series Meter Box Calibration

6 mo. Orifice Calibration

English Meter Box Units, English K' Factor

Average Yd:	0.986
Average dH@:	1.950
Variation of Yd's:	PASS
Variation of ΔH @:	PASS
Vacuum Criteria:	PASS

Meter #----------	CB14
Calibrated by----------	B. Do
Date: ----------	01/02/13
Barometric Pressure: ----	30.09 (in. Hg)
Theoretical Critical Vacuur	14.19 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

---------- DRY GAS METER READINGS ---------- -CRITICAL ORIFICE READINGS-

		Volume			Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual -- Ambient Temperature --			
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.33	17.00	899.032	904.188	5.156	61.0	61.0	61.0	61.0	RG 40	0.2327	16.0	73.0	73.0	73.0
0.68	11.00	894.030	899.032	5.002	62.0	62.0	62.0	62.0	RG 48	0.3444	16.0	73.0	73.0	73.0
1.10	10.00	887.815	893.403	5.588	62.0	62.0	62.0	62.0	RG 55	0.4359	16.0	73.0	73.0	73.0
2.00	7.00	882.512	887.815	5.303	63.0	63.0	63.0	63.0	RG 63	0.5918	16.0	73.0	73.0	73.0
3.40	6.00	876.505	882.512	6.007	56.0	56.0	62.0	62.0	RG 73	0.7805	16.0	73.0	73.0	73.0

********** RESULTS **********

-- DRY GAS METER --

VOLUME CORRECTED Vm(std) (cu ft)
5.257
5.095
5.697
5.408
6.134

------ ORIFICE ------

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME NOMINAL Vcr (cu ft)
5.156	5.177
4.938	4.958
5.681	5.705
5.399	5.422
6.104	6.129

-- DRY GAS METER --

CALIBRATION FACTOR Yd Value (number)	Variation (number)
0.981	-0.005
0.969	-0.017
0.997	0.011
0.998	0.012
0.985	-0.001

------ ORIFICE ------

CALIBRATION FACTOR dH@ Value (in H2O)	Variation (in H2O)
2.057	0.107
1.931	-0.019
1.950	0.000
1.920	-0.030
1.891	-0.059

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/-0.2.

SIGNED: _____ Date: 1/2/13

The Avogadro Group, LLC

EPA Method 5

522 Series Meter Box Calibration

6 mo. Orifice Calibration

English Meter Box Units, English K' Factor

Average Yd: 1.006
Average dH@: 1.891
Variation of Yd's: PASS
Variation of ΔH @: PASS
Vacuum Criteria: PASS

Meter #—— CB021
Calibrated by—— B. Do
Date: —— 01/02/13
Barometric Pressure: —— 30.09 (in. Hg)
Theoretical Critical Vacuur 14.19 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

—— DRY GAS METER READINGS —— -CRITICAL ORIFICE READINGS-

		Volume			Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual – Ambient Temperature –			
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.34	17.00	190.459	195.549	5.090	63.0	63.0	65.0	65.0	RG 40	0.2327	16.0	56.1	58.2	57.2
0.66	11.00	185.453	190.459	5.006	63.0	63.0	63.0	63.0	RG 48	0.3444	16.0	54.5	58.1	55.3
1.10	10.00	195.549	201.152	5.603	65.0	65.0	66.0	66.0	RG 55	0.4359	16.0	57.7	57.7	57.7
2.00	7.00	201.152	206.462	5.310	66.0	66.0	65.0	65.0	RG 63	0.5918	16.0	57.7	57.9	57.8
3.34	6.00	206.462	212.556	6.094	65.0	65.0	65.0	65.0	RG 73	0.7805	16.0	57.9	57.3	57.6

********** RESULTS **********

— DRY GAS METER —

VOLUME CORRECTED Vm(std) (cu ft)
5.160
5.089
5.675
5.390
6.211

—— ORIFICE ——

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME NOMINAL Vcr (cu ft)
5.234	5.100
5.022	4.875
5.765	5.622
5.478	5.344
6.194	6.040

— DRY GAS METER —

CALIBRATION FACTOR Yd

Value (number)	Variation (number)
1.014	0.008
0.987	-0.019
1.016	0.010
1.016	0.010
0.997	-0.009

—— ORIFICE ——

CALIBRATION FACTOR dH@

Value (in H2O)	Variation (in H2O)
2.044	0.153
1.891	0.000
1.881	-0.010
1.856	-0.035
1.783	-0.108

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/-0.2.

SIGNED: B C L c

Date: 1/3/13

The Avogadro Group, LLC

EPA Method 5

522 Series Meter Box Calibration

6 mo. Orifice Calibration

English Meter Box Units, English K' Factor

Average Yd:	0.984
Average dH@:	1.929
Variation of Yd's:	PASS
Variation of ΔH @:	PASS
Vacuum Criteria:	PASS

Meter #----------	CB11	
Calibrated by----------	B. Do/RM	
Date: ----------	01/02/13	
Barometric Pressure: ----	30.09	(in. Hg)
Theoretical Critical Vacuur	14.19	(in. Hg)

!!!!!!!!!

IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

!!!!!!!!!

---------- DRY GAS METER READINGS ----------

-CRITICAL ORIFICE READINGS-

		Volume			Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual -- Ambient Temperature --			
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.33	17.00	692.211	697.315	5.104	61.0	61.0	61.0	61.0	RG 40	0.2327	16.0	73.0	73.0	73.0
0.68	11.00	686.778	691.785	5.007	60.0	60.0	60.0	60.0	RG 48	0.3444	16.0	72.0	72.0	72.0
1.10	10.00	670.546	676.210	5.664	63.0	63.0	64.0	64.0	RG 55	0.4359	16.0	70.0	71.0	70.5
2.00	7.00	681.490	686.869	5.379	64.0	64.0	64.0	64.0	RG 63	0.5918	16.0	71.0	72.0	71.5
3.30	5.00	676.438	681.490	5.052	64.0	64.0	64.0	64.0	RG 73	0.7805	16.0	70.0	70.0	70.0

********** RESULTS **********

— DRY GAS METER —

VOLUME CORRECTED Vm(std) (cu ft)
5.204
5.119
5.758
5.475
5.159

——— ORIFICE ———

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME NOMINAL Vcr (cu ft)
5.156	5.177
4.942	4.954
5.695	5.692
5.407	5.414
5.101	5.093

– DRY GAS METER –

CALIBRATION FACTOR Yd

Value (number)	Variation (number)
0.991	0.006
0.965	-0.019
0.989	0.005
0.987	0.003
0.989	0.004

——— ORIFICE ———

CALIBRATION FACTOR dH@

Value (in H2O)	Variation (in H2O)
2.057	0.128
1.935	0.006
1.935	0.006
1.911	-0.018
1.808	-0.122

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/-0.2.

SIGNED: _____ Date: 1/2/13

The Avogadro Group, LLC

EPA Method 5

522 Series Meter Box Calibration

6 mo. Orifice Calibration

English Meter Box Units, English K' Factor

Average Yd:	**0.973**
Average dH@:	**1.909**
Variation of Yd's:	**PASS**
Variation of ΔH @:	**PASS**
Vacuum Criteria:	**PASS**

Meter #———	**CB13**
Calibrated by———	R.Moreno
Date: ———	01/08/13
Barometric Pressure: ——	30.24 (in. Hg)
Theoretical Critical Vacuur	14.26 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

——— DRY GAS METER READINGS ———

-CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual -- Ambient Temperature -- Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.32	17.00	222.833	228.124	5.241	61.0	61.0	61.0	62.0	RG 40	0.2327	16.0	67.0	67.0	67.0
0.68	11.00	228.124	233.125	5.001	62.0	62.0	62.0	63.0	RG 48	0.3444	16.0	67.0	67.0	67.0
1.10	11.00	204.557	210.842	6.285	58.0	58.0	58.0	59.0	RG 55	0.4359	16.0	67.0	67.0	67.0
2.00	8.00	211.548	217.746	6.198	59.0	59.0	59.0	60.0	RG 63	0.5918	16.0	67.0	67.0	67.0
3.40	5.00	217.768	222.883	5.115	60.0	60.0	60.0	61.0	RG 73	0.7805	16.0	67.0	67.0	67.0

********** RESULTS **********

— DRY GAS METER —

VOLUME CORRECTED Vm(std) (cu ft)
5.368
5.117
6.486
6.398
5.288

——— ORIFICE ———

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME NOMINAL Vcr (cu ft)
5.211	5.148
4.990	4.930
6.316	6.240
6.237	6.161
5.141	5.079

– DRY GAS METER –

CALIBRATION FACTOR Yd

Value (number)	Variation (number)
0.971	-0.003
0.975	0.002
0.974	0.000
0.975	0.001
0.972	-0.001

——— ORIFICE ———

CALIBRATION FACTOF dH@

Value (in H2O)	Variation (in H2O)
1.960	0.051
1.898	-0.011
1.931	0.022
1.902	-0.008
1.855	-0.054

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/-0.2.

SIGNED: _____

Date: 1/8/13

The Avogadro Group, LLC

EPA Method 5

522 Series Meter Box Calibration

6 mo. Orifice Calibration

English Meter Box Units, English K' Factor

Average Yd:	**0.994**
Average dH@:	**1.835**
Variation of Yd's:	**PASS**
Variation of ΔH @:	**PASS**
Vacuum Criteria:	**PASS**

Meter #	CB04	
Calibrated by	R.Moreno	
Date:	01/08/13	
Barometric Pressure:	30.24	(in. Hg)
Theoretical Critical Vacuur	14.26	(in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

DRY GAS METER READINGS | -CRITICAL ORIFICE READINGS-

dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual – Ambient Temperature – Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.32	17.00	485.123	490.273	5.150	70.0	70.0	70.0	71.0	RG 40	0.2327	16.0	67.0	67.0	67.0
0.68	12.00	490.273	495.704	5.431	71.0	71.0	71.0	71.0	RG 48	0.3444	16.0	67.0	67.0	67.0
1.10	10.00	495.704	501.415	5.711	71.0	71.0	71.0	72.0	RG 55	0.4359	16.0	67.0	68.0	67.5
1.90	7.00	469.368	474.816	5.448	69.0	69.0	68.0	69.0	RG 63	0.5918	16.0	67.0	67.0	67.0
3.20	5.00	474.816	479.952	5.136	69.0	69.0	69.0	70.0	RG 73	0.7805	16.0	67.0	67.0	67.0

********** RESULTS **********

— DRY GAS METER —

VOLUME CORRECTED Vm(std) (cu ft)
5.185
5.465
5.750
5.527
5.217

——— ORIFICE ———

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME NOMINAL Vcr (cu ft)
5.211	5.148
5.444	5.378
5.739	5.675
5.457	5.391
5.141	5.079

-- DRY GAS METER --

CALIBRATION FACTOR Yd Value (number)	Variation (number)
1.005	0.011
0.996	0.002
0.998	0.004
0.987	-0.007
0.985	-0.009

——— ORIFICE ———

CALIBRATION FACTOF dH@ Value (in H2O)	Variation (in H2O)
1.927	0.093
1.868	0.033
1.886	0.051
1.776	-0.059
1.716	-0.118

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/-0.2.

SIGNED: _____ Date: 1/8/13

The Avogadro Group, LLC

Pitot Tube Calibration Data Sheet

Calibration Date:	January 15, 2013	**Performed by :**	JO/JM	P_{bar} (inHg) =	30.27
Reference Pitot Tube:	**Standard**	**ID No.:**	144-NP-14	**5/16 in. O.D.**	$C_{p(std)}$ = 0.99
Calibrated Pitot Tube:	**S-Type**	**Probe/Pitot ID No.:**	**144**	**Configuration:**	**Permanent**
Probe Description:	Nonself Supporting Probe (NP)	**Effective Length:**	14'	**Condition:**	Good
Previous Calibrations		**A-side:**	0.8400	**B-side:**	0.8400

A-side Calibration

	ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	$C_{p(s)}$ [a]	Deviation [b]
Run 1	0.87	1.20	**0.8430**	**0.0000**
Run 2	**0.87**	1.20	**0.8430**	**0.0000**
Run 3	0.87	1.20	**0.8430**	**0.0000**
Avg. (A)			**0.8430**	**0.0000**

B-side Calibration

	ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	$C_{p(s)}$ [a]	Deviation [b]
Run 1	0.88	1.25	**0.8307**	**0.0098**
Run 2	0.87	1.20	**0.8430**	**0.0025**
Run 3	0.88	1.20	**0.8478**	**0.0073**
Avg. (B)			**0.8405**	**0.0065**

[a] $C_{p(s)} = (C_{p(std)})(\sqrt{(\Delta P_{std} / \Delta P_s)})$

[b] Deviation = $C_{p(s)} - C_{p(s)avg}$

Avg $C_{p(s)}$(A) - Avg $C_{p(s)}$(B) =	**0.0025**	(must be ≤ 0.01)	**PASS**
		(must be ≤ 0.01)	**PASS**

	A-side	B-side		A-side	B-side
Calibration range =	**0.8430**	**0.8405**	(must be 0.7900-0.8900)	**OK**	**OK**
Calibration change =	**0.0030**	**0.0005**	(must be < 0.02)	**OK**	**OK**

Signed: _____ Date: 1/15/13

The Avogadro Group, LLC

Pitot Tube Calibration Data Sheet

Calibration Date:	January 15, 2013	**Performed by :**	JO/JM	P_{bar} (inHg) =	30.27
Reference Pitot Tube:	**Standard**	**ID No.:**	145-NP-14	**5/16 in. O.D.**	$C_{p(std)}$ = **0.99**
Calibrated Pitot Tube:	**S-Type**	**Probe/Pitot ID No.:**	**145**	**Configuration:**	**Permanent**
Probe Description:	Nonself Supporting Probe (NP)	**Effective Length:**	14'	**Condition:**	Good
Previous Calibrations		**A-side:**	0.8400	**B-side:**	0.8400

A-side Calibration		ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	$C_{p(s)}$ [a]	Deviation [b]
	Run 1	0.83	1.15	**0.8411**	**0.0017**
	Run 2	0.83	1.15	**0.8411**	**0.0017**
	Run 3	0.84	1.15	**0.8461**	**0.0034**
	Avg. (A)			**0.8427**	**0.0022**

B-side Calibration		ΔP_{std} (in. H_2O)	ΔP_s (in. H_2O)	$C_{p(s)}$ [a]	Deviation [b]
	Run 1	0.83	1.13	**0.8485**	**0.0012**
	Run 2	0.83	1.14	**0.8447**	**0.0025**
	Run 3	0.83	1.13	**0.8485**	**0.0012**
	Avg. (B)			**0.8472**	**0.0017**

[a] $C_{p(s)} = (C_{p(std)})(\sqrt{(\Delta P_{std} / \Delta P_s)})$

[b] Deviation = $C_{p(s)} - C_{p(s)avg}$

		(must be ≤ 0.01)	**PASS**	
Avg $C_{p(s)}$(A) - Avg $C_{p(s)}$(B) =	**0.0045**	(must be ≤ 0.01)	**PASS**	

	A-side	B-side		A-side	B-side
Calibration range =	**0.8427**	**0.8472**	(must be 0.7900-0.8900)	**OK**	**OK**
Calibration change =	**0.0027**	**0.0072**	(must be < 0.02)	**OK**	**OK**

Signed: Jose Orozco Date: 1/15/13

Airgas

CERTIFICATE OF BATCH ANALYSIS

NITROGEN - CEM-CAL ZERO

Airgas Specialty Gases
11711 South Alameda Street
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-3686
www.airgas.com

Part Number:	NI CZ15A	Reference Number:	48-124328656-1
Cylinder Analyzed:	CC43503	Cylinder Volume:	142 Cubic Feet
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2000 PSIG
Analysis Date:	Jul 26, 2012	Valve Outlet:	580
Lot #:	48-124328656-1		

Expiration Date: Jul 26, 2017

ANALYTICAL RESULTS

Component	Requested Purity	Certified Concentration
NitrogenCEM	99.9995%	99.9995%
CARBON DIOXIDE	< 1.0 PPM	0.040 PPM
Moisture	< 1.0 PPM	0.059 PPM
NOx	< 0.1 PPM	0.100 PPM
SO2	< 0.1 PPM	0.100 PPM
THC	< 0.1 PPM	0.030 PPM
CARBON MONOXIDE	< 0.5 PPM	0.210 PPM
Oxygen	< 0.5 PPM	0.319 PPM

Cylinders in Batch:
CC100216 (CC43503)

Permanent Notes:
Product meets 40 CFR 1065 requirements

Notes:

Impurities verified against analytical standards traceable to NIST by weight and/or analysis.

Approved for Release

60.73

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI99E15A73F4	Reference Number:	48-124320621-1
Cylinder Number:	CC1562	Cylinder Volume:	115 CF
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	1600 PSIG
PGVP Number:	B32012	Valve Outlet:	660
Gas Code:	CO,NO	Analysis Date:	Jun 12, 2012

Expiration Date: Jun 12, 2015

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOx	2.500 PPM	2.516 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	2.500 PPM	2.325 PPM	G1	+/- 1% NIST Traceable
CARBON MONOXIDE	4.750 PPM	4.746 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	100603	CC281041	20.34 PPM NITRIC OXIDE/NITROGEN	Feb 01, 2013
NTRM	100603	CC281041-NOx	20.36 PPM NOx/NITROGEN	Feb 01, 2013
NTRM	080609	CC255515	10.04 PPM CARBON MONOXIDE/NITROGEN	Jun 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801551 CO	FTIR	May 14, 2012
California Analytical NO	CLD NO	May 21, 2012
California Analitical NOx	CLD NOx	May 21, 2012

Triad Data Available Upon Request

Notes:

Signature on file

Approved for Release

Airgas

Airgas Specialty Gases
11781 S. Alameda St.
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-3365
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02AI99E15A2782	Reference Number:	48-124288318-1
Cylinder Number:	XC002743B	Cylinder Volume:	116 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	1600 PSIG
PGVP Number:	B32011	Valve Outlet:	590
		Analysis Date:	Oct 20, 2011

Expiration Date: Oct 20, 2014

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig (i.e., 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	2250 PPM	2262 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	60807	SG9051698ALB	2579PPM PROPANE/NITROGEN	May 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801551 C3H8	FTIR	Sep 21, 2011

Triad Data Available Upon Request

Notes:
RECERTIFICATION

Approved for Release

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

DocNumber: 000014778

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PITTSBURG CA
1930 LOVERIDGE RD
PITTSBURG CA 945650

Praxair Order Number: 14333459
Customer P. O. Number: 03020552 1
Customer Reference Number:

Fill Date: 9/23/2010
Part Number: NI CO950E-AS
Lot Number: 109023505
Cylinder Style & Outlet: AS CGA 350
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	9/16/2013	NIST Traceable Analytical Uncertainty:
Cylinder Number:	SGAL2238	
950 ppm	CARBON MONOXIDE	± 1 %
Balance	NITROGEN	

Certifcation Information: *Certification Date:* 9/16/2010 *Term:* 36 Months *Expiration Date:* 9/16/2013

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: CARBON MONOXIDE

Requested Concentration: 950 ppm
Certified Concentration: 950 ppm
Instrument Used: Horiba VIA-510, 577172043
Analytical Method: NDIR
Last Multipoint Calibration: 9/11/2010

First Analysis Data:						Date:	9/7/2010
Z:	0	R:	1011	C:	950	Conc:	950
R:	1011	Z:	0	C:	950	Conc:	950
Z:	0	C:	950	R:	1011	Conc:	950
UOM:	ppm			Mean Test Assay:			950 ppm

Analyzed by: Aruna Nalla

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC207134
Ref. Std. Conc: 1011 ppm
Ref. Std. Traceable to SRM # : vs. 1681b
SRM Sample # : 1-28-I
SRM Cylinder # : CLM-009404

Second Analysis Data:						Date:	9/15/2010
Z:	0	R:	1011	C:	949	Conc:	949
R:	1011	Z:	0	C:	949	Conc:	949
Z:	0	C:	948	R:	1011	Conc:	948
UOM:	ppm			Mean Test Assay:			949 ppm

Certified by: Shameela Jiffrey

Airgas

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2930
(323) 567-1601 Fax: (323) 567-3600
http://www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02AI99E15A0333	Reference Number:	48-124251156-1
Cylinder Number:	CC317126	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Feb 01, 2011	Valve Outlet:	590

Expiration Date: Feb 01, 2014

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	850.0 PPM	844.3 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	01050617	SG9141831	985.6PPM PROPANE/NITROGEN	May 12, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0901551 C3H8	FTIR	Jan 13 2011

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 South Alameda Street
Los Angeles, CA 90059
(323) 566-2203 Fax: (323) 567-3686
www.airgas.com

Part Number:	E02AI99E15A0966	Reference Number:	48-124316017-1
Cylinder Number:	CC406220	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
PGVP Number:	B32012	Valve Outlet:	590
Gas Code:	APPVD	Analysis Date:	May 15, 2012

Expiration Date: May 15, 2016

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	1500 PPM	1497 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	110609	CC343402	1000.3PPM PROPANE/NITROGEN	Mar 04, 2017

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801551 C3H8	FTIR	Apr 24, 2012

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2130
(323) 357-6891 Fax: (323) 567-3686
http://www.airgas.com

Part Number:	E03NI99E15A7415	Reference Number:	48-124251160-2
Cylinder Number:	CC284994	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Feb 10, 2011	Valve Outlet:	660

Expiration Date: Feb 10, 2013

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOx	5.500 PPM	5.696 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	5.500 PPM	5.639 PPM	G1	+/- 1% NIST Traceable
CARBON MONOXIDE	9.500 PPM	9.519 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	090607	CC253474	9.90PPM NITRIC OXIDE/NITROGEN	Oct 02, 2011
NTRM	090607NOx	CC263474	9.90PPM NOx/NITROGEN	Oct 02, 2011
NTRM	080609	CC255505	10.04PPM CARBON MONOXIDE/NITROGEN	Jun 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AMP0900118 CO	FTIR	Jan 16, 2011
California Analytical NO	CLD NO	Jan 14, 2011
California Analitical NOx	CLD NOx	Jan 14, 2011

Triad Data Available Upon Request

Notes:

Approved for Release

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

DocNumber: 000015070

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PITTSBURG CA
1930 LOVERIDGE RD
PITTSBURG CA 945650

Praxair Order Number: 14586226
Customer P. O. Number: 03057311
Customer Reference Number:

Fill Date: 9/16/2010
Part Number: EV NICDOXE64-AS
Lot Number: 109025905
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	9/24/2013	NIST Traceable Analytical Uncertainty:
Cylinder Number:	CC248733	
8.60 %	CARBON DIOXIDE	± 1 %
20.08 %	OXYGEN	± 1 %
Balance	NITROGEN	

Certifcation Information: *Certification Date:* 9/24/2010 *Term:* 36 Months *Expiration Date:* 9/24/2013

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1 . Component: CARBON DIOXIDE

Requested Concentration: 8.5 %
Certified Concentration: 8.60 %
Instrument Used: Siemens Ultramat 5E S/N A12-730
Analytical Method: NDIR
Last Multipoint Calibration: 9/10/2010

First Analysis Data:						Date: 9/23/2010
Z: 0	R: 10.09	C: 8.59	Conc: 8.59			
R: 10.1	Z: 0	C: 8.62	Conc: 8.61			
Z: 0	C: 8.62	R: 10.1	Conc: 8.61			
UOM: %		Mean Test Assay: 8.6 %				

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC66993
Ref. Std. Conc: 10.09%
Ref. Std. Traceable to SRM # : vs. 1675b
SRM Sample # : 6-F-51
SRM Cylinder # : CAL014538

Second Analysis Data:						Date:
Z: 0	R: 0	C: 0	Conc: 0			
R: 0	Z: 0	C: 0	Conc: 0			
Z: 0	C: 0	R: 0	Conc: 0			
UOM: %		Mean Test Assay: 0 %				

2 . Component: OXYGEN

Requested Concentration: 20 %
Certified Concentration: 20.08 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 9/11/2010

First Analysis Data:						Date: 9/23/2010
Z: 0	R: 21.04	C: 20.08	Conc: 20.08			
R: 21.04	Z: 0	C: 20.08	Conc: 20.08			
Z: 0	C: 20.08	R: 21.04	Conc: 20.08			
UOM: %		Mean Test Assay: 20.08 %				

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC109074
Ref. Std. Conc: 21.04 %
Ref. Std. Traceable to SRM # : vs. 2659a
SRM Sample # : 71-37-B
SRM Cylinder # : CLM-006734

Second Analysis Data:						Date:
Z: 0	R: 0	C: 0	Conc: 0			
R: 0	Z: 0	C: 0	Conc: 0			
Z: 0	C: 0	R: 0	Conc: 0			
UOM: %		Mean Test Assay: 0 %				

Analyzed by: Aruna Nalla

Certified by: Shameela Jiffrey

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 South Alameda Street
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-3686
www.airgas.com

Part Number:	E02NI99E15A0069	Reference Number:	48-124322978-3
Cylinder Number:	CC195373	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
PGVP Number:	B32012	Valve Outlet:	350
Gas Code:	APPVD	Analysis Date:	Jul 02, 2012

Expiration Date: Jul 02, 2015

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	2200 PPM	2228 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	000525	SG9160713	1985PPM CARBON MONOXIDE/NITROGEN	Aug 17, 2016

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801551 CO	FTIR	Jun 14, 2012

Triad Data Available Upon Request

Notes:

Approved for Release

54.65

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 South Alameda Street
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-3686
www.airgas.com

Part Number:	E03NI84E15A7419	Reference Number:	48-124338791-2
Cylinder Number:	CC140197	Cylinder Volume:	148 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
PGVP Number:	B32012	Valve Outlet:	590
Gas Code:	OC2	Analysis Date:	Oct 03, 2012

Expiration Date: Oct 03, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	4.000 %	4.129 %	G1	+/- 1% NIST Traceable
OXYGEN	11.50 %	11.72 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	090302	CC262089	9.961% OXYGEN/NITROGEN	Jan 15, 2013
NTRM	100621	CC281372	5.027% CARBON DIOXIDE/NITROGEN	Nov 01, 2015

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS 6E CO2	NDIR	Sep 25, 2012
SIEMENS OXYMAT 6	PARAMAGNETIC	Sep 27, 2012

Triad Data Available Upon Request

61.15

Notes:

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 South Alameda Street
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-3686
www.airgas.com

Part Number:	E03NI99E15A0980	Reference Number:	48-124336544-1
Cylinder Number:	CC317394	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
PGVP Number:	B32012	Valve Outlet:	660
Gas Code:	NC	Analysis Date:	Oct 01, 2012

Expiration Date: Oct 01, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	55.00 PPM	55.51 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	55.00 PPM	54.05 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		54.48 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	120608	CC283964	49.95PPM NITRIC OXIDE/NITROGEN	Dec 16, 2017
NTRM	120605	CC353899	49.53PPM CARBON MONOXIDE/NITROGEN	Dec 20, 2017

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801551 CO	FTIR	Sep 18, 2012
Nicolet 6700 AHR0801551 NO	FTIR	Sep 25, 2012

Triad Data Available Upon Request

Notes:

Approved for Release

59.67

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

DocNumber: 000023604

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PITTSBURG CA
1930 LOVERIDGE RD
PITTSBURG CA 945650

Praxair Order Number: 16556353
Customer P. O. Number: 03346786
Customer Reference Number:

Fill Date: 4/19/2011
Part Number: NI CO95MN1E-AS
Lot Number: 109110906
Cylinder Style & Outlet: AS CGA 660
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date: 5/5/2013			NIST Traceable Analytical Uncertainty:
Cylinder Number: CC101428			
94.4	ppm	CARBON MONOXIDE	± 1 %
94.1	ppm	NITRIC OXIDE	± 1 %
Balance		NITROGEN	

NOx ≈ 94.2 ppm

NOx for Reference Only

Certifcation Information: *Certification Date:* 5/5/2011 *Term:* 24 Months *Expiration Date:* 5/5/2013

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1 . Component: CARBON MONOXIDE

Requested Concentration: 95 ppm
Certified Concentration: 94.4 ppm
Instrument Used: HORIBA, VIA-510 576 876 015
Analytical Method: INFRARED
Last Multipoint Calibration: 4/10/2011

First Analysis Data: **Date:** 4/28/2011

Z: 0	R: 103.1	C: 94.5	Conc:	94.5
R: 103.1	Z: 0	C: 94.5	Conc:	94.5
Z: 0	C: 94.5	R: 103.1	Conc:	94.5

UOM: ppm **Mean Test Assay:** 94.5 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder # : A9603
Ref. Std. Conc: 103.1 ppm
Ref. Std. Traceable to SRM # : vs. 1679c
SRM Sample # : 3-I-45
SRM Cylinder # : FF28593

Second Analysis Data: **Date:** 5/5/2011

Z: 0	R: 103.1	C: 94.4	Conc:	94.4
R: 103.1	Z: 0	C: 94.4	Conc:	94.4
Z: 0	C: 94.4	R: 103.1	Conc:	94.4

UOM: ppm **Mean Test Assay:** 94.4 ppm

2 . Component: NITRIC OXIDE

Requested Concentration: 95 ppm
Certified Concentration: 94.1 ppm
Instrument Used: Thermo Electron 42I S/N 072602432C
Analytical Method: Chemiluminescence
Last Multipoint Calibration: 4/10/2011

First Analysis Data: **Date:** 4/28/2011

Z: 0	R: 99.8	C: 93.8	Conc:	93.8
R: 99.8	Z: 0	C: 93.5	Conc:	93.5
Z: 0	C: 93.7	R: 99.8	Conc:	93.7

UOM: ppm **Mean Test Assay:** 93.7 ppm

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC115349
Ref. Std. Conc: 99.8 ppm
Ref. Std. Traceable to SRM # : vs. 1684b
SRM Sample # : 44-S-107
SRM Cylinder # : CAL015468

Second Analysis Data: **Date:** 5/5/2011

Z: 0	R: 99.8	C: 94.5	Conc:	94.5
R: 99.8	Z: 0	C: 94.5	Conc:	94.5
Z: 0	C: 94.5	R: 99.8	Conc:	94.5

UOM: ppm **Mean Test Assay:** 94.5 ppm

Analyzed by:

Nelson Ma

Certified by:

Helena Tran

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

DocNumber: 000013745

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PITTSBURG CA
1930 LOVERIDGE RD
PITTSBURG CA 945650

Praxair Order Number: 14227967
Customer P. O. Number: 03004671
Customer Reference Number:

1

Fill Date: 8/12/2010
Part Number: EV AIPR30ME-AS
Lot Number: 109022405
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	8/20/2013	NIST Traceable
Cylinder Number:	CC77754	Analytical Uncertainty:
31.2 ppm	PROPANE	± 1 %
Balance	AIR	

Certifcation Information: *Certification Date:* 8/20/2010 *Term:* 36 Months *Expiration Date:* 8/20/2013

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: **PROPANE**

Requested Concentration: 30 ppm
Certified Concentration: 31.2 ppm
Instrument Used: HP 5890 Series II+ S/N 3310A48
Analytical Method: G.C. / Flame Ionization
Last Multipoint Calibration: 8/10/2010

First Analysis Data:					Date: 8/17/2010
Z: 0	R: 9597.1	C: 9357.7	Conc:	31.2	
R: 9614.6	Z: 0	C: 9391.8	Conc:	31.2	
Z: 0	C: 9427.2	R: 9686	Conc:	31.1	
UOM: ppm		Mean Test Assay:		31.2 ppm	

Reference Standard Type: GMIS
Ref. Std. Cylinder # : SA 9789
Ref. Std. Conc: 32.0 ppm
Ref. Std. Traceable to SRM # : vs. 1667b
SRM Sample # : 83-51-H
SRM Cylinder # : CAL-011857

Second Analysis Data:					Date:
Z: 0	R: 0	C: 0	Conc:	0	
R: 0	Z: 0	C: 0	Conc:	0	
Z: 0	C: 0	R: 0	Conc:	0	
UOM: ppm		Mean Test Assay:		0 ppm	

Analyzed by: Shameela Jiffrey

Certified by: Aruna Nalla

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

DocNumber: 000014225

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PITTSBURG CA
1930 LOVERIDGE RD
PITTSBURG CA 945650

Praxair Order Number: 14228001
Customer P. O. Number: 03004706 1
Customer Reference Number:

Fill Date: 8/18/2010
Part Number: EV AIPR50ME-AS
Lot Number: 109023001
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	9/2/2013	NIST Traceable
Cylinder Number:	CC149439	Analytical Uncertainty:
51.8 ppm	PROPANE	± 1 %
Balance	AIR	

Certifcation Information: *Certification Date:* 9/2/2010 *Term:* 36 Months *Expiration Date:* 9/2/2013

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1
Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1. Component: PROPANE

Requested Concentration: 50 ppm
Certified Concentration: 51.8 ppm
Instrument Used: HP 5890 Series II+ S/N 3310A48
Analytical Method: G.C. / Flame Ionization
Last Multipoint Calibration: 8/10/2010

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC 95262
Ref. Std. Conc: 100.4 ppm
Ref. Std. Traceable to SRM # : vs. 1668b
SRM Sample # : 82-13-H
SRM Cylinder # : CLM-006437

First Analysis Data:					Date: 8/17/2010
Z: 0	R: 266.9	C: 137.9	Conc:	51.9	
R: 267.1	Z: 0	C: 137.7	Conc:	51.7	
Z: 0	C: 138.1	R: 267.4	Conc:	51.8	
UOM: ppm		Mean Test Assay:		51.8 ppm	

Second Analysis Data:					Date:
Z: 0	R: 0	C: 0	Conc:	0	
R: 0	Z: 0	C: 0	Conc:	0	
Z: 0	C: 0	R: 0	Conc:	0	
UOM: ppm		Mean Test Assay:		0 ppm	

Analyzed by: Shameela Jiffrey

Certified by: Aruna Nalla

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda St.
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-3686
www.airgas.com

Part Number:	E02AI99E15A0461	Reference Number:	48-124283286-8
Cylinder Number:	SG9162961BAL	Cylinder Volume:	146 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
PGVP Number:	B32011	Valve Outlet:	590
Gas Code:	APPVD	Analysis Date:	Sep 27, 2011

Expiration Date: Sep 27, 2014

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
PROPANE	85.00 PPM	84.94 PPM	G1	+/- 1% NIST Traceable
Air	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	090617	CC301753	97.82PPM PROPANE/AIR	Oct 02, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801551 C3H8	FTIR	Sep 21, 2011

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

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11711 S. Alameda St.
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-5636
www.airgas.com

CERTIFICATE OF BATCH ANALYSIS

NITROGEN - CEM-CAL ZERO

Part Number:	NI CZ15A	Reference Number:	48-124286479-1
Cylinder Analyzed:	890626	Cylinder Volume:	142 Cubic Feet
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2000 PSIG
Analysis Date:	Oct 10, 2011	Valve Outlet:	580
Lot #:	48-124286479-1		

Expiration Date: Oct 10, 2016

ANALYTICAL RESULTS

Component	Requested Purity	Certified Concentration
NitrogenCEM	99.9995%	99.9995%
CARBON DIOXIDE	< 1.0 PPM	0.150 PPM
Moisture	< 1.0 PPM	0.215 PPM
NOx	< 0.1 PPM	0.100 PPM
SO2	< 0.1 PPM	0.100 PPM
THC	< 0.1 PPM	0.030 PPM
CARBON MONOXIDE	< 0.5 PPM	0.030 PPM
Oxygen	< 0.5 PPM	0.298 PPM

Cylinders in Batch:

890626, CC123973, CC124731, CC147756, CC190314, CC84267

Permanent Notes:

Product meets 40 CFR 1065 requirements

Notes:

Impurities verified against analytical standards traceable to NIST by weight and/or analysis.

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda Street
Los Angeles, CA 90059-2150
(323) 357-6691 Fax: (323) 567-3856
http://www.airgas.com

Part Number:	E03NI84E15A7419	Reference Number:	48-124260222-2
Cylinder Number:	CC241527	Cylinder Volume:	148 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Apr 13, 2011	Valve Outlet:	590

Expiration Date: Apr 13, 2014

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	4.000 %	3.999 %	G1	+/- 1% NIST Traceable
OXYGEN	11.50 %	11.45 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	980510	SG9168397	12.05% OXYGEN/NITROGEN	Jan 15, 2012
NTRM	81674	XC018412B	4.811% CARBON DIOXIDE/	May 15, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS % CO2	NDIR	Mar 21, 2011
Siemens %O2	PARAMAGNETIC	Mar 21, 2011

Triad Data Available Upon Request

Notes:

Approved for Release

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

DocNumber: 000015068

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR WHSE PITTSBURG CA
1930 LOVERIDGE RD
PITTSBURG CA 945650

Praxair Order Number: 14586226
Customer P. O. Number: 03057311
Customer Reference Number:

Fill Date: 9/16/2010
Part Number: EV NICDOXE64-AS
Lot Number: 109025905
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date: 9/24/2013			NIST Traceable
Cylinder Number: CC272451			Analytical Uncertainty:
8.67	%	CARBON DIOXIDE	± 1 %
20.12	%	OXYGEN	± 1 %
Balance		NITROGEN	

Certifcation Information: *Certification Date:* 9/24/2010 *Term:* 36 Months *Expiration Date:* 9/24/2013

This cylinder was certified according to the 1997 EPA Traceability Protocol, Document #EPA-600/R-97/121, using Procedure G1

Do Not Use this Standard if Pressure is less than 150 PSIG

Analytical Data: *(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)*

1 . Component: CARBON DIOXIDE

Requested Concentration: 8.5 %
Certified Concentration: 8.67 %
Instrument Used: Siemens Ultramat 5E S/N A12-730
Analytical Method: NDIR
Last Multipoint Calibration: 9/10/2010

First Analysis Data:						Date:	9/23/2010
Z:	0	R:	10.09	C:	8.67	Conc:	8.67
R:	10.1	Z:	0	C:	8.68	Conc:	8.67
Z:	0	C:	8.68	R:	10.1	Conc:	8.67
UOM:	%			Mean Test Assay:			8.67 %

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC66993
Ref. Std. Conc: 10.09%
Ref. Std. Traceable to SRM # : vs. 1675b
SRM Sample # : 6-F-51
SRM Cylinder # : CAL014538

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			0 %

2 . Component: OXYGEN

Requested Concentration: 20 %
Certified Concentration: 20.12 %
Instrument Used: OXYMAT 5E
Analytical Method: PARAMAGNETIC
Last Multipoint Calibration: 9/11/2010

First Analysis Data:						Date:	9/23/2010
Z:	0	R:	21.04	C:	20.12	Conc:	20.12
R:	21.04	Z:	0	C:	20.12	Conc:	20.12
Z:	0	C:	20.12	R:	21.04	Conc:	21.12
UOM:	%			Mean Test Assay:			20.12 %

Reference Standard Type: GMIS
Ref. Std. Cylinder # : CC109074
Ref. Std. Conc: 21.04 %
Ref. Std. Traceable to SRM # : vs. 2659a
SRM Sample # : 71-37-B
SRM Cylinder # : CLM-006734

Second Analysis Data:						Date:	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			0 %

Analyzed by: Aruna Nalla

Certified by: Shameela Jiffrey

Airgas CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 South Alameda Street
Los Angles, CA 90059-2130
(323) 357-6891
Fax: (323) 567-3686
www.airgas.com

Part Number:	E03NI99E15A73F4	Reference Number:	48-124341711-1
Cylinder Number:	CC406701	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
PGVP Number:	B32012	Valve Outlet:	660
Gas Code:	NC	Analysis Date:	Nov 06, 2012

Expiration Date: Nov 06, 2015

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 100 psig, i.e. 0 7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOX	2.500 PPM	2.467 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	2.500 PPM	2.350 PPM	G1	+/- 1% NIST Traceable
CARBON MONOXIDE	4.750 PPM	4.858 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	080609	CC255531	10.04PPM CARBON MONOXIDE/NITROGEN	May 14, 2018
NTRM	120611	CC281035	9.76PPM NITRIC OXIDE/NITROGEN	Jan 30, 2015
NTRM	120611NOx	CC281035-NOx	9.79PPM NOX/NITROGEN	Jan 30, 2015

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801551 CO	FTIR	Oct 19, 2012
Thermo 42-iLS 1115848421 NO	Chemiluminescence	Oct 13, 2012
Thermo 42-iLS 1115848421 NOx	Chemiluminescence	Oct 13, 2012

Triad Data Available Upon Request

Notes:

Approved for Release

58.92

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Specialty Gases
11711 S. Alameda St.
Los Angeles, CA 90059
(323) 568-2203 Fax: (323) 567-3586
www.airgas.com

Part Number:	E03NI99E15A7415	Reference Number:	48-124272530-1
Cylinder Number:	CC280082	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Los Angeles - CA	Cylinder Pressure:	2015 PSIG
PGVP Number	B32011	Valve Outlet:	660
		Analysis Date:	Jul 13, 2011

Expiration Date: Jul 13, 2013

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOx	5.500 PPM	5.449 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	5.500 PPM	5.384 PPM	G1	+/- 1% NIST Traceable
CARBON MONOXIDE	9.500 PPM	9.570 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	08060902	CC255238	10.04PPM CARBON MONOXIDE/NITROGEN	Jun 15, 2012
NTRM	100603	CC280968	20.34PPM NITRIC OXIDE/NITROGEN	Feb 01, 2013
NTRM	100603NOx	CC280968	20.36PPM NOx/NITROGEN	Feb 01, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS CO LOW	NDIR	Jul 07, 2011
Thermo 42i-LS	Chemiluminescence	Jun 14, 2011
Thermo 42i-LS NOx	Chemiluminescence	Jun 14, 2011

Triad Data Available Upon Request

Notes:

Approved for Release

APPENDIX C

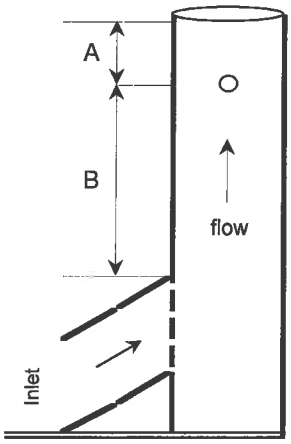
DATA SHEETS

Appendix C.1

Sampling Locations

Marsh Landing
TRAVERSE POINT LAYOUT (PARTICULATE)
CIRCULAR STACKS OVER 24 INCHES

Stack diameter:	**376.0**	***inches***
Upstream diameter (A):	**192.0**	***inches***
Downstream diameter (B):	**704.0**	***inches***
Port length:	**11.50**	***inches***
Number of ports being used:	**2**	
Equivalent upstream diameter (A):	**0.511**	
Equivalent downstream diameter (B):	**1.872**	
All points at least 1.0" from stack wall:	**7.896**	
Total points:	**24**	
Points per port:	**12**	

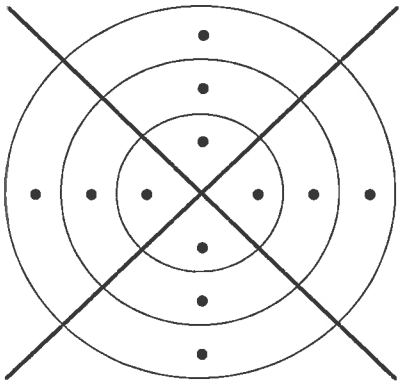


Typical vertical exhaust stack

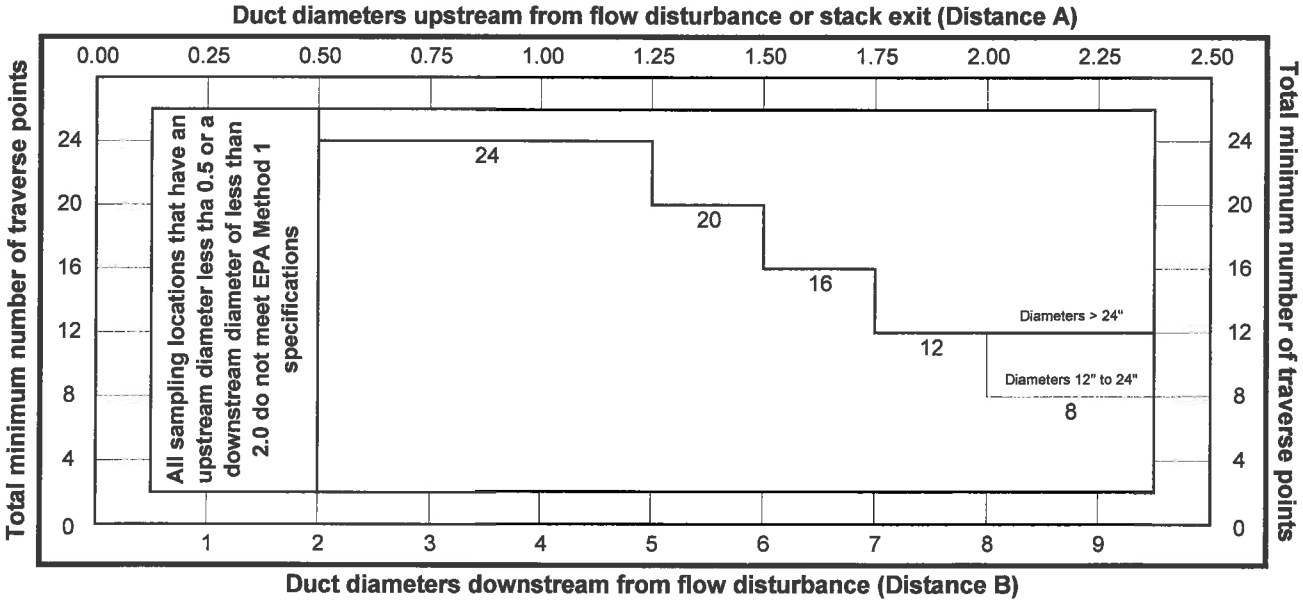
Point	% Diameter	Inside wall Distance (in)	Outside port Distance (in)
1	2.1	7.9	19.4
2	6.7	25.2	36.7
3	11.8	44.4	55.9
4	17.7	66.6	78.1
5	25.0	94.0	105.5
6	35.6	133.9	145.4
7	64.4	242.1	253.6
8	75.0	282.0	293.5
9	82.3	309.4	320.9
10	88.2	331.6	343.1
11	93.3	350.8	362.3
12	97.9	368.1	379.6

Note: No traverse point shall be within 1.0" of the stack walls (see Sections 11.3.1)

DUCT AREA = 771.070 ft^2



Example: Location of 12 points



Appendix C.2

Plant Process Data and CEMS Data

Appendix C.2.1

Process Data and CEMS Data

Unit 1

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	10:32	20,175.4	103,740.0	1,037.4	2,093.0	206	212.1	1.7	15.8
03/12/13	10:33	20,173.6	103,736.7	1,037.4	2,092.7	206	212.1	1.7	15.8
03/12/13	10:34	20,171.5	103,741.3	1,037.4	2,092.6	206	211.7	1.8	15.8
03/12/13	10:35	20,162.1	103,745.6	1,037.5	2,091.7	206	210.0	1.8	15.8
03/12/13	10:36	20,168.6	103,745.8	1,037.5	2,092.4	206	211.2	1.8	15.8
03/12/13	10:37	20,156.7	103,747.0	1,037.5	2,091.2	206	212.8	1.8	15.8
03/12/13	10:38	20,147.7	103,746.8	1,037.5	2,090.3	206	212.9	1.7	15.8
03/12/13	10:39	20,134.9	103,745.3	1,037.5	2,088.9	206	211.5	1.6	15.8
03/12/13	10:40	20,133.4	103,745.1	1,037.5	2,088.7	206	209.0	1.6	15.8
03/12/13	10:41	20,128.1	103,745.3	1,037.5	2,088.2	206	211.6	1.7	15.8
03/12/13	10:42	20,143.2	103,745.1	1,037.5	2,089.8	206	214.5	1.7	15.8
03/12/13	10:43	20,127.9	103,746.2	1,037.5	2,088.2	206	215.7	1.7	15.8
03/12/13	10:44	20,116.5	103,746.4	1,037.5	2,087.0	206	216.0	1.7	15.8
03/12/13	10:45	20,115.0	103,745.1	1,037.5	2,086.8	206	213.3	1.6	15.8
03/12/13	10:46	20,101.2	103,745.4	1,037.5	2,085.4	205	214.2	1.6	15.9
03/12/13	10:47	20,097.2	103,745.4	1,037.5	2,085.0	205	212.2	1.6	15.9
03/12/13	10:48	20,086.8	103,743.1	1,037.4	2,083.9	205	210.6	1.6	15.9
03/12/13	10:49	20,075.7	103,745.7	1,037.5	2,082.8	205	209.5	1.6	15.9
03/12/13	10:50	20,104.1	103,741.8	1,037.4	2,085.6	205	210.4	1.6	15.9
03/12/13	10:51	20,111.7	103,735.9	1,037.4	2,086.3	205	210.1	1.6	15.9
03/12/13	10:52	20,117.6	103,739.1	1,037.4	2,087.0	206	213.2	1.7	15.9
03/12/13	10:53	20,127.7	103,738.9	1,037.4	2,088.0	206	214.6	1.7	15.8
03/12/13	10:54	20,104.0	103,732.2	1,037.3	2,085.4	205	215.4	1.7	15.9
03/12/13	10:55	20,089.9	103,725.8	1,037.3	2,083.8	205	215.8	1.6	15.9
03/12/13	10:56	20,086.0	103,726.0	1,037.3	2,083.4	205	211.5	1.6	15.9
03/12/13	10:57	20,080.0	103,725.8	1,037.3	2,082.8	205	209.5	1.6	15.9
03/12/13	10:58	20,055.9	103,718.4	1,037.2	2,080.2	205	212.5	1.7	15.9
03/12/13	10:59	20,069.1	103,705.8	1,037.1	2,081.3	205	203.7	1.6	15.9
03/12/13	11:00	20,087.2	103,704.7	1,037.0	2,083.1	205	197.5	1.6	15.9

F = Unit Offline
E = Exceedance
M = Maintenance
T = Out Of Control
C = Calibration
S = Substituted
*** = Suspect**
U = Startup

Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	11:01	20,094.4	103,702.7	1,037.0	2,083.8	205	207.5	1.8	15.9
03/12/13	11:02	20,089.1	103,707.1	1,037.1	2,083.4	205	210.7	1.7	15.9
03/12/13	11:03	20,079.8	103,706.5	1,037.1	2,082.4	205	212.3	1.7	15.9
03/12/13	11:04	20,082.3	103,704.0	1,037.0	2,082.6	205	213.9	1.7	15.9
03/12/13	11:05	20,067.3	103,705.1	1,037.1	2,081.1	205	209.6	1.6	15.9
03/12/13	11:06	20,054.1	103,701.6	1,037.0	2,079.6	205	208.6	1.6	15.9
03/12/13	11:07	20,029.2	103,706.0	1,037.1	2,077.1	204	213.5	1.7	15.9
03/12/13	11:08	20,034.8	103,707.1	1,037.1	2,077.8	204	205.1	1.6	15.9
03/12/13	11:09	20,030.0	103,706.0	1,037.1	2,077.2	204	194.0	1.6	15.9
03/12/13	11:10	20,042.9	103,701.6	1,037.0	2,078.5	204	206.7	1.8	15.9
03/12/13	11:11	20,046.9	103,696.0	1,037.0	2,078.8	204	205.2	1.7	15.9
03/12/13	11:12	20,027.4	103,699.7	1,037.0	2,076.8	204	206.7	1.7	15.9
03/12/13	11:13	20,035.3	103,701.4	1,037.0	2,077.7	204	210.2	1.7	15.9
03/12/13	11:14	20,044.8	103,700.7	1,037.0	2,078.7	204	210.1	1.6	15.9
03/12/13	11:15	20,035.3	103,698.8	1,037.0	2,077.6	204	210.0	1.6	15.9
03/12/13	11:16	20,017.3	103,696.0	1,037.0	2,075.7	204	212.9	1.7	15.9
03/12/13	11:17	20,025.3	103,694.7	1,036.9	2,076.5	204	205.8	1.6	15.9
03/12/13	11:18	20,019.2	103,694.5	1,036.9	2,075.9	204	202.1	1.6	15.9
03/12/13	11:19	20,003.8	103,697.1	1,037.0	2,074.3	204	209.9	1.7	15.9
03/12/13	11:20	19,981.6	103,696.5	1,037.0	2,072.0	204	204.5	1.6	15.9
03/12/13	11:21	19,995.8	103,697.5	1,037.0	2,073.5	204	196.6	1.6	15.9
03/12/13	11:22	19,995.6	103,696.2	1,037.0	2,073.5	204	205.6	1.8	15.9
03/12/13	11:23	20,008.2	103,697.1	1,037.0	2,074.8	204	201.5	1.7	15.9
03/12/13	11:24	20,020.1	103,697.3	1,037.0	2,076.0	204	199.7	1.7	15.9
03/12/13	11:25	20,023.8	103,700.5	1,037.0	2,076.5	204	205.2	1.8	15.9
03/12/13	11:26	20,017.3	103,699.9	1,037.0	2,075.8	204	204.9	1.7	15.9
03/12/13	11:27	20,005.4	103,697.7	1,037.0	2,074.5	204	206.1	1.7	15.9
03/12/13	11:28	20,003.0	103,695.2	1,037.0	2,074.2	204	204.4	1.7	15.9
03/12/13	11:29	19,987.6	103,695.4	1,037.0	2,072.6	203	205.3	1.7	15.9

F = Unit Offline
E = Exceedance
M = Maintenance
T = Out Of Control
C = Calibration
S = Substituted
*** = Suspect**
U = Startup

Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	11:30	19,989.4	103,694.8	1,036.9	2,072.8	203	204.4	1.7	15.9
03/12/13	11:31	20,014.8	103,688.0	1,036.9	2,075.3	204	206.1	1.7	15.9
03/12/13	11:32	19,995.0	103,686.4	1,036.9	2,073.2	204	207.6	1.7	15.9
03/12/13	11:33	19,999.9	103,686.2	1,036.9	2,073.7	203	207.0	1.7	15.9
03/12/13	11:34	19,970.8	103,686.7	1,036.9	2,070.7	203	204.8	1.6	15.9
03/12/13	11:35	19,974.0	103,687.2	1,036.9	2,071.0	203	205.9	1.7	15.9
03/12/13	11:36	19,985.2	103,685.0	1,036.9	2,072.2	203	205.7	1.6	15.9
03/12/13	11:37	19,987.6	103,688.3	1,036.9	2,072.5	203	207.4	1.7	15.9
03/12/13	11:38	19,980.1	103,689.6	1,036.9	2,071.7	203	207.6	1.7	15.9
03/12/13	11:39	19,979.2	103,689.4	1,036.9	2,071.6	203	206.0	1.7	15.9
03/12/13	11:40	19,940.4	103,686.6	1,036.9	2,067.6	203	207.8	1.7	15.9
03/12/13	11:41	19,954.3	103,685.3	1,036.9	2,069.0	203	205.0	1.6	15.9
03/12/13	11:42	19,938.3	103,684.9	1,036.8	2,067.3	203	203.7	1.6	15.9
03/12/13	11:43	19,939.9	103,685.2	1,036.9	2,067.5	203	203.7	1.7	15.9
03/12/13	11:44	19,913.2	103,685.2	1,036.9	2,064.7	202	204.4	1.7	15.9
03/12/13	11:45	19,898.8	103,686.7	1,036.9	2,063.2	202	203.3	1.7	15.9
03/12/13	11:46	19,894.0	103,693.8	1,036.9	2,062.9	202	203.4	1.6	15.9
03/12/13	11:47	19,925.5	103,699.2	1,037.0	2,066.3	203	203.5	1.7	15.9
03/12/13	11:48	19,946.5	103,697.1	1,037.0	2,068.4	203	203.7	1.7	15.9
03/12/13	11:49	19,938.8	103,700.7	1,037.0	2,067.7	203	206.0	1.7	15.9
03/12/13	11:50	19,917.1	103,698.1	1,037.0	2,065.4	202	206.4	1.7	15.9
03/12/13	11:51	19,898.9	103,697.0	1,037.0	2,063.5	202	203.5	1.7	15.9
03/12/13	11:52	19,892.8	103,696.6	1,037.0	2,062.8	202	200.3	1.6	15.9
03/12/13	11:53	19,891.4	103,699.0	1,037.0	2,062.7	202	199.4	1.7	15.9
03/12/13	11:54	19,893.1	103,693.5	1,036.9	2,062.8	202	197.9	1.7	15.9
03/12/13	11:55	19,885.8	103,688.0	1,036.9	2,061.9	202	196.6	1.7	15.9
03/12/13	11:56	19,881.0	103,689.4	1,036.9	2,061.4	202	195.2	1.7	15.9
03/12/13	11:57	19,873.4	103,689.9	1,036.9	2,060.7	202	195.1	1.8	15.9
03/12/13	11:58	19,888.1	103,685.3	1,036.9	2,062.1	202	195.8	1.8	15.9

F = Unit Offline
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U = Startup

Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	11:59	19,914.0	103,677.0	1,036.8	2,064.6	202	196.3	1.8	15.9
03/12/13	12:00	19,917.8	103,674.8	1,036.7	2,065.0	202	199.7	1.9	15.9
03/12/13	12:01	19,911.9	103,676.8	1,036.8	2,064.4	202	201.8	1.9	15.9
03/12/13	12:02	19,885.9	103,677.9	1,036.8	2,061.7	202	203.0	1.8	15.9
03/12/13	12:03	19,885.4	103,677.8	1,036.8	2,061.7	202	202.6	1.8	15.9
03/12/13	12:04	19,870.5	103,677.6	1,036.8	2,060.1	202	201.4	1.7	15.9
03/12/13	12:05	19,875.3	103,677.4	1,036.8	2,060.6	202	201.1	1.7	15.9
03/12/13	12:06	19,874.5	103,676.9	1,036.8	2,060.5	202	200.4	1.7	15.9
03/12/13	12:07	19,856.0	103,675.2	1,036.8	2,058.6	201	200.7	1.7	15.9
03/12/13	12:08	19,838.1	103,675.0	1,036.7	2,056.7	201	200.8	1.7	15.9
03/12/13	12:09	19,835.3	103,676.7	1,036.8	2,056.5	201	201.5	1.7	15.9
03/12/13	12:10	19,835.5	103,681.9	1,036.8	2,056.6	201	201.0	1.7	15.9
03/12/13	12:11	19,817.8	103,686.3	1,036.9	2,054.8	201	203.1	1.7	15.9
03/12/13	12:12	19,830.5	103,686.5	1,036.9	2,056.2	201	205.0	1.7	15.9
03/12/13	12:13	19,825.1	103,687.0	1,036.9	2,055.6	201	205.3	1.7	15.9
03/12/13	12:14	19,816.3	103,692.6	1,036.9	2,054.8	201	205.6	1.7	15.9
03/12/13	12:15	19,789.2	103,697.4	1,037.0	2,052.1	201	207.9	1.7	15.9
03/12/13	12:16	19,789.4	103,695.8	1,037.0	2,052.1	201	204.1	1.6	15.9
03/12/13	12:17	19,794.5	103,695.6	1,037.0	2,052.6	201	203.3	1.6	15.9
03/12/13	12:18	19,782.8	103,696.0	1,037.0	2,051.4	201	203.5	1.7	15.9
03/12/13	12:19	19,778.0	103,697.2	1,037.0	2,050.9	201	204.8	1.7	15.9
03/12/13	12:20	19,759.7	103,695.7	1,037.0	2,049.0	200	202.3	1.6	15.9
03/12/13	12:21	19,755.8	103,696.2	1,037.0	2,048.6	200	201.9	1.6	15.9
03/12/13	12:22	19,748.6	103,694.8	1,036.9	2,047.8	200	201.4	1.7	15.9
03/12/13	12:23	19,747.8	103,688.1	1,036.9	2,047.6	200	201.1	1.7	15.9
03/12/13	12:24	19,763.3	103,685.1	1,036.9	2,049.2	201	201.4	1.7	15.9
03/12/13	12:25	19,781.6	103,686.1	1,036.9	2,051.1	201	202.6	1.7	15.9
03/12/13	12:26	19,776.8	103,684.2	1,036.8	2,050.5	201	203.5	1.7	15.9
03/12/13	12:27	19,759.7	103,685.7	1,036.9	2,048.8	200	204.9	1.7	15.9

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	12:28	19,729.1	103,684.3	1,036.8	2,045.6	200	204.4	1.7	15.9
03/12/13	12:29	19,737.6	103,684.4	1,036.8	2,046.5	200	203.3	1.6	15.9
03/12/13	12:30	19,732.8	103,680.3	1,036.8	2,045.9	200	201.5	1.6	15.9
03/12/13	12:31	19,706.4	103,674.6	1,036.7	2,043.1	200	201.7	1.7	16.0
03/12/13	12:32	19,712.2	103,674.6	1,036.7	2,043.7	200	200.6	1.6	15.9
03/12/13	12:33	19,727.3	103,673.9	1,036.7	2,045.2	199	203.0	1.6	16.0
03/12/13	12:34	19,729.2	103,678.3	1,036.8	2,045.5	200	205.7	1.7	16.0
03/12/13	12:35	19,716.7	103,686.0	1,036.9	2,044.3	200	204.3	1.6	16.0
03/12/13	12:36	19,676.3	103,686.1	1,036.9	2,040.2	199	203.9	1.6	16.0
03/12/13	12:37	19,664.5	103,686.8	1,036.9	2,038.9	199	206.0	1.7	15.9
03/12/13	12:38	19,675.9	103,685.2	1,036.9	2,040.1	199	203.4	1.6	16.0
03/12/13	12:39	19,692.4	103,686.7	1,036.9	2,041.8	199	204.7	1.7	16.0
03/12/13	12:40	19,680.5	103,684.6	1,036.8	2,040.6	199	203.6	1.7	16.0
03/12/13	12:41	19,689.9	103,685.3	1,036.9	2,041.6	199	204.6	1.7	16.0
03/12/13	12:42	19,702.2	103,687.8	1,036.9	2,042.9	200	196.8	1.6	16.0
03/12/13	12:43	19,687.5	103,693.8	1,036.9	2,041.5	199	200.3	1.7	16.0
03/12/13	12:44	19,696.7	103,693.4	1,036.9	2,042.4	199	199.1	1.7	16.0
03/12/13	12:45	19,701.6	103,692.3	1,036.9	2,042.9	199	199.2	1.6	16.0
03/12/13	12:46	19,675.1	103,699.0	1,037.0	2,040.3	199	200.1	1.6	16.0
03/12/13	12:47	19,660.8	103,704.6	1,037.0	2,038.9	199	198.6	1.7	16.0
03/12/13	12:48	19,660.2	103,706.1	1,037.1	2,038.9	199	198.6	1.6	16.0
03/12/13	12:49	19,648.7	103,705.3	1,037.1	2,037.7	199	198.9	1.6	16.0
03/12/13	12:50	19,628.2	103,700.1	1,037.0	2,035.4	199	200.1	1.7	15.9
03/12/13	12:51	19,642.2	103,696.2	1,037.0	2,036.8	199	201.1	1.7	16.0
03/12/13	12:52	19,665.5	103,697.0	1,037.0	2,039.3	199	201.5	1.7	16.0
03/12/13	12:53	19,662.1	103,696.3	1,037.0	2,038.9	199	202.4	1.7	15.9
03/12/13	12:54	19,657.9	103,695.6	1,037.0	2,038.4	199	201.2	1.7	16.0
03/12/13	12:55	19,644.6	103,691.6	1,036.9	2,037.0	199	201.8	1.6	15.9
03/12/13	12:56	19,648.1	103,695.3	1,037.0	2,037.4	199	201.2	1.6	15.9

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	12:57	19,635.2	103,695.1	1,037.0	2,036.1	199	200.1	1.6	16.0
03/12/13	12:58	19,635.5	103,701.0	1,037.0	2,036.2	199	201.1	1.7	16.0
03/12/13	12:59	19,641.3	103,704.7	1,037.0	2,036.9	199	196.0	1.6	16.0
03/12/13	13:00	19,615.4	103,704.9	1,037.1	2,034.2	199	198.6	1.7	16.0
03/12/13	13:01	19,612.2	103,704.7	1,037.0	2,033.9	199	198.9	1.7	15.9
03/12/13	13:02	19,631.4	103,701.2	1,037.0	2,035.8	199	197.6	1.6	16.0
03/12/13	13:03	19,647.9	103,702.3	1,037.0	2,037.5	199	198.2	1.7	15.9
03/12/13	13:04	19,658.5	103,702.9	1,037.0	2,038.6	199	199.3	1.7	16.0
03/12/13	13:05	19,651.9	103,703.6	1,037.0	2,038.0	199	201.5	1.8	16.0
03/12/13	13:06	19,649.9	103,708.1	1,037.1	2,037.9	199	202.3	1.8	15.9
03/12/13	13:07	19,672.0	103,714.1	1,037.1	2,040.3	199	200.9	1.7	15.9
03/12/13	13:08	19,684.6	103,715.9	1,037.2	2,041.6	199	200.2	1.6	15.9
03/12/13	13:09	19,655.7	103,715.1	1,037.2	2,038.6	199	202.2	1.7	15.9
03/12/13	13:10	19,636.5	103,718.3	1,037.2	2,036.7	199	202.1	1.7	16.0
03/12/13	13:11	19,602.1	103,717.2	1,037.2	2,033.1	198	202.5	1.7	16.0
03/12/13	13:12	19,602.1	103,716.4	1,037.2	2,033.1	198	202.9	1.7 IM	16.0 M
03/12/13	13:13	19,570.1	103,715.6	1,037.2	2,029.7	198	206.4	1.7 IM	16.0 M
03/12/13	13:14	19,588.1	103,715.0	1,037.2	2,031.6	198	204.9	1.6 IM	16.0 M
03/12/13	13:15	19,588.4	103,718.3	1,037.2	2,031.7	198	203.8	1.6 IM	16.0 M
03/12/13	13:16	19,581.1	103,720.8	1,037.2	2,031.0	198	206.9	2.3 IM	10.7 IM
03/12/13	13:17	19,599.8	103,720.8	1,037.2	2,032.9	198	208.5	9.1 IM	0.0 IM
03/12/13	13:18	19,611.3	103,720.9	1,037.2	2,034.1	199	208.9	8.7 IM	0.0 IM
03/12/13	13:19	19,592.8	103,721.0	1,037.2	2,032.2	198	208.8	8.8 IM	0.0 IM
03/12/13	13:20	19,572.4	103,715.9	1,037.2	2,030.0	198	208.5	8.8 IM	0.3 IM
03/12/13	13:21	19,543.4	103,713.7	1,037.1	2,026.9	198	251.4	4.8 IM	15.7 IM
03/12/13	13:22	19,533.8	103,710.1	1,037.1	2,025.9	198	213.8	1.3 IM	16.0 M
03/12/13	13:23	19,536.0	103,704.6	1,037.0	2,026.0	198	185.8	1.3	16.0
03/12/13	13:24	19,535.5	103,702.0	1,037.0	2,025.9	198	211.7	2.0	16.0
03/12/13	13:25	19,528.6	103,706.1	1,037.1	2,025.2	198	209.8	1.7 IC	16.0 C

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	13:26	19,519.3	103,710.6	1,037.1	2,024.4	197	210.4	1.6 IC	17.8 IC
03/12/13	13:27	19,520.6	103,710.1	1,037.1	2,024.5	197	209.9	0.1 IC	22.1 IC
03/12/13	13:28	19,547.3	103,708.8	1,037.1	2,027.2	198	210.6	0.0 IC	22.1 IC
03/12/13	13:29	19,586.7	103,709.0	1,037.1	2,031.3	198	210.0	0.0 IC	22.1 IC
03/12/13	13:30	19,593.7	103,715.1	1,037.2	2,032.2	198	210.3	2.2 IC	7.1 IC
03/12/13	13:31	19,595.1	103,720.6	1,037.2	2,032.4	198	210.5	8.6 IC	0.0 IC
03/12/13	13:32	19,569.4	103,720.1	1,037.2	2,029.7	198	210.2	8.8 IC	0.0 IC
03/12/13	13:33	19,579.2	103,720.0	1,037.2	2,030.8	198	210.8	8.8 IC	0.0 IC
03/12/13	13:34	19,561.7	103,725.5	1,037.3	2,029.0	198	210.9	8.8 IC	0.0 IC
03/12/13	13:35	19,545.0	103,731.8	1,037.3	2,027.4	197	210.8	25.1 IC	0.0 IC
03/12/13	13:36	19,552.2	103,732.8	1,037.3	2,028.2	198	211.0	114.3 IC	0.0 IC
03/12/13	13:37	19,560.1	103,733.1	1,037.3	2,029.0	198	211.0	133.5 IC	0.0 IC
03/12/13	13:38	19,535.4	103,730.5	1,037.3	2,026.4	198	210.4	133.4 IC	0.0 IC
03/12/13	13:39	19,539.0	103,724.8	1,037.2	2,026.7	198	223.2	90.8 IC	11.4 IC
03/12/13	13:40	19,558.4	103,723.5	1,037.2	2,028.7	198	213.1	2.3 IC	15.9 IC
03/12/13	13:41	19,566.7	103,723.8	1,037.2	2,029.5	198	202.2	1.6 IC	16.0 IC
03/12/13	13:42	19,569.9	103,723.3	1,037.2	2,029.9	198	206.9	1.8 IC	15.9 IC
03/12/13	13:43	19,583.1	103,725.5	1,037.3	2,031.3	198	207.6	1.8 IC	15.9 C
03/12/13	13:44	19,602.7	103,727.4	1,037.3	2,033.3	198	206.7	1.7	16.0
03/12/13	13:45	19,588.9	103,726.6	1,037.3	2,031.9	198	207.4	1.8	15.9
03/12/13	13:46	19,560.5	103,726.5	1,037.3	2,028.9	198	207.6	1.8	16.0
03/12/13	13:47	19,553.7	103,724.6	1,037.2	2,028.2	198	206.9	1.7	16.0
03/12/13	13:48	19,575.7	103,722.8	1,037.2	2,030.4	198	205.5	1.7	16.0
03/12/13	13:49	19,573.2	103,721.7	1,037.2	2,030.2	198	205.4	1.7	15.9
03/12/13	13:50	19,557.7	103,723.5	1,037.2	2,028.6	198	206.4	1.7	16.0
03/12/13	13:51	19,527.3	103,724.1	1,037.2	2,025.5	197	209.2	1.8	16.0
03/12/13	13:52	19,484.0	103,723.8	1,037.2	2,021.0	197	208.8	1.8	16.0
03/12/13	13:53	19,477.8	103,724.9	1,037.2	2,020.3	197	208.6	1.7	16.0
03/12/13	13:54	19,482.1	103,719.4	1,037.2	2,020.7	197	208.9	1.7	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	13:55	19,494.9	103,714.5	1,037.1	2,021.9	197	208.9	1.7	16.0
03/12/13	13:56	19,504.4	103,714.9	1,037.1	2,022.9	197	209.4	1.8	16.0
03/12/13	13:57	19,490.4	103,713.5	1,037.1	2,021.4	197	210.9	1.8	16.0
03/12/13	13:58	19,472.4	103,711.3	1,037.1	2,019.5	197	212.3	1.8	16.0
03/12/13	13:59	19,460.7	103,704.5	1,037.0	2,018.2	197	210.8	1.7	16.0
03/12/13	14:00	19,475.7	103,704.5	1,037.0	2,019.7	197	209.1	1.7	16.0
03/12/13	14:01	19,480.9	103,704.3	1,037.0	2,020.3	197	209.1	1.7	16.0
03/12/13	14:02	19,483.2	103,701.8	1,037.0	2,020.4	197	208.7	1.7	16.0
03/12/13	14:03	19,473.3	103,703.9	1,037.0	2,019.5	197	208.3	1.7	16.0
03/12/13	14:04	19,468.3	103,702.1	1,037.0	2,018.9	196	208.6	1.7	16.0
03/12/13	14:05	19,458.7	103,703.6	1,037.0	2,017.9	196	208.9	1.7	16.0
03/12/13	14:06	19,467.8	103,707.2	1,037.1	2,019.0	197	208.6	1.7	16.0
03/12/13	14:07	19,497.5	103,712.5	1,037.1	2,022.1	197	209.0	1.6	16.0
03/12/13	14:08	19,515.3	103,713.5	1,037.1	2,024.0	197	209.0	1.7	16.0
03/12/13	14:09	19,529.0	103,714.4	1,037.1	2,025.4	197	208.8	1.7	16.0
03/12/13	14:10	19,521.7	103,712.5	1,037.1	2,024.6	197	209.0	1.8	15.9
03/12/13	14:11	19,488.5	103,710.1	1,037.1	2,021.2	197	208.3	1.8	15.9
03/12/13	14:12	19,484.9	103,713.3	1,037.1	2,020.8	197	208.4	1.8	16.0
03/12/13	14:13	19,475.5	103,713.5	1,037.1	2,019.9	197	208.2	1.7	16.0
03/12/13	14:14	19,459.1	103,708.4	1,037.1	2,018.1	197	208.6	1.6	16.0
03/12/13	14:15	19,473.6	103,702.6	1,037.0	2,019.5	197	208.8	1.7	16.0
03/12/13	14:16	19,450.0	103,701.4	1,037.0	2,017.0	197	208.9	1.6	16.0
03/12/13	14:17	19,460.8	103,702.7	1,037.0	2,018.1	197	208.4	1.7	16.0
03/12/13	14:18	19,455.3	103,702.7	1,037.0	2,017.6	197	209.3	1.7	16.0
03/12/13	14:19	19,456.3	103,703.9	1,037.0	2,017.7	197	203.6	1.7	16.0
03/12/13	14:20	19,464.9	103,703.5	1,037.0	2,018.6	197	210.7	1.8	16.0
03/12/13	14:21	19,476.0	103,703.7	1,037.0	2,019.7	197	211.3	1.8	16.0
03/12/13	14:22	19,457.1	103,706.9	1,037.1	2,017.8	196	209.6	1.7	16.0
03/12/13	14:23	19,443.7	103,714.3	1,037.1	2,016.6	196	210.7	1.8	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	14:24	19,414.4	103,713.9	1,037.1	2,013.5	196	210.2	1.7	16.0
03/12/13	14:25	19,414.0	103,712.8	1,037.1	2,013.5	196	209.7	1.7	16.0
03/12/13	14:26	19,426.1	103,709.1	1,037.1	2,014.7	196	209.7	1.7	16.0
03/12/13	14:27	19,403.6	103,705.4	1,037.1	2,012.3	196	209.8	1.7	15.9
03/12/13	14:28	19,399.1	103,704.5	1,037.0	2,011.8	196	209.4	1.7	16.0
03/12/13	14:29	19,404.1	103,702.9	1,037.0	2,012.3	196	209.6	1.7	16.0
03/12/13	14:30	19,399.0	103,701.3	1,037.0	2,011.7	196	210.1	1.7	16.0
03/12/13	14:31	19,420.2	103,703.8	1,037.0	2,013.9	196	209.0	1.7	16.0
03/12/13	14:32	19,411.8	103,703.4	1,037.0	2,013.1	196	209.1	1.7	16.0
Run 1 Averages		**19,765.2**	**103,705.6**	**1,037.1**	**2,049.8**	**200.6**	**206.2**	**1.7**	**15.9**
03/12/13	15:38	19,334.1	103,679.3	1,036.8	2,004.5	195	206.7	1.7	16.0
03/12/13	15:39	19,344.8	103,679.0	1,036.8	2,005.6	195	206.8	1.7	16.0
03/12/13	15:40	19,311.6	103,679.1	1,036.8	2,002.2	194	206.7	1.7	16.0
03/12/13	15:41	19,318.2	103,675.0	1,036.8	2,002.8	194	206.8	1.8	16.0
03/12/13	15:42	19,301.6	103,673.9	1,036.7	2,001.1	194	207.2	1.8	16.0
03/12/13	15:43	19,304.5	103,671.6	1,036.7	2,001.3	195	211.9	1.8	16.0
03/12/13	15:44	19,306.2	103,671.7	1,036.7	2,001.5	195	208.8	1.6	16.0
03/12/13	15:45	19,320.9	103,673.7	1,036.7	2,003.1	195	208.1	1.6	16.0
03/12/13	15:46	19,343.8	103,673.3	1,036.7	2,005.4	195	208.4	1.7	16.0
03/12/13	15:47	19,333.3	103,669.3	1,036.7	2,004.3	195	208.4	1.7	16.0
03/12/13	15:48	19,343.7	103,671.1	1,036.7	2,005.4	195	208.9	1.7	16.0
03/12/13	15:49	19,334.9	103,673.1	1,036.7	2,004.5	195	208.9	1.7	16.0
03/12/13	15:50	19,309.8	103,679.9	1,036.8	2,002.0	195	207.7	1.7	16.0
03/12/13	15:51	19,324.4	103,684.9	1,036.8	2,003.6	195	206.1	1.7	16.0
03/12/13	15:52	19,312.7	103,684.8	1,036.8	2,002.4	195	206.9	1.7	16.0
03/12/13	15:53	19,292.6	103,684.6	1,036.8	2,000.3	194	206.7	1.7	16.0
03/12/13	15:54	19,275.4	103,686.2	1,036.9	1,998.6	194	206.6	1.7	16.0
03/12/13	15:55	19,282.6	103,685.2	1,036.9	1,999.3	194	206.4	1.7	16.0
03/12/13	15:56	19,293.5	103,684.6	1,036.8	2,000.4	194	204.8	1.7	16.0

F = Unit Offline
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U = Startup

Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	15:57	19,316.5	103,685.1	1,036.9	2,002.8	195	203.4	1.7	16.0
03/12/13	15:58	19,304.4	103,687.9	1,036.9	2,001.6	195	204.6	1.7	16.0
03/12/13	15:59	19,314.2	103,689.8	1,036.9	2,002.7	195	202.7	1.7	16.0
03/12/13	16:00	19,341.0	103,690.9	1,036.9	2,005.5	195	206.4	1.8	16.0
03/12/13	16:01	19,333.8	103,691.6	1,036.9	2,004.8	195	207.6	1.8	16.0
03/12/13	16:02	19,324.4	103,694.9	1,036.9	2,003.8	195	205.4	1.8	16.0
03/12/13	16:03	19,312.7	103,695.3	1,037.0	2,002.6	195	204.8	1.7	16.0
03/12/13	16:04	19,305.2	103,694.5	1,036.9	2,001.8	195	204.8	1.7	16.0
03/12/13	16:05	19,312.0	103,694.0	1,036.9	2,002.5	195	203.5	1.7	16.0
03/12/13	16:06	19,301.8	103,688.4	1,036.9	2,001.4	195	202.7	1.7	16.0
03/12/13	16:07	19,315.3	103,685.0	1,036.9	2,002.7	195	201.5	1.7	16.0
03/12/13	16:08	19,313.3	103,685.0	1,036.9	2,002.5	195	201.7	1.7	16.0
03/12/13	16:09	19,318.3	103,683.8	1,036.8	2,003.0	195	201.5	1.7	16.0
03/12/13	16:10	19,346.2	103,678.6	1,036.8	2,005.8	195	201.6	1.7	16.0
03/12/13	16:11	19,338.8	103,675.7	1,036.8	2,005.0	195	203.1	1.8	16.0
03/12/13	16:12	19,354.9	103,674.5	1,036.7	2,006.6	195	202.7	1.8	16.0
03/12/13	16:13	19,340.8	103,673.7	1,036.7	2,005.1	195	205.1	1.8	16.0
03/12/13	16:14	19,316.7	103,673.8	1,036.7	2,002.6	195	204.2	1.8	16.0
03/12/13	16:15	19,329.6	103,672.4	1,036.7	2,003.9	195	204.7	1.8	16.0
03/12/13	16:16	19,321.4	103,670.6	1,036.7	2,003.1	195	202.6	1.7	15.9
03/12/13	16:17	19,308.3	103,670.2	1,036.7	2,001.7	195	203.2	1.8	16.0
03/12/13	16:18	19,288.5	103,668.6	1,036.7	1,999.6	194	203.6	1.8	16.0
03/12/13	16:19	19,289.1	103,665.5	1,036.7	1,999.6	194	204.3	1.8	16.0
03/12/13	16:20	19,288.3	103,663.7	1,036.6	1,999.5	194	203.5	1.7	16.0
03/12/13	16:21	19,295.3	103,665.9	1,036.7	2,000.3	195	203.2	1.7	16.0
03/12/13	16:22	19,324.1	103,660.2	1,036.6	2,003.1	195	203.4	1.8	16.0
03/12/13	16:23	19,329.3	103,654.1	1,036.5	2,003.6	195	204.3	1.8	16.0
03/12/13	16:24	19,337.8	103,653.8	1,036.5	2,004.4	195	205.1	1.8	16.0
03/12/13	16:25	19,343.6	103,653.5	1,036.5	2,005.0	195	205.2	1.8	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	16:26	19,315.3	103,653.9	1,036.5	2,002.1	195	204.8	1.8	16.0
03/12/13	16:27	19,330.1	103,654.1	1,036.5	2,003.6	195	204.1	1.7	16.0
03/12/13	16:28	19,326.3	103,653.0	1,036.5	2,003.2	195	204.3	1.7	16.0
03/12/13	16:29	19,341.8	103,654.7	1,036.5	2,004.9	195	204.0	1.8	16.0
03/12/13	16:30	19,301.8	103,648.1	1,036.5	2,000.6	195	202.3	1.7	16.0
03/12/13	16:31	19,299.5	103,644.8	1,036.4	2,000.3	195	201.1	1.7	16.0
03/12/13	16:32	19,319.7	103,644.4	1,036.4	2,002.4	195	202.4	1.7	16.0
03/12/13	16:33	19,344.9	103,646.3	1,036.5	2,005.0	195	203.0	1.8	16.0
03/12/13	16:34	19,358.7	103,646.6	1,036.5	2,006.5	195	202.7	1.8	16.0
03/12/13	16:35	19,372.8	103,646.5	1,036.5	2,007.9	195	204.1	1.8	16.0
03/12/13	16:36	19,372.5	103,645.4	1,036.5	2,007.9	195	204.2	1.8	16.0
03/12/13	16:37	19,361.8	103,645.7	1,036.5	2,006.8	195	204.9	1.8	16.0
03/12/13	16:38	19,364.9	103,645.3	1,036.5	2,007.1	195	204.0	1.8	16.0
03/12/13	16:39	19,335.9	103,645.2	1,036.5	2,004.1	195	204.7	1.8	15.9
03/12/13	16:40	19,324.5	103,646.2	1,036.5	2,002.9	195	204.8	1.8	16.0
03/12/13	16:41	19,326.4	103,644.2	1,036.4	2,003.1	195	205.1	1.8	16.0
03/12/13	16:42	19,318.0	103,643.0	1,036.4	2,002.2	195	202.9	1.7	16.0
03/12/13	16:43	19,332.6	103,646.8	1,036.5	2,003.8	195	205.5	1.8	16.0
03/12/13	16:44	19,344.1	103,645.6	1,036.5	2,004.9	195	207.5	1.8	16.0
03/12/13	16:45	19,334.9	103,646.2	1,036.5	2,004.0	195	205.8	1.8	16.0
03/12/13	16:46	19,350.7	103,649.7	1,036.5	2,005.7	195	204.7	1.7	16.0
03/12/13	16:47	19,343.1	103,652.2	1,036.5	2,005.0	195	205.4	1.8	16.0
03/12/13	16:48	19,358.8	103,653.0	1,036.5	2,006.6	195	206.0	1.8	15.9
03/12/13	16:49	19,365.1	103,653.1	1,036.5	2,007.3	195	204.6	1.8	16.0
03/12/13	16:50	19,357.9	103,658.5	1,036.6	2,006.6	195	205.4	1.8	16.0
03/12/13	16:51	19,347.8	103,662.6	1,036.6	2,005.6	195	204.6	1.8	16.0
03/12/13	16:52	19,360.2	103,663.8	1,036.6	2,007.0	195	202.8	1.7	16.0
03/12/13	16:53	19,346.1	103,663.6	1,036.6	2,005.5	195	201.4	1.7	16.0
03/12/13	16:54	19,366.3	103,667.9	1,036.7	2,007.7	195	201.6	1.7	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	16:55	19,346.1	103,670.1	1,036.7	2,005.6	195	200.9	1.7	16.0
03/12/13	16:56	19,358.0	103,670.9	1,036.7	2,006.9	195	199.9	1.7	16.0
03/12/13	16:57	19,365.1	103,673.1	1,036.7	2,007.6	195	199.2	1.7	16.0
03/12/13	16:58	19,372.9	103,671.4	1,036.7	2,008.4	196	199.4	1.7	16.0
03/12/13	16:59	19,387.7	103,673.6	1,036.7	2,010.0	196	199.4	1.7	16.0
03/12/13	17:00	19,395.5	103,672.0	1,036.7	2,010.8	196	200.7	1.8	16.0
03/12/13	17:01	19,403.4	103,671.1	1,036.7	2,011.6	196	202.3	1.8	15.9
03/12/13	17:02	19,392.5	103,669.5	1,036.7	2,010.4	196	202.4	1.8	16.0
03/12/13	17:03	19,394.0	103,667.7	1,036.7	2,010.5	196	203.1	1.8	16.0
03/12/13	17:04	19,377.9	103,672.4	1,036.7	2,009.0	196	202.2	1.7	16.0
03/12/13	17:05	19,389.0	103,672.9	1,036.7	2,010.1	196	201.8	1.7	16.0
03/12/13	17:06	19,385.2	103,671.2	1,036.7	2,009.7	196	200.8	1.7	16.0
03/12/13	17:07	19,378.9	103,672.6	1,036.7	2,009.1	196	200.2	1.7	16.0
03/12/13	17:08	19,376.4	103,672.1	1,036.7	2,008.8	196	198.2	1.7	16.0
03/12/13	17:09	19,368.8	103,670.4	1,036.7	2,008.0	195	199.4	1.8	16.0
03/12/13	17:10	19,368.1	103,672.6	1,036.7	2,007.9	195	199.3	1.8	16.0
03/12/13	17:11	19,385.4	103,672.5	1,036.7	2,009.7	196	199.7	1.7	16.0
03/12/13	17:12	19,403.9	103,674.0	1,036.7	2,011.7	196	200.1	1.8	16.0
03/12/13	17:13	19,409.9	103,674.0	1,036.7	2,012.3	196	200.0	1.8	16.0
03/12/13	17:14	19,413.7	103,670.8	1,036.7	2,012.6	196	201.4	1.8	16.0
03/12/13	17:15	19,411.0	103,663.7	1,036.6	2,012.2	196	201.5	1.8	15.9
03/12/13	17:16	19,389.9	103,663.0	1,036.6	2,010.0	196	202.4	1.8	16.0
03/12/13	17:17	19,399.1	103,663.0	1,036.6	2,011.0	196	201.6	1.7	16.0
03/12/13	17:18	19,387.1	103,663.4	1,036.6	2,009.7	196	201.3	1.7	16.0
03/12/13	17:19	19,385.0	103,665.7	1,036.7	2,009.6	196	198.6	1.7	16.0
03/12/13	17:20	19,399.4	103,666.1	1,036.7	2,011.1	196	200.5	1.8	16.0
03/12/13	17:21	19,389.6	103,665.4	1,036.7	2,010.0	196	200.0	1.8	16.0
03/12/13	17:22	19,395.4	103,664.6	1,036.6	2,010.6	196	198.7	1.7	16.0
03/12/13	17:23	19,376.6	103,663.7	1,036.6	2,008.7	196	199.0	1.7	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	17:24	19,420.6	103,664.3	1,036.6	2,013.2	196	197.2	1.7	16.0
03/12/13	17:25	19,414.7	103,663.6	1,036.6	2,012.6	196	198.6	1.8	16.0
03/12/13	17:26	19,454.0	103,658.4	1,036.6	2,016.6	196	198.9	1.7	16.0
03/12/13	17:27	19,457.6	103,653.2	1,036.5	2,016.8	197	200.5	1.8	16.0
03/12/13	17:28	19,458.5	103,651.7	1,036.5	2,016.9	197	201.3	1.8	15.9
03/12/13	17:29	19,442.3	103,654.7	1,036.5	2,015.3	196	201.1	1.8	16.0
03/12/13	17:30	19,446.7	103,653.7	1,036.5	2,015.7	196	200.8	1.7	16.0
03/12/13	17:31	19,440.5	103,654.2	1,036.5	2,015.1	196	199.9	1.7	16.0
03/12/13	17:32	19,432.5	103,653.8	1,036.5	2,014.3	196	199.7	1.7	16.0
03/12/13	17:33	19,439.9	103,654.5	1,036.5	2,015.0	196	199.6	1.7	16.0
03/12/13	17:34	19,436.2	103,653.7	1,036.5	2,014.6	196	199.3	1.7	16.0
03/12/13	17:35	19,428.9	103,653.5	1,036.5	2,013.9	196	198.6	1.7	16.0
03/12/13	17:36	19,443.5	103,653.0	1,036.5	2,015.4	196	197.5	1.7	16.0
03/12/13	17:37	19,466.2	103,654.9	1,036.5	2,017.8	197	197.5	1.7	16.0
03/12/13	17:38	19,454.4	103,661.5	1,036.6	2,016.7	197	196.2	1.7	16.0
03/12/13	17:39	19,491.1	103,664.5	1,036.6	2,020.5	197	197.5	1.7	16.0
03/12/13	17:40	19,486.7	103,665.2	1,036.7	2,020.1	197	199.9	1.8	16.0
03/12/13	17:41	19,497.2	103,666.5	1,036.7	2,021.2	197	200.6	1.8	16.0
03/12/13	17:42	19,494.7	103,674.3	1,036.7	2,021.1	197	200.3	1.8	16.0
03/12/13	17:43	19,492.7	103,686.9	1,036.9	2,021.1	197	199.7	1.7	15.9
03/12/13	17:44	19,500.7	103,684.1	1,036.8	2,021.9	197	199.6	1.7	16.0
03/12/13	17:45	19,504.2	103,686.3	1,036.9	2,022.3	197	201.7	1.8	16.0
03/12/13	17:46	19,520.7	103,685.7	1,036.9	2,024.0	197	203.9	1.8	16.0
03/12/13	17:47	19,499.1	103,686.4	1,036.9	2,021.8	197	205.3	1.8	16.0
03/12/13	17:48	19,496.8	103,685.9	1,036.9	2,021.5	197	202.0	1.7	16.0
03/12/13	17:49	19,491.1	103,685.9	1,036.9	2,021.0	197	198.4	1.6	16.0
03/12/13	17:50	19,493.9	103,688.9	1,036.9	2,021.3	197	199.7	1.7	16.0
03/12/13	17:51	19,502.7	103,691.9	1,036.9	2,022.3	197	198.5	1.7	15.9
03/12/13	17:52	19,521.8	103,691.9	1,036.9	2,024.3	198	197.5	1.7	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	17:53	19,538.6	103,693.1	1,036.9	2,026.0	198	198.0	1.7	16.0
03/12/13	17:54	19,555.9	103,693.9	1,036.9	2,027.8	198	200.3	1.8	16.0
03/12/13	17:55	19,563.0	103,691.5	1,036.9	2,028.5	198	201.7	1.8	15.9
03/12/13	17:56	19,554.7	103,691.2	1,036.9	2,027.7	198	201.5	1.8	16.0
03/12/13	17:57	19,562.0	103,691.1	1,036.9	2,028.4	198	201.5	1.7	16.0
03/12/13	17:58	19,560.9	103,690.5	1,036.9	2,028.3	198	200.7	1.7	16.0
03/12/13	17:59	19,551.2	103,691.4	1,036.9	2,027.3	198	199.6	1.7	16.0
03/12/13	18:00	19,555.4	103,695.7	1,037.0	2,027.8	198	198.8	1.7	16.0
03/12/13	18:01	19,559.8	103,694.7	1,036.9	2,028.2	198	199.5	1.7	16.0
03/12/13	18:02	19,576.5	103,692.6	1,036.9	2,029.9	198	199.2	1.7	16.0
03/12/13	18:03	19,562.2	103,690.8	1,036.9	2,028.4	198	198.3	1.7	16.0
03/12/13	18:04	19,557.2	103,691.3	1,036.9	2,027.9	198	198.3	1.7	16.0
03/12/13	18:05	19,565.6	103,695.7	1,037.0	2,028.9	198	197.8	1.7	16.0
03/12/13	18:06	19,577.3	103,690.9	1,036.9	2,030.0	198	198.4	1.7	16.0
03/12/13	18:07	19,588.7	103,685.9	1,036.9	2,031.1	199	199.5	1.7	16.0
03/12/13	18:08	19,591.2	103,684.8	1,036.8	2,031.3	199	200.6	1.8	16.0
03/12/13	18:09	19,610.5	103,683.1	1,036.8	2,033.3	199	202.7	1.8	16.0
03/12/13	18:10	19,627.0	103,684.3	1,036.8	2,035.0	199	203.1	1.8	16.0
03/12/13	18:11	19,587.3	103,684.5	1,036.8	2,030.9	198	203.6	1.8	16.0
03/12/13	18:12	19,590.0	103,683.5	1,036.8	2,031.2	199	200.9	1.7	16.0
03/12/13	18:13	19,596.2	103,684.2	1,036.8	2,031.8	199	201.5	1.7	16.0
03/12/13	18:14	19,605.6	103,686.4	1,036.9	2,032.8	199	202.2	1.7	16.0
03/12/13	18:15	19,588.8	103,685.9	1,036.9	2,031.1	199	201.8	1.7	16.0
03/12/13	18:16	19,586.8	103,686.2	1,036.9	2,030.9	199	200.4	1.6	16.0
03/12/13	18:17	19,585.2	103,684.9	1,036.8	2,030.7	199	199.7	1.7	16.0
03/12/13	18:18	19,586.0	103,688.6	1,036.9	2,030.8	199	199.4	1.7	16.0
03/12/13	18:19	19,586.2	103,693.0	1,036.9	2,031.0	199	199.1	1.7	16.0
03/12/13	18:20	19,590.1	103,695.8	1,037.0	2,031.4	199	198.8	1.7	16.0
03/12/13	18:21	19,597.6	103,696.2	1,037.0	2,032.2	199	200.1	1.7	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	18:22	19,590.5	103,696.5	1,037.0	2,031.5	199	200.1	1.7	16.0
03/12/13	18:23	19,625.7	103,694.3	1,036.9	2,035.1	199	201.0	1.7	16.0
03/12/13	18:24	19,606.9	103,694.8	1,036.9	2,033.1	199	202.7	1.8	16.0
03/12/13	18:25	19,599.9	103,693.9	1,036.9	2,032.4	199	202.7	1.8	16.0
03/12/13	18:26	19,604.0	103,690.3	1,036.9	2,032.7	199	203.6	1.7	15.9
03/12/13	18:27	19,607.8	103,693.2	1,036.9	2,033.2	199	204.8	1.7	15.9
03/12/13	18:28	19,588.3	103,695.7	1,037.0	2,031.2	199	203.6	1.7	15.9
03/12/13	18:29	19,548.1	103,694.0	1,036.9	2,027.0	198	201.2	1.7	15.9
03/12/13	18:30	19,556.2	103,692.6	1,036.9	2,027.8	198	202.1	1.7	15.9
03/12/13	18:31	19,548.3	103,694.7	1,036.9	2,027.1	198	202.7	1.7	16.0
03/12/13	18:32	19,525.9	103,696.2	1,037.0	2,024.8	198	201.5	1.7	16.0
03/12/13	18:33	19,516.7	103,696.1	1,037.0	2,023.8	198	201.2	1.7	16.0
03/12/13	18:34	19,497.5	103,696.0	1,037.0	2,021.8	197	200.9	1.7	16.0
03/12/13	18:35	19,505.7	103,696.1	1,037.0	2,022.7	197	200.3	1.7	16.0
03/12/13	18:36	19,501.4	103,697.2	1,037.0	2,022.2	197	200.4	1.7	16.0
03/12/13	18:37	19,517.1	103,694.9	1,036.9	2,023.8	198	200.6	1.7	16.0
03/12/13	18:38	19,523.5	103,696.0	1,037.0	2,024.5	198	199.9	1.7	16.0
03/12/13	18:39	19,529.8	103,693.5	1,036.9	2,025.1	198	201.5	1.8	15.9
03/12/13	18:40	19,520.4	103,692.5	1,036.9	2,024.1	198	203.4	1.8	16.0
03/12/13	18:41	19,524.3	103,693.6	1,036.9	2,024.5	198	203.6	1.8	16.0
03/12/13	18:42	19,541.1	103,696.4	1,037.0	2,026.3	198	204.4	1.8	16.0
03/12/13	18:43	19,569.0	103,695.0	1,036.9	2,029.2	198	204.0	1.8	16.0
03/12/13	18:44	19,574.4	103,692.1	1,036.9	2,029.7	198	203.6	1.7	15.9
03/12/13	18:45	19,565.8	103,694.7	1,036.9	2,028.9	198	202.9	1.7	15.9
03/12/13	18:46	19,564.6	103,695.7	1,037.0	2,028.8	198	201.0	1.7	16.0
03/12/13	18:47	19,574.1	103,692.3	1,036.9	2,029.7	198	200.0	1.7	15.9
03/12/13	18:48	19,599.4	103,692.2	1,036.9	2,032.3	198	202.6	1.8	15.9
03/12/13	18:49	19,598.5	103,691.5	1,036.9	2,032.2	199	205.6	1.9	15.9
03/12/13	18:50	19,578.8	103,694.4	1,036.9	2,030.2	199	205.2	1.8	15.9

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	18:51	19,600.6	103,696.0	1,037.0	2,032.5	199	202.3	1.6	15.9
03/12/13	18:52	19,608.3	103,694.4	1,036.9	2,033.3	199	202.1	1.7	16.0
03/12/13	18:53	19,619.9	103,696.8	1,037.0	2,034.5	199	201.2	1.7	15.9
03/12/13	18:54	19,638.1	103,694.7	1,036.9	2,036.4	199	200.9	1.7	15.9
03/12/13	18:55	19,662.2	103,692.2	1,036.9	2,038.8	199	202.0	1.7	15.9
03/12/13	18:56	19,671.3	103,693.2	1,036.9	2,039.8	200	201.8	1.7	15.9
03/12/13	18:57	19,666.9	103,695.8	1,037.0	2,039.4	200	204.1	1.8	15.9
03/12/13	18:58	19,676.7	103,700.3	1,037.0	2,040.5	200	204.0	1.8	15.9
03/12/13	18:59	19,667.3	103,703.8	1,037.0	2,039.6	200	204.7	1.7	15.9
03/12/13	19:00	19,675.0	103,703.6	1,037.0	2,040.4	200	204.7	1.7	15.9
03/12/13	19:01	19,669.0	103,704.4	1,037.0	2,039.8	200	203.6	1.7	15.9
03/12/13	19:02	19,675.9	103,708.6	1,037.1	2,040.6	200	203.2	1.7	15.9
03/12/13	19:03	19,684.8	103,712.5	1,037.1	2,041.6	200	201.6	1.7	15.9
03/12/13	19:04	19,687.0	103,713.7	1,037.1	2,041.8	200	203.0	1.7	15.9
03/12/13	19:05	19,671.0	103,712.3	1,037.1	2,040.1	200	202.0	1.7	15.9
03/12/13	19:06	19,703.6	103,715.7	1,037.2	2,043.6	200	201.8	1.7	15.9
03/12/13	19:07	19,685.0	103,713.4	1,037.1	2,041.6	200	201.7	1.7	16.0
03/12/13	19:08	19,681.3	103,714.4	1,037.1	2,041.2	200	200.3	1.7	16.0
03/12/13	19:09	19,679.7	103,714.2	1,037.1	2,041.1	200	201.8	1.7	16.0
03/12/13	19:10	19,670.2	103,719.3	1,037.2	2,040.2	200	201.2	1.7	15.9
03/12/13	19:11	19,682.0	103,722.3	1,037.2	2,041.5	200	200.1	1.7	16.0
03/12/13	19:12	19,710.0	103,724.7	1,037.2	2,044.4	200	200.6	1.7	15.9
03/12/13	19:13	19,729.9	103,725.3	1,037.3	2,046.5	201	203.2	1.8	16.0
03/12/13	19:14	19,737.9	103,726.7	1,037.3	2,047.3	201	204.3	1.8	15.9
03/12/13	19:15	19,725.9	103,724.6	1,037.2	2,046.1	201	205.3	1.8	15.9
03/12/13	19:16	19,723.8	103,726.0	1,037.3	2,045.9	200	205.2	1.7	15.9
03/12/13	19:17	19,682.5	103,723.7	1,037.2	2,041.5	200	206.2	1.7	15.9
03/12/13	19:18	19,696.5	103,729.3	1,037.3	2,043.1	200	204.8	1.7	15.9
03/12/13	19:19	19,673.8	103,734.4	1,037.3	2,040.8	200	203.4	1.7	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/12/13	19:20	19,675.7	103,734.6	1,037.3	2,041.1	200	201.7	1.6	15.9
03/12/13	19:21	19,699.2	103,736.2	1,037.4	2,043.5	200	201.6	1.7	16.0
03/12/13	19:22	19,704.1	103,737.7	1,037.4	2,044.1	200	202.6	1.7	15.9
03/12/13	19:23	19,702.5	103,736.3	1,037.4	2,043.9	200	201.7	1.7	16.0
03/12/13	19:24	19,706.0	103,736.1	1,037.4	2,044.2	200	202.2	1.7	15.9
03/12/13	19:25	19,716.2	103,734.4	1,037.3	2,045.2	200	200.4	1.7	16.0
03/12/13	19:26	19,712.5	103,733.3	1,037.3	2,044.8	200	201.7	1.7	16.0
03/12/13	19:27	19,739.6	103,733.6	1,037.3	2,047.7	201	199.3	1.7	16.0
03/12/13	19:28	19,732.5	103,735.1	1,037.4	2,047.0	201	200.0	1.7	15.9
03/12/13	19:29	19,756.8	103,734.9	1,037.3	2,049.5	201	200.0	1.7	15.9
03/12/13	19:30	19,771.7	103,733.2	1,037.3	2,051.0	201	198.7	1.7	15.9
03/12/13	19:31	19,806.1	103,733.4	1,037.3	2,054.6	202	199.1	1.7	15.9
03/12/13	19:32	19,821.7	103,735.6	1,037.4	2,056.2	202	199.9	1.8	15.9
03/12/13	19:33	19,859.7	103,733.8	1,037.3	2,060.1	202	202.3	1.8	15.9
03/12/13	19:34	19,869.9	103,737.6	1,037.4	2,061.3	203	203.6	1.8	15.9
03/12/13	19:35	19,867.4	103,740.4	1,037.4	2,061.1	203	204.4	1.8	15.9
03/12/13	19:36	19,870.5	103,741.1	1,037.4	2,061.4	203	202.9	1.7	15.9
03/12/13	19:37	19,871.7	103,739.9	1,037.4	2,061.5	203	202.4	1.7	15.9
03/12/13	19:38	19,873.2	103,747.4	1,037.5	2,061.8	203	201.2	1.7	15.9
Run 2 Averages		**19,487.1**	**103,684.5**	**1,036.8**	**2,020.5**	**197.2**	**202.3**	**1.7**	**16.0**
03/13/13	08:00	20,265.8	103,478.0	1,034.8	2,097.1	206	214.2	1.7	15.9
03/13/13	08:01	20,267.1	103,478.3	1,034.8	2,097.2	206	213.5	1.7	15.9
03/13/13	08:02	20,262.2	103,478.0	1,034.8	2,096.7	206	212.7	1.7	15.9
03/13/13	08:03	20,265.7	103,480.5	1,034.8	2,097.1	206	211.8	1.7	15.9
03/13/13	08:04	20,277.0	103,479.4	1,034.8	2,098.3	206	210.6	1.7	15.9
03/13/13	08:05	20,273.0	103,479.1	1,034.8	2,097.8	206	211.3	1.7	15.9
03/13/13	08:06	20,276.4	103,479.9	1,034.8	2,098.2	206	210.9	1.7	15.9
03/13/13	08:07	20,268.9	103,478.7	1,034.8	2,097.4	206	211.9	1.7	15.9
03/13/13	08:08	20,267.4	103,478.2	1,034.8	2,097.2	206	212.3	1.7	15.9

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/13/13	08:09	20,284.0	103,479.5	1,034.8	2,099.0	206	213.7	1.8	15.9
03/13/13	08:10	20,297.3	103,471.4	1,034.7	2,100.2	207	214.6	1.8	15.9
03/13/13	08:11	20,319.2	103,470.8	1,034.7	2,102.4	207	214.9	1.8	15.9
03/13/13	08:12	20,345.3	103,470.1	1,034.7	2,105.1	207	216.9	1.8	15.9
03/13/13	08:13	20,309.7	103,470.8	1,034.7	2,101.5	207	218.0	1.8	15.9
03/13/13	08:14	20,337.0	103,470.5	1,034.7	2,104.3	207	215.8	1.7	15.9
03/13/13	08:15	20,326.2	103,471.6	1,034.7	2,103.2	207	217.2	1.7	15.9
03/13/13	08:16	20,359.1	103,471.5	1,034.7	2,106.6	207	219.0	1.7	15.9
03/13/13	08:17	20,356.3	103,469.4	1,034.7	2,106.3	207	221.4	1.8	15.9
03/13/13	08:18	20,362.3	103,461.3	1,034.6	2,106.7	207	221.8	1.8	15.9
03/13/13	08:19	20,363.9	103,457.6	1,034.6	2,106.8	207	221.1	1.7	15.9
03/13/13	08:20	20,344.7	103,459.4	1,034.6	2,104.9	207	221.2	1.7	15.9
03/13/13	08:21	20,357.5	103,459.3	1,034.6	2,106.2	207	220.7	1.7	15.9
03/13/13	08:22	20,353.1	103,459.6	1,034.6	2,105.7	207	222.6	1.7	15.9
03/13/13	08:23	20,340.2	103,459.6	1,034.6	2,104.4	207	222.4	1.7	15.9
03/13/13	08:24	20,328.5	103,460.0	1,034.6	2,103.2	207	222.1	1.7	15.9
03/13/13	08:25	20,326.5	103,459.6	1,034.6	2,103.0	207	219.2	1.6	15.9
03/13/13	08:26	20,320.6	103,458.4	1,034.6	2,102.3	207	214.1	1.6	15.9
03/13/13	08:27	20,311.0	103,459.6	1,034.6	2,101.4	207	214.5	1.7	15.9
03/13/13	08:28	20,296.0	103,459.3	1,034.6	2,099.8	207	213.8	1.7	15.9
03/13/13	08:29	20,296.0	103,458.3	1,034.6	2,099.8	207	214.3	1.6	15.9
03/13/13	08:30	20,310.6	103,452.9	1,034.5	2,101.2	207	213.0	1.6	15.9
03/13/13	08:31	20,327.8	103,450.9	1,034.5	2,102.9	207	214.8	1.7	15.9
03/13/13	08:32	20,333.6	103,452.2	1,034.5	2,103.6	207	216.1	1.7	15.9
03/13/13	08:33	20,350.1	103,450.9	1,034.5	2,105.2	207	217.3	1.7	15.9
03/13/13	08:34	20,346.4	103,451.4	1,034.5	2,104.9	207	216.7	1.7	15.9
03/13/13	08:35	20,341.1	103,451.9	1,034.5	2,104.3	207	216.9	1.7	15.9
03/13/13	08:36	20,343.3	103,453.4	1,034.5	2,104.6	207	217.3	1.7	15.9
03/13/13	08:37	20,330.8	103,451.2	1,034.5	2,103.2	207	219.3	1.7	15.9

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Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/13/13	08:38	20,338.9	103,451.5	1,034.5	2,104.1	207	218.1	1.6	15.9
03/13/13	08:39	20,336.7	103,452.3	1,034.5	2,103.9	207	215.4	1.6	15.9
03/13/13	08:40	20,334.1	103,452.0	1,034.5	2,103.6	207	220.6	1.7	15.9
03/13/13	08:41	20,333.2	103,452.7	1,034.5	2,103.5	207	222.3	1.7	15.9
03/13/13	08:42	20,313.6	103,452.8	1,034.5	2,101.5	207	225.0	1.6	15.9
03/13/13	08:43	20,289.0	103,452.1	1,034.5	2,098.9	206	216.4	1.6	16.0
03/13/13	08:44	20,271.5	103,451.9	1,034.5	2,097.1	206	219.5	1.6	16.0
03/13/13	08:45	20,277.9	103,451.2	1,034.5	2,097.8	206	211.1	1.5	16.0
03/13/13	08:46	20,290.5	103,443.2	1,034.4	2,098.9	207	197.3	1.6	16.0
03/13/13	08:47	20,312.9	103,440.8	1,034.4	2,101.2	207	210.6	1.8	16.0
03/13/13	08:48	20,313.5	103,441.2	1,034.4	2,101.3	207	213.1	1.6	15.9
03/13/13	08:49	20,335.1	103,440.2	1,034.4	2,103.5	207	210.8	1.6	15.9
03/13/13	08:50	20,336.9	103,435.8	1,034.4	2,103.6	207	213.8	1.7	15.9
03/13/13	08:51	20,337.4	103,434.6	1,034.3	2,103.6	207	216.3	1.7	15.9
03/13/13	08:52	20,296.7	103,432.9	1,034.3	2,099.3	207	215.9	1.7	15.9
03/13/13	08:53	20,277.1	103,434.0	1,034.3	2,097.3	206	218.1	1.6	16.0
03/13/13	08:54	20,270.4	103,433.7	1,034.3	2,096.6	206	205.2	1.5	16.0
03/13/13	08:55	20,272.8	103,436.6	1,034.4	2,096.9	206	208.9	1.7	16.0
03/13/13	08:56	20,280.8	103,433.4	1,034.3	2,097.7	206	206.4	1.6	16.0
03/13/13	08:57	20,289.2	103,433.0	1,034.3	2,098.6	206	204.8	1.6	16.0
03/13/13	08:58	20,297.8	103,436.4	1,034.4	2,099.5	207	209.9	1.7	16.0
03/13/13	08:59	20,307.1	103,435.3	1,034.4	2,100.5	207	202.3	1.6	16.0
03/13/13	09:00	20,293.0	103,435.1	1,034.4	2,099.0	206	210.9	1.8	16.0
03/13/13	09:01	20,289.4	103,434.0	1,034.3	2,098.6	206	209.1	1.6	16.0
03/13/13	09:02	20,292.3	103,435.8	1,034.4	2,099.0	206	203.1	1.6	16.0
03/13/13	09:03	20,282.2	103,432.9	1,034.3	2,097.8	206	208.9	1.7	16.0
03/13/13	09:04	20,289.3	103,433.0	1,034.3	2,098.6	206	203.4	1.6	16.0
03/13/13	09:05	20,281.4	103,433.5	1,034.3	2,097.8	206	204.6	1.6	16.0
03/13/13	09:06	20,297.1	103,409.3	1,034.1	2,098.9	206	208.7	1.7	16.0

F = Unit Offline
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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/13/13	09:07	20,291.5	103,403.5	1,034.0	2,098.2	206	208.7	1.6	16.0
03/13/13	09:08	20,290.4	103,402.8	1,034.0	2,098.1	206	211.7	1.6	16.0
03/13/13	09:09	20,270.3	103,402.1	1,034.0	2,096.0	206	203.9	1.6	16.0
03/13/13	09:10	20,277.5	103,370.6	1,033.7	2,096.1	206	206.6	1.6	16.0
03/13/13	09:11	20,264.3	103,363.3	1,033.6	2,094.6	206	208.2	1.6	16.0
03/13/13	09:12	20,256.0	103,361.2	1,033.6	2,093.7	206	198.1	1.6	16.0
03/13/13	09:13	20,268.5	103,364.2	1,033.6	2,095.0	206	206.6	1.7	16.0
03/13/13	09:14	20,268.0	103,348.3	1,033.5	2,094.7	206	207.0	1.6	16.0
03/13/13	09:15	20,259.8	103,343.1	1,033.4	2,093.7	205	209.4	1.6	16.0
03/13/13	09:16	20,240.9	103,342.7	1,033.4	2,091.7	205	211.1	1.6	16.0
03/13/13	09:17	20,238.4	103,343.2	1,033.4	2,091.5	205	208.2	1.6	16.0
03/13/13	09:18	20,244.4	103,341.4	1,033.4	2,092.1	205	203.3	1.6	16.0
03/13/13	09:19	20,244.7	103,340.9	1,033.4	2,092.1	205	210.2	1.7	16.0
03/13/13	09:20	20,217.3	103,343.8	1,033.4	2,089.3	205	214.3	1.7	16.0
03/13/13	09:21	20,211.4	103,343.1	1,033.4	2,088.7	205	208.9	1.6	16.0
03/13/13	09:22	20,212.0	103,343.9	1,033.4	2,088.8	205	201.9	1.6	16.0
03/13/13	09:23	20,190.6	103,343.6	1,033.4	2,086.6	205	209.9	1.7	16.0
03/13/13	09:24	20,180.7	103,343.9	1,033.4	2,085.6	204	207.0	1.6	16.0
03/13/13	09:25	20,154.3	103,346.2	1,033.5	2,082.9	204	209.4	1.6	16.0
03/13/13	09:26	20,131.7	103,327.1	1,033.3	2,080.2	204	208.7	1.6	16.0
03/13/13	09:27	20,122.6	103,323.6	1,033.2	2,079.1	203	199.8	1.5	16.0
03/13/13	09:28	20,107.4	103,326.0	1,033.3	2,077.6	203	205.3	1.6	16.0
03/13/13	09:29	20,096.7	103,323.8	1,033.2	2,076.5	203	205.2	1.6	16.0
03/13/13	09:30	20,116.7	103,294.0	1,032.9	2,077.9	203	203.5	1.6	16.0
03/13/13	09:31	20,128.3	103,281.5	1,032.8	2,078.9	203	207.1	1.6	16.0
03/13/13	09:32	20,108.3	103,282.9	1,032.8	2,076.8	203	209.3	1.6	16.0
03/13/13	09:33	20,094.9	103,281.8	1,032.8	2,075.4	203	207.7	1.6	16.0
03/13/13	09:34	20,096.7	103,246.2	1,032.5	2,074.9	203	199.8	1.6	16.0
03/13/13	09:35	20,084.1	103,235.7	1,032.4	2,073.4	203	214.6	1.7	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/13/13	09:36	20,080.3	103,234.2	1,032.3	2,073.0	203	221.9	1.5	16.0
03/13/13	09:37	20,097.5	103,233.3	1,032.3	2,074.7	203	220.8	1.3	16.0
03/13/13	09:38	20,115.3	103,229.3	1,032.3	2,076.5	203	220.3	1.3	16.0
03/13/13	09:39	20,136.5	103,222.9	1,032.2	2,078.5	203	217.0	1.4	16.0
03/13/13	09:40	20,137.9	103,224.9	1,032.2	2,078.7	203	213.9	1.4	16.0
03/13/13	09:41	20,112.7	103,225.0	1,032.2	2,076.1	203	211.2	1.5	16.0
03/13/13	09:42	20,110.4	103,234.4	1,032.3	2,076.1	203	209.8	1.5	16.0
03/13/13	09:43	20,116.1	103,235.4	1,032.4	2,076.7	203	208.9	1.5	16.0
03/13/13	09:44	20,114.7	103,236.2	1,032.4	2,076.6	203	207.7	1.5	16.0
03/13/13	09:45	20,110.9	103,236.3	1,032.4	2,076.2	203	206.0	1.5	16.0
03/13/13	09:46	20,130.3	103,243.3	1,032.4	2,078.3	203	203.2	1.5	16.0
03/13/13	09:47	20,132.0	103,244.8	1,032.4	2,078.5	203	203.3	1.6	16.0
03/13/13	09:48	20,127.6	103,243.2	1,032.4	2,078.0	203	202.1	1.6	16.0
03/13/13	09:49	20,122.6	103,242.5	1,032.4	2,077.5	203	191.0	1.6	16.0
03/13/13	09:50	20,122.4	103,236.2	1,032.4	2,077.4	203	195.4	1.7	16.0
03/13/13	09:51	20,089.0	103,235.5	1,032.4	2,073.9	203	202.0	1.8	16.0
03/13/13	09:52	20,091.4	103,233.4	1,032.3	2,074.1	203	186.8	1.6	16.0
03/13/13	09:53	20,075.0	103,235.3	1,032.4	2,072.4	202	196.0	1.8	16.0
03/13/13	09:54	20,078.8	103,219.7	1,032.2	2,072.5	203	202.0	1.8	16.0
03/13/13	09:55	20,096.3	103,214.9	1,032.1	2,074.2	203	201.5	1.6	16.0
03/13/13	09:56	20,077.4	103,214.8	1,032.1	2,072.3	203	197.3	1.6	16.0
03/13/13	09:57	20,046.0	103,213.4	1,032.1	2,069.0	202	203.5	1.7	16.0
03/13/13	09:58	20,035.5	103,205.8	1,032.1	2,067.8	202	208.3	1.7	16.0
03/13/13	09:59	20,034.8	103,202.6	1,032.0	2,067.6	202	188.2	1.5	16.0
03/13/13	10:00	20,046.0	103,204.2	1,032.0	2,068.8	202	192.5	1.7	16.0
03/13/13	10:01	20,068.7	103,205.2	1,032.1	2,071.2	202	201.3	1.8	16.0
03/13/13	10:02	20,077.0	103,211.8	1,032.1	2,072.2	203	199.7	1.6	16.0
03/13/13	10:03	20,085.2	103,218.2	1,032.2	2,073.2	202	203.7	1.7	16.0
03/13/13	10:04	20,088.2	103,216.2	1,032.2	2,073.4	202	207.4	1.6	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/13/13	10:05	20,078.3	103,216.3	1,032.2	2,072.4	202	202.0	1.6	16.0
03/13/13	10:06	20,066.2	103,215.5	1,032.2	2,071.1	202	201.4	1.6	16.0
03/13/13	10:07	20,048.4	103,216.6	1,032.2	2,069.3	202	205.0	1.7	16.0
03/13/13	10:08	20,048.9	103,217.2	1,032.2	2,069.4	202	200.3	1.6	16.0
03/13/13	10:09	20,038.2	103,218.1	1,032.2	2,068.3	202	201.7	1.6	16.0
03/13/13	10:10	20,053.1	103,222.6	1,032.2	2,069.9	202	204.8	1.6	16.0
03/13/13	10:11	20,041.0	103,225.6	1,032.3	2,068.7	202	204.3	1.6	16.0
03/13/13	10:12	20,024.3	103,225.1	1,032.3	2,067.0	202	207.8	1.6	16.0
03/13/13	10:13	20,014.2	103,222.3	1,032.2	2,065.9	202	208.3	1.6	16.0
03/13/13	10:14	20,024.3	103,225.2	1,032.3	2,067.0	202	205.1	1.6	16.0
03/13/13	10:15	20,005.2	103,223.5	1,032.2	2,065.0	201	197.9	1.5	16.0
03/13/13	10:16	19,996.6	103,225.3	1,032.3	2,064.2	201	204.0	1.7	16.0
03/13/13	10:17	19,995.1	103,222.9	1,032.2	2,064.0	201	203.3	1.6	16.0
03/13/13	10:18	19,982.3	103,232.4	1,032.3	2,062.8	201	204.1	1.6	16.0
03/13/13	10:19	19,984.6	103,235.1	1,032.4	2,063.1	201	206.1	1.6	16.0
03/13/13	10:20	19,963.9	103,235.5	1,032.4	2,061.0	201	207.9	1.7	16.0
03/13/13	10:21	19,974.0	103,235.2	1,032.4	2,062.0	201	210.2	1.7	16.0
03/13/13	10:22	19,975.0	103,235.6	1,032.4	2,062.1	201	212.1	1.7	16.0
03/13/13	10:23	19,940.6	103,233.9	1,032.3	2,058.5	201	213.0	1.7	16.0
03/13/13	10:24	19,923.8	103,233.3	1,032.3	2,056.8	200	204.6	1.6	16.0
03/13/13	10:25	19,933.1	103,234.0	1,032.3	2,057.8	200	194.7	1.5	16.0
03/13/13	10:26	19,949.5	103,241.0	1,032.4	2,059.6	201	203.9	1.7	16.0
03/13/13	10:27	19,948.9	103,241.7	1,032.4	2,059.6	201	203.1	1.6	16.0
03/13/13	10:28	19,953.6	103,242.5	1,032.4	2,060.1	201	206.9	1.6	16.0
03/13/13	10:29	19,969.4	103,242.2	1,032.4	2,061.7	201	204.8	1.6	16.0
03/13/13	10:30	19,965.2	103,241.5	1,032.4	2,061.2	201	203.5	1.6	16.0
03/13/13	10:31	19,953.3	103,241.8	1,032.4	2,060.0	201	205.3	1.6	16.0
03/13/13	10:32	19,962.4	103,241.7	1,032.4	2,061.0	201	201.3	1.6	16.0
03/13/13	10:33	19,962.7	103,242.4	1,032.4	2,061.0	201	195.8	1.5	16.0

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/13/13	10:34	19,967.1	103,241.5	1,032.4	2,061.4	201	201.6	1.6	16.0
03/13/13	10:35	19,957.5	103,241.5	1,032.4	2,060.4	201	203.9	1.6	16.0
03/13/13	10:36	19,969.6	103,242.0	1,032.4	2,061.7	201	205.2	1.6	16.0
03/13/13	10:37	19,957.7	103,242.8	1,032.4	2,060.5	201	207.0	1.6	16.0
03/13/13	10:38	19,936.1	103,243.4	1,032.4	2,058.3	201	209.1	1.6	16.0
03/13/13	10:39	19,942.1	103,241.8	1,032.4	2,058.9	201	198.4	1.5	16.0
03/13/13	10:40	19,932.6	103,241.9	1,032.4	2,057.9	201	196.5	1.6	16.0
03/13/13	10:41	19,937.8	103,242.2	1,032.4	2,058.4	201	201.7	1.7	16.0
03/13/13	10:42	19,935.2	103,242.5	1,032.4	2,058.2	201	196.5	1.6	16.0
03/13/13	10:43	19,929.5	103,242.4	1,032.4	2,057.6	201	203.7	1.7	16.0
03/13/13	10:44	19,924.1	103,242.7	1,032.4	2,057.0	201	205.6	1.6	16.0
03/13/13	10:45	19,912.3	103,242.0	1,032.4	2,055.8	201	204.6	1.6	16.0
03/13/13	10:46	19,895.6	103,242.0	1,032.4	2,054.1	200	206.7	1.6	16.0
03/13/13	10:47	19,849.4	103,240.8	1,032.4	2,049.3	199	207.0	1.6	16.1
03/13/13	10:48	19,826.6	103,241.8	1,032.4	2,046.9	199	207.9	1.6	16.1
03/13/13	10:49	19,825.6	103,240.8	1,032.4	2,046.8	199	192.7	1.5	16.1
03/13/13	10:50	19,834.9	103,241.6	1,032.4	2,047.8	199	195.1	1.6	16.1
03/13/13	10:51	19,841.0	103,241.7	1,032.4	2,048.4	199	199.7	1.7	16.0
03/13/13	10:52	19,846.7	103,241.2	1,032.4	2,049.0	199	190.7	1.5	16.1
03/13/13	10:53	19,857.3	103,242.9	1,032.4	2,050.1	200	198.7	1.7	16.0
03/13/13	10:54	19,857.4	103,241.8	1,032.4	2,050.1	199	198.8	1.7	16.0
03/13/13	10:55	19,821.3	103,241.5	1,032.4	2,046.4	199	200.6	1.7	16.1
03/13/13	10:56	19,774.2	103,241.9	1,032.4	2,041.5	199	201.1	1.7	16.1
03/13/13	10:57	19,790.3	103,240.2	1,032.4	2,043.2	199	199.9	1.6	16.1
03/13/13	10:58	19,822.3	103,242.3	1,032.4	2,046.5	199	190.6	1.5	16.1
03/13/13	10:59	19,845.6	103,241.8	1,032.4	2,048.9	199	193.4	1.6	16.1
03/13/13	11:00	19,847.5	103,240.0	1,032.4	2,049.1	199	195.3	1.6	16.0
03/13/13	11:01	19,843.7	103,240.7	1,032.4	2,048.7	199	196.0	1.6	16.1
03/13/13	11:02	19,803.1	103,241.7	1,032.4	2,044.5	199	197.6	1.7	16.1

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Report Generated: 03/21/13 10:49
Report Version 3.1.1130

Average Data

Plant: Marsh Landing Generating Station
Interval: 1 Minute
Type: Roll
Report Period: 03/12/2013 07:00 Through 03/13/2013 19:59
Time Online Criteria: 1 minute(s)

Source		UNIT1							
Parameter (Unit)		GASFLOW (HSCFH)	GASGCV (BTU/HSCF)	GASHHV (BTU/SCF)	HEATIN (MMBTU/HR)	LOADMW (MW)	NH3FLOW (LB/HR)	NOXPPM (PPM)	O2 (PERCENT)
03/13/13	11:03	19,809.9	103,241.4	1,032.4	2,045.2	199	198.5	1.6	16.1
03/13/13	11:04	19,805.9	103,244.6	1,032.4	2,044.9	199	199.3	1.7	16.1
03/13/13	11:05	19,808.6	103,242.6	1,032.4	2,045.1	199	199.0	1.6	16.0
03/13/13	11:06	19,813.0	103,242.7	1,032.4	2,045.5	199	192.7	1.6	16.1
03/13/13	11:07	19,800.9	103,243.0	1,032.4	2,044.3	199	196.9	1.7	16.1
03/13/13	11:08	19,789.6	103,241.2	1,032.4	2,043.1	199	196.9	1.6	16.1
03/13/13	11:09	19,775.4	103,242.6	1,032.4	2,041.7	198	197.3	1.6	16.1
03/13/13	11:10	19,795.9	103,240.6	1,032.4	2,043.7	199	197.6	1.6	16.0
03/13/13	11:11	19,789.3	103,243.5	1,032.4	2,043.1	199	199.2	1.6	16.1
03/13/13	11:12	19,812.5	103,241.8	1,032.4	2,045.5	199	200.2	1.6	16.1
03/13/13	11:13	19,811.3	103,241.6	1,032.4	2,045.4	199	202.0	1.6	16.0
03/13/13	11:14	19,806.6	103,242.2	1,032.4	2,044.9	199	202.3	1.6	16.1
03/13/13	11:15	19,791.1	103,242.6	1,032.4	2,043.3	199	202.4	1.6	16.1
03/13/13	11:16	19,769.9	103,241.6	1,032.4	2,041.1	198	202.1	1.6	16.1
03/13/13	11:17	19,765.7	103,241.4	1,032.4	2,040.6	198	199.4	1.6	16.1
03/13/13	11:18	19,753.1	103,234.0	1,032.3	2,039.2	198	202.3	1.6	16.1
03/13/13	11:19	19,725.9	103,232.9	1,032.3	2,036.4	198	201.3	1.6	16.1
03/13/13	11:20	19,735.3	103,230.9	1,032.3	2,037.3	198	201.9	1.6	16.1
03/13/13	11:21	19,720.8	103,232.0	1,032.3	2,035.8	198	202.1	1.6	16.1
03/13/13	11:22	19,725.8	103,239.4	1,032.4	2,036.5	198	203.0	1.6	16.1
03/13/13	11:23	19,732.2	103,243.4	1,032.4	2,037.2	198	203.4	1.6	16.1
03/13/13	11:24	19,759.6	103,241.8	1,032.4	2,040.0	198	204.9	1.6	16.1
03/13/13	11:25	19,733.9	103,240.9	1,032.4	2,037.3	198	207.9	1.7	16.1
03/13/13	11:26	19,707.3	103,232.5	1,032.3	2,034.4	197	206.5	1.6	16.1
03/13/13	11:27	19,702.0	103,231.7	1,032.3	2,033.9	197	199.2	1.5	16.1
03/13/13	11:28	19,706.5	103,231.6	1,032.3	2,034.3	198	195.0	1.5	16.1
03/13/13	11:29	19,717.4	103,232.4	1,032.3	2,035.5	198	198.9	1.6	16.1
03/13/13	11:30	19,742.1	103,240.2	1,032.4	2,038.2	198	199.6	1.6	16.1
03/13/13	11:31	19,767.6	103,240.8	1,032.4	2,040.8	198	199.0	1.6	16.1

F = Unit Offline
E = Exceedance
M = Maintenance
T = Out Of Control
C = Calibration
S = Substituted
*** = Suspect**
U = Startup

Report Generated: 03/21/13 10:49
Report Version 3.1.1130