



40 CFR 60, Subpart OOOO Performance Testing for Q100 Model

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Appendices

Appendix A Q100 Blue Print and PI&D Schematic



40 CFR 60, Subpart OOOO Performance Test for Q100 Model

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1. Summary

Air Hygiene was contracted by Questor Technology Inc. to conduct a performance testing on Combustion Flare Q100 Model. The model was tested on March 17th through March 19th at Broken Arrow Rental Facility at Broken Arrow, Oklahoma. The flare model was tested to satisfy the specifications as described in United States Code of Federal Regulations Title 40, Part 60, Subpart OOOO (40 CFR 60, Subpart OOOO).

2. Test Method

The production flare model was tested according to EPA source emissions test method

- Method 1 – Sample and Velocity Traverse for Stationary Sources
- Method 2 – Determination of Stack Gas Velocity and Volumetric Flow Rate
- Method 2A – Direct Measurement of Gas Volume Through Pipes and Small Ducts
- Method 3C – Determination of Carbon Dioxide, Methane, Nitrogen and Oxygen from stationary Sources
- Method 4 – Determination of Moisture Content in Stack Gas
- Method 10 – Determination of Carbon Monoxide Emission from Stationary Sources
- Method 22 – Visual Determination of Fugitive Emissions from Material Sources and Smoke Emission from Flares
- Method 25A – Determination of Total Gaseous Organic Concentration Using Flame Ionization Analyzer
- ASTM D1945-03 – Standard Test Method for Analysis of Natural Gas by Gas Chromatography
- ASTM D3588-98 – Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels

3. Requirement Specification

In accordance to 40 CFR 60 Subpart OOOO, §60.5413(d)(12)(i) through (vi), this report contains the following information.

- A full schematic and dimensions of the flare model are presented in Appendix A
- The maximum net Heat Input Rating of the Q100 is 2.0 MMBtu/hr (Based on HHV)
- The inlet gas fuel range for 0% (min. rate) and 100% (max. rate) are 4 MSCFD and 21 MSCFD, respectively
- Air/Stream injection/assist is not applicable
- The test parameter ranges below, as applicable to this model
 - Fuel gas delivery pressure and temperature – See Air Hygiene report Appendix B
 - Fuel gas moisture range – >3ppm
 - Purge gas usage range – Not applicable
 - Condensate liquid fuel separation range – No liquid in the gas
 - Combustion temperature range – See Air Hygiene report Appendix B



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- Excess combustion air range – See Air Hygiene report Table 2.1 - 2.4
- Flame arrestor – See blue print of the production flare model on Appendix A
- Burner manifold pressure – 0.1-20 psig
- Pilot flame indicator – Ionization Flame Detection
- Pilot flame fuel usage – 0.5 MSCFD
- Tip velocity range – 2-11 m/s
- Momentum flux ratio – Not applicable
- Exit temperature range – See Air Hygiene report Appendix B
- Weather condition - See Air Hygiene report Appendix B

4. Specified Testing Conclusion for Q100 Model

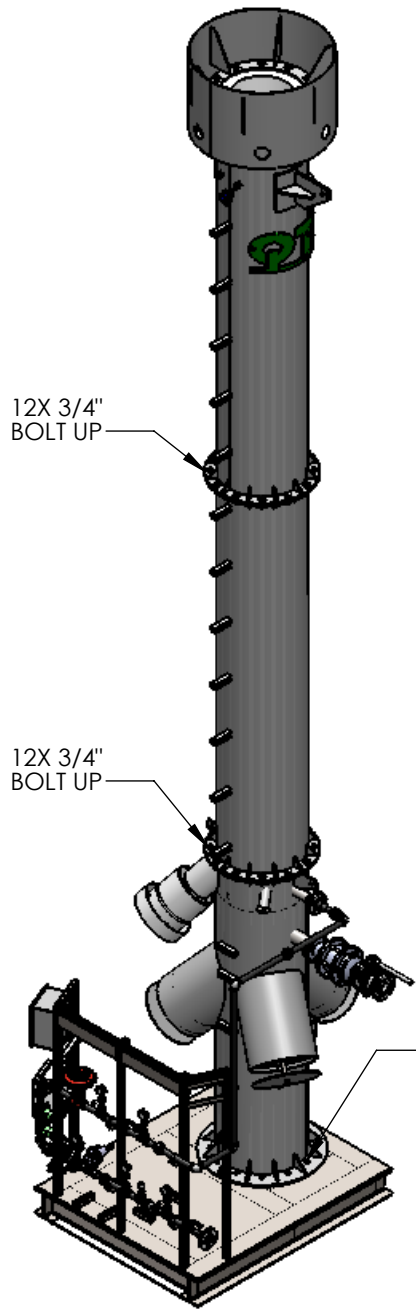
- The device was tested with no visible emission
- The device was tested with less than 10 ppm average as propane corrected to 3 percent carbon dioxide
- The device was tested with less than 10 ppm average as carbon monoxide corrected to 3 percent carbon dioxide
- The device was tested with higher than 150 percent excess air
- The device was tested with higher than 95 percent destruction efficiency for VOC

Appendix A

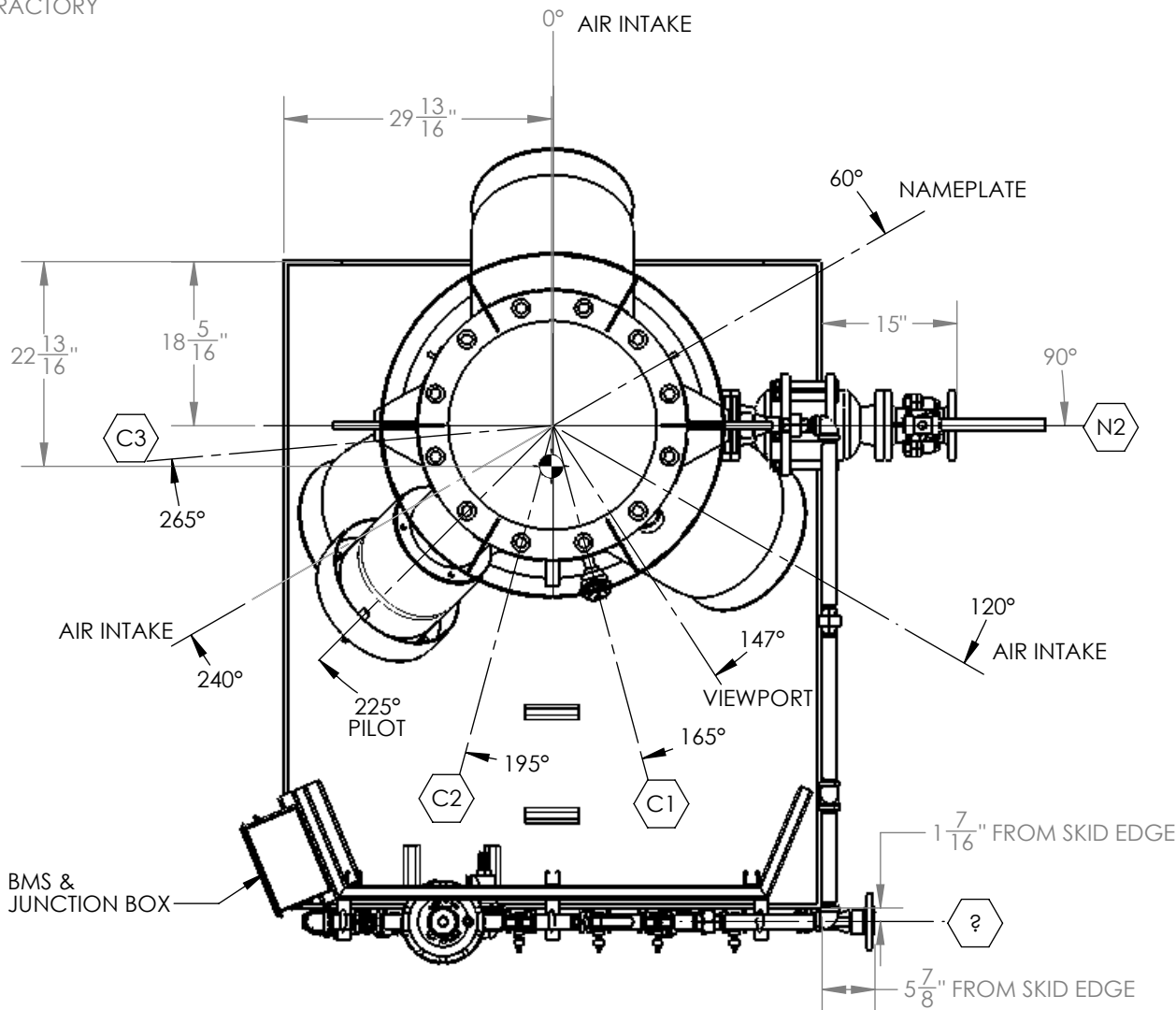
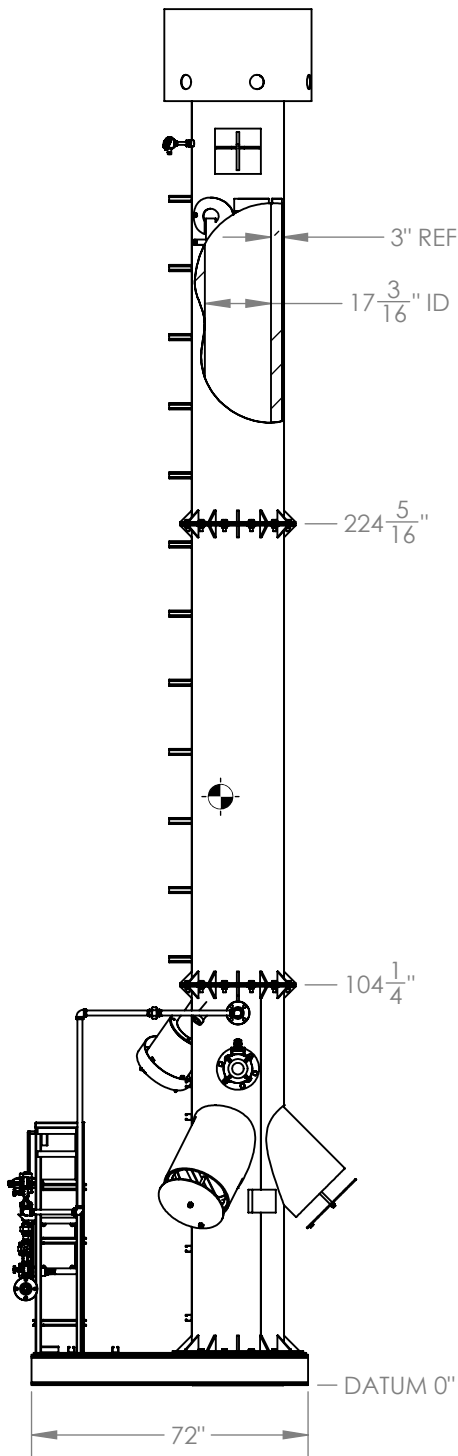
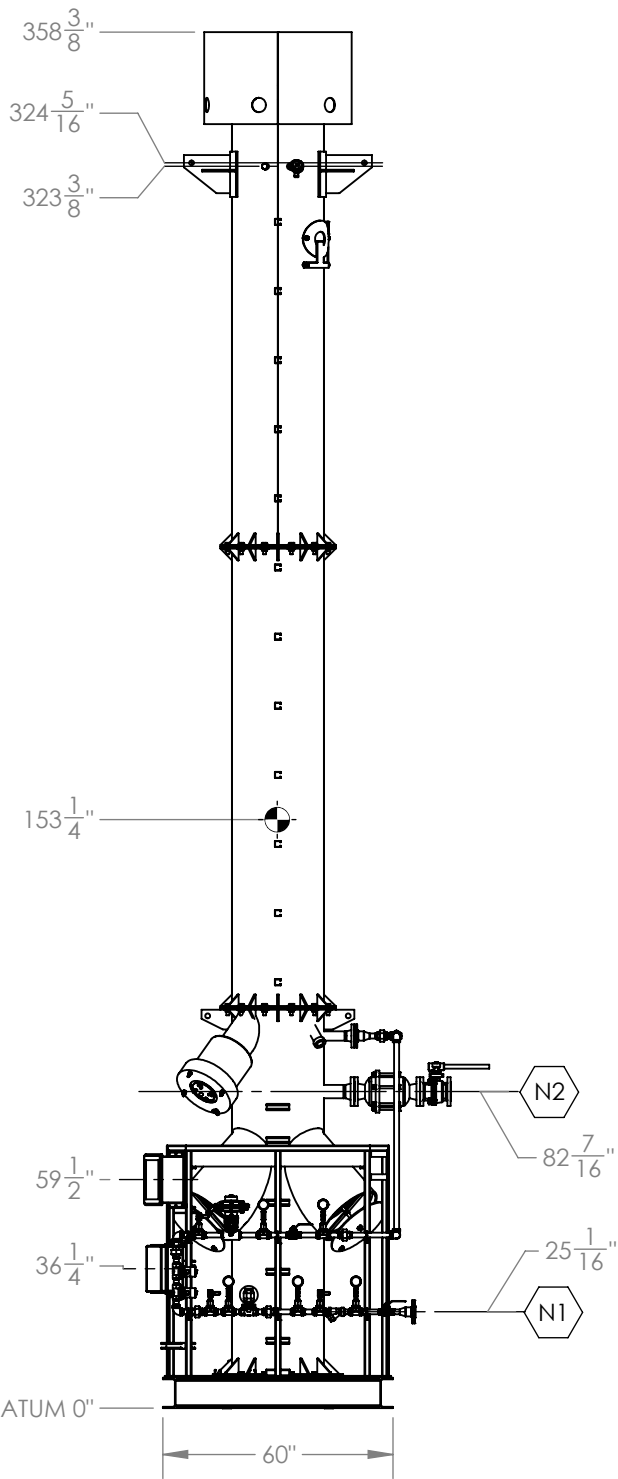
Q250 Blue Print and PI&D Schematic

F
E
D
C
B
A

NOZZLE SCHEDULE				
MARK	SIZE	GRADE	ELEV.	DESCRIPTION
N1	2"	150#	25-1/16"	FUEL GAS INLET
N2	3"	150#	82-3/4"	WASTE GAS INLET
C1	1"	3000#	320-15/16"	THERMOCOUPLE PORT
C2	1"	3000#	320-15/16"	SAMPLE PORT
C3	1"	3000#	11-1/8"	FLOOR DRAIN



TOTAL UNIT WEIGHT = 8250 LBS



GENERAL NOTES: A) UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
B) TOLERANCES:
DECIMAL FRACTION ANGULAR
X = +/- .1 X = +/- .1°
.XX = +/- .03 .XXX = +/- .010
C) ALL HOLES, SQUARES, SLOTS, CUTOUTS & EDGES TO BE BURR FREE.
D) ALL WELDS TO BE APPROPRIATE FOR FINAL ASSEMBLY AND PAINT.
E) SHEET TO BE PRINTED ON 11 x 17 PAPER ONLY

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CUSTOMER: TYPICAL ARRANGEMENT	GENERAL ARRANGEMENT	SCALE: 1:100	DWG NO.: ENG-D-M-16_Q100 GA	REV NO.: A	SHEET 1 of 2
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13 12 11 10 9 8 7 6 5 4 3 2 1

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AIR HYGIENE, INC.

Testing Solutions for a Better World

STACK EMISSIONS STUDY
EPA 40 CFR PART 60 SUBPART OOOO
FOR THE
COMBUSTION FLARE Q100 MODEL
PREPARED FOR
QUESTOR TECHNOLOGY INC.
AT THE
BROKEN ARROW RENTAL FACILITY
BROKEN ARROW, OKLAHOMA
MARCH 17-19, 2015



Corporate Headquarters

1600 W Tacoma Street
Broken Arrow, OK 74012



AIR HYGIENE, INC.

(918) 307-8865 or (888) 461-8778
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Remote Testing Offices

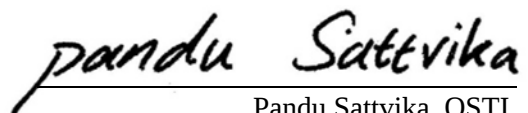
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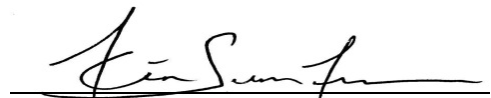
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Appendix D	Quality Assurance and Quality Control Data
Appendix E	Fuel Analysis Records
Appendix F	Method 3C Results
Appendix G	Field Data Sheets

**Stack Emissions Study
Combustion Flare Q100 Model
Questor Technology Inc.
Broken Arrow Rental Facility
Broken Arrow, Oklahoma
March 17-19, 2015**

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the emissions testing study for carbon monoxide (CO), total hydrocarbons (THC), flow, visual emission (VE), moisture (H₂O), carbon dioxide (CO₂), and oxygen (O₂) from the exhaust of the Combustion Flare Q100 Model for Questor Technology Inc. at the Broken Arrow Rental Facility near Broken Arrow, Oklahoma. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on March 17-19, 2015.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to conduct compliance emission testing to document levels of selected pollutants at four ramp-up / ramp-down test loads (0-30-0%, 30-70-30%, 70-100-70%, and 90-100%). The information will be used to confirm compliance with United States Code of Federal Regulations (CFR), Title 40 (40 CFR), Part 60 (40 CFR 60), Subpart OOOO. The specific objective was to determine the emission concentration of CO, THC, flow, visual emission, H₂O, CO₂, and O₂ from the exhaust of Questor Technology Inc.'s Combustion Flare Q100 Model.

1.2 SUMMARY OF TEST PROGRAM

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

- 1.2.1 Participating Organizations
 - Environment Protection Agency (EPA)
 - Questor Technology Inc.
 - Air Hygiene
- 1.2.2 Industry
 - Oil and Natural Gas Storage Transport and Processing
- 1.2.3 Air Permit and Federal Requirements
 - 40 CFR 60, Subpart OOOO
- 1.2.4 Plant Location
 - Broken Arrow Rental Facility near Broken Arrow, Oklahoma
 - 1600 West Tacoma Street, Broken Arrow, OK 74012
- 1.2.5 Equipment Tested
 - Combustion Flare Q100 Model
- 1.2.6 Emission Points
 - For all gases, three sample points in the exhaust duct from the Combustion Flare Q100 Model, determined according 40 CFR 60 Subpart OOOO
 - For all moisture, flow and fixed gas testing, 24 sampling points in the exhaust duct from the Combustion Flare Q100 Model
 - For visual emission, one sample visual observation point from the exit of the exhaust duct to the atmosphere from the Combustion Flare Q100 Model

- 1.2.7 Pollutants Measured
 - CO
 - THC
 - Flow
 - Visual Emission
 - H₂O
 - CO₂
 - O₂
- 1.2.8 Dates of Emission Test
 - March 17-19, 2015

1.3 KEY PERSONNEL

Questor Technology Inc.:	Jeff Nelson	587-390-0965
Air Hygiene	Min Sum Lee	918-307-8865
Air Hygiene:	Colby Gniech	918-307-8865
Air Hygiene:	Mike Schroeder	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on Questor Technology Inc.'s Combustion Flare Q100 Model located at the Broken Arrow Rental Facility on March 17-19, 2015 are summarized in the following table and relate only to the items tested.

TABLE 2.1
Q100 0-30-0 LOAD DATA SUMMARY

Parameter	0-30-0 Load, Run - Q100 R1	0-30-0 Load, Run - Q100 R2	0-30-0 Load, Run - Q100 R3	Average
Date (mm/dd/yy)	03/17/15	03/17/15	03/17/15	--
Start Time (hh:mm:ss)	14:50:09	16:17:09	17:41:09	--
End Time (hh:mm:ss)	16:00:09	17:27:09	18:51:09	--
Run Duration (min / run)	71	71	70	71
Bar. Pressure (in. Hg)	30.20	30.19	30.19	30.19
Amb. Temp. (°F)	62	63	59	61
Rel. Humidity (%)	58	57	59	58
Spec. Humidity (lb water / lb air)	0.006707	0.006891	0.006182	0.006593
Wind Speed (mph)	15.0	10.0	10.0	11.7
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-29.31	-20.38	-13.04	-20.91
Inlet Gas Canister Pressure Stop (inHg)	-20.38	-13.04	-3.82	-12.41
Gross Fuel Heating Value (Btu/ft ³)	2,517	2,517	2,517	2,517
Stack Flow (M2) (dscfh)	47,568	50,008	51,941	49,839
Stack Moisture (Method 4)	4.7	5.3	4.8	4.9
Gross Fuel Heating Value (Btu/ft ³)	2,517.4	2,517.4	2,517.4	2,517.40
Average Inlet Fuel Flowrate (SCFH)	226.2	222.9	226.4	225.19
Average Inlet Mass Fuel Flowrate (lb/hr)	26.3	25.9	26.3	26.15
% Excess Air	187.8	200.9	209.7	199.47
CO ₂ (%) - Modified method 3C	6.10	5.88	5.69	5.89
O ₂ (%) - Modified Method 3C	13.80	14.10	14.30	14.07
N ₂ (%) - Modified Method 3C	80.10	80.00	80.00	80.03
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	4.45	4.50	3.14	4.03
CO (ppm@3%CO ₂)	2.19	2.30	1.66	2.05
THC (ppmvw)	0.05	0.06	0.05	0.05
THC (ppm@3%CO ₂)	0.03	0.03	0.02	0.03
THC (lb/hr)	0.00	0.00	0.00	0.00
VOC Destruction Efficiency (%)	99.999	99.999	99.999	99.999

TABLE 2.2
Q100 30-70-30 LOAD DATA SUMMARY

Parameter	30-70-30 Load, Run - Q100 R4	30-70-30 Load, Run - Q100 R5	30-70-30 Load, Run - Q100 R6	Average
Date (mm/dd/yy)	03/18/15	03/18/15	03/18/15	--
Start Time (hh:mm:ss)	10:05:09	11:36:09	13:00:09	--
End Time (hh:mm:ss)	11:15:09	12:46:09	14:10:09	--
Run Duration (min / run)	70	71	71	71
Bar. Pressure (in. Hg)	30.11	30.11	30.08	30.10
Amb. Temp. (°F)	55	54	55	55
Rel. Humidity (%)	80	85	71	79
Spec. Humidity (lb water / lb air)	0.007288	0.007468	0.006466	0.007074
Wind Speed (mph)	5.0	5.0	5.0	5.0
Wind Direction (--)	E	E	E	--
Inlet Gas Canister Pressure Start (inHg)	-29.17	-21.23	-10.82	--
Inlet Gas Canister Pressure Stop (inHg)	-21.23	-10.82	-0.23	--
Gross Fuel Heating Value (Btu/ft ³)	2,481	2,481	2,481	2,481
Stack Flow (M2) (dscfh)	62,598	57,848	58,520	59,655
Stack Moisture (Method 4)	5.8	5.0	5.3	5.4
Gross Fuel Heating Value (Btu/ft ³)	2,481.1	2,481.1	2,481.1	2,481.10
Average Inlet Fuel Flowrate (SCFH)	474.6	478.7	472.9	475.40
Average Inlet Mass Fuel Flowrate (lb/hr)	54.9	55.6	50.3	53.57
% Excess Air	247.2	230.9	236.2	238.10
CO ₂ (%) - Modified method 3C	5.27	5.43	5.40	5.37
O ₂ (%) - Modified Method 3C	15.00	14.70	14.80	14.83
N ₂ (%) - Modified Method 3C	79.80	79.80	79.80	79.80
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	5.35	3.54	3.21	4.03
CO (ppm@3%CO ₂)	3.04	1.96	1.78	2.26
THC (ppmvw)	0.10	0.07	0.08	0.08
THC (ppm@3%CO ₂)	0.06	0.04	0.04	0.05
THC (lb/hr)	0.00	0.00	0.00	0.00
VOC Destruction Efficiency (%)	99.999	99.999	99.999	99.999

TABLE 2.3
Q100 70-100-70 LOAD DATA SUMMARY

Parameter	70-100-70 Load, Run - Q100 R7	70-100-70 Load, Run - Q100 R8	70-100-70 Load, Run - Q100 R9	Average
Date (mm/dd/yy)	03/19/15	03/19/15	03/19/15	--
Start Time (hh:mm:ss)	8:40:10	10:03:10	11:31:10	--
End Time (hh:mm:ss)	9:50:10	11:13:10	12:41:10	--
Run Duration (min / run)	71	71	71	71
Bar. Pressure (in. Hg)	30.05	30.06	30.07	30.06
Amb. Temp. (°F)	52	52	52	52
Rel. Humidity (%)	85	92	87	88
Spec. Humidity (lb water / lb air)	0.006947	0.007549	0.007100	0.007199
Wind Speed (mph)	5.0	5.0	5.0	5.0
Wind Direction (--)	SE	SE	SE	--
Inlet Gas Canister Pressure Start (inHg)	-29.12	-20.38	-11.07	--
Inlet Gas Canister Pressure Stop (inHg)	-20.38	-11.07	-3.78	--
Gross Fuel Heating Value (Btu/ft ³)	2,469	2,469	2,469	2,469
Stack Flow (M2) (dscfh)	74,438	70,747	84,603	76,596
Stack Moisture (Method 4)	6.0	5.9	5.4	5.8
Gross Fuel Heating Value (Btu/ft ³)	2,469.3	2,469.3	2,469.3	2,469.30
Average Inlet Fuel Flowrate (SCFH)	785.4	782.5	779.1	782.35
Average Inlet Mass Fuel Flowrate (lb/hr)	91.2	90.4	90.5	90.69
% Excess Air	196.6	314.1	225.8	245.50
CO ₂ (%) - Modified method 3C	5.96	4.62	5.60	5.39
O ₂ (%) - Modified Method 3C	14.00	15.90	14.60	14.83
N ₂ (%) - Modified Method 3C	80.00	79.40	79.80	79.73
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	2.66	2.63	2.53	2.60
CO (ppm@3%CO ₂)	1.34	1.70	1.35	1.47
THC (ppmvw)	0.05	0.07	0.09	0.07
THC (ppm@3%CO ₂)	0.03	0.04	0.05	0.04
THC (lb/hr)	0.00	0.00	0.00	0.00
VOC Destruction Efficiency (%)	99.999	99.999	99.999	99.999

TABLE 2.4
Q100 90-100 LOAD DATA SUMMARY

Parameter	90-100 Load, Run - Q100 R10	90-100 Load, Run - Q100 R11	90-100 Load, Run - Q100 R12	Average
Date (mm/dd/yy)	03/17/15	03/17/15	03/17/15	--
Start Time (hh:mm:ss)	9:23:09	10:57:09	12:28:09	--
End Time (hh:mm:ss)	10:33:39	12:07:09	13:38:09	--
Run Duration (min / run)	71	71	71	71
Bar. Pressure (in. Hg)	30.16	30.19	30.23	30.19
Amb. Temp. (°F)	58	60	66	61
Rel. Humidity (%)	70	59	57	62
Spec. Humidity (lb water / lb air)	0.007094	0.006355	0.007679	0.007043
Wind Speed (mph)	10.0	10.0	10.0	10.0
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-28.75	-19.88	-12.13	--
Inlet Gas Canister Pressure Stop (inHg)	-19.88	-12.13	-3.54	--
Gross Fuel Heating Value (Btu/ft ³)	2,395	2,395	2,395	2,395
Stack Flow (M2) (dscfh)	93,131	86,567	85,967	88,555
Stack Moisture (Method 4)	6.2	6.3	6.4	6.3
Gross Fuel Heating Value (Btu/ft ³)	2,395.3	2,395.3	2,395.3	2,395.30
Average Inlet Fuel Flowrate (SCFH)	843.1	856.8	854.5	851.43
Average Inlet Mass Fuel Flowrate (lb/hr)	97.9	99.5	99.2	98.89
% Excess Air	172.4	215.1	205.2	197.57
CO ₂ (%) - Modified method 3C	6.37	5.70	5.83	5.97
O ₂ (%) - Modified Method 3C	13.40	14.40	14.20	14.00
N ₂ (%) - Modified Method 3C	80.20	79.90	80.00	80.03
Visual Emission (mm:ss)	0:00	0:00	0:00	0.00
CO (ppmvd)	5.39	6.19	6.92	6.17
CO (ppm@3%CO ₂)	2.54	3.26	3.56	3.12
THC (ppmvw)	-0.05	0.08	0.07	0.03
THC (ppm@3%CO ₂)	-0.03	0.04	0.03	0.02
THC (lb/hr)	0.00	0.00	0.00	0.00
VOC Destruction Efficiency (%)	99.999	99.999	99.999	99.999

All testing was conducted according to the requirement of 40 CFR 60.5413 and 40 CFR 60.5412

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

Questor Technology Inc. (Questor) is an international environmental oilfield service company headquartered in Calgary, Alberta. Questor manufactures and services high efficiency waste gas incinerator systems, provides combustion and burner-related oilfield services as well as power generation systems. The interest of this certification testing is a Questor designed combustion flare, designated as Q100. This combustion flare was tested in Broken Arrow, Oklahoma.

3.2 SAMPLING LOCATION

The sample ports were located approximately 18 feet above grade level on the exhaust system. The stack has a 17.2 inch inner diameter and was equipped with two, 3 inch ports oriented at 90 degrees. The ports were 5 duct diameters downstream from the flare tip and 1 duct diameters upstream from the stack exit to the atmosphere. THC and CO samples for gaseous emissions were continuously drawn from the exhaust system at one sample port with three sampling points located at 16.7 percent, 50 percent, and 83.3 percent of the stack diameter. All visual emission observation was made by viewing the point where the exhaust system exited to the atmosphere at the top of the exhaust stack. All fuel sampling was continuously drawn from the fuel supply system with silonite-coated stainless steel evacuated canister from a tap located at 24 pipe diameter, 48 inches upstream of the fuel monitoring system. All flow, fixed gases and moisture sampling was continuously drawn from the exhaust system at two ports with 24 points across the stack according to Method 1.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Combustion Flare Q100 Model at the Broken Arrow Rental Facility was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on March 17-19, 2015.

TABLE 4.1
SUMMARY OF SAMPLING METHODS

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Stack Flow Rate	EPA Method 2	S-Type Pitot Tube
Fuel Flow Rate	EPA Method 2a	Volume Displacement
CO ₂ , O ₂ , Methane	EPA Method 3C	Gas Chromatograph-TCD
Stack Moisture Content	EPA Method 4	Gravimetric Analysis
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer

Pollutant or Parameter	Sampling Method	Analysis Method
Visual Emission	EPA Method 22	Visual Observation
Total Hydrocarbons	EPA Method 25a	Flame Ionization Detector
Fuel Content Analysis	ASTM D 1945-03, ASTM D 3588-98	Gas Chromatograph

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 2, 2a, 3c, 4, 10, 22, 25a; American Society for Testing and Materials (ASTM) Standard D1945-03, and D3588-98 .

Figure 4.1 depicts the sample system used for the real-time gas analyzer tests. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the real-time analyzers through rotameters that controlled the flow rate of the sample. Exhaust samples were routed to the wet based analyzer prior to gas conditioning.

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

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

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

Figure 4.2 represents the sample system used for moisture O₂,CO₂ and flow testing. A hastelloy probe with an inconel 3/8 inches tubing, pitot tubes and thermocouple were inserted into the sample ports of the stack to extract gas measurements from the emission stream through a glass impinger train. Flow rates were monitored with oil filled manometers (low flow) and total sample volumes were measured with a dry gas meter. Tedlar bags were collected at the exit of this train for 3c analysis.

Three test runs for each of the firing rates at 0-30-0 percent, 30-70-30 percent, 70-100-70 percent, and 90-100 percent (ramp up, ramp down) of approximately 61 minutes each were conducted on the Combustion Flare Q100 Model for CO, THC, CO₂, and O₂.

Figure 4.3 represents the inlet sampling system in accordance with Method 2A, 40 CFR part 60 to measure inlet gas flow rate, pressure and temperature. Fuel sample was collected at 48 inches upstream from gas flow meter.

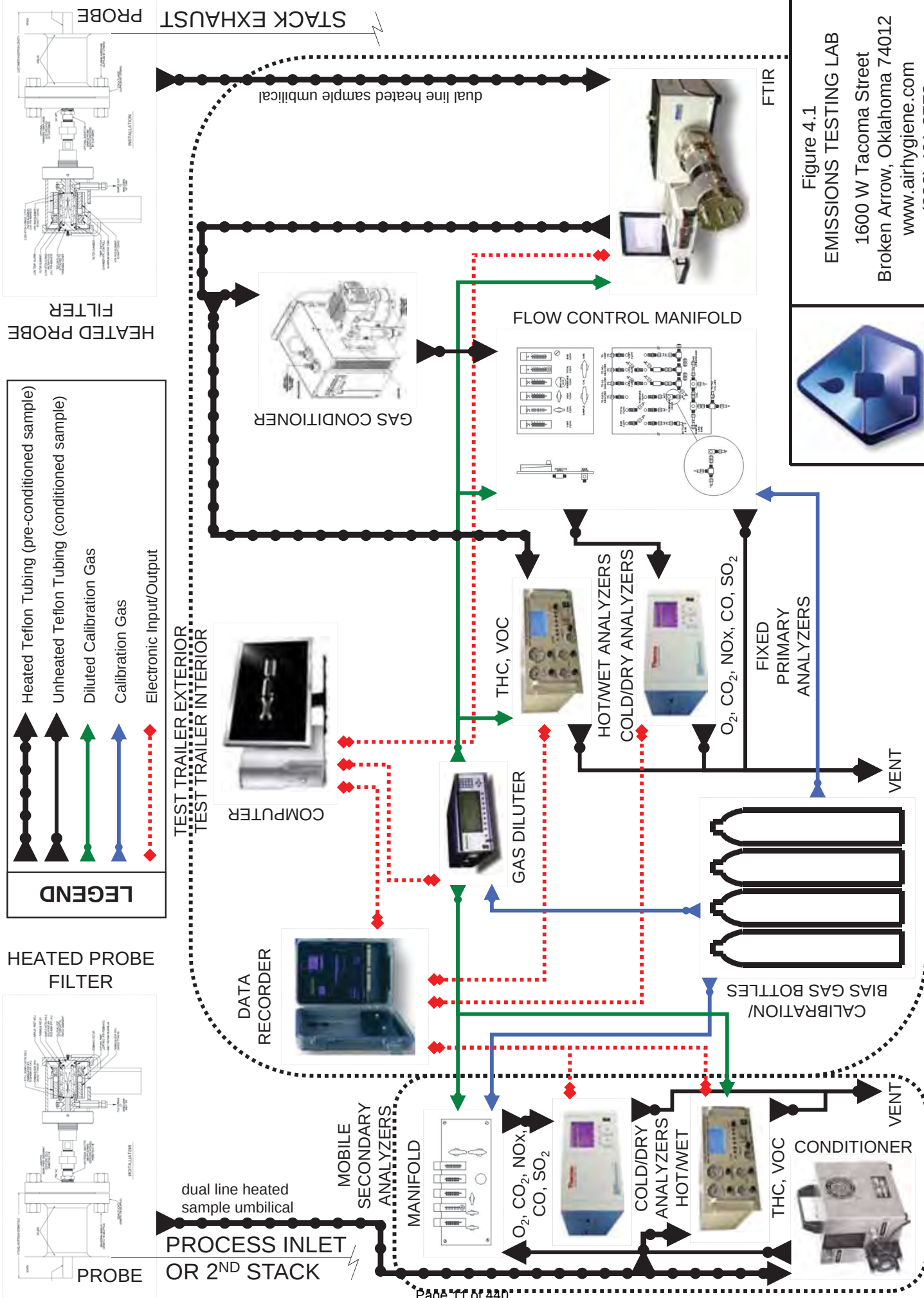
The stack gas analysis for O₂ and CO₂ concentrations was performed in accordance with procedures set forth in EPA Method 3C. The sample were collected in a tedlar bag and analyzed by GC-TCD at an offsite laboratory.

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

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

TABLE 4.2
ANALYTICAL INSTRUMENTATION

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
CO	Thermo 48C	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
THC	Thermo 51C-HT	User may select up to 10,000 ppm	0.1 ppm	Flame Ionization Detector



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Figure 4.1

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

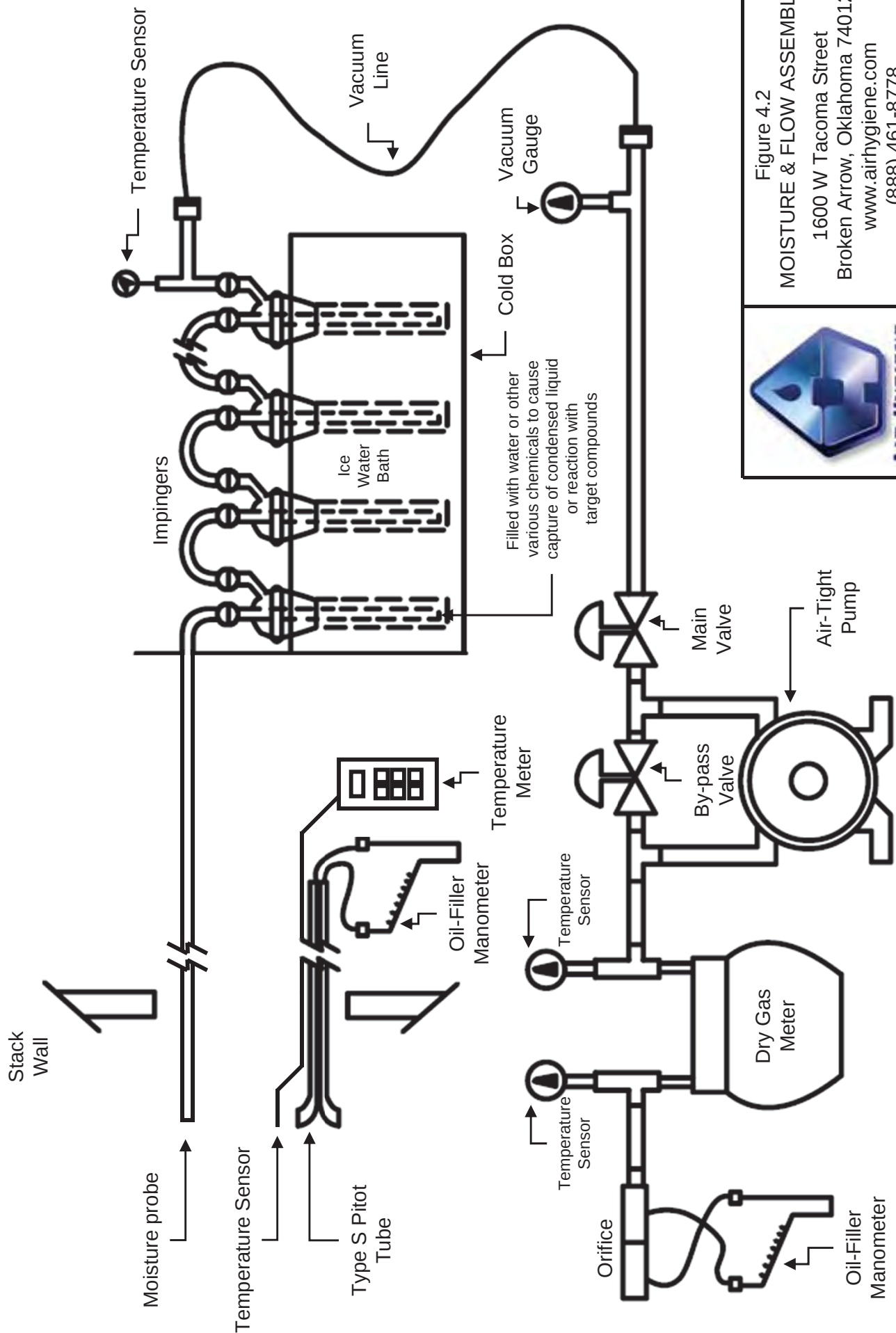


Figure 4.2
MOISTURE & FLOW ASSEMBLY
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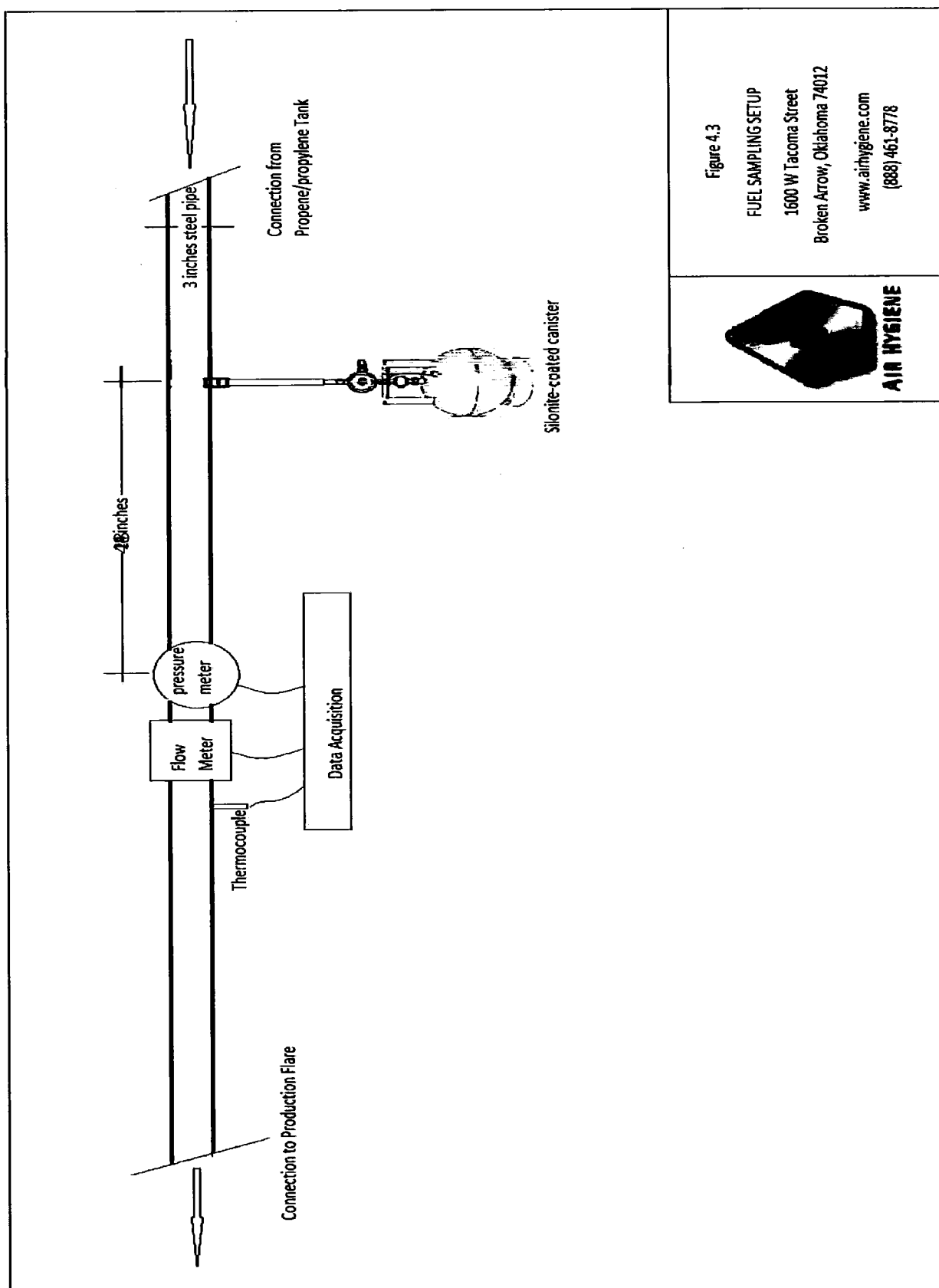


Figure 4.3
FUEL SAMPLING SETUP
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APPENDIX A

TEST RESULTS AND CALCULATIONS

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

Unit	Load	Test Type	Run	Date	Start	Stop	Time Sync
Q100	90-100	CO, THC, Fuel Sampling	Q100 R10	03/17/15	9:23:09	10:33:39	CST
Q100	90-100	CO, THC, Fuel Sampling	Q100 R11	03/17/15	10:57:09	12:07:09	CST
Q100	90-100	CO, THC, Fuel Sampling	Q100 R12	03/17/15	12:28:09	13:38:09	CST
Q100	0-30-0	CO, THC, Fuel Sampling	Q100 R1	03/17/15	14:50:09	16:00:09	CST
Q100	0-30-0	CO, THC, Fuel Sampling	Q100 R2	03/17/15	16:17:09	17:27:09	CST
Q100	0-30-0	CO, THC, Fuel Sampling	Q100 R3	03/17/15	17:41:09	18:51:09	CST
Q100	30-70-30	CO, THC, Fuel Sampling	Q100 R4	03/18/15	10:05:09	11:15:09	CST
Q100	30-70-30	CO, THC, Fuel Sampling	Q100 R5	03/18/15	11:36:09	12:46:09	CST
Q100	30-70-30	CO, THC, Fuel Sampling	Q100 R6	03/18/15	13:00:09	14:10:09	CST
Q100	70-100-70	CO, THC, Fuel Sampling	Q100 R7	03/19/15	8:40:10	9:50:10	CST
Q100	70-100-70	CO, THC, Fuel Sampling	Q100 R8	03/19/15	10:03:10	11:13:10	CST
Q100	70-100-70	CO, THC, Fuel Sampling	Q100 R9	03/19/15	11:31:10	12:41:10	CST
Q100	90-100	Fixed Gas & Moisture	90-100%-1	03/17/15	9:23:00	10:33:00	CST
Q100	90-100	Fixed Gas & Moisture	90-100%-2	03/17/15	10:57:00	12:07:00	CST
Q100	90-100	Fixed Gas & Moisture	90-100%-3	03/17/15	12:28:00	13:38:00	CST
Q100	0-30-0	Fixed Gas & Moisture	0-30-0%-1	03/17/15	14:50:00	16:00:00	CST
Q100	0-30-0	Fixed Gas & Moisture	0-30-0%-2	03/17/15	16:17:00	17:27:00	CST
Q100	0-30-0	Fixed Gas & Moisture	0-30-0%-3	03/17/15	17:41:00	18:51:00	CST
Q100	30-70-30	Fixed Gas & Moisture	30-70-30%-1	03/18/15	10:05:00	11:15:00	CST
Q100	30-70-30	Fixed Gas & Moisture	30-70-30%-2	03/18/15	11:36:00	12:46:00	CST
Q100	30-70-30	Fixed Gas & Moisture	30-70-30%-3	03/18/15	13:00:00	14:10:00	CST
Q100	70-100-70	Fixed Gas & Moisture	70-100-70%-1	03/19/15	8:40:00	9:50:00	CST
Q100	70-100-70	Fixed Gas & Moisture	70-100-70%-2	03/19/15	10:03:00	11:13:00	CST
Q100	70-100-70	Fixed Gas & Moisture	70-100-70%-3	03/19/15	11:31:00	12:41:00	CST

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

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

$$RH_{sp} (lb / lb) = \left[\left(\frac{gr}{lb} \right) \times \frac{lb}{7000 gr} \right] \quad RH_{sp} = \frac{49.66 \text{ gr}}{lb} \times \frac{1 lb}{7000 gr} = 0.007094 \frac{lb \text{ H}_2\text{O}}{lb \text{ Air}}$$

EXAMPLE CALCULATIONS (CALIBRATION)

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

RM 25A, (12-17-09), 8.4 Calibration Error Test. Immediately prior to the test series (within 2 hours of the start of the test), introduce zero gas and high-level calibration gas at the calibration valve assembly. Adjust the analyzer output to the appropriate levels, if necessary. Calculate the predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response. Then introduce low-level and mid-level calibration gases successively to the measurement system. ... These differences must be less than 5 percent of the respective calibration gas value. (calc for THC analyzer mid gas, if applicable)

$$E_p = \frac{C_{Dir(H)} - C_{Dir(Z)}}{C_{V(H)} - C_{V(Z)}} \times C_{Dir(M)} + C_{Dir(Z)} \quad \text{Eq. of a line } y=mx+b \quad E_p = \frac{8.45 \text{ ppm} - 0.11 \text{ ppm}}{8.48 \text{ ppm} - 0.00 \text{ ppm}} \times 5.01 \text{ ppm} + 0.11 = 5.04 \text{ ppm}$$

$$ACE = \left(\frac{C_{Dir} - C_V}{CS} \right) \times 100 \quad \text{Eq. 7E-1} \quad ACE_{THC} = \frac{5.01 \text{ ppm} - 5.04 \text{ ppm}}{5.01 \text{ ppm}} \times 100 = -0.54 \%$$

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

System Bias

RM 7E, (12-17-09), 12.3 System Bias. For non-dilution systems, use Equation 7E-2 to calculate the system bias separately for the low-level and upscale calibration gases. (calc for THC analyzer upscale gas, Run 1 initial bias, if applicable)

$$SB = \left(\frac{C_S - C_{Dir}}{CS} \right) \times 100 \quad \text{Eq. 7E-2} \quad SB = \frac{3.02 \text{ ppm} - 3.03 \text{ ppm}}{10.00 \text{ ppm}} \times 100 = -0.10 \%$$

Drift Assessment

RM 7E, (12-17-09), 12.5 Drift Assessment. Use Equation 7E-4 to separately calculate the low-level and upscale drift over each test run. (calc for THC analyzer upscale drift, Run 1, if applicable)

$$D = |SB_{final} - SB_i| \quad \text{Eq. 7E-4} \quad D = |2.20 \% - -0.10 \%| = 2.30 \%$$

Alternative Drift and Bias

RM 7E, (12-17-09), 13.2 / 13.3 System Bias and Drift. Alternatively, the results are acceptable if |C_s - C_{dir}| is ≤ 0.5 ppmv or if |C_s - C_v| is ≤ 0.5 ppmv (as applicable). (calc for THC analyzer initial upscale, Run 1, if applicable)

$$SB / D_{Alt} = |C_S - C_{Dir}| \quad \text{Eq. Section 13.2 and 13.3} \quad SB / D_{Alt} = |3.02 \text{ ppm} - 3.03 \text{ ppm}| = 0.01 \text{ ppm}$$

Bias Adjusted Average

RM 7E, (12-17-09), 12.6 Effluent Gas Concentration. For each test run, calculate C_{avg}, the arithmetic average of all valid THC concentration values (e.g., 1-minute averages). Then adjust the value of C_{avg} for bias, using Equation 7E-5b. (calc for THC analyzer, Run 1, if applicable)

$$C_{Gas} = (C_{Avg} - C_o) \times \left(\frac{C_{MA}}{C_M - C_o} \right) \quad \text{Eq. 7E-5b} \quad C_{Gas} = \left(0.00 \text{ ppm} - 0.06 \text{ ppm} \right) \times \left(\frac{3.02 \text{ ppm}}{3.14 \text{ ppm} - 0.06 \text{ ppm}} \right) = -0.05 \text{ ppm}$$

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

EXAMPLE CALCULATIONS (RUNS)

Diluent-Corrected Pollutant Concentration, CO₂ Based

Calculate the CO₂ corrected pollutant concentration, as follows: (calc for THC gas, Run 1, if applicable)

Uinsg Method 3C fixed gas analysis

$$C_{adj} = -0.05 \text{ ppm} \times \left(\frac{3.00 \%}{5.90 \%} \right) = -0.03 \text{ ppm@3\%CO}_2$$

EXAMPLE CALCULATIONS (RUNS)

Emissions Rate (lb/hr)

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

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_S \times MW}{G} \quad E_{lb/hr} = \frac{-0.05 \text{ ppm}}{10^6 \text{ ppm/part}} \times \frac{86,567 \text{ SCFH} \times 44.00 \text{ lb/lb-mol}}{385.23 \text{ SCF/lb-mol}} = \frac{-0.001 \text{ lb}}{\text{hr}}$$

VOC Destruction Efficiency

Calculation for VOC destruction Efficiency. Calculate, as follows: (calc for run 1, if applicable)

$$DE\% = \frac{97.918 - (-0.001 \text{ lb/hr})}{97.918 \text{ lb/hr}} \times 100 = 100.001 \%$$

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

EXAMPLE CALCULATIONS (Reference Method 1 - Circular Stack)

Diameter of Stack (in.)

$$D(\text{in.}) = L_{fw} - L_{rw}$$

$$D(\text{in.}) = 29.63 \text{ in.} - 6.00 \text{ in.} = 23.63 \text{ in.}$$

Stack Diameters Downstream

$$B_D(\text{dia.}) = \frac{B}{D}$$

$$B_D(\text{dia.}) = \frac{113.50 \text{ in.}}{23.63 \text{ in.}} = 4.80 \text{ diameters}$$

Area of Stack (ft²)

$$A_s(\text{ft}^2) = \pi \times \left(\frac{D}{2 \times 12} \right)^2$$

$$A_s(\text{ft}^2) = 3.14 \times \left(\frac{23.63 \text{ in.}}{2 \times 12 \text{ in./ft}} \right)^2 = 3.05 \text{ ft}^2$$

Stack Diameters Upstream

$$A_D(\text{dia.}) = \frac{A}{D}$$

$$A_D(\text{dia.}) = \frac{24.00 \text{ in.}}{23.63 \text{ in.}} = 1.02 \text{ diameters}$$

EXAMPLE CALCULATIONS (Reference Method 3C) [Values from Run 1 test]

Carbon Monoxide Concentration (%)

$$\%CO = \frac{\text{ppmCO}}{10,000}$$

$$\%CO(\%) = \frac{0.00 \text{ ppm}}{10,000 \text{ ppm/\%}} = 0.0000 \%$$

Nitrogen Concentration (%)

$$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$$

$$\%N_2(\%) = 100 - 6.10 \% - 13.80 \% - 0.00 / 10,000 \% = 80.1 \%$$

Stack Dry Molecular Weight (lb/lb-mole)

$$M_d(\text{lb} / \text{lb} - \text{mole}) = \sum \left(\frac{MW_{comp}}{100} \times \%component \right)$$

$$M_d(\text{lb/lb-mol}) = \left(\frac{44 \text{ lb/lb-mol}}{100} \times 6.10 \% \right) +$$

$$\left(\frac{32 \text{ lb/lb-mol}}{100} \times 13.80 \% \right) + \left(\frac{28 \text{ lb/lb-mol}}{100} \times \left[\frac{0.00}{10,000} + 80.10 \right] \right) = \frac{29.53 \text{ lb}}{\text{lb-mol}}$$

Stack Wet Molecular Weight (lb/lb-mole)

$$M_s(\text{lb} / \text{lb} - \text{mole}) = \left[M_d \times \left(1 - \frac{B_{ws}}{100} \right) \right] + \left[MW_{H_2O} \times \frac{B_{ws}}{100} \right]$$

$$M_s(\text{lb/lb-mol}) = \left\{ \frac{29.53 \text{ lb}}{\text{lb-mol}} \times \left(1 - \frac{4.69 \%}{100} \right) \right\} + \left\{ \frac{18 \text{ lb}}{\text{lb-mol}} \times \frac{4.69 \%}{100} \right\} = \frac{28.99 \text{ lb}}{\text{lb-mol}}$$

Average Excess Air (%)

$$\%EA_{avg}(\%) = \frac{100 \times \left[(\%O_2)_{avg} - (0.5 \times (\%CO)_{avg}) \right]}{\left[(0.264 \times (N_2)_{avg}) - \left[(\%O_2)_{avg} - (0.5 \times (\%CO)_{avg}) \right] \right]}$$

$$(\%EA)_{AVG} = \frac{100 \times \{ 13.80 \% - (0.5 \times 0.000 \%) \}}{(0.264 \times 80.10 \%) - \{ 13.80 \% - (0.5 \times 0.000 \%) \}} = 187.85 \%$$

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

EXAMPLE CALCULATIONS (Reference Method 2) [Values from Run 1 test]

Absolute Stack Pressure (in. Hg)

$$P_s (\text{in. Hg}) = P_b + \frac{P_{\text{static}}}{13.6}$$

$$P_s (\text{in. Hg}) = 30.20 \text{ in. Hg} + \frac{0.00 \text{ in. H}_2\text{O}}{13.6 \text{ in. H}_2\text{O/in. Hg}} = 30.20 \text{ in. Hg}$$

Average Stack Gas Velocity (ft/sec)

$$v_s (\text{ft/sec}) = K_p \times C_p \times (\sqrt{\Delta p})_{\text{avg}} \times \sqrt{\frac{(t_s)_{\text{avg}} + T_u}{P_s \times M_s}}$$

$$v_{sl} (\text{ft/sec}) = \left(\frac{85.49 \text{ ft (lb/lb-mol)(in. Hg)}}{\text{sec} (\text{°R})(\text{in. H}_2\text{O})} \right)^{1/2} \times 0.82 \times 0.14 \text{ in. H}_2\text{O}^{1/2} \times \sqrt{\frac{1053.96 + 460 \text{ °R}}{30.20 \text{ in. Hg} \times 28.99 \text{ lb/lb-mol}}} = \frac{12.8 \text{ ft}}{\text{sec}}$$

Average Stack Dry Standard Flow Rate (dscfh)

$$Q_{sd} (\text{dscfh}) = \frac{60 \times 60 \times \left(1 - \frac{B_{ws}}{100} \right) \times v_s \times A_s \times T_{std} \times P_s}{(t_s + T_u) \times P_{std}}$$

$$Q_{sd} (\text{dscf/hr}) = \frac{3600 \text{ sec}}{\text{hr}} \times \left(1 - \frac{4.69 \%}{100} \right) \times \frac{12.93 \text{ ft}}{\text{sec}} \times 3.05 \text{ ft}^2 \times \frac{68.00 + 460 \text{ °R}}{1,053.96 + 460 \text{ °R}} \times \frac{30.20 \text{ in. Hg}}{29.92 \text{ in. Hg}} = \frac{47,568.31 \text{ dscf}}{\text{hr}}$$

Average Stack Wet Flow Rate (acfm)

$$Q_{aw} (\text{acfm}) = 60 \times v_s \times A_s$$

$$Q_{aw} (\text{acf/min}) = \frac{60 \text{ sec}}{\text{min}} \times \frac{12.93 \text{ ft}}{\text{sec}} \times 3.05 \text{ ft}^2 = \frac{2,362.92 \text{ acf}}{\text{min}}$$

Average Stack Wet Standard Flow Rate (ascfh)

$$Q_{sw} (\text{ascfh}) = \frac{60 \times Q_{aw} \times T_{std} \times P_s}{(t_s + T_u) \times P_{std}}$$

$$Q_{sw} (\text{ascf/hr}) = \frac{60 \text{ min}}{\text{hr}} \times \frac{2,362.92 \text{ acf}}{\text{min}} \times \frac{68.00 + 460 \text{ °R}}{1,053.96 + 460 \text{ °R}} \times \frac{30.20 \text{ in. Hg}}{29.92 \text{ in. Hg}} = \frac{49,907.57 \text{ ascf}}{\text{hr}}$$

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

EXAMPLE CALCULATIONS (Reference Method 4) [Values from Run 1 test]

Water Volume Weighed (scf)

$$V_{ws(g\ std)} (scf) = W_t \times K_5$$

$$V_{ws(g\ std)} = 47.60 \text{ g} \times 0.04715 \text{ ft}^3/\text{g} = 2.240 \text{ scf}$$

Standard Meter Volume (dscf)

$$V_{m(std)} (dscf) = \frac{K_1 \times Y \times V_m \times \left(P_b + \frac{\Delta H_{avg}}{13.6} \right)}{(t_m)_{avg} + T_u}$$

$$V_{m(std)} = \frac{17.65 \text{ }^{\circ}\text{R}}{\text{in. Hg}} \times 0.88 \times 53.04 \text{ dcf} \times \left(30.20 \text{ in. Hg} + \frac{1.60 \text{ in. H}_2\text{O}}{13.6 \text{ in. H}_2\text{O} / \text{in. Hg}} \right) = 45.64 \text{ dscf}$$

$$89.04 \text{ }^{\circ}\text{F} + 460 \text{ }^{\circ}\text{R}$$

Calculated Moisture Content (%)

$$B_{ws(calc)} (\%) = 100 \times \frac{V_{ws(g\ std)}}{V_{ws(g\ std)} + V_{m(std)}}$$

$$B_{ws(calc)} = 100 \times \frac{2.24 \text{ dscf}}{2.24 \text{ dscf} + 45.64 \text{ dscf}} = 4.69 \%$$

Saturated Moisture Content (%)

$$B_{ws(svp)} (\%) = 100 \times \frac{10^{\frac{6.691 - \frac{3144}{t_s(avg) + 390.86}}}{P_b + \frac{P_{static}}{13.6}}} \leq 100$$

$$B_{ws(svp)} = 100 \times \frac{10^{\left(6.691 - \frac{3144}{1053.96 \text{ }^{\circ}\text{F} + 390.86} \right)}}{30.20 \text{ in. Hg} + \frac{0.00 \text{ in. H}_2\text{O}}{13.6 \text{ in. H}_2\text{O} / \text{in. Hg}}} \leq 100 = 100.00 \%$$

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

Nomenclature

- %CO = carbon monoxide concentration (%)
- %CO₂ = carbon dioxide concentration (%)
- %N₂ = nitrogen concentration (%)
- %O₂ = oxygen concentration (%)
- %O_{2,wet} = Oxygen content of gas stream, % by volume of wet gas. (Note: The oxygen percentage used in Method 201A, Equation 3 is on a wet gas basis. That means that since oxygen is typically measured on a dry gas basis, the measured percent O₂ must be multiplied by the quantity (1 - B_{ws}) to convert to the actual volume fraction. Therefore, %O_{2,wet} = (1 - B_{ws}) * %O_{2, dry})
- (%EA)_{avg} = average excess air (%)
- (F_o)_{avg} = average calculated fuel factor
- [(Δp)^{0.5}]_{avg} = Average of square roots of the velocity pressures measured during the preliminary traverse, inches W.C.
- μ = Gas viscosity, micropoise
- 12.0 = Constant calculated as 60 percent of 20.5 square inch cross-sectional area of combined cyclone head, square inches
- 17.03 = mg/milliequivalents for ammonium ion
- 22.4 = liters of ideal gas per mol of substance at 0°C and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)
- 5.02 × 10⁴ = constant derived from the molecular weight and correcting standard temperature and pressure (ref. Bay Area Air Quality Management District, Source Test Procedure ST-1B, Ammonia Integrated Sampling, Adopted January 20, 1982, Regulation 7-303)
- A = distance upstream (in.)
- A_D = stack diameters upstream (dia.)
- A_n = Area of nozzle, square feet
- A_s = area of stack (ft²)
- B = distance downstream (in.)
- B_D = stack diameters downstream (dia.)
- b_f = Average blockage factor calculated in Equation 26, dimensionless
- B_{wm} = meter moisture content (%)
- B_{ws} = stack moisture content (%)
- C = Cunningham correction factor for particle diameter, D_p, and calculated using the actual stack gas temperature, dimensionless
- C₁ = -150.3162 (micropoise)
- C₂ = 18.0614 (micropoise/K^{0.5}) = 13.4622 (micropoise/R^{0.5})
- C₃ = 1.19183 × 10⁶ (micropoise/K²) = 3.86153 × 10⁶ (micropoise/R²)
- C₄ = 0.591123 (micropoise)
- C₅ = 91.9723 (micropoise)
- C₆ = 4.91705 × 10⁻⁵ (micropoise/K²) = 1.51761 × 10⁻⁵ (micropoise/R²)
- C_a = Acetone blank concentration, mg/mg
- C_b = Concentration of NH₃ ion in the back half of train (breakthrough)
- C_f = Concentration of NH₃ ion in the front half of train (main catch)
- C_{fPM10} = Conc. of filterable PM₁₀, gr/dscf
- C_{fPM2.5} = Conc. of filterable PM_{2.5}, gr/dscf
- C_k = K Factor Constant, 849.8
- C_n = nozzle diameter constant, 0.03575
- C_p' = Coefficient for the pitot used in the preliminary traverse, dimensionless

Nomenclature

- C_p = Pitot coefficient for the combined cyclone pitot, dimensionless
- C_{cpm} = Concentration of the condensable PM in the stack gas, dry basis, corrected to standard conditions, milligrams/dry standard cubic foot.
- C_r = Re-estimated Cunningham correction factor for particle diameter equivalent to the actual cut size diameter and calculated using the actual stack gas temperature, dimensionless
- D_{50} = Particle cut diameter, micrometers
- $D_{50(N+1)}$ = D_{50} value for cyclone IV calculated during the N+1 iterative step, micrometers
- D_{50-1} = Re-calculated particle cut diameters based on re-estimated C_r , micrometers
- D_{50LL} = Cut diameter for cyclone I corresponding to the 2.25 micrometer cut diameter for cyclone IV, micrometer
- D_{50N} = D_{50} value for cyclone IV calculated during the Nth iterative step, micrometers
- D_{50T} = Cyclone I cut diameter corresponding to the middle of the overlap zone shown in Method 201A, Figure 10 of Section 17, micrometers
- D_e = equivalent stack diameter (in.)
- $\Delta H@$ = ΔH @ 0.75 scfm (in. H₂O)
- ΔH_{avg} = average orifice pressure (in. H₂O)
- D_n = Inner diameter of sampling nozzle mounted on Cyclone I, inches
- D_{na} = actual nozzle diameter (in.)
- D_p = Physical particle size, micrometers
- Δp = velocity head (in. H₂O)
- Δp_1 = velocity head at first current traverse point (in. H₂O)
- $\Delta p'_1$ = velocity head at first preliminary traverse point (in. H₂O)
- Δp_{avg} = average pitot tube differential pressure (in. H₂O)
- Δp_n = velocity head at subsequent current traverse point (in. H₂O)
- Δp_{RM2} = method 2 velocity head (in. H₂O)
- D_s = diameter of stack (in.)
- F_d = fuel f-factor (dscf/MMBtu)
- f_{O_2} = stack gas fraction of O₂, by volume, dry basis
- I = Percent isokinetic sampling, dimensionless
- K_1 = standard volume correction, 17.65°R/in. Hg
- K_4 = isokinetic conversion constant, 0.0945min•in.Hg/sec•°R
- K_5 = water mass to std water vapor, 0.04715 ft³/g
- K_p = 85.49, ((ft/sec)/(pounds/mole •°R))
- L = length of stack (in.)
- L_{fw} = distance to far wall of stack (in.)
- L_{nw} = distance to near wall of stack (in.) [reference]
- $m_{\#x}$ = weight measurements (g)
- M_1 = Milligrams of PM collected on the filter, less than or equal to 2.5 micrometers
- M_2 = Milligrams of PM recovered from Container #2 (acetone blank corrected), greater than 10 micrometers
- M_3 = Milligrams of PM recovered from Container #3 (acetone blank corrected), less than or equal to 10 and greater than 2.5 micrometers
- M_4 = Milligrams of PM recovered from Container #4 (acetone blank corrected), less than or equal to 2.5 micrometers
- m_a = Mass of residue of acetone after evaporation, mg
- m_c = Mass of the NH₄⁺ added to sample to form ammonium sulfate, mg

Nomenclature

- m_{cpm} = Mass of the total condensable PM, mg
- M_d = Molecular weight of dry gas, pounds/pound mole
- m_{fb} = Mass of total CPM in field train recovery blank, mg
- m_{fx} = final weight, avg of last two measurements (g)
- mg = Milligram
- mg/L = Milligram per liter
- m_i = Mass of inorganic CPM, mg
- m_{ib} = Mass of inorganic CPM in field train recovery blank, mg
- M_n = total particulates (mg)
- m_o = Mass of organic CPM, mg
- m_{ob} = Mass of organic CPM in field train blank, mg
- m_r = Mass of dried sample from inorganic fraction, mg
- m_{tx} = tare weight (g)
- MW = molecular weight (lb/lb-mole)
- M_w = Molecular weight of wet gas, pounds/pound mole
- N = Normality of ammonium hydroxide titrant
- N_a = null angle (deg.)
- N_{re} = Reynolds number, dimensionless
- N_{tp} = Number of iterative steps or total traverse points
- $P_b = P_{\text{bar}}$ = barometric pressure (in. Hg)
- P_{bar} = barometric pressure (in. Hg)
- ppmCO = carbon monoxide concentration (ppm)
- ppmv = Parts per million by volume
- ppmw = Parts per million by weight
- P_s = absolute stack pressure (in. Hg)
- P_{static} = static pressure (in. H₂O)
- P_{std} = standard pressure, 29.92 in. Hg
- Θ = total sampling time (min)
- Q_{aw} = average stack wet flow rate (ascf/min)
- Q_l = Sampling rate for cyclone I to achieve specified D_{50}
- Q_m = estimated orifice flow rate, 0.750 acfm, else V_m/Q from previous run
- Q_s = Sampling rate for cyclone I to achieve specified D_{50}
- $Q_{\text{s(std)}}$ = total cyclone flow rate at standard conditions (dscf/min)
- Q_{sd} = dry standard stack flow rate (dscfm)
- Q_{sST} = Dry gas sampling rate through the sampling assembly, dscfm
- Q_{sw} = wet standard stack flow rate (ascfm)
- R_{max} = Nozzle/stack velocity ratio parameter, dimensionless
- R_{min} = Nozzle/stack velocity ratio parameter, dimensionless
- t_1 = Sampling time at point 1, min
- t_m = average gas meter temperature (°F)
- t_m = average meter temperature (°F)
- T_m = Meter box and orifice gas temperature, °R
- t_n = Sampling time at point n, min
- t_r = Total projected run time, min
- T_s = Absolute stack gas temperature, °R
- T_{std} = standard temperature, 68°F, 528°R

Nomenclature

- T_u = absolute temperature offset, 460°R
- V_a = Volume of acetone blank, ml
- V_{aw} = Volume of acetone used in sample recovery wash, ml
- V_b = Volume of aliquot taken for IC analysis, ml
- V_c = Quantity of water captured in impingers and silica gel, ml
- V_f = final impinger volume (ml)
- V_i = initial impinger volume (ml)
- V_{ic} = Volume of impinger contents sample, ml
- V_m = Dry gas meter volume sampled, acf
- $V_{m(std)}$ = standard meter volume (dscf)
- v_{max} = Maximum gas velocity calculated from Equations 18 or 19, ft/sec
- v_{max} = maximum nozzle velocity (ft/sec)
- V_{mf} = final dry gas meter reading (dcf)
- V_{mi} = initial dry gas meter reading (dcf)
- v_{min} = Minimum gas velocity calculated from Method 201A, Equations 16 or 17, ft/sec
- V_{ms} = Dry gas meter volume sampled, corrected to standard conditions, dscf
- v_n = Sample gas velocity in the nozzle, ft/sec
- v_{org} = organics wash volume (ml)
- V_p = Volume of water added during train purge
- v_s = average stack gas velocity (ft/sec)
- v_{sl} = local velocity (ft/sec)
- V_t = total impinger volume (ml) = $;(V_f - V_i)$
- V_t = Volume of NH₄OH titrant, ml
- $V_{w(std)}$ = volume of water vapor in gas sample at standard conditions (scf)
- v_x = blank volume (ml)
- W = width of stack (in.)
- $W_{2,3,4}$ = Weight of PM recovered from Containers #2, #3, and #4, mg
- W_a = Weight of blank residue in acetone used to recover samples, mg
- W_f = final impinger weight (g)
- W_i = initial impinger weight (g)
- W_t = total impinger weight (g) = $;(W_f - W_i)$
- w_x = blank weight of solids (g)
- Y = meter calibration factor (a.k.a gamma)
- Z = Ratio between estimated cyclone IV D₅₀ values, dimensionless
- γ = Dry gas meter gamma value, dimensionless
- ΔH = Meter box orifice pressure drop, inches W.C.
- $\Delta H@$ = Pressure drop across orifice at flow rate of 0.75 scfm at standard conditions, inches W.C.
(Note: Specific to each orifice and meter box.)
- Δp_1 = Velocity pressure measured at point 1, inches W.C.
- Δp_{avg} = Average velocity pressure, inches W.C.
- Δp_m = Observed velocity pressure using S-type pitot tube in preliminary traverse, inches W.C.
- Δp_{max} = Maximum velocity pressure, inches W.C.
- Δp_{min} = Minimum velocity pressure, inches W.C.
- Δp_n = Velocity pressure measured at point n during the test run, inches W.C.
- Δp_s = Velocity pressure calculated in Method 201a, Equation 25, inches W.C.
- Δp_{s1} = Velocity pressure adjusted for combined cyclone pitot tube, inches W.C.

Nomenclature

- Δp_{s2} = Velocity pressure corrected for blockage, inches W.C.
- θ = Total run time, min
- ρ_a = Density of acetone, mg/ml (see label on bottle)
- Σ_n = total number of sampling points

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

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

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

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

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

AdjFactor = Percent oxygen or carbon dioxide adjustment applied to a target pollutant
 B_{wa} = Moisture fraction of ambient air, percent.
 Btu = British thermal unit
 $\%C$ = Concentration of carbon from an ultimate analysis of fuel, weight percent.
 $\%CO_{2d}, \%CO_{2w}$ = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
 CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
 E = Pollutant emission rate, ng/J (lb/million Btu).
 E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
 E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
 E_{gi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
 E_{go} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
 E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
 E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
 E_d = Average pollutant rate for each sampling period (e.g., 24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million Btu).
 E_{di} = Average inlet SO_2 rate for each sampling period d, ng/J (lb/million Btu).
 E_g = Pollutant rate from gas turbine, ng/J (lb/million Btu).
 E_{ga} = Daily geometric average pollutant rate, ng/J (lbs/million Btu) or ppm corrected to 7 percent O_2 .
 E_{go}, E_{gi} = Matched pair hourly arithmetic average pollutant rate, outlet and inlet, respectively, ng/J (lb/million Btu) or ppm corrected to 7 percent O_2 .
 E_h = Hourly average pollutant, ng/J (lb/million Btu).
 E_{hj} = Hourly arithmetic average pollutant rate for hour "j," ng/J (lb/million Btu) or ppm corrected to 7 percent O_2 .
 EXP = Natural logarithmic base (2.718) raised to the value enclosed by brackets.
 Fc = Ratio of the volume of carbon dioxide produced to the gross calorific value of the fuel from Method 19
 F_d, F_w, F_c = Volumes of combustion components per unit of heat content, scm/J (scf/million Btu).
 ft^3 = cubic feet
 G = ideal gas conversion factor
 (385.23 SCF/lb-mol at 68 deg F & 14.696 psia)
 GCM = gross Btu per SCF (constant, compound based)
 GCV = Gross calorific value of the fuel consistent with the ultimate analysis, kJ/kg (Btu/lb).
 GCV_p, GCV_r = Gross calorific value for the product and raw fuel lots, respectively, dry basis, kJ/kg (Btu/lb).
 $\%H$ = Concentration of hydrogen from an ultimate analysis of fuel, weight percent.
 H_b = Heat input rate to the steam generating unit from fuels fired in the steam generating unit, J/hr (million Btu/hr).
 H_g = Heat input rate to gas turbine from all fuels fired in the gas turbine, J/hr (million Btu/hr).
 $\%H_{2O}$ = Concentration of water from an ultimate analysis of fuel, weight percent.
 H_t = Total numbers of hours in the performance test period (e.g., 720 hours for 30-day performance test period).
 K = volume of combustion component per pound of component (constant)
 K = Conversion factor, 10^{-5} (kJ/J)/(%) [10^6 Btu/million Btu].
 $K_c = (9.57 \text{ scm/kg})/\% [(1.53 \text{ scf/lb})/\%]$.
 $K_{cc} = (2.0 \text{ scm/kg})/\% [(0.321 \text{ scf/lb})/\%]$.
 $K_{hd} = (22.7 \text{ scm/kg})/\% [(3.64 \text{ scf/lb})/\%]$.
 $K_{hw} = (34.74 \text{ scm/kg})/\% [(5.57 \text{ scf/lb})/\%]$.
 $K_n = (0.86 \text{ scm/kg})/\% [(0.14 \text{ scf/lb})/\%]$.
 $K_o = (2.85 \text{ scm/kg})/\% [(0.46 \text{ scf/lb})/\%]$.
 $K_s = (3.54 \text{ scm/kg})/\% [(0.57 \text{ scf/lb})/\%]$.
 $K_{sulfur} = 2 \times 10^4 \text{ Btu/mt}\% \text{-MMBtu}$
 $K_w = (1.30 \text{ scm/kg})/\% [(0.21 \text{ scf/lb})/\%]$.
 lb = pound
 ln = Natural log of indicated value.
 L_p, L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
 $\%N$ = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
 $M_{\%}$ = mole percent
 mol = mole
 MW = molecular weight (lb/lb-mol)
 MW_{AIR} = molecular weight of air (28.9625 lb/lb-mole)⁻¹
 NCM = net Btu per SCF (constant based on compound)
 $\%O$ = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
 $\%O_{2d}, \%O_{2w}$ = Concentration of oxygen on a dry and wet basis, respectively, percent.
 P_B = barometric pressure, in Hg
 P_s = Potential SO_2 emissions, percent.
 $\%S$ = Sulfur content of as-fired fuel lot, dry basis, weight percent.
 S_a = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
 $\%S_f$ = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
 $S(\text{wt}\%)$ = weight percent of sulfur, per lab analysis by appropriate ASTM standard
 S_i = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
 S_o = Standard deviation of the hourly average emission rates for each performance test period, ng/J (lb/million Btu).
 $\%S_p, \%S_r$ = Sulfur content of the product and raw fuel lots respectively, dry basis, weight percent.
 SCF = standard cubic feet
 SH = specific humidity, pounds of water per pound of air
 $t_{0.95}$ = Values shown in Table 19-3 for the indicated number of data points n.
 T_{amb} = ambient temperature, °F
 W/D Factor = 1.0236 = conv. at 14.696 psia and
 68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
 X_{CO_2} = CO_2 Correction factor, percent.
 X_k = Fraction of total heat input from each type of fuel k.

Calculations, Formulas, and Constants

The following information supports the spreadsheets for this testing project.

Given Data:

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

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

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

ASTM D 3588

Molecular Weight of NOx (lb/lb-mole)	= 46.01
Molecular Weight of CO (lb/lb-mole)	= 28.00
Molecular Weight of SO ₂ (lb/lb-mole)	= 64.00
Molecular Weight of THC (propane) (lb/lb-mole)	= 44.00
Molecular Weight of VOC (methane) (lb/lb-mole)	= 16.00
Molecular Weight of NH ₃ (lb/lb-mole)	= 17.03
Molecular Weight of HCHO (lb/lb-mole)	= 30.03

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

Conversion Constant for NOx	= 0.0000001194351
Conversion Constant for CO	= 0.0000000726839
Conversion Constant for SO ₂	= 0.0000001661345
Conversion Constant for THC	= 0.0000001142175
Conversion Constant for VOC (methane)	= 0.0000000415336
Conversion Constant for NH ₃	= 0.0000000442074
Conversion Constant for HCHO	= 0.0000000779534

NOTE: units are lb/ppm*ft³

Formulas:

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

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

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

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

3. Correction to % O₂ and ISO Conditions

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

4. Method 19 stack exhaust flow (scfh)

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

5. Emission Rate in lb/hr

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

6. Emission Rate in tons per year

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

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

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

8. Emission Concentration in g/hp*hr

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

APPENDIX B

EMISSION DATA RECORDS

Questor Technology Inc	
Air Permit # :	40 CFR 60 Sub Part OOOO
Plant Name or Location:	Broken Arrow Rental Facility
Date:	March 17, 2015
Project Number:	qti-15-brokenarrow.ok-comp#1
Manufacturer & Equipment:	Q100
Test Load:	Multiple
Tester(s) / Test Unit(s):	MSL/CG/MS/JS

		RUN											
	UNITS	Q100 R10	Q100 R11	Q100 R12	Q100 R1	Q100 R2	Q100 R3	Q100 R4	Q100 R5	Q100 R6	Q100 R7	Q100 R8	Q100 R9
Start Time	hh:mm:ss	09:23:09	10:57:09	12:28:09	14:50:09	16:17:09	17:41:09	10:05:09	11:36:09	13:00:09	08:40:10	10:03:10	11:31:10
End Time	hh:mm:ss	10:33:39	12:07:09	13:38:09	16:00:09	17:27:09	18:51:09	11:15:09	12:46:09	14:10:09	09:50:10	11:13:10	12:41:10
Bar. Pressure	in. Hg	30.16	30.19	30.23	30.20	30.19	30.19	30.11	30.11	30.08	30.05	30.06	30.07
Amb. Temp.	°F	58	60	66	62	63	59	55	54	55	52	52	52
Rel. Humidity	%	70	59	57	58	57	59	80	85	71	85	92	87
Spec. Humidity	lb water / lb air	0.007094	0.006355	0.007679	0.006707	0.006891	0.006182	0.007288	0.007468	0.006466	0.006947	0.007549	0.007100
Date	mm/dd/yy	03/17/15	03/17/15	03/17/15	03/17/15	03/17/15	03/17/15	03/18/15	03/18/15	03/18/15	03/19/15	03/19/15	03/19/15
Unit Number		Q100	Q100	Q100	Q100	Q100	Q100	Q100	Q100	Q100	Q100	Q100	Q100
Load Designator	%	90-100	90-100	90-100	0-30-0	0-30-0	0-30-0	30-70-30	30-70-30	30-70-30	70-100-70	70-100-70	70-100-70
Gross Fuel Heating Value	Btu/ft3	2,395	2,395	2,395	2,517	2,517	2,517	2,481	2,481	2,481	2,469	2,469	2,469
Stack Flow (M2)	dscfh	93,131	86,567	85,967	47,568	50,008	51,941	62,598	57,848	58,520	74,438	70,747	84,603
Stack Moisture	Method 4	6.24	6.31	6.37	4.69	5.32	4.79	5.82	4.99	5.30	6.01	5.86	5.43
Wind Speed	mph	10	10	10	15	10	10	5	5	5	5	5	5
Wind Direction	--	N	N	N	N	N	N	E	E	E	SE	SE	SE
CO ₂ - Method 3C	%	6.37	5.70	5.83	6.10	5.88	5.69	5.27	5.43	5.40	5.96	4.62	5.60
O ₂ - Method 3C	%	13.40	14.40	14.20	13.80	14.10	14.30	15.00	14.70	14.80	14.00	15.90	14.60
N ₂ -Method 3C	%	80.20	79.90	80.00	80.10	80.00	80.00	79.80	79.80	79.80	80.00	79.40	79.80
Excess Air	%	172.40	215.10	205.20	187.80	200.90	209.70	247.20	230.90	236.20	196.60	314.10	225.80

METHOD 1 - ISOKINETIC TRAVERSE FOR A CIRCULAR SOURCE

Company	Questor Technology Inc.	Date	03/17/15
Plant Name	Broken Arrow Rental Facility	Project #	qti-15-brokenarrow.ok-comp#1
Equipment	Q100	# of Ports Available	2
Location	Ports	# of Ports Used	2

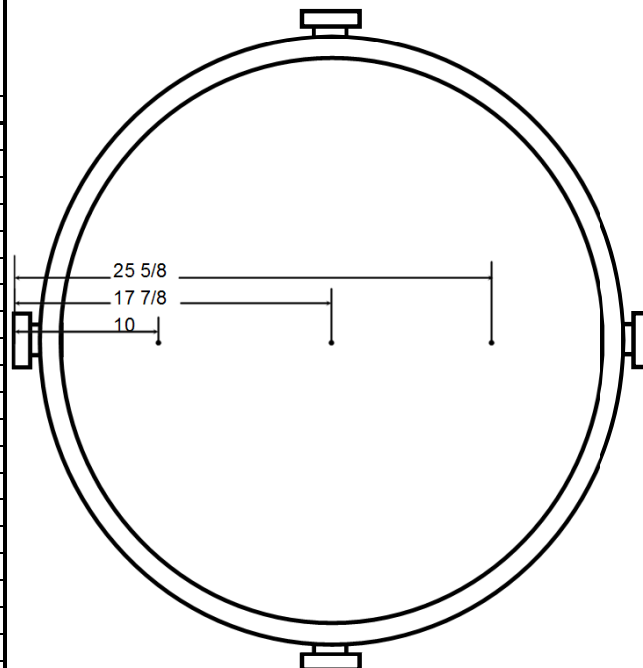
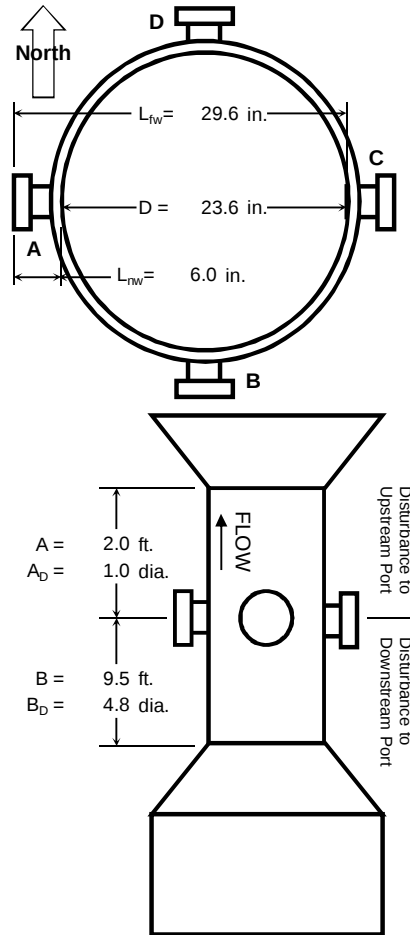
Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	29.63	in.
Distance to Near Wall of Stack	(L _{nw})	6.00	in.
Diameter of Stack	(D)	23.63	in.
Area of Stack	(A _s)	3.05	ft ²

Distance from Disturbances to Port			
Distance Upstream	(A)	24.00	in.
Diameters Upstream	(A _D)	1.02	diameters
Distance Downstream	(B)	113.50	in.
Diameters Downstream	(B _D)	4.80	diameters

Number of Traverse Points Required					
Diameters to		Minimum Number of ¹		Minimum Number of	
Flow Disturbance		Traverse Points		Traverse Points	
Down (B _D)	Up (A _B)	Particulate	Velocity	Comp Stratification	
Stream	Stream	Points	Points	Criteria	Points
2.00-4.99	0.50-1.24	24	16	○ RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	● 0000 Req.	3 points
6.00-6.99	1.50-1.74	16	12		
7.00-7.99	1.75-1.99	12	12		
>= 8.00	>=2.00	8 or 12 ²	8 or 12 ²	Minimum Number of	
Upstream Spec		24	16	Traverse Points	
Downstream Spec		24	16	RATA Stratification	
Traverse Pts Required		24	16	Criteria	Points
¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.				○ Part75/60	12 RM1 pts
				○ 75 abrv (a)	3 points
				○ 75 abrv (b)	6 points
² 8 for Circular Stacks 12 to 24 inches 12 for Circular Stacks over 24 inches					

Number of Traverse Points Used			
2	Ports by	3	Pts / port
1	Pts Used	3	Required

Traverse Point Locations			
Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
	%	in.	in.
1	16.7%	4	10
2	50.0%	11 7/8	17 7/8
3	83.3%	19 5/8	25 5/8
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			



METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Broken Arrow Rental Facility	Date	03/17/15
Sampling Location	Q100	Stack Type	Circular
Operator	CG	Ports Available	2
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2
Stack Size	Small (<24 inch diameter)	Port ID (inches)	3.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	29.63	in
Distance to Near Wall of Stack	(L _{nw})	6.00	in
Diameter of Stack	(D)	23.63	in
Area of Stack	(A _s)	3.05	ft ²

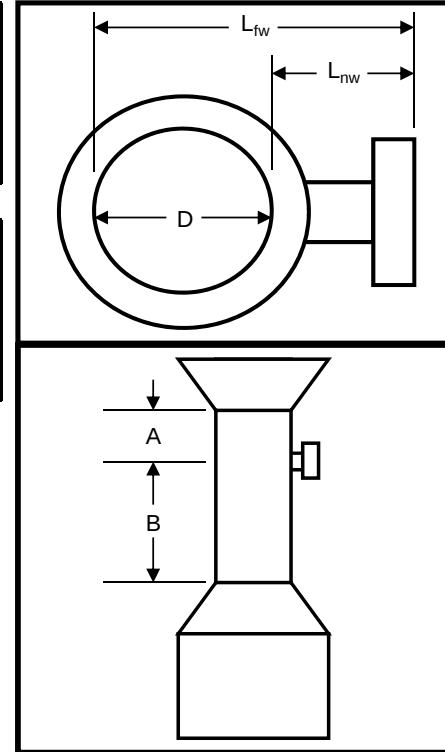
Distance from Port to Disturbances			
Distance Upstream	(A)	24.00	in
Diameters Upstream	(A _D)	1.02	diameters
Distance Downstream	(B)	113.50	in
Diameters Downstream	(B _D)	4.80	diameters

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

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

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

Location of Traverse Points in Circular Stacks									
Traverse Point	(Fraction of Stack Dimension from Inside Wall to Traverse Point)								
Number	2	4	6	8	10	12	14	16	18
1	.146	.087	.044	.032	.026	.021	.018	.016	.014
2	.854	.250	.146	.105	.082	.067	.057	.049	.044
3		.750	.296	.194	.146	.118	.099	.085	.075
4		.933	.704	.323	.226	.177	.146	.125	.109
5			.854	.677	.342	.250	.201	.169	.146
6			.956	.806	.658	.356	.269	.220	.188
7				.895	.774	.644	.366	.283	.236
8				.968	.854	.750	.634	.375	.296
9					.918	.823	.731	.625	.382
10					.974	.882	.799	.717	.618
11						.933	.854	.780	.704
12						.979	.901	.831	.764



Number of Traverse Points Used			
2	Ports by	12	Across
24	Pts Used	24	Required

- ☒ Method 1 Trav
☐ 12 Point PM Trav
☐ Velocity

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
		in	in
1	0.021	4/8	6 4/8
2	0.067	1 5/8	7 5/8
3	0.118	2 6/8	8 6/8
4	0.177	4 1/8	10 1/8
5	0.250	5 7/8	11 7/8
6	0.356	8 3/8	14 3/8
7	0.644	15 2/8	21 2/8
8	0.750	17 6/8	23 6/8
9	0.823	19 4/8	25 4/8
10	0.882	20 7/8	26 7/8
11	0.933	22	28
12	0.979	23 1/8	29 1/8

EMISSION DATA RECORDS

0-30-0% Ramp-up, Ramp-down Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	03/17/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		0-30-0%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		1	2	3	
Test Date	(mm/dd/yy)	03/17/15	03/17/15	03/17/15	
Load	% or w/DB	0-30-0	0-30-0	0-30-0	
Meter Box Number	from ACS	SAMP-CP-0008	SAMP-CP-0008	SAMP-CP-0008	
Meter Calibration Factor	(Y)	0.883	0.883	0.883	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.698	1.698	1.698	in H ₂ O
Pitot Identification	from ACS	4-17-14-2	4-17-14-2	4-17-14-2	
Pitot Tube Coefficient	(C _p)	0.819	0.819	0.819	
Probe Number	from ACS	SAMP-PF-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Impinger Case Number	from ACS	SAMP-BC-0002	SAMP-BC-0002	SAMP-BC-0002	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Run Start Time	14:50	16:17	17:41		hh:mm
Run Stop Time	16:00	17:27	18:51		hh:mm
Test Date	03/17/15	03/17/15	03/17/15		mm/dd/yy
Meter Calibration Factor	0.883	0.883	0.883		
Pitot Tube Coefficient	0.819	0.819	0.819		
Initial Meter Volume	682.040	735.010	790.080		ft ³
Final Meter Volume	735.080	789.020	846.010		ft ³
Total Meter Volume	53.040	54.010	55.930	54.327	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	89.04	91.19	92.75	90.99	°F
Average Stack Temperature	1053.96	1062.71	1049.04	1055.24	°F
Barometric Pressure	30.20	30.19	30.19	30.19	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	30.20	30.19	30.19	30.19	in Hg
Average Orifice Pressure Drop	1.60	1.60	1.60	1.60	in H ₂ O
Absolute Meter Pressure	30.32	30.31	30.31	30.32	in Hg
Avg Square Root Pitot Pressure	0.14	0.15	0.15	0.15	√(in H ₂ O)
Moisture Content Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Impinger Water Weight Gain	40.60	43.70	39.20	41.17	g
Silica Gel Weight Gain	7.00	11.40	11.80	10.07	g
Total Water Volume Collected	47.69	55.20	51.09	51.33	ml
Standard Water Vapor Volume	2.24	2.60	2.40	2.42	scf
Standard Meter Volume	45.6	46.3	47.8	46.6	dscf
Calculated Stack Moisture	4.69	5.32	4.79	4.93	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	4.69	5.32	4.79	4.93	%
Method 3C Gas Analysis Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Carbon Dioxide Content	6.1	5.9	5.7	5.9	%
Oxygen Content	13.8	14.1	14.3	14.1	%
Nitrogen Content	80.1	80.0	80.0	80.0	%
Stack Dry Molecular Weight	29.53	29.50	29.48	29.50	lb/lb-mole
Stack Wet Molecular Weight	28.99	28.89	28.93	28.94	lb/lb-mole
Percent Excess Air	187.8	200.9	209.7	199.5	%
Volumetric Flow Rate Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Average Stack Gas Velocity	12.93	13.77	14.09	13.60	ft/sec
Stack Cross-Sectional Area	3.05	3.05	3.05	3.05	ft ²
Actual Stack Flow Rate	2,363	2,516	2,575	2,485	acfm
Wet Standard Stack Flow Rate	50	53	55	52	wkscfh
Dry Standard Stack Flow Rate	47,568	50,008	51,941	49,839	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/17/15		
Sampling Location	Q100	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	0-30-0%-1		Date	03/17/15	Run Start Time	14:50	Run Stop Time	16:00
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	6.1	13.8	0.0	80.1	29.53	1.164	187.8	N/A

Gas Analysis Data								
Run Number	0-30-0%-2		Date	03/17/15	Run Start Time	16:17	Run Stop Time	17:27
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.9	14.1	0.0	80.0	29.50	1.156	200.9	N/A

Gas Analysis Data								
Run Number	0-30-0%-3		Date	03/17/15	Run Start Time	17:41	Run Stop Time	18:51
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.7	14.3	0.0	80.0	29.48	1.160	209.7	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/17/15
Sampling Location	Q100	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	0-30-0%-1		Date	03/17/15	Start Time	02:50	Stop Time	04:00
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	53.040	dcf		Barometric Pressure	(P _b)	30.20	in Hg
Average Stack Temp	(t _s) _{avg}	1054	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	89	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	840.50	848.10	582.40	866.70			
Initial Value	(V _i),(W _i)	807.60	842.90	579.90	859.70			
Net Value	(V _n),(W _n)	32.9	5.2	2.5	7.0			
Results								
Total Weight	(W _f)	47.60	g	Water Vol Weighed	(V _{wsg(std)})	2.244	scf	
Std Meter Volume	(V _{m(std)})	45.638	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	4.69	%	Final Moisture Content	(B _{ws})	4.69	%	

Moisture Content Data								
Run Number	0-30-0%-2		Date	03/17/15	Start Time	04:17	Stop Time	05:27
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	54.010	dcf		Barometric Pressure	(P _b)	30.19	in Hg
Average Stack Temp	(t _s) _{avg}	1063	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	91	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	875.20	854.60	584.90	915.00			
Initial Value	(V _i),(W _i)	840.50	848.10	582.40	903.60			
Net Value	(V _n),(W _n)	34.7	6.5	2.5	11.4			
Results								
Total Weight	(W _f)	55.10	g	Water Vol Weighed	(V _{wsg(std)})	2.598	scf	
Std Meter Volume	(V _{m(std)})	46.276	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.32	%	Final Moisture Content	(B _{ws})	5.32	%	

Moisture Content Data								
Run Number	0-30-0%-3		Date	03/17/15	Start Time	05:41	Stop Time	06:51
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	0.883	0.883	
Total Meter Volume	(V _m)	55.930	dcf		Barometric Pressure	(P _b)	30.19	in Hg
Average Stack Temp	(t _s) _{avg}	1049	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	93	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	908.50	859.50	585.90	926.80			
Initial Value	(V _i),(W _i)	875.20	854.60	584.90	915.00			
Net Value	(V _n),(W _n)	33.3	4.9	1.0	11.8			
Results								
Total Weight	(W _f)	51.00	g	Water Vol Weighed	(V _{wsg(std)})	2.405	scf	
Std Meter Volume	(V _{m(std)})	47.786	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	4.79	%	Final Moisture Content	(B _{ws})	4.79	%	

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/17/15
Operator	CG
Run Number	0-30-0%-1

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.25	in H ₂ O for	20.0
		Pre (-)	0.20	in H ₂ O for	25.0
		Post (+)	0.20	in H ₂ O for	15.0
		Post (-)	0.25	in H ₂ O for	20.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	14:50	End	16:00

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	807.6	842.9	579.9	859.7				
Post	840.5	848.1	582.4	866.7				

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Low Flow Meter	SAMP-MN-0001	
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4297 in
Probe Number	SAMP-PF-0001	in
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number		
Impinger Case Number	SAMP-BC-0002	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1054.0	°F
Average Meter Temp	(t _m)	89.0	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.14	in H ₂ O
Stack Moisture Content	(B _{wt})	4.69	%
Stack Dry Molecular Weight	(M _d)	29.53	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.20	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.20	in Hg
Absolute Meter Pressure	(P _m)	30.32	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	682.040	0.005	1.698	1.60	631	255		52			80	83	0.8	0.07	5.53	1.754		42.086
A-2	2.7	00:02:43	684.050	0.005	1.698	1.60	525	256		51			82	81	0.8	0.07	5.25	3.481		41.772
A-3	5.4	00:05:25	686.030	0.010	1.698	1.60	733	258		52			84	81	0.8	0.10	8.18	5.214		41.711
A-4	8.1	00:08:07	688.020	0.030	1.698	1.60	939	258		52			86	80	0.8	0.17	15.34	6.997		41.985
A-5	10.8	00:10:50	690.070	0.030	1.698	1.60	1046	260		52			87	81	0.8	0.17	15.91	6.945		33.338
A-6	13.5	00:13:33	690.010	0.030	1.698	1.60	1128	260		51			90	81	0.8	0.17	16.34	10.479		41.915
A-7	16.3	00:16:15	694.090	0.020	1.698	1.60	1175	261		51			91	81	0.8	0.14	13.54	13.014		44.619
A-8	19.0	00:18:58	697.020	0.040	1.698	1.60	1176	262		51			92	81	0.8	0.20	19.15	14.751		44.254
A-9	21.7	00:21:40	699.030	0.030	1.698	1.60	1256	258		51			93	82	0.8	0.17	16.99	16.512		44.031
A-10	24.4	00:24:22	701.070	0.030	1.698	1.60	1261	259		51			94	83	0.8	0.17	17.01	18.217		43.721
A-11	27.1	00:27:05	703.050	0.010	1.698	1.60	1262	259		51			95	83	0.8	0.10	9.82	19.921		43.464
A-12	29.8	00:29:47	705.030	0.030	1.698	1.60	1266	259		51			96	84	0.9	0.17	17.04	21.622		43.243
B-1	32.5	00:32:30	707.010	0.010	1.698	1.60	667	254		51			94	85	0.9	0.10	7.95	24.235		44.742
B-2	35.2	00:35:12	710.050	0.010	1.698	1.60	577	256		51			96	86	0.9	0.10	7.62	25.984		44.544
B-3	37.9	00:37:55	712.090	0.030	1.698	1.60	692	258		51			96	86	0.9	0.17	13.92	27.699		44.318
B-4	40.6	00:40:37	714.090	0.020	1.698	1.60	1076	255		51			97	87	0.9	0.14	13.12	30.198		45.297
B-5	43.3	00:43:20	717.010	0.030	1.698	1.60	1203	257		51			98	87	0.9	0.17	16.72	31.968		45.131
B-6	46.0	00:46:03	719.080	0.030	1.698	1.60	1234	256		51			98	87	0.9	0.17	16.88	33.652		44.870
B-7	48.8	00:48:45	721.050	0.020	1.698	1.60	1148	255		51			99	88	0.9	0.14	13.43	35.342		44.643
B-8	51.5	00:51:28	723.030	0.010	1.698	1.60	1187	254		52			99	88	0.9	0.10	9.61	37.903		45.484
B-9	54.2	00:54:10	726.030	0.030	1.698	1.60	1261	257		52			99	89	0.9	0.17	17.01	39.924		45.627
B-10	56.9	00:56:53	728.400	0.030	1.698	1.60	1278	254		52			99	89	0.9	0.17	17.10	41.314		45.070
B-11	59.6	00:59:35	730.030	0.010	1.698	1.60	1284	254		52			99	89	0.9	0.10	9.89	43.037		44.908
B-12	62.3	01:02:18	732.050	0.005	1.698	1.60	1290	253		52			99	89	0.9	0.07	7.00	45.620		45.620
Last Pt	65.0	01:05:00	735.080																	
Final Val	65.0	01:05:00	735.080												Max Vac	0.9	Final Values	45.620		
Average Values				0.02		1.60	1054	257		51			93	85		0.14	12.93			
													89							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/17/15
Operator	CG
Run Number	0-30-0%-2

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.30	in H ₂ O for	20.0
		Pre (-)	0.30	in H ₂ O for	20.0
		Post (+)	0.25	in H ₂ O for	30.0
		Post (-)	0.20	in H ₂ O for	15.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	16:17	End	17:27

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	840.5	848.1	582.4	903.6				
Post	875.2	854.6	584.9	915.0				

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Low Flow Meter	SAMP-MN-0001	
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4083 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number		
Impinger Case Number	SAMP-BC-0002	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1062.7	°F
Average Meter Temp	(t _m)	91.2	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.15	in H ₂ O
Stack Moisture Content	(B _{ws})	5.32	%
Stack Dry Molecular Weight	(M _d)	29.50	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.70	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.19	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.19	in Hg
Absolute Meter Pressure	(P _m)	30.31	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	735.010	0.005	1.698	1.60	531	256		56			84	87	0.9	0.07	5.28	1.801		43.218
A-2	2.7	00:02:43	737.090	0.005	1.698	1.60	532	260		51			86	87	0.9	0.07	5.28	4.324		51.889
A-3	5.4	00:05:25	740.010	0.020	1.698	1.60	570	260		52			87	87	0.9	0.14	10.77	6.085		48.683
A-4	8.1	00:08:07	742.050	0.030	1.698	1.60	1065	259		55			90	86	0.9	0.17	16.04	7.775		46.647
A-5	10.8	00:10:50	744.010	0.030	1.698	1.60	1163	259		55			92	86	0.9	0.17	16.55	10.355		49.705
A-6	13.5	00:13:33	747.010	0.030	1.698	1.60	1204	261		55			92	86	0.9	0.17	16.76	12.136		48.543
A-7	16.3	00:16:15	749.080	0.030	1.698	1.60	1167	258		55			93	85	0.9	0.17	16.57	13.822		47.389
A-8	19.0	00:18:58	751.040	0.020	1.698	1.60	1180	260		55			93	85	0.9	0.14	13.58	15.517		46.550
A-9	21.7	00:21:40	753.010	0.020	1.698	1.60	1300	261		55			95	85	0.9	0.14	14.07	17.242		45.980
A-10	24.4	00:24:22	755.020	0.040	1.698	1.60	1307	258		55			95	86	0.9	0.20	19.94	19.808		47.538
A-11	27.1	00:27:05	758.010	0.020	1.698	1.60	1291	260		56			96	86	0.9	0.14	14.04	21.573		47.069
A-12	29.8	00:29:47	760.070	0.030	1.698	1.60	1294	261		56			93	86	0.9	0.17	17.21	23.301		46.601
B-1	32.5	00:32:30	762.080	0.030	1.698	1.60	595	257		55			95	87	0.9	0.17	13.34	24.963		46.086
B-2	35.2	00:35:12	764.020	0.030	1.698	1.60	529	260		55			97	87	0.9	0.17	12.92	27.590		47.297
B-3	37.9	00:37:55	767.090	0.030	1.698	1.60	619	257		56			98	87	0.9	0.17	13.50	29.265		46.825
B-4	40.6	00:40:37	769.050	0.030	1.698	1.60	1095	260		57			98	88	0.9	0.17	16.20	30.999		46.498
B-5	43.3	00:43:20	771.080	0.020	1.698	1.60	1195	260		57			99	89	0.9	0.14	13.65	33.505		47.301
B-6	46.0	00:46:03	774.020	0.030	1.698	1.60	1247	257		57			99	89	0.9	0.17	16.97	35.236		46.981
B-7	48.8	00:48:45	776.050	0.030	1.698	1.60	1213	256		57			99	89	0.9	0.17	16.80	36.907		46.619
B-8	51.5	00:51:28	778.010	0.030	1.698	1.60	1219	257		57			99	89	0.9	0.17	16.83	38.620		46.344
B-9	54.2	00:54:10	780.020	0.030	1.698	1.60	1289	261		57			100	90	0.9	0.17	17.18	41.224		47.113
B-10	56.9	00:56:53	783.080	0.005	1.698	1.60	1299	262		58			100	90	0.9	0.07	7.03	42.875		46.772
B-11	59.6	00:59:35	785.020	0.010	1.698	1.60	1300	258		58			100	90	0.9	0.10	9.95	44.568		46.506
B-12	62.3	01:02:18	787.010	0.010	1.698	1.60	1301	258		58			100	90	0.9	0.10	9.95	46.278		46.278
Last Pt	65.0	01:05:00	789.020																	
Final Val	65.0	01:05:00	789.020												Max Vac	0.9	Final Values	46.278		
Average Values				0.02		1.60	1063	259		56			95	87		0.15	13.77			
													91							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/17/15
Operator	CG
Run Number	0-30-09%-3

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.25	in H ₂ O for	15.0
		Pre (-)	0.25	in H ₂ O for	20.0
		Post (+)	0.30	in H ₂ O for	20.0
		Post (-)	0.25	in H ₂ O for	20.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	17:41	End	18:51

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	875.2	854.6	584.9	915.0				
Post	908.5	859.5	585.9	926.8				

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Low Flow Meter	SAMP-MN-0001	
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4072 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number		
Impinger Case Number	SAMP-BC-0002	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1049.0	°F
Average Meter Temp	(t _m)	92.8	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.15	in H ₂ O
Stack Moisture Content	(B _{ws})	4.79	%
Stack Dry Molecular Weight	(M _d)	29.48	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.71	acfm
ΔP to ΔH IsoKinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.19	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.19	in Hg
Absolute Meter Pressure	(P _m)	30.31	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (±±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	790.080	0.005	1.698	1.60	380	258		54			86	89	0.9	0.07	4.86	2.562		61.485
A-2	2.7	00:02:43	793.050	0.010	1.698	1.60	408	259		54			86	89	0.9	0.10	6.98	5.132		61.588
A-3	5.4	00:05:25	796.030	0.010	1.698	1.60	578	259		56			91	88	0.9	0.10	7.64	6.834		54.673
A-4	8.1	00:08:07	798.010	0.025	1.698	1.60	830	258		56			91	88	0.9	0.16	13.46	8.605		51.627
A-5	10.8	00:10:50	800.070	0.030	1.698	1.60	1098	258		57			94	87	0.9	0.17	16.21	11.890		57.073
A-6	13.5	00:13:33	803.900	0.025	1.698	1.60	1172	257		57			94	87	0.9	0.16	15.14	12.894		51.576
A-7	16.3	00:16:15	805.070	0.030	1.698	1.60	1186	256		58			96	88	0.9	0.17	16.66	14.622		50.133
A-8	19.0	00:18:58	807.090	0.020	1.698	1.60	1192	257		58			96	88	0.9	0.14	13.62	17.120		51.361
A-9	21.7	00:21:40	810.010	0.020	1.698	1.60	1245	261		58			98	89	0.9	0.14	13.84	18.861		50.296
A-10	24.4	00:24:22	812.050	0.030	1.698	1.60	1258	261		60			98	89	0.9	0.17	17.02	20.533		49.280
A-11	27.1	00:27:05	814.010	0.030	1.698	1.60	1262	254		60			98	89	0.9	0.17	17.04	22.248		48.542
A-12	29.8	00:29:47	816.020	0.020	1.698	1.60	1258	257		61			95	89	0.9	0.14	13.89	24.806		49.613
B-1	32.5	00:32:30	819.010	0.030	1.698	1.60	628	256		59			95	90	0.9	0.17	13.54	26.567		49.047
B-2	35.2	00:35:12	821.070	0.040	1.698	1.60	610	257		60			95	90	0.9	0.20	15.51	28.234		48.401
B-3	37.9	00:37:55	823.020	0.030	1.698	1.60	767	258		60			98	90	0.9	0.17	14.38	30.800		49.280
B-4	40.6	00:40:37	826.030	0.040	1.698	1.60	1105	258		60			99	91	0.9	0.20	18.75	32.485		48.727
B-5	43.3	00:43:20	828.010	0.040	1.698	1.60	1233	257		61			99	91	0.9	0.20	19.51	34.221		48.312
B-6	46.0	00:46:03	830.050	0.040	1.698	1.60	1225	259		61			99	90	0.9	0.20	19.46	36.793		49.057
B-7	48.8	00:48:45	833.070	0.040	1.698	1.60	1266	259		61			99	91	0.9	0.20	19.70	38.444		48.560
B-8	51.5	00:51:28	835.010	0.030	1.698	1.60	1291	259		62			99	91	0.9	0.17	17.18	40.179		48.215
B-9	54.2	00:54:10	837.050	0.040	1.698	1.60	1302	255		63			99	91	0.9	0.20	19.90	41.847		47.825
B-10	56.9	00:56:53	839.010	0.010	1.698	1.60	1312	256		63			100	91	0.9	0.10	9.98	43.616		47.581
B-11	59.6	00:59:35	841.090	0.005	1.698	1.60	1310	257		63			100	91	0.9	0.07	7.05	46.132		48.138
B-12	62.3	01:02:18	844.050	0.005	1.698	1.60	1261	257		64			100	90	0.9	0.07	6.95	47.800		47.800
Last Pt	65.0	01:05:00	846.010																	
Final Val	65.0	01:05:00	846.010												Max Vac	0.9		Final Values	47.800	
Average Values				0.03		1.60	1049	258		59			96	89			0.15	14.09		
													93							

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.7	%
Stack Exhaust Flow (M2)	47,568	SCFH

Weather Data

Barometric Pressure	30.20	in. Hg
Relative Humidity	58	%
Ambient Temperature	62	°F
Specific Humidity	0.006707	lb H ₂ O / lb air

0-30-0 Load, Run - Q100 R1

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/17/15 14:50:09	19680	13.37	6.50	0.07	5.30	60.03	67.40	170.00
	03/17/15 14:50:39	19710	13.26	5.18	0.07	5.61	60.03	67.40	170.00
	03/17/15 14:51:09	19740	13.97	6.23	0.08	5.02	60.18	67.40	199.00
	03/17/15 14:51:39	19770	13.64	6.93	0.08	5.21	60.18	67.40	199.00
	03/17/15 14:52:09	19800	13.23	6.41	0.07	5.52	60.32	67.50	185.00
	03/17/15 14:52:39	19830	13.39	5.97	0.07	5.41	60.32	67.50	185.00
	03/17/15 14:53:09	19860	13.54	6.26	0.07	5.28	60.49	67.60	171.00
	03/17/15 14:53:39	19890	13.16	5.80	0.06	5.62	60.49	67.60	171.00
	03/17/15 14:54:09	19920	13.59	6.52	0.07	5.25	60.66	67.50	171.00
	03/17/15 14:54:39	19950	12.99	6.85	0.06	5.70	60.66	67.50	171.00
	03/17/15 14:55:09	19980	11.84	4.10	0.07	6.62	60.76	67.50	258.00
	03/17/15 14:55:39	20010	13.18	4.07	0.08	5.62	60.76	67.50	258.00
	03/17/15 14:56:09	20040	12.62	5.25	0.06	5.88	60.85	67.20	272.00
	03/17/15 14:56:39	20070	11.71	3.75	0.06	6.68	60.85	67.20	272.00
	03/17/15 14:57:09	20100	12.44	3.13	0.07	6.26	60.94	67.00	244.00
	03/17/15 14:57:39	20130	13.02	4.11	0.07	5.76	60.94	67.00	244.00
	03/17/15 14:58:09	20160	13.27	4.75	0.08	5.53	61.06	66.80	259.00
	03/17/15 14:58:39	20190	13.02	4.89	0.07	5.70	61.06	66.80	259.00
	03/17/15 14:59:09	20220	12.71	4.48	0.07	5.98	61.18	66.70	245.00
	03/17/15 14:59:39	20250	13.12	4.41	0.08	5.65	61.18	66.70	245.00
	03/17/15 15:00:09	20280	12.85	4.45	0.08	5.79	61.27	66.60	260.00
	03/17/15 15:00:39	20310	12.83	4.12	0.07	5.87	61.27	66.60	260.00
	03/17/15 15:01:09	20340	12.67	4.13	0.08	6.01	61.38	66.50	260.00
	03/17/15 15:01:39	20370	13.06	4.02	0.08	5.70	61.38	66.50	260.00
	03/17/15 15:02:09	20400	12.98	4.36	0.08	5.75	61.49	66.40	246.00
	03/17/15 15:02:39	20430	12.91	4.34	0.08	5.79	61.49	66.40	246.00
	03/17/15 15:03:09	20460	12.78	4.24	0.05	5.87	61.60	66.30	261.00
	03/17/15 15:03:39	20490	12.84	4.00	0.08	5.88	61.60	66.30	261.00
	03/17/15 15:04:09	20520	12.99	4.03	0.07	5.77	61.72	66.20	262.00
	03/17/15 15:04:39	20550	12.67	4.13	0.07	5.95	61.72	66.20	262.00
	03/17/15 15:05:09	20580	12.68	3.50	0.08	5.97	61.84	66.10	233.00
	03/17/15 15:05:39	20610	12.67	3.54	0.06	6.00	61.84	66.10	233.00
	03/17/15 15:06:09	20640	12.60	3.51	0.06	6.04	61.97	66.00	219.00
	03/17/15 15:06:39	20670	13.18	3.71	0.08	5.68	61.97	66.00	219.00
	03/17/15 15:07:09	20700	14.50	5.03	0.09	4.65	62.17	65.90	175.00
	03/17/15 15:07:39	20730	14.79	6.11	0.11	4.50	62.17	65.90	175.00
	03/17/15 15:08:09	20760	14.31	6.36	0.09	4.70	62.35	66.10	176.00
	03/17/15 15:08:39	20790	14.20	6.40	0.09	4.87	62.35	66.10	176.00
	03/17/15 15:09:09	20820	14.27	6.33	0.08	4.77	62.48	66.00	176.00
	03/17/15 15:09:39	20850	14.21	6.39	0.09	4.84	62.48	66.00	176.00
	03/17/15 15:10:09	20880	14.15	6.46	0.08	4.86	62.59	66.10	206.00
	03/17/15 15:10:39	20910	13.21	6.40	0.08	5.46	62.59	66.10	206.00
	03/17/15 15:11:09	20940	11.57	4.53	0.06	6.81	62.61	66.10	279.00
	03/17/15 15:11:39	20970	12.96	3.48	0.08	5.74	62.61	66.10	279.00
	03/17/15 15:12:09	21000	13.18	5.07	0.08	5.63	62.68	66.20	235.00
	03/17/15 15:12:39	21030	13.22	5.34	0.08	5.58	62.68	66.20	235.00
	03/17/15 15:13:09	21060	13.27	5.50	0.08	5.51	62.78	66.20	236.00
A2	03/17/15 15:13:39	21090	13.22	5.21	0.09	5.55	62.78	66.20	236.00
	03/17/15 15:14:09	21120	13.16	5.35	0.09	5.60	62.90	66.10	251.00
	03/17/15 15:14:39	21150	13.17	5.34	0.08	5.59	62.90	66.10	251.00
	03/17/15 15:15:09	21180	13.31	5.33	0.09	5.49	63.03	66.10	237.00
	03/17/15 15:15:39	21210	13.32	5.53	0.07	5.49	63.03	66.10	237.00
	03/17/15 15:16:09	21240	13.32	5.54	0.08	5.46	63.15	65.90	252.00
	03/17/15 15:16:39	21270	13.38	5.58	0.08	5.44	63.15	65.90	252.00
	03/17/15 15:17:09	21300	13.39	5.66	0.08	5.43	63.27	65.80	237.00
	03/17/15 15:17:39	21330	12.73	5.49	0.08	5.85	63.27	65.80	237.00
	03/17/15 15:18:09	21360	12.81	3.96	0.07	5.93	63.37	65.80	238.00
	03/17/15 15:18:39	21390	12.90	4.50	0.07	5.83	63.37	65.80	238.00
	03/17/15 15:19:09	21420	13.38	4.93	0.08	5.43	63.48	65.70	253.00
	03/17/15 15:19:39	21450	13.12	5.35	0.08	5.61	63.48	65.70	253.00
	03/17/15 15:20:09	21480	13.26	5.07	0.08	5.54	63.58	65.60	238.00
	03/17/15 15:20:39	21510	13.17	5.15	0.08	5.59	63.58	65.60	238.00

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.7	%
Stack Exhaust Flow (M2)	47,568	SCFH

Weather Data

Barometric Pressure	30.20	in. Hg
Relative Humidity	58	%
Ambient Temperature	62	°F
Specific Humidity	0.006707	lb H ₂ O / lb air

0-30-0 Load, Run - Q100 R1

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/17/15 15:21:09	21540	13.38	5.15	0.09	5.43	63.66	65.60	239.00
	03/17/15 15:21:39	21570	13.38	5.27	0.09	5.44	63.66	65.60	239.00
	03/17/15 15:22:09	21600	13.04	5.18	0.09	5.69	63.75	65.60	239.00
	03/17/15 15:22:39	21630	13.11	4.92	0.07	5.64	63.75	65.60	239.00
	03/17/15 15:23:09	21660	13.12	4.82	0.08	5.62	63.85	65.50	239.00
	03/17/15 15:23:39	21690	13.06	4.71	0.08	5.72	63.85	65.50	239.00
	03/17/15 15:24:09	21720	13.52	4.92	0.08	5.34	63.98	65.40	180.00
	03/17/15 15:24:39	21750	14.66	5.47	0.09	4.58	63.98	65.40	180.00
	03/17/15 15:25:09	21780	14.32	5.69	0.07	4.76	64.19	65.40	165.00
	03/17/15 15:25:39	21810	14.03	5.68	0.08	4.90	64.19	65.40	165.00
	03/17/15 15:26:09	21840	13.55	5.53	0.07	5.32	64.36	65.40	181.00
	03/17/15 15:26:39	21870	14.44	5.78	0.08	4.66	64.36	65.40	181.00
	03/17/15 15:27:09	21900	13.89	5.81	0.08	5.04	64.49	65.20	181.00
	03/17/15 15:27:39	21930	13.94	6.02	0.09	5.02	64.49	65.20	181.00
	03/17/15 15:28:09	21960	14.10	6.15	0.08	4.91	64.62	65.20	181.00
	03/17/15 15:28:39	21990	13.65	5.89	0.07	5.21	64.62	65.20	181.00
	03/17/15 15:29:09	22020	13.80	6.00	0.08	5.09	64.72	65.20	227.00
	03/17/15 15:29:39	22050	12.13	5.28	0.06	6.29	64.72	65.20	227.00
	03/17/15 15:30:09	22080	12.30	3.85	0.06	6.30	64.77	65.10	258.00
	03/17/15 15:30:39	22110	12.45	3.62	0.06	6.17	64.77	65.10	258.00
	03/17/15 15:31:09	22140	12.43	3.77	0.05	6.16	64.81	65.10	243.00
	03/17/15 15:31:39	22170	12.63	3.88	0.06	6.02	64.81	65.10	243.00
	03/17/15 15:32:09	22200	12.50	3.62	0.07	6.15	64.86	65.10	258.00
	03/17/15 15:32:39	22230	12.95	3.97	0.08	5.77	64.86	65.10	258.00
	03/17/15 15:33:09	22260	12.70	4.21	0.07	5.98	64.92	65.10	258.00
	03/17/15 15:33:39	22290	12.53	3.71	0.06	6.08	64.92	65.10	258.00
	03/17/15 15:34:09	22320	12.59	3.58	0.06	6.06	65.00	65.10	258.00
	03/17/15 15:34:39	22350	12.85	3.89	0.06	5.85	65.00	65.10	258.00
	03/17/15 15:35:09	22380	12.68	3.82	0.06	5.95	65.07	65.10	259.00
	03/17/15 15:35:39	22410	12.77	3.56	0.07	5.94	65.07	65.10	259.00
	03/17/15 15:36:09	22440	12.60	3.83	0.07	6.05	65.14	65.20	259.00
	03/17/15 15:36:39	22470	12.69	3.59	0.07	5.97	65.14	65.20	259.00
A3	03/17/15 15:37:09	22500	13.04	3.82	0.07	5.72	65.21	65.20	259.00
	03/17/15 15:37:39	22530	12.89	4.07	0.07	5.80	65.21	65.20	259.00
	03/17/15 15:38:09	22560	12.38	3.75	0.05	6.21	65.28	65.20	244.00
	03/17/15 15:38:39	22590	12.54	3.08	0.05	6.12	65.28	65.20	244.00
	03/17/15 15:39:09	22620	12.86	3.59	0.06	5.85	65.36	65.30	229.00
	03/17/15 15:39:39	22650	13.41	4.26	0.07	5.50	65.36	65.30	229.00
	03/17/15 15:40:09	22680	14.66	4.94	0.08	4.54	65.55	65.40	153.00
	03/17/15 15:40:39	22710	15.39	5.27	0.11	4.08	65.55	65.40	153.00
	03/17/15 15:41:09	22740	14.86	5.47	0.10	4.36	65.74	65.60	138.00
	03/17/15 15:41:39	22770	15.18	5.46	0.11	4.19	65.74	65.60	138.00
	03/17/15 15:42:09	22800	13.99	5.45	0.07	4.94	65.90	65.80	169.00
	03/17/15 15:42:39	22830	13.74	5.38	0.07	5.18	65.90	65.80	169.00
	03/17/15 15:43:09	22860	14.45	5.61	0.09	4.68	66.04	65.80	185.00
	03/17/15 15:43:39	22890	13.72	5.67	0.07	5.18	66.04	65.80	185.00
	03/17/15 15:44:09	22920	13.18	5.26	0.05	5.52	66.15	65.80	231.00
	03/17/15 15:44:39	22950	12.35	4.17	0.06	6.18	66.15	65.80	231.00
	03/17/15 15:45:09	22980	12.95	3.56	0.07	5.78	66.19	65.70	247.00
	03/17/15 15:45:39	23010	12.89	4.54	0.07	5.87	66.19	65.70	247.00
	03/17/15 15:46:09	23040	13.09	4.55	0.08	5.62	66.23	65.70	278.00
	03/17/15 15:46:39	23070	12.75	4.35	0.06	5.92	66.23	65.70	278.00
	03/17/15 15:47:09	23100	12.71	4.08	0.07	5.95	66.28	65.60	247.00
	03/17/15 15:47:39	23130	12.46	3.82	0.07	6.13	66.28	65.60	247.00
	03/17/15 15:48:09	23160	12.60	3.39	0.07	6.04	66.33	65.60	262.00
	03/17/15 15:48:39	23190	12.50	3.45	0.07	6.07	66.33	65.60	262.00
	03/17/15 15:49:09	23220	12.44	3.10	0.07	6.21	66.39	65.60	263.00
	03/17/15 15:49:39	23250	12.53	3.14	0.07	6.12	66.39	65.60	263.00
	03/17/15 15:50:09	23280	12.67	3.24	0.07	5.97	66.43	65.60	247.00
	03/17/15 15:50:39	23310	12.63	3.28	0.06	6.03	66.43	65.60	247.00
	03/17/15 15:51:09	23340	12.51	3.20	0.07	6.10	66.48	65.60	263.00
	03/17/15 15:51:39	23370	12.41	2.92	0.07	6.20	66.48	65.60	263.00

Unit Data

Weather Data

0-30-0 Load, Run - Q100 R1

RAW AVERAGE

Upscale Cal Gas

App. B

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	50,008	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	57	%
Ambient Temperature	63	°F
Specific Humidity	0.006891	lb H ₂ O / lb air

0-30-0 Load, Run - Q100 R2

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmwv)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/17/15 16:17:09	412	12.73	2.89	0.05	5.92	66.68	63.70	156.00
	03/17/15 16:17:39	442	12.76	3.22	0.05	5.91	66.68	63.70	156.00
	03/17/15 16:18:09	472	12.78	3.42	0.05	5.91	66.81	63.60	172.00
	03/17/15 16:18:39	502	12.91	3.97	0.05	5.79	66.81	63.60	172.00
	03/17/15 16:19:09	532	12.36	3.43	0.05	6.22	66.91	63.40	187.00
	03/17/15 16:19:39	562	12.95	4.16	0.05	5.76	66.91	63.40	187.00
	03/17/15 16:20:09	592	12.35	6.06	0.05	6.20	67.01	63.40	188.00
	03/17/15 16:20:39	622	12.52	5.55	0.04	6.13	67.01	63.40	188.00
	03/17/15 16:21:09	652	12.46	6.45	0.04	6.15	67.12	63.30	188.00
	03/17/15 16:21:39	682	12.30	7.83	0.04	6.29	67.12	63.30	188.00
	03/17/15 16:22:09	712	13.60	7.16	0.07	5.22	67.22	63.20	188.00
	03/17/15 16:22:39	742	13.19	7.64	0.07	5.57	67.22	63.20	188.00
	03/17/15 16:23:09	772	12.94	4.88	0.06	5.88	67.29	63.20	204.00
	03/17/15 16:23:39	802	13.80	5.81	0.07	5.10	67.29	63.20	204.00
	03/17/15 16:24:09	832	14.03	6.90	0.09	4.95	67.32	63.20	251.00
	03/17/15 16:24:39	862	13.20	6.17	0.06	5.55	67.32	63.20	251.00
	03/17/15 16:25:09	892	13.21	4.82	0.07	5.56	67.32	63.20	251.00
	03/17/15 16:25:39	922	13.17	4.71	0.07	5.52	67.32	63.20	251.00
	03/17/15 16:26:09	952	12.52	4.06	0.06	6.16	67.37	63.20	236.00
	03/17/15 16:26:39	982	13.34	3.75	0.07	5.50	67.37	63.20	236.00
	03/17/15 16:27:09	1012	13.21	4.28	0.06	5.56	67.40	63.20	236.00
	03/17/15 16:27:39	1042	13.15	4.15	0.06	5.58	67.40	63.20	236.00
	03/17/15 16:28:09	1072	13.26	4.14	0.06	5.54	67.45	63.20	252.00
	03/17/15 16:28:39	1102	13.22	4.20	0.05	5.54	67.45	63.20	252.00
	03/17/15 16:29:09	1132	13.22	4.38	0.07	5.54	67.51	63.10	252.00
	03/17/15 16:29:39	1162	12.97	4.40	0.06	5.76	67.51	63.10	252.00
	03/17/15 16:30:09	1192	13.05	4.45	0.06	5.70	67.56	63.10	236.00
	03/17/15 16:30:39	1222	12.72	4.80	0.06	5.89	67.56	63.10	236.00
	03/17/15 16:31:09	1252	12.65	3.83	0.06	6.07	67.61	63.10	252.00
	03/17/15 16:31:39	1282	12.92	4.31	0.06	5.75	67.61	63.10	252.00
	03/17/15 16:32:09	1312	13.18	4.58	0.06	5.61	67.66	63.20	252.00
	03/17/15 16:32:39	1342	12.88	4.71	0.05	5.82	67.66	63.20	252.00
	03/17/15 16:33:09	1372	13.19	4.75	0.06	5.54	67.72	63.20	253.00
	03/17/15 16:33:39	1402	13.02	3.44	0.04	5.79	67.72	63.20	253.00
	03/17/15 16:34:09	1432	13.49	3.71	0.06	5.38	67.78	63.20	237.00
	03/17/15 16:34:39	1462	14.28	6.91	0.06	4.77	67.78	63.20	237.00
	03/17/15 16:35:09	1492	13.87	10.29	0.06	4.99	67.88	63.30	158.00
	03/17/15 16:35:39	1522	12.74	6.65	0.04	5.90	67.88	63.30	158.00
	03/17/15 16:36:09	1552	12.18	3.15	0.04	6.31	68.04	63.40	158.00
	03/17/15 16:36:39	1582	12.26	2.29	0.04	6.28	68.04	63.40	158.00
	03/17/15 16:37:09	1612	11.95	1.89	0.04	6.50	68.17	63.60	174.00
	03/17/15 16:37:39	1642	12.06	2.08	0.05	6.47	68.17	63.60	174.00
	03/17/15 16:38:09	1672	12.26	2.97	0.05	6.25	68.26	63.60	159.00
	03/17/15 16:38:39	1702	12.37	3.40	0.06	6.26	68.26	63.60	159.00
	03/17/15 16:39:09	1732	12.48	3.72	0.05	6.11	68.32	63.70	254.00
	03/17/15 16:39:39	1762	12.44	3.89	0.05	6.18	68.32	63.70	254.00
	03/17/15 16:40:09	1792	12.43	3.87	0.05	6.13	68.33	63.70	254.00
A2	03/17/15 16:40:39	1822	12.43	3.34	0.06	6.17	68.33	63.70	254.00
	03/17/15 16:41:09	1852	12.51	3.27	0.06	6.12	68.33	63.80	270.00
	03/17/15 16:41:39	1882	12.10	2.96	0.05	6.39	68.33	63.80	270.00
	03/17/15 16:42:09	1912	12.00	2.97	0.05	6.45	68.32	63.80	254.00
	03/17/15 16:42:39	1942	12.55	2.82	0.07	6.16	68.32	63.80	254.00
	03/17/15 16:43:09	1972	12.84	3.76	0.07	5.84	68.32	64.00	254.00
	03/17/15 16:43:39	2002	12.90	4.40	0.07	5.79	68.32	64.00	254.00
	03/17/15 16:44:09	2032	12.85	4.12	0.07	5.83	68.32	64.10	254.00
	03/17/15 16:44:39	2062	12.44	3.83	0.05	6.14	68.32	64.10	254.00
	03/17/15 16:45:09	2092	12.68	3.37	0.06	6.01	68.33	64.20	270.00
	03/17/15 16:45:39	2122	12.43	3.79	0.06	6.14	68.33	64.20	270.00
	03/17/15 16:46:09	2152	12.60	3.01	0.05	6.05	68.35	64.30	270.00
	03/17/15 16:46:39	2182	12.86	3.52	0.06	5.86	68.35	64.30	270.00

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	50,008	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	57	%
Ambient Temperature	63	°F
Specific Humidity	0.006891	lb H ₂ O / lb air

0-30-0 Load, Run - Q100 R2

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmwv)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/17/15 16:47:09	2212	12.59	3.97	0.05	6.01	68.37	64.40	270.00
	03/17/15 16:47:39	2242	12.51	3.74	0.06	6.12	68.37	64.40	270.00
	03/17/15 16:48:09	2272	12.39	3.01	0.06	6.17	68.38	64.50	254.00
	03/17/15 16:48:39	2302	12.54	2.92	0.06	6.08	68.38	64.50	254.00
	03/17/15 16:49:09	2332	12.42	2.78	0.06	6.16	68.41	64.50	270.00
	03/17/15 16:49:39	2362	12.70	3.51	0.05	6.05	68.41	64.50	270.00
	03/17/15 16:50:09	2392	14.39	4.96	0.06	4.77	68.44	64.60	254.00
	03/17/15 16:50:39	2422	13.82	9.42	0.05	5.00	68.44	64.60	254.00
	03/17/15 16:51:09	2452	12.84	4.63	0.03	5.93	68.49	64.60	238.00
	03/17/15 16:51:39	2482	12.50	3.19	0.03	6.01	68.49	64.60	238.00
	03/17/15 16:52:09	2512	11.98	1.98	0.03	6.49	68.65	64.60	143.00
	03/17/15 16:52:39	2542	12.40	1.57	0.02	6.23	68.65	64.60	143.00
	03/17/15 16:53:09	2572	12.54	2.29	0.02	6.09	68.78	64.70	175.00
	03/17/15 16:53:39	2602	12.57	2.36	0.03	6.05	68.78	64.70	175.00
	03/17/15 16:54:09	2632	12.29	2.67	0.03	6.21	68.87	64.70	176.00
	03/17/15 16:54:39	2662	13.04	2.81	0.05	5.81	68.87	64.70	176.00
	03/17/15 16:55:09	2692	13.35	5.46	0.05	5.47	68.94	64.70	176.00
	03/17/15 16:55:39	2722	13.47	6.32	0.06	5.35	68.94	64.70	176.00
	03/17/15 16:56:09	2752	13.16	6.47	0.06	5.60	68.99	64.70	208.00
	03/17/15 16:56:39	2782	13.17	6.28	0.05	5.61	68.99	64.70	208.00
	03/17/15 16:57:09	2812	13.47	6.44	0.06	5.35	68.98	64.60	224.00
	03/17/15 16:57:39	2842	13.45	6.69	0.06	5.34	68.98	64.60	224.00
	03/17/15 16:58:09	2872	13.27	6.97	0.06	5.53	68.99	64.60	224.00
	03/17/15 16:58:39	2902	13.57	7.02	0.06	5.26	68.99	64.60	224.00
	03/17/15 16:59:09	2932	13.46	6.90	0.06	5.38	68.98	64.50	224.00
	03/17/15 16:59:39	2962	13.46	7.21	0.06	5.33	68.98	64.50	224.00
	03/17/15 17:00:09	2992	12.84	6.24	0.05	5.81	69.00	64.50	224.00
	03/17/15 17:00:39	3022	13.38	5.57	0.06	5.53	69.00	64.50	224.00
	03/17/15 17:01:09	3052	13.04	6.22	0.05	5.67	69.00	64.50	224.00
	03/17/15 17:01:39	3082	12.99	5.82	0.05	5.73	69.00	64.50	224.00
	03/17/15 17:02:09	3112	12.58	5.35	0.05	6.06	69.01	64.50	224.00
	03/17/15 17:02:39	3142	13.16	5.32	0.05	5.57	69.01	64.50	224.00
	03/17/15 17:03:09	3172	13.45	5.80	0.05	5.44	69.03	64.50	224.00
	03/17/15 17:03:39	3202	13.12	6.05	0.05	5.63	69.03	64.50	224.00
A3	03/17/15 17:04:09	3232	12.96	5.86	0.05	5.78	69.06	64.40	224.00
	03/17/15 17:04:39	3262	13.24	6.25	0.05	5.56	69.06	64.40	224.00
	03/17/15 17:05:09	3292	13.41	6.63	0.06	5.42	69.08	64.30	224.00
	03/17/15 17:05:39	3322	13.31	6.96	0.05	5.50	69.08	64.30	224.00
	03/17/15 17:06:09	3352	13.44	6.57	0.06	5.37	69.12	64.20	256.00
	03/17/15 17:06:39	3382	13.40	6.68	0.06	5.41	69.12	64.20	256.00
	03/17/15 17:07:09	3412	13.78	7.02	0.05	5.14	69.16	64.00	225.00
	03/17/15 17:07:39	3442	12.89	5.78	0.03	5.82	69.16	64.00	225.00
	03/17/15 17:08:09	3472	13.38	4.99	0.04	5.47	69.20	63.80	225.00
	03/17/15 17:08:39	3502	12.65	5.84	0.03	5.93	69.20	63.80	225.00
	03/17/15 17:09:09	3532	12.30	3.22	0.02	6.26	69.26	63.70	177.00
	03/17/15 17:09:39	3562	12.42	2.59	0.03	6.17	69.26	63.70	177.00
	03/17/15 17:10:09	3592	12.64	2.90	0.03	6.01	69.37	63.70	177.00
	03/17/15 17:10:39	3622	12.22	3.58	0.02	6.28	69.37	63.70	177.00
	03/17/15 17:11:09	3652	12.47	2.46	0.02	6.13	69.46	63.60	177.00
	03/17/15 17:11:39	3682	12.91	3.65	0.05	5.86	69.46	63.60	177.00
	03/17/15 17:12:09	3712	13.08	6.05	0.05	5.66	69.54	63.40	177.00
	03/17/15 17:12:39	3742	13.13	6.30	0.06	5.62	69.54	63.40	177.00
	03/17/15 17:13:09	3772	12.65	5.89	0.05	5.99	69.60	63.30	210.00
	03/17/15 17:13:39	3802	12.45	5.08	0.05	6.13	69.60	63.30	210.00
	03/17/15 17:14:09	3832	11.92	4.12	0.04	6.56	69.59	63.20	242.00
	03/17/15 17:14:39	3862	12.19	3.15	0.05	6.37	69.59	63.20	242.00
	03/17/15 17:15:09	3892	12.46	3.99	0.05	6.16	69.57	63.10	258.00
	03/17/15 17:15:39	3922	12.73	4.21	0.05	5.97	69.57	63.10	258.00
	03/17/15 17:16:09	3952	12.78	4.79	0.05	5.90	69.55	63.00	242.00
	03/17/15 17:16:39	3982	12.69	5.10	0.06	5.98	69.55	63.00	242.00

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	50,008	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	57	%
Ambient Temperature	63	°F
Specific Humidity	0.006891	lb H ₂ O / lb air

0-30-0 Load, Run - Q100 R2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/17/15 17:17:09	4012	12.52	4.77	0.05	6.09	69.54	63.00	258.00
03/17/15 17:17:39	4042	12.59	4.28	0.05	5.98	69.54	63.00	258.00
03/17/15 17:18:09	4072	12.15	4.36	0.05	6.43	69.54	62.90	258.00
03/17/15 17:18:39	4102	12.49	3.81	0.05	6.14	69.54	62.90	258.00
03/17/15 17:19:09	4132	12.52	4.36	0.04	6.13	69.55	62.90	258.00
03/17/15 17:19:39	4162	12.32	4.02	0.04	6.28	69.55	62.90	258.00
03/17/15 17:20:09	4192	12.20	4.23	0.05	6.32	69.62	62.80	259.00
03/17/15 17:20:39	4222	12.78	4.03	0.05	5.91	69.62	62.80	259.00
03/17/15 17:21:09	4252	12.80	5.13	0.05	5.90	69.64	62.80	259.00
03/17/15 17:21:39	4282	12.63	5.09	0.06	5.97	69.64	62.80	259.00
03/17/15 17:22:09	4312	12.37	4.10	0.05	6.25	69.66	62.70	259.00
03/17/15 17:22:39	4342	13.05	4.47	0.05	5.69	69.66	62.70	259.00
03/17/15 17:23:09	4372	12.84	5.45	0.06	5.87	69.66	62.70	259.00
03/17/15 17:23:39	4402	13.21	5.38	0.05	5.64	69.66	62.70	259.00
03/17/15 17:24:09	4432	13.18	5.59	0.04	5.46	69.68	62.70	227.00
03/17/15 17:24:39	4462	12.29	3.60	0.03	6.29	69.68	62.70	227.00
03/17/15 17:25:09	4492	12.27	1.98	0.01	6.31	69.84	62.70	178.00
03/17/15 17:25:39	4522	13.03	2.85	0.04	5.70	69.84	62.70	178.00
03/17/15 17:26:09	4552	13.17	3.91	0.03	5.62	69.95	62.60	162.00
03/17/15 17:26:39	4582	13.07	4.20	0.04	5.67	69.95	62.60	162.00
03/17/15 17:27:09	4612	13.30	4.47	0.03	5.52	70.05	62.60	146.00
RAW AVERAGE		12.85	4.62	0.05	5.84	68.56	63.67	222.92

Bias	Serial Number:				Press. Trans	Temp. Trans.	F-Flow Trans.
	INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557
		(%)	(ppmvd)	(ppmvw)	(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.08	0.21	-0.02			
	Final Zero	0.09	0.22	-0.01			
	Avg. Zero	0.09	0.22	-0.02			
	Initial UpScale	12.02	9.21	3.13			
	Final UpScale	12.06	9.19	3.15			
	Avg. UpScale	12.04	9.20	3.14			
Upscale Cal Gas		12.06	9.19	3.02	8.87		

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.88	4.50	0.07	5.78
Corrected Raw Average (ppm/% wet basis)	12.19	4.25	0.06	5.47
Emission Rate (lb/hr)	N/A	0.02	0.00	N/A

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.8	%
Stack Exhaust Flow (M2)	51,941	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	59	%
Ambient Temperature	59	°F
Specific Humidity	0.006182	lb H ₂ O / lb air

0-30-0 Load, Run - Q100 R3

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmwv)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/17/15 17:41:09	5452	13.75	3.45	0.04	5.11	69.50	61.50	162.00
	03/17/15 17:41:39	5482	13.74	3.85	0.04	5.19	69.50	61.50	162.00
	03/17/15 17:42:09	5512	13.90	3.84	0.04	5.00	69.63	61.50	162.00
	03/17/15 17:42:39	5542	13.19	3.66	0.03	5.51	69.63	61.50	162.00
	03/17/15 17:43:09	5572	13.40	3.28	0.03	5.46	69.73	61.50	179.00
	03/17/15 17:43:39	5602	13.74	3.68	0.04	5.18	69.73	61.50	179.00
	03/17/15 17:44:09	5632	13.84	4.39	0.04	5.09	69.83	61.50	195.00
	03/17/15 17:44:39	5662	13.59	4.47	0.03	5.20	69.83	61.50	195.00
	03/17/15 17:45:09	5692	13.45	4.39	0.03	5.34	69.89	61.50	195.00
	03/17/15 17:45:39	5722	12.33	3.44	0.03	6.21	69.89	61.50	195.00
	03/17/15 17:46:09	5752	12.10	3.58	0.02	6.40	69.94	61.50	195.00
	03/17/15 17:46:39	5782	11.74	3.59	0.02	6.62	69.94	61.50	195.00
	03/17/15 17:47:09	5812	12.56	2.90	0.03	6.17	70.00	61.50	195.00
	03/17/15 17:47:39	5842	13.11	4.21	0.04	5.66	70.00	61.50	195.00
	03/17/15 17:48:09	5872	12.95	4.81	0.03	5.72	70.05	61.50	179.00
	03/17/15 17:48:39	5902	13.18	4.83	0.04	5.60	70.05	61.50	179.00
	03/17/15 17:49:09	5932	13.14	5.31	0.05	5.61	70.10	61.60	196.00
	03/17/15 17:49:39	5962	12.76	4.75	0.03	5.90	70.10	61.60	196.00
	03/17/15 17:50:09	5992	13.23	4.50	0.05	5.56	70.15	61.50	196.00
	03/17/15 17:50:39	6022	13.27	4.69	0.04	5.47	70.15	61.50	196.00
	03/17/15 17:51:09	6052	13.13	4.59	0.05	5.65	70.19	61.50	228.00
	03/17/15 17:51:39	6082	13.33	4.63	0.03	5.48	70.19	61.50	228.00
	03/17/15 17:52:09	6112	13.23	4.81	0.02	5.57	70.17	61.50	261.00
	03/17/15 17:52:39	6142	13.22	4.80	0.05	5.55	70.17	61.50	261.00
	03/17/15 17:53:09	6172	13.21	4.59	0.04	5.57	70.16	61.40	245.00
	03/17/15 17:53:39	6202	13.37	4.79	0.05	5.47	70.16	61.40	245.00
	03/17/15 17:54:09	6232	13.07	4.99	0.04	5.65	70.15	61.40	245.00
	03/17/15 17:54:39	6262	13.11	4.95	0.05	5.63	70.15	61.40	245.00
	03/17/15 17:55:09	6292	13.32	5.10	0.04	5.50	70.14	61.30	245.00
	03/17/15 17:55:39	6322	12.98	5.04	0.03	5.73	70.14	61.30	245.00
	03/17/15 17:56:09	6352	13.23	5.10	0.03	5.51	70.16	61.30	245.00
	03/17/15 17:56:39	6382	12.85	5.18	0.03	5.84	70.16	61.30	245.00
	03/17/15 17:57:09	6412	13.08	4.69	0.05	5.70	70.18	61.20	229.00
	03/17/15 17:57:39	6442	12.84	4.91	0.04	5.82	70.18	61.20	229.00
	03/17/15 17:58:09	6472	13.87	4.79	0.05	5.12	70.20	61.10	261.00
	03/17/15 17:58:39	6502	13.69	4.25	0.04	5.21	70.20	61.10	261.00
	03/17/15 17:59:09	6532	14.22	4.44	0.05	4.83	70.22	61.10	245.00
	03/17/15 17:59:39	6562	13.75	4.88	0.04	5.10	70.22	61.10	245.00
	03/17/15 18:00:09	6592	13.68	4.78	0.04	5.21	70.22	60.90	245.00
	03/17/15 18:00:39	6622	13.80	4.63	0.04	5.07	70.22	60.90	245.00
	03/17/15 18:01:09	6652	13.79	4.34	0.04	5.14	70.23	60.80	245.00
	03/17/15 18:01:39	6682	13.74	4.66	0.04	5.09	70.23	60.80	245.00
	03/17/15 18:02:09	6712	13.72	4.52	0.03	5.20	70.25	60.80	229.00
	03/17/15 18:02:39	6742	13.56	4.53	0.04	5.23	70.25	60.80	229.00
	03/17/15 18:03:09	6772	12.16	4.57	0.03	6.27	70.31	60.80	180.00
	03/17/15 18:03:39	6802	12.46	3.41	0.03	6.22	70.31	60.80	180.00
	03/17/15 18:04:09	6832	12.97	3.45	0.04	5.77	70.41	60.70	164.00
A2	03/17/15 18:04:39	6862	13.12	3.74	0.03	5.60	70.41	60.70	164.00
	03/17/15 18:05:09	6892	13.36	3.89	0.03	5.42	70.47	60.70	164.00
	03/17/15 18:05:39	6922	13.18	3.87	0.03	5.58	70.47	60.70	164.00
	03/17/15 18:06:09	6952	13.09	3.88	0.04	5.61	70.54	60.70	197.00
	03/17/15 18:06:39	6982	13.35	3.84	0.04	5.47	70.54	60.70	197.00
	03/17/15 18:07:09	7012	12.86	3.71	0.02	5.84	70.60	60.60	181.00
	03/17/15 18:07:39	7042	13.15	3.57	0.03	5.57	70.60	60.60	181.00
	03/17/15 18:08:09	7072	12.86	3.77	0.03	5.82	70.61	60.50	279.00
	03/17/15 18:08:39	7102	12.86	3.56	0.03	5.78	70.61	60.50	279.00
	03/17/15 18:09:09	7132	13.11	3.52	0.04	5.68	70.60	60.50	263.00
	03/17/15 18:09:39	7162	13.10	3.80	0.05	5.67	70.60	60.50	263.00
	03/17/15 18:10:09	7192	13.16	3.89	0.05	5.58	70.58	60.50	246.00
	03/17/15 18:10:39	7222	13.21	3.92	0.04	5.55	70.58	60.50	246.00

Questor Technology Inc
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Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.8	%
Stack Exhaust Flow (M2)	51,941	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	59	%
Ambient Temperature	59	°F
Specific Humidity	0.006182	lb H ₂ O / lb air

0-30-0 Load, Run - Q100 R3

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/17/15 18:11:09	7252	12.99	3.98	0.04	5.70	70.60	60.40	247.00
	03/17/15 18:11:39	7282	13.26	3.59	0.04	5.54	70.60	60.40	247.00
	03/17/15 18:12:09	7312	12.94	3.92	0.05	5.74	70.59	60.40	263.00
	03/17/15 18:12:39	7342	13.09	3.82	0.04	5.66	70.59	60.40	263.00
	03/17/15 18:13:09	7372	12.83	3.56	0.04	5.81	70.58	60.40	263.00
	03/17/15 18:13:39	7402	14.42	3.53	0.06	4.83	70.58	60.40	263.00
	03/17/15 18:14:09	7432	14.55	4.49	0.06	4.59	70.58	60.40	263.00
	03/17/15 18:14:39	7462	14.23	4.62	0.05	4.83	70.58	60.40	263.00
	03/17/15 18:15:09	7492	13.51	4.16	0.02	5.28	70.57	60.40	263.00
	03/17/15 18:15:39	7522	13.59	4.25	0.03	5.24	70.57	60.40	263.00
	03/17/15 18:16:09	7552	13.70	4.27	0.02	5.15	70.57	60.40	230.00
	03/17/15 18:16:39	7582	13.48	4.23	0.03	5.36	70.57	60.40	230.00
	03/17/15 18:17:09	7612	13.24	4.16	0.02	5.51	70.57	60.40	230.00
	03/17/15 18:17:39	7642	13.45	3.89	0.02	5.37	70.57	60.40	230.00
	03/17/15 18:18:09	7672	13.10	4.35	0.02	5.61	70.57	60.50	214.00
	03/17/15 18:18:39	7702	12.47	4.23	0.03	6.11	70.57	60.50	214.00
	03/17/15 18:19:09	7732	12.29	3.97	0.02	6.28	70.65	60.50	148.00
	03/17/15 18:19:39	7762	12.34	3.85	0.04	6.19	70.65	60.50	148.00
	03/17/15 18:20:09	7792	12.25	3.45	0.03	6.31	70.76	60.50	165.00
	03/17/15 18:20:39	7822	12.29	3.26	0.02	6.28	70.76	60.50	165.00
	03/17/15 18:21:09	7852	12.43	3.31	0.03	6.17	70.86	60.50	165.00
	03/17/15 18:21:39	7882	12.41	3.38	0.03	6.17	70.86	60.50	165.00
	03/17/15 18:22:09	7912	12.35	3.31	0.03	6.19	70.95	60.50	165.00
	03/17/15 18:22:39	7942	12.26	3.14	0.02	6.26	70.95	60.50	165.00
	03/17/15 18:23:09	7972	12.09	2.74	0.02	6.44	70.99	60.40	248.00
	03/17/15 18:23:39	8002	11.96	2.61	0.02	6.45	70.99	60.40	248.00
	03/17/15 18:24:09	8032	12.21	2.29	0.02	6.39	70.95	60.20	264.00
	03/17/15 18:24:39	8062	12.38	2.72	0.03	6.18	70.95	60.20	264.00
	03/17/15 18:25:09	8092	12.32	2.81	0.02	6.24	70.93	60.00	264.00
	03/17/15 18:25:39	8122	12.48	2.88	0.03	6.10	70.93	60.00	264.00
	03/17/15 18:26:09	8152	12.23	2.97	0.02	6.33	70.88	59.90	264.00
	03/17/15 18:26:39	8182	12.36	2.88	0.03	6.22	70.88	59.90	264.00
	03/17/15 18:27:09	8212	12.25	2.84	0.02	6.30	70.82	59.80	264.00
	03/17/15 18:27:39	8242	12.38	2.71	0.02	6.20	70.82	59.80	264.00
A3	03/17/15 18:28:09	8272	12.44	2.84	0.02	6.16	70.79	59.70	264.00
	03/17/15 18:28:39	8302	12.44	2.83	0.03	6.16	70.79	59.70	264.00
	03/17/15 18:29:09	8332	12.36	2.83	0.03	6.21	70.77	59.60	264.00
	03/17/15 18:29:39	8362	12.41	2.58	0.03	6.19	70.77	59.60	264.00
	03/17/15 18:30:09	8392	12.31	2.52	0.02	6.27	70.74	59.60	264.00
	03/17/15 18:30:39	8422	13.14	2.98	0.02	5.58	70.74	59.60	264.00
	03/17/15 18:31:09	8452	12.13	2.56	0.00	6.32	70.72	59.50	264.00
	03/17/15 18:31:39	8482	11.55	1.24	0.00	6.84	70.72	59.50	264.00
	03/17/15 18:32:09	8512	11.52	0.81	0.00	6.83	70.69	59.40	264.00
	03/17/15 18:32:39	8542	11.60	0.76	0.00	6.75	70.69	59.40	264.00
	03/17/15 18:33:09	8572	11.50	0.69	0.00	6.84	70.67	59.30	264.00
	03/17/15 18:33:39	8602	11.68	0.64	0.00	6.74	70.67	59.30	264.00
	03/17/15 18:34:09	8632	11.69	0.71	0.00	6.72	70.63	59.20	264.00
	03/17/15 18:34:39	8662	11.66	0.74	0.00	6.70	70.63	59.20	264.00
	03/17/15 18:35:09	8692	11.66	0.65	0.00	6.77	70.59	59.10	231.00
	03/17/15 18:35:39	8722	13.02	1.59	0.03	5.77	70.59	59.10	231.00
	03/17/15 18:36:09	8752	13.07	3.30	0.03	5.66	70.62	59.10	181.00
	03/17/15 18:36:39	8782	12.69	2.91	0.03	5.95	70.62	59.10	181.00
	03/17/15 18:37:09	8812	12.36	2.30	0.03	6.24	70.68	59.10	198.00
	03/17/15 18:37:39	8842	12.63	2.20	0.03	6.01	70.68	59.10	198.00
	03/17/15 18:38:09	8872	12.63	2.21	0.03	6.01	70.72	59.00	198.00
	03/17/15 18:38:39	8902	12.57	2.10	0.03	6.06	70.72	59.00	198.00
	03/17/15 18:39:09	8932	12.66	2.12	0.03	6.00	70.74	59.00	198.00
	03/17/15 18:39:39	8962	12.67	2.23	0.03	5.98	70.74	59.00	198.00
	03/17/15 18:40:09	8992	12.68	2.20	0.03	5.95	70.75	58.90	215.00
	03/17/15 18:40:39	9022	12.74	2.12	0.03	5.96	70.75	58.90	215.00

Questor Technology Inc
March 17, 2015
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Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.8	%
Stack Exhaust Flow (M2)	51,941	SCFH

Weather Data

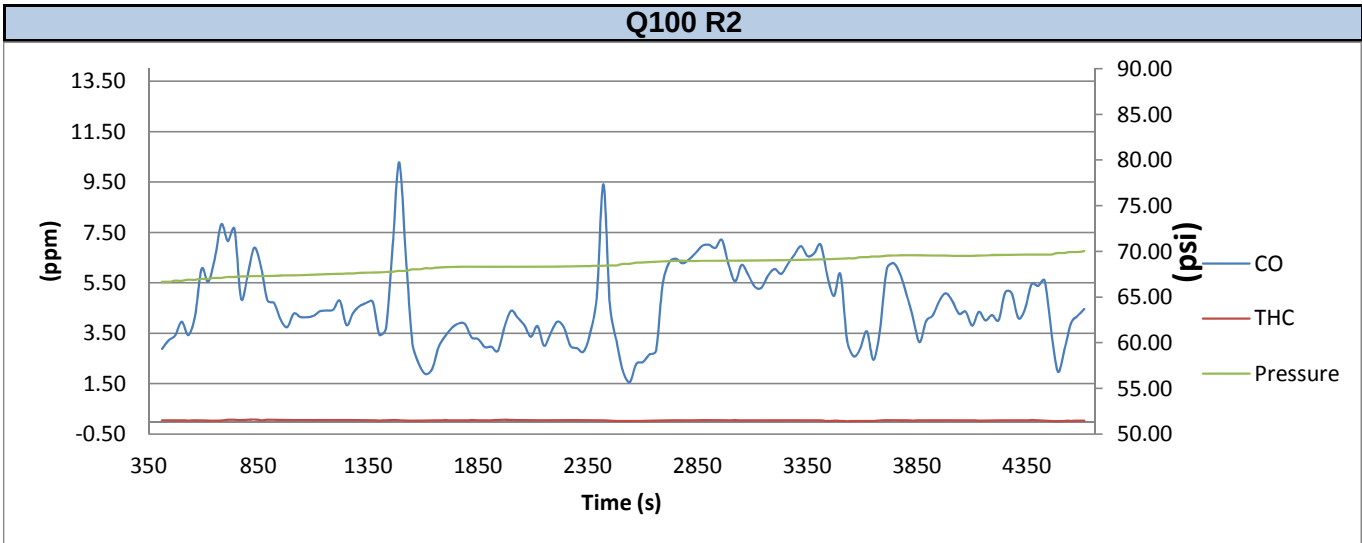
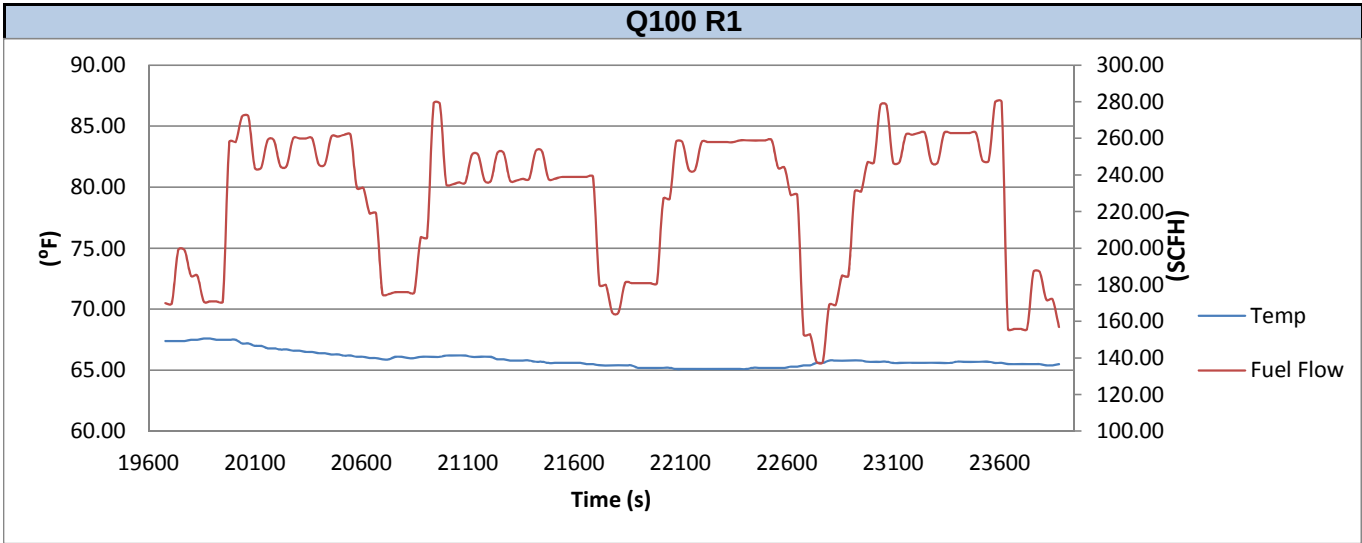
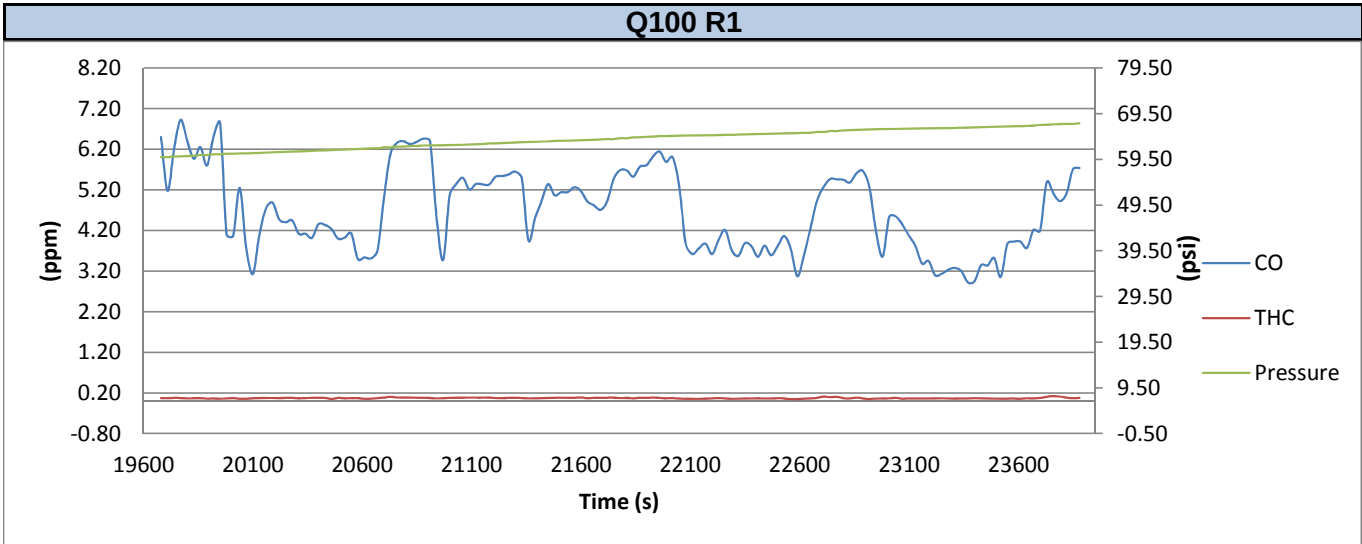
Barometric Pressure	30.19	in. Hg
Relative Humidity	59	%
Ambient Temperature	59	°F
Specific Humidity	0.006182	lb H ₂ O / lb air

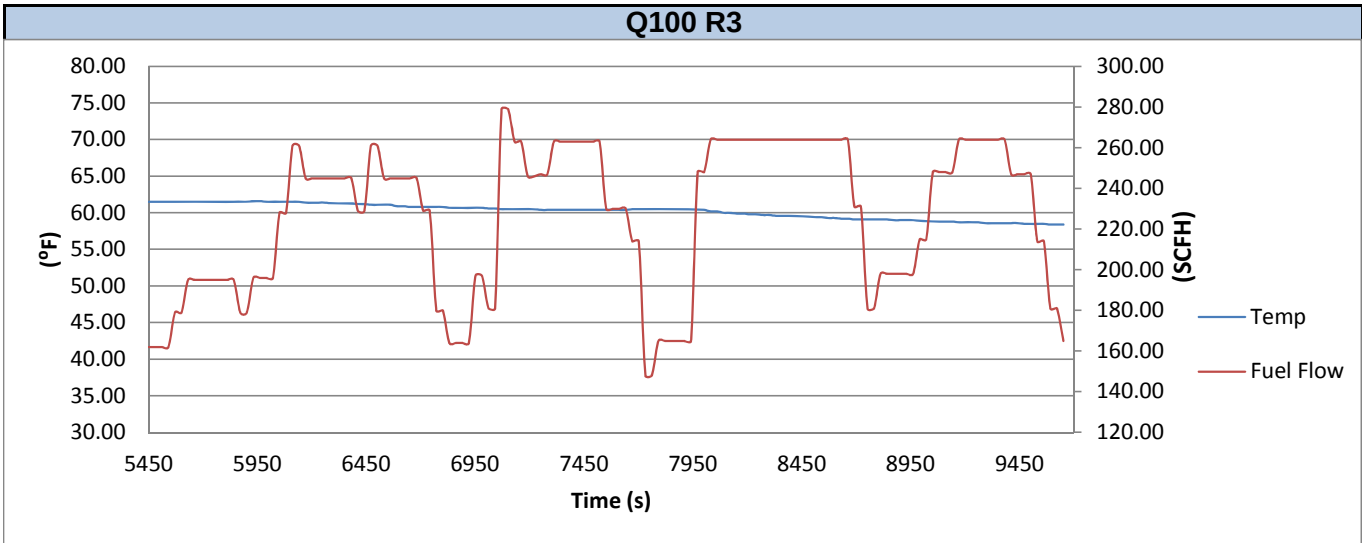
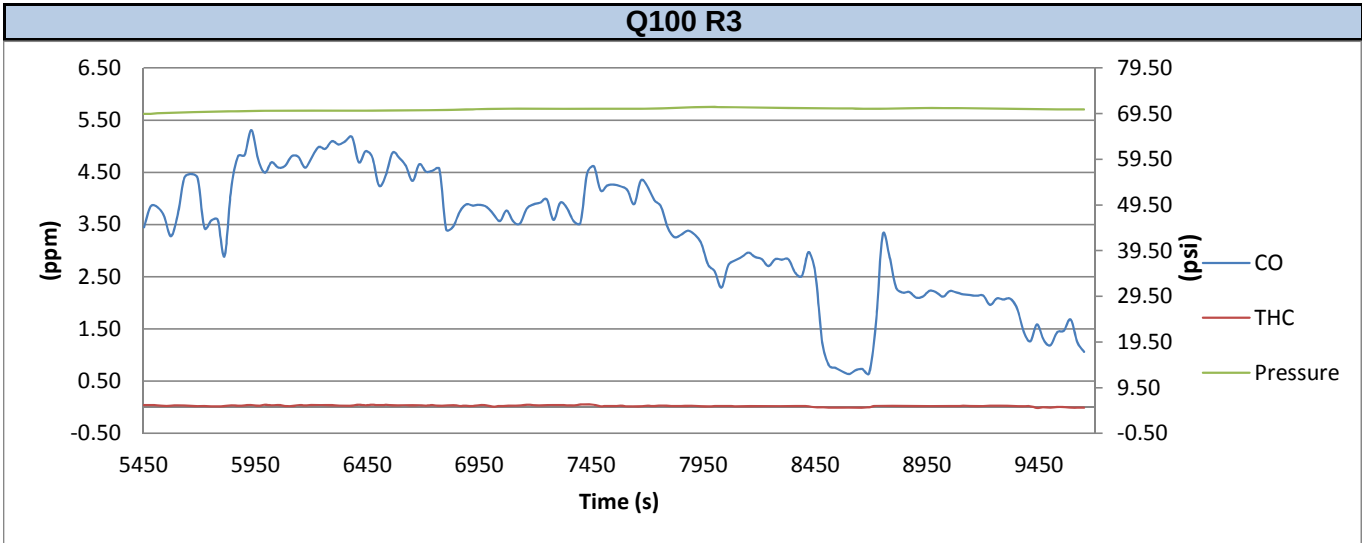
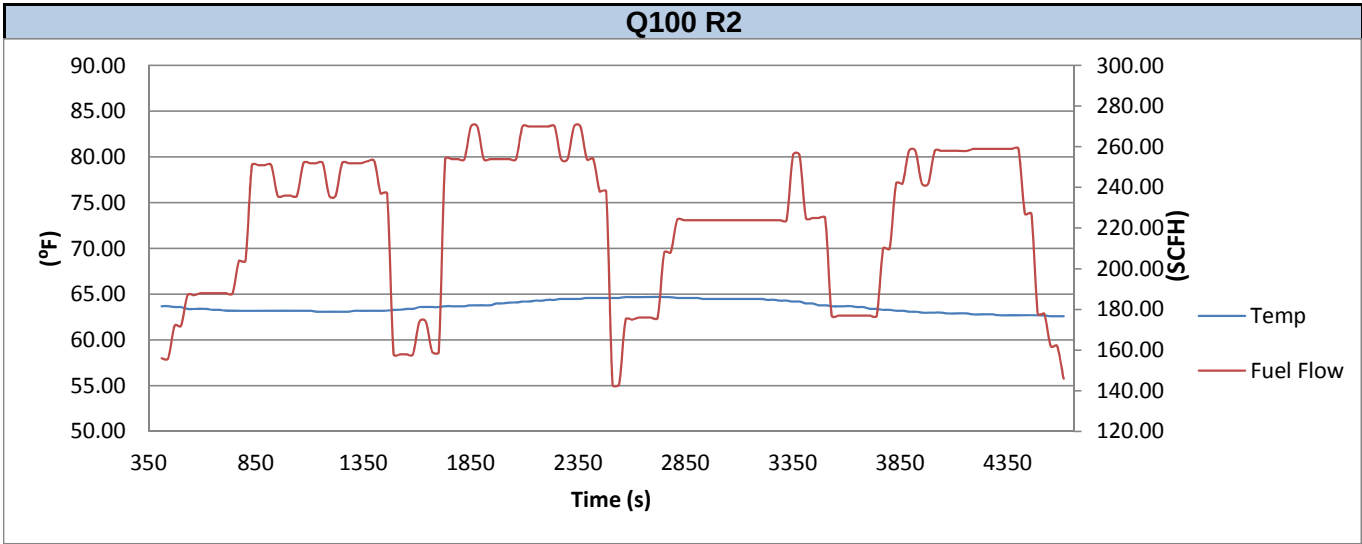
0-30-0 Load, Run - Q100 R3

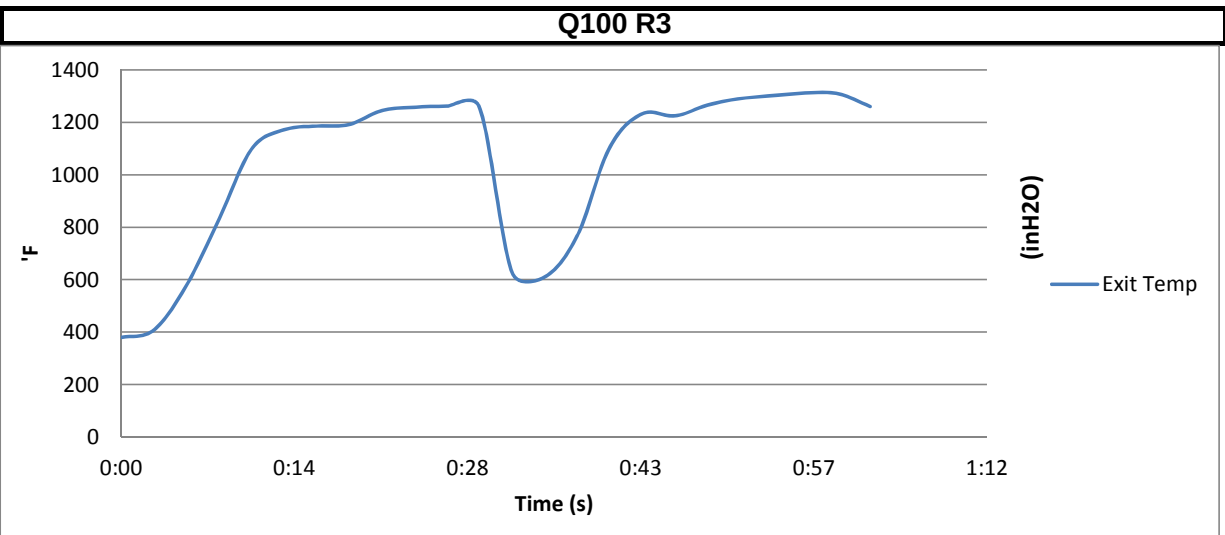
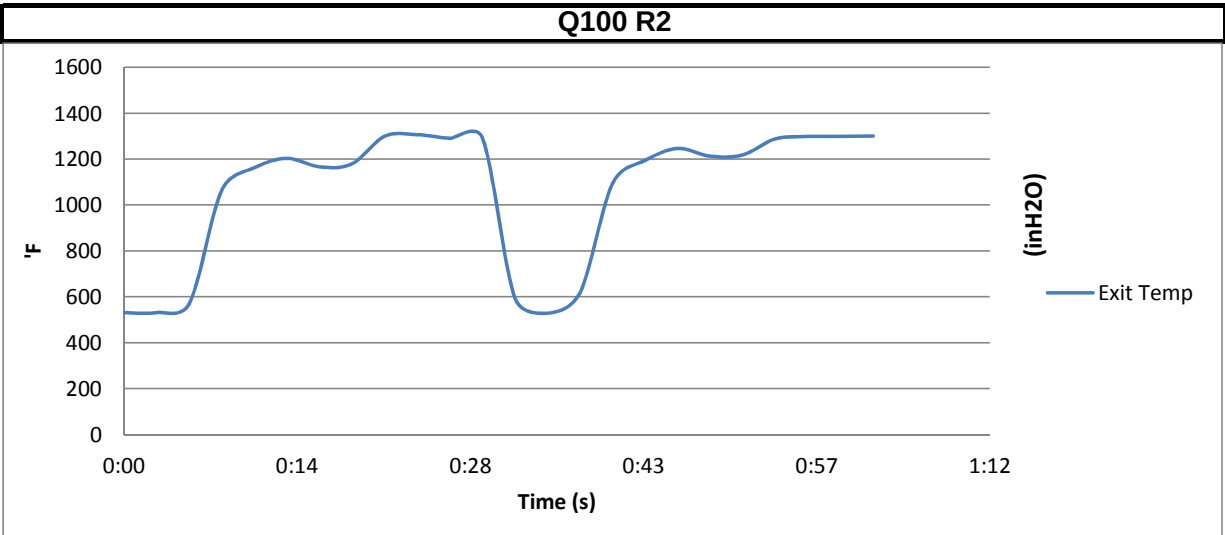
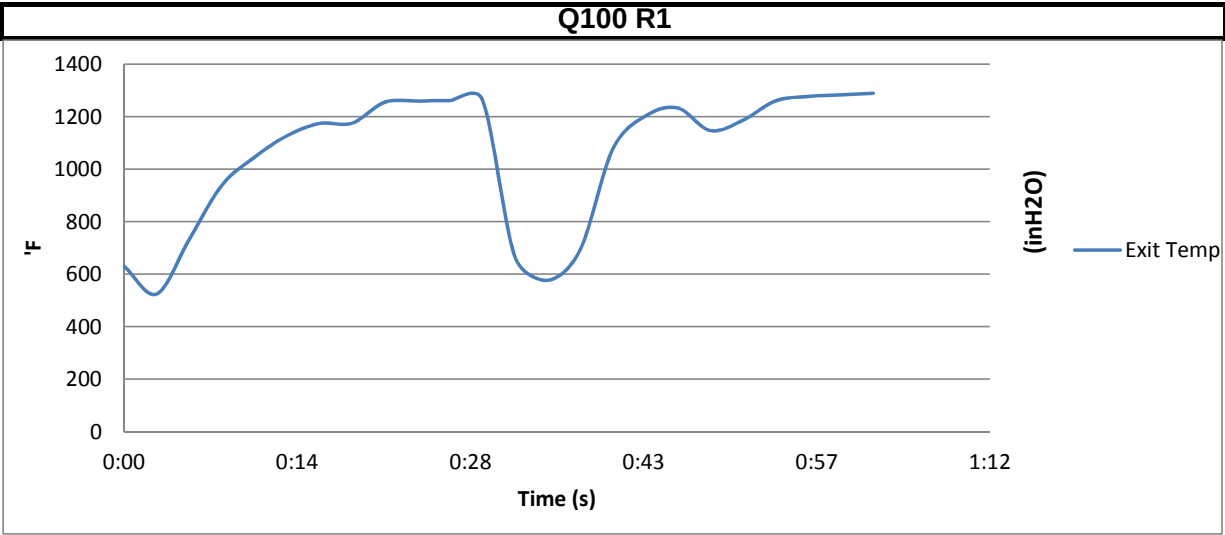
Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/17/15 18:41:09	9052	12.74	2.23	0.03	5.93	70.73	58.80	248.00
03/17/15 18:41:39	9082	12.65	2.20	0.03	6.01	70.73	58.80	248.00
03/17/15 18:42:09	9112	12.69	2.17	0.03	5.96	70.71	58.80	248.00
03/17/15 18:42:39	9142	12.66	2.15	0.03	5.98	70.71	58.80	248.00
03/17/15 18:43:09	9172	12.64	2.14	0.02	6.01	70.69	58.70	264.00
03/17/15 18:43:39	9202	12.51	2.14	0.03	6.12	70.69	58.70	264.00
03/17/15 18:44:09	9232	12.63	1.96	0.03	6.02	70.64	58.70	264.00
03/17/15 18:44:39	9262	12.68	2.09	0.03	5.98	70.64	58.70	264.00
03/17/15 18:45:09	9292	12.68	2.07	0.03	5.98	70.59	58.60	264.00
03/17/15 18:45:39	9322	12.60	2.08	0.03	6.05	70.59	58.60	264.00
03/17/15 18:46:09	9352	12.23	1.91	0.03	6.31	70.55	58.60	264.00
03/17/15 18:46:39	9382	12.05	1.46	0.02	6.40	70.55	58.60	264.00
03/17/15 18:47:09	9412	12.21	1.27	0.02	6.37	70.51	58.60	247.00
03/17/15 18:47:39	9442	12.29	1.59	-0.01	6.26	70.51	58.60	247.00
03/17/15 18:48:09	9472	12.11	1.29	0.00	6.39	70.49	58.50	247.00
03/17/15 18:48:39	9502	12.46	1.19	0.00	6.14	70.49	58.50	247.00
03/17/15 18:49:09	9532	12.51	1.44	0.01	6.13	70.48	58.50	214.00
03/17/15 18:49:39	9562	12.57	1.47	0.01	6.05	70.48	58.50	214.00
03/17/15 18:50:09	9592	12.32	1.69	0.00	6.22	70.45	58.40	181.00
03/17/15 18:50:39	9622	12.26	1.25	-0.01	6.29	70.45	58.40	181.00
03/17/15 18:51:09	9652	12.15	1.07	-0.01	6.38	70.44	58.40	165.00
RAW AVERAGE		12.84	3.29	0.03	5.84	70.46	60.23	226.43

Bias	Serial Number:	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans (in. H ₂ O)	Temp. Trans. (°F)	F-Flow Trans. (SCFH)
	INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557	
	Initial Zero	0.09	0.22	-0.01	0.12			
	Final Zero	0.05	0.22	-0.03	0.12			
	Avg. Zero	0.07	0.22	-0.02	0.12			
	Initial UpScale	12.06	9.19	3.15	8.89			
	Final UpScale	12.01	9.21	3.07	8.91			
	Avg. UpScale	12.04	9.20	3.11	8.90			
Upscale Cal Gas		12.06	9.19	3.02	8.87			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.87	3.14	0.05	5.78
Corrected Raw Average (ppm/% wet basis)	12.25	2.98	0.05	5.50
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A







EMISSION DATA RECORDS

30-70-30% Ramp-up, Ramp-down Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	03/18/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		30-70-30%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		4	5	6	
Test Date	(mm/dd/yy)	03/18/15	03/18/15	03/18/15	
Load	% or w/DB	30-70-30	30-70-30	30-70-30	
Meter Box Number	from ACS	SAMP-CP-0008	SAMP-CP-0008	SAMP-CP-0008	
Meter Calibration Factor	(Y)	0.883	0.883	0.883	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.698	1.698	1.698	in H ₂ O
Pitot Identification	from ACS	4-17-14-2	4-17-14-2	4-17-14-2	
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840	
Probe Number	from ACS	SAMP-SP-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Impinger Case Number	from ACS	SAMP-BC-0002	SAMP-BC-0002	SAMP-BC-0002	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Run Start Time	10:05	11:36	13:00		hh:mm
Run Stop Time	11:15	12:46	14:10		hh:mm
Test Date	03/18/15	03/18/15	03/18/15		mm/dd/yy
Meter Calibration Factor	0.883	0.883	0.883		
Pitot Tube Coefficient	0.840	0.840	0.840		
Stack Test Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Initial Meter Volume	846.080	901.090	956.030		ft ³
Final Meter Volume	900.010	955.070	1010.080		ft ³
Total Meter Volume	53.930	53.980	54.050	53.987	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	82.56	87.10	89.39	86.35	°F
Average Stack Temperature	1288.79	1288.88	1306.21	1294.63	°F
Barometric Pressure	30.11	30.11	30.08	30.10	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	30.11	30.11	30.08	30.10	in Hg
Average Orifice Pressure Drop	1.60	1.60	1.60	1.60	in H ₂ O
Absolute Meter Pressure	30.23	30.23	30.20	30.22	in Hg
Avg Square Root Pitot Pressure	0.19	0.18	0.18	0.19	√(in H ₂ O)
Moisture Content Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Impinger Water Weight Gain	47.90	40.10	44.50	44.17	g
Silica Gel Weight Gain	13.50	11.70	10.50	11.90	g
Total Water Volume Collected	61.51	51.89	55.10	56.17	ml
Standard Water Vapor Volume	2.90	2.44	2.59	2.64	scf
Standard Meter Volume	46.8	46.5	46.3	46.5	dscf
Calculated Stack Moisture	5.82	4.99	5.30	5.37	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	5.82	4.99	5.30	5.37	%
Gas Analysis Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Carbon Dioxide Content	5.3	5.4	5.4	5.4	%
Oxygen Content	15.0	14.7	14.8	14.8	%
Nitrogen Content	79.8	79.9	79.8	79.8	%
Stack Dry Molecular Weight	29.46	29.46	29.46	29.46	lb/lb-mole
Stack Wet Molecular Weight	28.80	28.88	28.85	28.84	lb/lb-mole
Percent Excess Air	247.2	230.4	236.2	237.9	%
Volumetric Flow Rate Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Average Stack Gas Velocity	19.95	18.28	18.75	19.00	ft/sec
Stack Cross-Sectional Area	3.05	3.05	3.05	3.05	ft ²
Actual Stack Flow Rate	3,646	3,340	3,427	3,471	acfm
Wet Standard Stack Flow Rate	66	61	62	63	wkscfh
Dry Standard Stack Flow Rate	62,598	57,848	58,520	59,655	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/18/15		
Sampling Location	Q100	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	30-70-30%-4		Date	03/18/15	Run Start Time	10:05	Run Stop Time	11:15
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.3	15.0	0.0	79.8	29.46	1.120	247.2	N/A

Gas Analysis Data								
Run Number	30-70-30%-5		Date	03/18/15	Run Start Time	11:36	Run Stop Time	12:46
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.4	14.7	79.8	79.9	29.46	1.139	230.1	N/A

Gas Analysis Data								
Run Number	30-70-30%-6		Date	03/18/15	Run Start Time	13:00	Run Stop Time	14:10
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.4	14.8	0.0	79.8	29.46	1.130	236.2	N/A

Gas Analysis Data								
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METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/18/15
Sampling Location	Q100	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	30-70%		Date	03/18/15	Start Time	10:05	Stop Time	11:15
Meter Box Number	SAM-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	53.930	dcf		Barometric Pressure	(P _b)	30.11	in Hg
Average Stack Temp	(t _s) _{avg}	1289	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	83	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	949.30	864.00	588.50	917.50			
Initial Value	(V _i),(W _i)	908.50	859.50	585.90	904.00			
Net Value	(V _n),(W _n)	40.8	4.5	2.6	13.5			
Results								
Total Weight	(W _f)	61.40	g	Water Vol Weighed	(V _{wsg(std)})	2.895	scf	
Std Meter Volume	(V _{m(std)})	46.819	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.82	%	Final Moisture Content	(B _{ws})	5.82	%	

Moisture Content Data								
Run Number	30-70-30%-5		Date	03/18/15	Start Time	11:36	Stop Time	12:46
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	53.980	dcf		Barometric Pressure	(P _b)	30.11	in Hg
Average Stack Temp	(t _s) _{avg}	1289	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	87	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	969.50	883.10	589.30	831.20			
Initial Value	(V _i),(W _i)	949.30	864.00	588.50	819.50			
Net Value	(V _n),(W _n)	20.2	19.1	0.8	11.7			
Results								
Total Weight	(W _f)	51.80	g	Water Vol Weighed	(V _{wsg(std)})	2.442	scf	
Std Meter Volume	(V _{m(std)})	46.473	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	4.99	%	Final Moisture Content	(B _{ws})	4.99	%	

Moisture Content Data								
Run Number	30-70-30%-6		Date	03/18/15	Start Time	13:00	Stop Time	14:10
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	54.050	dcf		Barometric Pressure	(P _b)	30.08	in Hg
Average Stack Temp	(t _s) _{avg}	1306	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	89	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	972.60	922.00	591.80	848.10			
Initial Value	(V _i),(W _i)	969.50	883.10	589.30	837.60			
Net Value	(V _n),(W _n)	3.1	38.9	2.5	10.5			
Results								
Total Weight	(W _f)	55.00	g	Water Vol Weighed	(V _{wsg(std)})	2.593	scf	
Std Meter Volume	(V _{m(std)})	46.293	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.30	%	Final Moisture Content	(B _{ws})	5.30	%	

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/18/15
Operator	CG
Run Number	30-70-30%-4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.840	
Average Stack Temp	(t _s)	1288.8	°F
Average Meter Temp	(t _m)	82.6	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(Δp ^{1/2} _{avg})	0.19	in H ₂ O
Stack Moisture Content	(B _{ws})	5.82	%
Stack Dry Molecular Weight	(M _d)	29.46	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
#REF!	Pitot	Pre (+)	0.250	in H ₂ O for	15.0
		Pre (-)	0.300	in H ₂ O for	20.0
		Post (+)	0.250	in H ₂ O for	20.0
		Post (-)	0.200	in H ₂ O for	15.0

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4062 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0002	

Pressures			
Barometric Pressure	(P _b)	30.11	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.11	in Hg
Absolute Meter Pressure	(P _m)	30.23	in Hg

Run Time			
Start	10:05	End	11:15

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	908.5	859.5	585.9	904.0				
Post	949.3	864.0	588.5	917.5				

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (±±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (Δp ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	846.080	0.010	1.698	1.60	790	254		54			72	72	0.9	0.10	8.62	2.612		62.684
A-2	2.7	00:02:43	849.030	0.020	1.698	1.60	833	254		51			73	72	0.9	0.14	12.40	4.381		52.571
A-3	5.4	00:05:25	851.030	0.060	1.698	1.60	1134	255		52			75	72	0.9	0.24	23.85	6.156		49.244
A-4	8.1	00:08:07	853.040	0.070	1.698	1.60	1270	255		52			76	72	0.9	0.26	26.84	7.928		47.571
A-5	10.8	00:10:50	855.050	0.050	1.698	1.60	1343	254		52			80	73	0.9	0.22	23.16	10.527		50.530
A-6	13.5	00:13:33	858.010	0.050	1.698	1.60	1428	253		52			83	74	0.9	0.22	23.70	12.303		49.211
A-7	16.3	00:16:15	860.040	0.030	1.698	1.60	1380	253		52			84	74	0.9	0.17	18.12	14.094		48.323
A-8	19.0	00:18:58	862.090	0.030	1.698	1.60	1351	256		52			86	75	0.9	0.17	17.98	15.820		47.459
A-9	21.7	00:21:40	864.070	0.050	1.698	1.60	1437	256		52			87	75	0.9	0.22	23.75	17.561		46.829
A-10	24.4	00:24:22	866.070	0.050	1.698	1.60	1464	256		52			88	77	0.9	0.22	23.92	20.157		48.377
A-11	27.1	00:27:05	869.060	0.040	1.698	1.60	1461	256		52			89	78	0.9	0.20	21.38	21.856		47.685
A-12	29.8	00:29:47	871.020	0.040	1.698	1.60	1475	256		52			84	78	0.9	0.20	21.46	23.658		47.316
B-1	32.5	00:32:30	873.090	0.010	1.698	1.60	850	256		52			87	79	0.9	0.10	8.83	25.349		46.799
B-2	35.2	00:35:12	875.040	0.030	1.698	1.60	859	257		52			89	80	0.9	0.17	15.34	27.927		47.875
B-3	37.9	00:37:55	878.020	0.040	1.698	1.60	1125	256		51			90	80	0.9	0.20	19.42	29.656		47.449
B-4	40.6	00:40:37	880.020	0.040	1.698	1.60	1195	254		51			92	81	0.9	0.20	19.84	31.423		47.134
B-5	43.3	00:43:20	882.070	0.050	1.698	1.60	1388	257		52			92	82	0.9	0.22	23.44	33.954		47.935
B-6	46.0	00:46:03	885.010	0.040	1.698	1.60	1493	254		52			93	83	0.9	0.20	21.56	35.733		47.644
B-7	48.8	00:48:45	887.080	0.020	1.698	1.60	1379	254		52			93	83	0.9	0.14	14.79	37.409		47.254
B-8	51.5	00:51:28	889.030	0.020	1.698	1.60	1371	261		52			94	83	0.9	0.14	14.76	39.144		46.973
B-9	54.2	00:54:10	891.050	0.050	1.698	1.60	1456	257		54			95	84	0.9	0.22	23.87	40.841		46.676
B-10	56.9	00:56:53	893.030	0.060	1.698	1.60	1478	260		54			94	84	0.9	0.24	26.30	43.398		47.343
B-11	59.6	00:59:35	896.010	0.050	1.698	1.60	1481	258		54			94	84	0.9	0.22	24.03	45.165		47.129
B-12	62.3	01:02:18	898.070	0.040	1.698	1.60	1490	257		54			94	84	0.9	0.20	21.54	46.830		46.830
Last Pt	65.0	01:05:00	900.010																	
Final Val	65.0	01:05:00	900.010											Max Vac	0.9		Final Values	46.830		
Average Values				0.04		1.60	1289	256		52			87	78		0.19	19.95			
													83							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Date	03/18/15
Operator	CG
Run Number	30-70-30%-5

Sampling Equipment			
Meter Box Number	SAMP-CP-0008		
Meter Cal Factor	(Y)	0.883	
Nozzle Number			
Average Nozzle Diameter	(D _{no})		in
Suggested Nozzle Diameter	(D _{ni})	0.4051	in
Probe Number	SAMP-SP-0001		
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0002		

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.840	
Average Stack Temp	(T_p)	1288.9	°F
Average Meter Temp	(t_m)	87.1	
Orifice Meter Coefficient	($\Delta H @$)	1.698	in H ₂ O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.18	in H ₂ O
Stack Moisture Content	(E_{ws})	4.99	%
Stack Dry Molecular Weight	(M_d)	29.46	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.72	acfm
ΔP to ΔH IsoKinetic Factor	(K)		

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	949.3	864.0	588.5	819.5				
Post	969.5	883.1	589.3	831.2				

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _m)	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (Δp ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{Std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{Std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	901.090	0.020	1.698	1.60	700	258		51			78	82	0.9	0.14	11.73	1.683		40.403
A-2	2.7	00:02:43	903.020	0.020	1.698	1.60	725	258		56			81	82	0.9	0.14	11.85	3.441		41.286
A-3	5.4	00:05:25	905.040	0.040	1.698	1.60	1167	258		57			83	81	0.9	0.20	19.64	6.022		48.173
A-4	8.1	00:08:07	908.010	0.040	1.698	1.60	1327	258		58			85	81	0.9	0.20	20.59	7.791		46.747
A-5	10.8	00:10:50	910.050	0.030	1.698	1.60	1408	256		58			85	81	0.9	0.17	18.23	9.543		45.808
A-6	13.5	00:13:33	912.070	0.040	1.698	1.60	1454	258		57			89	81	0.9	0.20	21.31	11.246		44.984
A-7	16.3	00:16:15	914.040	0.010	1.698	1.60	1400	255		57			90	81	0.9	0.10	10.50	13.810		47.350
A-8	19.0	00:18:58	917.010	0.010	1.698	1.60	1352	255		57			90	81	0.9	0.10	10.37	15.537		46.612
A-9	21.7	00:21:40	919.010	0.040	1.698	1.60	1477	255		57			90	81	0.9	0.20	21.43	17.333		46.222
A-10	24.4	00:24:22	921.090	0.060	1.698	1.60	1490	255		56			91	81	0.9	0.24	26.34	19.007		45.617
A-11	27.1	00:27:05	923.030	0.030	1.698	1.60	1478	255		58			92	82	0.9	0.17	18.57	20.755		45.283
A-12	29.8	00:29:47	925.060	0.060	1.698	1.60	1503	257		58			89	83	0.9	0.24	26.43	23.300		46.600
B-1	32.5	00:32:30	928.010	0.030	1.698	1.60	706	254		58			92	83	0.9	0.17	14.40	25.081		46.303
B-2	35.2	00:35:12	930.080	0.020	1.698	1.60	844	253		57			93	84	0.9	0.14	12.44	26.798		45.940
B-3	37.9	00:37:55	932.080	0.030	1.698	1.60	865	256		57			93	84	0.9	0.17	15.35	29.331		46.930
B-4	40.6	00:40:37	935.030	0.030	1.698	1.60	1419	255		57			95	84	0.9	0.17	18.28	31.037		46.556
B-5	43.3	00:43:20	937.020	0.040	1.698	1.60	1463	257		57			95	84	0.9	0.20	21.36	32.777		46.274
B-6	46.0	00:46:03	939.050	0.040	1.698	1.60	1489	256		57			95	85	0.9	0.20	21.50	35.329		47.106
B-7	48.8	00:48:45	942.030	0.030	1.698	1.60	1383	256		57			95	85	0.9	0.17	18.11	37.034		46.779
B-8	51.5	00:51:28	944.020	0.020	1.698	1.60	1300	256		57			95	85	0.9	0.14	14.45	38.798		46.557
B-9	54.2	00:54:10	946.080	0.030	1.698	1.60	1471	256		58			97	86	0.9	0.17	18.53	40.446		46.224
B-10	56.9	00:56:53	948.010	0.050	1.698	1.60	1505	257		58			97	86	0.9	0.22	24.14	43.025		46.937
B-11	59.6	00:59:35	951.030	0.040	1.698	1.60	1499	258		58			97	87	0.9	0.20	21.56	44.715		46.659
B-12	62.3	01:02:18	953.010	0.040	1.698	1.60	1508	255		58			97	87	0.9	0.20	21.60	46.473		46.473
Last Pt	65.0	01:05:00	955.070																	
Final Val	65.0	01:05:00	955.070																	
Average Values				0.03		1.60	1289	256		57			91	83	0.9	Final Values		46.473		
													87				0.18	18.28		

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/18/15
Operator	CG
Run Number	30-70-30%-6

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
#REF!	Pitot	Pre (+)	0.250	in H ₂ O for	15.0
		Pre (-)	0.250	in H ₂ O for	15.0
		Post (+)	0.300	in H ₂ O for	20.0
		Post (-)	0.250	in H ₂ O for	20.0

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4015 in
Probe Number	SAMP-SP-0001	
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0002	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.840	
Average Stack Temp	(t _s)	1306.2	°F
Average Meter Temp	(t _m)	89.4	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.18	in H ₂ O
Stack Moisture Content	(B _{ws})	5.30	%
Stack Dry Molecular Weight	(M _d)	29.46	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.71	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Nozzle Measurements			
Pre			PASS
Post			PASS

Run Time			
Start	13:00	End	14:10

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	969.5	883.1	589.3	837.6				
Post	972.6	922.0	591.8	848.1				

Pressures			
Barometric Pressure	(P _b)	30.08	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.08	in Hg
Absolute Meter Pressure	(P _m)	30.20	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (±±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	956.030	0.010	1.698	1.60	850	258		57			82	86	0.9	0.10	8.82	1.756		42.142
A-2	2.7	00:02:43	958.060	0.020	1.698	1.60	891	258		61			83	85	0.9	0.14	12.67	4.308		51.691
A-3	5.4	00:05:25	961.010	0.020	1.698	1.60	1178	257		63			86	84	0.9	0.14	13.95	6.103		48.828
A-4	8.1	00:08:07	963.090	0.040	1.698	1.60	1387	258		61			89	84	0.9	0.20	20.95	7.757		46.540
A-5	10.8	00:10:50	965.010	0.040	1.698	1.60	1417	257		61			89	84	0.9	0.20	21.12	9.487		45.539
A-6	13.5	00:13:33	967.020	0.050	1.698	1.60	1477	259		60			91	84	0.9	0.22	23.99	12.057		48.228
A-7	16.3	00:16:15	970.010	0.020	1.698	1.60	1409	256		58			92	84	0.9	0.14	14.90	13.792		47.285
A-8	19.0	00:18:58	972.030	0.060	1.698	1.60	1327	254		58			92	84	0.9	0.24	25.24	15.518		46.553
A-9	21.7	00:21:40	974.040	0.040	1.698	1.60	1396	257		58			93	84	0.9	0.20	21.00	17.259		46.024
A-10	24.4	00:24:22	976.070	0.040	1.698	1.60	1486	254		57			94	85	0.9	0.20	21.51	18.946		45.470
A-11	27.1	00:27:05	978.040	0.060	1.698	1.60	1495	254		57			95	86	0.9	0.24	26.40	21.510		46.932
A-12	29.8	00:29:47	981.040	0.030	1.698	1.60	1355	254		59			89	85	0.9	0.17	17.99	23.265		46.530
B-1	32.5	00:32:30	983.080	0.030	1.698	1.60	792	256		56			92	86	0.9	0.17	14.94	24.937		46.037
B-2	35.2	00:35:12	985.030	0.030	1.698	1.60	820	256		56			93	86	0.9	0.17	15.11	27.531		47.196
B-3	37.9	00:37:55	988.060	0.030	1.698	1.60	863	257		56			94	87	0.9	0.17	15.36	29.198		46.717
B-4	40.6	00:40:37	990.010	0.040	1.698	1.60	1210	257		56			95	87	0.9	0.20	19.92	30.974		46.461
B-5	43.3	00:43:20	992.090	0.040	1.698	1.60	1461	255		56			95	87	0.9	0.20	21.37	32.640		46.079
B-6	46.0	00:46:03	994.040	0.030	1.698	1.60	1531	256		56			96	87	0.9	0.17	18.84	35.208		46.944
B-7	48.8	00:48:45	997.050	0.010	1.698	1.60	1419	255		56			97	87	0.9	0.10	10.57	36.947		46.670
B-8	51.5	00:51:28	999.090	0.040	1.698	1.60	1390	257		57			98	87	0.9	0.20	20.97	39.434		47.320
B-9	54.2	00:54:10	1002.010	0.040	1.698	1.60	1528	260		57			98	87	0.9	0.20	21.74	41.188		47.072
B-10	56.9	00:56:53	1004.070	0.040	1.698	1.60	1540	255		57			99	87	0.9	0.20	21.80	42.907		46.808
B-11	59.6	00:59:35	1006.090	0.040	1.698	1.60	1561	255		58			99	89	0.9	0.20	21.92	44.589		46.527
B-12	62.3	01:02:18	1008.070	0.030	1.698	1.60	1566	255		58			99	89	0.9	0.17	19.01	46.296		46.296
Last Pt	65.0	01:05:00	1010.080																	
Final Val	65.0	01:05:00	1010.080											Max Vac	0.9		Final Values	46.296		
Average Values				0.03		1.60	1306	256		58			93	86		0.18	18.75			
													89							

Questor Technology Inc
March 18, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	62,598	SCFH

Weather Data

Barometric Pressure	30.11	in. Hg
Relative Humidity	80	%
Ambient Temperature	55	°F
Specific Humidity	0.007288	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R4

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/18/15 10:05:09	64492	12.81	1.59	0.26	5.83	53.21	51.40	265.00
	03/18/15 10:05:39	64522	12.87	1.63	0.26	5.79	53.21	51.40	265.00
	03/18/15 10:06:09	64552	12.99	1.62	0.26	5.69	53.13	51.50	265.00
	03/18/15 10:06:39	64582	13.01	1.84	0.25	5.66	53.13	51.50	265.00
	03/18/15 10:07:09	64612	13.03	1.83	0.25	5.64	52.85	51.60	501.00
	03/18/15 10:07:39	64642	13.05	1.84	0.24	5.64	52.85	51.60	501.00
	03/18/15 10:08:09	64672	12.91	1.85	0.23	5.73	52.42	51.50	577.00
	03/18/15 10:08:39	64702	12.92	1.70	0.23	5.74	52.42	51.50	577.00
	03/18/15 10:09:09	64732	12.98	1.71	0.22	5.69	52.02	51.40	600.00
	03/18/15 10:09:39	64762	13.08	1.80	0.23	5.66	52.02	51.40	600.00
	03/18/15 10:10:09	64792	15.51	13.23	3.15	4.02	51.65	51.40	596.00
	03/18/15 10:10:39	64822	14.58	19.98	0.90	4.46	51.65	51.40	596.00
	03/18/15 10:11:09	64852	13.47	20.00	0.33	5.30	51.31	51.40	606.00
	03/18/15 10:11:39	64882	13.69	15.89	0.34	5.16	51.31	51.40	606.00
	03/18/15 10:12:09	64912	14.04	11.60	0.35	4.93	50.98	51.30	616.00
	03/18/15 10:12:39	64942	14.24	14.82	0.38	4.77	50.98	51.30	616.00
	03/18/15 10:13:09	64972	14.45	18.42	0.43	4.64	50.66	51.40	587.00
	03/18/15 10:13:39	65002	14.16	10.19	0.30	4.82	50.66	51.40	587.00
	03/18/15 10:14:09	65032	14.16	12.74	0.31	4.82	50.35	51.40	597.00
	03/18/15 10:14:39	65062	14.23	14.02	0.33	4.76	50.35	51.40	597.00
	03/18/15 10:15:09	65092	14.31	14.48	0.30	4.76	50.05	51.40	594.00
	03/18/15 10:15:39	65122	13.90	14.42	0.26	4.95	50.05	51.40	594.00
	03/18/15 10:16:09	65152	13.06	10.58	0.22	5.57	49.75	51.50	592.00
	03/18/15 10:16:39	65182	12.59	8.23	0.20	5.97	49.75	51.50	592.00
	03/18/15 10:17:09	65212	12.59	6.07	0.21	6.02	49.48	51.50	539.00
	03/18/15 10:17:39	65242	12.95	7.38	0.20	5.75	49.48	51.50	539.00
	03/18/15 10:18:09	65272	13.26	8.03	0.21	5.43	49.41	51.50	313.00
	03/18/15 10:18:39	65302	12.51	7.73	0.20	6.05	49.41	51.50	313.00
	03/18/15 10:19:09	65332	12.62	6.25	0.19	6.00	49.44	51.60	263.00
	03/18/15 10:19:39	65362	12.74	6.87	0.18	5.87	49.44	51.60	263.00
	03/18/15 10:20:09	65392	12.97	6.26	0.20	5.78	49.45	51.80	263.00
	03/18/15 10:20:39	65422	13.21	8.53	0.19	5.41	49.45	51.80	263.00
	03/18/15 10:21:09	65452	11.47	5.07	0.15	6.79	49.46	51.80	275.00
	03/18/15 10:21:39	65482	11.42	0.97	0.14	6.86	49.46	51.80	275.00
	03/18/15 10:22:09	65512	12.65	0.70	0.15	6.06	49.47	51.90	288.00
	03/18/15 10:22:39	65542	13.02	1.12	0.15	5.66	49.47	51.90	288.00
	03/18/15 10:23:09	65572	13.00	1.31	0.15	5.70	49.25	52.00	486.00
	03/18/15 10:23:39	65602	12.93	1.36	0.15	5.73	49.25	52.00	486.00
	03/18/15 10:24:09	65632	13.04	1.39	0.15	5.63	48.84	51.90	583.00
	03/18/15 10:24:39	65662	12.83	1.34	0.14	5.79	48.84	51.90	583.00
	03/18/15 10:25:09	65692	12.97	1.30	0.14	5.72	48.47	51.80	579.00
	03/18/15 10:25:39	65722	12.95	1.40	0.16	5.73	48.47	51.80	579.00
	03/18/15 10:26:09	65752	14.54	11.74	0.38	4.62	48.13	51.80	588.00
	03/18/15 10:26:39	65782	13.74	20.00	0.20	5.08	48.13	51.80	588.00
	03/18/15 10:27:09	65812	12.95	15.59	0.19	5.70	47.82	51.80	585.00
	03/18/15 10:27:39	65842	12.64	6.80	0.17	5.96	47.82	51.80	585.00
	03/18/15 10:28:09	65872	12.77	5.44	0.17	5.91	47.51	51.80	583.00
A2	03/18/15 10:28:39	65902	12.87	6.17	0.17	5.79	47.51	51.80	583.00
	03/18/15 10:29:09	65932	12.81	5.86	0.18	5.85	47.22	51.80	604.00
	03/18/15 10:29:39	65962	12.86	6.07	0.16	5.82	47.22	51.80	604.00
	03/18/15 10:30:09	65992	12.68	5.74	0.16	5.90	46.94	51.80	601.00
	03/18/15 10:30:39	66022	12.54	5.43	0.15	6.03	46.94	51.80	601.00
	03/18/15 10:31:09	66052	12.24	4.46	0.16	6.27	46.65	51.80	598.00
	03/18/15 10:31:39	66082	12.29	4.40	0.16	6.25	46.65	51.80	598.00
	03/18/15 10:32:09	66112	12.82	4.97	0.17	5.83	46.37	51.80	595.00
	03/18/15 10:32:39	66142	12.69	5.65	0.16	5.99	46.37	51.80	595.00
	03/18/15 10:33:09	66172	12.78	5.42	0.18	5.86	46.09	51.80	593.00
	03/18/15 10:33:39	66202	12.81	5.62	0.15	5.85	46.09	51.80	593.00
	03/18/15 10:34:09	66232	12.62	5.67	0.15	5.96	45.81	51.80	590.00
	03/18/15 10:34:39	66262	12.45	5.25	0.16	6.11	45.81	51.80	590.00

Questor Technology Inc
March 18, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	62,598	SCFH

Weather Data

Barometric Pressure	30.11	in. Hg
Relative Humidity	80	%
Ambient Temperature	55	°F
Specific Humidity	0.007288	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R4

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/18/15 10:35:09	66292	12.68	4.58	0.15	5.99	45.67	51.80	377.00
	03/18/15 10:35:39	66322	12.31	5.12	0.16	6.19	45.67	51.80	377.00
	03/18/15 10:36:09	66352	12.61	3.78	0.16	6.05	45.75	51.90	271.00
	03/18/15 10:36:39	66382	12.46	4.46	0.14	6.08	45.75	51.90	271.00
	03/18/15 10:37:09	66412	12.65	3.99	0.14	5.99	45.85	52.00	260.00
	03/18/15 10:37:39	66442	12.27	4.44	0.14	6.20	45.85	52.00	260.00
	03/18/15 10:38:09	66472	9.98	2.47	0.12	7.80	45.87	52.10	260.00
	03/18/15 10:38:39	66502	12.31	0.58	0.12	6.39	45.87	52.10	260.00
	03/18/15 10:39:09	66532	12.81	0.81	0.13	5.82	45.87	52.10	283.00
	03/18/15 10:39:39	66562	13.32	1.11	0.14	5.47	45.87	52.10	283.00
	03/18/15 10:40:09	66592	13.35	1.59	0.14	5.41	45.67	52.20	541.00
	03/18/15 10:40:39	66622	13.32	1.60	0.13	5.42	45.67	52.20	541.00
	03/18/15 10:41:09	66652	13.25	1.58	0.13	5.48	45.25	52.10	584.00
	03/18/15 10:41:39	66682	13.36	1.65	0.13	5.39	45.25	52.10	584.00
	03/18/15 10:42:09	66712	13.28	1.73	0.13	5.48	44.87	52.10	592.00
	03/18/15 10:42:39	66742	13.30	1.72	0.14	5.45	44.87	52.10	592.00
	03/18/15 10:43:09	66772	14.54	10.24	0.25	4.65	44.54	52.00	589.00
	03/18/15 10:43:39	66802	13.59	20.00	0.19	5.18	44.54	52.00	589.00
	03/18/15 10:44:09	66832	12.90	12.46	0.16	5.76	44.23	52.00	597.00
	03/18/15 10:44:39	66862	13.06	6.30	0.17	5.65	44.23	52.00	597.00
	03/18/15 10:45:09	66892	13.00	6.33	0.16	5.73	43.94	52.00	594.00
	03/18/15 10:45:39	66922	12.65	6.42	0.16	5.91	43.94	52.00	594.00
	03/18/15 10:46:09	66952	12.49	5.04	0.15	6.12	43.64	52.00	591.00
	03/18/15 10:46:39	66982	12.35	4.16	0.16	6.20	43.64	52.00	591.00
	03/18/15 10:47:09	67012	12.57	4.18	0.16	6.07	43.36	52.10	611.00
	03/18/15 10:47:39	67042	12.77	5.22	0.16	5.88	43.36	52.10	611.00
	03/18/15 10:48:09	67072	12.92	5.25	0.16	5.78	43.09	52.10	596.00
	03/18/15 10:48:39	67102	13.13	6.25	0.17	5.59	43.09	52.10	596.00
	03/18/15 10:49:09	67132	12.93	5.87	0.16	5.76	42.80	52.20	582.00
	03/18/15 10:49:39	67162	12.46	5.29	0.15	6.08	42.80	52.20	582.00
	03/18/15 10:50:09	67192	12.43	4.01	0.15	6.20	42.52	52.20	590.00
	03/18/15 10:50:39	67222	12.20	4.24	0.14	6.25	42.52	52.20	590.00
	03/18/15 10:51:09	67252	12.71	3.82	0.15	5.94	42.23	52.30	587.00
	03/18/15 10:51:39	67282	12.83	4.73	0.15	5.87	42.23	52.30	587.00
A3	03/18/15 10:52:09	67312	12.74	4.73	0.17	5.92	42.00	52.30	463.00
	03/18/15 10:52:39	67342	12.96	5.46	0.17	5.73	42.00	52.30	463.00
	03/18/15 10:53:09	67372	12.73	5.44	0.16	5.88	42.05	52.40	254.00
	03/18/15 10:53:39	67402	12.82	5.01	0.16	5.84	42.05	52.40	254.00
	03/18/15 10:54:09	67432	13.03	5.25	0.17	5.70	42.14	52.50	276.00
	03/18/15 10:54:39	67462	12.56	5.35	0.15	5.99	42.14	52.50	276.00
	03/18/15 10:55:09	67492	10.23	3.47	0.12	7.51	42.15	52.60	276.00
	03/18/15 10:55:39	67522	9.99	0.75	0.11	8.08	42.15	52.60	276.00
	03/18/15 10:56:09	67552	12.79	0.55	0.13	5.85	42.16	52.60	287.00
	03/18/15 10:56:39	67582	13.67	0.98	0.13	5.25	42.16	52.60	287.00
	03/18/15 10:57:09	67612	13.14	1.77	0.12	5.52	42.05	52.60	452.00
	03/18/15 10:57:39	67642	12.78	1.37	0.13	5.84	42.05	52.60	452.00
	03/18/15 10:58:09	67672	12.83	1.11	0.13	5.85	41.65	52.60	592.00
	03/18/15 10:58:39	67702	12.88	1.28	0.13	5.77	41.65	52.60	592.00
	03/18/15 10:59:09	67732	12.80	1.19	0.12	5.84	41.27	52.60	599.00
	03/18/15 10:59:39	67762	12.53	1.03	0.12	6.04	41.27	52.60	599.00
	03/18/15 11:00:09	67792	13.25	1.13	0.15	5.65	40.93	52.50	584.00
	03/18/15 11:00:39	67822	14.09	13.66	0.20	4.82	40.93	52.50	584.00
	03/18/15 11:01:09	67852	13.15	16.30	0.17	5.54	40.62	52.50	592.00
	03/18/15 11:01:39	67882	12.88	6.72	0.16	5.81	40.62	52.50	592.00
	03/18/15 11:02:09	67912	13.08	5.64	0.17	5.62	40.32	52.40	599.00
	03/18/15 11:02:39	67942	12.98	5.67	0.18	5.69	40.32	52.40	599.00
	03/18/15 11:03:09	67972	12.81	4.85	0.17	5.88	40.03	52.40	607.00
	03/18/15 11:03:39	68002	12.97	5.11	0.15	5.72	40.03	52.40	607.00
	03/18/15 11:04:09	68032	12.98	5.65	0.15	5.72	39.74	52.40	593.00
	03/18/15 11:04:39	68062	12.95	5.34	0.16	5.75	39.74	52.40	593.00

Questor Technology Inc
March 18, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	62,598	SCFH

Weather Data

Barometric Pressure	30.11	in. Hg
Relative Humidity	80	%
Ambient Temperature	55	°F
Specific Humidity	0.007288	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R4

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/18/15 11:05:09	68092	12.88	5.16	0.16	5.81	39.44	52.40	600.00
03/18/15 11:05:39	68122	12.82	5.33	0.16	5.83	39.44	52.40	600.00
03/18/15 11:06:09	68152	12.86	4.71	0.16	5.79	39.15	52.40	607.00
03/18/15 11:06:39	68182	12.82	4.90	0.15	5.86	39.15	52.40	607.00
03/18/15 11:07:09	68212	12.81	4.75	0.15	5.84	38.89	52.30	594.00
03/18/15 11:07:39	68242	12.93	5.14	0.16	5.74	38.89	52.30	594.00
03/18/15 11:08:09	68272	12.72	4.95	0.15	5.93	38.73	52.40	228.00
03/18/15 11:08:39	68302	12.87	5.10	0.15	5.80	38.73	52.40	228.00
03/18/15 11:09:09	68332	12.89	4.83	0.16	5.78	38.89	52.50	219.00
03/18/15 11:09:39	68362	12.55	4.73	0.13	6.07	38.89	52.50	219.00
03/18/15 11:10:09	68392	12.58	4.38	0.14	5.97	38.98	52.50	219.00
03/18/15 11:10:39	68422	12.81	4.10	0.15	5.84	38.98	52.50	219.00
03/18/15 11:11:09	68452	11.40	3.73	0.13	6.71	39.06	52.60	230.00
03/18/15 11:11:39	68482	10.78	1.31	0.12	7.43	39.06	52.60	230.00
03/18/15 11:12:09	68512	13.30	0.65	0.12	5.55	39.11	52.70	209.00
03/18/15 11:12:39	68542	14.06	1.46	0.14	4.92	39.11	52.70	209.00
03/18/15 11:13:09	68572	14.25	2.54	0.15	4.75	39.15	52.70	209.00
03/18/15 11:13:39	68602	14.39	2.94	0.15	4.69	39.15	52.70	209.00
03/18/15 11:14:09	68632	14.20	3.32	0.14	4.76	39.17	52.70	230.00
03/18/15 11:14:39	68662	14.07	3.09	0.14	4.88	39.17	52.70	230.00
03/18/15 11:15:09	68692	14.04	2.97	0.14	4.91	34.15	52.70	230.00
RAW AVERAGE		12.96	5.50	0.20	5.73	45.16	52.03	474.62

Bias					Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	O ₂	CO	THC	CO ₂		
	INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)
	Initial Zero	0.08	0.22	0.11	0.08		
	Final Zero	0.10	0.26	0.07	0.12		
	Avg. Zero	0.09	0.24	0.09	0.10		
	Initial UpScale	12.01	9.21	3.07	8.91		
	Final UpScale	11.97	9.34	3.30	8.94		
	Avg. UpScale	11.99	9.28	3.19	8.93		
Upscale Cal Gas		12.06	9.19	3.02	8.87		

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.04	5.35	0.11	5.66
Corrected Raw Average (ppm/% wet basis)	12.27	5.02	0.10	5.32
Emission Rate (lb/hr)	N/A	0.02	0.00	N/A

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.0	%
Stack Exhaust Flow (M2)	57,848	SCFH

Weather Data

Barometric Pressure	30.11	in. Hg
Relative Humidity	85	%
Ambient Temperature	54	° F
Specific Humidity	0.007468	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R5

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/18/15 11:36:09	69952	14.18	3.11	0.14	4.81	39.21	54.30	219.00
	03/18/15 11:36:39	69982	14.25	3.28	0.14	4.75	39.21	54.30	219.00
	03/18/15 11:37:09	70012	14.29	3.13	0.15	4.72	39.21	54.30	303.00
	03/18/15 11:37:39	70042	14.51	3.41	0.14	4.59	39.21	54.30	303.00
	03/18/15 11:38:09	70072	14.41	3.74	0.14	4.63	38.85	54.10	550.00
	03/18/15 11:38:39	70102	14.30	3.46	0.14	4.72	38.85	54.10	550.00
	03/18/15 11:39:09	70132	14.24	3.44	0.14	4.77	38.42	53.90	587.00
	03/18/15 11:39:39	70162	14.02	3.00	0.13	4.91	38.42	53.90	587.00
	03/18/15 11:40:09	70192	14.20	2.85	0.14	4.81	38.03	53.90	593.00
	03/18/15 11:40:39	70222	13.86	3.12	0.14	5.04	38.03	53.90	593.00
	03/18/15 11:41:09	70252	14.17	15.34	0.20	4.79	37.67	53.90	589.00
	03/18/15 11:41:39	70282	13.34	18.80	0.16	5.44	37.67	53.90	589.00
	03/18/15 11:42:09	70312	13.34	15.64	0.16	5.43	37.52	53.90	607.00
	03/18/15 11:42:39	70342	13.38	10.07	0.16	5.39	37.52	53.90	607.00
	03/18/15 11:43:09	70372	13.29	9.90	0.16	5.46	41.12	53.60	649.00
	03/18/15 11:43:39	70402	13.25	7.94	0.15	5.51	41.12	53.60	649.00
	03/18/15 11:44:09	70432	13.17	8.66	0.15	5.56	48.05	52.50	682.00
	03/18/15 11:44:39	70462	13.47	8.66	0.15	5.32	48.05	52.50	682.00
	03/18/15 11:45:09	70492	13.22	10.18	0.16	5.46	54.77	51.40	610.00
	03/18/15 11:45:39	70522	13.22	7.95	0.16	5.54	54.77	51.40	610.00
	03/18/15 11:46:09	70552	12.75	6.37	0.15	5.87	59.25	50.70	609.00
	03/18/15 11:46:39	70582	12.89	4.62	0.15	5.77	59.25	50.70	609.00
	03/18/15 11:47:09	70612	12.27	4.96	0.14	6.20	67.03	50.30	626.00
	03/18/15 11:47:39	70642	12.44	3.99	0.12	6.16	67.03	50.30	626.00
	03/18/15 11:48:09	70672	12.59	4.31	0.13	5.99	69.99	50.00	600.00
	03/18/15 11:48:39	70702	13.29	5.33	0.15	5.50	69.99	50.00	600.00
	03/18/15 11:49:09	70732	12.60	6.81	0.14	5.91	71.84	49.90	340.00
	03/18/15 11:49:39	70762	12.83	3.95	0.14	5.86	71.84	49.90	340.00
	03/18/15 11:50:09	70792	12.52	5.00	0.15	6.07	73.00	50.30	276.00
	03/18/15 11:50:39	70822	12.64	4.17	0.14	5.94	73.00	50.30	276.00
	03/18/15 11:51:09	70852	12.44	3.80	0.14	6.15	73.80	50.70	261.00
	03/18/15 11:51:39	70882	12.41	3.38	0.13	6.15	73.80	50.70	261.00
	03/18/15 11:52:09	70912	11.17	3.39	0.11	6.87	73.95	51.10	279.00
	03/18/15 11:52:39	70942	12.12	1.07	0.10	6.51	73.95	51.10	279.00
	03/18/15 11:53:09	70972	13.05	0.85	0.11	5.61	73.96	51.50	261.00
	03/18/15 11:53:39	71002	12.06	0.80	0.09	6.35	73.96	51.50	261.00
	03/18/15 11:54:09	71032	12.88	0.63	0.11	5.82	73.86	51.80	504.00
	03/18/15 11:54:39	71062	12.78	0.82	0.11	5.77	73.86	51.80	504.00
	03/18/15 11:55:09	71092	11.77	0.71	0.07	6.63	73.64	52.00	572.00
	03/18/15 11:55:39	71122	12.76	0.62	0.10	5.86	73.64	52.00	572.00
	03/18/15 11:56:09	71152	12.77	0.74	0.11	5.84	73.42	52.20	605.00
	03/18/15 11:56:39	71182	12.56	0.74	0.10	5.98	73.42	52.20	605.00
	03/18/15 11:57:09	71212	12.97	1.07	0.14	5.77	73.19	52.40	586.00
	03/18/15 11:57:39	71242	13.12	4.34	0.15	5.57	73.19	52.40	586.00
	03/18/15 11:58:09	71272	13.06	4.10	0.13	5.61	72.97	52.70	584.00
	03/18/15 11:58:39	71302	13.10	5.34	0.15	5.63	72.97	52.70	584.00
	03/18/15 11:59:09	71332	12.43	5.24	0.12	6.09	72.75	52.90	599.00
A2	03/18/15 11:59:39	71362	12.21	3.60	0.13	6.34	72.75	52.90	599.00
	03/18/15 12:00:09	71392	12.85	3.72	0.13	5.80	72.52	53.10	614.00
	03/18/15 12:00:39	71422	12.57	3.97	0.13	6.03	72.52	53.10	614.00
	03/18/15 12:01:09	71452	12.69	3.73	0.15	5.92	72.30	53.30	578.00
	03/18/15 12:01:39	71482	12.62	3.82	0.13	5.96	72.30	53.30	578.00
	03/18/15 12:02:09	71512	12.25	3.72	0.13	6.22	72.07	53.50	611.00
	03/18/15 12:02:39	71542	12.47	3.64	0.13	6.15	72.07	53.50	611.00
	03/18/15 12:03:09	71572	12.66	3.95	0.14	5.96	71.86	53.70	609.00
	03/18/15 12:03:39	71602	12.55	3.95	0.14	6.03	71.86	53.70	609.00
	03/18/15 12:04:09	71632	12.03	3.51	0.13	6.38	71.66	53.80	607.00
	03/18/15 12:04:39	71662	12.47	2.94	0.13	6.11	71.66	53.80	607.00
	03/18/15 12:05:09	71692	12.60	3.55	0.13	6.01	71.46	53.90	522.00
	03/18/15 12:05:39	71722	12.60	3.79	0.14	5.98	71.46	53.90	522.00
	03/18/15 12:06:09	71752	12.33	3.26	0.14	6.20	71.42	54.00	235.00

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.0	%
Stack Exhaust Flow (M2)	57,848	SCFH

Weather Data

Barometric Pressure	30.11	in. Hg
Relative Humidity	85	%
Ambient Temperature	54	° F
Specific Humidity	0.007468	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R5

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/18/15 12:06:39	71782	12.17	2.47	0.14	6.32	71.42	54.00	235.00
	03/18/15 12:07:09	71812	11.99	1.92	0.13	6.43	71.43	54.10	235.00
	03/18/15 12:07:39	71842	11.99	1.68	0.13	6.49	71.43	54.10	235.00
	03/18/15 12:08:09	71872	12.06	1.73	0.13	6.43	71.44	54.20	235.00
	03/18/15 12:08:39	71902	11.78	2.01	0.12	6.55	71.44	54.20	235.00
	03/18/15 12:09:09	71932	11.86	1.09	0.09	6.64	71.43	54.30	235.00
	03/18/15 12:09:39	71962	13.09	0.51	0.10	5.62	71.43	54.30	235.00
	03/18/15 12:10:09	71992	13.30	0.72	0.11	5.45	71.34	54.40	470.00
	03/18/15 12:10:39	72022	13.24	0.87	0.10	5.50	71.34	54.40	470.00
	03/18/15 12:11:09	72052	13.53	0.97	0.11	5.25	71.15	54.50	553.00
	03/18/15 12:11:39	72082	13.52	1.17	0.12	5.25	71.15	54.50	553.00
	03/18/15 12:12:09	72112	13.49	1.26	0.12	5.26	70.93	54.60	601.00
	03/18/15 12:12:39	72142	13.40	1.20	0.11	5.34	70.93	54.60	601.00
	03/18/15 12:13:09	72172	12.32	1.13	0.11	6.10	70.72	54.70	599.00
	03/18/15 12:13:39	72202	13.07	1.68	0.14	5.72	70.72	54.70	599.00
	03/18/15 12:14:09	72232	13.64	6.28	0.15	5.15	70.52	54.90	598.00
	03/18/15 12:14:39	72262	13.40	10.52	0.14	5.44	70.52	54.90	598.00
	03/18/15 12:15:09	72292	13.03	8.64	0.14	5.55	70.32	55.00	613.00
	03/18/15 12:15:39	72322	11.99	4.45	0.13	6.49	70.32	55.00	613.00
	03/18/15 12:16:09	72352	12.89	3.42	0.14	5.79	70.12	55.20	628.00
	03/18/15 12:16:39	72382	12.91	5.06	0.14	5.76	70.12	55.20	628.00
	03/18/15 12:17:09	72412	12.68	4.48	0.13	5.92	69.93	55.20	610.00
	03/18/15 12:17:39	72442	12.70	4.07	0.14	5.92	69.93	55.20	610.00
	03/18/15 12:18:09	72472	12.51	3.51	0.14	6.07	69.75	55.30	608.00
	03/18/15 12:18:39	72502	12.57	3.28	0.12	5.98	69.75	55.30	608.00
	03/18/15 12:19:09	72532	12.07	2.43	0.12	6.40	69.55	55.40	590.00
	03/18/15 12:19:39	72562	12.25	2.08	0.13	6.26	69.55	55.40	590.00
	03/18/15 12:20:09	72592	12.26	2.02	0.13	6.30	69.36	55.50	605.00
	03/18/15 12:20:39	72622	12.36	2.51	0.12	6.14	69.36	55.50	605.00
	03/18/15 12:21:09	72652	12.63	2.51	0.13	6.02	69.17	55.70	620.00
	03/18/15 12:21:39	72682	12.72	3.51	0.14	5.87	69.17	55.70	620.00
	03/18/15 12:22:09	72712	11.93	3.47	0.11	6.46	68.98	55.90	602.00
	03/18/15 12:22:39	72742	12.70	2.83	0.14	5.95	68.98	55.90	602.00
A3	03/18/15 12:23:09	72772	12.41	3.02	0.13	6.15	68.94	56.10	228.00
	03/18/15 12:23:39	72802	12.66	2.91	0.14	5.94	68.94	56.10	228.00
	03/18/15 12:24:09	72832	12.49	3.04	0.14	6.11	69.00	56.40	211.00
	03/18/15 12:24:39	72862	12.66	3.49	0.14	5.94	69.00	56.40	211.00
	03/18/15 12:25:09	72892	12.03	3.16	0.12	6.37	69.04	56.60	195.00
	03/18/15 12:25:39	72922	10.65	2.42	0.10	7.24	69.04	56.60	195.00
	03/18/15 12:26:09	72952	11.28	1.00	0.08	7.22	69.08	56.90	195.00
	03/18/15 12:26:39	72982	14.37	0.79	0.10	4.73	69.08	56.90	195.00
	03/18/15 12:27:09	73012	14.41	1.53	0.10	4.66	69.02	57.10	455.00
	03/18/15 12:27:39	73042	14.45	1.67	0.12	4.63	69.02	57.10	455.00
	03/18/15 12:28:09	73072	14.47	1.92	0.11	4.61	68.82	57.30	583.00
	03/18/15 12:28:39	73102	14.48	2.22	0.11	4.60	68.82	57.30	583.00
	03/18/15 12:29:09	73132	14.52	2.46	0.12	4.58	68.64	57.40	581.00
	03/18/15 12:29:39	73162	14.51	2.62	0.12	4.57	68.64	57.40	581.00
	03/18/15 12:30:09	73192	13.17	2.53	0.11	5.42	68.47	57.50	580.00
	03/18/15 12:30:39	73222	13.53	4.53	0.15	5.32	68.47	57.50	580.00
	03/18/15 12:31:09	73252	13.01	8.24	0.14	5.66	68.30	57.70	579.00
	03/18/15 12:31:39	73282	12.97	4.29	0.13	5.71	68.30	57.70	579.00
	03/18/15 12:32:09	73312	12.82	3.84	0.12	5.82	68.14	57.90	593.00
	03/18/15 12:32:39	73342	12.90	4.26	0.14	5.75	68.14	57.90	593.00
	03/18/15 12:33:09	73372	12.77	4.14	0.14	5.84	67.98	58.10	576.00
	03/18/15 12:33:39	73402	12.97	3.61	0.14	5.72	67.98	58.10	576.00
	03/18/15 12:34:09	73432	13.07	4.45	0.13	5.64	67.83	58.30	575.00
	03/18/15 12:34:39	73462	12.45	4.82	0.12	6.03	67.83	58.30	575.00
	03/18/15 12:35:09	73492	12.14	3.42	0.12	6.32	67.66	58.40	589.00
	03/18/15 12:35:39	73522	12.00	2.95	0.11	6.50	67.66	58.40	589.00
	03/18/15 12:36:09	73552	12.38	3.31	0.11	6.14	67.50	58.60	604.00
	03/18/15 12:36:39	73582	12.41	3.57	0.11	6.09	67.50	58.60	604.00

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.0	%
Stack Exhaust Flow (M2)	57,848	SCFH

Weather Data

Barometric Pressure	30.11	in. Hg
Relative Humidity	85	%
Ambient Temperature	54	° F
Specific Humidity	0.007468	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R5

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/18/15 12:37:09	73612	12.01	2.97	0.11	6.52	67.34	58.70	586.00
03/18/15 12:37:39	73642	13.34	3.81	0.14	5.43	67.34	58.70	586.00
03/18/15 12:38:09	73672	13.06	5.40	0.14	5.57	67.18	58.90	569.00
03/18/15 12:38:39	73702	13.03	4.36	0.13	5.68	67.18	58.90	569.00
03/18/15 12:39:09	73732	13.11	4.92	0.13	5.56	66.89	59.10	425.00
03/18/15 12:39:39	73762	13.04	4.94	0.13	5.67	66.89	59.10	425.00
03/18/15 12:40:09	73792	12.85	5.17	0.13	5.74	66.93	59.20	205.00
03/18/15 12:40:39	73822	12.33	3.96	0.11	6.19	66.93	59.20	205.00
03/18/15 12:41:09	73852	12.86	4.03	0.13	5.76	66.97	59.50	189.00
03/18/15 12:41:39	73882	12.48	4.09	0.12	6.14	66.97	59.50	189.00
03/18/15 12:42:09	73912	12.71	4.17	0.13	5.92	67.02	59.70	205.00
03/18/15 12:42:39	73942	12.47	3.64	0.12	6.06	67.02	59.70	205.00
03/18/15 12:43:09	73972	8.79	2.41	0.09	8.44	67.06	59.90	205.00
03/18/15 12:43:39	74002	10.43	0.53	0.06	7.83	67.06	59.90	205.00
03/18/15 12:44:09	74032	13.95	0.45	0.10	5.04	67.09	60.20	221.00
03/18/15 12:44:39	74062	14.07	0.95	0.11	4.87	67.09	60.20	221.00
03/18/15 12:45:09	74092	14.17	1.26	0.11	4.81	67.13	60.30	221.00
03/18/15 12:45:39	74122	14.27	1.64	0.10	4.74	67.13	60.30	221.00
RAW AVERAGE		12.88	3.76	0.13	5.77	65.82	55.01	478.72

Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press. Trans	Temp. Trans.	F-Flow Trans.
		INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.10	0.26	0.07	0.12			
	Final Zero	0.07	0.26	0.02	0.12			
	Avg. Zero	0.09	0.26	0.05	0.12			
	Initial UpScale	11.97	9.34	3.30	8.94			
	Final UpScale	11.94	9.35	3.27	8.93			
	Avg. UpScale	11.96	9.35	3.29	8.94			
Upscale Cal Gas		12.06	9.19	3.02	8.87			

EMISSIONS DATA	O₂	CO	THC	CO₂
Corrected Raw Average (ppm/% dry basis)	13.00	3.54	0.08	5.69
Corrected Raw Average (ppm/% wet basis)	12.35	3.35	0.07	5.40
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A

Questor Technology Inc
March 18, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	58,520	SCFH

Weather Data

Barometric Pressure	30.08	in. Hg
Relative Humidity	71	%
Ambient Temperature	55	°F
Specific Humidity	0.006466	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R6

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/18/15 13:00:09	74992	14.34	3.23	0.12	4.70	67.29	59.60	221.00
	03/18/15 13:00:39	75022	14.11	3.21	0.12	4.82	67.29	59.60	221.00
	03/18/15 13:01:09	75052	12.55	2.10	0.09	5.91	67.28	59.50	237.00
	03/18/15 13:01:39	75082	13.15	0.98	0.10	5.61	67.28	59.50	237.00
	03/18/15 13:02:09	75112	13.41	1.32	0.11	5.33	67.29	59.40	237.00
	03/18/15 13:02:39	75142	13.27	1.34	0.10	5.44	67.29	59.40	237.00
	03/18/15 13:03:09	75172	13.32	1.14	0.08	5.43	67.28	59.20	237.00
	03/18/15 13:03:39	75202	13.33	1.18	0.09	5.40	67.28	59.20	237.00
	03/18/15 13:04:09	75232	13.52	1.15	0.11	5.23	67.27	59.20	285.00
	03/18/15 13:04:39	75262	14.54	3.21	0.19	4.67	67.27	59.20	285.00
	03/18/15 13:05:09	75292	14.46	16.97	0.21	4.59	67.14	58.90	553.00
	03/18/15 13:05:39	75322	13.66	19.36	0.15	5.11	67.14	58.90	553.00
	03/18/15 13:06:09	75352	13.14	9.18	0.14	5.57	66.94	58.70	584.00
	03/18/15 13:06:39	75382	13.06	5.98	0.14	5.62	66.94	58.70	584.00
	03/18/15 13:07:09	75412	13.17	5.95	0.14	5.56	66.75	58.70	598.00
	03/18/15 13:07:39	75442	13.27	6.05	0.14	5.49	66.75	58.70	598.00
	03/18/15 13:08:09	75472	13.30	6.28	0.15	5.41	66.56	58.60	597.00
	03/18/15 13:08:39	75502	13.04	5.84	0.13	5.64	66.56	58.60	597.00
	03/18/15 13:09:09	75532	13.14	4.98	0.14	5.56	66.37	58.60	611.00
	03/18/15 13:09:39	75562	13.07	5.54	0.14	5.59	66.37	58.60	611.00
	03/18/15 13:10:09	75592	12.63	4.79	0.13	5.99	66.18	58.70	594.00
	03/18/15 13:10:39	75622	13.05	4.41	0.14	5.65	66.18	58.70	594.00
	03/18/15 13:11:09	75652	13.19	4.56	0.14	5.53	66.01	58.70	608.00
	03/18/15 13:11:39	75682	13.14	4.77	0.12	5.56	66.01	58.70	608.00
	03/18/15 13:12:09	75712	12.87	4.77	0.13	5.71	65.84	58.70	591.00
	03/18/15 13:12:39	75742	12.47	3.90	0.12	6.15	65.84	58.70	591.00
	03/18/15 13:13:09	75772	12.85	3.94	0.13	5.77	65.69	58.70	606.00
	03/18/15 13:13:39	75802	12.57	4.01	0.12	5.99	65.69	58.70	606.00
	03/18/15 13:14:09	75832	12.77	3.77	0.12	5.86	65.53	58.60	604.00
	03/18/15 13:14:39	75862	12.62	3.64	0.13	6.00	65.53	58.60	604.00
	03/18/15 13:15:09	75892	12.59	3.40	0.12	5.96	65.37	58.60	619.00
	03/18/15 13:15:39	75922	12.86	3.51	0.12	5.83	65.37	58.60	619.00
	03/18/15 13:16:09	75952	12.69	3.68	0.12	5.94	65.24	58.60	510.00
	03/18/15 13:16:39	75982	10.09	3.36	0.09	7.55	65.24	58.60	510.00
	03/18/15 13:17:09	76012	12.39	0.90	0.09	6.40	65.25	58.50	216.00
	03/18/15 13:17:39	76042	14.15	0.87	0.11	4.82	65.25	58.50	216.00
	03/18/15 13:18:09	76072	14.16	1.18	0.10	4.81	65.33	58.50	216.00
	03/18/15 13:18:39	76102	14.19	1.42	0.11	4.78	65.33	58.50	216.00
	03/18/15 13:19:09	76132	14.09	1.35	0.11	4.86	65.39	58.60	201.00
	03/18/15 13:19:39	76162	13.89	1.48	0.11	4.96	65.39	58.60	201.00
	03/18/15 13:20:09	76192	14.01	1.45	0.11	4.93	65.45	58.50	217.00
	03/18/15 13:20:39	76222	14.19	1.59	0.10	4.80	65.45	58.50	217.00
	03/18/15 13:21:09	76252	13.91	1.80	0.12	4.95	65.49	58.50	372.00
	03/18/15 13:21:39	76282	13.76	3.83	0.15	5.06	65.49	58.50	372.00
	03/18/15 13:22:09	76312	13.24	7.76	0.13	5.55	65.36	58.40	542.00
	03/18/15 13:22:39	76342	13.89	11.54	0.14	4.95	65.36	58.40	542.00
	03/18/15 13:23:09	76372	13.26	10.61	0.13	5.41	65.21	58.30	602.00
A2	03/18/15 13:23:39	76402	12.85	5.88	0.12	5.83	65.21	58.30	602.00
	03/18/15 13:24:09	76432	12.80	4.95	0.12	5.79	65.06	58.20	586.00
	03/18/15 13:24:39	76462	12.83	4.43	0.13	5.84	65.06	58.20	586.00
	03/18/15 13:25:09	76492	12.87	4.48	0.12	5.78	64.90	58.20	616.00
	03/18/15 13:25:39	76522	12.76	4.21	0.13	5.84	64.90	58.20	616.00
	03/18/15 13:26:09	76552	12.54	4.14	0.12	6.03	64.76	58.10	599.00
	03/18/15 13:26:39	76582	12.30	3.22	0.12	6.20	64.76	58.10	599.00
	03/18/15 13:27:09	76612	12.97	3.40	0.12	5.70	64.63	58.10	614.00
	03/18/15 13:27:39	76642	12.66	4.23	0.13	5.93	64.63	58.10	614.00
	03/18/15 13:28:09	76672	12.49	3.76	0.12	6.06	64.50	58.10	612.00
	03/18/15 13:28:39	76702	12.45	3.25	0.13	6.12	64.50	58.10	612.00
	03/18/15 13:29:09	76732	12.86	3.76	0.12	5.80	64.40	58.10	612.00
	03/18/15 13:29:39	76762	12.55	4.29	0.13	6.01	64.40	58.10	612.00
	03/18/15 13:30:09	76792	12.55	3.76	0.13	6.01	64.28	58.00	611.00
	03/18/15 13:30:39	76822	12.68	3.51	0.12	5.93	64.28	58.00	611.00

Questor Technology Inc
March 18, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	58,520	SCFH

Weather Data

Barometric Pressure	30.08	in. Hg
Relative Humidity	71	%
Ambient Temperature	55	°F
Specific Humidity	0.006466	lb H ₂ O / lb air

30-70-30 Load, Run - Q100 R6

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/18/15 13:31:09	76852	12.24	3.34	0.12	6.25	64.16	58.00	610.00
	03/18/15 13:31:39	76882	12.13	2.33	0.11	6.35	64.16	58.00	610.00
	03/18/15 13:32:09	76912	12.23	2.25	0.11	6.28	64.07	57.90	487.00
	03/18/15 13:32:39	76942	11.83	1.82	0.10	6.54	64.07	57.90	487.00
	03/18/15 13:33:09	76972	13.47	0.79	0.08	5.46	64.12	58.00	213.00
	03/18/15 13:33:39	77002	13.67	0.82	0.10	5.07	64.12	58.00	213.00
	03/18/15 13:34:09	77032	12.47	0.75	0.08	6.03	64.23	58.00	275.00
	03/18/15 13:34:39	77062	12.33	0.51	0.08	6.19	64.23	58.00	275.00
	03/18/15 13:35:09	77092	12.42	0.50	0.08	6.14	64.30	58.00	244.00
	03/18/15 13:35:39	77122	12.31	0.54	0.08	6.18	64.30	58.00	244.00
	03/18/15 13:36:09	77152	12.59	0.55	0.08	5.99	64.38	58.00	260.00
	03/18/15 13:36:39	77182	12.19	0.54	0.07	6.32	64.38	58.00	260.00
	03/18/15 13:37:09	77212	13.38	0.58	0.09	5.42	64.41	57.90	383.00
	03/18/15 13:37:39	77242	13.62	2.53	0.13	5.24	64.41	57.90	383.00
	03/18/15 13:38:09	77272	13.61	8.69	0.14	5.16	64.31	57.70	596.00
	03/18/15 13:38:39	77302	13.01	6.76	0.13	5.64	64.31	57.70	596.00
	03/18/15 13:39:09	77332	12.87	4.56	0.12	5.72	64.18	57.60	611.00
	03/18/15 13:39:39	77362	12.46	3.39	0.13	6.09	64.18	57.60	611.00
	03/18/15 13:40:09	77392	12.46	2.58	0.12	6.09	64.05	57.60	594.00
	03/18/15 13:40:39	77422	12.28	2.46	0.12	6.23	64.05	57.60	594.00
	03/18/15 13:41:09	77452	12.28	1.90	0.13	6.25	63.94	57.50	609.00
	03/18/15 13:41:39	77482	12.26	2.23	0.12	6.21	63.94	57.50	609.00
	03/18/15 13:42:09	77512	12.51	2.13	0.13	6.13	63.84	57.50	608.00
	03/18/15 13:42:39	77542	12.24	2.67	0.12	6.21	63.84	57.50	608.00
	03/18/15 13:43:09	77572	12.62	2.29	0.13	6.02	63.73	57.40	607.00
	03/18/15 13:43:39	77602	12.57	3.34	0.11	5.97	63.73	57.40	607.00
	03/18/15 13:44:09	77632	12.21	2.79	0.11	6.26	63.62	57.50	606.00
	03/18/15 13:44:39	77662	12.45	2.42	0.13	6.16	63.62	57.50	606.00
	03/18/15 13:45:09	77692	13.04	3.20	0.13	5.65	63.52	57.50	606.00
	03/18/15 13:45:39	77722	12.58	3.63	0.13	6.01	63.52	57.50	606.00
	03/18/15 13:46:09	77752	12.74	3.45	0.13	5.85	63.41	57.50	635.00
	03/18/15 13:46:39	77782	12.72	3.60	0.13	5.89	63.41	57.50	635.00
A3	03/18/15 13:47:09	77812	12.26	2.92	0.12	6.22	63.31	57.50	619.00
	03/18/15 13:47:39	77842	12.30	1.83	0.12	6.27	63.31	57.50	619.00
	03/18/15 13:48:09	77872	12.76	2.72	0.13	5.87	63.21	57.60	603.00
	03/18/15 13:48:39	77902	12.69	3.55	0.11	5.86	63.21	57.60	603.00
	03/18/15 13:49:09	77932	11.86	3.08	0.09	6.33	63.10	57.60	617.00
	03/18/15 13:49:39	77962	5.58	2.46	0.10	10.47	63.10	57.60	617.00
	03/18/15 13:50:09	77992	4.73	17.52	0.11	11.99	63.06	57.60	286.00
	03/18/15 13:50:39	78022	12.57	9.13	0.08	6.23	63.06	57.60	286.00
	03/18/15 13:51:09	78052	13.67	0.78	0.09	5.11	63.17	57.70	226.00
	03/18/15 13:51:39	78082	13.06	0.62	0.08	5.63	63.17	57.70	226.00
	03/18/15 13:52:09	78112	12.90	0.55	0.08	5.72	63.25	57.80	241.00
	03/18/15 13:52:39	78142	13.59	0.54	0.09	5.27	63.25	57.80	241.00
	03/18/15 13:53:09	78172	13.81	0.75	0.08	5.02	63.34	57.80	226.00
	03/18/15 13:53:39	78202	13.92	0.89	0.10	4.97	63.34	57.80	226.00
	03/18/15 13:54:09	78232	13.91	1.06	0.08	4.95	63.41	57.90	227.00
	03/18/15 13:54:39	78262	13.75	1.08	0.08	5.06	63.41	57.90	227.00
	03/18/15 13:55:09	78292	14.30	6.20	0.15	4.76	63.38	57.90	544.00
	03/18/15 13:55:39	78322	13.31	12.77	0.13	5.34	63.38	57.90	544.00
	03/18/15 13:56:09	78352	12.94	5.44	0.12	5.69	63.24	57.80	573.00
	03/18/15 13:56:39	78382	13.11	4.75	0.12	5.62	63.24	57.80	573.00
	03/18/15 13:57:09	78412	12.83	5.12	0.12	5.79	63.10	57.80	602.00
	03/18/15 13:57:39	78442	12.38	3.47	0.11	6.12	63.10	57.80	602.00
	03/18/15 13:58:09	78472	12.16	2.46	0.12	6.29	62.98	57.80	631.00
	03/18/15 13:58:39	78502	12.52	2.54	0.11	6.07	62.98	57.80	631.00
	03/18/15 13:59:09	78532	11.94	2.60	0.10	6.43	62.85	57.80	600.00
	03/18/15 13:59:39	78562	12.07	1.99	0.11	6.41	62.85	57.80	600.00
	03/18/15 14:00:09	78592	12.54	2.58	0.12	6.05	62.72	57.80	614.00
	03/18/15 14:00:39	78622	12.21	2.77	0.11	6.27	62.72	57.80	614.00
	03/18/15 14:01:09	78652	11.90	2.42	0.11	6.48	62.60	57.90	628.00
	03/18/15 14:01:39	78682	12.45	2.08	0.11	6.17	62.60	57.90	628.00

Questor Technology Inc
March 18, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	58,520	SCFH

Weather Data

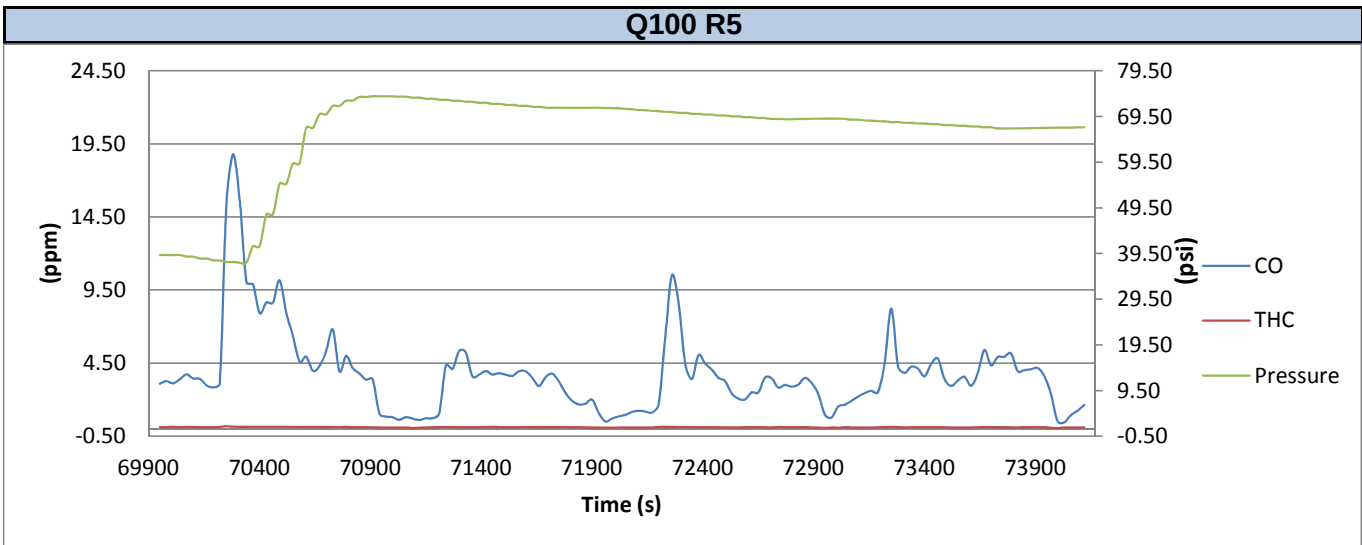
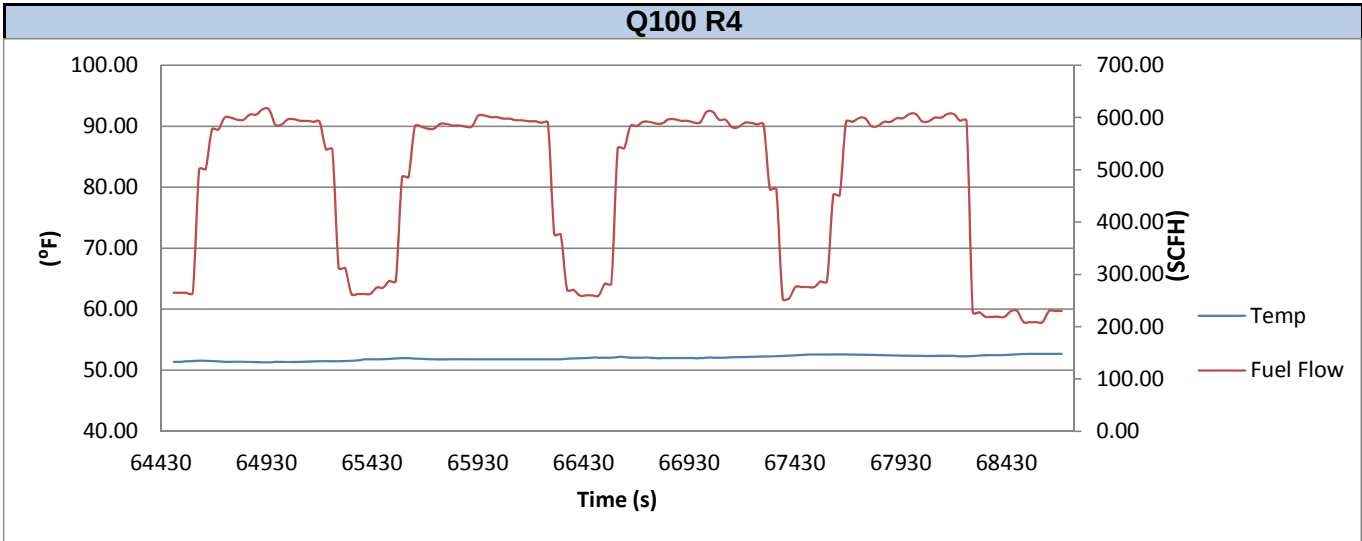
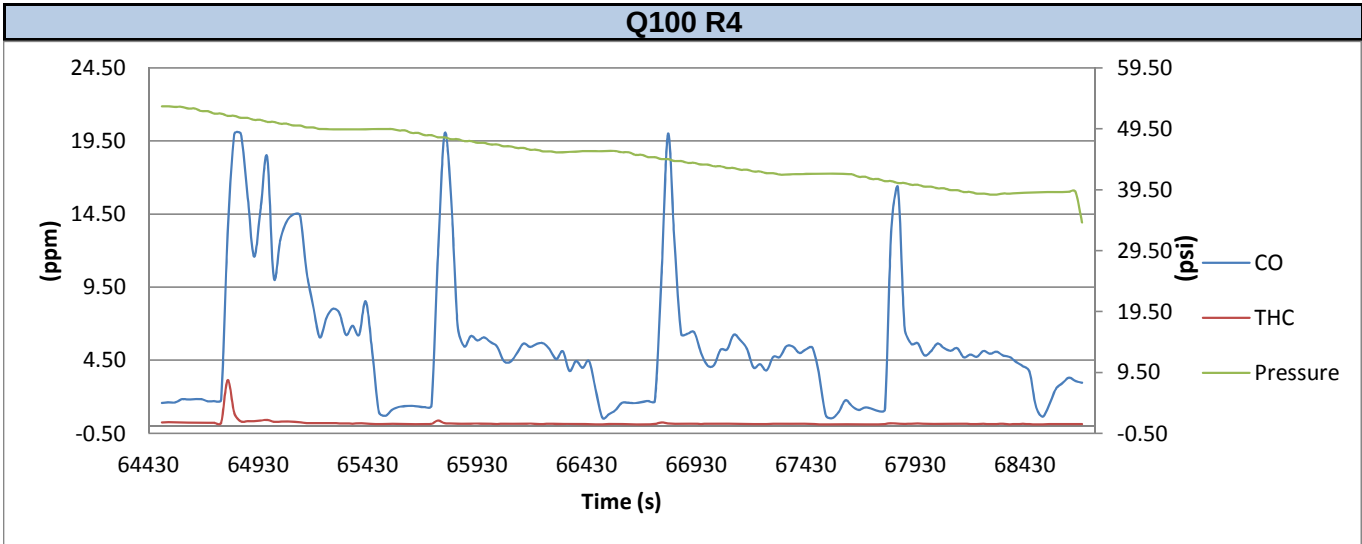
Barometric Pressure	30.08	in. Hg
Relative Humidity	71	%
Ambient Temperature	55	°F
Specific Humidity	0.006466	lb H ₂ O / lb air

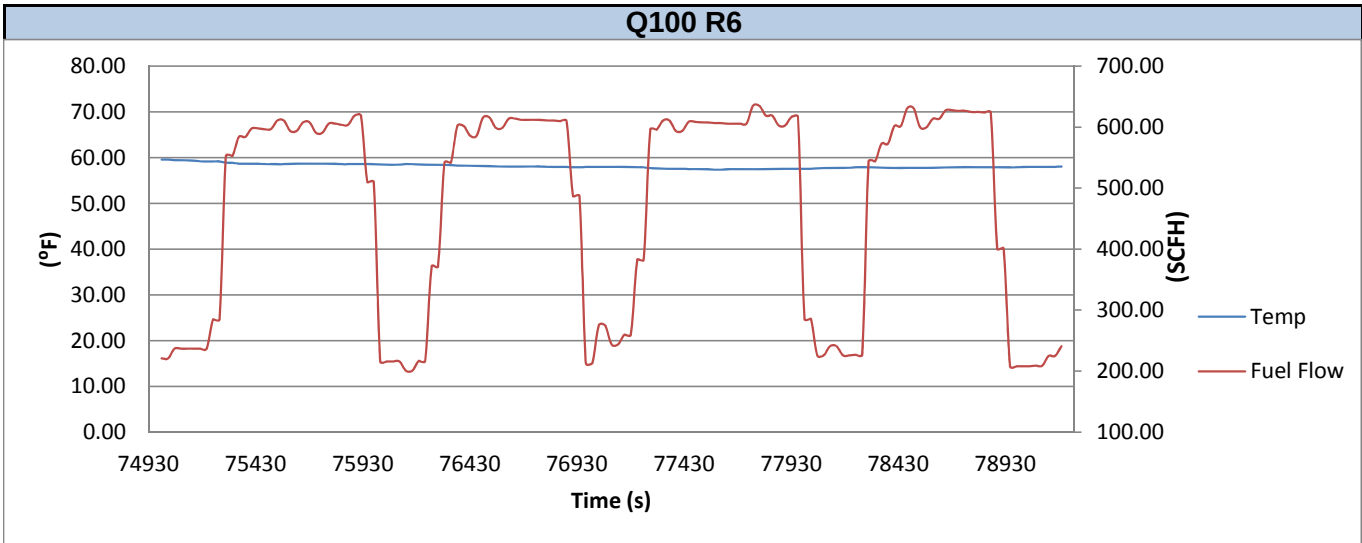
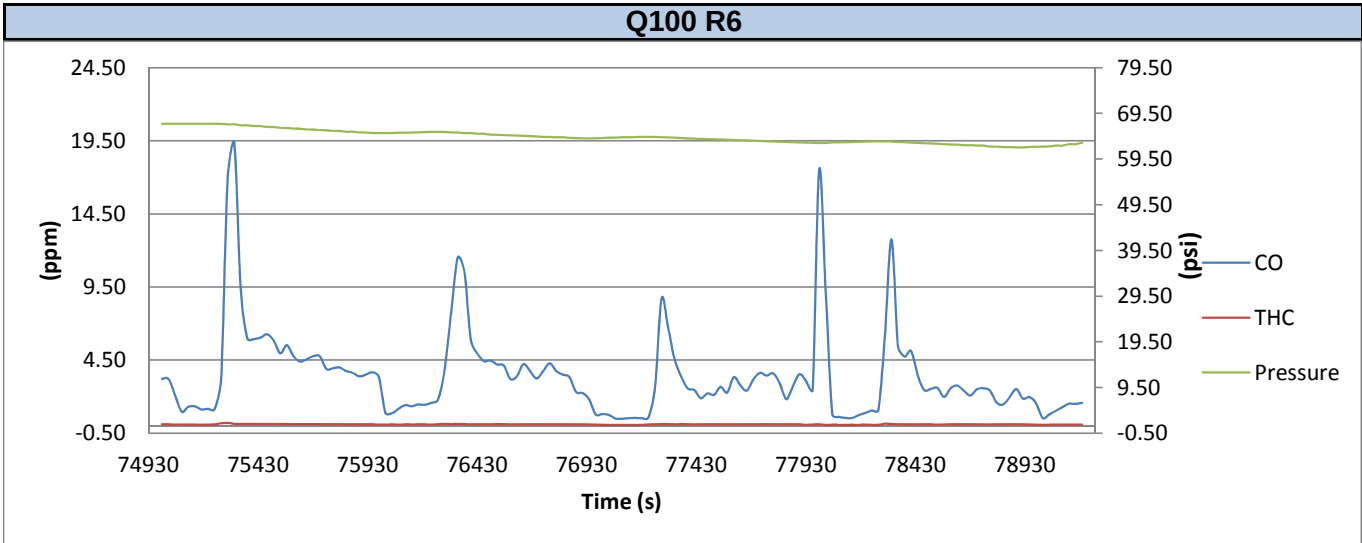
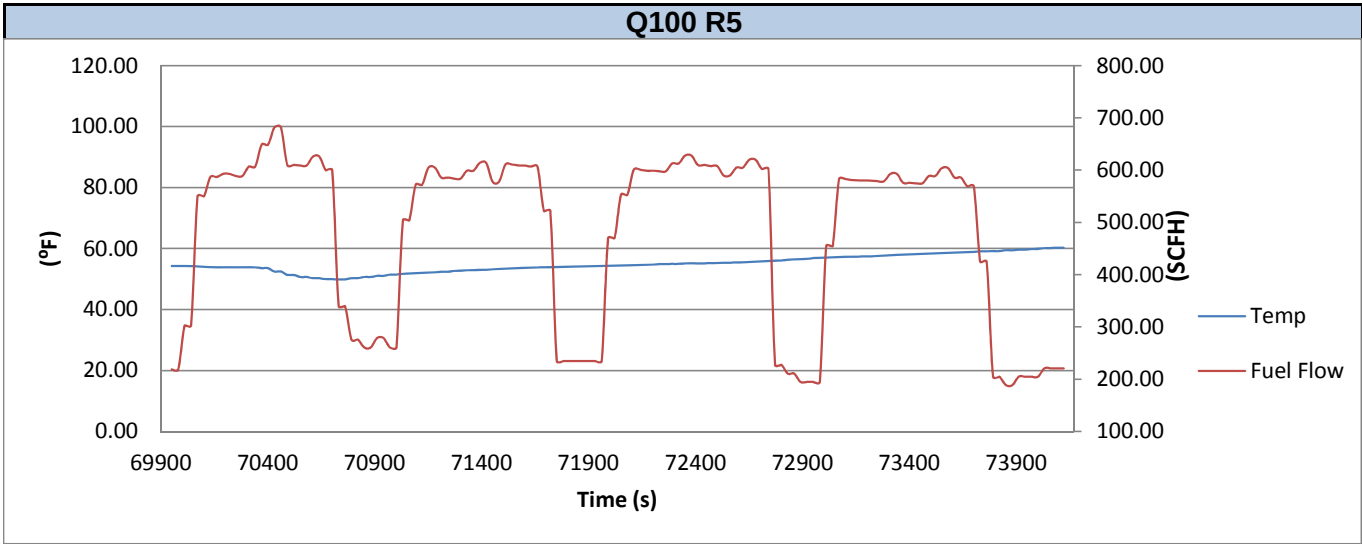
30-70-30 Load, Run - Q100 R6

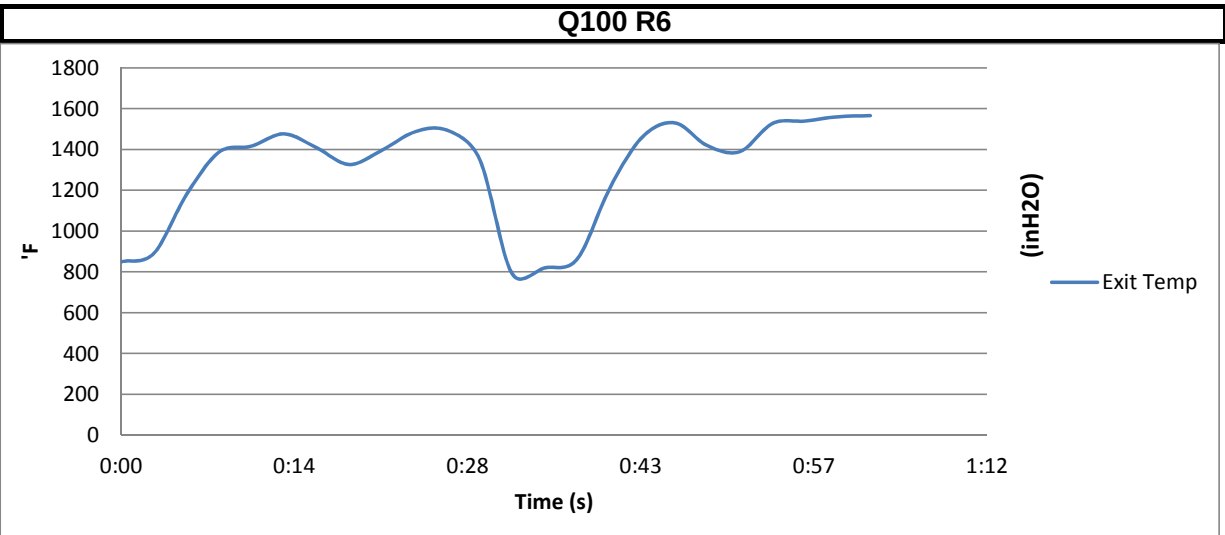
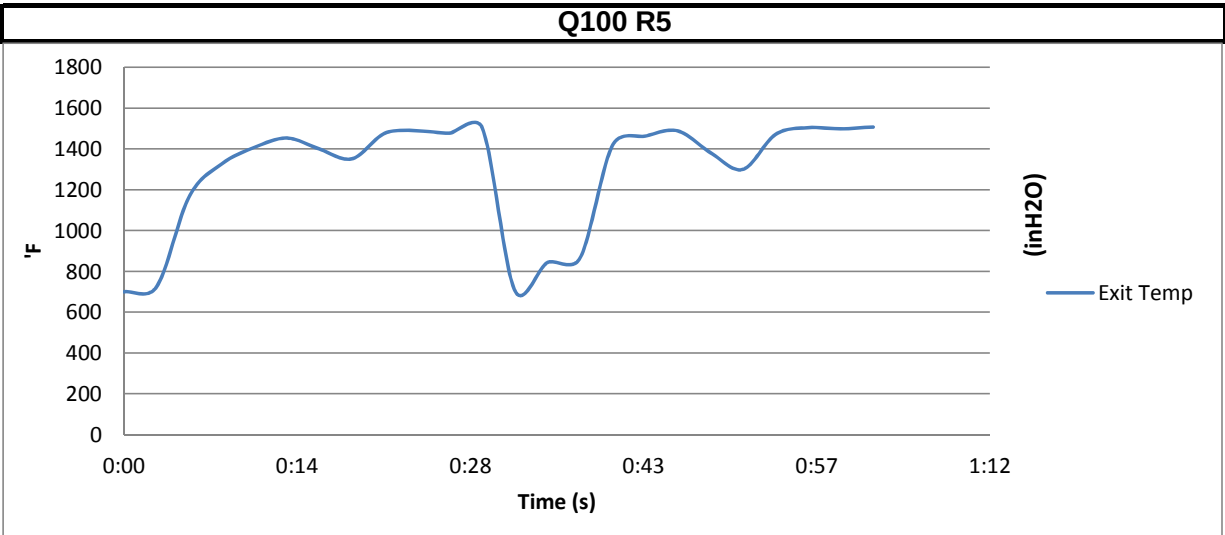
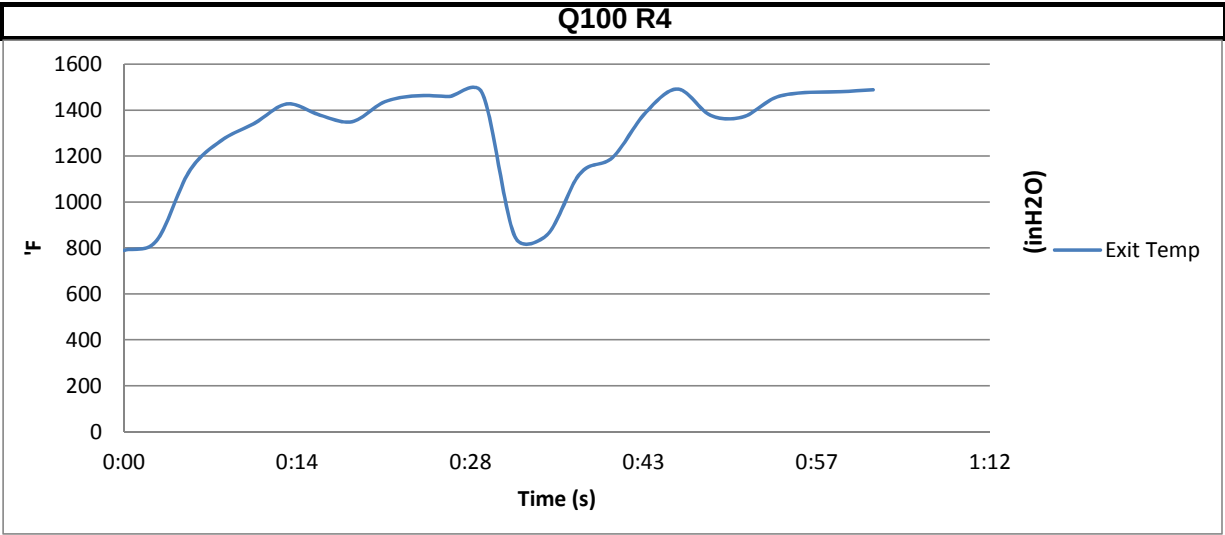
Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/18/15 14:02:09	78712	12.30	2.51	0.11	6.22	62.47	57.90	627.00
03/18/15 14:02:39	78742	12.40	2.58	0.11	6.11	62.47	57.90	627.00
03/18/15 14:03:09	78772	12.05	2.41	0.11	6.36	62.26	57.90	625.00
03/18/15 14:03:39	78802	11.97	1.61	0.11	6.46	62.26	57.90	625.00
03/18/15 14:04:09	78832	11.96	1.48	0.11	6.48	62.15	57.90	624.00
03/18/15 14:04:39	78862	12.55	1.99	0.11	6.03	62.15	57.90	624.00
03/18/15 14:05:09	78892	12.21	2.53	0.11	6.25	62.08	57.90	401.00
03/18/15 14:05:39	78922	12.14	1.87	0.11	6.34	62.08	57.90	401.00
03/18/15 14:06:09	78952	12.39	1.98	0.11	6.12	62.19	57.90	208.00
03/18/15 14:06:39	78982	11.25	1.56	0.07	6.99	62.19	57.90	208.00
03/18/15 14:07:09	79012	13.85	0.55	0.09	5.10	62.30	58.00	208.00
03/18/15 14:07:39	79042	14.21	0.79	0.10	4.79	62.30	58.00	208.00
03/18/15 14:08:09	79072	14.32	1.03	0.10	4.70	62.47	58.00	209.00
03/18/15 14:08:39	79102	14.35	1.29	0.10	4.68	62.47	58.00	209.00
03/18/15 14:09:09	79132	14.30	1.52	0.10	4.70	62.80	58.00	225.00
03/18/15 14:09:39	79162	14.32	1.51	0.10	4.70	62.80	58.00	225.00
03/18/15 14:10:09	79192	14.23	1.58	0.09	4.74	63.14	58.10	241.00
RAW AVERAGE		12.83	3.43	0.11	5.80	64.42	58.15	472.86

Bias	Serial Number:	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans. (in. H ₂ O)	Temp. Trans. (°F)	F-Flow Trans. (SCFH)
	INSTO2-0011		INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557
	Initial Zero	0.07	0.26	0.02	0.12			
	Final Zero	0.09	0.25	0.03	0.10			
	Avg. Zero	0.08	0.26	0.03	0.11			
	Initial UpScale	11.94	9.35	3.27	8.93			
	Final UpScale	11.98	9.34	3.30	8.92			
	Avg. UpScale	11.96	9.35	3.29	8.93			
Upscale Cal Gas		12.06	9.19	3.02	8.87			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.94	3.21	0.08	5.72
Corrected Raw Average (ppm/% wet basis)	12.25	3.03	0.08	5.41
Concentration (ppm@ 3%CO ₂)	N/A	1.68	0.04	N/A
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A







EMISSION DATA RECORDS

70-100-70% Ramp-up, Ramp-down Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	03/18/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		70-100-70%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		7	8	9	
Test Date	(mm/dd/yy)	03/19/15	03/19/15	03/19/15	
Load	% or w/DB	70-100-70	70-100-70	70-100-70	
Meter Box Number	from ACS	SAMP-CP-0008	SAMP-CP-0008	SAMP-CP-0008	
Meter Calibration Factor	(Y)	0.883	0.883	0.883	
Orifice Meter Coefficient	(ΔH_{or})	1.698	1.698	1.698	in H ₂ O
Pitot Identification	from ACS	4-17-14-2	4-17-14-2	4-17-14-2	
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840	
Probe Number	from ACS	SAMP-SP-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Impinger Case Number	from ACS	SAMP-BC-0002	SAMP-BC-0002	SAMP-BC-0002	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Run Start Time	08:40	10:03	11:31		hh:mm
Run Stop Time	09:50	11:13	12:41		hh:mm
Test Date	03/19/15	03/19/15	03/19/15		mm/dd/yy
Meter Calibration Factor	0.883	0.883	0.883		
Pitot Tube Coefficient	0.840	0.840	0.840		
Stack Test Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Initial Meter Volume	11.020	66.030	123.040		ft ³
Final Meter Volume	65.060	121.020	180.060		ft ³
Total Meter Volume	54.040	54.990	57.020	55.350	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	76.25	92.06	94.25	87.52	°F
Average Stack Temperature	1456.29	1455.00	1425.71	1445.67	°F
Barometric Pressure	30.05	30.06	30.07	30.06	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	30.05	30.06	30.07	30.06	in Hg
Average Orifice Pressure Drop	1.60	1.60	1.60	1.60	in H ₂ O
Absolute Meter Pressure	30.17	30.18	30.19	30.18	in Hg
Avg Square Root Pitot Pressure	0.24	0.23	0.27	0.25	√(in H ₂ O)
Moisture Content Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Impinger Water Weight Gain	50.60	49.20	46.00	48.60	g
Silica Gel Weight Gain	13.70	12.60	12.90	13.07	g
Total Water Volume Collected	64.42	61.91	59.01	61.78	ml
Standard Water Vapor Volume	3.03	2.91	2.78	2.91	scf
Standard Meter Volume	47.4	46.8	48.4	47.5	dscf
Calculated Stack Moisture	6.01	5.86	5.43	5.77	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	6.01	5.86	5.43	5.77	%
Gas Analysis Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Carbon Dioxide Content	6.0	4.6	5.6	5.4	%
Oxygen Content	14.0	15.9	14.6	14.8	%
Nitrogen Content	80.0	79.4	79.8	79.7	%
Stack Dry Molecular Weight	29.50	29.35	29.48	29.45	lb/lb-mole
Stack Wet Molecular Weight	28.81	28.69	28.86	28.79	lb/lb-mole
Percent Excess Air	196.6	314.1	225.8	245.5	%
Volumetric Flow Rate Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Average Stack Gas Velocity	26.10	24.74	29.00	26.61	ft/sec
Stack Cross-Sectional Area	3.05	3.05	3.05	3.05	ft ²
Actual Stack Flow Rate	4,770	4,521	5,298	4,863	acfm
Wet Standard Stack Flow Rate	79	75	89	81	wkscfh
Dry Standard Stack Flow Rate	74,438	70,747	84,603	76,596	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/18/15		
Sampling Location	Q100	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	70-100-70%-7		Date	03/19/15	Run Start Time	08:40	Run Stop Time	09:50
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	6.0	14.0	0.0	80.0	29.50	1.158	196.6	N/A

Gas Analysis Data								
Run Number	70-100-70%-8		Date	03/19/15	Run Start Time	10:03	Run Stop Time	11:13
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	4.6	15.9	0.0	79.4	29.35	1.082	314.1	N/A

Gas Analysis Data								
Run Number	70-100-70%-9		Date	03/19/15	Run Start Time	11:31	Run Stop Time	12:41
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.6	14.6	0.0	79.8	29.48	1.125	225.8	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/18/15
Sampling Location	Q100	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	70-100-70%-7		Date	03/19/15	Start Time	08:40	Stop Time	09:50
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	54.040	dcf		Barometric Pressure	(P _b)	30.05	in Hg
Average Stack Temp	(t _s) _{avg}	1456	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	76	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	822.20	761.30	594.40	851.90			
Initial Value	(V _i),(W _i)	779.60	755.90	591.80	838.20			
Net Value	(V _n),(W _n)	42.6	5.4	2.6	13.7			
Results								
Total Weight	(W _f)	64.30	g	Water Vol Weighed	(V _{wsg(std)})	3.032	scf	
Std Meter Volume	(V _{m(std)})	47.372	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	6.01	%	Final Moisture Content	(B _{ws})	6.01	%	

Moisture Content Data								
Run Number	70-100-70%-8		Date	03/19/15	Start Time	10:03	Stop Time	11:13
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	54.990	dcf		Barometric Pressure	(P _b)	30.06	in Hg
Average Stack Temp	(t _s) _{avg}	1455	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	92	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	863.80	766.10	597.20	866.60			
Initial Value	(V _i),(W _i)	822.20	761.30	594.40	854.00			
Net Value	(V _n),(W _n)	41.6	4.8	2.8	12.6			
Results								
Total Weight	(W _f)	61.80	g	Water Vol Weighed	(V _{wsg(std)})	2.914	scf	
Std Meter Volume	(V _{m(std)})	46.840	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.86	%	Final Moisture Content	(B _{ws})	5.86	%	

Moisture Content Data								
Run Number	70-100-70%-9		Date	03/19/15	Start Time	11:31	Stop Time	12:41
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	57.020	dcf		Barometric Pressure	(P _b)	30.07	in Hg
Average Stack Temp	(t _s) _{avg}	1426	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	94	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	903.90	770.00	599.20	833.10			
Initial Value	(V _i),(W _i)	863.80	766.10	597.20	820.20			
Net Value	(V _n),(W _n)	40.1	3.9	2.0	12.9			
Results								
Total Weight	(W _f)	58.90	g	Water Vol Weighed	(V _{wsg(std)})	2.777	scf	
Std Meter Volume	(V _{m(std)})	48.393	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.43	%	Final Moisture Content	(B _{ws})	5.43	%	

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/19/15
Operator	CG
Run Number	70-100-70%-7

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.250	in H ₂ O for	15.0
		Pre (-)	0.200	in H ₂ O for	15.0
		Post (+)	0.250	in H ₂ O for	20.0
		Post (-)	0.250	in H ₂ O for	25.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	08:40	End	09:50

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	779.6	755.9	591.8	838.2				
Post	822.2	761.3	594.4	851.9				

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.3956 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0002	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.840	
Average Stack Temp	(t _s)	1456.3	°F
Average Meter Temp	(t _m)	76.3	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.24	in H ₂ O
Stack Moisture Content	(B _{ws})	6.01	%
Stack Dry Molecular Weight	(M _d)	29.50	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.05	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.05	in Hg
Absolute Meter Pressure	(P _m)	30.17	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	11.020	0.070	1.698	1.60	1086	258		57			61	60	0.9	0.26	25.39	1.860		44.651
A-2	2.7	00:02:43	13.080	0.030	1.698	1.60	1148	258		65			64	60	0.9	0.17	16.95	3.599		43.182
A-3	5.4	00:05:25	15.010	0.040	1.698	1.60	1276	256		68			68	60	0.9	0.20	20.34	6.308		50.462
A-4	8.1	00:08:07	18.030	0.090	1.698	1.60	1496	258		67			71	61	0.9	0.30	32.38	8.077		48.464
A-5	10.8	00:10:50	20.010	0.100	1.698	1.60	1568	259		64			72	62	0.9	0.32	34.76	9.888		47.463
A-6	13.5	00:13:33	22.040	0.100	1.698	1.60	1613	259		61			76	63	0.9	0.32	35.14	11.690		46.761
A-7	16.3	00:16:15	24.070	0.090	1.698	1.60	1635	260		60			77	64	0.9	0.30	33.51	13.436		46.066
A-8	19.0	00:18:58	26.040	0.040	1.698	1.60	1513	259		60			78	65	0.9	0.20	21.68	15.196		45.588
A-9	21.7	00:21:40	28.030	0.040	1.698	1.60	1523	259		59			81	66	0.9	0.20	21.74	17.875		47.666
A-10	24.4	00:24:22	31.070	0.090	1.698	1.60	1618	258		58			82	67	0.9	0.30	33.38	19.616		47.078
A-11	27.1	00:27:05	33.050	0.060	1.698	1.60	1632	256		58			83	67	0.9	0.24	27.34	21.400		46.690
A-12	29.8	00:29:47	35.080	0.060	1.698	1.60	1628	255		58			80	69	0.9	0.24	27.32	23.159		46.317
B-1	32.5	00:32:30	37.080	0.010	1.698	1.60	902	256		55			84	71	0.9	0.10	9.01	25.739		47.517
B-2	35.2	00:35:12	40.030	0.010	1.698	1.60	827	258		56			86	72	0.9	0.10	8.76	27.518		47.173
B-3	37.9	00:37:55	42.070	0.050	1.698	1.60	1297	258		56			87	63	0.9	0.22	22.88	29.222		46.756
B-4	40.6	00:40:37	44.010	0.060	1.698	1.60	1477	258		56			88	64	0.9	0.24	26.31	31.871		47.806
B-5	43.3	00:43:20	47.030	0.080	1.698	1.60	1565	257		56			91	75	0.9	0.28	31.06	33.585		47.414
B-6	46.0	00:46:03	49.010	0.090	1.698	1.60	1594	255		56			93	77	0.9	0.30	33.18	35.336		47.115
B-7	48.8	00:48:45	51.040	0.040	1.698	1.60	1541	254		57			93	78	0.9	0.20	21.83	37.103		46.866
B-8	51.5	00:51:28	53.090	0.040	1.698	1.60	1490	254		57			93	78	0.9	0.20	21.55	39.636		47.563
B-9	54.2	00:54:10	56.030	0.090	1.698	1.60	1590	258		57			94	79	0.9	0.30	33.15	41.408		47.324
B-10	56.9	00:56:53	58.090	0.07	1.698	1.60	1638	258		57			98	81	0.9	0.26	29.58	43.076		46.992
B-11	59.6	00:59:35	60.040	0.07	1.698	1.60	1644	260		58			98	81	0.9	0.26	29.62	44.821		46.770
B-12	62.3	01:02:18	62.080	0.07	1.698	1.60	1650	258		58			98	81	0.9	0.26	29.66	47.371		47.371
Last Pt	65.0	01:05:00	65.060																	
Final Val	65.0	01:05:00	65.060												Max Vac	0.9	Final Values	47.371		
Average Values				0.06		1.60	1456	257		59			83	69		0.24	26.10			
													76							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/19/15
Operator	CG
Run Number	70-100-70%-8

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.250	in H ₂ O for	20.0
		Pre (-)	0.300	in H ₂ O for	20.0
		Post (+)	0.300	in H ₂ O for	15.0
		Post (-)	0.250	in H ₂ O for	15.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	10:03	End	11:13

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	822.2	761.3	594.4	854.0				
Post	863.8	766.1	597.2	866.6				

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.3896 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0002	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.840	
Average Stack Temp	(t _s)	1455.0	°F
Average Meter Temp	(t _m)	92.1	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.23	in H ₂ O
Stack Moisture Content	(B _{ws})	5.86	%
Stack Dry Molecular Weight	(M _d)	29.35	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.73	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.06	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.06	in Hg
Absolute Meter Pressure	(P _m)	30.18	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	66.030	0.010	1.698	1.60	500	257		63			86	83	0.9	0.10	7.58	1.762		42.283
A-2	2.7	00:02:43	68.070	0.030	1.698	1.60	993	257		63			86	83	0.9	0.17	16.15	4.318		51.817
A-3	5.4	00:05:25	71.030	0.080	1.698	1.60	1473	257		66			89	83	0.9	0.28	30.41	6.058		48.462
A-4	8.1	00:08:07	73.050	0.080	1.698	1.60	1526	259		67			92	83	0.9	0.28	30.82	7.758		46.550
A-5	10.8	00:10:50	75.030	0.080	1.698	1.60	1628	257		65			93	83	0.9	0.28	31.61	10.324		49.556
A-6	13.5	00:13:33	78.020	0.080	1.698	1.60	1645	256		60			95	84	0.9	0.28	31.73	12.027		48.108
A-7	16.3	00:16:15	80.010	0.030	1.698	1.60	1567	256		58			96	84	0.9	0.17	19.07	13.763		47.186
A-8	19.0	00:18:58	82.040	0.030	1.698	1.60	1529	255		57			97	85	0.9	0.17	18.89	16.297		48.892
A-9	21.7	00:21:40	85.010	0.070	1.698	1.60	1631	255		57			97	85	0.9	0.26	29.59	17.176		45.804
A-10	24.4	00:24:22	86.040	0.060	1.698	1.60	1642	253		54			98	86	0.9	0.24	27.46	19.758		47.418
A-11	27.1	00:27:05	89.070	0.060	1.698	1.60	1631	255		54			99	87	0.9	0.24	27.39	21.467		46.837
A-12	29.8	00:29:47	91.080	0.060	1.698	1.60	1627	253		55			95	87	0.9	0.24	27.36	23.157		46.313
B-1	32.5	00:32:30	93.060	0.010	1.698	1.60	922	254		51			96	88	0.9	0.10	9.09	25.712		47.469
B-2	35.2	00:35:12	96.060	0.020	1.698	1.60	880	255		51			96	88	0.9	0.14	12.66	28.251		48.430
B-3	37.9	00:37:55	99.040	0.050	1.698	1.60	1300	257		52			99	89	0.9	0.22	22.94	29.923		47.877
B-4	40.6	00:40:37	101.010	0.060	1.698	1.60	1555	258		52			100	89	0.9	0.24	26.89	31.670		47.505
B-5	43.3	00:43:20	103.070	0.080	1.698	1.60	1603	259		52			100	90	0.9	0.28	31.42	33.314		47.031
B-6	46.0	00:46:03	105.010	0.080	1.698	1.60	1621	258		52			100	90	0.9	0.28	31.55	35.034		46.711
B-7	48.8	00:48:45	107.040	0.040	1.698	1.60	1547	260		52			101	90	0.9	0.20	21.91	37.565		47.450
B-8	51.5	00:51:28	110.030	0.070	1.698	1.60	1561	256		52			102	91	0.9	0.26	29.09	40.100		48.120
B-9	54.2	00:54:10	113.030	0.080	1.698	1.60	1619	255		52			101	92	0.9	0.28	31.54	41.840		47.818
B-10	56.9	00:56:53	115.090	0.07	1.698	1.60	1637	255		52			101	92	0.9	0.26	29.63	43.497		47.451
B-11	59.6	00:59:35	117.050	0.07	1.698	1.60	1646	257		52			102	92	0.9	0.26	29.69	45.202		47.167
B-12	62.3	01:02:18	119.070	0.03	1.698	1.60	1637	257		52			102	92	0.9	0.17	19.40	46.848		46.848
Last Pt	65.0	01:05:00	121.020																	
Final Val	65.0	01:05:00	121.020												Max Vac	0.9	Final Values	46.848		
Average Values				0.06		1.60	1455	256		56			97	87		0.23	24.74			
													92							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/19/15
Operator	CG
Run Number	70-100-70%-9

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.250	in H ₂ O for	20.0 sec
		Pre (-)	0.200	in H ₂ O for	20.0 sec
		Post (+)	0.300	in H ₂ O for	25.0 sec
		Post (-)	0.300	in H ₂ O for	15.0 sec

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	11:31	End	12:41

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	863.8	766.1	597.2	820.2				
Post	903.9	770.0	599.2	833.1				

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.840	
Average Stack Temp	(t _s)	1425.7	°F
Average Meter Temp	(t _m)	94.3	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.27	in H ₂ O
Stack Moisture Content	(B _{ws})	5.43	%
Stack Dry Molecular Weight	(M _d)	29.48	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.72	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.07	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.07	in Hg
Absolute Meter Pressure	(P _m)	30.19	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	123.040	0.010	1.698	1.60	602	254		55			87	90	0.9	0.10	7.94	2.616		62.776
A-2	2.7	00:02:43	126.090	0.020	1.698	1.60	584	255		58			90	89	0.9	0.14	11.14	4.276		51.317
A-3	5.4	00:05:25	128.030	0.050	1.698	1.60	763	255		58			92	89	0.9	0.22	19.06	6.823		54.582
A-4	8.1	00:08:07	131.010	0.090	1.698	1.60	1511	260		58			94	89	0.9	0.30	32.47	8.537		51.223
A-5	10.8	00:10:50	133.020	0.100	1.698	1.60	1574	259		58			96	88	0.9	0.32	34.77	10.267		49.282
A-6	13.5	00:13:33	135.050	0.100	1.698	1.60	1601	261		58			96	88	0.9	0.32	35.00	11.988		47.954
A-7	16.3	00:16:15	137.070	0.060	1.698	1.60	1544	262		59			98	88	0.9	0.24	26.73	14.515		49.765
A-8	19.0	00:18:58	140.040	0.050	1.698	1.60	1544	260		58			99	89	0.9	0.22	24.40	16.204		48.613
A-9	21.7	00:21:40	142.030	0.100	1.698	1.60	1590	257		58			99	89	0.9	0.32	34.90	17.911		47.763
A-10	24.4	00:24:22	144.040	0.100	1.698	1.60	1621	260		58			99	89	0.9	0.32	35.17	20.484		49.161
A-11	27.1	00:27:05	147.070	0.090	1.698	1.60	1633	261		58			99	89	0.9		33.46	22.199		48.434
A-12	29.8	00:29:47	149.090	0.100	1.698	1.60	1635	256		58			94	89	0.9	0.32	35.29	23.871		47.742
B-1	32.5	00:32:30	151.050	0.040	1.698	1.60	1073	259		58			98	90	0.9	0.20	19.09	26.435		48.803
B-2	35.2	00:35:12	154.070	0.070	1.698	1.60	1046	256		58			99	91	0.9	0.26	25.03	28.139		48.238
B-3	37.9	00:37:55	156.080	0.100	1.698	1.60	1474	256		58			99	91	0.9	0.32	33.90	30.622		48.995
B-4	40.6	00:40:37	159.010	0.110	1.698	1.60	1577	257		58			101	91	0.9	0.33	36.49	32.322		48.484
B-5	43.3	00:43:20	161.020	0.110	1.698	1.60	1620	258		58			101	91	0.9	0.33	36.87	34.065		48.092
B-6	46.0	00:46:03	163.080	0.100	1.698	1.60	1638	257		59			102	92	0.9	0.32	35.31	36.540		48.720
B-7	48.8	00:48:45	166.010	0.070	1.698	1.60	1552	255		59			102	92	0.9	0.26	28.93	38.271		48.342
B-8	51.5	00:51:28	168.060	0.050	1.698	1.60	1522	254		60			102	92	0.9	0.22	24.27	40.788		48.945
B-9	54.2	00:54:10	171.040	0.10	1.698	1.60	1610	256		60			102	92	0.9	0.32	35.07	42.510		48.583
B-10	56.9	00:56:53	173.080	0.08	1.698	1.60	1638	255		60			102	93	0.9	0.28	31.58	44.181		48.198
B-11	59.6	00:59:35	175.060	0.07	1.698	1.60	1633	259		60			103	93	0.9	0.26	29.51	45.825		47.817
B-12	62.3	01:02:18	177.010	0.07	1.698	1.60	1632	260		60			103	93	0.9	0.26	29.50	48.396		48.396
Last Pt	65.0	01:05:00	180.060																	
Final Val	65.0	01:05:00	180.060												Max Vac	0.9		Final Values	48.396	
Average Values				0.08		1.60	1426	258		58			98	90			0.27	29.00		
													94							

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.0	%
Stack Exhaust Flow (M2)	74,438	SCFH

Weather Data

Barometric Pressure	30.05	in. Hg
Relative Humidity	85	%
Ambient Temperature	52	° F
Specific Humidity	0.006947	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R7

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/19/15 8:40:10	5970	11.28	0.78	0.19	7.01	83.30	44.20	626.00
	03/19/15 8:40:40	6000	11.46	1.00	0.19	6.85	83.30	44.20	626.00
	03/19/15 8:41:10	6030	11.53	1.18	0.17	6.80	83.13	44.50	762.00
	03/19/15 8:41:40	6060	11.63	1.26	0.17	6.72	83.13	44.50	762.00
	03/19/15 8:42:10	6090	11.50	1.27	0.17	6.80	83.04	44.70	917.00
	03/19/15 8:42:40	6120	12.18	1.23	0.19	6.43	83.04	44.70	917.00
	03/19/15 8:43:10	6150	13.40	3.67	0.19	5.33	82.63	44.80	893.00
	03/19/15 8:43:40	6180	13.06	5.26	0.20	5.64	82.63	44.80	893.00
	03/19/15 8:44:10	6210	13.19	4.97	0.20	5.51	82.69	44.50	894.00
	03/19/15 8:44:40	6240	13.39	5.82	0.20	5.35	82.69	44.50	894.00
	03/19/15 8:45:10	6270	13.11	5.95	0.20	5.57	82.52	45.10	892.00
	03/19/15 8:45:40	6300	13.06	4.43	0.19	5.65	82.52	45.10	892.00
	03/19/15 8:46:10	6330	13.06	4.44	0.20	5.61	82.30	45.10	889.00
	03/19/15 8:46:40	6360	13.07	4.33	0.20	5.62	82.30	45.10	889.00
	03/19/15 8:47:10	6390	13.29	4.86	0.19	5.47	82.08	44.80	888.00
	03/19/15 8:47:40	6420	12.13	4.83	0.18	6.24	82.08	44.80	888.00
	03/19/15 8:48:10	6450	11.90	2.21	0.18	6.56	81.84	44.70	886.00
	03/19/15 8:48:40	6480	11.92	1.96	0.17	6.52	81.84	44.70	886.00
	03/19/15 8:49:10	6510	12.21	2.09	0.18	6.30	81.84	44.90	886.00
	03/19/15 8:49:40	6540	12.16	3.66	0.17	6.34	81.84	44.90	886.00
	03/19/15 8:50:10	6570	12.24	5.69	0.18	6.27	81.45	45.10	882.00
	03/19/15 8:50:40	6600	12.17	4.99	0.19	6.33	81.45	45.10	882.00
	03/19/15 8:51:10	6630	12.16	3.78	0.18	6.34	81.47	44.60	806.00
	03/19/15 8:51:40	6660	12.25	2.81	0.19	6.25	81.47	44.60	806.00
	03/19/15 8:52:10	6690	12.24	2.52	0.19	6.27	81.49	45.30	652.00
	03/19/15 8:52:40	6720	12.18	2.50	0.17	6.31	81.49	45.30	652.00
	03/19/15 8:53:10	6750	12.16	2.52	0.19	6.33	81.55	45.00	576.00
	03/19/15 8:53:40	6780	12.15	2.62	0.17	6.34	81.55	45.00	576.00
	03/19/15 8:54:10	6810	12.08	2.62	0.17	6.40	81.50	45.00	614.00
	03/19/15 8:54:40	6840	11.97	2.50	0.17	6.49	81.50	45.00	614.00
	03/19/15 8:55:10	6870	12.06	2.41	0.19	6.42	81.45	44.10	595.00
	03/19/15 8:55:40	6900	12.03	2.39	0.19	6.43	81.45	44.10	595.00
	03/19/15 8:56:10	6930	12.08	2.22	0.18	6.40	81.44	44.80	728.00
	03/19/15 8:56:40	6960	12.03	2.17	0.19	6.46	81.44	44.80	728.00
	03/19/15 8:57:10	6990	11.91	2.15	0.19	6.48	81.19	44.60	880.00
	03/19/15 8:57:40	7020	11.68	1.86	0.18	6.77	81.19	44.60	880.00
	03/19/15 8:58:10	7050	12.85	2.66	0.18	5.82	80.85	45.40	875.00
	03/19/15 8:58:40	7080	12.86	3.53	0.18	5.82	80.85	45.40	875.00
	03/19/15 8:59:10	7110	13.36	4.08	0.20	5.39	80.82	45.30	913.00
	03/19/15 8:59:40	7140	13.26	5.15	0.19	5.45	80.82	45.30	913.00
	03/19/15 9:00:10	7170	13.28	5.12	0.18	5.46	80.71	45.50	893.00
	03/19/15 9:00:40	7200	13.34	5.17	0.19	5.40	80.71	45.50	893.00
A2	03/19/15 9:01:10	7230	13.35	5.47	0.18	5.39	80.40	45.70	889.00
	03/19/15 9:01:40	7260	13.34	5.52	0.19	5.39	80.40	45.70	889.00
	03/19/15 9:02:10	7290	13.34	5.61	0.19	5.37	80.44	45.00	891.00
	03/19/15 9:02:40	7320	11.64	4.58	0.17	6.63	80.44	45.00	891.00
	03/19/15 9:03:10	7350	12.14	1.67	0.18	6.38	80.12	46.30	905.00
A2	03/19/15 9:03:40	7380	12.23	1.61	0.18	6.28	80.12	46.30	905.00
	03/19/15 9:04:10	7410	12.29	1.85	0.18	6.23	79.96	45.70	904.00
	03/19/15 9:04:40	7440	12.30	1.90	0.18	6.21	79.96	45.70	904.00
	03/19/15 9:05:10	7470	12.22	1.91	0.18	6.29	79.93	46.20	903.00
	03/19/15 9:05:40	7500	12.20	1.85	0.18	6.30	79.93	46.20	903.00
	03/19/15 9:06:10	7530	12.23	1.89	0.18	6.29	79.74	45.70	902.00
	03/19/15 9:06:40	7560	12.20	1.91	0.18	6.30	79.74	45.70	902.00
	03/19/15 9:07:10	7590	12.19	1.99	0.18	6.30	79.86	46.30	639.00
	03/19/15 9:07:40	7620	11.94	2.02	0.17	6.47	79.86	46.30	639.00
	03/19/15 9:08:10	7650	11.73	1.81	0.17	6.65	79.67	46.10	638.00
	03/19/15 9:08:40	7680	11.96	1.77	0.17	6.50	79.67	46.10	638.00
	03/19/15 9:09:10	7710	11.89	1.91	0.17	6.54	79.47	46.20	599.00
	03/19/15 9:09:40	7740	11.84	1.81	0.16	6.58	79.47	46.20	599.00
	03/19/15 9:10:10	7770	11.76	1.82	0.17	6.65	79.66	45.60	639.00

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.0	%
Stack Exhaust Flow (M2)	74,438	SCFH

Weather Data

Barometric Pressure	30.05	in. Hg
Relative Humidity	85	%
Ambient Temperature	52	° F
Specific Humidity	0.006947	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R7

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/19/15 9:10:40	7800	11.94	1.82	0.17	6.53	79.66	45.60	639.00
	03/19/15 9:11:10	7830	11.99	1.92	0.17	6.45	79.61	45.70	619.00
	03/19/15 9:11:40	7860	12.15	2.04	0.17	6.34	79.61	45.70	619.00
	03/19/15 9:12:10	7890	11.87	2.11	0.18	6.55	79.48	46.30	599.00
	03/19/15 9:12:40	7920	11.93	1.71	0.18	6.50	79.48	46.30	599.00
	03/19/15 9:13:10	7950	11.94	1.37	0.17	6.54	79.51	46.10	730.00
	03/19/15 9:13:40	7980	13.17	2.30	0.18	5.62	79.51	46.10	730.00
	03/19/15 9:14:10	8010	13.20	3.93	0.19	5.52	79.28	45.70	897.00
	03/19/15 9:14:40	8040	13.18	4.21	0.18	5.54	79.28	45.70	897.00
	03/19/15 9:15:10	8070	13.12	4.26	0.18	5.56	79.18	46.20	877.00
	03/19/15 9:15:40	8100	13.13	4.16	0.18	5.57	79.18	46.20	877.00
	03/19/15 9:16:10	8130	13.35	4.59	0.19	5.40	78.98	46.50	874.00
	03/19/15 9:16:40	8160	13.40	5.46	0.19	5.34	78.98	46.50	874.00
	03/19/15 9:17:10	8190	13.26	5.46	0.19	5.45	78.81	46.80	891.00
	03/19/15 9:17:40	8220	13.00	4.75	0.17	5.68	78.81	46.80	891.00
	03/19/15 9:18:10	8250	13.24	4.25	0.18	5.50	78.60	47.40	888.00
	03/19/15 9:18:40	8280	13.20	4.99	0.19	5.52	78.60	47.40	888.00
	03/19/15 9:19:10	8310	13.35	5.30	0.17	5.42	78.48	47.70	886.00
	03/19/15 9:19:40	8340	13.30	7.43	0.19	5.40	78.48	47.70	886.00
	03/19/15 9:20:10	8370	12.49	5.90	0.17	6.05	78.31	47.40	903.00
	03/19/15 9:20:40	8400	12.52	2.94	0.18	6.07	78.31	47.40	903.00
A3	03/19/15 9:21:10	8430	12.23	2.70	0.17	6.28	78.07	47.80	900.00
	03/19/15 9:21:40	8460	12.34	2.22	0.17	6.20	78.07	47.80	900.00
	03/19/15 9:22:10	8490	12.41	2.18	0.19	6.16	77.95	47.70	881.00
	03/19/15 9:22:40	8520	12.49	2.06	0.18	6.09	77.95	47.70	881.00
	03/19/15 9:23:10	8550	12.31	2.04	0.18	6.22	77.85	47.70	898.00
	03/19/15 9:23:40	8580	12.28	1.99	0.17	6.26	77.85	47.70	898.00
	03/19/15 9:24:10	8610	12.29	2.00	0.17	6.22	77.69	48.30	768.00
	03/19/15 9:24:40	8640	12.19	1.90	0.17	6.32	77.69	48.30	768.00
	03/19/15 9:25:10	8670	12.31	1.88	0.17	6.22	77.65	48.00	640.00
	03/19/15 9:25:40	8700	12.18	1.85	0.17	6.34	77.65	48.00	640.00
	03/19/15 9:26:10	8730	12.15	1.81	0.16	6.34	77.70	48.10	622.00
	03/19/15 9:26:40	8760	12.29	1.77	0.16	6.26	77.70	48.10	622.00
A3	03/19/15 9:27:10	8790	12.50	1.99	0.18	6.07	77.73	48.00	622.00
	03/19/15 9:27:40	8820	12.43	2.15	0.18	6.11	77.73	48.00	622.00
	03/19/15 9:28:10	8850	12.37	2.05	0.18	6.20	77.56	47.90	584.00
	03/19/15 9:28:40	8880	12.34	2.06	0.17	6.22	77.56	47.90	584.00
	03/19/15 9:29:10	8910	12.26	1.99	0.17	6.26	77.53	48.30	584.00
	03/19/15 9:29:40	8940	12.29	1.93	0.18	6.23	77.53	48.30	584.00
	03/19/15 9:30:10	8970	12.16	1.91	0.18	6.34	77.61	48.40	675.00
	03/19/15 9:30:40	9000	12.54	1.78	0.17	6.10	77.61	48.40	675.00
	03/19/15 9:31:10	9030	12.74	2.55	0.18	5.93	77.32	48.50	873.00
	03/19/15 9:31:40	9060	12.78	2.86	0.19	5.81	77.32	48.50	873.00
	03/19/15 9:32:10	9090	12.67	2.61	0.17	5.95	77.26	49.20	890.00
	03/19/15 9:32:40	9120	12.85	2.59	0.18	5.87	77.26	49.20	890.00
	03/19/15 9:33:10	9150	13.42	4.25	0.18	5.32	76.93	49.00	905.00
	03/19/15 9:33:40	9180	13.42	5.18	0.19	5.34	76.93	49.00	905.00
	03/19/15 9:34:10	9210	13.33	5.08	0.17	5.42	76.81	49.50	885.00
	03/19/15 9:34:40	9240	13.38	5.01	0.19	5.37	76.81	49.50	885.00
	03/19/15 9:35:10	9270	13.44	5.63	0.18	5.29	76.62	49.00	884.00
	03/19/15 9:35:40	9300	13.32	5.75	0.18	5.43	76.62	49.00	884.00
	03/19/15 9:36:10	9330	13.26	5.37	0.18	5.44	76.48	49.80	899.00
	03/19/15 9:36:40	9360	13.24	6.14	0.18	5.45	76.48	49.80	899.00
	03/19/15 9:37:10	9390	12.32	4.89	0.17	6.19	76.18	49.90	878.00
	03/19/15 9:37:40	9420	12.25	2.11	0.17	6.27	76.18	49.90	878.00
	03/19/15 9:38:10	9450	12.22	1.98	0.17	6.30	76.13	50.20	895.00
	03/19/15 9:38:40	9480	12.13	1.91	0.17	6.35	76.13	50.20	895.00
	03/19/15 9:39:10	9510	12.09	1.65	0.17	6.43	76.04	49.70	877.00
	03/19/15 9:39:40	9540	12.25	1.68	0.17	6.28	76.04	49.70	877.00
	03/19/15 9:40:10	9570	12.42	1.89	0.18	6.16	75.74	50.50	854.00
	03/19/15 9:40:40	9600	12.38	1.96	0.17	6.17	75.74	50.50	854.00

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.0	%
Stack Exhaust Flow (M2)	74,438	SCFH

Weather Data

Barometric Pressure	30.05	in. Hg
Relative Humidity	85	%
Ambient Temperature	52	° F
Specific Humidity	0.006947	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R7

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/19/15 9:41:10	9630	12.37	1.99	0.18	6.18	75.68	50.00	873.00
03/19/15 9:41:40	9660	12.42	2.11	0.17	6.13	75.68	50.00	873.00
03/19/15 9:42:10	9690	12.08	1.89	0.17	6.39	75.63	50.90	675.00
03/19/15 9:42:40	9720	12.15	1.74	0.16	6.35	75.63	50.90	675.00
03/19/15 9:43:10	9750	12.12	1.77	0.17	6.37	75.76	50.60	641.00
03/19/15 9:43:40	9780	12.03	1.61	0.17	6.44	75.76	50.60	641.00
03/19/15 9:44:10	9810	12.20	1.62	0.17	6.32	75.55	50.80	639.00
03/19/15 9:44:40	9840	12.14	1.71	0.17	6.36	75.55	50.80	639.00
03/19/15 9:45:10	9870	12.04	1.71	0.17	6.42	75.61	50.90	639.00
03/19/15 9:45:40	9900	12.02	1.59	0.17	6.45	75.61	50.90	639.00
03/19/15 9:46:10	9930	12.05	1.53	0.15	6.42	75.47	51.40	638.00
03/19/15 9:46:40	9960	12.29	1.49	0.16	6.27	75.47	51.40	638.00
03/19/15 9:47:10	9990	12.39	1.72	0.18	6.16	75.46	51.30	638.00
03/19/15 9:47:40	10020	11.79	1.61	0.17	6.58	75.46	51.30	638.00
03/19/15 9:48:10	10050	12.04	1.31	0.17	6.50	75.41	51.50	637.00
03/19/15 9:48:40	10080	12.79	2.42	0.17	5.82	75.41	51.50	637.00
03/19/15 9:49:10	10110	12.78	2.59	0.16	5.89	75.43	51.80	637.00
03/19/15 9:49:40	10140	12.50	2.83	0.17	6.05	75.43	51.80	637.00
03/19/15 9:50:10	10170	12.76	2.38	0.17	5.89	75.41	52.00	636.00
RAW AVERAGE		12.47	2.93	0.18	6.10	79.00	47.20	785.38

Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press. Trans	Temp. Trans.	F-Flow Trans.
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.07	0.33	0.14	0.09			
	Final Zero	0.09	0.32	0.09	0.10			
	Avg. Zero	0.08	0.33	0.12	0.10			
	Initial UpScale	11.98	9.33	3.03	8.93			
	Final UpScale	12.02	9.33	3.18	8.90			
	Avg. UpScale	12.00	9.33	3.11	8.92			
Upscale Cal Gas		12.06	9.19	3.02	8.87			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.53	2.66	0.06	6.03
Corrected Raw Average (ppm/% wet basis)	11.77	2.48	0.05	5.67
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.9	%
Stack Exhaust Flow (M2)	70,747	SCFH

Weather Data

Barometric Pressure	30.06	in. Hg
Relative Humidity	92	%
Ambient Temperature	52	° F
Specific Humidity	0.007549	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R8

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/19/15 10:03:10	10950	12.46	1.94	0.15	6.13	74.93	52.90	632.00
	03/19/15 10:03:40	10980	12.77	1.99	0.15	5.84	74.93	52.90	632.00
	03/19/15 10:04:10	11010	12.65	2.41	0.16	5.96	74.81	52.90	701.00
	03/19/15 10:04:40	11040	12.96	2.72	0.16	5.72	74.81	52.90	701.00
	03/19/15 10:05:10	11070	12.71	2.81	0.16	5.92	74.63	53.10	874.00
	03/19/15 10:05:40	11100	13.14	3.16	0.16	5.55	74.63	53.10	874.00
	03/19/15 10:06:10	11130	13.08	3.76	0.15	5.63	74.46	53.50	872.00
	03/19/15 10:06:40	11160	12.91	3.80	0.16	5.70	74.46	53.50	872.00
	03/19/15 10:07:10	11190	13.08	3.08	0.16	5.66	74.26	53.40	870.00
	03/19/15 10:07:40	11220	13.28	3.96	0.17	5.45	74.26	53.40	870.00
	03/19/15 10:08:10	11250	13.23	4.53	0.17	5.50	74.07	53.40	868.00
	03/19/15 10:08:40	11280	13.59	5.39	0.17	5.23	74.07	53.40	868.00
	03/19/15 10:09:10	11310	13.02	6.76	0.17	5.64	73.85	53.50	866.00
	03/19/15 10:09:40	11340	12.74	3.56	0.16	5.89	73.85	53.50	866.00
	03/19/15 10:10:10	11370	12.61	2.72	0.16	5.97	73.71	53.70	881.00
	03/19/15 10:10:40	11400	12.65	2.37	0.16	5.97	73.71	53.70	881.00
	03/19/15 10:11:10	11430	12.42	2.26	0.16	6.14	73.50	53.60	879.00
	03/19/15 10:11:40	11460	12.55	2.16	0.16	6.06	73.50	53.60	879.00
	03/19/15 10:12:10	11490	12.62	2.16	0.16	6.00	73.39	53.70	861.00
	03/19/15 10:12:40	11520	12.59	2.19	0.16	6.00	73.39	53.70	861.00
	03/19/15 10:13:10	11550	12.54	2.05	0.15	6.06	73.18	53.60	859.00
	03/19/15 10:13:40	11580	12.47	1.93	0.16	6.09	73.18	53.60	859.00
	03/19/15 10:14:10	11610	12.38	1.85	0.16	6.18	73.03	53.80	874.00
	03/19/15 10:14:40	11640	12.15	1.66	0.16	6.33	73.03	53.80	874.00
	03/19/15 10:15:10	11670	12.20	1.53	0.16	6.33	72.97	54.00	651.00
	03/19/15 10:15:40	11700	12.30	1.59	0.16	6.23	72.97	54.00	651.00
	03/19/15 10:16:10	11730	12.34	1.77	0.16	6.19	73.03	53.60	634.00
	03/19/15 10:16:40	11760	12.32	1.73	0.16	6.22	73.03	53.60	634.00
	03/19/15 10:17:10	11790	12.15	1.65	0.16	6.34	72.99	54.10	616.00
	03/19/15 10:17:40	11820	12.45	1.61	0.16	6.13	72.99	54.10	616.00
	03/19/15 10:18:10	11850	12.28	1.79	0.15	6.25	72.94	53.90	616.00
	03/19/15 10:18:40	11880	12.28	1.72	0.15	6.22	72.94	53.90	616.00
	03/19/15 10:19:10	11910	11.98	1.44	0.15	6.53	72.88	54.00	616.00
	03/19/15 10:19:40	11940	12.89	1.97	0.16	5.76	72.88	54.00	616.00
	03/19/15 10:20:10	11970	12.91	3.08	0.15	5.82	72.83	54.20	735.00
	03/19/15 10:20:40	12000	13.44	3.64	0.18	5.32	72.83	54.20	735.00
	03/19/15 10:21:10	12030	13.45	4.65	0.17	5.35	72.65	54.10	887.00
	03/19/15 10:21:40	12060	13.65	5.77	0.17	5.15	72.65	54.10	887.00
	03/19/15 10:22:10	12090	13.17	5.43	0.16	5.54	72.44	54.20	885.00
	03/19/15 10:22:40	12120	13.39	5.04	0.17	5.34	72.44	54.20	885.00
	03/19/15 10:23:10	12150	13.65	5.03	0.16	5.20	73.51	54.70	878.00
	03/19/15 10:23:40	12180	13.53	6.61	0.17	5.22	73.51	54.70	878.00
A2	03/19/15 10:24:10	12210	13.27	5.69	0.16	5.45	74.54	55.30	904.00
	03/19/15 10:24:40	12240	13.02	5.38	0.16	5.61	74.54	55.30	904.00
	03/19/15 10:25:10	12270	12.62	3.83	0.16	6.01	74.37	55.40	902.00
	03/19/15 10:25:40	12300	12.49	2.37	0.15	6.08	74.37	55.40	902.00
	03/19/15 10:26:10	12330	12.43	2.02	0.15	6.14	74.20	55.50	900.00
	03/19/15 10:26:40	12360	12.46	2.15	0.16	6.11	74.20	55.50	900.00
	03/19/15 10:27:10	12390	12.46	2.13	0.15	6.10	74.04	55.70	898.00
	03/19/15 10:27:40	12420	12.20	1.90	0.15	6.32	74.04	55.70	898.00
	03/19/15 10:28:10	12450	12.18	1.66	0.16	6.33	73.87	55.90	896.00
	03/19/15 10:28:40	12480	12.32	1.65	0.16	6.24	73.87	55.90	896.00
	03/19/15 10:29:10	12510	12.39	1.78	0.15	6.14	73.70	56.00	911.00
	03/19/15 10:29:40	12540	12.47	1.92	0.16	6.10	73.70	56.00	911.00
	03/19/15 10:30:10	12570	12.58	2.09	0.15	6.04	73.54	56.10	910.00
	03/19/15 10:30:40	12600	12.76	2.19	0.16	5.88	73.54	56.10	910.00
	03/19/15 10:31:10	12630	12.54	2.25	0.15	6.02	72.28	55.70	914.00
	03/19/15 10:31:40	12660	12.44	1.99	0.16	6.10	72.28	55.70	914.00
	03/19/15 10:32:10	12690	12.33	1.82	0.16	6.23	71.09	55.30	668.00
	03/19/15 10:32:40	12720	12.40	1.81	0.16	6.13	71.09	55.30	668.00
	03/19/15 10:33:10	12750	12.42	1.81	0.15	6.17	71.06	55.60	634.00

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.9	%
Stack Exhaust Flow (M2)	70,747	SCFH

Weather Data

Barometric Pressure	30.06	in. Hg
Relative Humidity	92	%
Ambient Temperature	52	° F
Specific Humidity	0.007549	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R8

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/19/15 10:33:40	12780	12.50	1.96	0.16	6.08	71.06	55.60	634.00
	03/19/15 10:34:10	12810	12.43	1.97	0.15	6.12	70.90	55.50	600.00
	03/19/15 10:34:40	12840	12.57	1.97	0.16	6.03	70.90	55.50	600.00
	03/19/15 10:35:10	12870	12.39	2.08	0.14	6.11	70.99	55.60	600.00
	03/19/15 10:35:40	12900	12.28	1.74	0.16	6.23	70.99	55.60	600.00
	03/19/15 10:36:10	12930	12.25	1.65	0.15	6.33	70.89	55.50	633.00
	03/19/15 10:36:40	12960	12.62	1.84	0.16	5.99	70.89	55.50	633.00
	03/19/15 10:37:10	12990	13.20	2.35	0.16	5.55	70.93	55.50	633.00
	03/19/15 10:37:40	13020	13.10	3.30	0.17	5.62	70.93	55.50	633.00
	03/19/15 10:38:10	13050	13.66	4.20	0.17	5.16	70.73	55.30	882.00
	03/19/15 10:38:40	13080	13.67	5.65	0.17	5.14	70.73	55.30	882.00
	03/19/15 10:39:10	13110	13.67	5.69	0.17	5.15	70.56	55.50	896.00
	03/19/15 10:39:40	13140	13.74	6.05	0.18	5.11	70.56	55.50	896.00
	03/19/15 10:40:10	13170	13.80	6.92	0.18	5.05	70.32	55.60	893.00
	03/19/15 10:40:40	13200	13.80	7.24	0.17	5.05	70.32	55.60	893.00
	03/19/15 10:41:10	13230	13.56	7.13	0.17	5.19	70.15	55.50	875.00
	03/19/15 10:41:40	13260	13.51	5.27	0.17	5.36	70.15	55.50	875.00
	03/19/15 10:42:10	13290	13.68	10.35	0.16	5.09	69.92	55.40	873.00
	03/19/15 10:42:40	13320	12.57	7.28	0.16	6.02	69.92	55.40	873.00
	03/19/15 10:43:10	13350	12.63	2.47	0.16	5.98	69.75	55.60	887.00
	03/19/15 10:43:40	13380	12.60	2.32	0.15	5.97	69.75	55.60	887.00
	03/19/15 10:44:10	13410	12.51	2.01	0.15	6.11	69.57	55.30	886.00
	03/19/15 10:44:40	13440	12.66	2.00	0.16	5.96	69.57	55.30	886.00
	03/19/15 10:45:10	13470	12.47	2.00	0.16	6.10	69.38	55.50	883.00
	03/19/15 10:45:40	13500	12.51	1.95	0.16	6.08	69.38	55.50	883.00
	03/19/15 10:46:10	13530	12.62	2.10	0.14	5.98	69.16	55.50	881.00
A	03/19/15 10:46:40	13560	12.68	2.18	0.16	5.95	69.16	55.50	881.00
	03/19/15 10:47:10	13590	12.65	2.06	0.15	5.96	69.06	55.40	880.00
	03/19/15 10:47:40	13620	12.74	1.99	0.16	5.91	69.06	55.40	880.00
	03/19/15 10:48:10	13650	12.72	2.30	0.15	5.90	68.92	55.20	895.00
	03/19/15 10:48:40	13680	12.69	2.15	0.15	5.96	68.92	55.20	895.00
	03/19/15 10:49:10	13710	12.66	2.01	0.14	5.97	68.87	55.60	634.00
	03/19/15 10:49:40	13740	12.65	2.06	0.15	5.96	68.87	55.60	634.00
	03/19/15 10:50:10	13770	12.61	2.01	0.15	6.01	68.90	55.60	634.00
	03/19/15 10:50:40	13800	12.65	1.87	0.14	5.98	68.90	55.60	634.00
	03/19/15 10:51:10	13830	12.71	1.89	0.16	5.93	68.91	55.30	618.00
	03/19/15 10:51:40	13860	12.75	2.15	0.15	5.89	68.91	55.30	618.00
	03/19/15 10:52:10	13890	12.83	2.12	0.16	5.84	68.86	55.20	618.00
	03/19/15 10:52:40	13920	12.33	2.01	0.14	6.18	68.86	55.20	618.00
	03/19/15 10:53:10	13950	12.94	2.15	0.16	5.77	68.79	55.30	618.00
	03/19/15 10:53:40	13980	13.09	2.67	0.16	5.64	68.79	55.30	618.00
	03/19/15 10:54:10	14010	13.16	3.22	0.16	5.55	68.80	55.30	683.00
	03/19/15 10:54:40	14040	13.08	3.17	0.16	5.62	68.80	55.30	683.00
	03/19/15 10:55:10	14070	13.25	3.38	0.16	5.49	68.60	55.50	875.00
	03/19/15 10:55:40	14100	13.28	3.80	0.16	5.45	68.60	55.50	875.00
	03/19/15 10:56:10	14130	13.28	3.77	0.16	5.47	68.42	54.90	874.00
	03/19/15 10:56:40	14160	13.17	3.87	0.16	5.54	68.42	54.90	874.00
	03/19/15 10:57:10	14190	12.96	3.54	0.15	5.69	68.23	55.20	888.00
	03/19/15 10:57:40	14220	13.15	3.14	0.16	5.57	68.23	55.20	888.00
	03/19/15 10:58:10	14250	13.19	3.69	0.16	5.50	68.08	55.00	903.00
	03/19/15 10:58:40	14280	13.35	3.70	0.16	5.45	68.08	55.00	903.00
	03/19/15 10:59:10	14310	13.01	5.17	0.16	5.63	67.86	55.30	900.00
	03/19/15 10:59:40	14340	12.68	3.22	0.15	5.93	67.86	55.30	900.00
	03/19/15 11:00:10	14370	12.63	2.36	0.15	5.98	67.68	55.40	898.00
	03/19/15 11:00:40	14400	12.74	2.22	0.14	5.91	67.68	55.40	898.00
	03/19/15 11:01:10	14430	12.65	2.28	0.13	5.96	67.49	55.60	879.00
	03/19/15 11:01:40	14460	12.60	2.19	0.14	6.00	67.49	55.60	879.00
	03/19/15 11:02:10	14490	12.67	2.05	0.15	5.95	67.33	55.60	877.00
	03/19/15 11:02:40	14520	12.62	2.07	0.14	5.99	67.33	55.60	877.00
	03/19/15 11:03:10	14550	12.59	2.08	0.15	5.99	67.15	55.50	875.00
	03/19/15 11:03:40	14580	12.36	1.79	0.15	6.21	67.15	55.50	875.00

Questor Technology Inc
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.9	%
Stack Exhaust Flow (M2)	70,747	SCFH

Weather Data

Barometric Pressure	30.06	in. Hg
Relative Humidity	92	%
Ambient Temperature	52	° F
Specific Humidity	0.007549	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R8

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/19/15 11:04:10	14610	12.47	1.71	0.14	6.08	67.04	55.80	778.00
03/19/15 11:04:40	14640	12.40	1.66	0.15	6.16	67.04	55.80	778.00
03/19/15 11:05:10	14670	12.52	1.64	0.15	6.08	67.06	55.70	636.00
03/19/15 11:05:40	14700	12.51	1.81	0.14	6.07	67.06	55.70	636.00
03/19/15 11:06:10	14730	12.41	1.81	0.15	6.13	67.10	55.70	636.00
03/19/15 11:06:40	14760	12.36	1.74	0.15	6.18	67.10	55.70	636.00
03/19/15 11:07:10	14790	12.45	1.71	0.14	6.13	67.02	55.70	620.00
03/19/15 11:07:40	14820	12.62	1.82	0.14	5.99	67.02	55.70	620.00
03/19/15 11:08:10	14850	12.57	1.89	0.15	5.99	66.99	55.60	619.00
03/19/15 11:08:40	14880	12.24	1.61	0.14	6.27	66.99	55.60	619.00
03/19/15 11:09:10	14910	12.40	1.56	0.15	6.18	67.00	55.90	635.00
03/19/15 11:09:40	14940	12.66	1.92	0.14	5.96	67.00	55.90	635.00
03/19/15 11:10:10	14970	13.05	2.52	0.14	5.66	66.90	55.80	619.00
03/19/15 11:10:40	15000	13.28	3.10	0.16	5.45	66.90	55.80	619.00
03/19/15 11:11:10	15030	12.84	3.17	0.15	5.78	66.88	56.10	634.00
03/19/15 11:11:40	15060	13.01	2.91	0.15	5.66	66.88	56.10	634.00
03/19/15 11:12:10	15090	12.92	3.16	0.15	5.75	66.91	55.70	619.00
03/19/15 11:12:40	15120	12.92	2.85	0.14	5.77	66.91	55.70	619.00
03/19/15 11:13:10	15150	13.25	3.02	0.15	5.51	66.83	56.10	618.00
RAW AVERAGE		12.78	2.89	0.16	5.86	70.76	54.99	782.52

Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press. Trans	Temp. Trans.	F-Flow Trans.
		INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.09	0.32	0.09	0.10			
	Final Zero	0.07	0.31	0.07	0.11			
	Avg. Zero	0.08	0.32	0.08	0.11			
	Initial UpScale	12.02	9.33	3.18	8.90			
	Final UpScale	12.00	9.31	3.13	8.94			
	Avg. UpScale	12.01	9.32	3.16	8.92			
Upscale Cal Gas		12.06	9.19	3.02	8.87			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.84	2.63	0.07	5.79
Corrected Raw Average (ppm/% wet basis)	12.08	2.45	0.07	5.44
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A

Questor Technology Inc
March 19, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.4	%
Stack Exhaust Flow (M2)	84,603	SCFH

Weather Data

Barometric Pressure	30.07	in. Hg
Relative Humidity	87	%
Ambient Temperature	52	°F
Specific Humidity	0.007100	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R9

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmwv)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/19/15 11:31:10	16230	13.32	4.62	0.15	5.68	66.37	56.30	630.00
	03/19/15 11:31:40	16260	13.40	4.59	0.15	5.58	66.37	56.30	630.00
	03/19/15 11:32:10	16290	13.39	4.82	0.16	5.56	66.47	56.50	614.00
	03/19/15 11:32:40	16320	13.42	4.76	0.16	5.49	66.47	56.50	614.00
	03/19/15 11:33:10	16350	13.32	4.79	0.15	5.56	66.35	56.60	629.00
	03/19/15 11:33:40	16380	13.47	4.87	0.16	5.44	66.35	56.60	629.00
	03/19/15 11:34:10	16410	13.56	6.06	0.14	5.32	66.25	56.20	613.00
	03/19/15 11:34:40	16440	13.59	6.35	0.14	5.28	66.25	56.20	613.00
	03/19/15 11:35:10	16470	13.54	6.36	0.16	5.31	66.12	56.60	815.00
	03/19/15 11:35:40	16500	13.59	6.20	0.16	5.26	66.12	56.60	815.00
	03/19/15 11:36:10	16530	13.41	6.45	0.15	5.32	65.91	56.20	908.00
	03/19/15 11:36:40	16560	12.39	4.91	0.14	6.22	65.91	56.20	908.00
	03/19/15 11:37:10	16590	12.69	2.99	0.15	5.98	65.67	56.80	888.00
	03/19/15 11:37:40	16620	12.45	2.71	0.14	6.15	65.67	56.80	888.00
	03/19/15 11:38:10	16650	12.55	2.50	0.14	6.09	65.56	57.00	902.00
	03/19/15 11:38:40	16680	12.61	2.59	0.14	6.01	65.56	57.00	902.00
	03/19/15 11:39:10	16710	12.61	2.19	0.14	6.02	65.29	56.80	884.00
	03/19/15 11:39:40	16740	12.53	2.16	0.14	6.07	65.29	56.80	884.00
	03/19/15 11:40:10	16770	12.26	1.87	0.15	6.27	65.21	56.80	883.00
	03/19/15 11:40:40	16800	12.53	1.84	0.14	6.10	65.21	56.80	883.00
	03/19/15 11:41:10	16830	12.44	2.21	0.14	6.11	65.02	56.90	881.00
	03/19/15 11:41:40	16860	12.63	1.92	0.15	6.03	65.02	56.90	881.00
	03/19/15 11:42:10	16890	12.84	2.10	0.14	5.83	64.83	57.20	893.00
	03/19/15 11:42:40	16920	12.85	2.37	0.15	5.83	64.83	57.20	893.00
	03/19/15 11:43:10	16950	12.73	2.25	0.14	5.91	64.62	57.10	891.00
	03/19/15 11:43:40	16980	12.72	2.18	0.14	5.92	64.62	57.10	891.00
	03/19/15 11:44:10	17010	12.62	2.21	0.14	5.95	64.41	56.80	889.00
	03/19/15 11:44:40	17040	12.34	1.89	0.14	6.22	64.41	56.80	889.00
	03/19/15 11:45:10	17070	12.60	1.69	0.15	6.02	64.24	57.00	856.00
	03/19/15 11:45:40	17100	12.56	1.73	0.13	6.05	64.24	57.00	856.00
	03/19/15 11:46:10	17130	12.76	1.90	0.13	5.89	64.23	56.80	643.00
	03/19/15 11:46:40	17160	12.12	1.91	0.14	6.38	64.23	56.80	643.00
	03/19/15 11:47:10	17190	12.76	1.83	0.14	5.88	64.15	57.10	611.00
	03/19/15 11:47:40	17220	12.53	2.21	0.12	6.04	64.15	57.10	611.00
	03/19/15 11:48:10	17250	12.85	2.04	0.14	5.85	64.23	57.10	627.00
	03/19/15 11:48:40	17280	12.76	2.82	0.13	5.87	64.23	57.10	627.00
	03/19/15 11:49:10	17310	13.06	2.77	0.15	5.69	64.16	57.10	626.00
	03/19/15 11:49:40	17340	13.05	3.33	0.14	5.65	64.16	57.10	626.00
	03/19/15 11:50:10	17370	13.05	3.31	0.15	5.66	64.16	57.20	611.00
	03/19/15 11:50:40	17400	12.79	3.33	0.15	5.86	64.16	57.20	611.00
	03/19/15 11:51:10	17430	13.10	3.24	0.15	5.59	64.10	57.00	611.00
	03/19/15 11:51:40	17460	12.51	3.12	0.14	6.07	64.10	57.00	611.00
	03/19/15 11:52:10	17490	12.52	2.13	0.13	6.08	63.98	57.00	823.00
	03/19/15 11:52:40	17520	12.78	2.34	0.14	5.87	63.98	57.00	823.00
	03/19/15 11:53:10	17550	12.91	3.03	0.14	5.79	63.79	56.80	882.00
	03/19/15 11:53:40	17580	12.79	3.80	0.13	5.79	63.79	56.80	882.00
	03/19/15 11:54:10	17610	12.63	2.84	0.14	5.98	63.54	57.00	879.00
A2	03/19/15 11:54:40	17640	12.58	2.26	0.14	6.01	63.54	57.00	879.00
	03/19/15 11:55:10	17670	12.41	2.03	0.14	6.15	63.36	57.20	892.00
	03/19/15 11:55:40	17700	12.47	2.04	0.13	6.10	63.36	57.20	892.00
	03/19/15 11:56:10	17730	12.71	2.08	0.12	5.93	63.16	57.10	890.00
	03/19/15 11:56:40	17760	12.52	2.12	0.13	6.06	63.16	57.10	890.00
	03/19/15 11:57:10	17790	12.60	2.08	0.14	5.97	62.94	57.70	886.00
	03/19/15 11:57:40	17820	12.32	1.82	0.14	6.25	62.94	57.70	886.00
	03/19/15 11:58:10	17850	12.58	1.76	0.13	6.02	62.71	57.90	883.00
	03/19/15 11:58:40	17880	12.62	1.90	0.15	5.98	62.71	57.90	883.00
	03/19/15 11:59:10	17910	12.65	1.91	0.15	5.98	62.54	57.70	896.00
	03/19/15 11:59:40	17940	12.29	1.84	0.14	6.24	62.54	57.70	896.00
	03/19/15 12:00:10	17970	12.48	1.83	0.13	6.08	62.38	57.40	895.00
	03/19/15 12:00:40	18000	12.50	1.09	0.08	7.97	62.38	57.40	895.00

Questor Technology Inc
March 19, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.4	%
Stack Exhaust Flow (M2)	84,603	SCFH

Weather Data

Barometric Pressure	30.07	in. Hg
Relative Humidity	87	%
Ambient Temperature	52	°F
Specific Humidity	0.007100	lb H ₂ O / lb air

70-100-70 Load, Run - Q100 R9

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/19/15 12:01:10	18030	12.31	1.13	0.09	7.78	62.26	57.70	893.00
	03/19/15 12:01:40	18060	12.39	1.54	0.10	7.54	62.26	57.70	893.00
	03/19/15 12:02:10	18090	12.44	1.59	0.11	7.34	62.14	57.30	848.00
	03/19/15 12:02:40	18120	12.52	1.72	0.11	7.23	62.14	57.30	848.00
	03/19/15 12:03:10	18150	12.48	1.78	0.11	7.04	62.13	57.40	669.00
	03/19/15 12:03:40	18180	12.58	2.14	0.12	6.87	62.13	57.40	669.00
	03/19/15 12:04:10	18210	12.58	1.84	0.11	6.93	62.17	57.50	640.00
	03/19/15 12:04:40	18240	12.42	2.25	0.13	6.45	62.17	57.50	640.00
	03/19/15 12:05:10	18270	12.95	3.25	0.13	6.28	62.04	57.20	624.00
	03/19/15 12:05:40	18300	13.02	3.27	0.14	6.33	62.04	57.20	624.00
	03/19/15 12:06:10	18330	12.87	3.55	0.14	5.98	62.10	57.30	639.00
	03/19/15 12:06:40	18360	13.22	3.96	0.12	6.02	62.10	57.30	639.00
	03/19/15 12:07:10	18390	13.08	4.06	0.15	5.76	62.13	56.60	625.00
	03/19/15 12:07:40	18420	13.35	4.50	0.15	5.71	62.13	56.60	625.00
	03/19/15 12:08:10	18450	13.58	6.43	0.16	5.24	62.06	57.20	713.00
	03/19/15 12:08:40	18480	13.65	6.42	0.14	5.25	62.06	57.20	713.00
	03/19/15 12:09:10	18510	13.00	6.49	0.15	5.46	62.01	57.30	876.00
	03/19/15 12:09:40	18540	11.97	6.27	0.15	6.45	62.01	57.30	876.00
	03/19/15 12:10:10	18570	12.42	4.91	0.15	6.31	61.79	57.00	874.00
	03/19/15 12:10:40	18600	12.76	3.55	0.13	5.91	61.79	57.00	874.00
	03/19/15 12:11:10	18630	12.71	2.97	0.15	6.00	61.61	57.00	887.00
	03/19/15 12:11:40	18660	12.68	3.00	0.15	5.96	61.61	57.00	887.00
	03/19/15 12:12:10	18690	12.69	3.00	0.14	6.00	61.44	57.00	885.00
	03/19/15 12:12:40	18720	12.44	2.89	0.14	6.10	61.44	57.00	885.00
	03/19/15 12:13:10	18750	12.43	2.70	0.15	6.22	61.21	57.20	881.00
	03/19/15 12:13:40	18780	12.49	2.55	0.14	6.13	61.21	57.20	881.00
	03/19/15 12:14:10	18810	12.36	2.47	0.13	6.20	61.08	57.30	880.00
	03/19/15 12:14:40	18840	12.56	2.46	0.14	6.12	61.08	57.30	880.00
	03/19/15 12:15:10	18870	12.72	2.56	0.15	5.94	60.95	57.00	879.00
	03/19/15 12:15:40	18900	12.65	2.70	0.15	5.98	60.95	57.00	879.00
	03/19/15 12:16:10	18930	12.56	2.63	0.13	6.05	60.79	57.00	877.00
	03/19/15 12:16:40	18960	12.63	2.44	0.14	6.00	60.79	57.00	877.00
	03/19/15 12:17:10	18990	12.67	2.24	0.15	6.00	60.63	57.00	904.00
	03/19/15 12:17:40	19020	12.63	2.16	0.14	5.97	60.63	57.00	904.00
A3	03/19/15 12:18:10	19050	12.53	2.18	0.14	6.08	60.43	57.20	887.00
	03/19/15 12:18:40	19080	12.73	2.20	0.15	6.02	60.43	57.20	887.00
	03/19/15 12:19:10	19110	12.82	2.17	0.13	5.95	60.33	57.00	886.00
	03/19/15 12:19:40	19140	12.73	2.12	0.14	6.23	60.33	57.00	886.00
	03/19/15 12:20:10	19170	12.37	2.00	0.14	6.19	60.27	57.10	682.00
	03/19/15 12:20:40	19200	11.74	1.87	0.15	6.38	60.27	57.10	682.00
	03/19/15 12:21:10	19230	12.25	1.74	0.15	6.26	60.29	56.90	624.00
	03/19/15 12:21:40	19260	12.72	1.74	0.15	6.07	60.29	56.90	624.00
	03/19/15 12:22:10	19290	12.84	1.83	0.15	6.21	60.33	57.20	610.00
	03/19/15 12:22:40	19320	12.73	1.94	0.14	6.01	60.33	57.20	610.00
	03/19/15 12:23:10	19350	12.67	2.33	0.13	5.92	60.37	57.30	596.00
	03/19/15 12:23:40	19380	12.55	2.23	0.12	6.04	60.37	57.30	596.00
	03/19/15 12:24:10	19410	12.36	2.07	0.11	6.15	60.27	57.30	580.00
	03/19/15 12:24:40	19440	12.46	1.92	0.13	6.19	60.27	57.30	580.00
	03/19/15 12:25:10	19470	13.04	1.93	0.14	5.76	60.28	57.50	609.00
	03/19/15 12:25:40	19500	13.04	2.28	0.15	5.61	60.28	57.50	609.00
	03/19/15 12:26:10	19530	12.87	2.74	0.14	5.73	60.33	57.30	886.00
	03/19/15 12:26:40	19560	12.66	2.92	0.12	5.99	60.33	57.30	886.00
	03/19/15 12:27:10	19590	12.75	2.78	0.12	5.89	60.00	57.10	882.00
	03/19/15 12:27:40	19620	12.97	2.64	0.14	5.79	60.00	57.10	882.00
	03/19/15 12:28:10	19650	13.13	2.72	0.15	5.58	59.86	57.30	865.00
	03/19/15 12:28:40	19680	13.06	2.94	0.15	5.69	59.86	57.30	865.00
	03/19/15 12:29:10	19710	13.10	3.19	0.15	5.58	59.66	57.30	863.00
	03/19/15 12:29:40	19740	13.03	3.39	0.14	5.68	59.66	57.30	863.00
	03/19/15 12:30:10	19770	13.01	3.41	0.15	5.69	59.45	57.50	889.00
	03/19/15 12:30:40	19800	12.80	3.36	0.14	5.79	59.45	57.50	889.00

Questor Technology Inc
March 19, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.4	%
Stack Exhaust Flow (M2)	84,603	SCFH

Weather Data

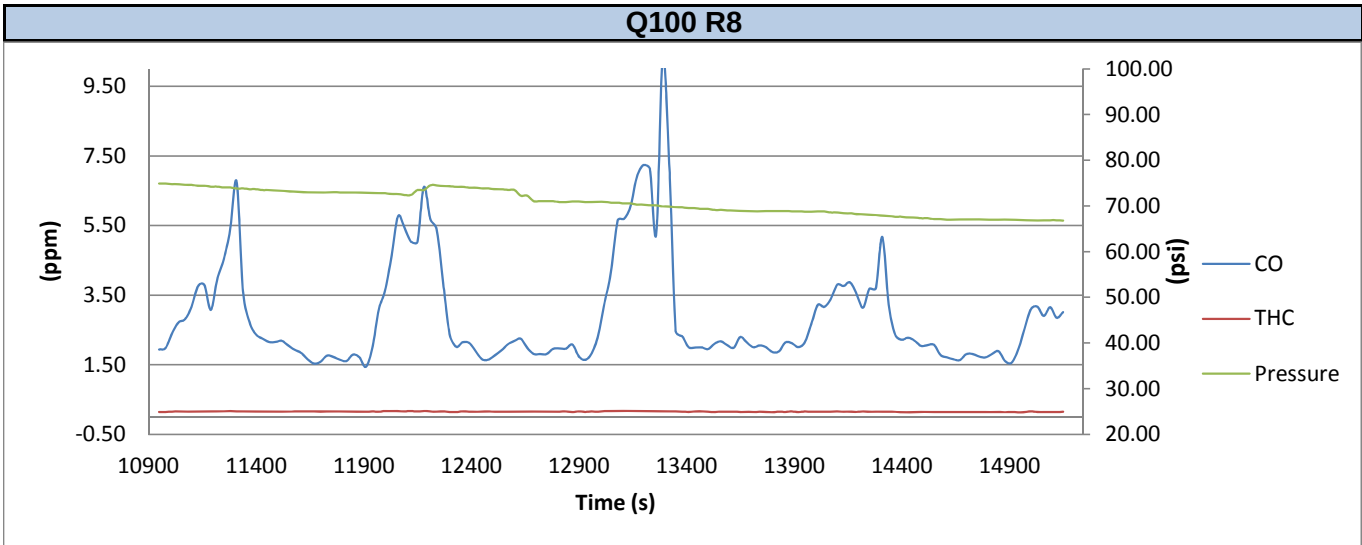
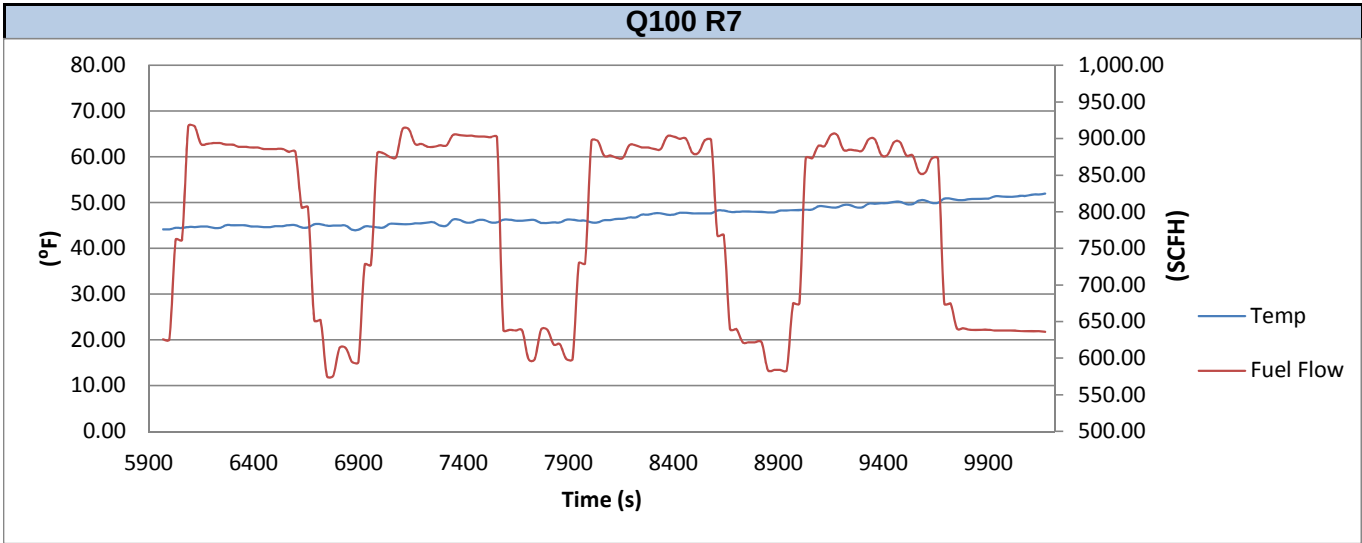
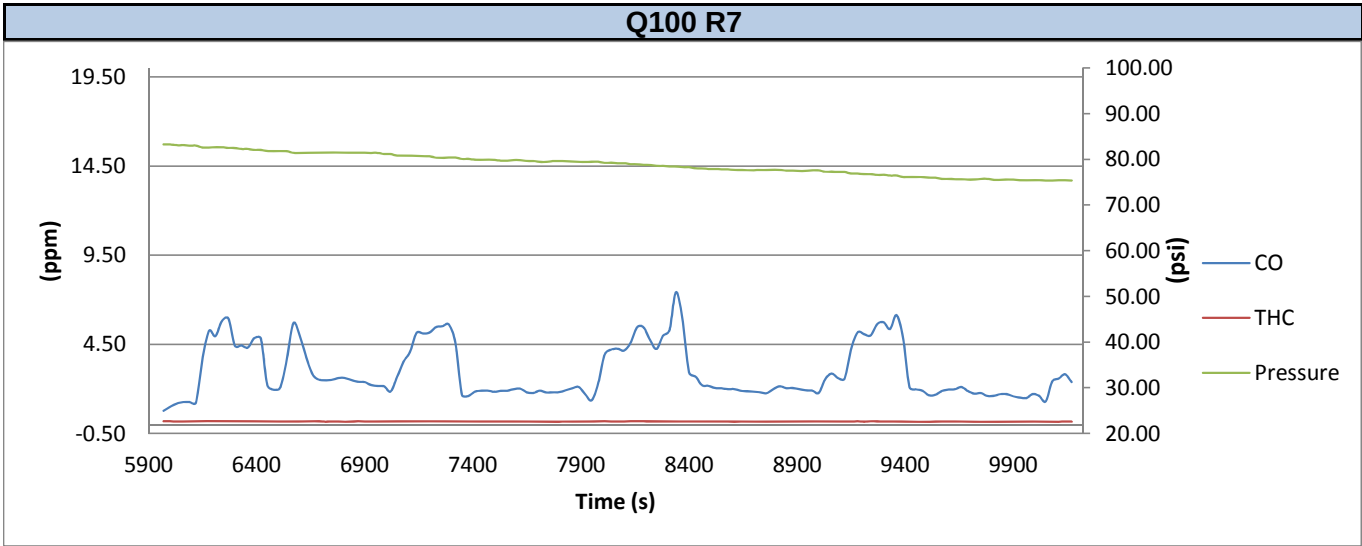
Barometric Pressure	30.07	in. Hg
Relative Humidity	87	%
Ambient Temperature	52	°F
Specific Humidity	0.007100	lb H ₂ O / lb air

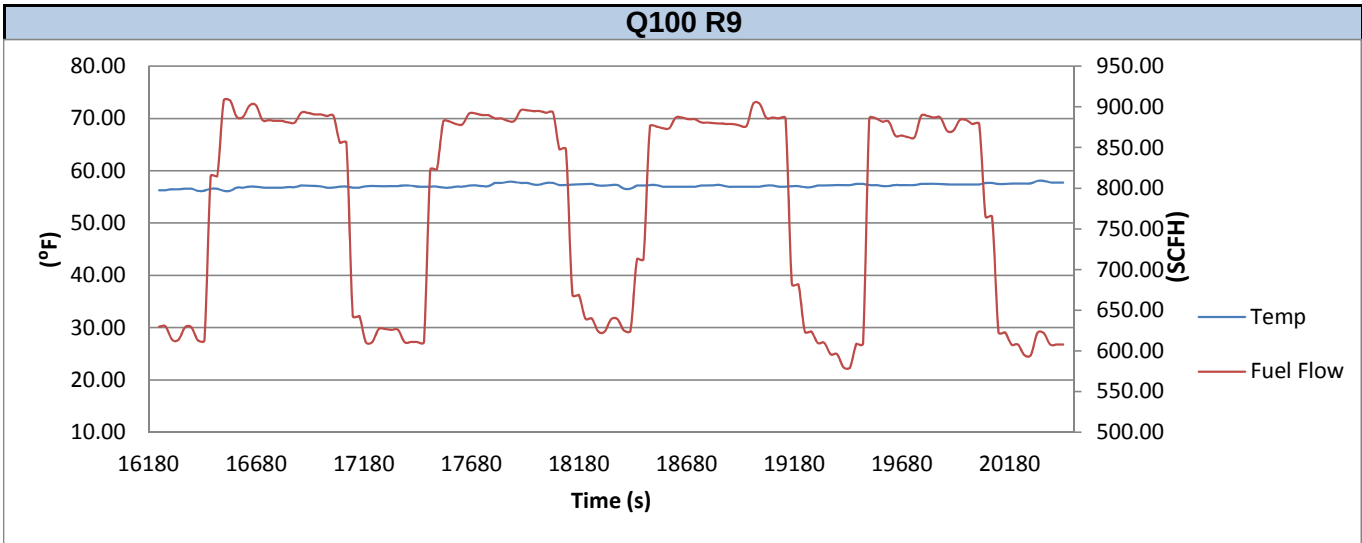
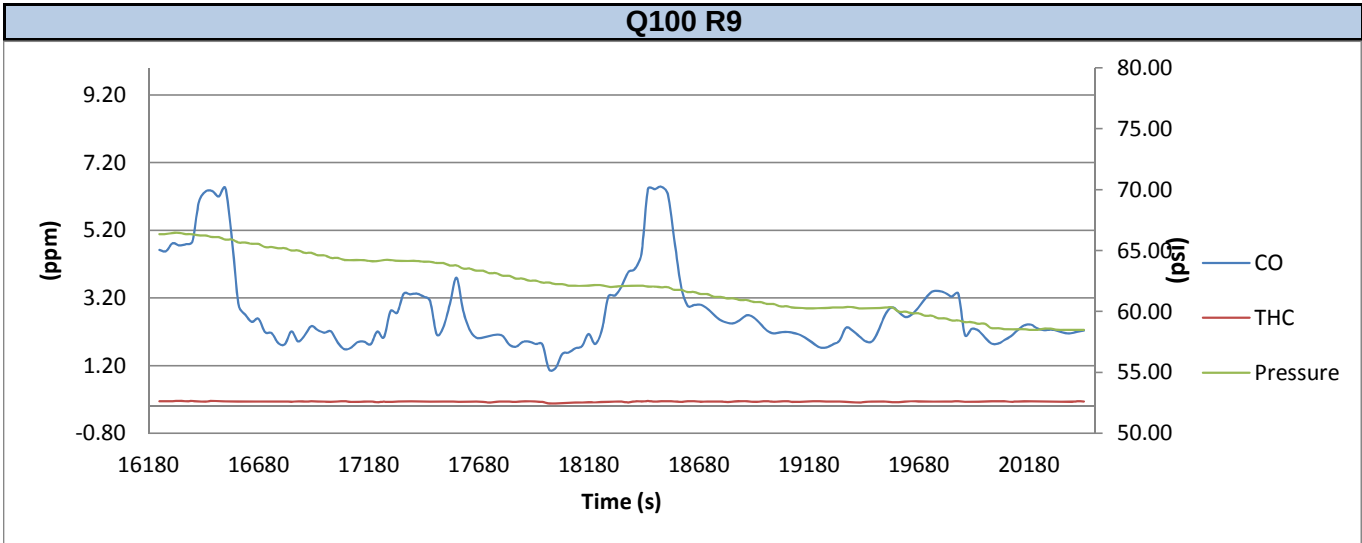
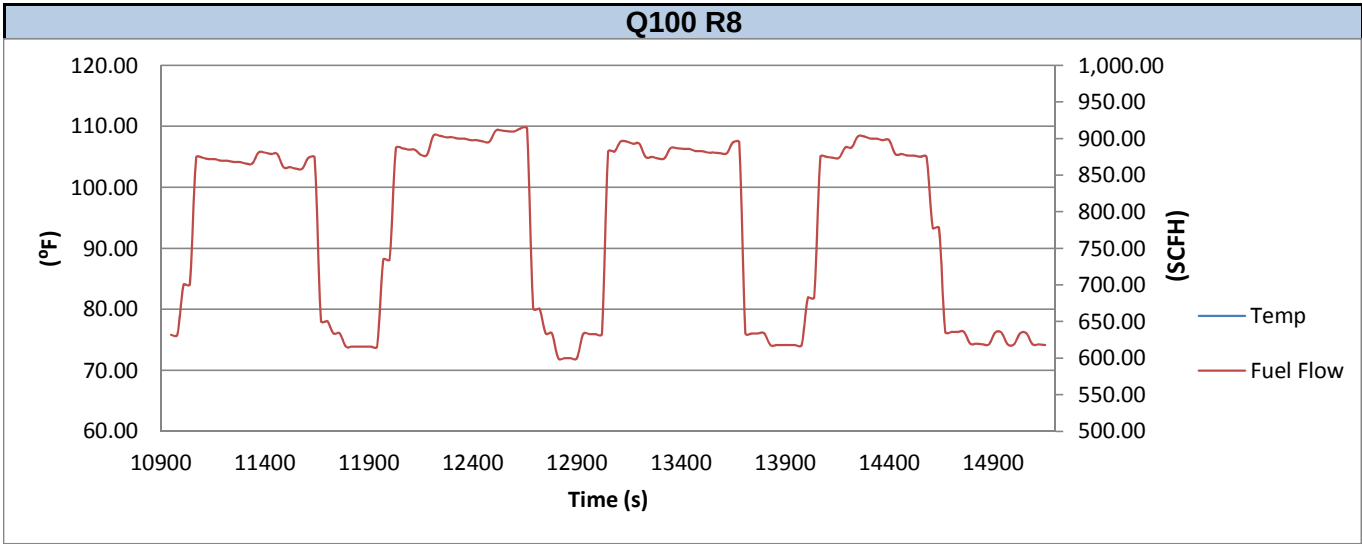
70-100-70 Load, Run - Q100 R9

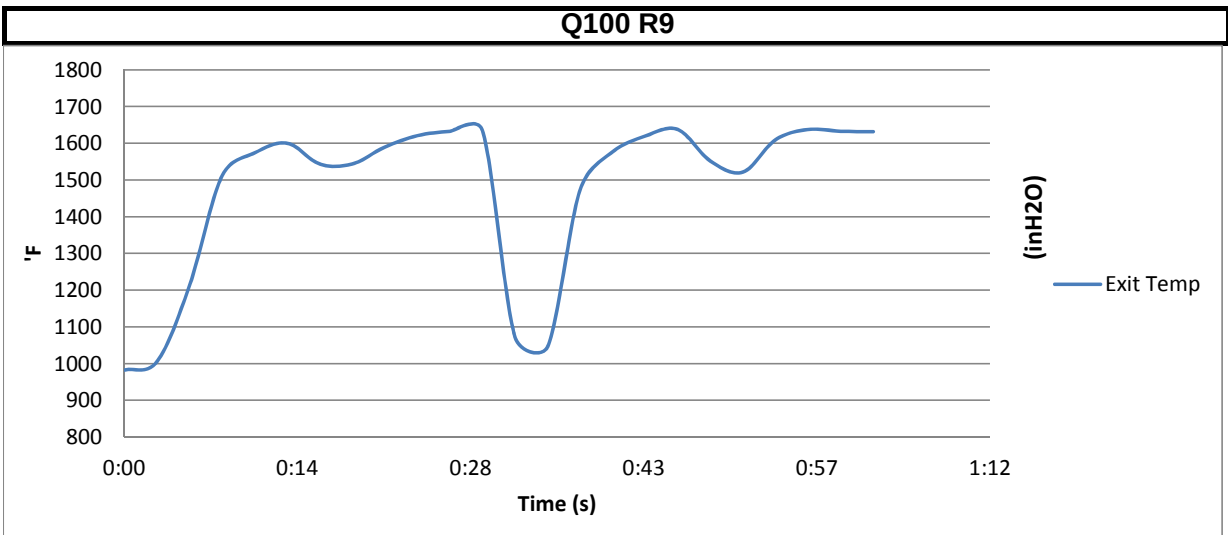
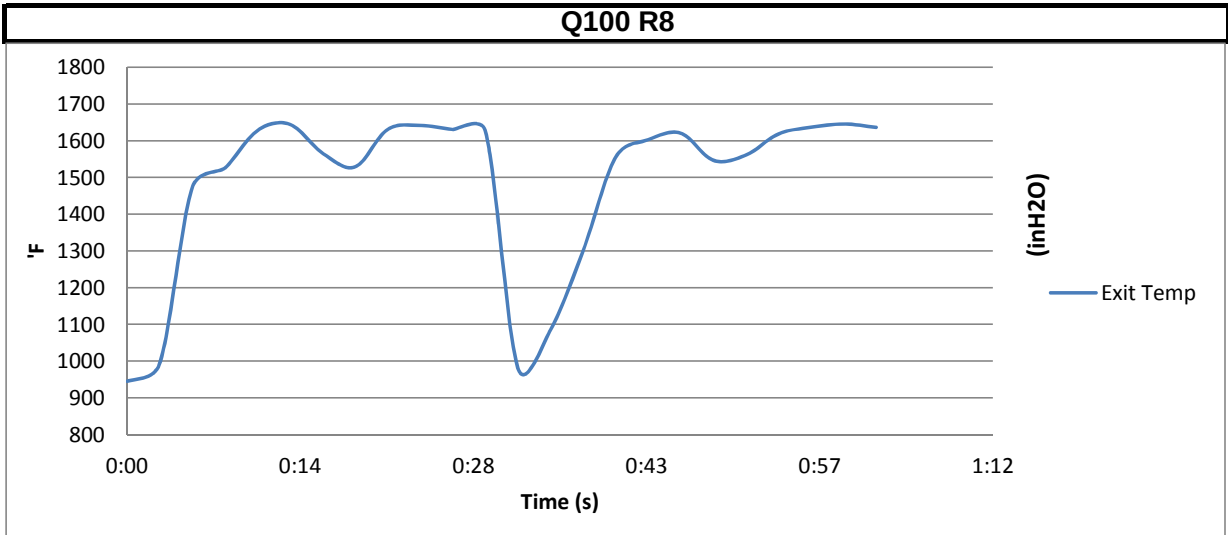
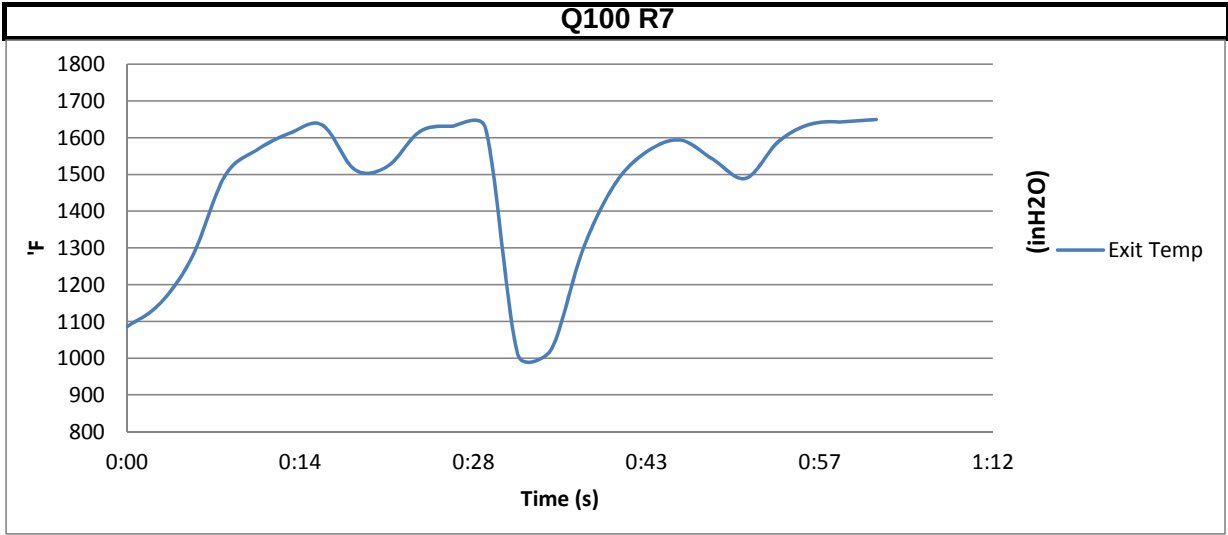
Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/19/15 12:31:10	19830	13.13	3.24	0.14	5.72	59.28	57.50	887.00
03/19/15 12:31:40	19860	13.21	3.33	0.15	5.47	59.28	57.50	887.00
03/19/15 12:32:10	19890	12.76	2.11	0.13	5.83	59.14	57.40	871.00
03/19/15 12:32:40	19920	12.35	2.29	0.13	6.19	59.14	57.40	871.00
03/19/15 12:33:10	19950	12.22	2.24	0.14	6.32	59.01	57.40	884.00
03/19/15 12:33:40	19980	12.47	2.04	0.15	6.20	59.01	57.40	884.00
03/19/15 12:34:10	20010	12.70	1.86	0.15	5.97	58.64	57.40	879.00
03/19/15 12:34:40	20040	12.73	1.85	0.15	5.92	58.64	57.40	879.00
03/19/15 12:35:10	20070	12.79	1.96	0.15	5.90	58.56	57.70	765.00
03/19/15 12:35:40	20100	12.90	2.08	0.13	5.80	58.56	57.70	765.00
03/19/15 12:36:10	20130	12.84	2.25	0.15	5.80	58.56	57.50	623.00
03/19/15 12:36:40	20160	12.84	2.39	0.15	5.83	58.56	57.50	623.00
03/19/15 12:37:10	20190	12.81	2.42	0.15	5.85	58.50	57.60	608.00
03/19/15 12:37:40	20220	12.89	2.30	0.14	5.79	58.50	57.60	608.00
03/19/15 12:38:10	20250	12.79	2.25	0.14	5.85	58.60	57.60	595.00
03/19/15 12:38:40	20280	12.66	2.27	0.15	5.94	58.60	57.60	595.00
03/19/15 12:39:10	20310	12.72	2.24	0.15	5.95	58.51	58.10	622.00
03/19/15 12:39:40	20340	12.70	2.17	0.13	5.92	58.51	58.10	622.00
03/19/15 12:40:10	20370	12.73	2.16	0.13	5.93	58.51	57.80	608.00
03/19/15 12:40:40	20400	12.72	2.20	0.15	5.91	58.51	57.80	608.00
03/19/15 12:41:10	20430	12.69	2.24	0.14	5.92	58.51	57.80	608.00
RAW AVERAGE		12.75	2.79	0.14	6.00	62.17	57.16	779.15

Bias	Serial Number:	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans (in. H ₂ O)	Temp. Trans. (°F)	F-Flow Trans. (SCFH)
	INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557	
	Initial Zero	0.07	0.31	0.07	0.11			
	Final Zero	0.03	0.31	0.02	0.08			
	Avg. Zero	0.05	0.31	0.05	0.10			
	Initial UpScale	12.00	9.31	3.13	8.94			
	Final UpScale	11.96	9.33	3.13	8.95			
	Avg. UpScale	11.98	9.32	3.13	8.95			
Upscale Cal Gas		12.06	9.19	3.02	8.87			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.83	2.53	0.09	5.92
Corrected Raw Average (ppm/% wet basis)	12.13	2.37	0.09	5.59
Emission Rate (lb/hr)	N/A	0.02	0.00	N/A







EMISSION DATA RECORDS

90-100% Fixed Rate Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	03/17/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		90-100%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		10	11	12	
Test Date	(mm/dd/yy)	03/17/15	03/17/15	03/17/15	
Load	% or w/DB	90-100	90-100	90-100	
Meter Box Number	from ACS	SAMP-CP-0008	SAMP-CP-0008	SAMP-CP-0008	
Meter Calibration Factor	(Y)	0.883	0.883	0.883	
Orifice Meter Coefficient	(ΔH_{or})	1.698	1.698	1.698	in H ₂ O
Pitot Identification	from ACS	4-17-14-2	4-17-14-2	4-17-14-2	
Pitot Tube Coefficient	(C _p)	0.840	0.840	0.840	
Probe Number	from ACS	SAMP-SP-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	inconel	inconel	inconel	
Impinger Case Number	from ACS	SAMP-BC-0002	SAMP-BC-0002	SAMP-BC-0002	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Run Start Time	09:23	10:57	12:28		hh:mm
Run Stop Time	10:33	12:07	13:38		hh:mm
Test Date	03/17/15	03/17/15	03/17/15		mm/dd/yy
Meter Calibration Factor	0.883	0.883	0.883		
Pitot Tube Coefficient	0.840	0.840	0.840		
Stack Test Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Initial Meter Volume	514.030	568.050	623.030		ft ³
Final Meter Volume	568.080	622.030	676.040		ft ³
Total Meter Volume	54.050	53.980	53.010	53.680	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	79.94	87.77	91.00	86.24	°F
Average Stack Temperature	1511.58	1486.92	1497.13	1498.54	°F
Barometric Pressure	30.16	30.19	30.23	30.19	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	30.16	30.19	30.23	30.19	in Hg
Average Orifice Pressure Drop	1.60	1.60	1.60	1.60	in H ₂ O
Absolute Meter Pressure	30.28	30.31	30.35	30.32	in Hg
Avg Square Root Pitot Pressure	0.31	0.29	0.29	0.29	√(in H ₂ O)
Moisture Content Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Impinger Water Weight Gain	49.40	53.20	54.30	52.30	g
Silica Gel Weight Gain	17.30	13.30	11.30	13.97	g
Total Water Volume Collected	66.82	66.62	65.72	66.39	ml
Standard Water Vapor Volume	3.14	3.14	3.09	3.12	scf
Standard Meter Volume	47.2	46.5	45.5	46.4	dscf
Calculated Stack Moisture	6.24	6.31	6.37	6.31	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	6.24	6.31	6.37	6.31	%
Gas Analysis Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Carbon Dioxide Content	6.4	5.7	5.8	6.0	%
Oxygen Content	13.4	14.4	14.2	14.0	%
Nitrogen Content	80.2	79.9	80.0	80.0	%
Stack Dry Molecular Weight	29.55	29.49	29.51	29.51	lb/lb-mole
Stack Wet Molecular Weight	28.83	28.76	28.78	28.79	lb/lb-mole
Percent Excess Air	172.4	215.1	205.2	197.6	%
Volumetric Flow Rate Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Average Stack Gas Velocity	33.56	30.80	30.72	31.69	ft/sec
Stack Cross-Sectional Area	3.05	3.05	3.05	3.05	ft ²
Actual Stack Flow Rate	6,133	5,628	5,614	5,791	acfm
Wet Standard Stack Flow Rate	99	92	92	95	wkscfh
Dry Standard Stack Flow Rate	93,131	86,567	85,967	88,555	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/17/15		
Sampling Location	Q100	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	90-100%-10		Date	03/17/15	Run Start Time	09:23	Run Stop Time	10:33
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	6.4	13.4	0.0	80.2	29.55	1.177	172.4	N/A

Gas Analysis Data								
Run Number	90-100%-11		Date	03/17/15	Run Start Time	10:57	Run Stop Time	12:07
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.7	14.4	0.0	79.9	29.49	1.140	215.1	N/A

Gas Analysis Data								
Run Number	90-100%-12		Date	03/17/15	Run Start Time	12:28	Run Stop Time	13:38
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.8	14.2	0.0	80.0	29.51	1.149	205.2	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Broken Arrow Rental Facility	Preliminary Date	03/17/15
Sampling Location	Q100	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	90-100%-10		Date	03/17/15	Start Time	09:23	Stop Time	10:33
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	54.050	dcf		Barometric Pressure	(P _b)	30.16	in Hg
Average Stack Temp	(t _s) _{avg}	1512	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	80	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	741.80	809.20	571.90	898.20			
Initial Value	(V _i),(W _i)	724.90	783.40	565.20	880.90			
Net Value	(V _n),(W _n)	16.9	25.8	6.7	17.3			
Results								
Total Weight	(W _f)	66.70	g	Water Vol Weighed	(V _{wsg(std)})	3.145	scf	
Std Meter Volume	(V _{m(std)})	47.229	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	6.24	%	Final Moisture Content	(B _{ws})	6.24	%	

Moisture Content Data								
Run Number	90-100%-10		Date	03/17/15	Start Time	10:57	Stop Time	12:07
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	53.980	dcf		Barometric Pressure	(P _b)	30.19	in Hg
Average Stack Temp	(t _s) _{avg}	1487	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	88	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	772.40	827.40	576.30	873.90			
Initial Value	(V _i),(W _i)	741.80	809.20	571.90	860.60			
Net Value	(V _n),(W _n)	30.6	18.2	4.4	13.3			
Results								
Total Weight	(W _f)	66.50	g	Water Vol Weighed	(V _{wsg(std)})	3.135	scf	
Std Meter Volume	(V _{m(std)})	46.539	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	6.31	%	Final Moisture Content	(B _{ws})	6.31	%	

Moisture Content Data								
Run Number	90-100%-10		Date	03/17/15	Start Time	12:28	Stop Time	01:38
Meter Box Number	SAMP-CP-0008				Meter Cal Factor	(Y)	0.883	
Total Meter Volume	(V _m)	53.010	dcf		Barometric Pressure	(P _b)	30.23	in Hg
Average Stack Temp	(t _s) _{avg}	1497	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	91	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	807.60	842.90	579.90	859.70			
Initial Value	(V _i),(W _i)	772.40	827.40	576.30	848.40			
Net Value	(V _n),(W _n)	35.2	15.5	3.6	11.3			
Results								
Total Weight	(W _f)	65.60	g	Water Vol Weighed	(V _{wsg(std)})	3.093	scf	
Std Meter Volume	(V _{m(std)})	45.495	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	6.37	%	Final Moisture Content	(B _{ws})	6.37	%	

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/17/15
Operator	CG
Run Number	90-100%-10

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.25	in H ₂ O for	20.0
		Pre (-)	0.20	in H ₂ O for	20.0
		Post (+)	0.25	in H ₂ O for	25.0
		Post (-)	0.20	in H ₂ O for	15.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	09:23	End	10:33

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	724.9	783.4	565.2	880.9				
Post	741.8	809.2	571.9	898.2				

Sampling Equipment		
Meter Box Number	SAMP-CP-0008	
Meter Cal Factor	(Y)	0.883
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.3737 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	inconel	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0002	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.840	
Average Stack Temp	(t _s)	1511.6	°F
Average Meter Temp	(t _m)	79.9	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.31	in H ₂ O
Stack Moisture Content	(B _{ws})	6.24	%
Stack Dry Molecular Weight	(M _d)	29.55	lb/lb-mole
Estimated Orifice Flow Rate	(Q _o)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.16	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.16	in Hg
Absolute Meter Pressure	(P _m)	30.28	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	514.030	0.040	1.698	1.60	1219	258		62			69	69	0.9	0.20	19.96	1.775		42.596
A-2	2.7	00:02:43	516.020	0.050	1.698	1.60	1250	258		53			69	69	0.9	0.22	22.52	4.441		53.298
A-3	5.4	00:05:25	519.010	0.070	1.698	1.60	1261	260		57			72	69	0.9	0.26	26.73	6.265		50.117
A-4	8.1	00:08:07	521.060	0.090	1.698	1.60	1416	261		62			75	69	0.9	0.30	31.65	8.003		48.017
A-5	10.8	00:10:50	523.020	0.140	1.698	1.60	1508	260		66			78	69	0.9	0.37	40.43	9.833		47.200
A-6	13.5	00:13:33	525.090	0.130	1.698	1.60	1538	258		69			80	69	0.9	0.36	39.25	12.455		49.820
A-7	16.3	00:16:15	528.060	0.140	1.698	1.60	1568	257		68			81	70	0.9	0.37	41.04	14.208		48.714
A-8	19.0	00:18:58	530.050	0.120	1.698	1.60	1599	253		68			83	70	0.9	0.35	38.28	15.967		47.901
A-9	21.7	00:21:40	532.050	0.120	1.698	1.60	1583	253		68			84	71	0.9	0.35	38.13	17.705		47.213
A-10	24.4	00:24:22	534.030	0.120	1.698	1.60	1613	255		68			86	72	0.9	0.35	38.41	19.491		46.778
A-11	27.1	00:27:05	536.070	0.135	1.698	1.60	1605	254		68			86	73	0.9	0.37	40.66	22.097		48.211
A-12	29.8	00:29:47	539.050	0.130	1.698	1.60	1555	257		68			81	75	0.9	0.36	39.42	23.009		46.018
B-1	32.5	00:32:30	540.090	0.140	1.698	1.60	1412	261		66			84	75	0.9	0.37	39.43	25.589		47.241
B-2	35.2	00:35:12	543.040	0.120	1.698	1.60	1465	260		68			87	77	0.9	0.35	37.02	27.321		46.836
B-3	37.9	00:37:55	545.030	0.120	1.698	1.60	1548	258		69			89	77	0.9	0.35	37.81	29.936		47.898
B-4	40.6	00:40:37	548.040	0.130	1.698	1.60	1556	255		68			90	78	0.9	0.36	39.43	31.662		47.493
B-5	43.3	00:43:20	550.030	0.130	1.698	1.60	1527	257		68			91	78	0.9	0.36	39.14	33.395		47.146
B-6	46.0	00:46:03	552.030	0.130	1.698	1.60	1606	254		69			92	79	0.9	0.36	39.91	35.142		46.856
B-7	48.8	00:48:45	554.050	0.120	1.698	1.60	1597	254		68			93	80	0.9	0.35	38.26	36.886		46.593
B-8	51.5	00:51:28	556.070	0.110	1.698	1.60	1582	258		68			94	81	0.9	0.33	36.50	39.419		47.303
B-9	54.2	00:54:10	559.010	0.050	1.698	1.60	1563	256		68			94	81	0.9	0.22	24.49	41.186		47.070
B-10	56.9	00:56:53	561.060	0.030	1.698	1.60	1557	257		69			94	81	0.9	0.17	18.95	42.866		46.763
B-11	59.6	00:59:35	563.010	0.030	1.698	1.60	1565	257		68			95	81	0.9	0.17	18.98	44.640		46.581
B-12	62.3	01:02:18	565.070	0.030	1.698	1.60	1585	257		68			95	82	0.9	0.17	19.08	47.229		47.229
Last Pt	65.0	01:05:00	568.080																	
Final Val	65.0	01:05:00	568.080												Max Vac	0.9	Final Values	47.229		
Average Values				0.10		1.60	1512	257		66			85	75		0.31	33.56			
													80							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Date	03/17/15
Operator	CG
Run Number	90-100%-11

Sampling Equipment			
Meter Box Number	SAMP-CP-0008		
Meter Cal Factor	(Y)	0.883	
Nozzle Number			
Average Nozzle Diameter	(D _{na})		in
Suggested Nozzle Diameter	(D _{ni})	0.3712	in
Probe Number	SAMP-SP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0002		

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.840	
Average Stack Temp	(t_s)	1486.9	°F
Average Meter Temp	(t_m)	87.8	
Orifice Meter Coefficient	($\Delta H @$)	1.698	in H ₂ O
Square Root ΔP	($\Delta P^{1/2}_{avg}$)	0.29	in H ₂ O
Stack Moisture Content	(w_{wc})	6.32	%
Stack Dry Molecular Weight	(M_d)	29.49	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.73	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	741.8	809.2	571.9	860.6				
Post	772.4	827.4	576.3	873.9				

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _m)	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (Δp ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{Std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{Std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	568.090	0.020	1.698	1.60	1235	259		59			78	81	0.9	0.14	14.19	2.556		61.346
A-2	2.7	00:02:43	571.010	0.030	1.698	1.60	1369	260		56			80	81	0.9	0.17	18.05	4.408		52.901
A-3	5.4	00:05:25	573.130	0.140	1.698	1.60	1487	260		58			83	80	0.9	0.37	40.23	6.100		48.803
A-4	8.1	00:08:07	575.070	0.040	1.698	1.60	1531	256		58			86	80	0.9	0.20	21.75	7.788		46.726
A-5	10.8	00:10:50	577.010	0.130	1.698	1.60	1571	256		59			87	80	0.9	0.36	39.60	9.595		46.056
A-6	13.5	00:13:33	579.090	0.150	1.698	1.60	1596	256		60			89	80	0.9	0.39	42.80	12.136		48.545
A-7	16.3	00:16:15	582.020	0.070	1.698	1.60	1602	256		60			90	80	0.9	0.26	29.28	13.878		47.582
A-8	19.0	00:18:58	584.030	0.060	1.698	1.60	1584	256		61			91	81	0.9	0.24	26.99	15.634		46.902
A-9	21.7	00:21:40	586.060	0.070	1.698	1.60	1572	254		61			92	81	0.9	0.26	29.06	17.319		46.184
A-10	24.4	00:24:22	588.010	0.050	1.698	1.60	1564	254		61			93	81	0.9	0.22	24.52	19.961		47.906
A-11	27.1	00:27:05	591.070	0.120	1.698	1.60	1572	255		62			94	81	0.9	0.35	38.05	21.643		47.221
A-12	29.8	00:29:47	593.020	0.080	1.698	1.60	1580	255		63			89	82	0.9	0.28	31.13	23.392		46.784
B-1	32.5	00:32:30	595.040	0.090	1.698	1.60	1218	255		62			93	84	0.8	0.30	29.95	25.157		46.444
B-2	35.2	00:35:12	597.090	0.120	1.698	1.60	1040	257		63			95	84	0.8	0.35	32.70	27.684		47.458
B-3	37.9	00:37:55	600.030	0.100	1.698	1.60	1223	258		63			95	84	0.8	0.32	31.61	29.454		47.127
B-4	40.6	00:40:37	602.090	0.050	1.698	1.60	1419	254		63			96	85	0.8	0.22	23.62	31.127		46.691
B-5	43.3	00:43:20	604.040	0.080	1.698	1.60	1488	255		63			96	85	0.9	0.28	30.42	33.692		47.565
B-6	46.0	00:46:03	607.030	0.070	1.698	1.60	1515	257		65			97	86	0.9	0.26	28.65	-50.185		-66.914
B-7	48.8	00:48:45	509.080	0.060	1.698	1.60	1552	253		64			98	86	0.9	0.24	26.78	37.021		46.764
B-8	51.5	00:51:28	611.010	0.120	1.698	1.60	1594	256		64			98	87	0.9	0.35	38.26	38.739		46.487
B-9	54.2	00:54:10	613.020	0.140	1.698	1.60	1599	254		64			99	87	0.9	0.37	41.38	41.344		47.250
B-10	56.9	00:56:53	616.070	0.120	1.698	1.60	1585	253		64			99	87	0.9	0.35	38.18	43.018		46.929
B-11	59.6	00:59:35	618.030	0.100	1.698	1.60	1580	256		65			99	87	0.9	0.32	34.81	44.726		46.670
B-12	62.3	01:02:18	620.030	0.060	1.698	1.60	1610			65			99	87	0.9	0.24	27.16	46.434		46.434
Last Pt	65.0	01:05:00	622.030																	
Final Val	65.0	01:05:00	622.030												Max Vac	0.9	Final Values	46.434		
Average Values				0.09		1.60	1487	256		62			92	83		0.29	30.80			
													88							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Broken Arrow Rental Facility
Sampling Location	Q100
Project #	qti-15-brokenarrow.ok-comp#1

Date	03/17/15
Operator	CG
Run Number	90-100%-12

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.25	in H ₂ O for	20.0
		Pre (-)	0.25	in H ₂ O for	15.0
		Post (+)	0.20	in H ₂ O for	15.0
		Post (-)	0.30	in H ₂ O for	15.0

Nozzle Measurements			
Pre			PASS
Post			PASS

Run Time			
Start	12:28	End	13:38

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	772.4	827.4	576.3	848.4				
Post	807.6	842.9	579.9	859.7				

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.840	
Average Stack Temp	(t _s)	1497.1	°F
Average Meter Temp	(t _m)	91.0	
Orifice Meter Coefficient	(ΔH@)	1.698	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.29	in H ₂ O
Stack Moisture Content	(B _{ws})	6.37	%
Stack Dry Molecular Weight	(M _d)	29.51	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.72	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.23	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.23	in Hg
Absolute Meter Pressure	(P _m)	30.35	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	623.030	0.050	1.698	1.60	1200	257		61			82	86	0.8	0.22	22.18	1.782		42.769
A-2	2.7	00:02:43	625.080	0.080	1.698	1.60	1305	257		57			84	86	0.9	0.28	28.93	3.474		41.688
A-3	5.4	00:05:25	627.030	0.070	1.698	1.60	1322	258		60			87	85	0.9	0.26	27.19	179.274		1434.191
A-4	8.1	00:08:07	830.010	0.090	1.698	1.60	1440	258		61			89	84	0.9	0.30	31.84	7.961		47.768
A-5	10.8	00:10:50	632.030	0.090	1.698	1.60	1507	259		61			91	84	0.9	0.30	32.40	9.672		46.423
A-6	13.5	00:13:33	634.010	0.150	1.698	1.60	1527	261		62			93	84	0.9	0.39	42.03	11.430		45.721
A-7	16.3	00:16:15	636.050	0.100	1.698	1.60	1535	261		63			94	84	0.9	0.32	34.39	13.179		45.185
A-8	19.0	00:18:58	638.080	0.080	1.698	1.60	1567	263		58			95	85	0.9	0.28	31.00	15.698		47.094
A-9	21.7	00:21:40	641.010	0.060	1.698	1.60	1570	260		55			96	85	0.9	0.24	26.87	17.433		46.489
A-10	24.4	00:24:22	643.030	0.070	1.698	1.60	1585	260		54			96	86	0.9	0.26	29.13	19.184		46.042
A-11	27.1	00:27:05	645.070	0.100	1.698	1.60	1590	262		54			98	86	0.9	0.32	34.86	20.906		45.613
A-12	29.8	00:29:47	647.080	0.060	1.698	1.60	1566	260		56			93	86	0.9	0.24	26.84	23.428		46.855
B-1	32.5	00:32:30	650.010	0.080	1.698	1.60	1319	261		51			95	87	0.8	0.28	29.05	25.170		46.467
B-2	35.2	00:35:12	652.040	0.090	1.698	1.60	1400	258		52			96	87	0.8	0.30	31.50	26.910		46.132
B-3	37.9	00:37:55	654.070	0.080	1.698	1.60	1459	261		52			97	88	0.8	0.28	30.17	28.639		45.823
B-4	40.6	00:40:37	656.090	0.100	1.698	1.60	1513	257		52			99	88	0.8	0.32	34.20	31.185		46.778
B-5	43.3	00:43:20	659.070	0.100	1.698	1.60	1544	259		52			99	89	0.8	0.32	34.47	32.841		46.364
B-6	46.0	00:46:03	661.010	0.090	1.698	1.60	1558	262		51			99	89	0.8	0.30	32.81	34.565		46.087
B-7	48.8	00:48:45	663.030	0.100	1.698	1.60	1567	260		52			100	89	0.8	0.32	34.66	36.288		45.838
B-8	51.5	00:51:28	665.050	0.090	1.698	1.60	1561	258		52			100	89	0.8	0.30	32.84	38.864		46.636
B-9	54.2	00:54:10	668.070	0.085	1.698	1.60	1574	259		52			100	89	0.8	0.29	32.01	40.561		46.355
B-10	56.9	00:56:53	670.060	0.070	1.698	1.60	1591	261		52			100	89	0.8	0.26	29.17	42.232		46.072
B-11	59.6	00:59:35	672.020	0.060	1.698	1.60	1573	261		52			100	90	0.8	0.24	26.89	43.928		45.838
B-12	62.3	01:02:18	674.010	0.040	1.698	1.60	1558	259		52			100	90	0.8	0.20	21.87	45.658		45.658
Last Pt	65.0	01:05:00	676.040																	
Final Val	65.0	01:05:00	676.040												Max Vac	0.9	Final Values	45.658		
Average Values				0.08		1.60	1497	260		55			95	87		0.29	30.72			
													91							

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.2	%
Stack Exhaust Flow (M2)	86,567	SCFH

Weather Data

Barometric Pressure	30.16	in. Hg
Relative Humidity	70	%
Ambient Temperature	58	°F
Specific Humidity	0.007094	lb H ₂ O / lb air

90-100 Load, Run - Q100 R10

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/17/15 9:23:09	60	13.16	15.26	-0.17	5.50	77.71	54.70	740.00
	03/17/15 9:23:39	90	12.29	11.17	-0.19	6.27	77.71	54.70	740.00
	03/17/15 9:24:09	120	12.27	5.82	-0.20	6.21	77.55	54.70	756.00
	03/17/15 9:24:39	150	12.28	6.30	-0.19	6.37	77.55	54.70	756.00
	03/17/15 9:25:09	180	12.63	6.91	-0.19	5.92	77.41	54.80	737.00
	03/17/15 9:25:39	210	11.88	4.79	-0.20	6.56	77.41	54.80	737.00
	03/17/15 9:26:09	240	12.00	3.08	-0.20	6.50	77.22	54.90	789.00
	03/17/15 9:26:39	270	11.80	3.17	-0.21	6.64	77.22	54.90	789.00
	03/17/15 9:27:09	300	12.09	2.71	-0.20	6.42	77.03	55.00	805.00
	03/17/15 9:27:39	330	12.46	3.52	-0.20	6.20	77.03	55.00	805.00
	03/17/15 9:28:09	360	12.52	3.64	-0.23	6.38	76.82	55.00	803.00
	03/17/15 9:28:39	390	12.56	3.05	-0.21	6.39	76.82	55.00	803.00
	03/17/15 9:29:09	420	12.76	3.69	-0.20	6.24	76.64	55.00	802.00
	03/17/15 9:29:39	450	12.72	3.55	-0.21	6.33	76.64	55.00	802.00
	03/17/15 9:30:09	480	13.50	7.99	-0.21	5.69	76.47	55.00	800.00
	03/17/15 9:30:39	510	13.04	7.96	-0.20	6.03	76.47	55.00	800.00
	03/17/15 9:31:09	540	13.01	7.04	-0.20	6.03	76.29	55.10	781.00
	03/17/15 9:31:39	570	12.74	6.10	-0.21	6.30	76.29	55.10	781.00
	03/17/15 9:32:09	600	12.36	4.09	-0.20	6.34	76.16	55.10	744.00
	03/17/15 9:32:39	630	13.16	6.06	-0.20	5.97	76.16	55.10	744.00
	03/17/15 9:33:09	660	13.86	10.16	-0.21	5.73	76.03	55.10	761.00
	03/17/15 9:33:39	690	13.48	9.39	-0.20	6.02	76.03	55.10	761.00
	03/17/15 9:34:09	720	12.67	7.81	-0.21	6.55	75.86	55.20	742.00
	03/17/15 9:34:39	750	13.01	3.32	-0.21	6.38	75.86	55.20	742.00
	03/17/15 9:35:09	780	12.80	5.55	-0.22	6.47	75.73	55.20	740.00
	03/17/15 9:35:39	810	12.92	3.29	-0.21	6.43	75.73	55.20	740.00
	03/17/15 9:36:09	840	12.17	3.90	-0.22	6.33	75.49	55.20	826.00
	03/17/15 9:36:39	870	12.13	2.48	-0.22	6.37	75.49	55.20	826.00
	03/17/15 9:37:09	900	12.19	2.35	-0.23	6.38	75.23	55.20	859.00
	03/17/15 9:37:39	930	12.33	4.43	-0.21	6.21	75.23	55.20	859.00
	03/17/15 9:38:09	960	11.52	3.34	-0.23	6.82	74.99	55.30	891.00
	03/17/15 9:38:39	990	11.69	2.22	-0.22	6.69	74.99	55.30	891.00
	03/17/15 9:39:09	1020	12.37	2.79	-0.21	6.22	74.80	55.30	872.00
	03/17/15 9:39:39	1050	12.03	4.54	-0.21	6.47	74.80	55.30	872.00
	03/17/15 9:40:09	1080	12.30	5.41	-0.22	6.18	74.63	55.40	853.00
	03/17/15 9:40:39	1110	11.83	3.34	-0.22	6.63	74.63	55.40	853.00
	03/17/15 9:41:09	1140	12.54	2.96	-0.22	6.11	74.43	55.40	868.00
	03/17/15 9:41:39	1170	12.59	4.44	-0.22	6.05	74.43	55.40	868.00
	03/17/15 9:42:09	1200	12.64	4.58	-0.22	6.38	74.22	55.40	849.00
	03/17/15 9:42:39	1230	13.02	3.83	-0.24	6.11	74.22	55.40	849.00
	03/17/15 9:43:09	1260	12.74	4.01	-0.25	6.33	74.03	55.50	847.00
	03/17/15 9:43:39	1290	13.00	4.63	-0.23	6.13	74.03	55.50	847.00
	03/17/15 9:44:09	1320	12.55	4.27	-0.22	6.42	73.85	55.50	862.00
	03/17/15 9:44:39	1350	12.69	3.65	-0.23	6.36	73.85	55.50	862.00
	03/17/15 9:45:09	1380	12.59	4.12	-0.24	6.40	73.68	55.60	860.00
	03/17/15 9:45:39	1410	12.86	4.36	-0.23	5.86	73.68	55.60	860.00
	03/17/15 9:46:09	1440	13.25	6.61	-0.23	5.91	73.51	55.80	876.00
A2	03/17/15 9:46:39	1470	12.77	6.45	-0.23	6.24	73.51	55.80	876.00
	03/17/15 9:47:09	1500	12.13	3.64	-0.23	6.40	73.34	56.00	856.00
	03/17/15 9:47:39	1530	12.43	3.18	-0.24	6.17	73.34	56.00	856.00
	03/17/15 9:48:09	1560	12.07	3.12	-0.23	6.40	73.22	56.30	872.00
	03/17/15 9:48:39	1590	12.13	2.80	-0.23	6.37	73.22	56.30	872.00
	03/17/15 9:49:09	1620	11.96	3.26	-0.24	6.50	73.08	56.40	853.00
	03/17/15 9:49:39	1650	12.43	3.38	-0.24	6.21	73.08	56.40	853.00
	03/17/15 9:50:09	1680	12.18	3.46	-0.23	6.37	72.92	56.60	868.00
	03/17/15 9:50:39	1710	12.56	3.69	-0.23	6.01	72.92	56.60	868.00
	03/17/15 9:51:09	1740	12.75	5.26	-0.23	5.97	72.76	56.80	883.00
	03/17/15 9:51:39	1770	12.51	5.46	-0.24	6.11	72.76	56.80	883.00
	03/17/15 9:52:09	1800	12.48	5.13	-0.23	6.09	72.64	56.90	865.00
	03/17/15 9:52:39	1830	12.67	5.07	-0.24	5.99	72.64	56.90	865.00

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.2	%
Stack Exhaust Flow (M2)	86,567	SCFH

Weather Data

Barometric Pressure	30.16	in. Hg
Relative Humidity	70	%
Ambient Temperature	58	°F
Specific Humidity	0.007094	lb H ₂ O / lb air

90-100 Load, Run - Q100 R10

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmwv)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/17/15 9:53:09	1860	12.84	5.52	-0.23	5.88	72.51	57.10	846.00
	03/17/15 9:53:39	1890	12.94	5.97	-0.24	5.74	72.51	57.10	846.00
	03/17/15 9:54:09	1920	12.66	5.60	-0.24	5.98	72.35	57.20	844.00
	03/17/15 9:54:39	1950	13.07	5.32	-0.23	5.70	72.35	57.20	844.00
	03/17/15 9:55:09	1980	12.99	7.85	-0.25	5.78	72.20	57.30	860.00
	03/17/15 9:55:39	2010	13.14	7.60	-0.25	5.59	72.20	57.30	860.00
	03/17/15 9:56:09	2040	13.24	7.42	-0.23	5.53	72.08	57.40	841.00
	03/17/15 9:56:39	2070	12.60	7.67	-0.25	6.02	72.08	57.40	841.00
	03/17/15 9:57:09	2100	12.73	6.42	-0.25	5.91	71.95	57.50	874.00
	03/17/15 9:57:39	2130	11.83	5.93	-0.24	6.57	71.95	57.50	874.00
	03/17/15 9:58:09	2160	13.03	4.77	-0.24	5.76	71.80	57.60	872.00
	03/17/15 9:58:39	2190	12.85	6.93	-0.25	5.87	71.80	57.60	872.00
	03/17/15 9:59:09	2220	12.26	5.46	-0.25	6.18	71.67	57.70	854.00
	03/17/15 9:59:39	2250	12.28	3.37	-0.25	6.35	71.67	57.70	854.00
	03/17/15 10:00:09	2280	12.37	3.75	-0.25	6.24	71.52	57.80	852.00
	03/17/15 10:00:39	2310	12.75	5.50	-0.25	5.84	71.52	57.80	852.00
	03/17/15 10:01:09	2340	12.33	4.50	-0.25	6.30	71.37	57.90	867.00
	03/17/15 10:01:39	2370	12.55	4.49	-0.25	6.06	71.37	57.90	867.00
	03/17/15 10:02:09	2400	12.92	4.66	-0.24	5.87	71.21	57.90	849.00
	03/17/15 10:02:39	2430	13.14	8.26	-0.25	5.59	71.21	57.90	849.00
	03/17/15 10:03:09	2460	12.90	7.64	-0.25	5.81	71.07	58.00	847.00
	03/17/15 10:03:39	2490	13.08	6.23	-0.26	5.64	71.07	58.00	847.00
	03/17/15 10:04:09	2520	12.80	5.47	-0.24	5.94	70.92	58.00	862.00
	03/17/15 10:04:39	2550	13.07	5.10	-0.24	5.68	70.92	58.00	862.00
	03/17/15 10:05:09	2580	13.03	5.35	-0.26	5.69	70.75	58.20	860.00
	03/17/15 10:05:39	2610	13.06	6.02	-0.28	5.69	70.75	58.20	860.00
	03/17/15 10:06:09	2640	13.08	5.59	-0.25	5.69	70.61	58.30	858.00
	03/17/15 10:06:39	2670	12.74	6.33	0.00	5.93	70.61	58.30	858.00
	03/17/15 10:07:09	2700	13.01	7.13	-0.01	5.69	70.47	58.50	890.00
	03/17/15 10:07:39	2730	13.09	6.46	-0.01	5.65	70.47	58.50	890.00
	03/17/15 10:08:09	2760	13.24	6.94	-0.01	5.57	70.33	58.70	855.00
	03/17/15 10:08:39	2790	13.23	9.13	0.00	5.52	70.33	58.70	855.00
	03/17/15 10:09:09	2820	13.02	7.65	0.00	5.71	70.20	58.80	870.00
	03/17/15 10:09:39	2850	12.99	6.34	-0.01	5.74	70.20	58.80	870.00
A3	03/17/15 10:10:09	2880	13.04	6.76	0.00	5.73	70.06	58.90	884.00
	03/17/15 10:10:39	2910	13.34	8.24	-0.01	5.46	70.06	58.90	884.00
	03/17/15 10:11:09	2940	12.55	9.77	-0.02	6.02	69.91	59.00	850.00
	03/17/15 10:11:39	2970	12.92	5.32	-0.02	5.79	69.91	59.00	850.00
	03/17/15 10:12:09	3000	12.54	5.96	-0.02	6.06	69.75	58.90	865.00
	03/17/15 10:12:39	3030	13.00	5.84	0.00	5.73	69.75	58.90	865.00
	03/17/15 10:13:09	3060	12.70	6.04	0.00	5.99	69.60	58.90	880.00
	03/17/15 10:13:39	3090	12.42	5.79	0.00	6.14	69.60	58.90	880.00
	03/17/15 10:14:09	3120	12.75	5.17	-0.01	5.92	69.46	58.80	862.00
	03/17/15 10:14:39	3150	12.92	5.23	0.00	5.84	69.46	58.80	862.00
	03/17/15 10:15:09	3180	12.89	5.16	0.00	5.78	69.31	58.70	861.00
	03/17/15 10:15:39	3210	12.72	5.66	-0.01	5.98	69.31	58.70	861.00
	03/17/15 10:16:09	3240	12.26	5.13	-0.01	6.24	69.18	58.60	860.00
	03/17/15 10:16:39	3270	12.92	4.59	0.00	5.81	69.18	58.60	860.00
	03/17/15 10:17:09	3300	12.84	7.00	0.00	5.86	69.02	58.50	858.00
	03/17/15 10:17:39	3330	12.88	5.77	0.00	5.83	69.02	58.50	858.00
	03/17/15 10:18:09	3360	12.71	6.21	-0.02	5.95	68.85	58.60	872.00
	03/17/15 10:18:39	3390	12.79	5.63	-0.01	5.84	68.85	58.60	872.00
	03/17/15 10:19:09	3420	12.91	5.62	0.00	5.86	68.70	58.70	870.00
	03/17/15 10:19:39	3450	13.00	6.02	-0.01	5.74	68.70	58.70	870.00
	03/17/15 10:20:09	3480	12.85	6.35	-0.01	5.82	68.56	58.70	837.00
	03/17/15 10:20:39	3510	12.98	5.77	-0.01	5.75	68.56	58.70	837.00
	03/17/15 10:21:09	3540	12.98	6.39	-0.01	5.73	68.41	58.60	851.00
	03/17/15 10:21:39	3570	13.01	6.27	-0.01	5.75	68.41	58.60	851.00
	03/17/15 10:22:09	3600	12.91	6.95	-0.01	5.78	68.28	58.50	850.00
	03/17/15 10:22:39	3630	12.65	6.88	-0.02	5.96	68.28	58.50	850.00

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.2	%
Stack Exhaust Flow (M2)	86,567	SCFH

Weather Data

Barometric Pressure	30.16	in. Hg
Relative Humidity	70	%
Ambient Temperature	58	°F
Specific Humidity	0.007094	lb H ₂ O / lb air

90-100 Load, Run - Q100 R10

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/17/15 10:23:09	3660	12.83	6.05	0.00	5.86	68.14	58.60	865.00
03/17/15 10:23:39	3690	12.96	6.05	-0.01	5.82	68.14	58.60	865.00
03/17/15 10:24:09	3720	13.20	7.02	-0.01	5.56	67.98	58.60	863.00
03/17/15 10:24:39	3750	13.02	6.45	-0.01	5.68	67.98	58.60	863.00
03/17/15 10:25:09	3780	13.26	5.82	0.08	5.54	67.81	58.60	845.00
03/17/15 10:25:39	3810	13.00	7.09	0.19	5.70	67.81	58.60	845.00
03/17/15 10:26:09	3840	12.83	5.49	0.18	5.85	67.50	58.90	842.00
03/17/15 10:26:39	3870	13.14	5.22	0.19	5.65	67.50	58.90	842.00
03/17/15 10:27:09	3900	13.02	7.03	0.19	5.70	67.40	58.90	872.00
03/17/15 10:27:39	3930	12.86	6.31	0.20	5.77	67.40	58.90	872.00
03/17/15 10:28:09	3960	12.75	5.45	0.18	5.97	67.29	58.90	855.00
03/17/15 10:28:39	3990	12.83	5.89	0.18	5.83	67.29	58.90	855.00
03/17/15 10:29:09	4020	12.57	5.63	0.19	6.03	67.15	59.00	853.00
03/17/15 10:29:39	4050	12.55	5.23	0.19	6.08	67.15	59.00	853.00
03/17/15 10:30:09	4080	12.52	4.36	0.18	6.12	67.00	59.20	852.00
03/17/15 10:30:39	4110	12.64	4.65	0.18	5.97	67.00	59.20	852.00
03/17/15 10:31:09	4140	12.38	4.37	0.18	6.21	66.85	59.40	850.00
03/17/15 10:31:39	4170	12.54	4.31	0.19	6.07	66.85	59.40	850.00
03/17/15 10:32:09	4200	12.89	4.52	0.19	5.83	66.71	59.50	848.00
03/17/15 10:32:39	4230	12.83	4.90	0.19	5.90	66.71	59.50	848.00
03/17/15 10:33:09	4260	11.80	4.93	0.19	6.59	66.58	59.60	862.00
RAW AVERAGE		12.70	5.51	0.00	6.03	71.96	57.16	843.08

Bias	Serial Number:	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans (in. H ₂ O)	Temp. Trans. (°F)	F-Flow Trans. (SCFH)
	INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557	
	Initial Zero	0.09	0.20	0.02	0.11			
	Final Zero	0.06	0.26	0.09	0.12			
	Avg. Zero	0.08	0.23	0.06	0.12			
	Initial UpScale	12.01	9.21	3.02	8.85			
	Final UpScale	11.99	9.23	3.25	8.88			
	Avg. UpScale	12.00	9.22	3.14	8.87			
Upscale Cal Gas		12.06	9.19	3.02	8.87			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.77	5.39	-0.05	5.99
Corrected Raw Average (ppm/% wet basis)	11.97	5.04	-0.05	5.61
Emission Rate (lb/hr)	N/A	0.03	0.00	N/A

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.3	%
Stack Exhaust Flow (M2)	85,967	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	59	%
Ambient Temperature	60	°F
Specific Humidity	0.006355	lb H ₂ O / lb air

90-100 Load, Run - Q100 R11

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmwv)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/17/15 10:57:09	5700	13.68	11.12	0.20	5.19	63.44	59.80	753.00
	03/17/15 10:57:39	5730	13.11	11.64	0.19	5.67	63.44	59.80	753.00
	03/17/15 10:58:09	5760	13.35	10.65	0.19	5.44	63.34	59.90	766.00
	03/17/15 10:58:39	5790	13.35	10.56	0.19	5.49	63.34	59.90	766.00
	03/17/15 10:59:09	5820	13.53	11.00	0.20	5.28	63.29	59.90	751.00
	03/17/15 10:59:39	5850	13.53	15.29	0.18	5.34	63.29	59.90	751.00
	03/17/15 11:00:09	5880	13.49	15.88	0.19	5.30	63.22	59.90	750.00
	03/17/15 11:00:39	5910	13.52	15.39	0.19	5.33	63.22	59.90	750.00
	03/17/15 11:01:09	5940	12.55	11.57	0.18	6.00	63.14	59.80	750.00
	03/17/15 11:01:39	5970	12.73	6.29	0.18	5.99	63.14	59.80	750.00
	03/17/15 11:02:09	6000	13.05	8.01	0.18	5.76	63.05	59.80	779.00
	03/17/15 11:02:39	6030	13.29	11.90	0.20	5.43	63.05	59.80	779.00
	03/17/15 11:03:09	6060	12.84	10.86	0.19	5.89	62.84	59.80	896.00
	03/17/15 11:03:39	6090	12.78	7.73	0.18	5.85	62.84	59.80	896.00
	03/17/15 11:04:09	6120	13.21	8.22	0.19	5.63	62.68	59.80	864.00
	03/17/15 11:04:39	6150	13.49	10.12	0.19	5.35	62.68	59.80	864.00
	03/17/15 11:05:09	6180	13.31	9.02	0.19	5.46	62.55	59.70	863.00
	03/17/15 11:05:39	6210	13.54	9.54	0.18	5.31	62.55	59.70	863.00
	03/17/15 11:06:09	6240	13.30	10.64	0.18	5.50	62.40	59.80	861.00
	03/17/15 11:06:39	6270	12.93	11.44	0.19	5.80	62.40	59.80	861.00
	03/17/15 11:07:09	6300	12.98	10.02	0.19	5.68	62.25	59.90	874.00
	03/17/15 11:07:39	6330	12.66	7.92	0.18	5.97	62.25	59.90	874.00
	03/17/15 11:08:09	6360	12.49	5.90	0.17	6.14	62.08	59.90	887.00
	03/17/15 11:08:39	6390	12.11	4.38	0.17	6.37	62.08	59.90	887.00
	03/17/15 11:09:09	6420	11.36	2.18	0.17	6.92	61.94	60.00	856.00
	03/17/15 11:09:39	6450	12.15	1.78	0.15	6.44	61.94	60.00	856.00
	03/17/15 11:10:09	6480	11.78	2.98	0.16	6.57	61.79	60.10	883.00
	03/17/15 11:10:39	6510	12.15	2.32	0.16	6.45	61.79	60.10	883.00
	03/17/15 11:11:09	6540	12.68	3.19	0.17	6.08	61.63	60.20	867.00
	03/17/15 11:11:39	6570	12.97	6.60	0.17	5.73	61.63	60.20	867.00
	03/17/15 11:12:09	6600	12.36	6.63	0.16	6.17	61.48	60.30	879.00
	03/17/15 11:12:39	6630	12.32	4.45	0.17	6.30	61.48	60.30	879.00
	03/17/15 11:13:09	6660	12.64	5.47	0.16	5.98	61.33	60.50	848.00
	03/17/15 11:13:39	6690	12.63	5.68	0.17	6.02	61.33	60.50	848.00
	03/17/15 11:14:09	6720	12.06	4.37	0.16	6.42	61.21	60.50	861.00
	03/17/15 11:14:39	6750	12.35	3.60	0.17	6.25	61.21	60.50	861.00
	03/17/15 11:15:09	6780	12.51	4.27	0.16	6.12	61.09	60.50	874.00
	03/17/15 11:15:39	6810	12.87	4.58	0.17	5.89	61.09	60.50	874.00
	03/17/15 11:16:09	6840	12.86	4.88	0.18	5.82	60.97	60.50	873.00
	03/17/15 11:16:39	6870	12.58	5.52	0.16	6.08	60.97	60.50	873.00
	03/17/15 11:17:09	6900	13.14	5.53	0.16	5.64	60.83	60.50	871.00
	03/17/15 11:17:39	6930	12.22	4.72	0.16	6.29	60.83	60.50	871.00
	03/17/15 11:18:09	6960	13.08	4.68	0.16	5.72	60.66	60.60	869.00
	03/17/15 11:18:39	6990	12.83	7.30	0.15	5.86	60.66	60.60	869.00
	03/17/15 11:19:09	7020	12.85	6.23	0.16	5.83	60.50	60.70	867.00
	03/17/15 11:19:39	7050	13.29	5.82	0.17	5.56	60.50	60.70	867.00
	03/17/15 11:20:09	7080	13.29	7.05	0.16	5.53	60.35	60.80	865.00
A2	03/17/15 11:20:39	7110	13.21	6.44	0.15	5.53	60.35	60.80	865.00
	03/17/15 11:21:09	7140	13.09	5.98	0.16	5.66	60.20	60.80	863.00
	03/17/15 11:21:39	7170	12.23	5.93	0.16	6.28	60.20	60.80	863.00
	03/17/15 11:22:09	7200	12.72	4.23	0.16	5.99	60.05	60.90	861.00
	03/17/15 11:22:39	7230	13.02	4.80	0.16	5.69	60.05	60.90	861.00
	03/17/15 11:23:09	7260	12.85	5.80	0.16	5.88	59.91	60.90	860.00
	03/17/15 11:23:39	7290	12.98	5.63	0.16	5.76	59.91	60.90	860.00
	03/17/15 11:24:09	7320	12.87	5.76	0.16	5.81	59.78	61.00	872.00
	03/17/15 11:24:39	7350	12.99	6.27	0.16	5.76	59.78	61.00	872.00
	03/17/15 11:25:09	7380	12.45	5.89	0.13	6.10	59.65	60.90	871.00
	03/17/15 11:25:39	7410	12.62	4.91	0.16	6.01	59.65	60.90	871.00
	03/17/15 11:26:09	7440	12.27	4.91	0.16	6.27	59.54	60.90	884.00
	03/17/15 11:26:39	7470	12.41	4.36	0.16	6.20	59.54	60.90	884.00

Questor Technology Inc
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Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.3	%
Stack Exhaust Flow (M2)	85,967	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	59	%
Ambient Temperature	60	°F
Specific Humidity	0.006355	lb H ₂ O / lb air

90-100 Load, Run - Q100 R11

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/17/15 11:27:09	7500	12.62	4.07	0.17	6.05	59.43	60.90	868.00
	03/17/15 11:27:39	7530	12.46	4.59	0.14	6.15	59.43	60.90	868.00
	03/17/15 11:28:09	7560	12.93	4.79	0.15	5.81	59.32	61.00	853.00
	03/17/15 11:28:39	7590	12.22	5.41	0.15	6.36	59.32	61.00	853.00
	03/17/15 11:29:09	7620	12.39	3.89	0.16	6.23	59.21	61.00	866.00
	03/17/15 11:29:39	7650	12.71	4.47	0.15	6.01	59.21	61.00	866.00
	03/17/15 11:30:09	7680	13.05	5.28	0.16	5.70	59.06	61.10	878.00
	03/17/15 11:30:39	7710	12.97	6.13	0.16	5.74	59.06	61.10	878.00
	03/17/15 11:31:09	7740	12.78	6.36	0.16	5.93	58.89	61.20	876.00
	03/17/15 11:31:39	7770	13.17	6.89	0.16	5.63	58.89	61.20	876.00
	03/17/15 11:32:09	7800	13.50	7.20	0.16	5.33	58.71	61.50	873.00
	03/17/15 11:32:39	7830	13.30	8.29	0.16	5.57	58.71	61.50	873.00
	03/17/15 11:33:09	7860	13.59	9.46	0.17	5.25	58.57	61.60	871.00
	03/17/15 11:33:39	7890	13.36	8.76	0.16	5.50	58.57	61.60	871.00
	03/17/15 11:34:09	7920	13.38	7.34	0.16	5.43	58.46	61.80	869.00
	03/17/15 11:34:39	7950	13.37	7.91	0.16	5.47	58.46	61.80	869.00
	03/17/15 11:35:09	7980	13.36	7.12	0.16	5.46	58.38	61.90	854.00
	03/17/15 11:35:39	8010	13.18	7.48	0.16	5.63	58.38	61.90	854.00
	03/17/15 11:36:09	8040	13.25	7.86	0.16	5.50	58.28	61.90	867.00
	03/17/15 11:36:39	8070	13.21	8.08	0.17	5.54	58.28	61.90	867.00
	03/17/15 11:37:09	8100	12.76	6.85	0.16	5.96	58.17	61.90	866.00
	03/17/15 11:37:39	8130	13.37	7.22	0.17	5.50	58.17	61.90	866.00
	03/17/15 11:38:09	8160	13.44	9.46	0.17	5.39	58.06	61.90	864.00
	03/17/15 11:38:39	8190	13.29	9.59	0.15	5.53	58.06	61.90	864.00
	03/17/15 11:39:09	8220	13.18	7.13	0.16	5.63	57.93	61.80	863.00
	03/17/15 11:39:39	8250	13.17	8.26	0.16	5.56	57.93	61.80	863.00
	03/17/15 11:40:09	8280	13.13	7.31	0.16	5.72	57.79	61.80	861.00
	03/17/15 11:40:39	8310	13.05	6.65	0.15	5.71	57.79	61.80	861.00
	03/17/15 11:41:09	8340	13.23	6.55	0.16	5.56	57.67	61.80	860.00
	03/17/15 11:41:39	8370	12.96	6.38	0.16	5.77	57.67	61.80	860.00
	03/17/15 11:42:09	8400	12.83	5.65	0.15	5.92	57.57	61.80	859.00
	03/17/15 11:42:39	8430	12.50	5.50	0.16	6.09	57.57	61.80	859.00
	03/17/15 11:43:09	8460	12.87	5.17	0.16	5.86	57.47	61.70	871.00
	03/17/15 11:43:39	8490	12.12	5.86	0.15	6.43	57.47	61.70	871.00
A3	03/17/15 11:44:09	8520	12.61	3.35	0.15	6.11	57.34	61.60	856.00
	03/17/15 11:44:39	8550	12.07	5.03	0.16	6.38	57.34	61.60	856.00
	03/17/15 11:45:09	8580	12.24	3.20	0.16	6.36	57.19	61.60	854.00
	03/17/15 11:45:39	8610	13.10	4.55	0.16	5.74	57.19	61.60	854.00
	03/17/15 11:46:09	8640	12.89	6.60	0.16	5.84	57.03	61.60	852.00
	03/17/15 11:46:39	8670	13.05	6.50	0.16	5.73	57.03	61.60	852.00
	03/17/15 11:47:09	8700	13.18	5.93	0.15	5.64	56.86	61.70	850.00
	03/17/15 11:47:39	8730	13.28	6.29	0.15	5.48	56.86	61.70	850.00
	03/17/15 11:48:09	8760	13.07	5.79	0.16	5.75	56.71	61.70	862.00
	03/17/15 11:48:39	8790	13.25	6.25	0.14	5.52	56.71	61.70	862.00
	03/17/15 11:49:09	8820	12.48	5.31	0.15	6.10	56.59	61.60	874.00
	03/17/15 11:49:39	8850	11.74	3.25	0.15	6.70	56.59	61.60	874.00
	03/17/15 11:50:09	8880	12.68	2.73	0.14	6.06	56.46	61.60	873.00
	03/17/15 11:50:39	8910	12.92	4.77	0.15	5.85	56.46	61.60	873.00
	03/17/15 11:51:09	8940	12.81	5.62	0.15	5.88	56.32	61.70	871.00
	03/17/15 11:51:39	8970	12.57	5.07	0.14	6.06	56.32	61.70	871.00
	03/17/15 11:52:09	9000	12.42	4.06	0.14	6.22	56.20	61.70	869.00
	03/17/15 11:52:39	9030	12.63	4.37	0.15	6.04	56.20	61.70	869.00
	03/17/15 11:53:09	9060	12.61	3.99	0.15	6.09	56.09	61.70	868.00
	03/17/15 11:53:39	9090	12.87	5.20	0.15	5.85	56.09	61.70	868.00
	03/17/15 11:54:09	9120	12.56	5.14	0.14	6.12	55.96	61.80	853.00
	03/17/15 11:54:39	9150	13.36	4.65	0.14	5.49	55.96	61.80	853.00
	03/17/15 11:55:09	9180	13.16	5.48	0.14	5.63	55.84	61.90	865.00
	03/17/15 11:55:39	9210	12.69	5.10	0.15	5.95	55.84	61.90	865.00
	03/17/15 11:56:09	9240	12.54	4.42	0.15	6.15	55.73	62.00	863.00
	03/17/15 11:56:39	9270	12.92	4.62	0.14	5.84	55.73	62.00	863.00

Questor Technology Inc
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Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.3	%
Stack Exhaust Flow (M2)	85,967	SCFH

Weather Data

Barometric Pressure	30.19	in. Hg
Relative Humidity	59	%
Ambient Temperature	60	°F
Specific Humidity	0.006355	lb H ₂ O / lb air

90-100 Load, Run - Q100 R11

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/17/15 11:57:09	9300	13.32	5.23	0.14	5.47	55.62	62.00	862.00
03/17/15 11:57:39	9330	13.10	5.15	0.14	5.72	55.62	62.00	862.00
03/17/15 11:58:09	9360	13.37	5.17	0.15	5.48	55.47	62.10	860.00
03/17/15 11:58:39	9390	13.53	6.54	0.14	5.34	55.47	62.10	860.00
03/17/15 11:59:09	9420	13.04	6.53	0.15	5.71	55.32	62.20	858.00
03/17/15 11:59:39	9450	13.14	5.75	0.13	5.63	55.32	62.20	858.00
03/17/15 12:00:09	9480	13.05	5.74	0.14	5.71	55.00	62.50	866.00
03/17/15 12:00:39	9510	12.97	6.23	0.15	5.78	55.00	62.50	866.00
03/17/15 12:01:09	9540	12.88	6.42	0.14	5.90	54.86	62.70	864.00
03/17/15 12:01:39	9570	12.72	5.23	0.14	5.92	54.86	62.70	864.00
03/17/15 12:02:09	9600	12.25	4.40	0.14	6.33	54.76	62.70	850.00
03/17/15 12:02:39	9630	12.60	3.45	0.14	6.13	54.76	62.70	850.00
03/17/15 12:03:09	9660	12.65	4.32	0.14	5.98	54.64	62.70	862.00
03/17/15 12:03:39	9690	12.53	4.14	0.14	6.13	54.64	62.70	862.00
03/17/15 12:04:09	9720	12.65	4.30	0.14	6.05	54.53	62.70	860.00
03/17/15 12:04:39	9750	12.69	4.42	0.14	5.97	54.53	62.70	860.00
03/17/15 12:05:09	9780	12.18	3.70	0.14	6.36	54.42	62.80	872.00
03/17/15 12:05:39	9810	12.72	3.15	0.14	6.00	54.42	62.80	872.00
03/17/15 12:06:09	9840	13.13	4.59	0.14	5.70	54.30	62.90	870.00
03/17/15 12:06:39	9870	12.92	5.91	0.14	5.81	54.30	62.90	870.00
03/17/15 12:07:09	9900	13.22	7.00	0.15	5.54	66.58	59.60	862.00
RAW AVERAGE		12.87	6.31	0.16	5.84	58.96	61.17	856.77

Bias	Serial Number:				Press. Trans.	Temp. Trans.	F-Flow Trans.
					1442557	1442557	1442557
					(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.06	0.26	0.09	0.12		
	Final Zero	0.08	0.24	0.05	0.11		
	Avg. Zero	0.07	0.25	0.07	0.12		
	Initial UpScale	11.99	9.23	3.25	8.88		
	Final UpScale	12.03	9.25	3.23	8.91		
	Avg. UpScale	12.01	9.24	3.24	8.90		
Upscale Cal Gas		12.06	9.19	3.02	8.87		

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.93	6.19	0.09	5.79
Corrected Raw Average (ppm/% wet basis)	12.11	5.79	0.08	5.41
Emission Rate (lb/hr)	N/A	0.04	0.00	N/A

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.4	%
Stack Exhaust Flow (M2)	47,568	SCFH

Weather Data

Barometric Pressure	30.23	in. Hg
Relative Humidity	57	%
Ambient Temperature	66	°F
Specific Humidity	0.007679	lb H ₂ O / lb air

90-100 Load, Run - Q100 R12

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmwv)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	03/17/15 12:28:09	11160	12.54	4.05	0.14	6.19	52.54	64.00	769.00
	03/17/15 12:28:39	11190	12.74	5.48	0.14	5.87	52.54	64.00	769.00
	03/17/15 12:29:09	11220	12.67	4.79	0.13	6.07	52.47	64.10	768.00
	03/17/15 12:29:39	11250	12.78	6.17	0.13	5.97	52.47	64.10	768.00
	03/17/15 12:30:09	11280	13.23	7.37	0.14	5.61	52.42	64.10	755.00
	03/17/15 12:30:39	11310	13.47	10.28	0.15	5.38	52.42	64.10	755.00
	03/17/15 12:31:09	11340	12.97	12.32	0.15	5.71	52.35	64.20	766.00
	03/17/15 12:31:39	11370	13.27	8.17	0.13	5.66	52.35	64.20	766.00
	03/17/15 12:32:09	11400	13.16	11.12	0.15	5.62	52.30	64.30	753.00
	03/17/15 12:32:39	11430	13.78	11.91	0.15	5.19	52.30	64.30	753.00
	03/17/15 12:33:09	11460	13.15	13.57	0.14	5.57	52.25	64.60	765.00
	03/17/15 12:33:39	11490	13.13	9.77	0.14	5.70	52.25	64.60	765.00
	03/17/15 12:34:09	11520	13.74	12.28	0.14	5.20	52.06	64.80	876.00
	03/17/15 12:34:39	11550	13.73	15.85	0.15	5.14	52.06	64.80	876.00
	03/17/15 12:35:09	11580	13.56	15.67	0.14	5.27	51.91	65.10	886.00
	03/17/15 12:35:39	11610	12.97	11.72	0.14	5.79	51.91	65.10	886.00
	03/17/15 12:36:09	11640	12.68	7.79	0.13	5.96	51.81	65.60	884.00
	03/17/15 12:36:39	11670	12.71	5.38	0.12	6.09	51.81	65.60	884.00
	03/17/15 12:37:09	11700	12.70	7.97	0.14	5.94	51.74	66.30	870.00
	03/17/15 12:37:39	11730	12.14	6.22	0.12	6.41	51.74	66.30	870.00
	03/17/15 12:38:09	11760	12.83	4.26	0.12	5.88	51.69	66.90	880.00
	03/17/15 12:38:39	11790	13.09	6.36	0.14	5.72	51.69	66.90	880.00
	03/17/15 12:39:09	11820	13.39	7.04	0.14	5.48	51.63	67.20	879.00
	03/17/15 12:39:39	11850	13.54	7.11	0.14	5.34	51.63	67.20	879.00
	03/17/15 12:40:09	11880	13.23	6.98	0.14	5.56	51.59	67.50	865.00
	03/17/15 12:40:39	11910	13.32	6.56	0.13	5.51	51.59	67.50	865.00
	03/17/15 12:41:09	11940	13.06	7.53	0.13	5.68	51.54	67.70	864.00
	03/17/15 12:41:39	11970	13.18	6.14	0.14	5.65	51.54	67.70	864.00
	03/17/15 12:42:09	12000	13.35	6.60	0.13	5.48	51.44	68.00	875.00
	03/17/15 12:42:39	12030	13.31	6.65	0.13	5.52	51.44	68.00	875.00
	03/17/15 12:43:09	12060	13.32	6.59	0.13	5.49	51.38	68.20	861.00
	03/17/15 12:43:39	12090	13.32	6.07	0.14	5.50	51.38	68.20	861.00
	03/17/15 12:44:09	12120	13.55	6.25	0.14	5.34	51.37	68.50	861.00
	03/17/15 12:44:39	12150	13.37	7.74	0.12	5.48	51.37	68.50	861.00
	03/17/15 12:45:09	12180	13.55	8.60	0.13	5.30	51.38	68.60	861.00
	03/17/15 12:45:39	12210	13.31	7.07	0.13	5.53	51.38	68.60	861.00
	03/17/15 12:46:09	12240	13.34	6.37	0.13	5.49	51.36	68.70	860.00
	03/17/15 12:46:39	12270	13.22	6.58	0.14	5.58	51.36	68.70	860.00
	03/17/15 12:47:09	12300	13.23	6.21	0.13	5.57	51.34	68.70	860.00
	03/17/15 12:47:39	12330	13.12	5.79	0.12	5.68	51.34	68.70	860.00
	03/17/15 12:48:09	12360	13.60	7.02	0.14	5.29	51.32	68.70	860.00
	03/17/15 12:48:39	12390	13.27	7.73	0.13	5.54	51.32	68.70	860.00
	03/17/15 12:49:09	12420	13.16	6.66	0.13	5.63	51.27	68.60	859.00
	03/17/15 12:49:39	12450	12.91	5.92	0.13	5.85	51.27	68.60	859.00
	03/17/15 12:50:09	12480	13.49	5.62	0.13	5.37	51.23	68.40	859.00
	03/17/15 12:50:39	12510	13.57	7.33	0.13	5.28	51.23	68.40	859.00
	03/17/15 12:51:09	12540	13.19	6.94	0.13	5.63	51.17	68.20	846.00
A2	03/17/15 12:51:39	12570	13.45	5.36	0.13	5.40	51.17	68.20	846.00
	03/17/15 12:52:09	12600	13.25	5.80	0.13	5.57	51.10	68.10	871.00
	03/17/15 12:52:39	12630	13.01	5.14	0.12	5.72	51.10	68.10	871.00
	03/17/15 12:53:09	12660	12.82	5.33	0.12	5.93	50.99	67.90	845.00
	03/17/15 12:53:39	12690	13.21	5.25	0.13	5.57	50.99	67.90	845.00
	03/17/15 12:54:09	12720	12.93	5.32	0.12	5.77	50.87	67.80	868.00
	03/17/15 12:54:39	12750	12.86	5.86	0.13	5.86	50.87	67.80	868.00
	03/17/15 12:55:09	12780	12.54	4.22	0.11	6.12	50.75	67.80	854.00
	03/17/15 12:55:39	12810	12.89	4.02	0.13	5.87	50.75	67.80	854.00
	03/17/15 12:56:09	12840	13.02	5.46	0.13	5.74	50.67	67.80	865.00
	03/17/15 12:56:39	12870	12.70	5.62	0.12	5.99	50.67	67.80	865.00
	03/17/15 12:57:09	12900	12.40	3.84	0.12	6.25	50.60	67.90	852.00
	03/17/15 12:57:39	12930	12.85	4.34	0.12	5.85	50.60	67.90	852.00

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.4	%
Stack Exhaust Flow (M2)	47,568	SCFH

Weather Data

Barometric Pressure	30.23	in. Hg
Relative Humidity	57	%
Ambient Temperature	66	°F
Specific Humidity	0.007679	lb H ₂ O / lb air

90-100 Load, Run - Q100 R12

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	03/17/15 12:58:09	12960	13.18	4.85	0.13	5.68	50.53	68.10	863.00
	03/17/15 12:58:39	12990	13.38	5.98	0.13	5.47	50.53	68.10	863.00
	03/17/15 12:59:09	13020	13.40	6.05	0.13	5.42	50.45	68.40	861.00
	03/17/15 12:59:39	13050	13.51	6.40	0.12	5.39	50.45	68.40	861.00
	03/17/15 13:00:09	13080	13.54	6.67	0.12	5.33	50.37	68.60	860.00
	03/17/15 13:00:39	13110	13.46	7.36	0.13	5.40	50.37	68.60	860.00
	03/17/15 13:01:09	13140	13.43	6.80	0.12	5.39	50.28	68.90	870.00
	03/17/15 13:01:39	13170	12.84	7.00	0.12	5.89	50.28	68.90	870.00
	03/17/15 13:02:09	13200	12.91	5.30	0.12	5.87	50.20	69.10	857.00
	03/17/15 13:02:39	13230	13.33	7.49	0.13	5.49	50.20	69.10	857.00
	03/17/15 13:03:09	13260	13.41	9.03	0.13	5.48	50.15	69.20	856.00
	03/17/15 13:03:39	13290	13.42	9.49	0.13	5.43	50.15	69.20	856.00
	03/17/15 13:04:09	13320	13.10	7.93	0.11	5.62	50.09	69.20	867.00
	03/17/15 13:04:39	13350	13.28	5.93	0.13	5.63	50.09	69.20	867.00
	03/17/15 13:05:09	13380	13.48	7.52	0.12	5.36	50.03	69.10	854.00
	03/17/15 13:05:39	13410	13.58	6.49	0.12	5.32	50.03	69.10	854.00
	03/17/15 13:06:09	13440	13.78	8.19	0.13	5.14	49.96	69.10	853.00
	03/17/15 13:06:39	13470	13.66	8.62	0.12	5.22	49.96	69.10	853.00
	03/17/15 13:07:09	13500	13.60	7.73	0.13	5.30	49.85	69.00	864.00
	03/17/15 13:07:39	13530	13.72	7.86	0.12	5.19	49.85	69.00	864.00
	03/17/15 13:08:09	13560	13.10	7.79	0.13	5.67	49.75	68.80	863.00
	03/17/15 13:08:39	13590	13.55	6.83	0.13	5.25	49.75	68.80	863.00
	03/17/15 13:09:09	13620	12.56	6.91	0.12	6.11	49.65	68.50	875.00
	03/17/15 13:09:39	13650	13.21	4.33	0.13	5.65	49.65	68.50	875.00
	03/17/15 13:10:09	13680	13.37	7.62	0.13	5.50	49.54	68.40	873.00
	03/17/15 13:10:39	13710	13.48	8.62	0.13	5.38	49.54	68.40	873.00
	03/17/15 13:11:09	13740	13.39	8.01	0.12	5.43	49.47	68.30	860.00
	03/17/15 13:11:39	13770	13.12	7.11	0.13	5.69	49.47	68.30	860.00
	03/17/15 13:12:09	13800	13.25	7.06	0.13	5.52	49.39	68.40	871.00
	03/17/15 13:12:39	13830	13.64	8.08	0.13	5.29	49.39	68.40	871.00
	03/17/15 13:13:09	13860	13.71	10.22	0.14	5.18	49.32	68.50	870.00
	03/17/15 13:13:39	13890	13.63	9.02	0.12	5.23	49.32	68.50	870.00
	03/17/15 13:14:09	13920	13.64	7.35	0.13	5.25	49.26	68.70	869.00
	03/17/15 13:14:39	13950	13.62	8.55	0.13	5.26	49.26	68.70	869.00
A3	03/17/15 13:15:09	13980	13.70	8.18	0.13	5.21	49.21	68.70	868.00
	03/17/15 13:15:39	14010	13.77	8.69	0.13	5.13	49.21	68.70	868.00
	03/17/15 13:16:09	14040	13.77	9.77	0.13	5.16	49.16	68.70	855.00
	03/17/15 13:16:39	14070	13.61	9.93	0.13	5.24	49.16	68.70	855.00
	03/17/15 13:17:09	14100	13.41	7.49	0.12	5.46	49.12	68.80	867.00
	03/17/15 13:17:39	14130	13.64	7.49	0.13	5.23	49.12	68.80	867.00
	03/17/15 13:18:09	14160	13.21	7.31	0.13	5.59	49.07	69.10	866.00
	03/17/15 13:18:39	14190	13.33	7.19	0.13	5.51	49.07	69.10	866.00
	03/17/15 13:19:09	14220	13.39	6.83	0.12	5.45	49.02	69.30	853.00
	03/17/15 13:19:39	14250	13.45	5.80	0.12	5.41	49.02	69.30	853.00
	03/17/15 13:20:09	14280	13.65	6.67	0.12	5.24	48.96	69.40	864.00
	03/17/15 13:20:39	14310	13.28	8.00	0.13	5.52	48.96	69.40	864.00
	03/17/15 13:21:09	14340	13.46	6.11	0.12	5.40	48.91	69.30	851.00
	03/17/15 13:21:39	14370	13.29	8.14	0.12	5.48	48.91	69.30	851.00
	03/17/15 13:22:09	14400	13.22	7.05	0.13	5.60	48.85	69.10	851.00
	03/17/15 13:22:39	14430	13.38	6.12	0.12	5.44	48.85	69.10	851.00
	03/17/15 13:23:09	14460	13.51	6.07	0.13	5.37	48.78	68.90	862.00
	03/17/15 13:23:39	14490	13.11	6.22	0.12	5.65	48.78	68.90	862.00
	03/17/15 13:24:09	14520	13.42	4.89	0.12	5.48	48.70	68.60	861.00
	03/17/15 13:24:39	14550	13.55	6.98	0.13	5.27	48.70	68.60	861.00
	03/17/15 13:25:09	14580	13.07	6.99	0.11	5.70	48.60	68.40	860.00
	03/17/15 13:25:39	14610	13.02	5.23	0.10	5.78	48.60	68.40	860.00
	03/17/15 13:26:09	14640	13.51	5.93	0.11	5.35	48.50	68.30	859.00
	03/17/15 13:26:39	14670	13.55	7.19	0.13	5.32	48.50	68.30	859.00
	03/17/15 13:27:09	14700	12.97	7.40	0.12	5.74	48.41	68.10	858.00
	03/17/15 13:27:39	14730	12.82	5.10	0.11	5.89	48.41	68.10	858.00

Questor Technology Inc
March 17, 2015
Q100
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.4	%
Stack Exhaust Flow (M2)	47,568	SCFH

Weather Data

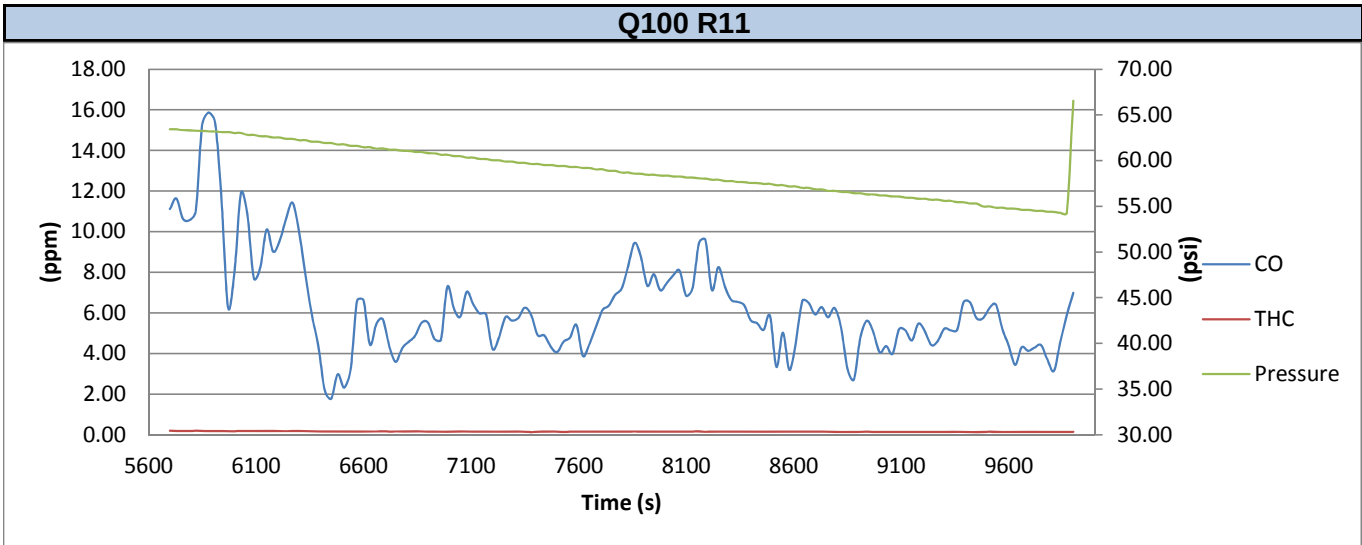
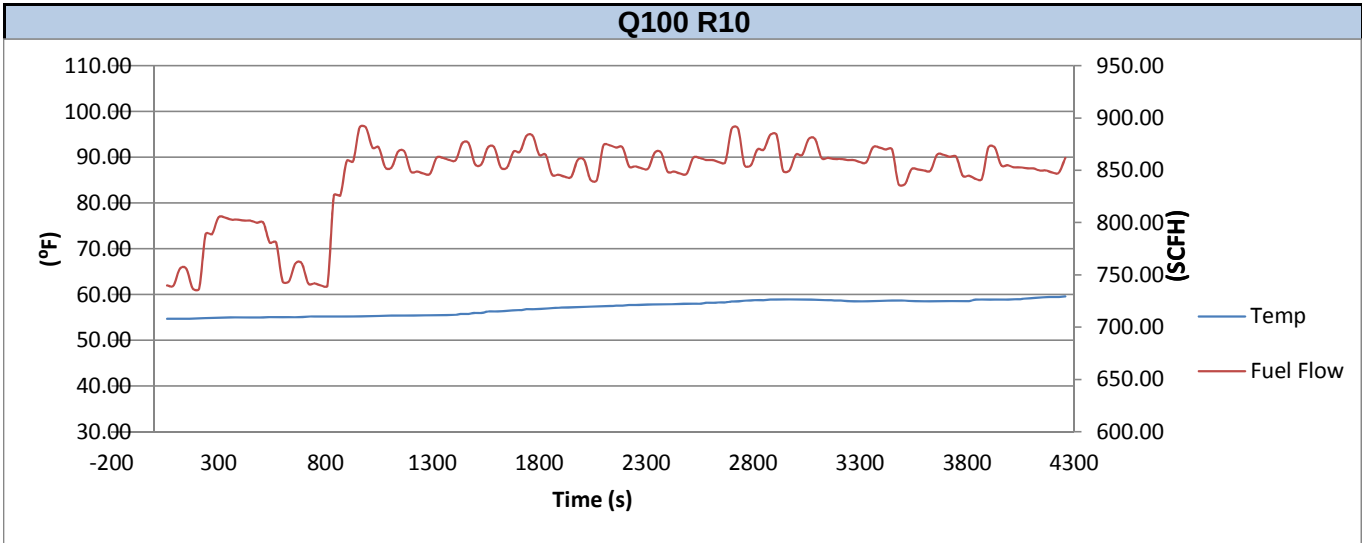
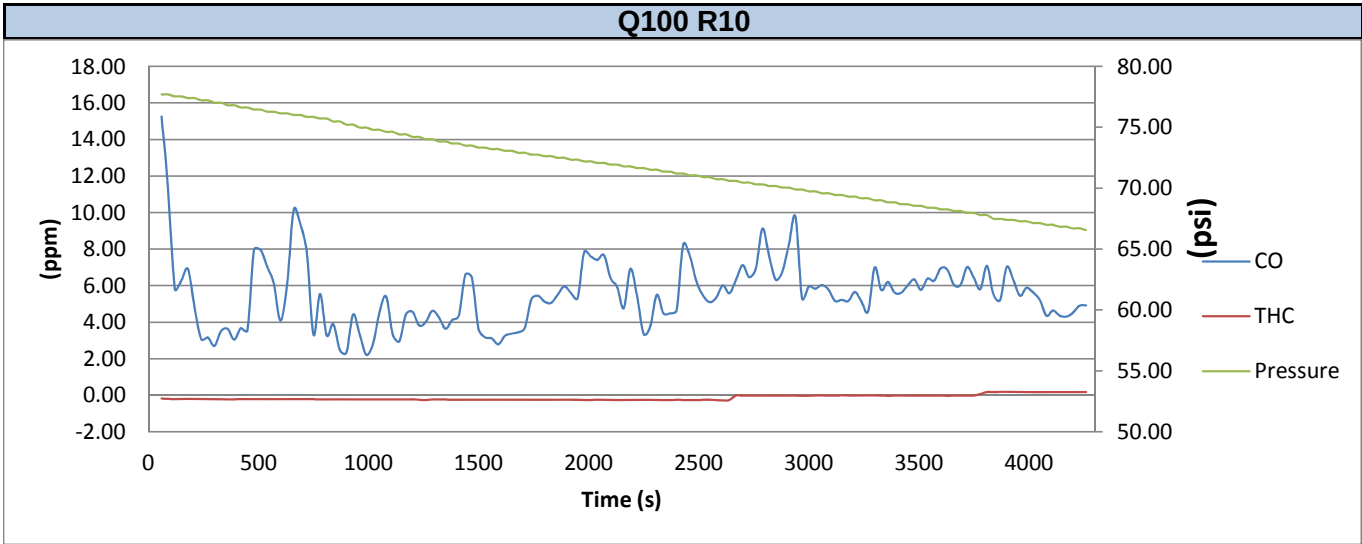
Barometric Pressure	30.23	in. Hg
Relative Humidity	57	%
Ambient Temperature	66	°F
Specific Humidity	0.007679	lb H ₂ O / lb air

90-100 Load, Run - Q100 R12

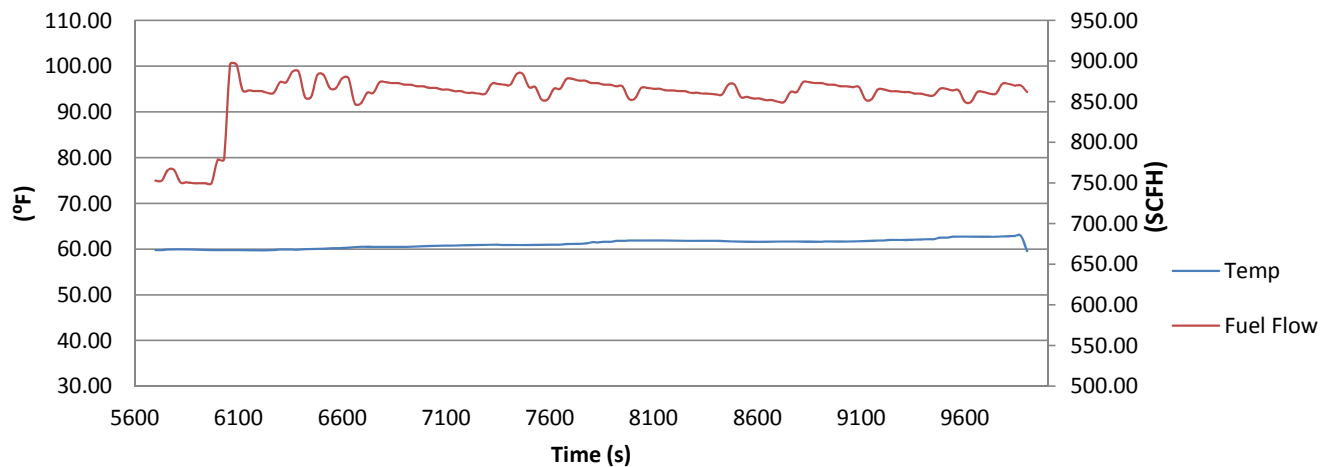
Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
03/17/15 13:28:09	14760	12.78	4.27	0.11	5.99	48.33	68.10	857.00
03/17/15 13:28:39	14790	13.18	5.17	0.11	5.60	48.33	68.10	857.00
03/17/15 13:29:09	14820	13.44	5.32	0.12	5.43	48.26	68.10	868.00
03/17/15 13:29:39	14850	13.13	6.32	0.12	5.62	48.26	68.10	868.00
03/17/15 13:30:09	14880	13.30	5.91	0.11	5.58	48.20	68.00	855.00
03/17/15 13:30:39	14910	13.04	6.65	0.10	5.68	48.20	68.00	855.00
03/17/15 13:31:09	14940	13.41	5.30	0.12	5.47	48.07	67.50	854.00
03/17/15 13:31:39	14970	13.38	6.07	0.12	5.46	48.07	67.50	854.00
03/17/15 13:32:09	15000	13.50	6.30	0.11	5.36	47.99	67.40	854.00
03/17/15 13:32:39	15030	13.36	5.97	0.12	5.48	47.99	67.40	854.00
03/17/15 13:33:09	15060	13.48	5.68	0.12	5.37	47.91	67.30	876.00
03/17/15 13:33:39	15090	13.37	6.86	0.11	5.44	47.91	67.30	876.00
03/17/15 13:34:09	15120	13.36	5.36	0.12	5.51	47.82	67.20	851.00
03/17/15 13:34:39	15150	13.33	5.53	0.12	5.49	47.82	67.20	851.00
03/17/15 13:35:09	15180	13.47	5.32	0.12	5.37	47.74	67.10	862.00
03/17/15 13:35:39	15210	13.42	5.86	0.11	5.42	47.74	67.10	862.00
03/17/15 13:36:09	15240	13.35	5.99	0.11	5.46	47.64	67.00	873.00
03/17/15 13:36:39	15270	13.38	5.55	0.12	5.49	47.64	67.00	873.00
03/17/15 13:37:09	15300	13.55	7.05	0.10	5.31	47.56	66.90	860.00
03/17/15 13:37:39	15330	13.53	7.55	0.10	5.28	47.56	66.90	860.00
03/17/15 13:38:09	15360	13.36	7.47	0.12	5.50	66.58	59.60	862.00
RAW AVERAGE		13.27	7.03	0.13	5.54	50.25	67.74	854.45

Bias	Serial Number:				Press. Trans	Temp. Trans.	F-Flow Trans.
	INSTO2-0011	INST-CO-0029	INST-TH-0008	INST-C2-0013	1442557	1442557	1442557
					(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.08	0.24	0.05	0.11		
	Final Zero	0.04	0.25	0.05	0.09		
	Avg. Zero	0.06	0.25	0.05	0.10		
	Initial UpScale	12.03	9.25	3.23	8.91		
	Final UpScale	12.05	9.27	3.20	8.93		
	Avg. UpScale	12.04	9.26	3.22	8.92		
Upscale Cal Gas		12.06	9.19	3.02	8.87		

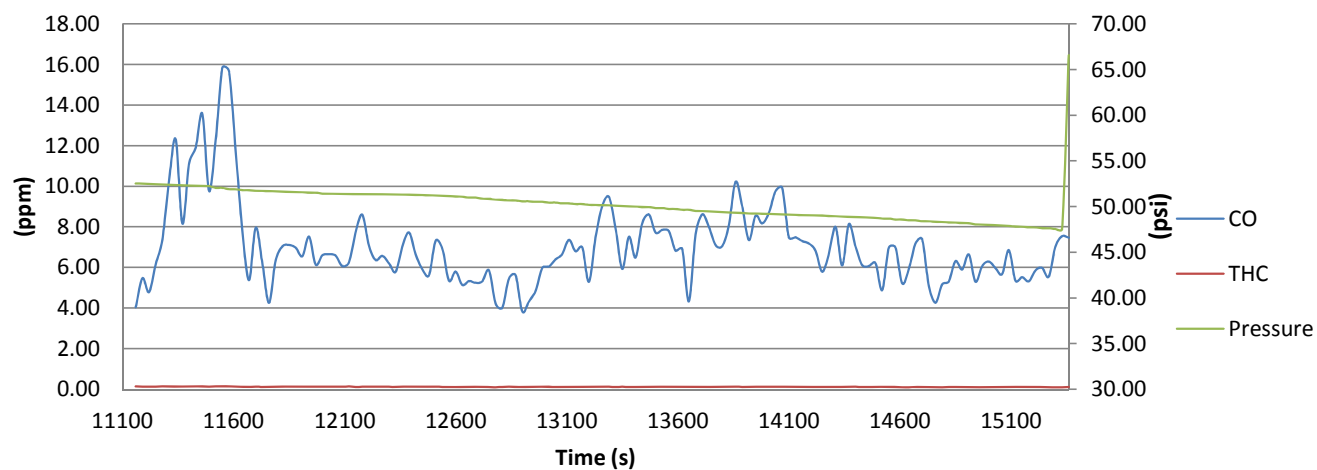
EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.30	6.92	0.07	5.47
Corrected Raw Average (ppm/% wet basis)	12.45	6.46	0.07	5.12
Emission Rate (lb/hr)	N/A	0.02	0.00	N/A



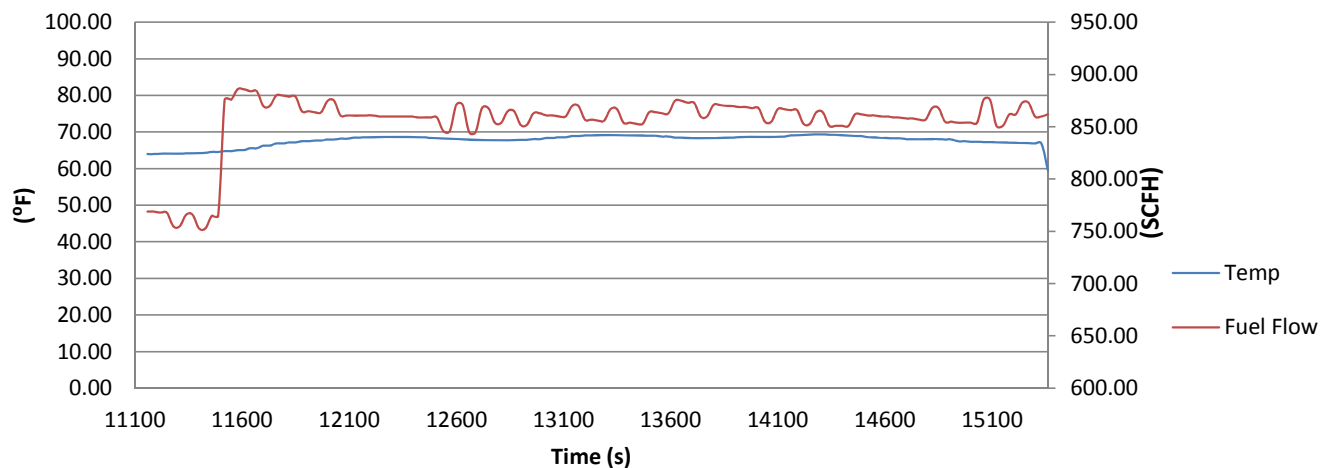
Q100 R11

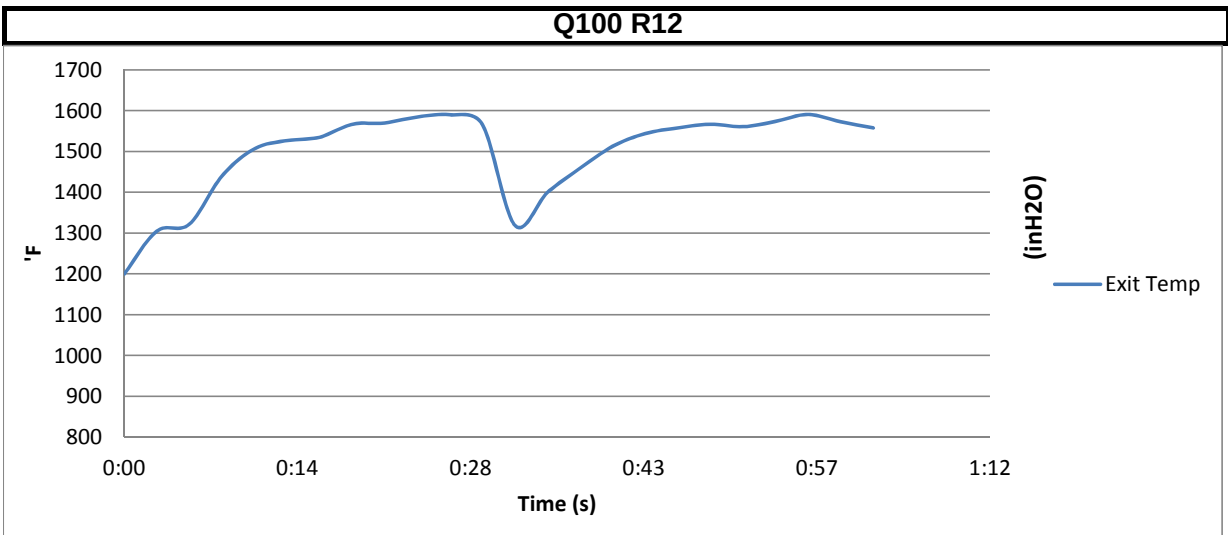
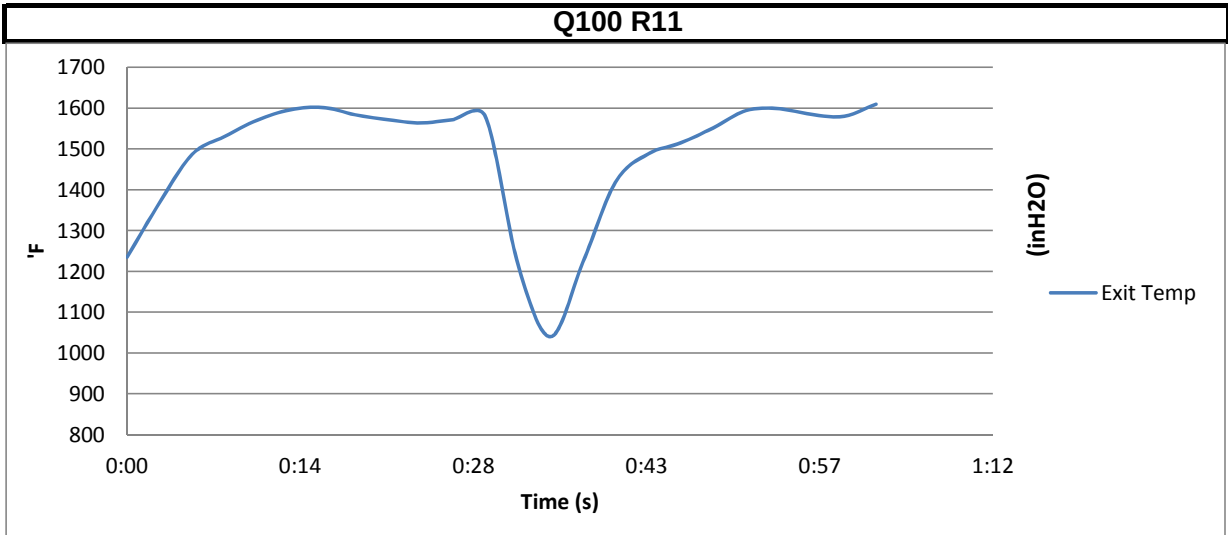
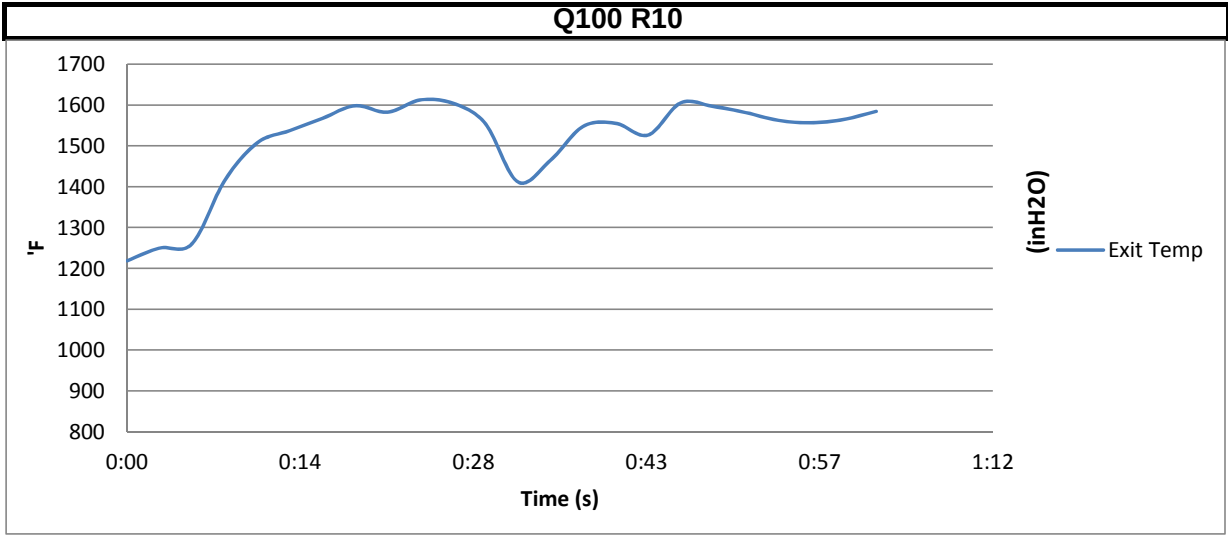


Q100 R12



Q100 R12





EMISSION DATA RECORDS
VISUAL EMISSION DATA RECORD



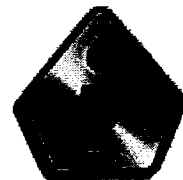
Tuesday, March 17, 2015 15:00:39
1600 W Tacoma St Broken Arrow OK 74012-1483 United States

Q100 @ Run 1

(4)

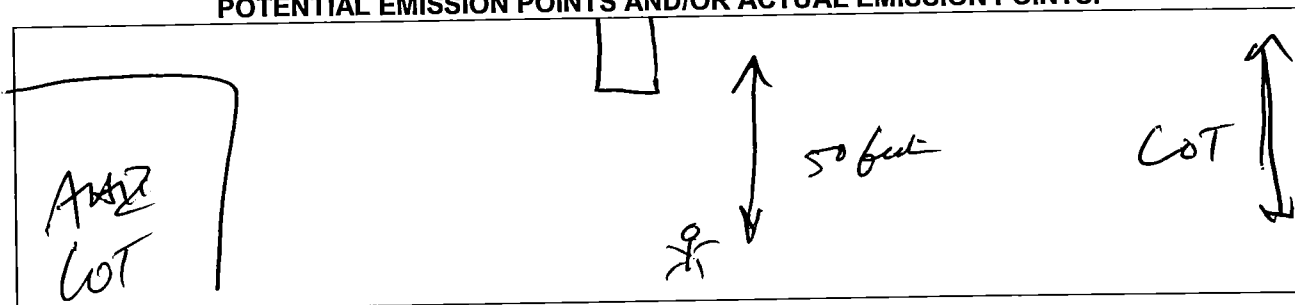
R1

**METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM**

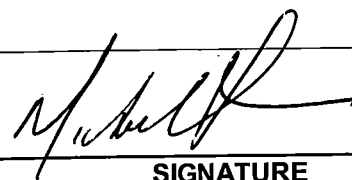
**AIR HYGIENE**

COMPANY: Questor Technology Incinerator	OBSERVER: Mike Schroeder
LOCATION: Broken Arrow	AFFILIATION: Air Hygiene
COMPANY REP: Benjamin	DATE: 3-17-2015
SKY CONDITIONS: Clear	WIND DIRECTION: N
PRECIPITATION: X	WIND SPEED: 10-15
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.

**OBSERVATIONS**

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
14:50	20:00	00:00	N
15:10	Break 5:00	00:00	
15:15	20:00	00:00	
15:35	Break 5:00	00:00	
15:40	20:00	00:00	
16:00			

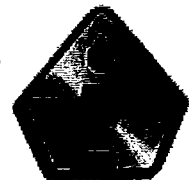

SIGNATURE



Q100 @ Run 2

R 2

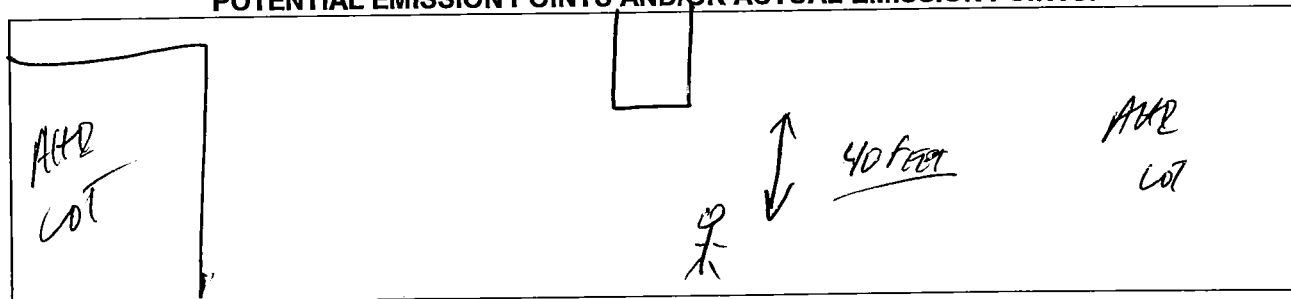
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator	OBSERVER: Mike Schroeder
LOCATION: Broken Arrow	AFFILIATION: Air Hygiene
COMPANY REP: Benjamin	DATE: 3-17-2015
SKY CONDITIONS: GREY - cloudy	WIND DIRECTION: N
PRECIPITATION: *	WIND SPEED: 10 MPH
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
16:17	20:00	00:00	N
16:37	Break Break 5:00	00:00	
16:42	20:00	00:00	
17:02	5 min Break Break 20:00	00:00	
17:07	20:00	00:00	
17:27			

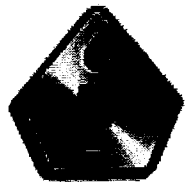

SIGNATURE



Q100 @ Run 3

6

R3

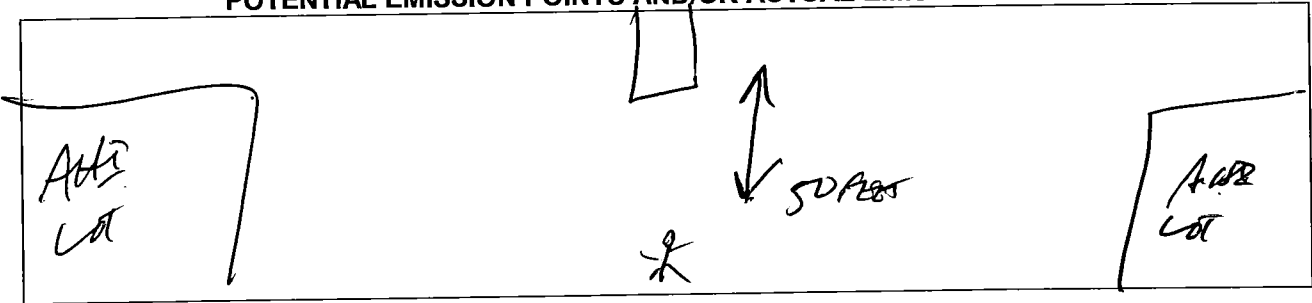


AIR HYGIENE

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-17-2015
SKY CONDITIONS: Grey - cloudy PRECIPITATION: X	WIND DIRECTION: N WIND SPEED: 10
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
17:41	20:00	00:00	N
18:01	Break 5:00	00:00	N
18:06	20:00	00:00	N
18:26	Break 5:00	00:00	N
18:31	20:00	00:00	N
18:51			

SIGNATURE



Q100 @ Run 4

①
② P

R4

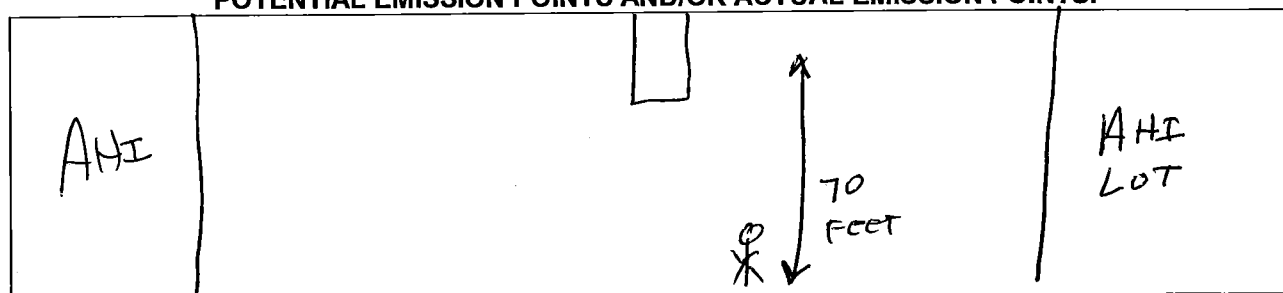
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

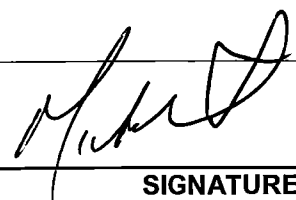
COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-10-2015
SKY CONDITIONS: Clear PRECIPITATION: Light Rain	WIND DIRECTION: E WIND SPEED: 5 mph
INDUSTRY:	PROCESS UNIT: Q100

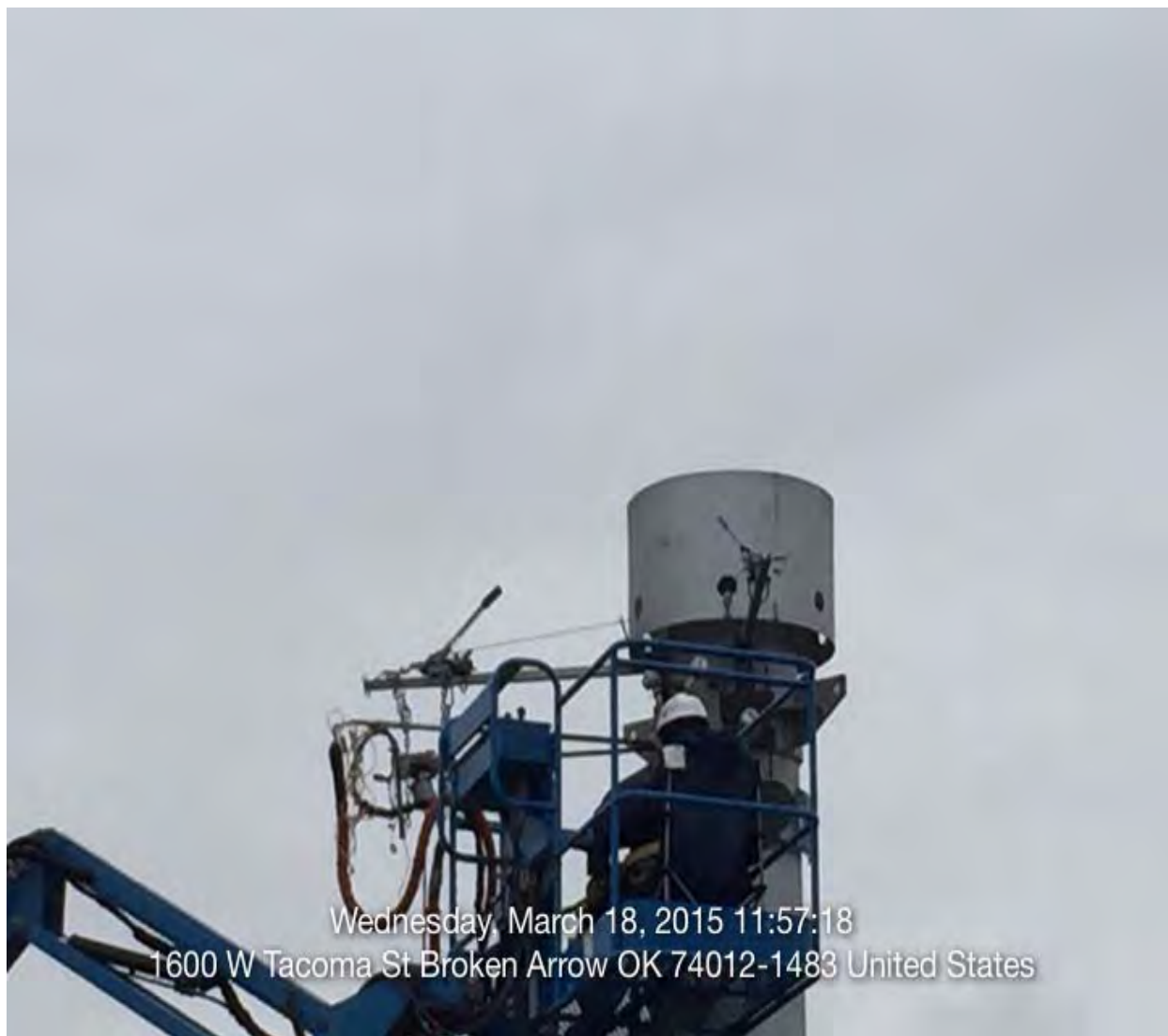
SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
10:05	20:00	00:00	N
10:25	Break 5:00	00:00	N
10:30	20:00	00:00	N
10:50	Break 5:00	00:00	N
10:55	20:00	00:00	N
11:15			


SIGNATURE



Q100 @ Run 5

2

RS

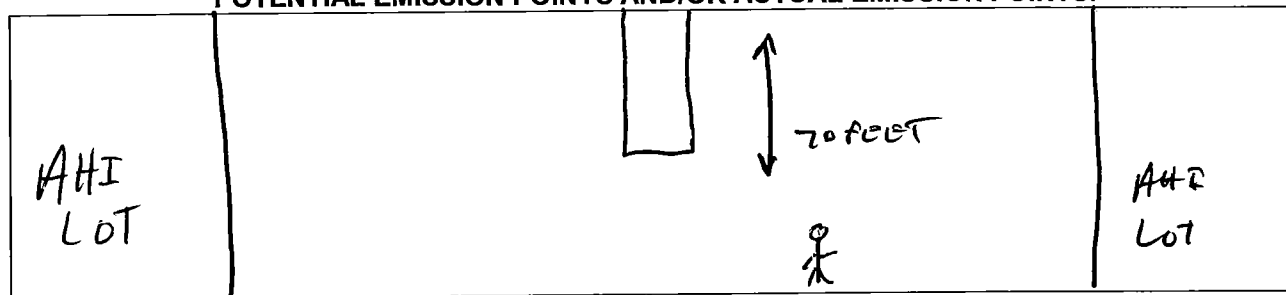
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

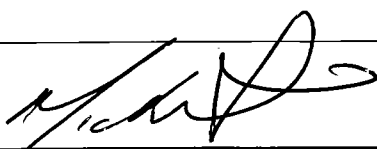
COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-18-2015
SKY CONDITIONS: Green, Cloudy PRECIPITATION: X	WIND DIRECTION: E WIND SPEED: 5 mph
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
11:36	20:00	00:00	N
11:56	5:00 Break	00:00	N
12:01	20:00	00:00	N
12:21	Break 5:00	00:00	N
12:26	20:00	00:00	N
12:46			


SIGNATURE



Q100 @ Run 6

3

R6

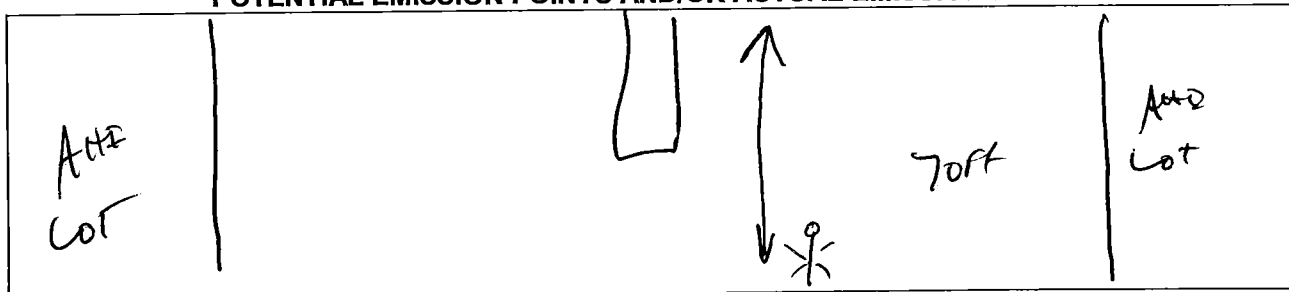
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-18-2015
SKY CONDITIONS: Grey-cloudy PRECIPITATION: X	WIND DIRECTION: E WIND SPEED: 5 mph
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
13:00	20:00	00:00	N
13:20	Break 5:00	00:00	N
13:25	20:00	00:00	N
13:45	Break 5:00	00:00	N
13:50	20:00	00:00	N
14:10			


SIGNATURE



Q100 @ Run 7

① P

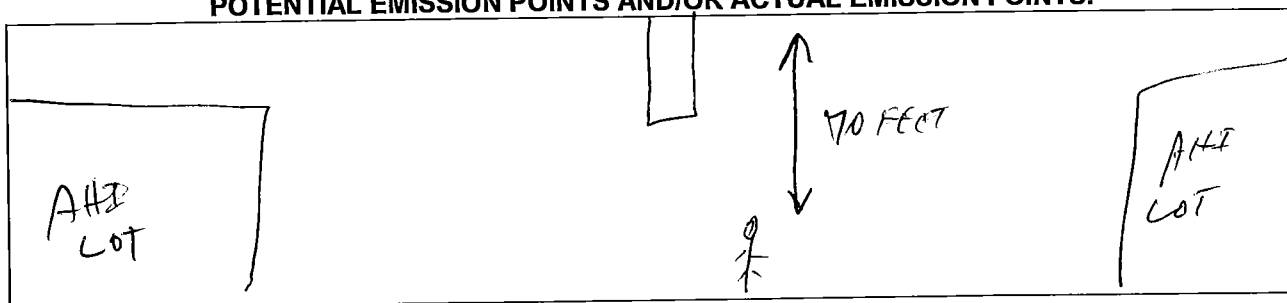
R7

**METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM**

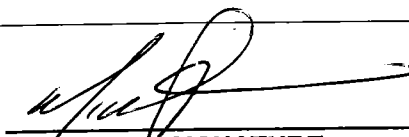
**AIR HYGIENE**

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-19-2015
SKY CONDITIONS: Grey - cloudy PRECIPITATION: X	WIND DIRECTION: SE WIND SPEED: 5 MPH
INDUSTRY:	PROCESS UNIT: Q 100

**SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.**

**OBSERVATIONS**

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
0840	20:00	00:00	N
0900	5:00 BREAK	00:00	N
0905	20:00	00:00	N
0925	5:00 BREAK	00:00	N
0930	20:00	00:00	N
0950			


 SIGNATURE



Q100 @ Run 8

2

R8

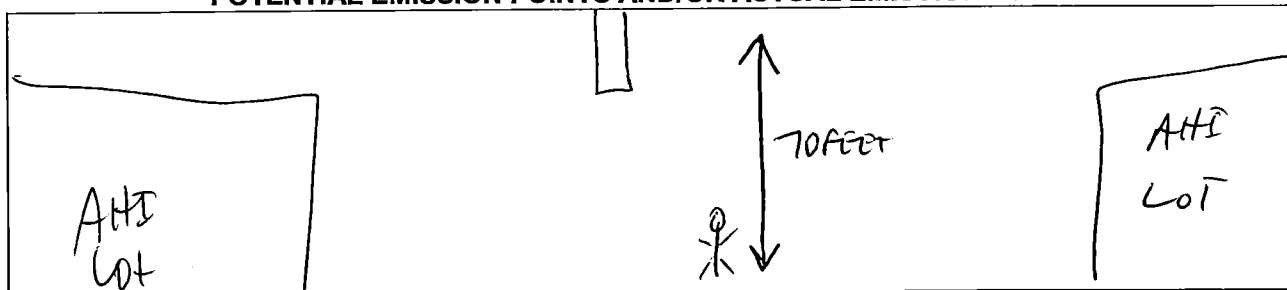
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator	OBSERVER: Mike Schroeder
LOCATION: Broken Arrow	AFFILIATION: Air Hygiene
COMPANY REP: Benjamin	DATE: 3-19-2015
SKY CONDITIONS: GREY - cloudy	WIND DIRECTION: SIE
PRECIPITATION: X	WIND SPEED: 5 MPH
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
10:03	20:00	00:00	N
10:23	5:00 BREAK	00:00	N
10:28	20:00	00:00	N
10:48	5:00 BREAK	00:00	N
10:53	20:00	00:00	N
11:13			

SIGNATURE



Q100 @ Run 9

R9

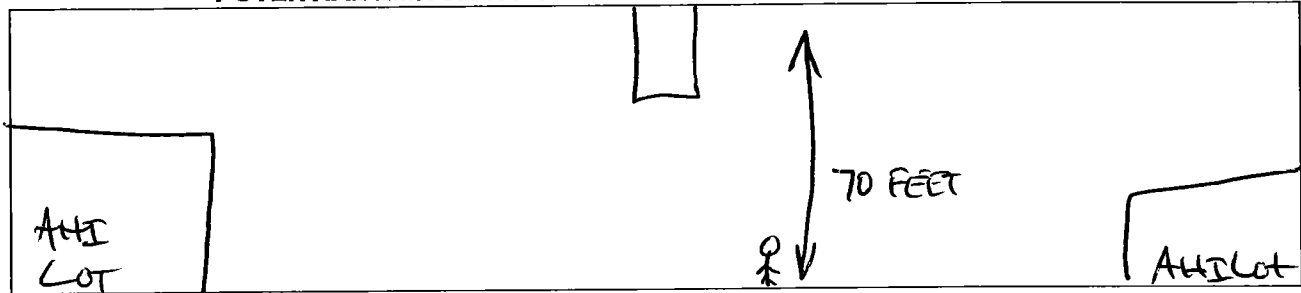
**METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM**



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE:
SKY CONDITIONS: GREY-Cloudy PRECIPITATION: X	WIND DIRECTION: S/E WIND SPEED: 5MPH
INDUSTRY:	PROCESS UNIT: Q 100

**SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.**



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
11:31	20:00	00:00	N
11:51	5:00 BREAK	00:00	N
11:56	20:00	00:00	N
12:16	5:00 BREAK	00:00	N
12:21	20:00	00:00	N
12:41			

SIGNATURE



Q100 @ Run 10

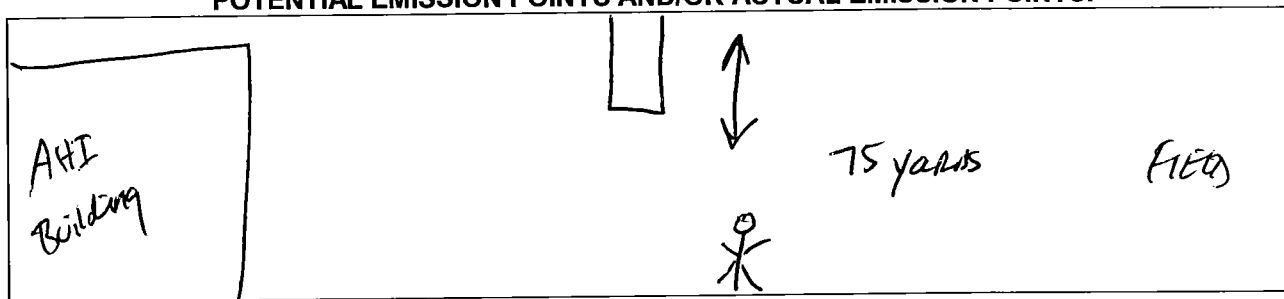
R10
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-17-2015
SKY CONDITIONS: cloudy PRECIPITATION: X	WIND DIRECTION: N WIND SPEED: 10 mph
INDUSTRY:	PROCESS UNIT: Q100

**SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.**



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
0923	20:00	00:00	NW
0943	5:00 break	00:00	}
0948	20:00	00:00	
10:08	Break 5:00	00:00	
10:13	20:00	00:00	
10:33			

SIGNATURE

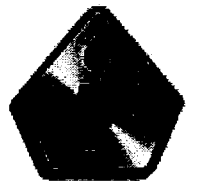


Q100 @ Run 11

2

R11

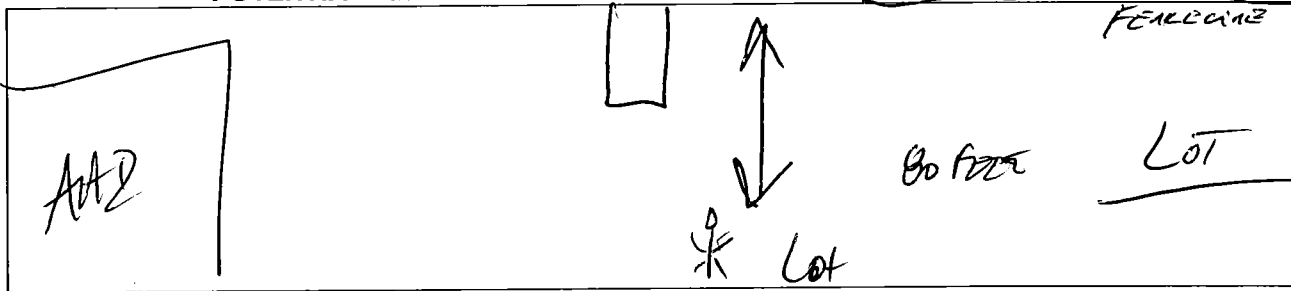
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-17-2015
SKY CONDITIONS: Grey - cloudy PRECIPITATION: X	WIND DIRECTION: N WIND SPEED: 10 MPH
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
10:57	20:00	00:00	N/E
11:17	Break 5:00	00:00	
11:22	20:00	00:00	
11:42	Break 5:00	00:00	
11:47	20:00	00:00	
12:07			

SIGNATURE

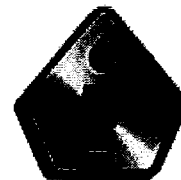


Q100 @ Run 12

3

R12

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

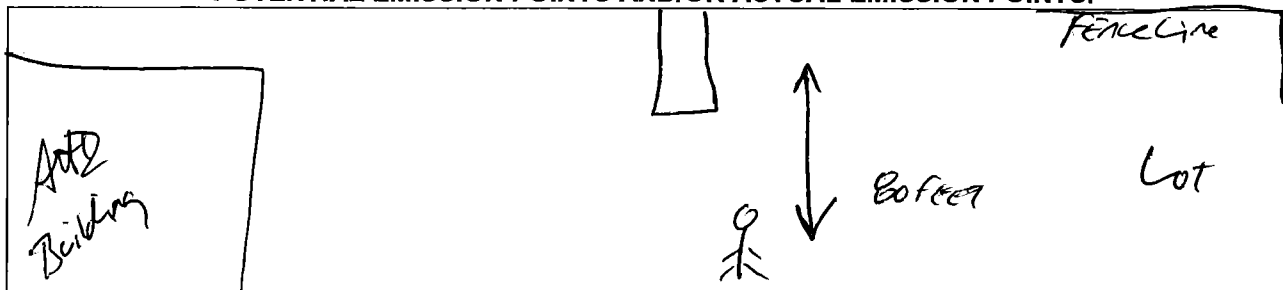


AIR HYGIENE

60-4
60-2
30-24

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 3-17-2015
SKY CONDITIONS: Gray, cloudy PRECIPITATION: X	WIND DIRECTION: N WIND SPEED: 10 MPH
INDUSTRY:	PROCESS UNIT: Q100

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
12:28	20:00	00:00	NE
12:40	Break 5:00	00:00	
12:53	20:00	00:00	
13:13	Break 5:00	00:00	
13:18	20:00	00:00	
13:30			

SIGNATURE

APPENDIX C

CALIBRATION GAS CERTIFICATIONS



Air Liquide America
Specialty Gases LLC



Intertek

Shipped
From:

8832 DICE ROAD
SANTA FE SPRINGS
Phone: 800-323-2212

CA 90670-2516

Fax: 562-464-5262

C E R T I F I C A T E O F A N A L Y S I S

ALA-CYL-TULSA OK (LOC 84231)

DOCUMENT#: 58443925 -001

PO#: FULLS

ITEM #: 7501-30AL

DATE: 20Jan2015

1319 NORTH PEORIA
TRANSFER ACCOUNT
TULSA OK 74106
US

CYLINDER #: CC86693
FILL PRESSURE: 02000 PSIG

PURE MATERIAL: NITROGEN

CAS# 7727-37-9

GRADE: ACID RAIN CEM 0

PURITY: 99.9995%

<u>IMPURITY</u>	<u>MAXIMUM CONCENTRATIONS</u>	<u>ACTUAL CONCENTRATIONS</u>
SOX	0.1 PPM	<0.1 PPM
NOX	0.1 PPM	<0.1 PPM
CO	0.5 PPM	<0.5 PPM
CO2	1 PPM	<0.5 PPM
THC	0.1 PPM	0.1 PPM
H2O	2 PPM	0.6 PPM
O2	0.5 PPM	0.4 PPM

LOT # : SBO0104684

THIS CERTIFICATION DOES NOT EXPIRE PER EPA 600/R-12/531.

ANALYST:

TN



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

11426 FAIRMONT PKWY, LA PORTE, TX 77571

Phone: 800-248-1427

Fax: 281-474-8419

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

Assay Laboratory - PGVP Vendor ID: A32012

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
11426 FAIRMONT PKWY
LA PORTE, TX 77571

P.O. No.:
Document # : 45457634-001
Folio #: AH073

Customer
AIR HYGIENE

MIKE SCOTT
1600 WEST TACOMA ST
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : CO,NO,BALN

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

Cylinder Number: CC75555 Certification Date: 27Mar2012 Exp. Date: 29Mar2015
Cylinder Pressure***: 1950 PSIG Batch No: LAP0061243

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
NITRIC OXIDE	18.4	PPM	+/- 1%	Direct NIST and VSL
CARBON MONOXIDE	17.3	PPM	+/- 1%	
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	18.5	PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	15Aug2013	KAL003017	19.83 PPM	NITRIC OXIDE
NTRM 2635	01Jun2016	AAL073309	25.54 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
NOX ANALYZER/400-CLD/7M07001	08Mar2012	CHEMI
FTIR/000929060	08Mar2012	FTIR

ANALYZER READINGS

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

First Triad Analysis

NITRIC OXIDE

Date: 21Mar2012 Response Unit: PPM
Z1 = 0.00000 R1 = 19.55000 T1 = 18.10000
R2 = 19.55000 Z2 = 0.00000 T2 = 18.10000
Z3 = 0.00000 T3 = 18.15000 R3 = 19.50000
Avg. Concentration: 18.39 PPM

Second Triad Analysis

Date: 28Mar2012 Response Unit: PPM
Z1 = 0.00000 R1 = 19.75000 T1 = 18.25000
R2 = 19.60000 Z2 = 0.00000 T2 = 18.12000
Z3 = 0.00000 T3 = 18.12000 R3 = 19.55000
Avg. Concentration: 18.34 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.9999927
Constants: A = 0.043392918
B = 1.016595028 C =
D = E =

CARBON MONOXIDE

Date: 20Mar2012 Response Unit: PPM
Z1 = -0.00994 R1 = 25.52915 T1 = 17.22629
R2 = 25.59899 Z2 = -0.00458 T2 = 17.28559
Z3 = -0.00378 T3 = 17.29797 R3 = 25.61528
Avg. Concentration: 17.24 PPM

Date: 27Mar2012 Response Unit: PPM
Z1 = -0.00936 R1 = 25.54199 T1 = 17.30803
R2 = 25.56195 Z2 = 0.00050 T2 = 17.30976
Z3 = 0.01579 T3 = 17.33766 R3 = 25.57913
Avg. Concentration: 17.30 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99995E-1
Constants: A = -9.34270E+2
B = 1.76177E+0 C = 0.00000E+0
D = 0.00000E+0 E = 0.00000E+0

Special Notes:

AH073 LIST ITEM AH073 ON CERTS ANG TAGS CGA 660; DEW PT. 40 DEG.F.
The expiration date has been extended without re-assay per EPA 600/R23-23/542.

APPROVED BY:

RON STITT



Assay Laboratory: Red Ball TGS
555 Craig Kennedy Way
Shreveport, LA 71107
800-551-8150

EPA PROTOCOL GAS CERTIFICATE OF ANALYSIS

Cylinder Number: EB0005590
Product ID Number: 124606
Cylinder Pressure: 1900 PSIG
COA #: EB0005590.20140807-0
Customer PO. NO.:
Customer:

Certification Date: 08/11/2014
Expiration Date: 08/09/2022
MFG Facility: RBTGS-Shreveport-LA
Lot Number: EB0005590.20140807
Tracking Number: 5953521
Previous Certification Dates:

This calibration standard has been certified per the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531, using procedure G1.

Do Not Use This Cylinder Below 100 psig (0.7 Megapascal).

Certified Concentration(s)

Component	Concentration	Uncertainty	Analytical Principle
Carbon Dioxide	8.87 %	±0.05 %	NDIR
Oxygen	12.06 %	±0.04 %	MPA
Nitrogen	Balance		

Analytical Measurement Data Available Online.

Reference Standard(s)

Lot	Expiration	Type	Balance	Component	Concentration	Uncertainty(%)	NIST Reference
GC1110110959	09/04/2021	GMIS	N2	CO2	21.55 %	0.594	3221755.02
GC1304111019	09/04/2021	GMIS	N2	CO2	12.57 %	0.552	3221755.02
CC237204 071001	03/24/2017	NTRM	N2	O2	24.52 %	0.494	071001
ED0507151330	04/28/2019	GMIS	N2	O2	11.1 %	0.348	071001

Analytical Instrumentation

Component	Analytical Principle	Make	Model	Serial	MPC Date
CO2	NDIR	Honiba	VA-3013	H0000P11	7/21/2014 12:48:05 PM
O2	MPA	Honiba	VA-3013	H0000P11	8/8/2014 10:15:49 AM

Red Ball Technical Gas Service
PGVP Vendor ID # G12014
Information and Ordering
800-551-8150
Fax (318-425-6309)

Fred Holt
Fred Holt
Analyst



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22012

P.O. No.: 48529652

Document #: 48529652-002

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

Customer
AIR HYGIENE

MAX CORBIN
1600 W TACOMA
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : NONE

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

Cylinder Number: ALM035126
Cylinder Pressure***: 1950 PSIG

Certification Date: 19Nov2012

Exp. Date: 20Nov2020
Batch No: TRO0069975

COMPONENT
PROPANE
AIR

CERTIFIED CONCENTRATION (Moles)
8.48 PPM
BALANCE

ACCURACY**
+/- 1%

TRACEABILITY
Direct NIST and VSL

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

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

REFERENCE STANDARD

TYPE/SRM NO.
NTRM 1668

EXPIRATION DATE
12Jul2018

CYLINDER NUMBER
ALM038653

CONCENTRATION
98.80 PPM

COMPONENT
PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#
VARIAN/3400/7506

DATE LAST CALIBRATED
01Nov2012

ANALYTICAL PRINCIPLE
TCD/FID

ANALYZER READINGS

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

First Triad Analysis

Second Triad Analysis

Calibration Curve

PROPANE

Date: 19Nov2012 Response Unit: AREA
Z1=0.00000 R1=2561613. T1=218575.0
R2=2563611. Z2=0.00000 T2=218288.0
Z3=0.00000 T3=218534.0 R3=2564288.
Avg. Concentration: 8.480 PPM

Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 0.999998155
Constants: A = -0.0106566
B = 3.80809E-05 C = 0
D = 0 E = 0

APPROVED BY:

ROBERT LESMAK



Air Liquide America
Specialty Gases LLC



RATA CLASS

Guaranteed +/- 1% Accuracy

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22014

AIR LIQUIDE AMERICA SPECIALTY GASES LLC P.O. No.: MAX
1290 COMBERMERE STREET Document #: 54740879-001
TROY, MI 48083

Customer

AIR HYGIENE
MAX CORBIN
1600 W TACOMA
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : PPN,BALA

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: ALM010279 Certification Date: 21Apr2014 Exp. Date: 22Apr2022
Cylinder Pressure: 1950 PSIG Batch No: TRO0107817

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
PROPANE	5.01 PPM	0.03 PPM / 0.7 %
AIR	BALANCE	

TRACEABILITY

REFERENCE STANDARD

COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
PROPANE	9.6000 PPM	0.0600 PPM	K012629	9 PPM C3H	24Feb2016

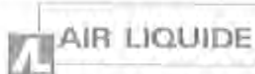
ANALYTICAL METHOD

1st Analysis: 21Apr2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
PROPANE	HORIBA/FIA-220/G05000JAS	FLAME IONIZATION	17Apr2014	5.010 PPM

APPROVED BY:

ROBERT LESNIAK



Air Liquide America
Specialty Gases LLC



RATA CLASS

Guaranteed +/- 1% Accuracy

8832 DICE ROAD, SANTA FE SPRINGS, CA 90670-2516

Phone: 800-323-2212

Fax: 562-464-5262

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A52014

AIR LIQUIDE AMERICA SPECIALTY GASES LLC P.O. No.: MAX
8832 DICE ROAD Document # : 55842938-001
SANTA FE SPRINGS, CA 90670-2516

Customer

AIR HYGIENE
MAX CORBIN
1600 W TACOMA
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : PPN,BALA

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: CC113372 Certification Date: 28Jul2014 Exp. Date: 29Jul2022
Cylinder Pressure: 2000 PSIG Batch No: SBO0096462

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
PROPANE	3.02 PPM	0.04 PPM / 1.3 %
AIR	BALANCE	

TRACEABILITY

REFERENCE STANDARD

COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
PROPANE	2.9500 PPM	0.0300 PPM	ALM023477	NTRM 1665/112097	03Aug2017

ANALYTICAL METHOD

1st Analysis: 28Jul2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
PROPANE	GC-TCD/HP 5890 II/3140A38374	GC	25Jul2014	3.019 PPM

APPROVED BY: _____

JMU



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

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

Assay Laboratory - PGVP Vendor ID: A22012

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

P.O. No.:
Document # : 45643060-002
Folio #: AH071

Customer
AIR HYGIENE

MIKE SCOTT
1600 WEST TACOMA ST
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : CO,NO,BALN

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

Cylinder Number: AAL069838 **Certification Date:** 17Apr2012 **Exp. Date:** 19Apr2015
Cylinder Pressure*:** 2015 PSIG **Batch No:** TRO0056158

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
NITRIC OXIDE	9.21 PPM	+/- 1%	Direct NIST and VSL
CARBON MONOXIDE	9.19 PPM	+/- 1%	Direct NIST and VSL
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	9.22 PPM		Reference Value Only

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	15Jan2013	KAL004325	20.36 PPM	NITRIC OXIDE
NTRM 1677	01Jun2012	KAL003992	9.855 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
CAI/600/X11041	19Mar2012	CHEMI
FTIR/0928621	02Apr2012	FTIR

ANALYZER READINGS

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

First Triad Analysis

NITRIC OXIDE

Date: 10Apr2012 Response Unit: PPM
Z1=0.00000 R1=20.36000 T1=9.16000
R2=20.36000 Z2=0.00000 T2=9.16000
Z3=0.00000 T3=9.16000 R3=20.36000
Avg. Concentration: 9.162 PPM

Second Triad Analysis

Date: 17Apr2012 Response Unit: PPM
Z1=0.00000 R1=20.35000 T1=9.25000
R2=20.35000 Z2=0.00000 T2=9.25000
Z3=0.00000 T3=9.25000 R3=20.35000
Avg. Concentration: 9.256 PPM

Calibration Curve

Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 0.999999
Constants: A = 0.00394107
B = 0.999826143 C = 0
D = 0 E = 0

CARBON MONOXIDE

Date: 10Apr2012 Response Unit: PPM
Z1=0.05204 R1=100.8349 T1=9.24320
R2=100.8686 Z2=0.05287 T2=9.25705
Z3=0.05985 T3=9.26326 R3=100.9291
Avg. Concentration: 9.215 PPM

Date: 17Apr2012 Response Unit: PPM
Z1=-0.03646 R1=9.84734 T1=9.17894
R2=9.92496 Z2=-0.01931 T2=9.22194
Z3=0.00390 T3=9.23706 R3=9.92587
Avg. Concentration: 9.172 PPM

Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 9.99998E-1
Constants: A = 0.00000E+0
B = 9.88859E-1 C = 6.27000E-4
D = 1.00000E-6 E = 0.00000E+0

Special Notes:

AH071 LIST ITEM AH071 ON CERTS AND TAGS The expiration date has been extended without re-assay per EPA 800/R23/542. Supplemental to test report 05-02555 -002 for AAL069838. Amended 04-22-2014, Tthatcher.

APPROVED BY:

JEFF CRÉTEAU



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

11426 FAIRMONT PKWY, LA PORTE, TX 77571

Phone: 800-248-1427

Fax: 281-474-8419

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

Assay Laboratory - PGVP Vendor ID: A32012

P.O. No.:
Document #: 47579022-003

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
11426 FAIRMONT PKWY
LA PORTE, TX 77571

Customer
AIR HYGIENE

MIKE SCOTT
1600 WEST TACOMA ST
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : OC2

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

Cylinder Number: CC89111
Cylinder Pressure***: 1898 PSIG

Certification Date: 10Sep2012

Exp. Date: 11Sep2020
Batch No: LAP0071716

COMPONENT

CERTIFIED CONCENTRATION (Moles)

ACCURACY**

TRACEABILITY

OXYGEN	21.2 %	+/- 1%	Direct NIST and VSL
CARBON DIOXIDE	18.8 %	+/- 1%	
NITROGEN	BALANCE		

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

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

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2658 1	01Feb2016	K025996	10.03 %	OXYGEN
NTRM 1800	01Mar2013	K017314	17.87 %	CARBON DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#
SERVOMEX/MODEL 244A/701/716
FTIR//MG-09-149

DATE LAST CALIBRATED

14Aug2012
07Sep2012

ANALYTICAL PRINCIPLE

PARAMAGNETIC
FTIR

ANALYZER READINGS

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

First Triad Analysis

Second Triad Analysis

Calibration Curve

OXYGEN

Date: 11Sep2012 Response Unit: VOLTS
Z1=0.00000 R1=0.40700 T1=0.86060
R2=407.0000 Z2=0.00000 T2=0.86060
Z3=0.00000 T3=0.86060 R3=0.40700
Avg. Concentration: 21.21 %

CARBON DIOXIDE

Date: 10Sep2012 Response Unit: %
Z1=0.00039 R1=17.83681 T1=18.76370
R2=17.84084 Z2=0.00263 T2=18.77170
Z3=0.00300 T3=18.78939 R3=17.85464
Avg. Concentration: 18.80 %

Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 0.9999994
Constants: A = -0.00359845
B = 24.67814797 C =
D = E =

Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 9.99995E-1
Constants: A = 0.00000E+0
B = 9.06873E-1 C = 1.21190E-2
D = 0.00000E+0 E = 0.00000E+0

Special Notes:

AH095 LIST ITEM AH095 ON CERTS AND TAGS CGA 590 ; DEW PT. 40 DEG. F.

APPROVED BY:

DAVID KELLY

APPENDIX D

QUALITY ASSURANCE AND QUALITY CONTROL DATA

QA/QC PROGRAM

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

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

Each of these areas is discussed individually below.

QA Reviews

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

Equipment Calibration and Maintenance

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

Chain-of-Custody

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

Training

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

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

Knowledge of Current Test Methods

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

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COMBUSTION TESTING QUALITY ASSURANCE ACTIVITIES

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

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within plus or minus two percent of the range of predicted values.

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

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

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

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

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

INSTRUMENTAL ANALYSIS QUALITY ASSURANCE DATA

Date: March 17-19, 2015
Company: Questor Technology Inc.
Location: Broken Arrow, Oklahoma
Techs: MSL, CG, JS

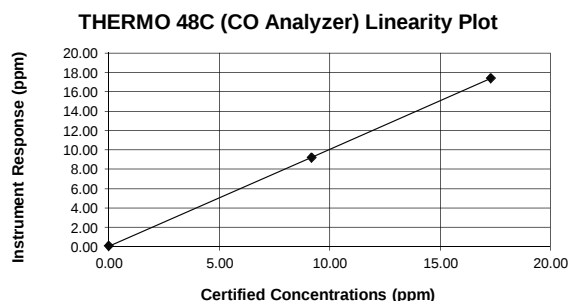
Sample System Leak Check

Date	Sample System	Leak Rate (l/min)
March 17-19, 2015	1	0

Calibration Date: March 17, 2015
Client: Questor Technology Inc

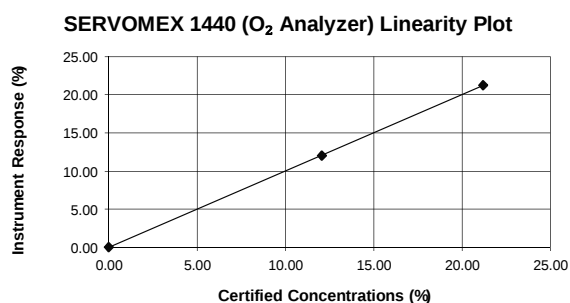
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail ($\pm 2\%$, $\leq 0.5\text{ppm}$)
0.00	0.07	0.40	0.07	YES (%)
9.19	9.23	0.23	0.04	YES (%)
17.30	17.39	0.52	0.09	YES (%)
Linearity = 0.999				



O₂ Span (%) = 21.20

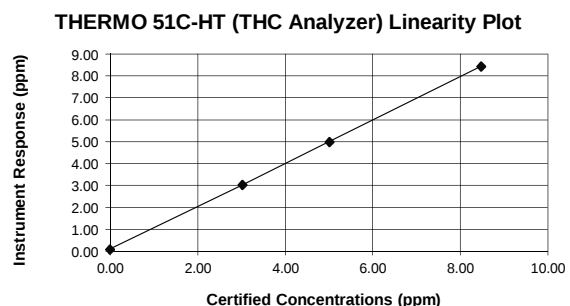
SERVOMEX 1440 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.03	0.14	0.03	YES (%)
12.06	12.06	0.00	0.00	YES (%)
21.20	21.26	0.28	0.06	YES (%)
Linearity = 0.999				



THC Range (ppm) = 10

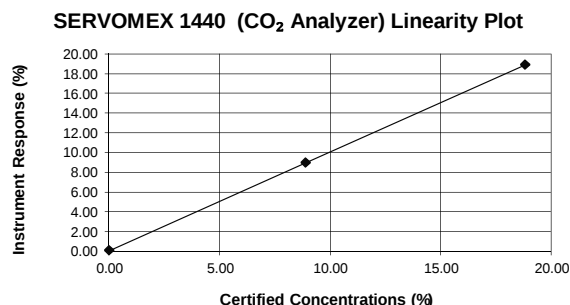
THERMO 51C-HT (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail ($\pm 2, 5\%$) ¹
0.00	0.11	1.10	N/A	YES
3.02	3.03	-1.66	3.08	YES
5.01	5.01	-0.54	5.04	YES
8.48	8.45	-0.30	N/A	YES
Linearity = 1.008				

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



CO₂ Span (%) = 18.80

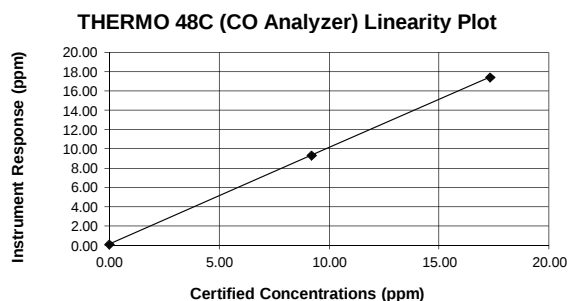
SERVOMEX 1440 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.06	0.32	0.06	YES (%)
8.87	8.95	0.43	0.08	YES (%)
18.80	18.85	0.27	0.05	YES (%)
Linearity = 1.001				



Calibration Date: March 18, 2015
Client: Questor Technology Inc

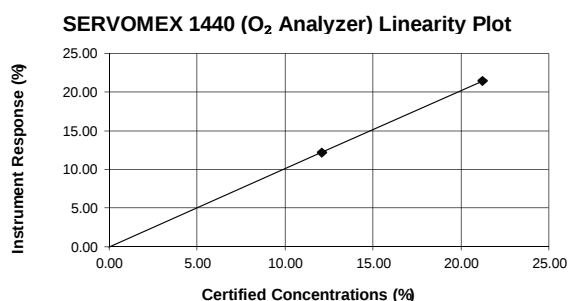
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail ($\pm 2\%$, $\leq 0.5\text{ppm}$)
0.00	0.10	0.58	0.10	YES (%)
9.19	9.33	0.81	0.14	YES (%)
17.30	17.40	0.58	0.10	YES (%)
Linearity = 1.000				



O2 Span (%) = 21.20

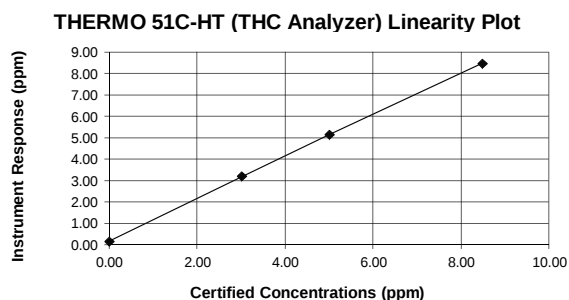
SERVOMEX 1440 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	-0.01	-0.05	0.01	YES (%)
12.06	12.17	0.52	0.11	YES (%)
21.20	21.38	0.85	0.18	YES (%)
Linearity = 0.991				



THC Range (ppm) = 10

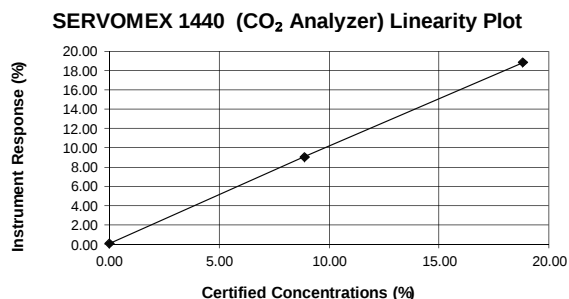
THERMO 51C-HT (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail ($\pm 2, 5\%$) ¹
0.00	0.17	1.70	N/A	YES
3.02	3.19	2.24	3.12	YES
5.01	5.14	1.44	5.07	YES
8.48	8.46	-0.20	N/A	YES
Linearity = 1.037				

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



CO₂ Span (%) = 18.80

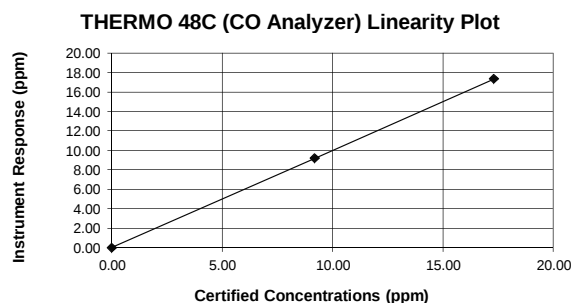
SERVOMEX 1440 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.06	0.32	0.06	YES (%)
8.87	9.04	0.90	0.17	YES (%)
18.80	18.82	0.11	0.02	YES (%)
Linearity = 1.002				



Calibration Date: March 19, 2015
Client: Questor Technology Inc

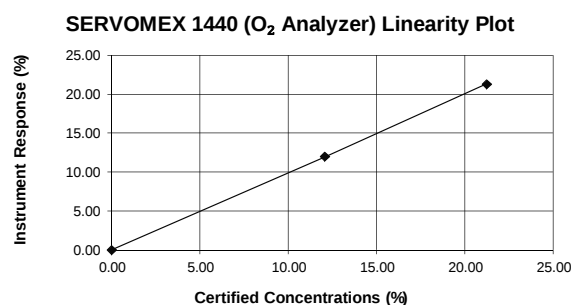
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail ($\pm 2\%$, $\leq 0.5\text{ppm}$)
0.00	0.03	0.17	0.03	YES (%)
9.19	9.18	-0.06	0.01	YES (%)
17.30	17.35	0.29	0.05	YES (%)
Linearity = 0.999				



O2 Span (%) = 21.20

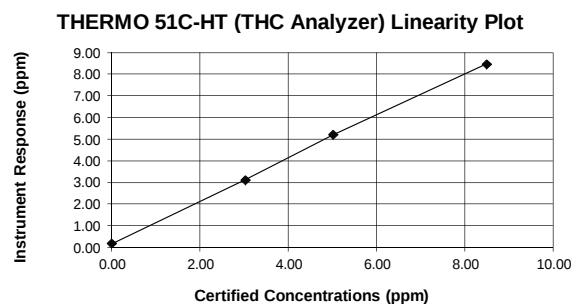
SERVOMEX 1440 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.03	0.14	0.03	YES (%)
12.06	11.99	-0.33	0.07	YES (%)
21.20	21.28	0.38	0.08	YES (%)
Linearity = 0.998				



THC Range (ppm) = 10

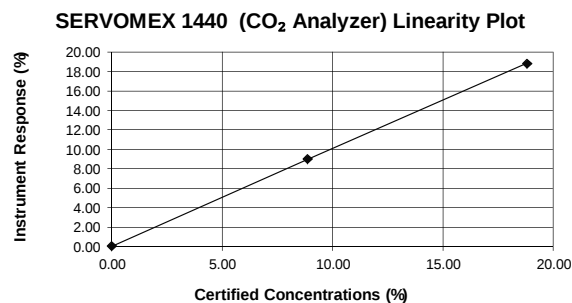
THERMO 51C-HT (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail ($\pm 2,5\%$) ¹
0.00	0.17	1.70	N/A	YES
3.02	3.12	-0.20	3.13	YES
5.01	5.20	2.52	5.07	YES
8.48	8.47	-0.10	N/A	YES
Linearity = 1.024				

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



CO₂ Span (%) = 18.80

SERVOMEX 1440 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.05	0.27	0.05	YES (%)
8.87	8.98	0.59	0.11	YES (%)
18.80	18.82	0.11	0.02	YES (%)
Linearity = 1.002				



DRIFT AND BIAS CHECK					
90-100 Load, Run - Q100 R10	O ₂	CO	THC	CO ₂	
Raw Average	12.70	5.51	0.00	6.03	
Corrected Average	12.77	5.39	-0.05	5.99	
Initial Zero	0.09	0.20	0.02	0.11	
Final Zero	0.06	0.26	0.09	0.12	
Avg. Zero	0.08	0.23	0.06	0.12	
Initial UpScale	12.01	9.21	3.02	8.85	
Final UpScale	11.99	9.23	3.25	8.88	
Avg. UpScale	12.00	9.22	3.14	8.87	
Sys Resp (Zero)	0.03	0.07	0.11	0.06	
Sys Resp (Upscale)	12.06	9.23	3.03	8.95	
Upscale Cal Gas	12.06	9.19	3.02	8.87	
Initial Zero Bias	0.28%	0.75%	-0.90%	0.27%	
Final Zero Bias	0.14%	1.10%	-0.20%	0.32%	
Zero Drift	0.14%	0.35%	0.70%	0.05%	
Initial Upscale Bias	-0.24%	-0.12%	-0.10%	-0.53%	
Final Upscale Bias	-0.33%	0.00%	2.20%	-0.37%	
Upscale Drift	0.09%	0.12%	2.30%	0.16%	
Alternative Specification Abs Diff	Initial Zero	0.06	0.13	--	0.05
	Final Zero	0.03	0.19	--	0.06
	Initial Upscale	0.05	0.02	--	0.10
	Final Upscale	0.07	0.00	--	0.07
Calibration Span	21.20	17.30	10.00	18.80	
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56	
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94	

DRIFT AND BIAS CHECK					
90-100 Load, Run - Q100 R11	O ₂	CO	THC	CO ₂	
Raw Average	12.87	6.31	0.16	5.84	
Corrected Average	12.93	6.19	0.09	5.79	
Initial Zero	0.06	0.26	0.09	0.12	
Final Zero	0.08	0.24	0.05	0.11	
Avg. Zero	0.07	0.25	0.07	0.12	
Initial UpScale	11.99	9.23	3.25	8.88	
Final UpScale	12.03	9.25	3.23	8.91	
Avg. UpScale	12.01	9.24	3.24	8.90	
Sys Resp (Zero)	0.03	0.07	0.11	0.06	
Sys Resp (Upscale)	12.06	9.23	3.03	8.95	
Upscale Cal Gas	12.06	9.19	3.02	8.87	
Initial Zero Bias	0.14%	1.10%	-0.20%	0.32%	
Final Zero Bias	0.24%	0.98%	-0.60%	0.27%	
Zero Drift	0.09%	0.12%	0.40%	0.05%	
Initial Upscale Bias	-0.33%	0.00%	2.20%	-0.37%	
Final Upscale Bias	-0.14%	0.12%	2.00%	-0.21%	
Upscale Drift	0.19%	0.12%	0.20%	0.16%	
Alternative Specification Abs Diff	Initial Zero	0.03	0.19	--	0.06
	Final Zero	0.05	0.17	--	0.05
	Initial Upscale	0.07	0.00	--	0.07
	Final Upscale	0.03	0.02	--	0.04
Calibration Span	21.20	17.30	10.00	18.80	
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56	
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94	

DRIFT AND BIAS CHECK				
90-100 Load, Run - Q100 R12	O ₂	CO	THC	CO ₂
Raw Average	13.27	7.03	0.13	5.54
Corrected Average	13.30	6.92	0.07	5.47
Initial Zero	0.08	0.24	0.05	0.11
Final Zero	0.04	0.25	0.05	0.09
Avg. Zero	0.06	0.25	0.05	0.10
Initial UpScale	12.03	9.25	3.23	8.91
Final UpScale	12.05	9.27	3.20	8.93
Avg. UpScale	12.04	9.26	3.22	8.92
Sys Resp (Zero)	0.03	0.07	0.11	0.06
Sys Resp (Upscale)	12.06	9.23	3.03	8.95
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.24%	0.98%	-0.60%	0.27%
Final Zero Bias	0.05%	1.04%	-0.60%	0.16%
Zero Drift	0.19%	0.06%	0.00%	0.11%
Initial Upscale Bias	-0.14%	0.12%	2.00%	-0.21%
Final Upscale Bias	-0.05%	0.23%	1.70%	-0.11%
Upscale Drift	0.09%	0.12%	0.30%	0.11%
Alternative Specification Abs Diff	Initial Zero	0.05	0.17	--
	Final Zero	0.01	0.18	--
	Initial Upscale	0.03	0.02	--
	Final Upscale	0.01	0.04	--
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - Q100 R1	O ₂	CO	THC	CO ₂
Raw Average	13.20	4.70	0.07	5.59
Corrected Average	13.16	4.45	0.06	5.86
Initial Zero	0.04	0.25	0.05	0.09
Final Zero	0.08	0.21	-0.02	0.11
Avg. Zero	0.06	0.23	0.02	0.10
Initial UpScale	12.05	9.27	3.20	8.93
Final UpScale	12.02	9.21	3.13	8.92
Avg. UpScale	12.04	9.24	3.17	8.93
Sys Resp (Zero)	0.03	0.07	0.11	0.06
Sys Resp (Upscale)	12.06	9.23	3.03	8.95
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.05%	1.04%	-0.60%	0.16%
Final Zero Bias	0.24%	0.81%	-1.30%	0.27%
Zero Drift	0.19%	0.23%	0.70%	0.11%
Initial Upscale Bias	-0.05%	0.23%	1.70%	-0.11%
Final Upscale Bias	-0.19%	-0.12%	1.00%	-0.16%
Upscale Drift	0.14%	0.35%	0.70%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.01	0.18	--
	Final Zero	0.05	0.14	--
	Initial Upscale	0.01	0.04	--
	Final Upscale	0.04	0.02	--
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - Q100 R2	O ₂	CO	THC	CO ₂
Raw Average	12.85	4.62	0.05	5.84
Corrected Average	12.88	4.50	0.07	5.78
Initial Zero	0.08	0.21	-0.02	0.11
Final Zero	0.09	0.22	-0.01	0.12
Avg. Zero	0.09	0.22	-0.02	0.12
Initial UpScale	12.02	9.21	3.13	8.92
Final UpScale	12.06	9.19	3.15	8.89
Avg. UpScale	12.04	9.20	3.14	8.91
Sys Resp (Zero)	0.03	0.07	0.11	0.06
Sys Resp (Upscale)	12.06	9.23	3.03	8.95
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.24%	0.81%	-1.30%	0.27%
Final Zero Bias	0.28%	0.87%	-1.20%	0.32%
Zero Drift	0.05%	0.06%	0.10%	0.05%
Initial Upscale Bias	-0.19%	-0.12%	1.00%	-0.16%
Final Upscale Bias	0.00%	-0.23%	1.20%	-0.32%
Upscale Drift	0.19%	0.12%	0.20%	0.16%
Alternative Specification Abs Diff	Initial Zero	0.05	--	0.05
	Final Zero	0.06	--	0.06
	Initial Upscale	0.04	--	0.03
	Final Upscale	0.00	--	0.06
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - Q100 R3	O ₂	CO	THC	CO ₂
Raw Average	12.84	3.29	0.03	5.84
Corrected Average	12.87	3.14	0.05	5.78
Initial Zero	0.09	0.22	-0.01	0.12
Final Zero	0.05	0.22	-0.03	0.12
Avg. Zero	0.07	0.22	-0.02	0.12
Initial UpScale	12.06	9.19	3.15	8.89
Final UpScale	12.01	9.21	3.07	8.91
Avg. UpScale	12.04	9.20	3.11	8.90
Sys Resp (Zero)	0.03	0.07	0.11	0.06
Sys Resp (Upscale)	12.06	9.23	3.03	8.95
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.28%	0.87%	-1.20%	0.32%
Final Zero Bias	0.09%	0.87%	-1.40%	0.32%
Zero Drift	0.19%	0.00%	0.20%	0.00%
Initial Upscale Bias	0.00%	-0.23%	1.20%	-0.32%
Final Upscale Bias	-0.24%	-0.12%	0.40%	-0.21%
Upscale Drift	0.24%	0.12%	0.80%	0.11%
Alternative Specification Abs Diff	Initial Zero	0.06	--	0.06
	Final Zero	0.02	--	0.06
	Initial Upscale	0.00	--	0.06
	Final Upscale	0.05	--	0.04
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - Q100 R4	O ₂	CO	THC	CO ₂
Raw Average	12.96	5.50	0.20	5.73
Corrected Average	13.04	5.35	0.11	5.66
Initial Zero	0.08	0.22	0.11	0.08
Final Zero	0.10	0.26	0.07	0.12
Avg. Zero	0.09	0.24	0.09	0.10
Initial UpScale	12.01	9.21	3.07	8.91
Final UpScale	11.97	9.34	3.30	8.94
Avg. UpScale	11.99	9.28	3.19	8.93
Sys Resp (Zero)	-0.01	0.10	0.17	0.06
Sys Resp (Upscale)	12.17	9.33	3.19	9.04
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.42%	0.69%	-0.60%	0.11%
Final Zero Bias	0.52%	0.92%	-1.00%	0.32%
Zero Drift	0.09%	0.23%	0.40%	0.21%
Initial Upscale Bias	-0.75%	-0.69%	-1.20%	-0.69%
Final Upscale Bias	-0.94%	0.06%	1.10%	-0.53%
Upscale Drift	0.19%	0.75%	2.30%	0.16%
Alternative Specification Abs Diff	Initial Zero	0.09	0.12	--
	Final Zero	0.11	0.16	--
	Initial Upscale	0.16	0.12	--
	Final Upscale	0.20	0.01	--
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - Q100 R5	O ₂	CO	THC	CO ₂
Raw Average	12.88	3.76	0.13	5.77
Corrected Average	13.00	3.54	0.08	5.69
Initial Zero	0.10	0.26	0.07	0.12
Final Zero	0.07	0.26	0.02	0.12
Avg. Zero	0.09	0.26	0.05	0.12
Initial UpScale	11.97	9.34	3.30	8.94
Final UpScale	11.94	9.35	3.27	8.93
Avg. UpScale	11.96	9.35	3.29	8.94
Sys Resp (Zero)	-0.01	0.10	0.17	0.06
Sys Resp (Upscale)	12.17	9.33	3.19	9.04
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.52%	0.92%	-1.00%	0.32%
Final Zero Bias	0.38%	0.92%	-1.50%	0.32%
Zero Drift	0.14%	0.00%	0.50%	0.00%
Initial Upscale Bias	-0.94%	0.06%	1.10%	-0.53%
Final Upscale Bias	-1.08%	0.12%	0.80%	-0.59%
Upscale Drift	0.14%	0.06%	0.30%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.11	0.16	--
	Final Zero	0.08	0.16	--
	Initial Upscale	0.20	0.01	--
	Final Upscale	0.23	0.02	--
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - Q100 R6	O ₂	CO	THC	CO ₂
Raw Average	12.83	3.43	0.11	5.80
Corrected Average	12.94	3.21	0.08	5.72
Initial Zero	0.07	0.26	0.02	0.12
Final Zero	0.09	0.25	0.03	0.10
Avg. Zero	0.08	0.26	0.03	0.11
Initial UpScale	11.94	9.35	3.27	8.93
Final UpScale	11.98	9.34	3.30	8.92
Avg. UpScale	11.96	9.35	3.29	8.93
Sys Resp (Zero)	-0.01	0.10	0.17	0.06
Sys Resp (Upscale)	12.17	9.33	3.19	9.04
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.38%	0.92%	-1.50%	0.32%
Final Zero Bias	0.47%	0.87%	-1.40%	0.21%
Zero Drift	0.09%	0.06%	0.10%	0.11%
Initial Upscale Bias	-1.08%	0.12%	0.80%	-0.59%
Final Upscale Bias	-0.90%	0.06%	1.10%	-0.64%
Upscale Drift	0.19%	0.06%	0.30%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.08	--	0.06
	Final Zero	0.10	--	0.04
	Initial Upscale	0.23	--	0.11
	Final Upscale	0.19	--	0.12
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - Q100 R7	O ₂	CO	THC	CO ₂
Raw Average	12.47	2.93	0.18	6.10
Corrected Average	12.53	2.66	0.06	6.03
Initial Zero	0.07	0.33	0.14	0.09
Final Zero	0.09	0.32	0.09	0.10
Avg. Zero	0.08	0.33	0.12	0.10
Initial UpScale	11.98	9.33	3.03	8.93
Final UpScale	12.02	9.33	3.18	8.90
Avg. UpScale	12.00	9.33	3.11	8.92
Sys Resp (Zero)	0.03	0.03	0.17	0.05
Sys Resp (Upscale)	11.99	9.18	3.12	8.98
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.19%	1.73%	-0.30%	0.21%
Final Zero Bias	0.28%	1.68%	-0.80%	0.27%
Zero Drift	0.09%	0.06%	0.50%	0.05%
Initial Upscale Bias	-0.05%	0.87%	-0.90%	-0.27%
Final Upscale Bias	0.14%	0.87%	0.60%	-0.43%
Upscale Drift	0.19%	0.00%	1.50%	0.16%
Alternative Specification Abs Diff	Initial Zero	0.04	--	0.04
	Final Zero	0.06	--	0.05
	Initial Upscale	0.01	--	0.05
	Final Upscale	0.03	--	0.08
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - Q100 R8	O ₂	CO	THC	CO ₂
Raw Average	12.78	2.89	0.16	5.86
Corrected Average	12.84	2.63	0.07	5.79
Initial Zero	0.09	0.32	0.09	0.10
Final Zero	0.07	0.31	0.07	0.11
Avg. Zero	0.08	0.32	0.08	0.11
Initial UpScale	12.02	9.33	3.18	8.90
Final UpScale	12.00	9.31	3.13	8.94
Avg. UpScale	12.01	9.32	3.16	8.92
Sys Resp (Zero)	0.03	0.03	0.17	0.05
Sys Resp (Upscale)	11.99	9.18	3.12	8.98
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.28%	1.68%	-0.80%	0.27%
Final Zero Bias	0.19%	1.62%	-1.00%	0.32%
Zero Drift	0.09%	0.06%	0.20%	0.05%
Initial Upscale Bias	0.14%	0.87%	0.60%	-0.43%
Final Upscale Bias	0.05%	0.75%	0.10%	-0.21%
Upscale Drift	0.09%	0.12%	0.50%	0.21%
Alternative Specification Abs Diff	Initial Zero	0.06	--	0.05
	Final Zero	0.04	--	0.06
	Initial Upscale	0.03	--	0.08
	Final Upscale	0.01	--	0.04
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - Q100 R9	O ₂	CO	THC	CO ₂
Raw Average	12.75	2.79	0.14	6.00
Corrected Average	12.83	2.53	0.09	5.92
Initial Zero	0.07	0.31	0.07	0.11
Final Zero	0.03	0.31	0.02	0.08
Avg. Zero	0.05	0.31	0.05	0.10
Initial UpScale	12.00	9.31	3.13	8.94
Final UpScale	11.96	9.33	3.13	8.95
Avg. UpScale	11.98	9.32	3.13	8.95
Sys Resp (Zero)	0.03	0.03	0.17	0.05
Sys Resp (Upscale)	11.99	9.18	3.12	8.98
Upscale Cal Gas	12.06	9.19	3.02	8.87
Initial Zero Bias	0.19%	1.62%	-1.00%	0.32%
Final Zero Bias	0.00%	1.62%	-1.50%	0.16%
Zero Drift	0.19%	0.00%	0.50%	0.16%
Initial Upscale Bias	0.05%	0.75%	0.10%	-0.21%
Final Upscale Bias	-0.14%	0.87%	0.10%	-0.16%
Upscale Drift	0.19%	0.12%	0.00%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.04	--	0.06
	Final Zero	0.00	--	0.03
	Initial Upscale	0.01	--	0.04
	Final Upscale	0.03	--	0.03
Calibration Span	21.20	17.30	10.00	18.80
3% of Cal. Span (drift)	0.64	0.52	0.30	0.56
5% of Cal. Span (bias)	1.06	0.87	0.50	0.94

METERING SYSTEM DRY GAS METER CALIBRATION SHEET

EPA Reference Method

Metering System Pre-Test Calibration

Air Hygiene Asset ID: samp-cp-0008

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current[SAMP-CP-0008 Calibration 12-12-14.xls]Original 12-12-14 (5 point)

Make: Thermo Environmental

Date: 12/12/14

Model #: MST-C1

Barometric Pressure: 29.73 (in. Hg)

Serial #: 90706

Theoretical Critical Vacuum: 14.02 (in. Hg)

DRY GAS METER READINGS

ΔH (in. H ₂ O)	Time (min)	Volume			Initial Temperature	
		Initial (ft ³)	Final (ft ³)	Total (ft ³)	Inlet (°F)	Outlet (°F)
0.26	17.00	369.250	375.190	5.940	71.0	69.0
0.56	12.00	375.190	381.190	6.000	74.0	69.0
1.10	10.00	381.190	387.960	6.770	76.0	71.0
2.00	10.00	387.960	397.020	9.060	79.0	71.0
3.40	10.00	397.020	409.030	12.010	80.0	72.0

Final Temperature		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in. Hg)	Ambient Temperature		
Inlet (°F)	Outlet (°F)				Initial (°F)	Final (°F)	Average (°F)
74.0	69.0	40	0.2355	16.0	68.1	68.3	68.2
77.0	70.0	48	0.3369	16.0	68.3	68.7	68.5
79.0	71.0	55	0.4557	16.0	68.7	68.7	68.7
80.0	72.0	63	0.6099	16.0	68.7	68.9	68.8
80.0	72.0	73	0.8065	15.5	68.9	68.9	68.9

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft ³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft ³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft ³)
5.873	166.33	5.179	146.7	5.216
5.917	167.58	5.228	148.1	5.269
6.664	188.72	5.892	166.9	5.940
8.917	252.52	7.885	223.3	7.951
11.850	335.58	10.426	295.3	10.515
DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR $\Delta H@$		
Variation (number)	Value (number)	Value (in. H ₂ O)	Value (mm H ₂ O)	Variation (in. H ₂ O)
-0.001	0.882	1.563	39.70	-0.135
0.001	0.884	1.644	41.76	-0.054
0.001	0.884	1.761	44.73	0.063
0.002	0.884	1.786	45.37	0.088
-0.003	0.880	1.735	44.07	0.037
AVERAGE:	0.883	1.698	43.13	PASSED

Notes:

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

SIGNATURE: _____

Craig McCarty

DATE: 12/12/14 12/12/14

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Pre-Test Calibration

Air Hygiene Asset ID: samp-cp-0008

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\IM-5 Consoles\Calibration Sheet v4.1\Current\{SAMP-CP-0008 Calibration 12-12-14.xls}Original 12-12-14 (5 point)

Make: Thermo Environmental

Date: 12/12/14

Model #: MST-C1

Barometric Pressure: 29.73 (in. Hg)

Serial #: 90706

Temperature (ASTM cal): 68.10 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	101.00	0.50	603.00	0.50	1206.00	0.50
Probe	102.00	1.00	604.00	0.67	1206.00	0.50
Filter	102.00	1.00	604.00	0.67	1206.00	0.50
Dryer	101.00	0.50	603.00	0.50	1206.00	0.50
Aux.	101.00	0.50	603.00	0.50	1206.00	0.50

Note: Calibrated against an ALTEK Thermocouple Source Series 22, direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	68.10 (°F)	
	Reading	(±°F)
DGM In	69.0	0.90
DGM Out	68.0	0.10

Note: Calibrated against ASTM Reference Thermometer.

SIGNATURE: Craig McCarty

DATE: 12/12/14 12/12/14

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60

Appendix A, Method 5

10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Pre-Test Calibration

Air Hygiene Asset ID(s):

Probe: samp-hp-0081

Hotbox: samp-bh-0012

Gooseneck: samp-ad-0028

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\{SAMP-CP-0008 Calibration 12-12-14.xls\Original 12-12-14 (5 point)

Barometric Pressure: 29.73

Thermo-couples	Temps		Signature	Date	
		(°F)			
Stack	Ref	68.10	<i>Craig McCarty</i>	12/12/14	12/12/14
	Read	69.00			
	±°F	0.90			
Filter	Ref	68.10	<i>Craig McCarty</i>	12/12/14	12/12/14
	Read	68.00			
	±°F	0.10			
Exit	Ref	68.10	<i>Craig McCarty</i>	12/12/14	12/12/14
	Read	69.00			
	±°F	0.90			

Note: Calibrated against ASTM Reference Thermometer.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

METERING SYSTEM DRY GAS METER CALIBRATION SHEET

EPA Reference Method

Metering System Post-Test Calibration

Air Hygiene Asset ID: samp-cp-0008

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current[SAMP-CP-0008 Calibration 12-12-14.xls]3-30-15 (3 point)

Make: Thermo Environmental

Date: 03/30/15

Model #: MST-C1

Barometric Pressure: 29.66 (in. Hg)

Serial #: 90706

Theoretical Critical Vacuum: 13.99 (in. Hg)

DRY GAS METER READINGS

ΔH (in. H2O)		Time (min)	Volume			Initial Temperature	
			Initial (ft³)	Final (ft³)	Total (ft³)	Inlet (°F)	Outlet (°F)
2.20		10.00	222.520	232.400	9.880	78.0	68.0
2.20		10.00	232.400	242.280	9.880	79.0	69.0
2.20		10.00	242.280	252.160	9.880	80.0	71.0
Final Temperature		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in. Hg)	Ambient Temperature		
Inlet (°F)	Outlet (°F)				Initial (°F)	Final (°F)	Average (°F)
79.0	70.0	23	0.6557	16.0	68.5	69.0	68.8
79.0	71.0	23	0.6557	16.0	69.0	69.6	69.3
80.0	72.0	23	0.6557	16.0	69.6	69.9	69.8

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft ³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft ³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft ³)
9.738	275.77	8.458	239.5	8.547
9.724	275.38	8.453	239.4	8.552
9.701	274.74	8.450	239.3	8.555
DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR $\Delta H@$		
Variation (number)	Value (number)	Value (in. H ₂ O)	Value (mm H ₂ O)	Variation (in. H ₂ O)
-0.001	0.869	1.712	43.48	0.002
0.000	0.869	1.710	43.44	0.001
0.001	0.871	1.707	43.35	-0.003
AVERAGE:	0.870	1.710	43.42	PASSED
LAST 5-PT:	0.883	1.698	PASSED	5-PT Date:
% DIFF:	1.5%	0.7%		12/12/14

40 CFR - CHAPTER I - PART 60

Appendix A, Method 5

10.3.2 Calibration After Use

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

10.3.3 Acceptable Variation in Calibration

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

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

SIGNATURE:

Craig McCarty

DATE: 03/30/15 03/30/15

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Post-Test Calibration

Air Hygiene Asset ID: samp-cp-0008

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\IM-5 Consoles\Calibration Sheet v4.1\Current\{SAMP-CP-0008 Calibration 12-12-14.xls}3-30-15 (3 point)

Make: Thermo Environmental

Date: 03/30/15

Model #: MST-C1

Barometric Pressure: 29.66 (in. Hg)

Serial #: 90706

Temperature (ASTM cal): 68.50 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	101.00	0.50	603.00	0.50	1206.00	0.50
Probe	101.00	0.50	603.00	0.50	1206.00	0.50
Filter	101.00	0.50	603.00	0.50	1206.00	0.50
Dryer	101.00	0.50	603.00	0.50	1206.00	0.50
Aux.	101.00	0.50	603.00	0.50	1206.00	0.50

Note: Calibrated against an ALTEK Thermocouple Source Series 22, direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	68.50 (°F)	
	Reading	(±°F)
DGM In	68.0	0.50
DGM Out	68.0	0.50

Note: Calibrated against ASTM Reference Thermometer.

SIGNATURE: _____

Craig M. Carthy

DATE: 03/30/15 03/30/15

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60

Appendix A, Method 5

10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Post-Test Calibration

Air Hygiene Asset ID(s):

Probe: samp-hp-0033

Hotbox: samp-bh-0012

Gooseneck: samp-ad-0028

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current[SAMP-CP-0008 Calibration 12-12-14.xls]3-30-15 (3 point)

Barometric Pressure: 29.66

Thermo-couples	Temps		Signature	Date	
		(°F)			
Stack	Ref	68.50	<i>Craig McCarty</i>	<u>03/30/15</u>	<u>03/30/15</u>
	Read	69.00			
	±°F	0.50			
Filter	Ref	68.50	<i>Craig McCarty</i>	<u>03/30/15</u>	<u>03/30/15</u>
	Read	68.00			
	±°F	0.50			
Exit	Ref	68.50	<i>Craig McCarty</i>	<u>03/30/15</u>	<u>03/30/15</u>
	Read	68.00			
	±°F	0.50			

Note: Calibrated against ASTM Reference Thermometer.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

WEATHER STATION CALIBRATION SHEET
Temperature, Barometric Pressure, and Relative Humidity Periodic Calibration
Air Hygiene Asset ID: samp-we-0026

Filename: P:\Shared\QAQC\Calibrations\Weather Stations\2014\Weather Station Calibration_samp-we-0026.xlsm]112013

Make: Kestrel

NIST ID 21470653

Model #: 4000

NIST S/N 21470653

Serial #: 693110

Cal Due 12/27/2014

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.00	0.00	29.85	29.84	0.01

Sean Barnes

02/03/14

(signature)

(date)

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.10	0.10	29.85	29.85	0.00

Sean Barnes

02/03/14

(signature)

(date)

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.20	0.20	29.85	29.89	0.04

Sean Barnes

02/03/14

(signature)

(date)

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.40	0.40	29.85	29.86	0.01

Sean Barnes

02/03/14

(signature)

(date)

Note: Calibrated against NIST Traceable Barometer and Thermometer (SAMP-WE-0100).

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall agree to within $\pm 2^\circ\text{F}$.

Standard of Calibration for Barometers

40 CFR Part 60, Appendix A, Method 5, Section:

6.0 Equipment and Supplies, 6.1 Sample Collection., 6.1.2 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in.).

10.0 Calibration and Standardization, 10.6 Barometer. Calibrate against a mercury barometer.

S-TYPE PITOT TUBE CALIBRATION SHEET

Reference USEPA Reference Method 2 (40CFR60, App. A, Meth. 2)

PITOT SERIAL# <u>4174</u>	CALIBRATION DATE: <u>11-Jan-13</u>
PITOT TYPE: <u>S-Type</u>	BAROMETRIC PRESSURE: <u>29.88</u> in Hg
STD. PITOT TYPE: <u>Ellipsoidal</u>	STATIC PRESSURE: <u>1.4</u> in H ₂ O
Cp(std): <u>0.990</u>	BLOCKAGE %: <u>N/A</u>
PROBE SERIAL# <u>NICK</u>	CORRECTION FACTOR: <u>1.00</u>

SIDE "A" CALIBRATION				
RUN NO.	Δ Pstd in H ₂ O	Δ Ps in H ₂ O	Cp(s)	DEVIATION Cp(s) - avg.Cp(s)
1	0.560	0.820	0.818	0.000
2	0.560	0.820	0.818	0.000
3	0.560	0.820	0.818	0.000
"A" AVERAGE			0.818	0.0000 (must be ≤ 0.01)

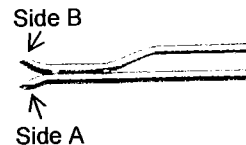
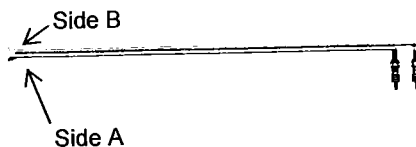
SIDE "B" CALIBRATION				
RUN NO.	Δ Pstd in H ₂ O	Δ Ps in H ₂ O	Cp(s)	DEVIATION Cp(s) - avg.Cp(s)
1	0.560	0.815	0.821	0.000
2	0.560	0.815	0.821	0.000
3	0.560	0.815	0.821	0.000
"B" AVERAGE			0.821	0.0000 (must be ≤ 0.01)

ACCEPTANCE CRITERIA

AVERAGE -0.0025 AVG. Cp (A) - AVG. Cp (B) must be ≤ 0.01

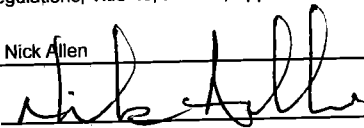
If the Average and both Deviation Averages "A" & "B" are ≤ 0.01, then the OVERALL AVERAGE below may be used.
* If NOT, use the "A" Average OR "B" Average.

OVERALL AVERAGE 0.8194



I certify that the above pitot tube was tested in accordance with the US EPA Method 2 standards.
See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4.

Print Name: Nick Allen

Signature: 

Date 1.11.13



GE Oil & Gas
Dresser Inc.
16240 Port Northwest Drive, Suite 100
Houston, TX 77041
USA
T +1 800 521 1114 +1 832 590 2303
F +1 800 335 5224 +1 832 590 2494

Customer Information

Name : PROCESS VALVE & EQUIPMENT
PO No. : 14-3156
Badge No. : NONE

Date Printed : 09 08 2014
Bill of Material : 055215-012
Model : 3M175
Serial No. : 1442557
Accessory S/N : UC324167
Sales Order No. : 206502-5
Spec. Req. No.
Prover Used : 50 cu. ft. (A)

Unit Description

3M175 SERIES B3 ROOTS METER,
COUNTER VERSION *1MC/W2*

MIN STATIC TEST PRESSURE	MIN LEAK TEST PRESSURE	MAX ALLOWABLE OPER PRESSURE	TC Acc at (deg F)	Accuracy	Proof	% Error
350 psig	219 psig	175 psig				

This meter has been tested and successfully passed a Shell Pressure Test and Leak Test at the above conditions.

P R O V E R T E S T D A T A

Test Point	Flow Rate Dis Vol	% Rated Capacity	Meter Accuracy	ERROR +/- %	Diff Pressure	TC Meter Accuracy	TC Meter Proof %	ERROR +/- %
1	3039.0	101.3	100.19	0.19	1.05			
2	300.0	10.0	99.67	-0.33	0.03			

Above data has been determined from tests performed with air at atmospheric pressure and ambient temperature, using positive displacement bell or piston provers dimensionally traceable to the United States National Institute of Standards and Technology (NIST) and traceable to NMI- Netherlands Measurement Institute for volumetric flow rate.

TC instrument accuracy has been determined from test performed in liquid baths at the temperatures show above using calibrated measurement instruments whose accuracy is traceable to NIST. TC Meter Accuracy (TC Meter Proof) of both meter and instrument in conjunction is calculated using TC accuracy (TC proof) at 60 degree F.

NMI accredited laboratory no: CE-085

This meter conforms to purchaser specifications.

Test date 06-September-14 by SANDOVAL, NEREIDA

IMCW2 #400 ASSEMBLY/TEST/SHIPPING CHECKLIST

Date: <u>11/24/14</u>	Instrument Serial #: <u>1408032553</u>
Customer & Work Order #: <u>206930-1</u>	Micro Corrector Serial #: <u>11-14-142838</u>
Process Value & Equipment	
Work Order Configuration Code: <u>W400XX SERB EN PTZ GA 12B 1P 1T CND5 IMP</u>	
Customer Special Req. Eng. Spec. #:	

TEST CHECKLIST

Mfg QA Initials
(as applicable)

DISPLAY TEST

~~PASS~~ / FAIL

TEMPERATURE TEST

~~PASS~~ / FAIL

IMCW TEMP: 70.4° REFERENCE TEMP: 70.2° DIF (IMCW T - REF T): .2°

T

VOLUME TEST

~~PASS~~ / FAIL (Include test sheet)

PULSE OUTPUT TEST:

~~PASS~~ / FAIL (Include test sheet)

LEAK TEST:

~~PASS~~ / FAIL

TEST TECHNICIAN INITIALS JO

PLACE TEST STAMP ON IMC (On back of IMCW2)

SHIPPING/QA CHECKLIST

Mfg QA Initials

Verify Test Stamp on back of IMCW2

Verify Tamper Evidence label is in place

Verify 3mm Allen wrench (1), drilled-head M4 screws (3) & spacers (4) provided

Verify hardware kit provided.

Verify meter & IMCW2 specs to work order config code specs or customer specs.

Perform scroll test

Verify mag pickup has tested identification mark on connector

Check unit configuration software (Read only mode)

The following documentation must be included:

- UK Calibration Certificate
- UK Volume/Pulse Output Test Certification
- Volume/Pulse Output Test Certification
- Unit Configuration Report
- Blueline Customer Wiring Diagram, 056903-000 (Cable Gland & Conduit only)
- Blueline Customer Field Installation, 056684-000

Q. A. STAMP





Volume Certification

Instrument

Type: IMC/W2
Firmware: 1.95
Serial Number: 11/14/142838 (Manuf.) 1408032553 (Inst.)

Configuration

Meter Type: Series B, Imperial
Meter Size: 3M
Pulse Outputs: Single

Test Conditions

Test Date: 11-24-2014 Time: 07:25
Fixture: E-0111
Temperature: 70.4 F.
Line Pressure: 0.06 psi G PASS
Battery: 6.20 Volts PASS
Flow Rate: 3000 cfh
Test Volume: 100.0 cu.ft. (uncorrected)
Correction Factor: 0.96381

Results:

PASS

VOLUME (CU.FT.)

	<u>Uncorrected</u>	<u>Corrected</u>
Initial:	0.0000	0.0000
Final:	100.0063	96.4101
Accumulated:	100.0063	96.4101
Calculated:	100.0000	96.3806
Error:	0.01 %	0.03 %

	<u>HF (Unc.)</u>	<u>Corrected (Prove)</u>
Comms Pulses:	PASS	PASS

PULSE OUTPUTS

	<u>Uncorrected</u>	<u>Corrected</u>	<u>Fault</u>
Multiplier:	1.0	1.0	-
Expected (± 1):	100	96	-
Received (Ch.A):	100	96	-
Error:	0	0	-
Min. Width (msec):	124.84	124.84	499.87
Result:	PASS	PASS	PASS

This test performs a check of the configuration, volume input, and pulse outputs of the instrument. The volume input is driven at a precise flow rate for a precise number of revolutions. The test is performed at ambient temperature and pressure.

Operator: JD



Dresser Roots Meters
and Instruments
Dresser, Inc.
16240 Port Northwest
Houston, TX 77041
Tel: 832-590-2300

Calibration Certificate

Corrector Serial No. 11/14/142838
Transducer Serial No. 48623-042
PCB Serial No. 666029607

Transducer: 12bar G
Date: 12/11/2014

Test Equipment

Envio. Chamber: LE0061
Druck 1: 51501570

PRT Simulator: RIG_C
Druck 2: 0624/98-02

Calibration Points

Temperatures: 60.00°C, 35.00°C, 10.00°C, -15.00°C, -40.00°C
Pressures: 0.000bar, 3.000bar, 6.000bar, 9.000bar, 12.000bar

Pressure Checks

Applied Pressure	Ambient @60.0°C		Ambient @35.0°C		Ambient @10.0°C		Ambient @-15.0°C		Ambient @-40.0°C	
	PTZ Reading	Deviation %	PTZ Reading	Deviation %	PTZ Reading	Deviation %	PTZ Reading	Deviation %	PTZ Reading	Deviation %
0.000Bar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.000Bar	2.995	-0.038	2.999	-0.011	3.000	0.004	3.000	-0.004	3.000	0.000
6.000Bar	5.983	-0.140	5.995	-0.045	6.000	0.001	5.998	-0.017	6.000	0.001
9.000Bar	8.968	-0.270	8.989	-0.088	8.998	-0.016	8.995	-0.042	9.000	0.001
12.000Bar	11.946	-0.449	11.981	-0.160	11.986	-0.113	11.991	-0.071	12.001	0.008

Errors are shown as %RDG at or above 20% of range, otherwise errors are displayed as %FS

Temperature Checks

Nominal Temperature	Ambient @60°C		Ambient @35°C		Ambient @10°C		Ambient @-15°C		Ambient @-40°C	
	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C
-40.0°C	-40.01	-0.01	-39.97	0.03	-39.96	0.04	-39.97	0.03	-39.97	0.03
10.0°C	9.99	-0.01	10.04	0.04	10.05	0.05	10.04	0.04	10.06	0.06
60.0°C	60.01	0.01	60.05	0.05	60.07	0.07	60.04	0.04	60.07	0.07

Note 1: Accuracy limits of the Micro Series Corrector readings are better than 0.7% of reading for 20% to 100% pressure range over the full temperature range of -40.0°C to 60.0°C (-40.0°F to 140.0°F).

Note 2: All pressure Measurements used in the calibration and check procedures have certificates issued in accordance with the conditions of accreditation granted by the National Measurement Accreditation Service. NMAS has assessed the measuring capability of the laboratory issuing the certificate and its traceability to British national standards and to the units of measurement realised at the corresponding laboratory (National Physical Laboratory).

Certified By E. Avera

Date 11/19/2014



Volume Certification

Instrument

Type: IMC/W2
Firmware: 1.95
Serial Number: 11/14/142838

Configuration

Meter Type: Series B, Imperial
Meter Size: 3M
Pulse Outputs: Single

Test Conditions

Test Date: 11-18-2014 Time: 18:24:16
Fixture: 11
Temperature: 69.5 °F.
Line Pressure: 0.07 psi G PASS
Battery: 6.25 Volts PASS
Flow Rate: 3000 cfh
Test Volume: 100.0 cu.ft. (uncorrected)
Correction Factor: 0.98719

Results:

PASS

VOLUME (CU.FT.)

	<u>Uncorrected</u>	<u>Corrected</u>
Initial:	-0.0063	-0.0062
Final:	99.9938	98.7089
Accumulated:	100.0000	98.7151
Calculated:	100.0000	98.7186
Error:	0.00 %	-0.00 %

	<u>HF (Unc.)</u>	<u>Corrected (Prove)</u>
Comms Pulses:	PASS	PASS

PULSE OUTPUTS

	<u>Uncorrected</u>	<u>Corrected</u>	<u>Fault</u>
Multiplier:	1.0	1.0	-
Expected (± 1):	100	99	-
Received (Ch.A):	100	98	-
Error:	0	-1	-
Min. Width (msec):	187.34	187.34	499.86
Result:	PASS	PASS	PASS

This test performs a check of the configuration, volume input, and pulse outputs of the instrument. The volume input is driven at a precise flow rate for a precise number of revolutions. The test is performed at ambient temperature and pressure.

Operator: SG

APPENDIX E

FUEL ANALYSIS RECORDS

GAS INNOVATIONS

CERTIFICATE OF CONFORMANCE

PROPYLENE

C.P. GRADE

Guaranteed Specifications

99.0 % +

Propylene

Sum of all impurities to

Ethane

be < 1 %

Total saturated C4's

Sulfur < 0.50 PPM

Propane

Water < 5 PPM

Water

Liquid Phase Analysis

Sulfur

Lot Analysis

99.105 % +

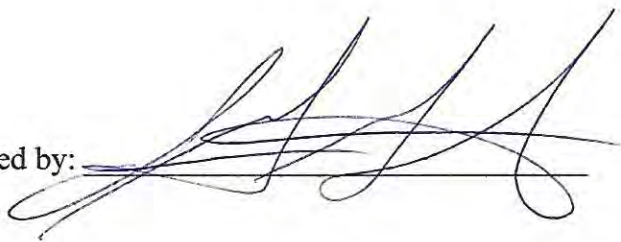
0.021 %

0.006 %

0.868 %

< 3 PPM

< 0.50 PPM

Certified by: 

Date: 02/16/15

SO# 00056581

Cylinder Serial Number(s)

BULK LOAD – 1000 gal. Deck Tanks:

#23194, #22577.

Lot Number

PRY-021615-C

CYLINDER - ½ TON:

#V849065, #V849117, #V849073.

CUSTOMER PO#: 170318

LABORATORY REPORT

April 7, 2015

Min Lee
Air Hygiene, Incorporated
1600 West Tacoma Street
Broken Arrow, OK 74012

RE: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on March 24, 2015. For your reference, these analyses have been assigned our service request number P1501165.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental



By Kelly Horiuchi at 4:45 pm, Apr 07, 2015

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated

Service Request No: P1501165

Project: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

CASE NARRATIVE

The samples were received intact under chain of custody on March 24, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Benzene Analysis

The samples were analyzed per ASTM D1945-03 for benzene using a gas chromatograph equipped with a flame ionization detector (FID). This procedure is described in laboratory SOP VOA-TO3C1C6. This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

BTU and CHONS Analysis

The results for BTU and CHONS were generated according to ASTM D 3588-98. The following analyses were performed and used to calculate the BTU and CHONS results. This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

C2 through C6 Hydrocarbon Analysis

The samples were analyzed according to modified EPA Method TO-3 for C2 through >C6 hydrocarbons using a gas chromatograph equipped with a flame ionization detector (FID). This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

Fixed Gases Analysis

The samples were also analyzed for fixed gases (hydrogen, oxygen/argon, nitrogen, carbon monoxide, methane and carbon dioxide) according to modified EPA Method 3C (single injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

Hydrogen Sulfide Analysis

The samples were also analyzed for hydrogen sulfide per ASTM D 5504-12 using a gas

Client: Air Hygiene, Incorporated

Service Request No: P1501165

Project: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

CASE NARRATIVE

chromatograph equipped with a sulfur chemiluminescence detector (SCD). This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	876241
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 4-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Air Hygiene, Incorporated
 Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

Service Request: P1501165

Date Received: 3/24/2015
 Time Received: 09:10

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-3 Modified - C1C6+ Can	3C Modified - Fxd Gases Can	ASTM D5504-01 - H2S Can
Qti-90-100%-Q100-can	P1501165-001	Air	3/17/2015	13:42	SSC00259	-1.51	3.62	X	X	X
Qti-0-30-0%-Q100-can	P1501165-002	Air	3/17/2015	19:03	SSC00135	-1.46	3.75	X	X	X
Qti-30-70-30%-Q100-can	P1501165-003	Air	3/18/2015	14:15	SSC00330	0.97	3.78	X	X	X
Qti-70-100-70%-Q100-can	P1501165-004	Air	3/19/2015	13:11	SSC00217	-0.38	3.78	X	X	X



2655 Park Center Drive, Suite A
Simi Valley, California 93065
- Phone (805) 526-7161
Fax (805) 526-7270

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1[illegible]

ALS Environmental **Sample Acceptance Check Form**

Client: Air Hygiene, Incorporated

Work order: P1501165

Project: Questor Q100 Test / Qti-15-Broken Arrow-ok-comp#1

Sample(s) received on: 3/24/15

Date opened: 3/24/15

by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	Yes	No	N/A
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Container(s) supplied by ALS ?	☒	☐	☐
3 Did sample containers arrive in good condition?	☒	☐	☐
4 Were chain-of-custody papers used and filled out?	☒	☐	☐
5 Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
6 Was sample volume received adequate for analysis?	☒	☐	☐
7 Are samples within specified holding times?	☒	☐	☐
8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9 Was a trip blank received?	☐	☒	☐
10 Were custody seals on outside of cooler/Box?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
Were custody seals on outside of sample container?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
11 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
12 Tubes: Are the tubes capped and intact?	☐	☐	☒
Do they contain moisture?	☐	☐	☒
13 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1501165-001.01	6.0 L Silonite Can					
P1501165-002.01	6.0 L Silonite Can					
P1501165-003.01	6.0 L Silonite Can					
P1501165-004.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

Benzene

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Wade Henton

Sampling Media: 6.0 L Silonite Canister(s)

Test Notes:

Date(s) Collected: 3/17 - 3/19/15

Date Received: 3/24/15

Date Analyzed: 4/2/15

Client Sample ID	ALS Sample ID	Canister Dilution Factor	Injection Volume ml(s)	Result ppmV	MRL ppmV	Data Qualifier
Qti-90-100%-Q100-can	P1501165-001	1.39	0.050	ND	17	
Qti-0-30-0%-Q100-can	P1501165-002	1.39	0.050	ND	17	
Qti-30-70-30%-Q100-can	P1501165-003	1.18	0.050	ND	14	
Qti-70-100-70%-Q100-can	P1501165-004	1.29	0.050	ND	15	
Method Blank	P150402-MB	1.00	1.0	ND	0.60	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Lab Control Sample

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P150402-LCS

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Wade Henton

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/02/15

Volume(s) Analyzed: NA ml(s)

Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS	Data Qualifier
				Acceptance Limits	
Benzene	110	106	96	50-150	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-90-100%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-001

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/17/15

Date Received: 3/24/15

Initial Pressure (psig): -1.51

Final Pressure (psig): 3.62

Canister Dilution Factor: 1.39

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	1.39	1.03	
Nitrogen	4.93	3.20	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	0.06	0.04	
C3 as Propane	93.50	95.54	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	0.11	0.18	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	26.91	78.23
Hydrogen	71.88	17.54
Oxygen + Argon	0.27	1.03
Nitrogen	0.95	3.21
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.4900
Specific Volume	ft3/lb	8.79
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,395.3
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,203.8
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,316.8
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,131.6
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,063.2
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	19,379.0
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9844

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-0-30-0%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-002

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/17/15

Date Received: 3/24/15

Initial Pressure (psig): -1.46

Final Pressure (psig): 3.75

Canister Dilution Factor: 1.39

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	0.36	0.26	
Nitrogen	1.35	0.86	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	0.03	0.02	
C3 as Propane	98.11	98.62	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	0.14	0.22	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	27.15	80.77
Hydrogen	72.54	18.11
Oxygen + Argon	< 0.10	0.26
Nitrogen	0.25	0.86
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.5147
Specific Volume	ft3/lb	8.65
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,517.4
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,316.1
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,431.6
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,237.2
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,776.7
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	20,035.5
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9831

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-30-70-30%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-003

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/18/15

Date Received: 3/24/15

Initial Pressure (psig): 0.97

Final Pressure (psig): 3.78

Canister Dilution Factor: 1.18

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	0.65	0.47	
Nitrogen	2.37	1.52	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	< 0.01	< 0.01	
C3 as Propane	96.95	97.96	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	0.01	0.02	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	27.12	80.08
Hydrogen	72.32	17.92
Oxygen + Argon	0.12	0.47
Nitrogen	0.44	1.52
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.5067
Specific Volume	ft3/lb	8.70
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,481.1
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,282.7
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,397.7
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,206.0
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,576.1
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	19,850.8
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9835

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-70-100-70%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-004

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/19/15

Date Received: 3/24/15

Initial Pressure (psig): -0.38

Final Pressure (psig): 3.78

Canister Dilution Factor: 1.29

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	0.76	0.56	
Nitrogen	2.82	1.81	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	< 0.01	< 0.01	
C3 as Propane	96.18	97.25	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	0.21	0.35	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	27.02	79.72
Hydrogen	72.30	17.90
Oxygen + Argon	0.14	0.56
Nitrogen	0.53	1.82
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.5057
Specific Volume	ft3/lb	8.70
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,469.3
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,271.9
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,386.6
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,195.8
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,488.4
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	19,770.4
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9836

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-90-100%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-001

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/17/15

Date Received: 3/24/15

Date Analyzed: 4/2/15

Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -1.51

Final Pressure (psig): 3.62

Canister Dilution Factor: 1.39

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	14	
C ₂ as Ethane	560	14	
C ₃ as Propane	940,000	14	
C ₄ as n-Butane	47	14	
C ₅ as n-Pentane	1,100	14	
C ₆ as n-Hexane	ND	14	
C ₆ + as n-Hexane	ND	28	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-0-30-0%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-002

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/17/15

Date Received: 3/24/15

Date Analyzed: 4/2/15

Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -1.46

Final Pressure (psig): 3.75

Canister Dilution Factor: 1.39

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	14	
C ₂ as Ethane	300	14	
C ₃ as Propane	980,000	14	
C ₄ as n-Butane	60	14	
C ₅ as n-Pentane	1,400	14	
C ₆ as n-Hexane	ND	14	
C ₆ ⁺ as n-Hexane	ND	28	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-30-70-30%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-003

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/18/15

Date Received: 3/24/15

Date Analyzed: 4/2/15

Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): 0.97 Final Pressure (psig): 3.78

Canister Dilution Factor: 1.18

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	12	
C ₂ as Ethane	33	12	
C ₃ as Propane	970,000	12	
C ₄ as n-Butane	47	12	
C ₅ as n-Pentane	140	12	
C ₆ as n-Hexane	ND	12	
C ₆ ⁺ as n-Hexane	ND	24	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-70-100-70%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-004

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: 3/19/15

Date Received: 3/24/15

Date Analyzed: 4/2/15

Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -0.38

Final Pressure (psig): 3.78

Canister Dilution Factor: 1.29

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	13	
C ₂ as Ethane	24	13	
C ₃ as Propane	960,000	13	
C ₄ as n-Butane	65	13	
C ₅ as n-Pentane	2,100	13	
C ₆ as n-Hexane	ND	13	
C ₆ ⁺ as n-Hexane	ND	26	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Method Blank

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P150402-MB

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/02/15

Volume(s) Analyzed: 1.0 ml(s)

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	0.50	
C ₂ as Ethane	ND	0.50	
C ₃ as Propane	ND	0.50	
C ₄ as n-Butane	ND	0.50	
C ₅ as n-Pentane	ND	0.50	
C ₆ as n-Hexane	ND	0.50	
C ₆ ⁺ as n-Hexane	ND	1.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Lab Control Sample

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P150402-LCS

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/02/15

Volume(s) Analyzed: NA ml(s)

Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS	Data Qualifier
				Acceptance Limits	
Methane	1,000	899	90	83-120	
Ethane	1,000	923	92	85-122	
Propane	1,000	936	94	84-121	
n-Butane	1,000	885	89	79-114	
n-Pentane	1,020	910	89	80-121	
n-Hexane	1,010	942	93	73-121	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-90-100%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-001

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00259

Date Collected: 3/17/15
Date Received: 3/24/15
Date Analyzed: 3/26/15
Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -1.51 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.39

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.14	
7782-44-7	Oxygen +			
7440-37-1	Argon	1.39	0.14	
7727-37-9	Nitrogen	4.93	0.14	
630-08-0	Carbon Monoxide	ND	0.14	
124-38-9	Carbon Dioxide	ND	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-0-30-0%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-002

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC1/TCD

Analyst: Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00135

Date Collected: 3/17/15

Date Received: 3/24/15

Date Analyzed: 3/26/15

Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -1.46

Final Pressure (psig): 3.75

Canister Dilution Factor: 1.39

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.14	
7782-44-7	Oxygen +			
7440-37-1	Argon	0.356	0.14	
7727-37-9	Nitrogen	1.35	0.14	
630-08-0	Carbon Monoxide	ND	0.14	
124-38-9	Carbon Dioxide	ND	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-30-70-30%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-003

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC1/TCD

Analyst: Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00330

Date Collected: 3/18/15

Date Received: 3/24/15

Date Analyzed: 3/26/15

Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): 0.97

Final Pressure (psig): 3.78

Canister Dilution Factor: 1.18

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.12	
7782-44-7	Oxygen +			
7440-37-1	Argon	0.646	0.12	
7727-37-9	Nitrogen	2.37	0.12	
630-08-0	Carbon Monoxide	ND	0.12	
124-38-9	Carbon Dioxide	ND	0.12	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti-70-100-70%-Q100-can

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P1501165-004

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC1/TCD

Analyst: Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00217

Date Collected: 3/19/15

Date Received: 3/24/15

Date Analyzed: 3/26/15

Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -0.38

Final Pressure (psig): 3.78

Canister Dilution Factor: 1.29

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.13	
7782-44-7	Oxygen +			
7440-37-1	Argon	0.764	0.13	
7727-37-9	Nitrogen	2.82	0.13	
630-08-0	Carbon Monoxide	ND	0.13	
124-38-9	Carbon Dioxide	ND	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Method Blank

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Project ID: P1501165

ALS Sample ID: P150326-MB

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC1/TCD

Analyst: Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 3/26/15

Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.10	
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Lab Control Sample

ALS Project ID: P1501165

Client Project ID: Questor Q100 Test / Qti-15-Broken Arrow-OK-comp#1

ALS Sample ID: P150326-LCS

Test Code: ASTM D1945-03

Date Collected: NA

Instrument ID: HP5890 II/GC1/TCD

Date Received: NA

Analyst: Nalini Lall

Date Analyzed: 3/26/15

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: NA ml(s)

Test Notes:

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS Acceptance Limits	Data Qualifier
1333-74-0	Hydrogen	40,000	40,600	102	83-114	
7782-44-7	Oxygen +					
7440-37-1	Argon	50,000	54,800	110	84-121	
7727-37-9	Nitrogen	50,000	56,600	113	88-122	
630-08-0	Carbon Monoxide	50,000	53,100	106	87-118	
124-38-9	Carbon Dioxide	50,000	51,700	103	84-117	

APPENDIX F

METHOD 3C RESULTS

LABORATORY REPORT

March 31, 2015

Min Lee
Air Hygiene, Incorporated
1600 West Tacoma Street
Broken Arrow, OK 74012

RE: qti-15-brokenarrow.ok-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on March 19, 2015. For your reference, these analyses have been assigned our service request number P1501103.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental



By Kelly Horiuchi at 9:45 am, Apr 01, 2015

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated
Project: qti-15-brokenarrow.ok-comp#1

Service Request No: P1501103

CASE NARRATIVE

The samples were received intact under chain of custody on March 19, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Fixed Gases Analysis

The samples were analyzed for fixed gases (oxygen/argon, nitrogen, methane and carbon dioxide) according to modified EPA Method 3C (triplicate injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This procedure is described in laboratory SOP VOA-EPA3C. This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

ALS Simi Valley standard operating procedure states an initial calibration curve shall be performed annually. The curve was generated on 3/10/14 and a new calibration standard has been on order for over 30 days. The EPA 3C method does not provide criteria for how often a calibration curve should be performed. Additionally, the instrument daily quality control parameters are within criteria, documenting the stability and performance of the instrument are acceptable, therefore data is not affected.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	876241
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 4-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Air Hygiene, Incorporated
Project ID: qti-15-brokenarrow.ok-comp#1

Service Request: P1501103

Date Received: 3/19/2015
Time Received: 09:40

3C Modified - Fxd Gases Bag 2X

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
R10-90-100%-Q100	P1501103-001	Air	3/17/2015	10:36	X
R11-90-100%-Q100	P1501103-003	Air	3/17/2015	12:11	X
R12-90-100%-Q100	P1501103-005	Air	3/17/2015	13:43	X
R1-0-30-0%-Q100	P1501103-007	Air	3/17/2015	16:02	X
R2-0-30-0%-Q100	P1501103-009	Air	3/17/2015	17:31	X
R3-0-30-0%-Q100	P1501103-011	Air	3/17/2015	19:00	X
R4-30-70-30%-Q100	P1501103-013	Air	3/18/2015	11:17	X
R5-30-70-30%-Q100	P1501103-015	Air	3/18/2015	12:49	X
R6-30-70-30%-Q100	P1501103-017	Air	3/18/2015	14:22	X

P1501103

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD



Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
(888) 461-8778
www.airhygiene.com

Project Number: qti-15-brokenarrow.ok-comp#1		Laboratory Analysis Requested: Methd 3C						
Person Taking Samples: MSL								
Sample Number	Location	Date	Time	Volume (L)	Analysis Method			
					O ₂	CO ₂	Nitrogen	Methane
✓ R10-90-100%-Q100	Broken Arrow Rental Facility	17-Mar	10:36	10	X	X	X	X
R10-90-100%-Q100-Backup	Broken Arrow Rental Facility	17-Mar		5	X	X	X	X
✓ R11-90-100%-Q100	Broken Arrow Rental Facility	17-Mar	12:11	10	X	X	X	X
R11-90-100%-Q100-Backup	Broken Arrow Rental Facility	17-Mar		5	X	X	X	X
✓ R12-90-100%-Q100	Broken Arrow Rental Facility	17-Mar	13:43	10	X	X	X	X
R12-90-100%-Q2100-Backup	Broken Arrow Rental Facility	17-Mar		5	X	X	X	X
✓ R1-0-30-0%-Q100	Broken Arrow Rental Facility	17-Mar	16:02	10	X	X	X	X
R1-0-30-0%-Q100-Backup	Broken Arrow Rental Facility	17-Mar		5	X	X	X	X
✓ R2-0-30-0%-Q100	Broken Arrow Rental Facility	17-Mar	17:31	10	X	X	X	X
R2-0-30-0%-Q100-Backup	Broken Arrow Rental Facility	17-Mar		5	X	X	X	X
✓ R3-0-30-0%-Q100	Broken Arrow Rental Facility	17-Mar	19:00	10	X	X	X	X
R3-0-30-0%-Q100-Backup	Broken Arrow Rental Facility	17-Mar		5	X	X	X	X

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Relinquished by: (Signature)	Date: 3/17/15	Time: 19:05	Received by: (Signature)	Date: 3/17/15	Time: 0940
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

3-brokenarrow.ok-comp#1-coc-q100

P1501103

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD				 Air Hygiene International, Inc. 1600 W Tacoma Street Broken Arrow, Oklahoma 74012 (888) 461-8778 www.airhygiene.com			
Project Number:		qti-15-brokenarrow.ok-comp#1		Laboratory Analysis Requested:		Methd 3C	
Person Taking Samples:		MSL					
Sample Number	Location	Date	Time	Volume (L)	Analysis Method		
					O ₂	CO ₂	Nitrogen
R4-30-70-30%-Q100	Broken Arrow Rental Facility	18-Mar	11:17	10	X	X	X
R4-30-70-30%-Q100-Backup	Broken Arrow Rental Facility	18-Mar		5	X	X	X
R5-30-70-30%-Q100	Broken Arrow Rental Facility	18-Mar	12:49	10	X	X	X
R5-30-70-30%-Q100-Backup	Broken Arrow Rental Facility	18-Mar		5	X	X	X
R6-30-70-30%-Q100	Broken Arrow Rental Facility	18-Mar	14:22	10	X	X	X
R6-30-70-30%-Q100-Backup	Broken Arrow Rental Facility	18-Mar		5	X	X	X
Relinquished by: (Signature)		Date: 3/18/15		Time: 14:25		Received by: (Signature)	
Date: 3/18/15		Time: 14:25		Received by: (Signature)		Date: 3/19/15	
Relinquished by: (Signature)		Date: 3/18/15		Time: 14:25		Received by: (Signature)	
Date: 3/18/15		Time: 14:25		Received by: (Signature)		Date: 3/19/15	

3-brokenarrow.ok-comp#1-coc-q100

ALS Environmental Sample Acceptance Check Form

Client: Air Hygiene, Incorporated

Work order: P1501103

Project: qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 3/19/15

Date opened: 3/19/15

by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	Yes	No	N/A
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Container(s) supplied by ALS ?	☐	☒	☐
3 Did sample containers arrive in good condition?	☒	☐	☐
4 Were chain-of-custody papers used and filled out?	☒	☐	☐
5 Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
6 Was sample volume received adequate for analysis?	☒	☐	☐
7 Are samples within specified holding times?	☒	☐	☐
8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9 Was a trip blank received?	☐	☒	☐
10 Were custody seals on outside of cooler/Box?	☐	☐	☒
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
Were custody seals on outside of sample container?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
11 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
12 Tubes: Are the tubes capped and intact?	☐	☐	☒
Do they contain moisture?	☐	☐	☒
13 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1501103-001.01	10 L Tedlar Bag					
P1501103-002.01	5.0 L Tedlar Bag					
P1501103-003.01	10 L Tedlar Bag					
P1501103-004.01	5.0 L Tedlar Bag					
P1501103-005.01	10 L Tedlar Bag					
P1501103-006.01	5.0 L Tedlar Bag					
P1501103-007.01	10 L Tedlar Bag					
P1501103-008.01	5.0 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS Environmental Sample Acceptance Check Form

Client: Air Hygiene, Incorporated

Work order: P1501103

Project: qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 3/19/15

Date opened: 3/19/15

by: ADAVID

[illegible]

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO₂, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R10-90-100%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/17/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	13.4	0.10	
7727-37-9	Nitrogen	80.2	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	6.37	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R11-90-100%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/17/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.4	0.10	
7727-37-9	Nitrogen	79.9	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.70	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R12-90-100%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/17/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.2	0.10	
7727-37-9	Nitrogen	80.0	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.83	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R1-0-30-0%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-007

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/17/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	13.8	0.10	
7727-37-9	Nitrogen	80.1	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	6.10	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R2-0-30-0%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-009

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/17/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.1	0.10	
7727-37-9	Nitrogen	80.0	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.88	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R3-0-30-0%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-011

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/17/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.3	0.10	
7727-37-9	Nitrogen	80.0	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.69	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R4-30-70-30%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-013

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/18/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	15.0	0.10	
7727-37-9	Nitrogen	79.8	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.27	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R5-30-70-30%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P1501103-015

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/18/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.7	0.10	
7727-37-9	Nitrogen	79.8	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.43	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R6-30-70-30%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
 ALS Sample ID: P1501103-017

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/18/15
Date Received: 3/19/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.8	0.10	
7727-37-9	Nitrogen	79.8	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.40	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Method Blank
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501103
ALS Sample ID: P150320-MB

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201504.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 8:10 am
Operator : NL
Sample : 1103-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:40 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.149	204182	123556.056 ppm
3) Nitrogen	2.274	1414009	736465.546 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.715	126228	58670.412 ppm

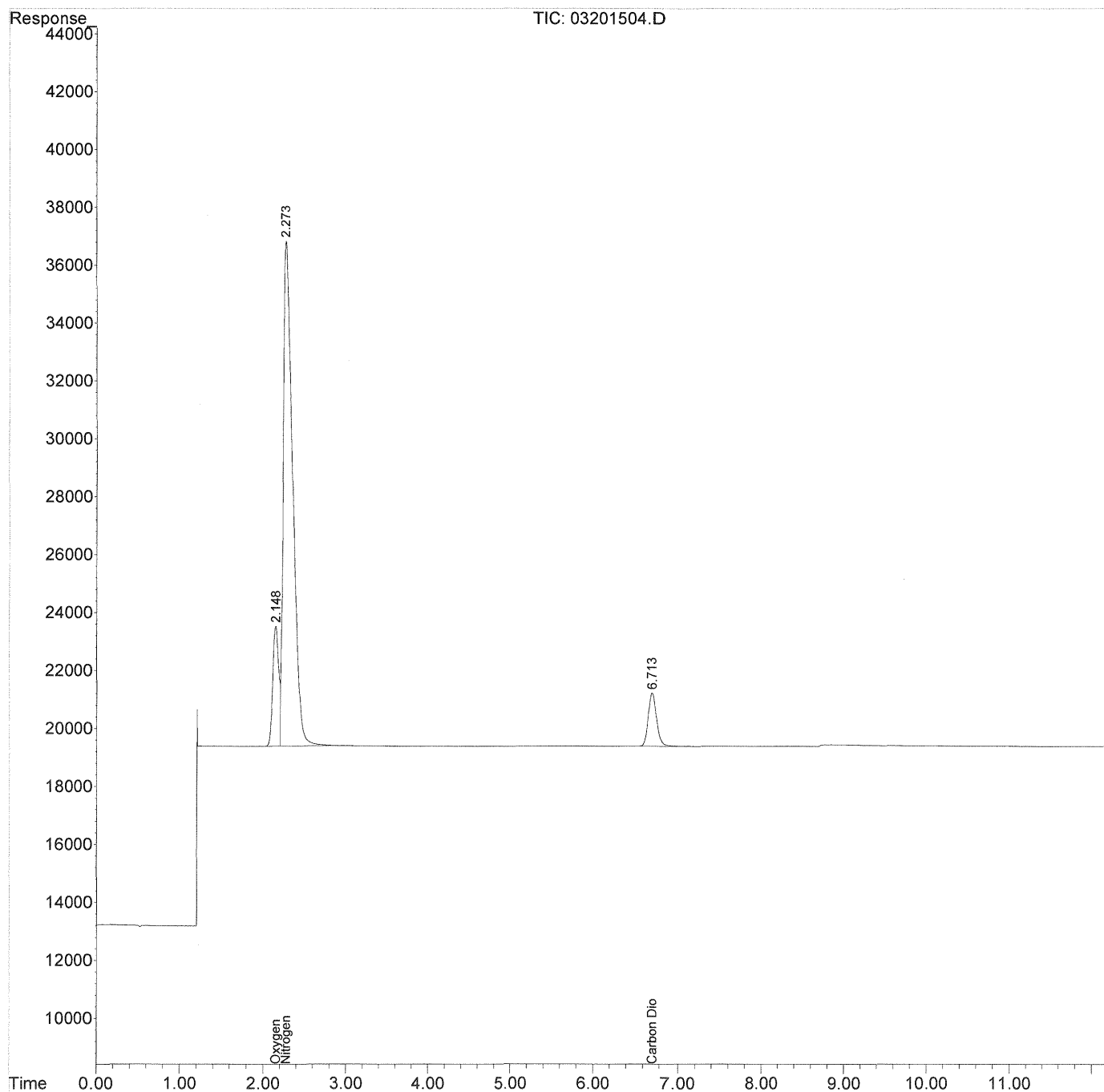
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201504.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 8:10 am
Operator : NL
Sample : 1103-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:40 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201505.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 8:26 am
Operator : NL
Sample : 1103-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:43 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.153	204653	123841.265 ppm
3) Nitrogen	2.278	1419223	739181.499 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.714	126495	58794.379 ppm

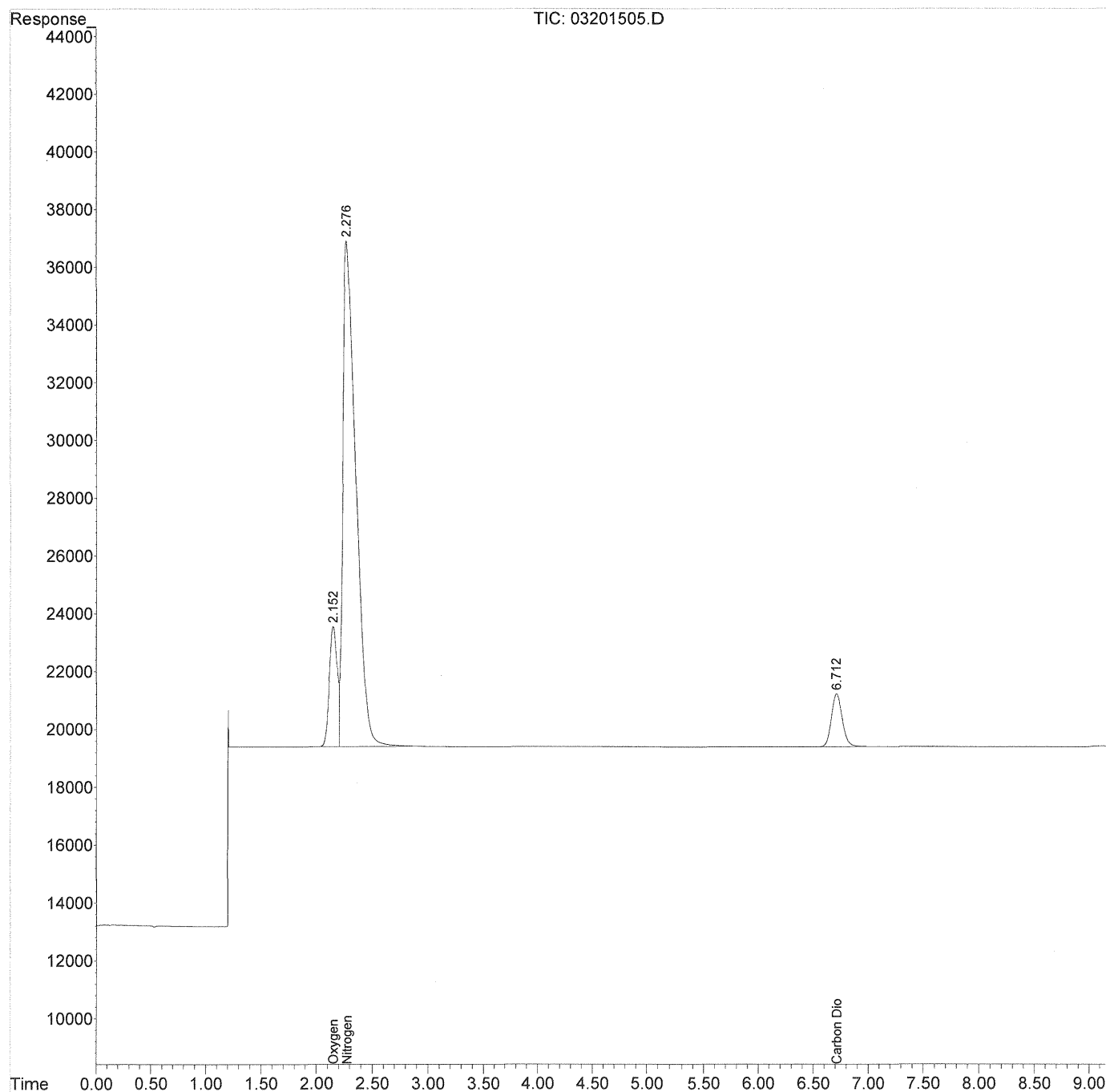
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201505.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 8:26 am
Operator : NL
Sample : 1103-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:43 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201506.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 8:39 am
Operator : NL
Sample : 1103-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:46 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.744	14	10.313 ppm
2) Oxygen	2.150	203951	123416.159 ppm
3) Nitrogen	2.275	1417833	738457.355 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.712	125895	58515.526 ppm

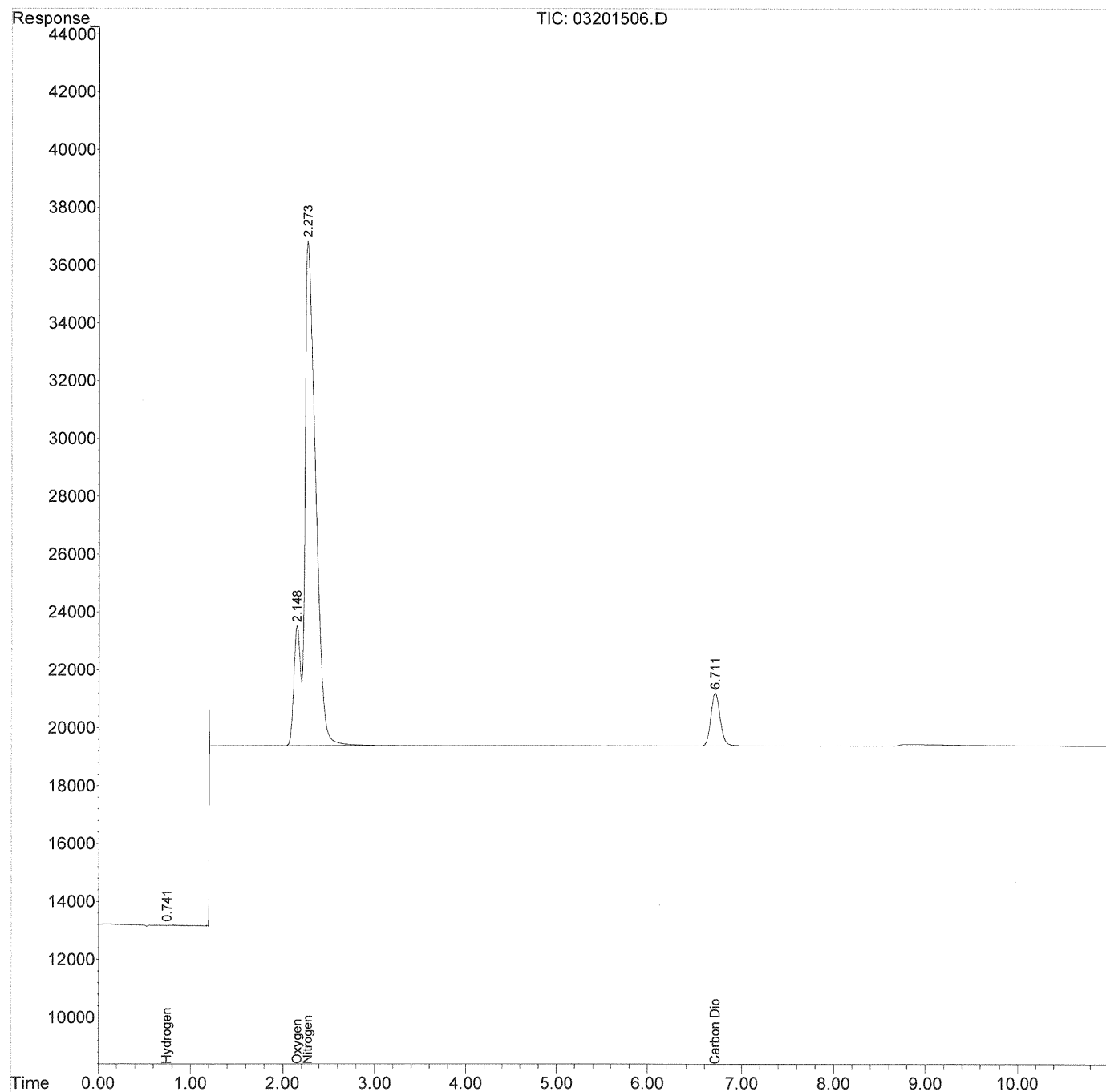
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201506.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 8:39 am
Operator : NL
Sample : 1103-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:46 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201507.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 8:54 am
Operator : NL
Sample : 1103-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:51 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.655	179	129.891 ppm
2) Oxygen	2.148	217165	131412.553 ppm
3) Nitrogen	2.275	1409084	733900.441 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.713	112445	52263.907 ppm

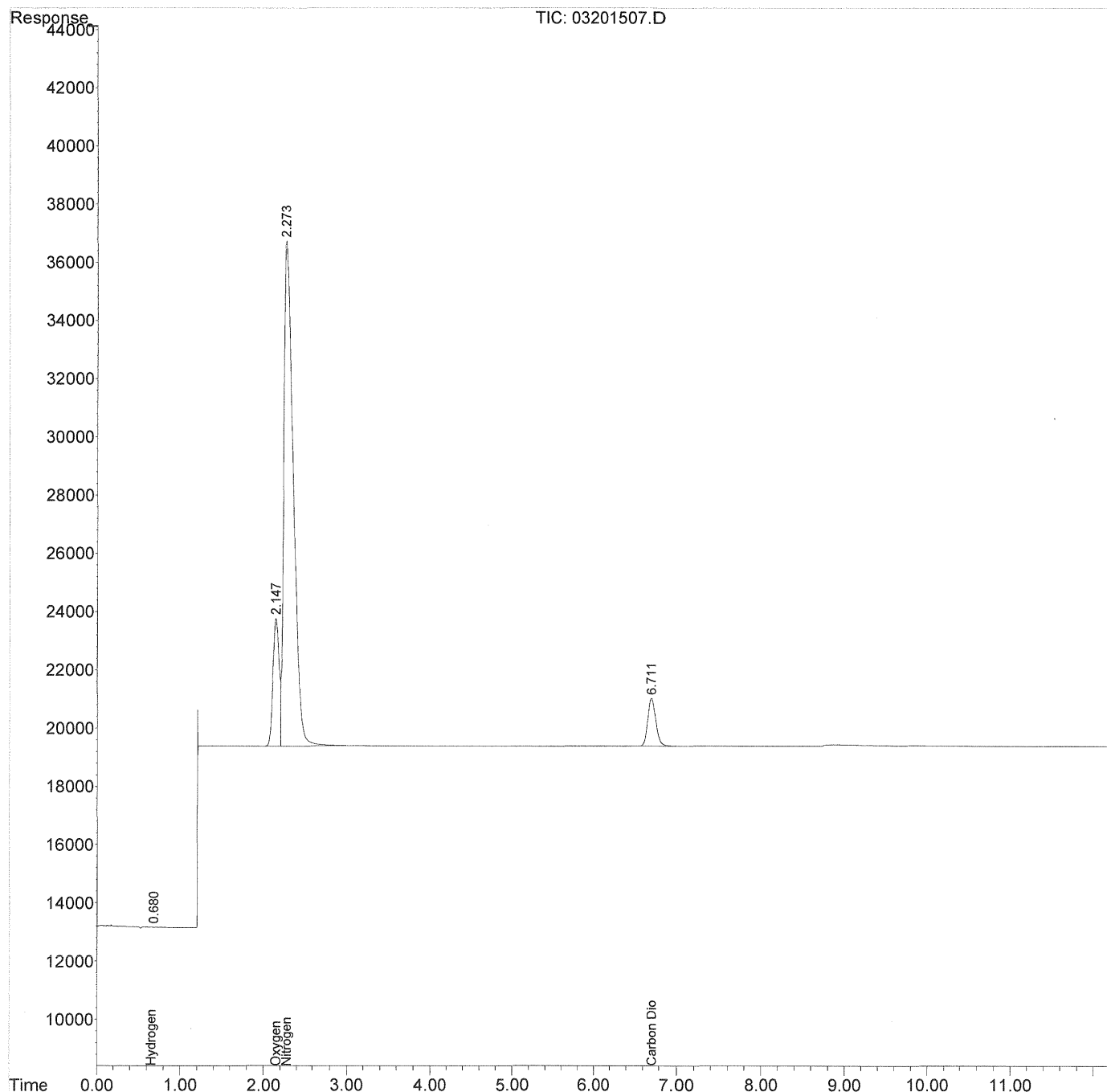
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 Data File : 03201507.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 8:54 am
 Operator : NL
 Sample : 1103-003
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:09:51 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201508.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 9:11 am
 Operator : NL
 Sample : 1103-003
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:09:54 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.158	218184	132029.135 ppm
3) Nitrogen	2.284	1410576	734677.700 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.714	112855	52454.364 ppm

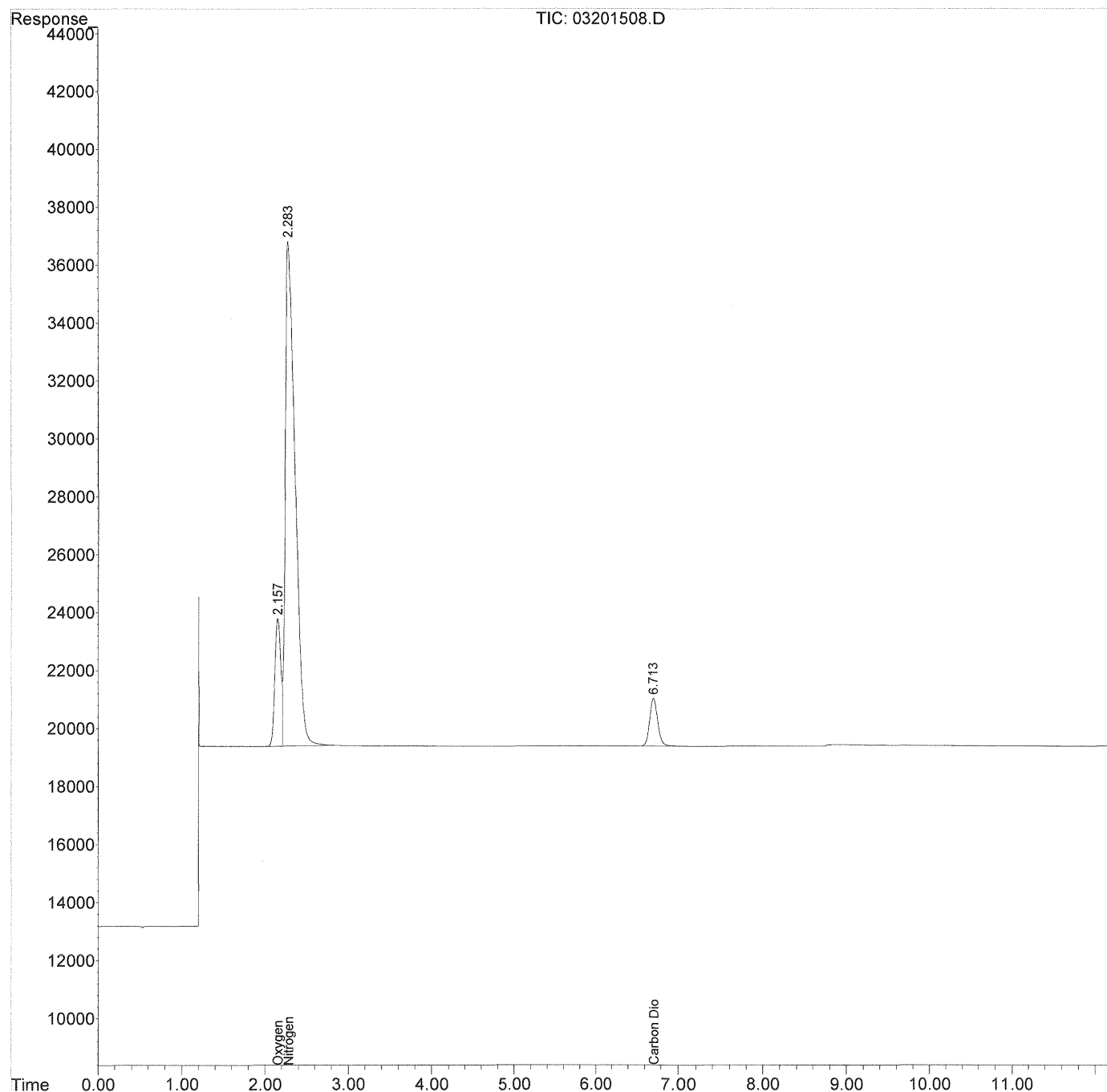
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201508.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 9:11 am
Operator : NL
Sample : 1103-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:54 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201509.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 9:30 am
Operator : NL
Sample : 1103-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:57 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.159	214129	129575.170 ppm
3) Nitrogen	2.286	1383689	720674.170 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.715	110501	51360.604 ppm

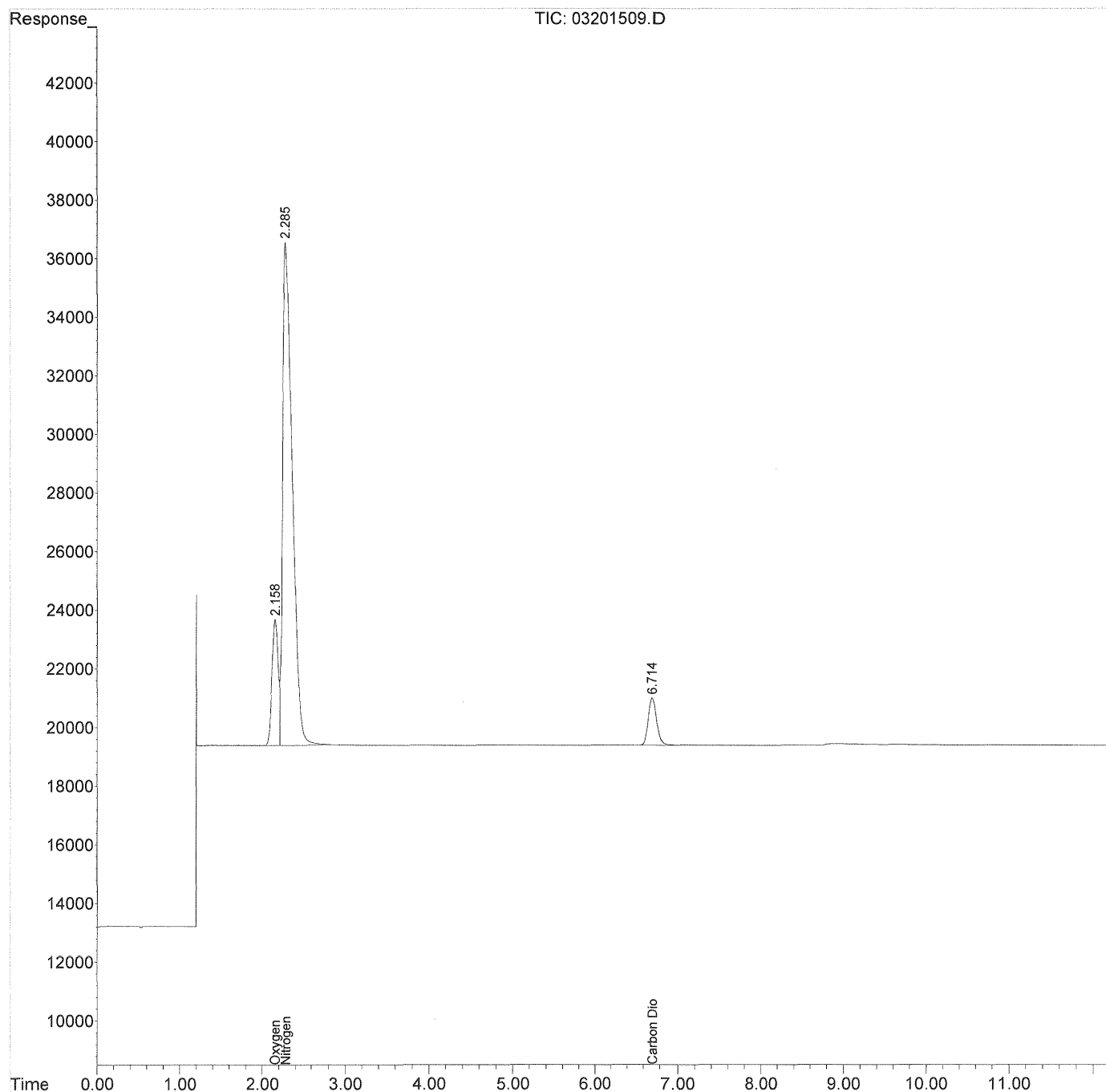
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201509.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 9:30 am
Operator : NL
Sample : 1103-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:57 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201510.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 9:46 am
Operator : NL
Sample : 1103-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:00 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.142	214405	129742.552 ppm
3) Nitrogen	2.268	1410738	734762.013 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.712	115219	53553.542 ppm

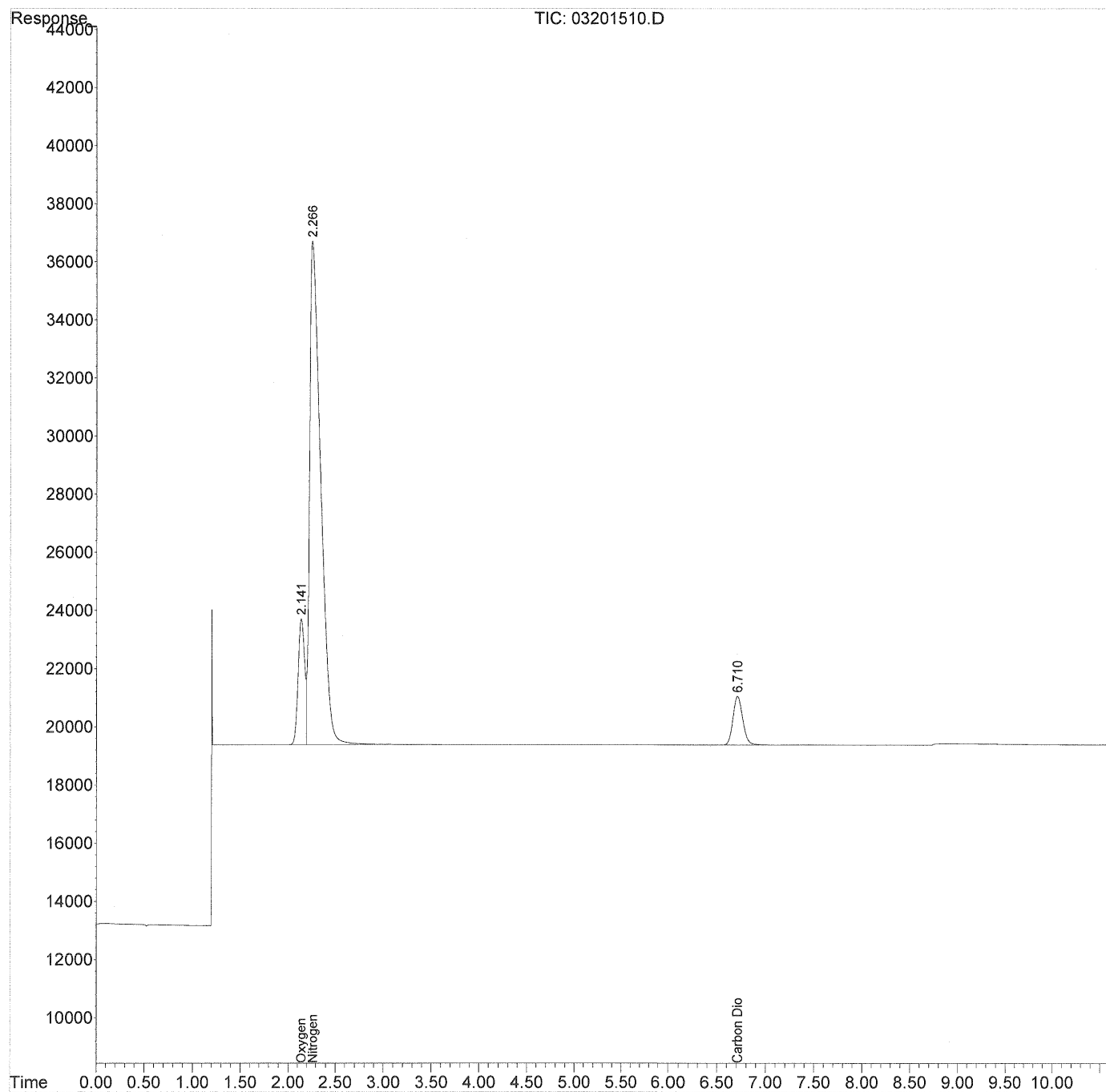
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201510.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 9:46 am
 Operator : NL
 Sample : 1103-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:00 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201511.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 10:18 am
 Operator : NL
 Sample : 1103-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:03 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.165	213542	129220.064 ppm
3) Nitrogen	2.292	1401306	729849.726 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.722	114327	53138.528 ppm

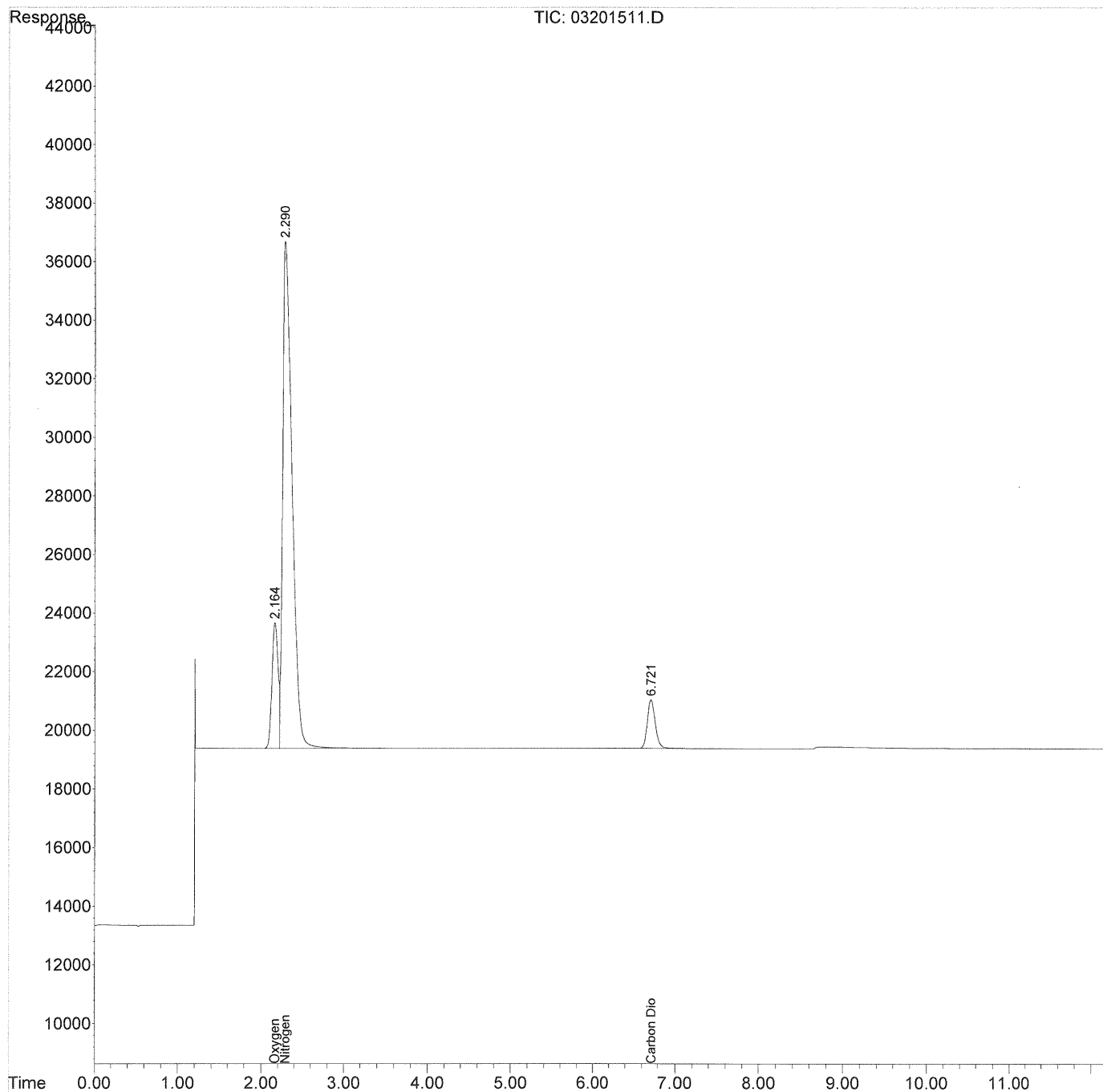
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201511.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 10:18 am
Operator : NL
Sample : 1103-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:03 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201512.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 10:35 am
Operator : NL
Sample : 1103-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:07 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.163	214700	129920.734	ppm
3) Nitrogen	2.289	1408892	733800.395	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.720	115171	53531.193	ppm

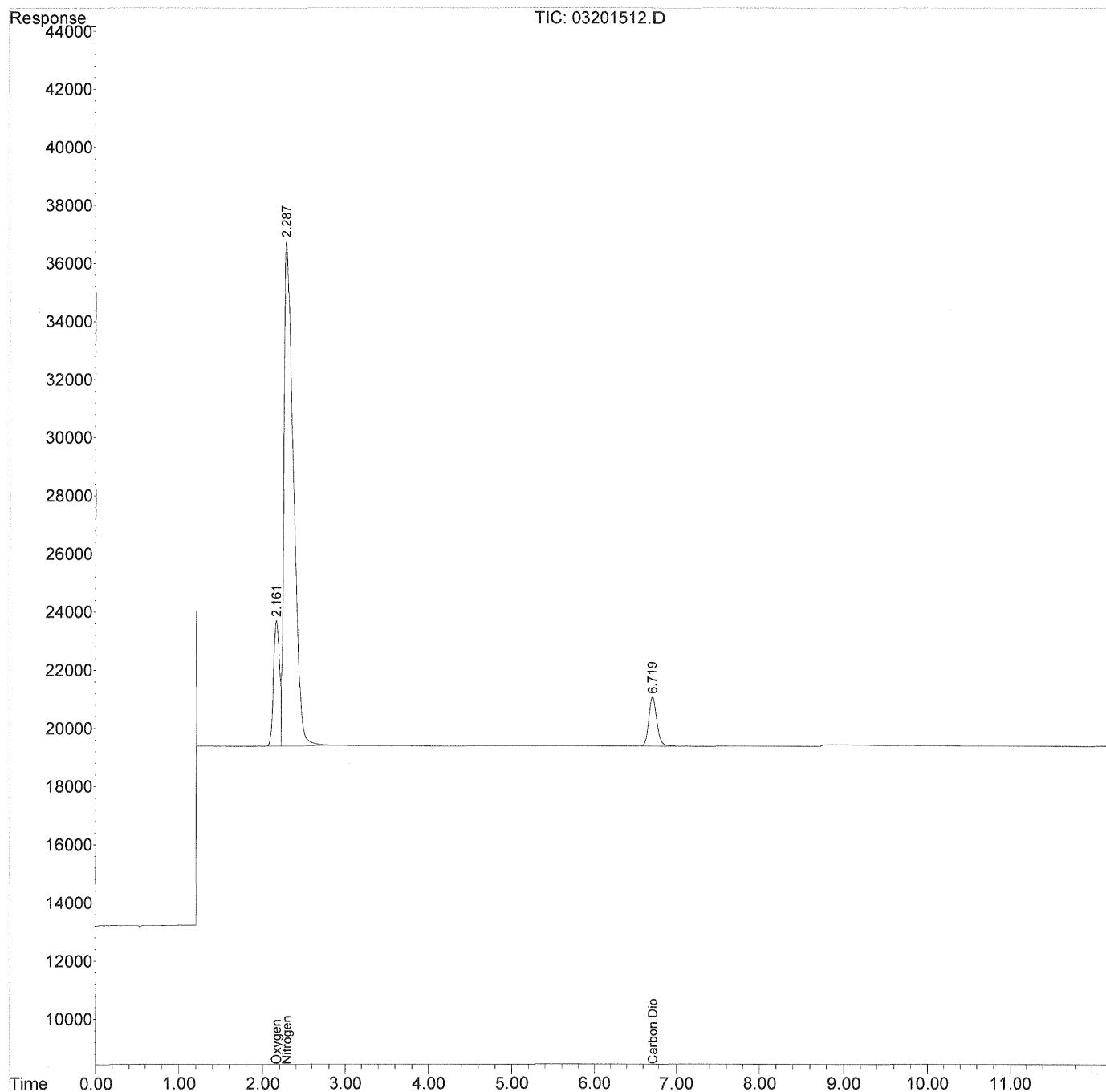
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201512.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 10:35 am
 Operator : NL
 Sample : 1103-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:07 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201513.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 10:52 am
Operator : NL
Sample : 1103-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:11 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.159	209353	126685.193	ppm
3) Nitrogen	2.285	1414363	736650.291	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.716	120625	56066.261	ppm

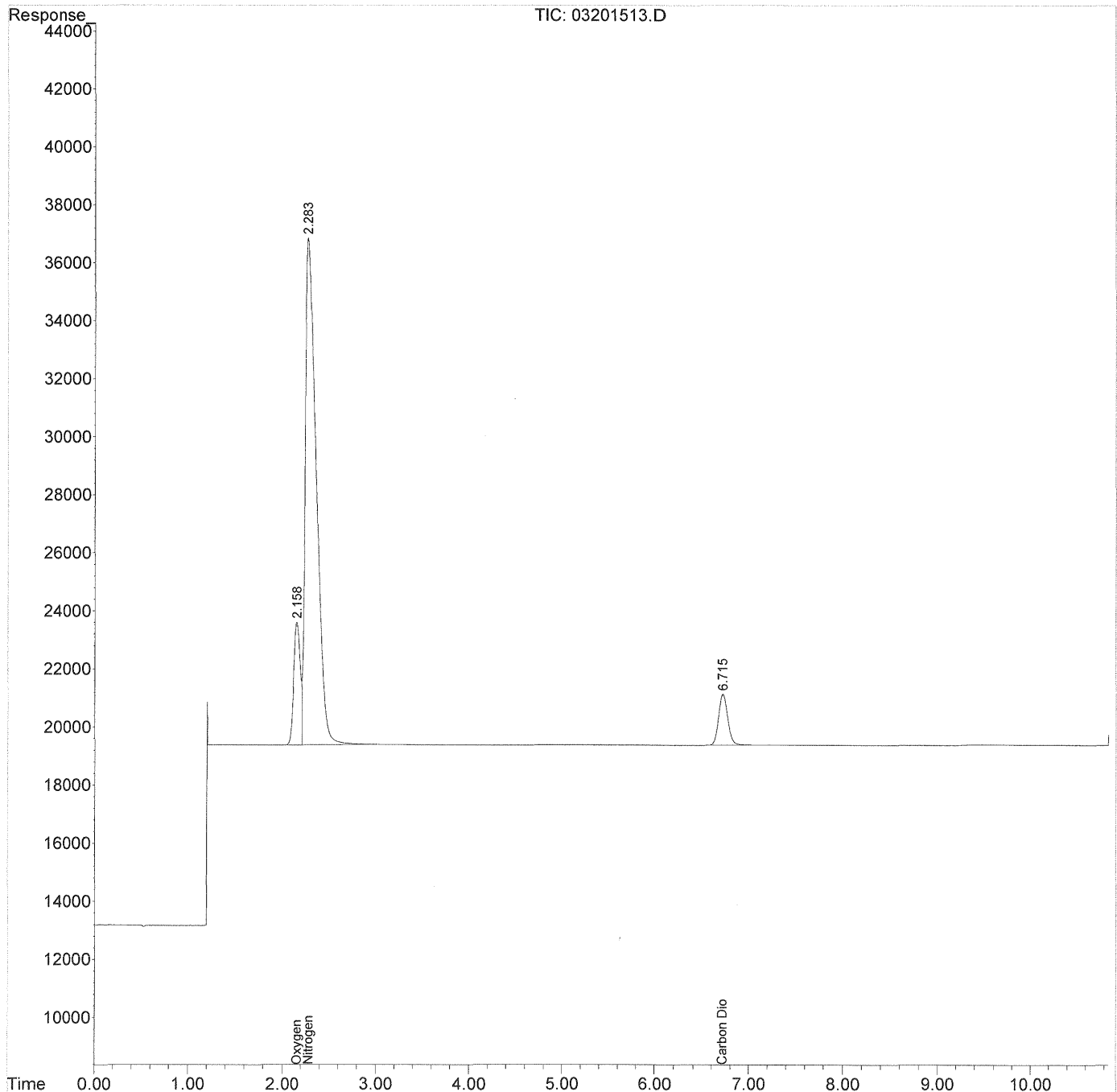
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201513.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 10:52 am
 Operator : NL
 Sample : 1103-007
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:11 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201514.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 11:07 am
 Operator : NL
 Sample : 1103-007
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:14 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.156	208982	126460.614 ppm
3) Nitrogen	2.282	1408636	733667.278 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.714	120347	55936.608 ppm

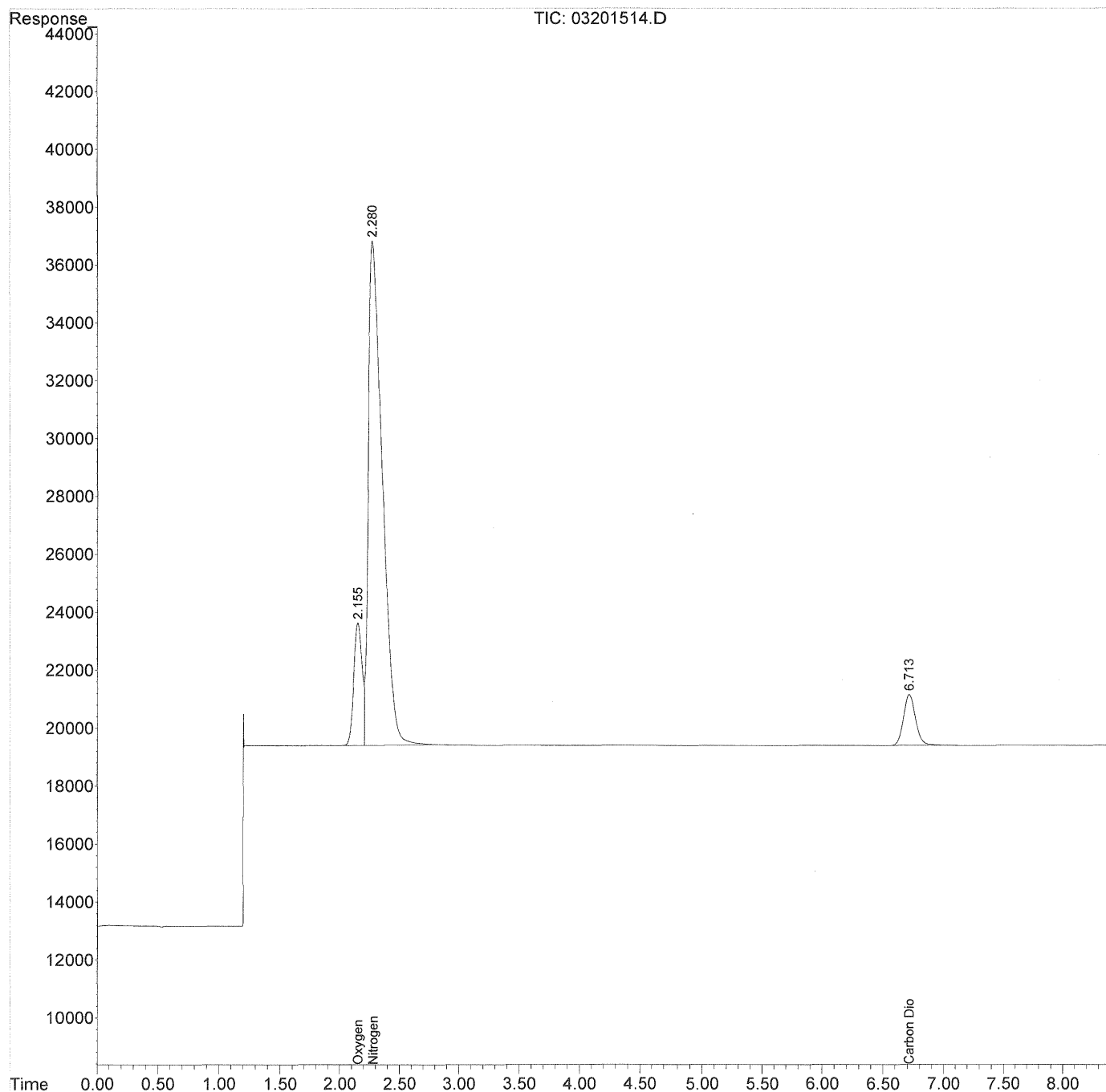
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201514.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 11:07 am
Operator : NL
Sample : 1103-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:14 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201515.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 11:22 am
 Operator : NL
 Sample : 1103-007
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:17 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.162	209191	126586.925 ppm
3) Nitrogen	2.288	1412050	735445.364 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.717	120337	55932.106 ppm

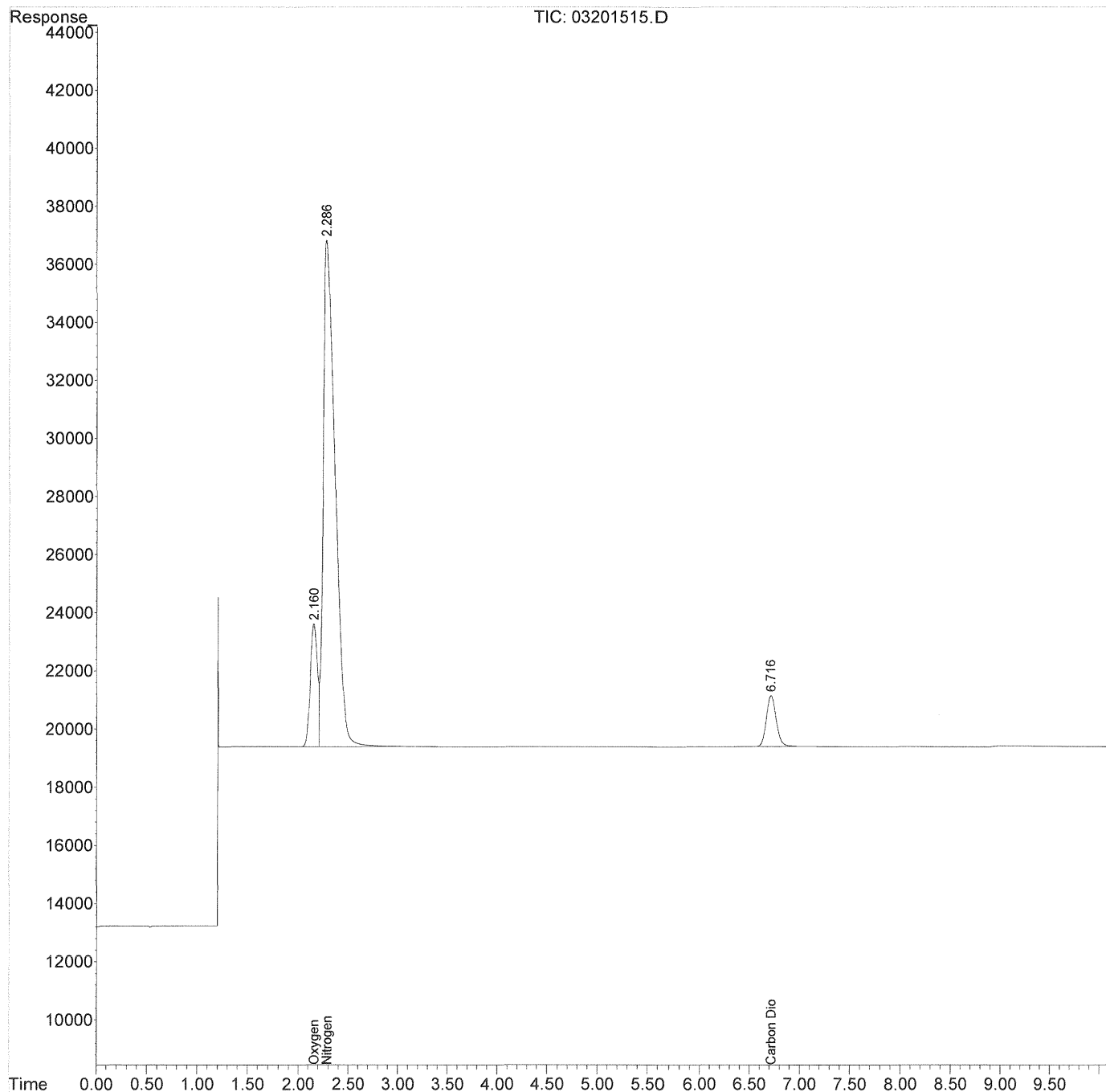
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201515.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 11:22 am
 Operator : NL
 Sample : 1103-007
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:17 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201516.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 11:42 am
Operator : NL
Sample : 1103-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:20 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.161	215082	130151.793 ppm
3) Nitrogen	2.287	1413219	736054.415 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.719	116540	54167.297 ppm

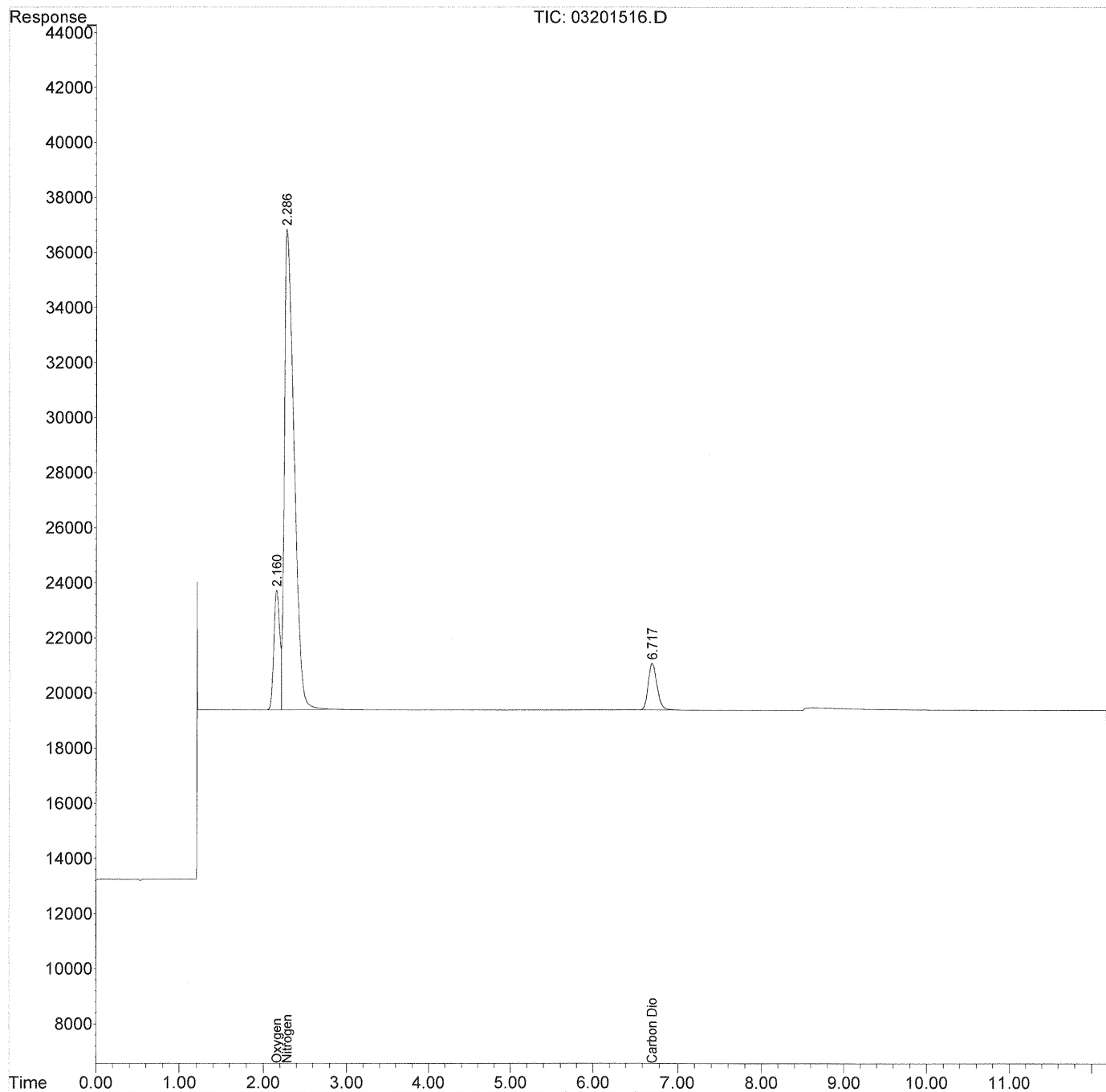
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201516.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 11:42 am
 Operator : NL
 Sample : 1103-009
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:20 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201517.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 11:58 am
 Operator : NL
 Sample : 1103-009
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:23 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.152	215219	130235.123 ppm
3) Nitrogen	2.278	1420670	739935.040 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.713	116839	54306.352 ppm

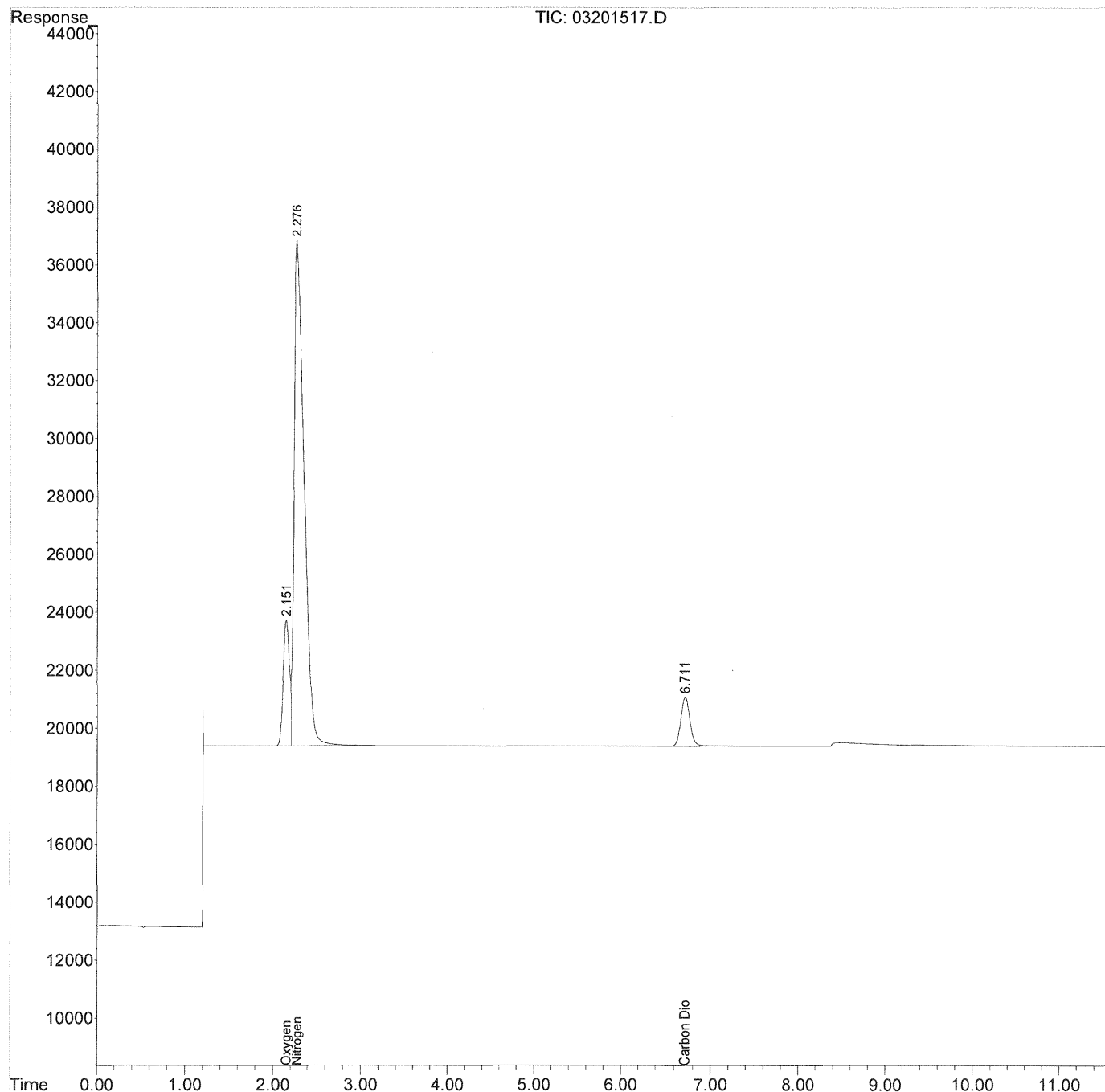
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201517.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 11:58 am
 Operator : NL
 Sample : 1103-009
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:23 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201518.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 12:14 pm
Operator : NL
Sample : 1103-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:26 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.150	214655	129893.526 ppm
3) Nitrogen	2.276	1413638	736272.357 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.712	116740	54260.484 ppm

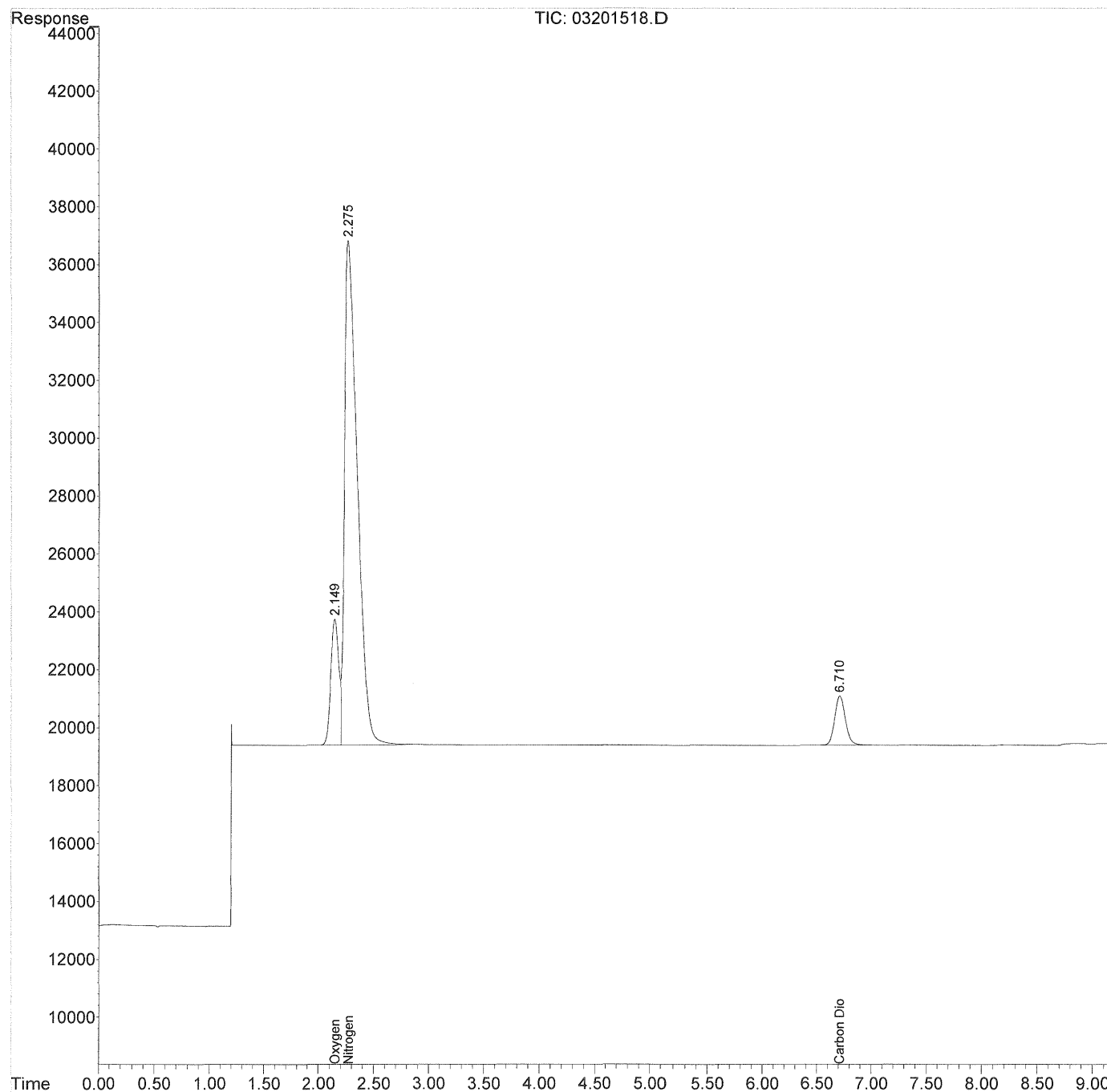
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201518.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 12:14 pm
Operator : NL
Sample : 1103-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:26 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201519.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 12:27 pm
 Operator : NL
 Sample : 1103-011
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:30 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.149	217227	131450.054 ppm
3) Nitrogen	2.276	1408228	733454.576 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.713	112169	52135.860 ppm

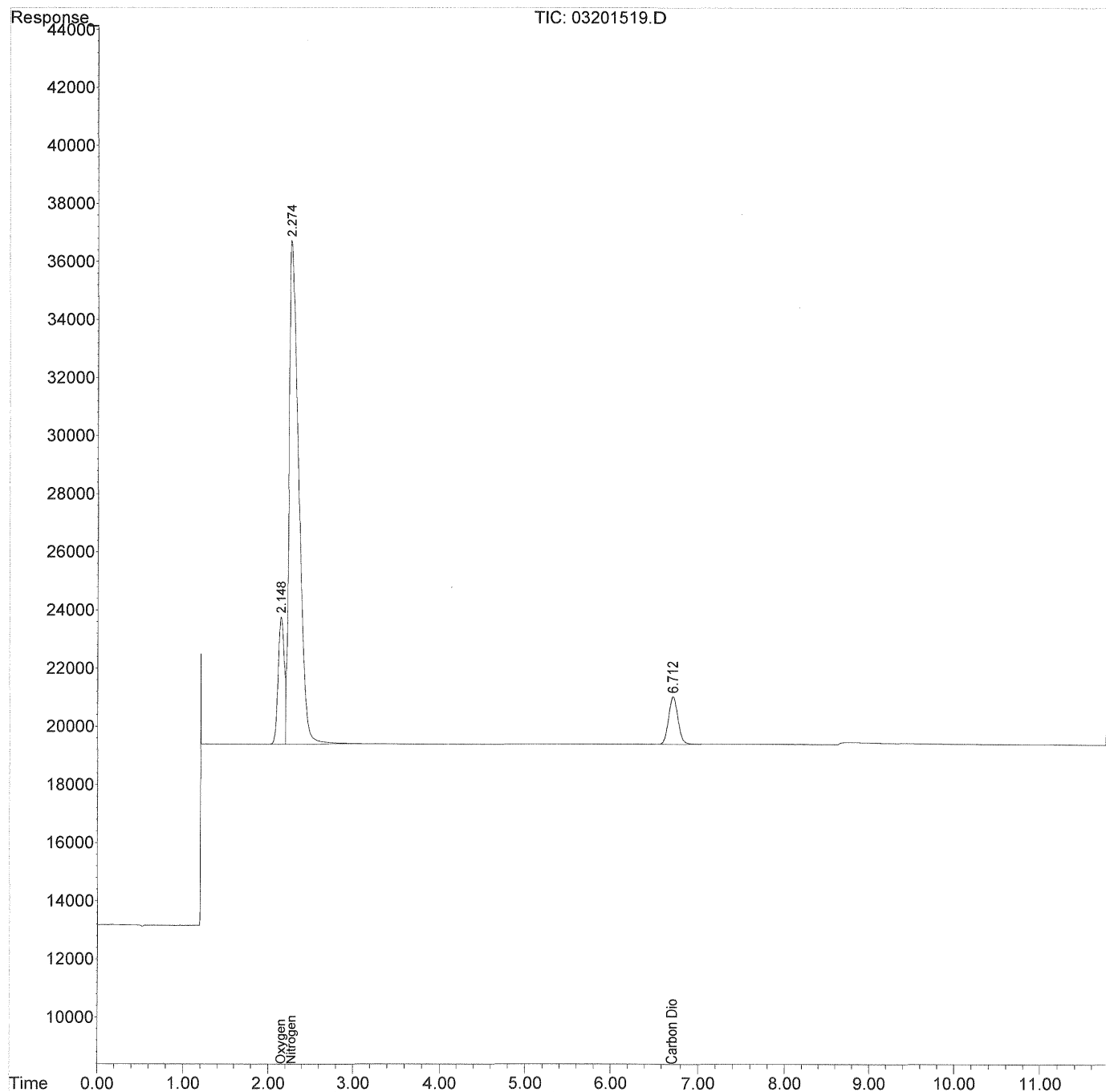
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201519.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 12:27 pm
 Operator : NL
 Sample : 1103-011
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:30 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201520.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 12:45 pm
Operator : NL
Sample : 1103-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:34 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.160	216460	130986.050 ppm
3) Nitrogen	2.287	1402982	730722.250 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.717	112004	52058.821 ppm

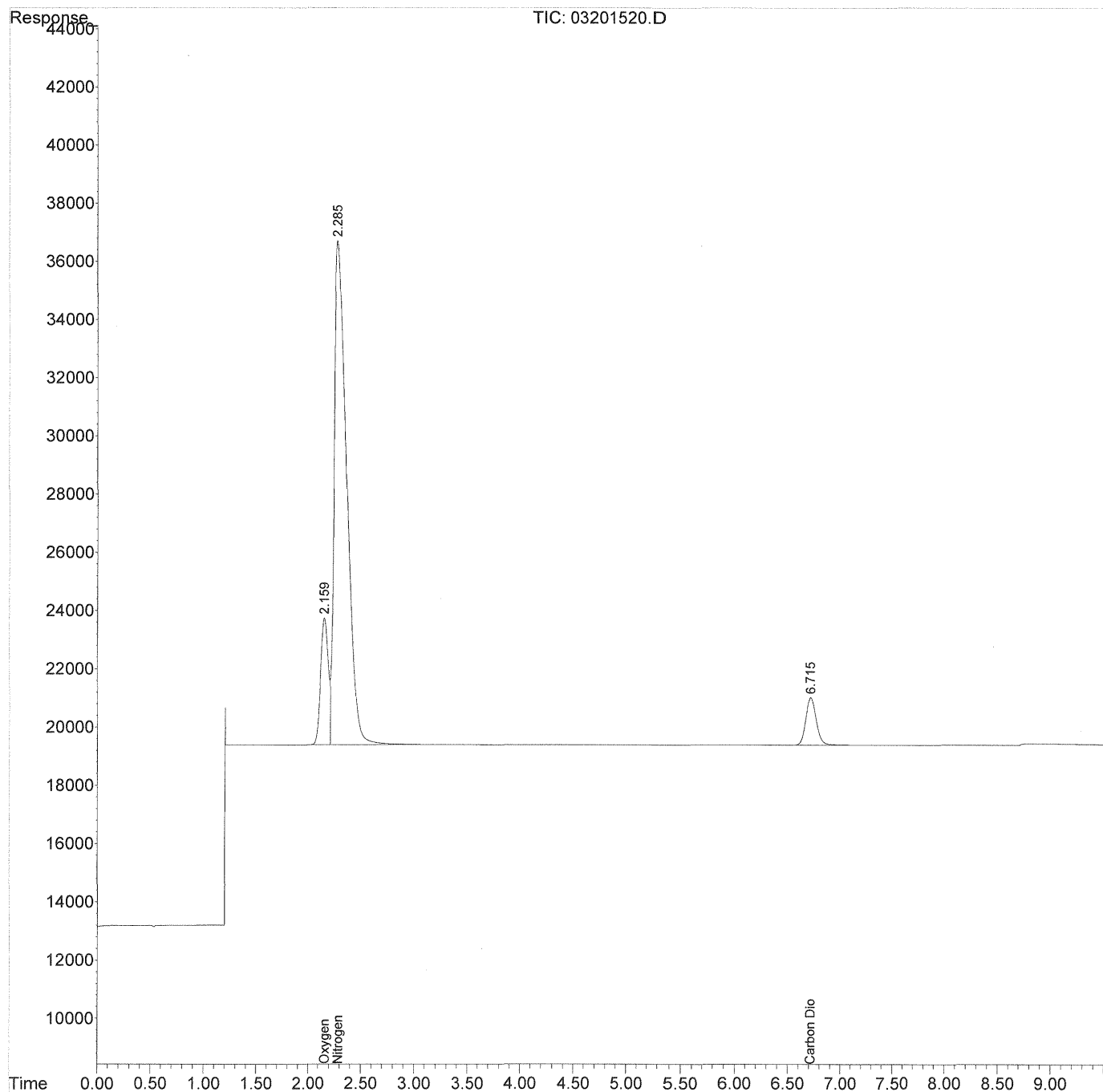
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201520.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 12:45 pm
Operator : NL
Sample : 1103-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:34 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201521.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 12:59 pm
Operator : NL
Sample : 1103-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:37 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.158	217424	131568.869 ppm
3) Nitrogen	2.284	1409643	734191.664 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.716	112357	52222.989 ppm

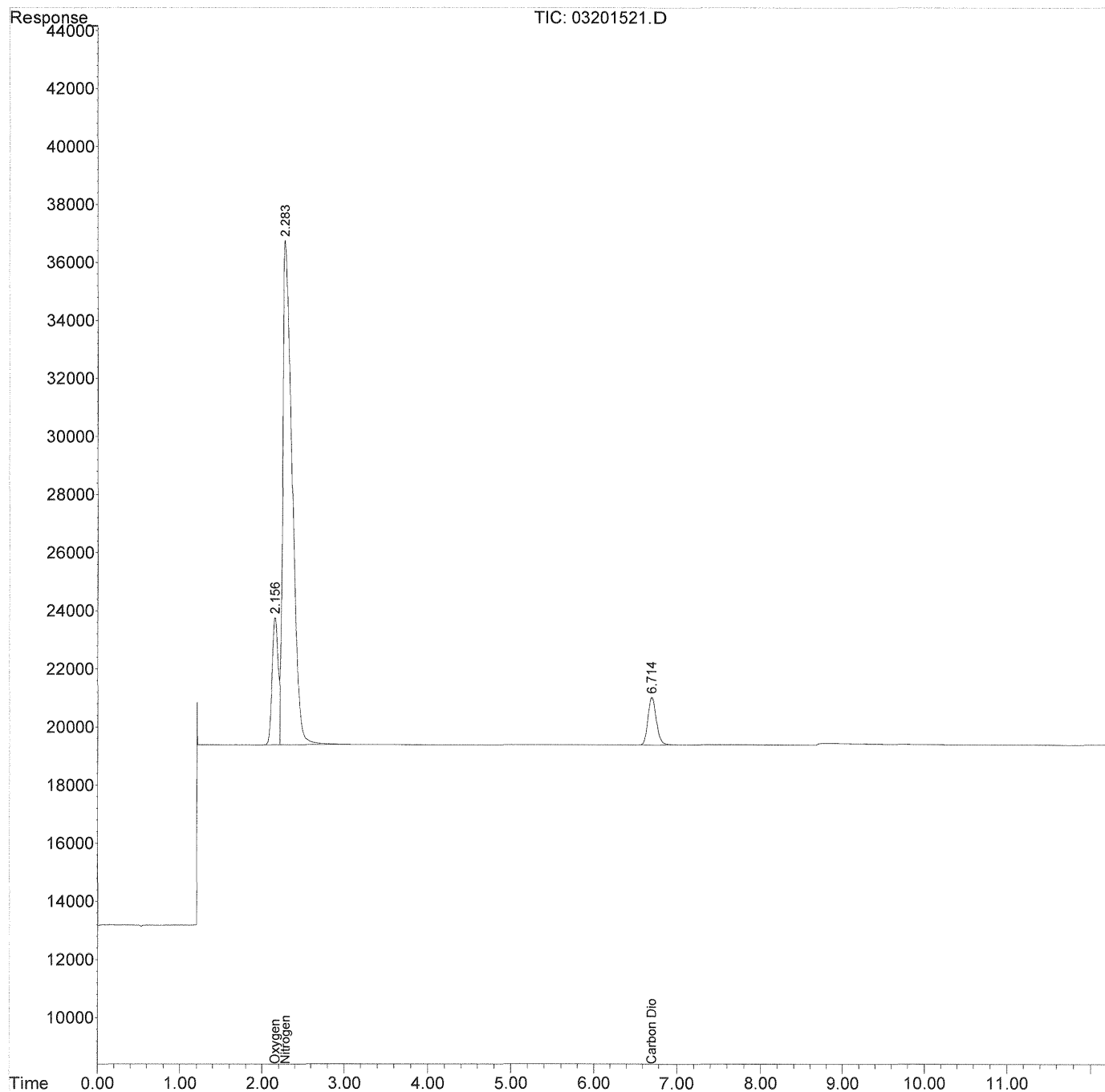
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201521.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 12:59 pm
Operator : NL
Sample : 1103-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:37 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201522.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 1:16 pm
 Operator : NL
 Sample : 1103-013
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:40 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.156	227040	137388.259 ppm
3) Nitrogen	2.283	1407186	732912.064 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.717	104038	48356.690 ppm

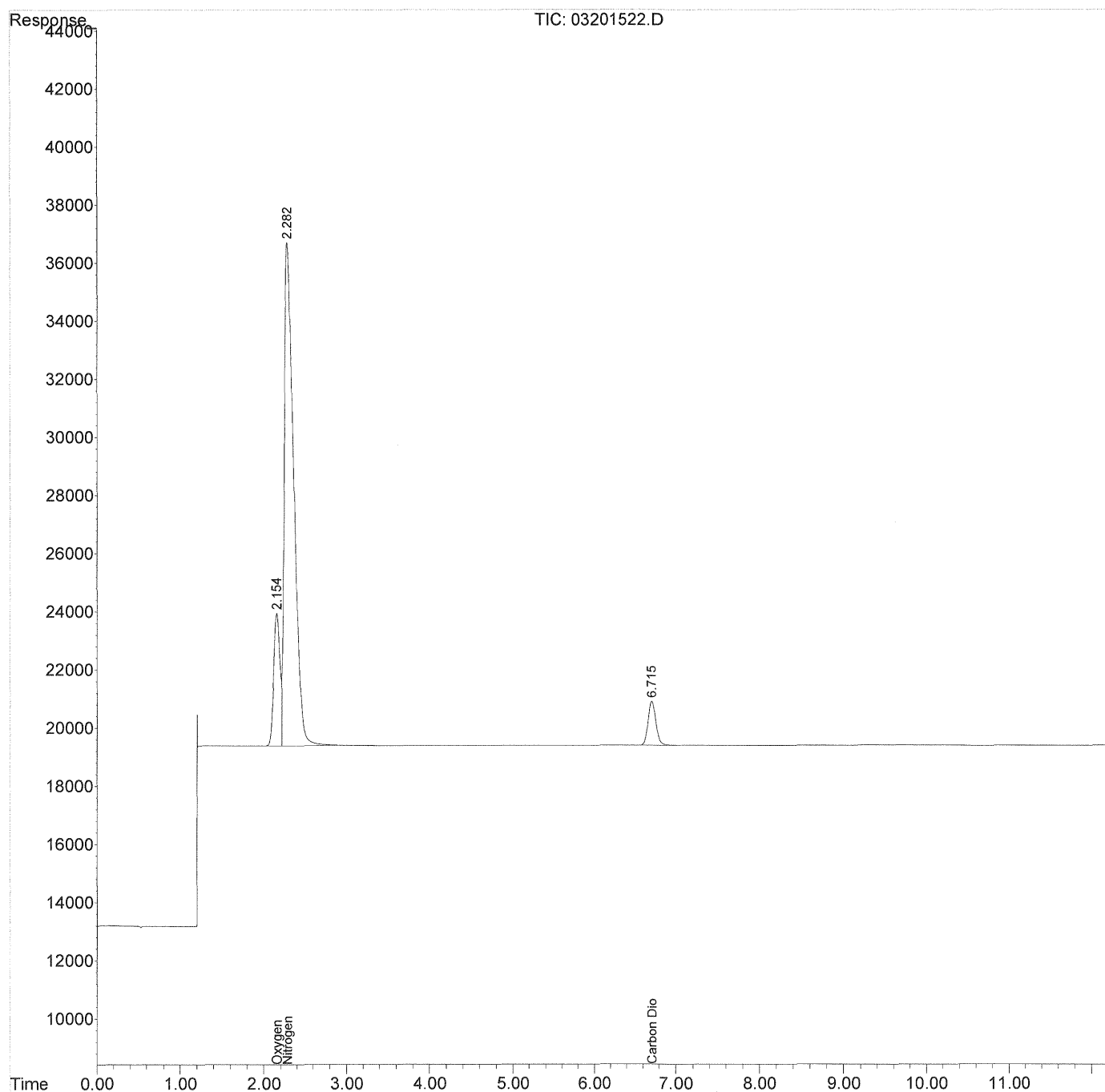
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201522.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 1:16 pm
Operator : NL
Sample : 1103-013
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:40 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201523.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 1:43 pm
 Operator : NL
 Sample : 1103-013
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:43 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.165	226076	136804.509 ppm
3) Nitrogen	2.292	1397555	727895.725 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.722	103608	48156.605 ppm

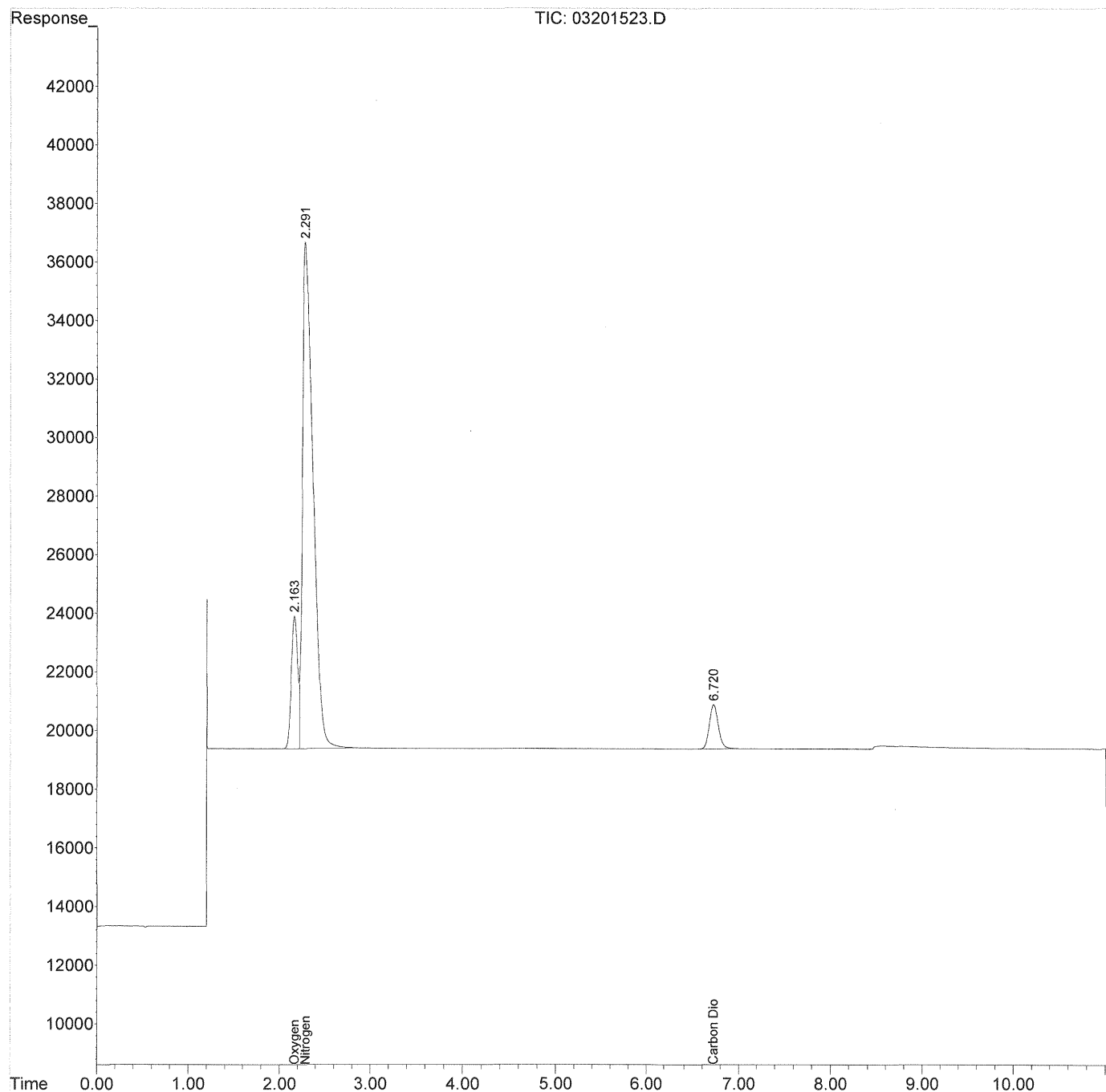
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201523.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 1:43 pm
Operator : NL
Sample : 1103-013
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:43 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201524.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 1:58 pm
Operator : NL
Sample : 1103-013
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:46 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.146	226837	137265.439 ppm
3) Nitrogen	2.273	1407985	733328.365 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.717	104322	48488.451 ppm

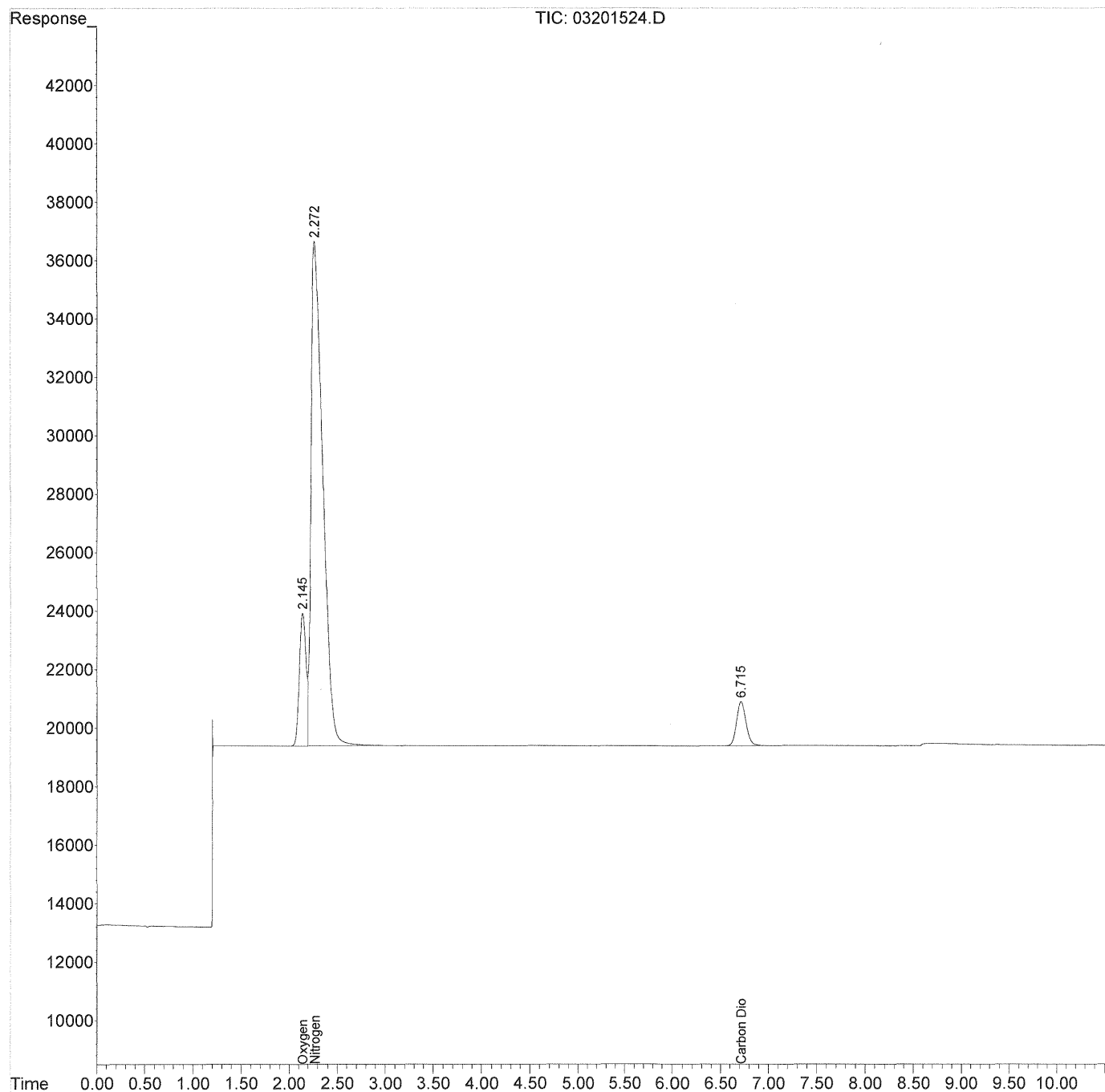
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201524.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 1:58 pm
Operator : NL
Sample : 1103-013
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:46 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201525.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 2:12 pm
Operator : NL
Sample : 1103-015
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:49 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.143	222951	134913.522	ppm
3) Nitrogen	2.270	1402413	730425.934	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.716	106969	49718.695	ppm

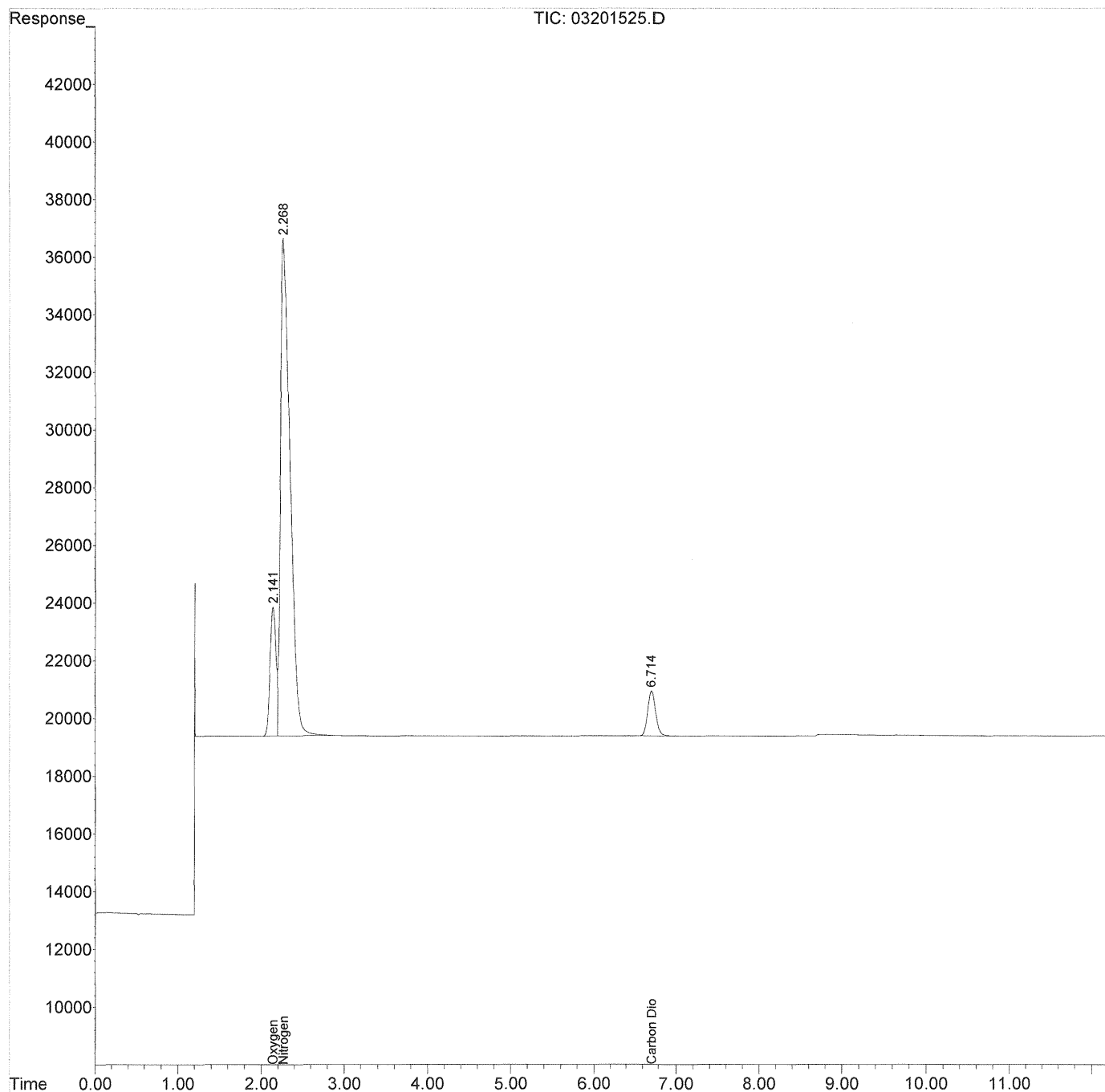
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201525.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 2:12 pm
Operator : NL
Sample : 1103-015
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:49 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201527.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 2:44 pm
Operator : NL
Sample : 1103-015
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:53 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.124	219391	132759.415 ppm
3) Nitrogen	2.252	1386076	721917.247 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.708	105394	48986.519 ppm

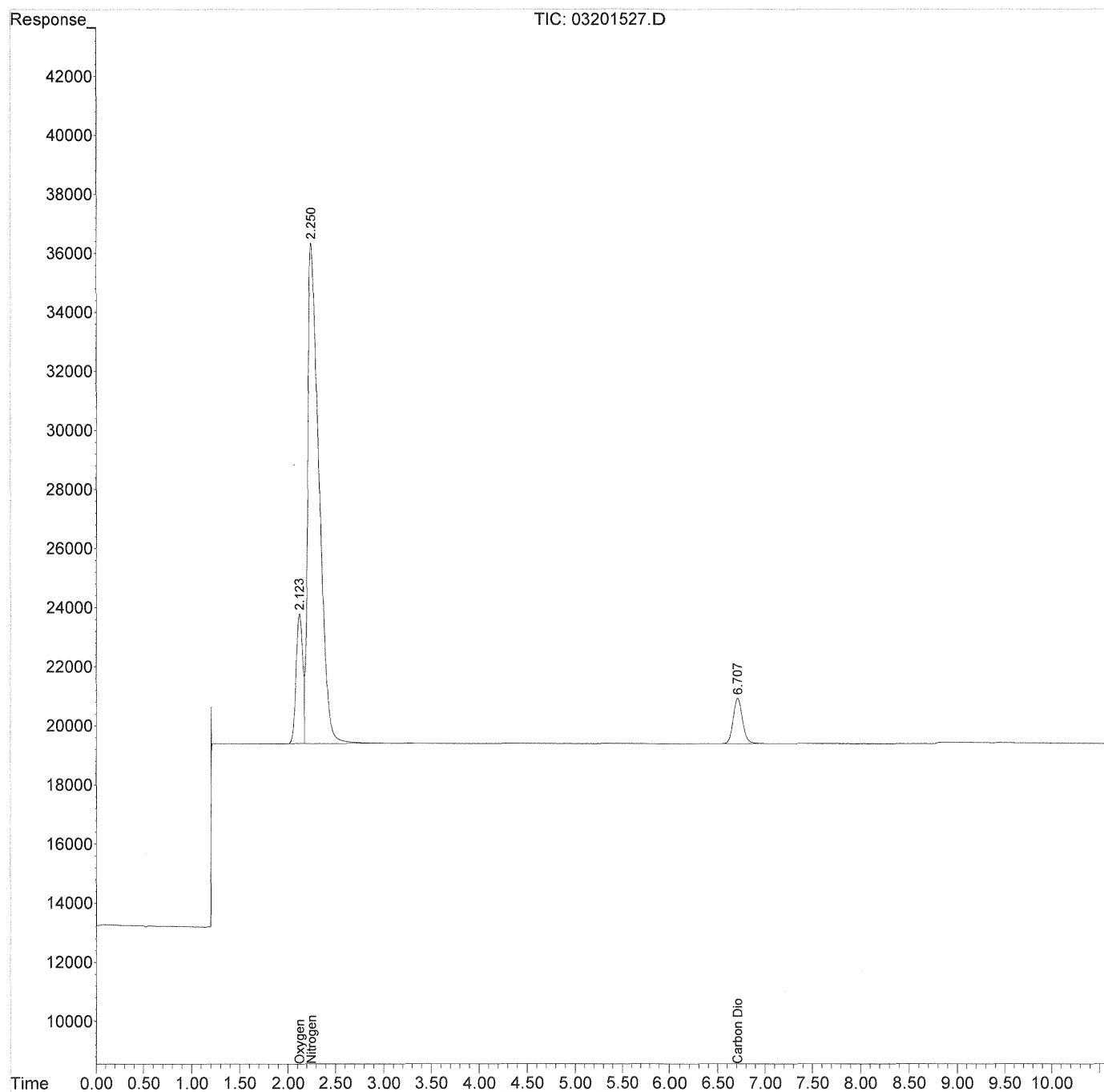
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201527.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 2:44 pm
Operator : NL
Sample : 1103-015
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:53 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201528.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 3:02 pm
Operator : NL
Sample : 1103-015
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:10:57 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.160	217485	131606.069	ppm
3) Nitrogen	2.288	1364425	710640.392	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.715	104004	48340.648	ppm

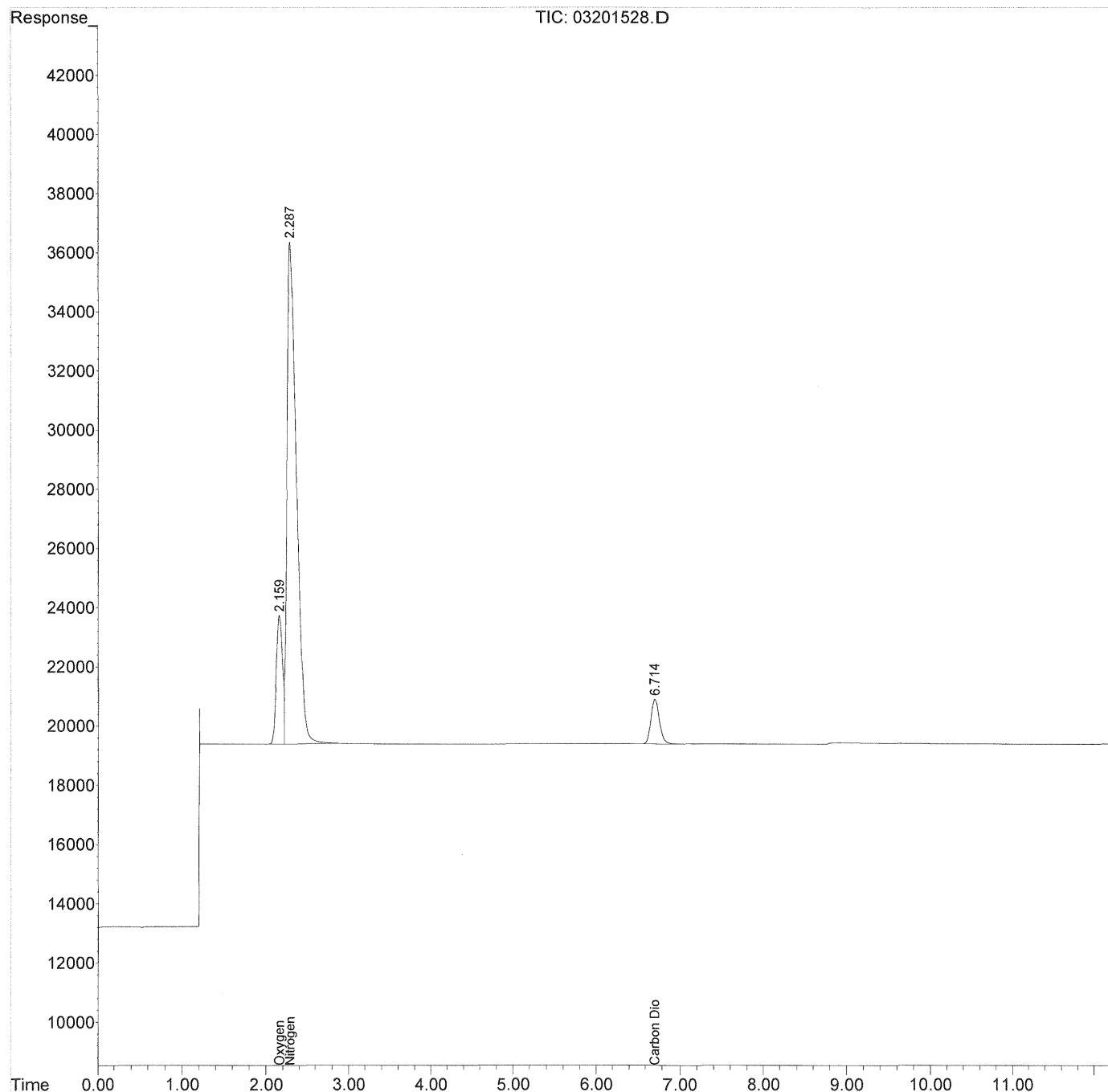
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201528.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 3:02 pm
 Operator : NL
 Sample : 1103-015
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:10:57 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201530.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 3:40 pm
Operator : NL
Sample : 1103-017
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:11:00 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.161	204674	123853.792 ppm
3) Nitrogen	2.291	1281229	667309.245 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.714	96832	45007.119 ppm

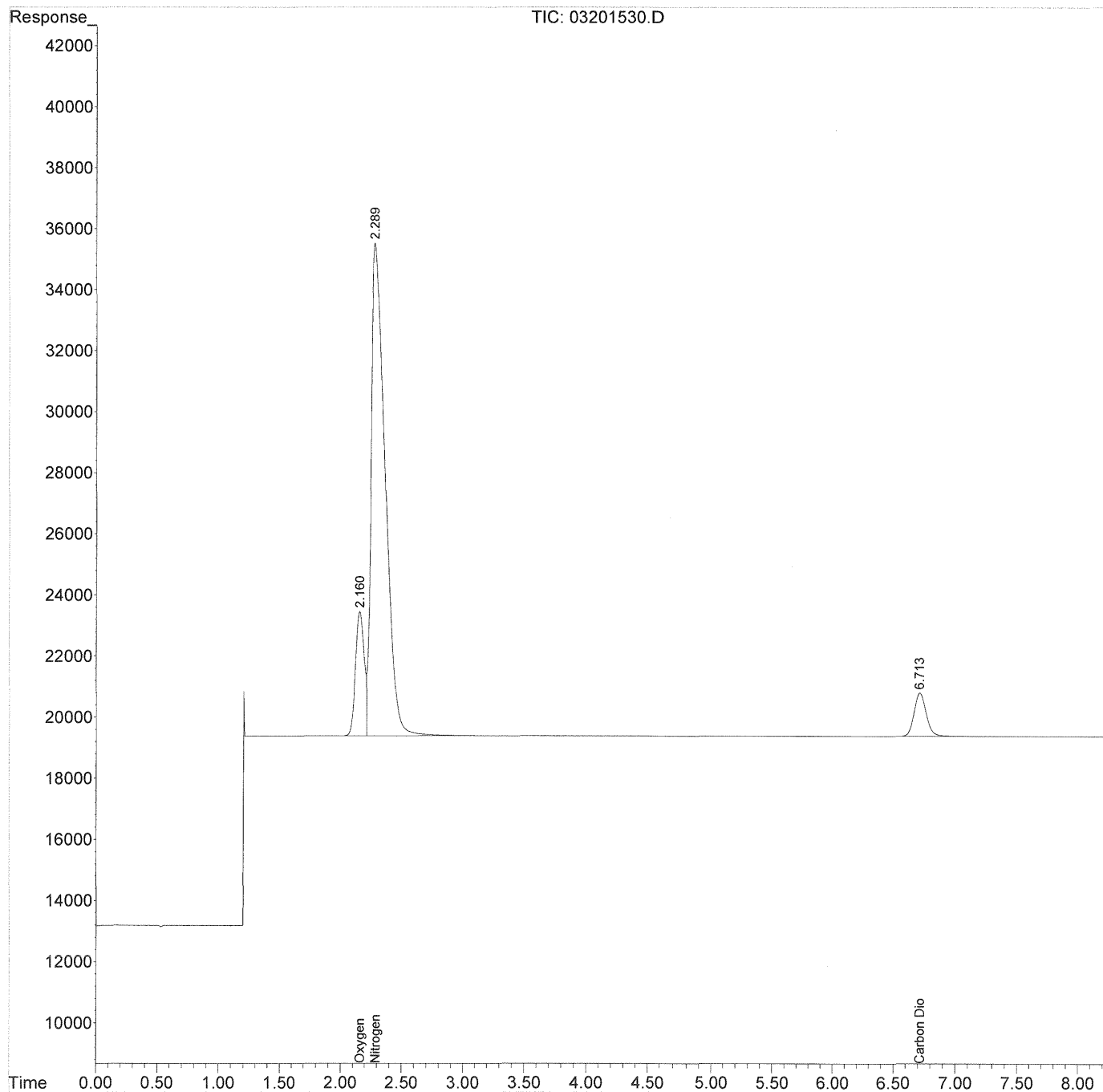
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201530.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 3:40 pm
 Operator : NL
 Sample : 1103-017
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:11:00 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201531.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 3:52 pm
Operator : NL
Sample : 1103-017
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:11:03 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.152	217754	131768.558	ppm
3) Nitrogen	2.279	1366841	711898.878	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.711	103859	48273.409	ppm

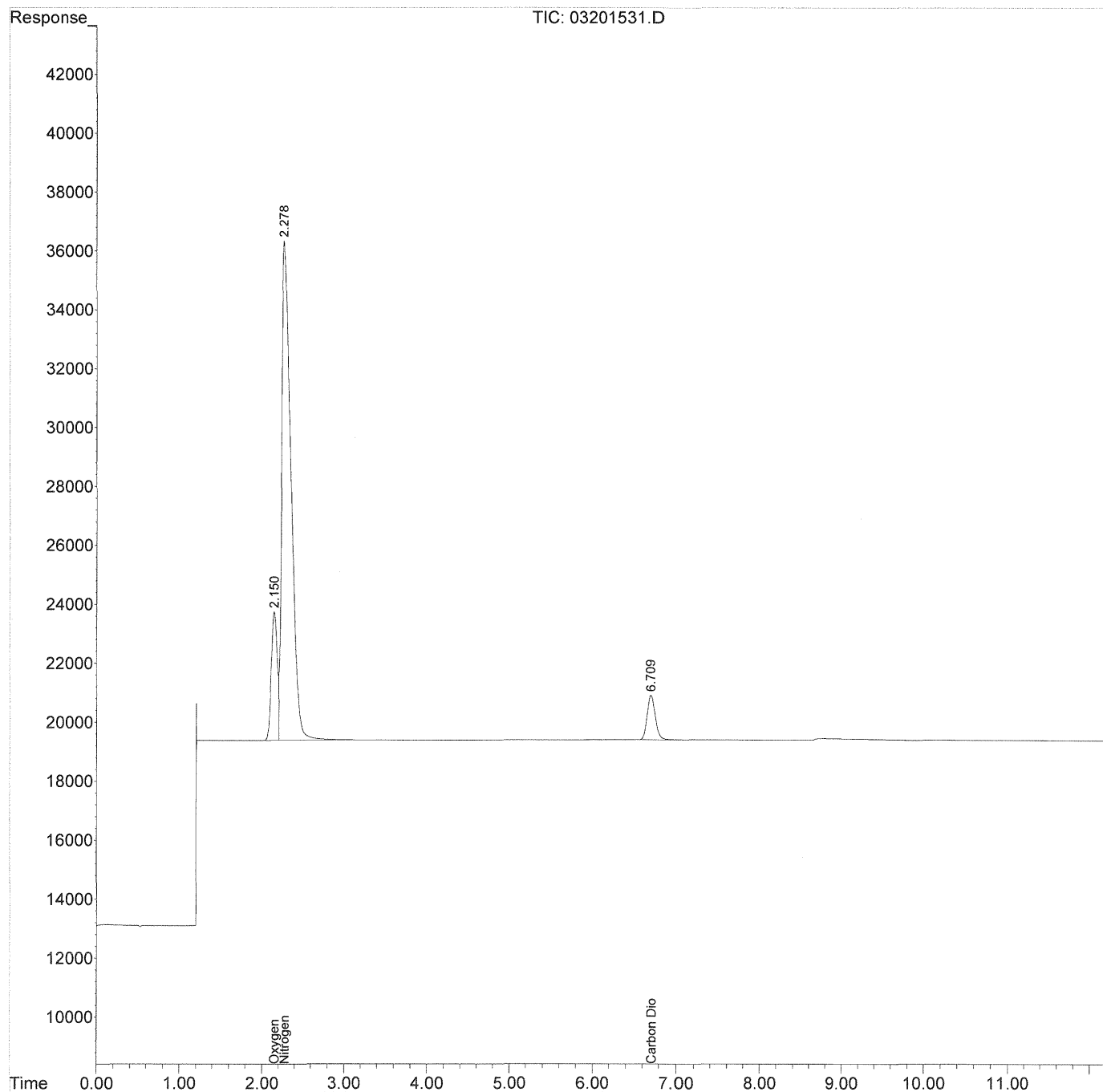
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201531.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 3:52 pm
Operator : NL
Sample : 1103-017
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:11:03 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201532.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 4:11 pm
Operator : NL
Sample : 1103-017
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:11:06 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.157	213974	129481.738 ppm
3) Nitrogen	2.286	1342305	699119.673 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.713	101689	47264.821 ppm

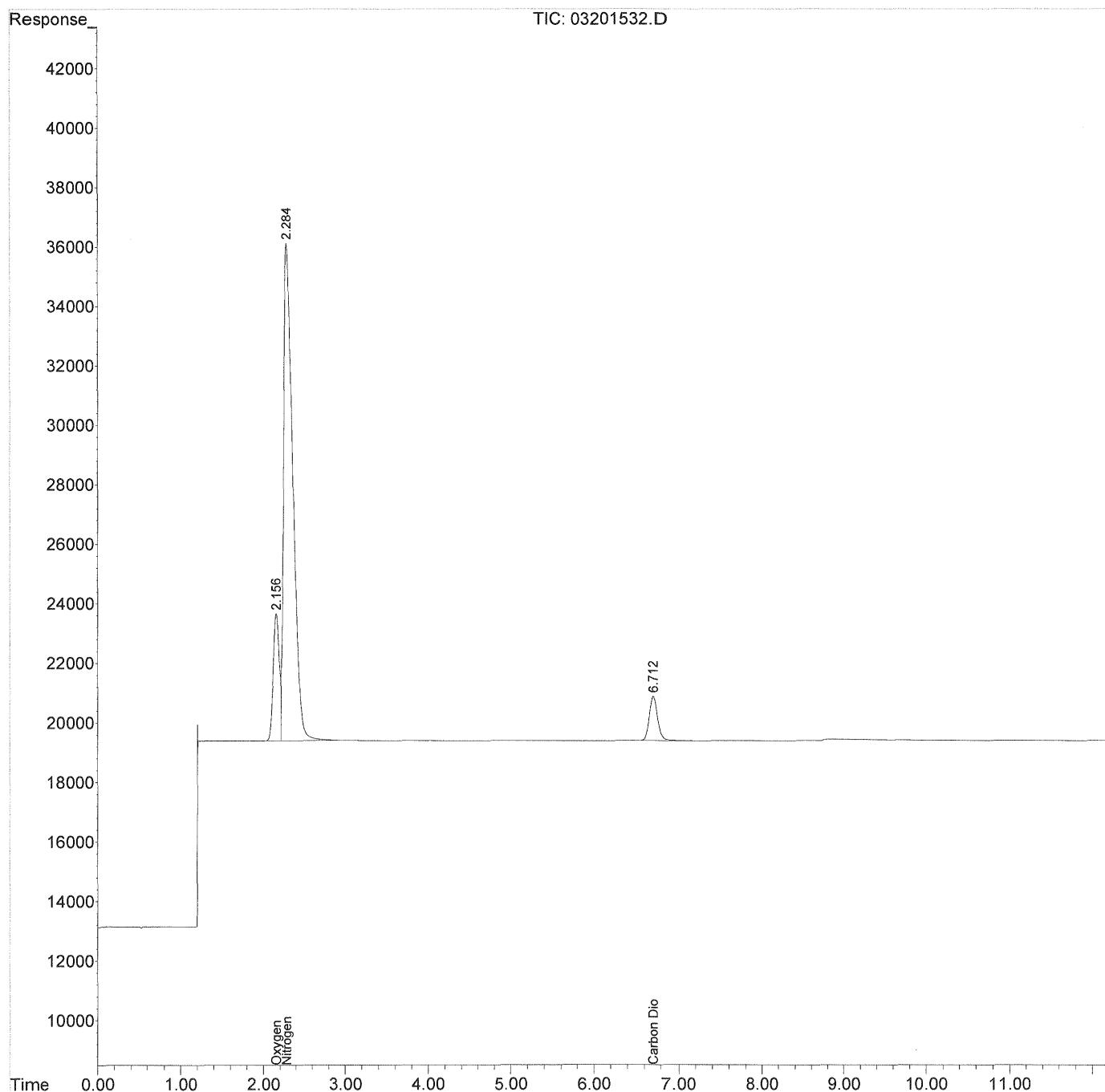
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201532.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 4:11 pm
Operator : NL
Sample : 1103-017
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:11:06 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201502.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:43 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:34 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	0.000	0	N.D.	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	0.000	0	N.D.	ppm

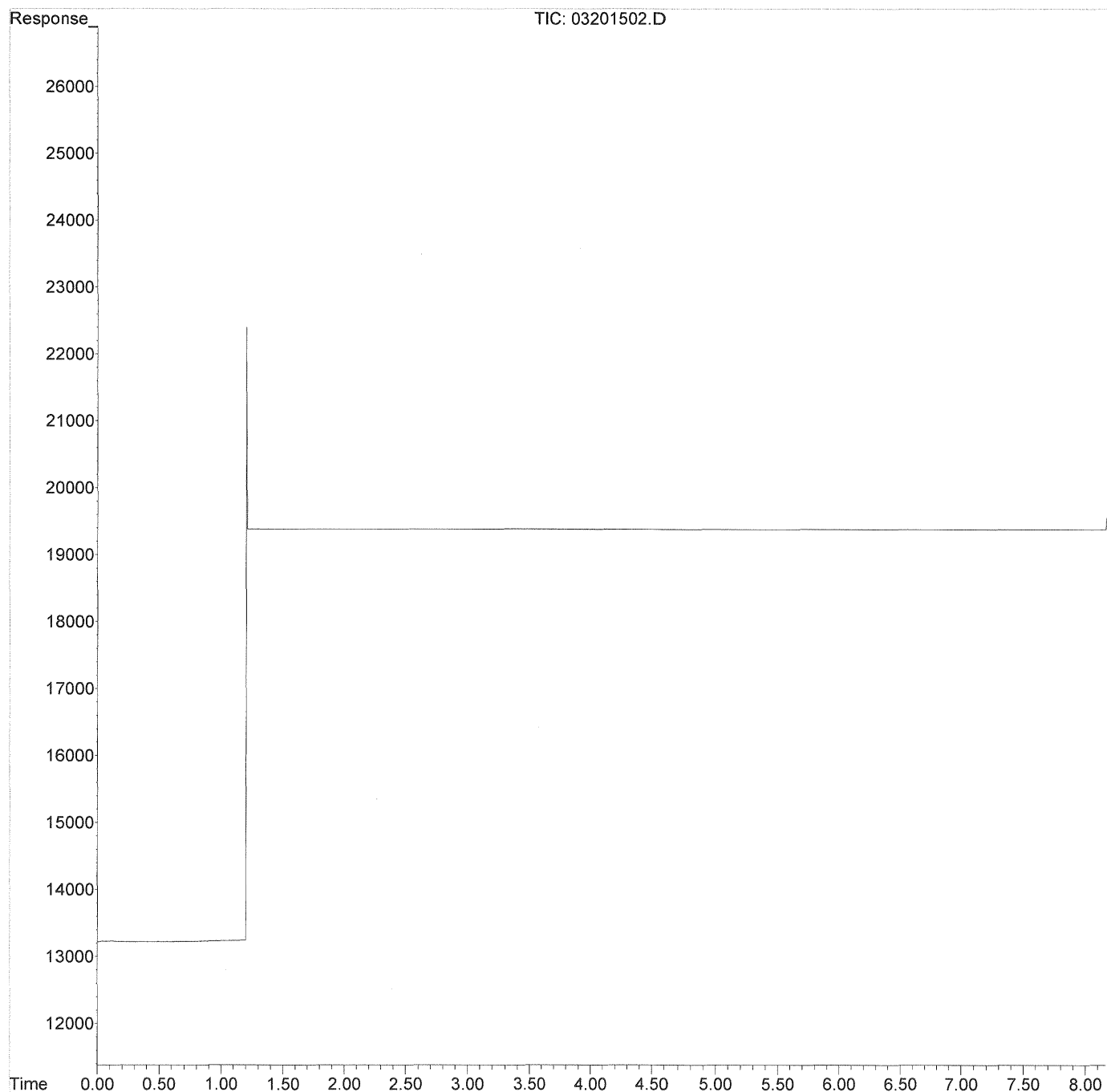
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201502.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:43 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:34 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Response Factor Report GC01

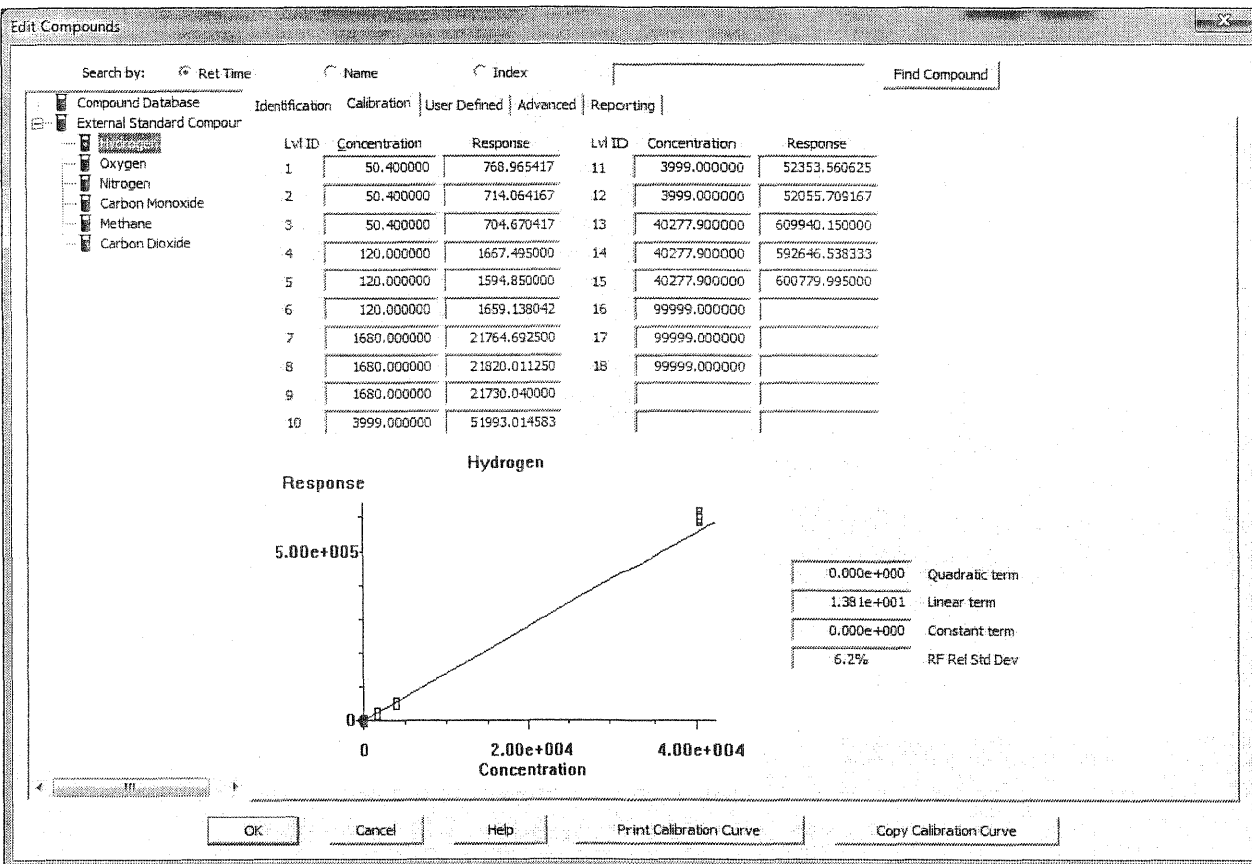
Method Path : J:\GC01\METHODS\
Method File : TR031014.M
Title : EPA 3C GC/TCD Analysis for Fixed Gases
Last Update : Tue Mar 11 11:04:23 2014
Response Via : Initial Calibration

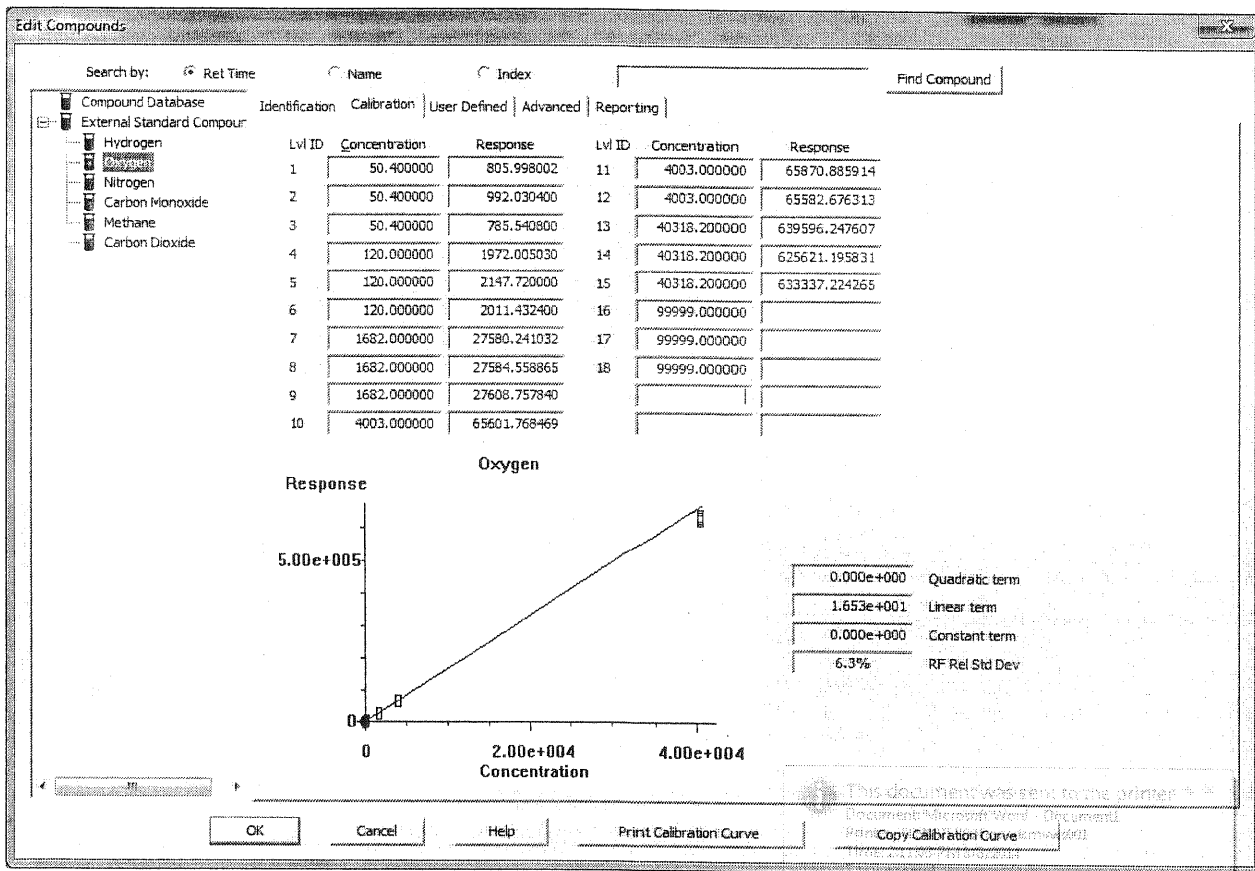
Calibration Files

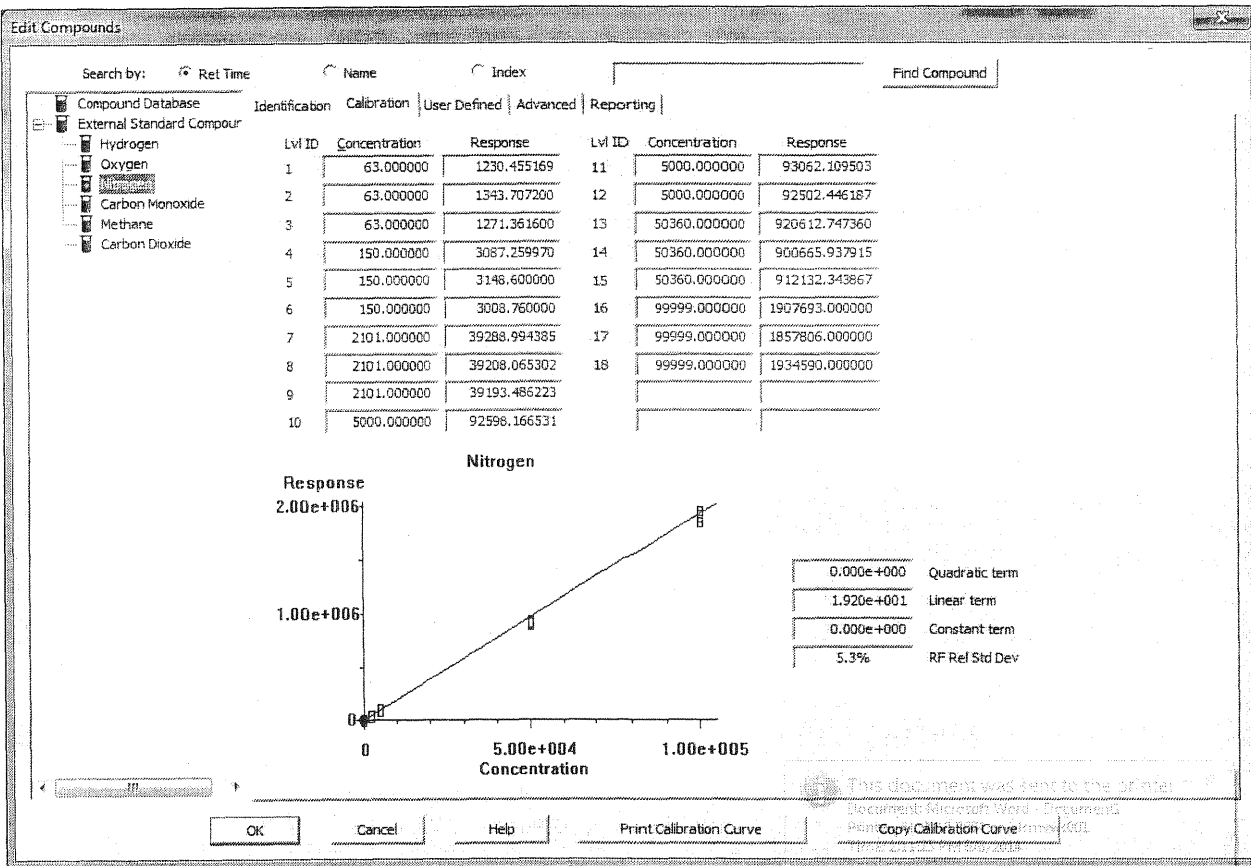
1	=03101403.D	2	=03101404.D	3	=03101405.D
4	=03101406.D	5	=03101407.D	6	=03101408.D

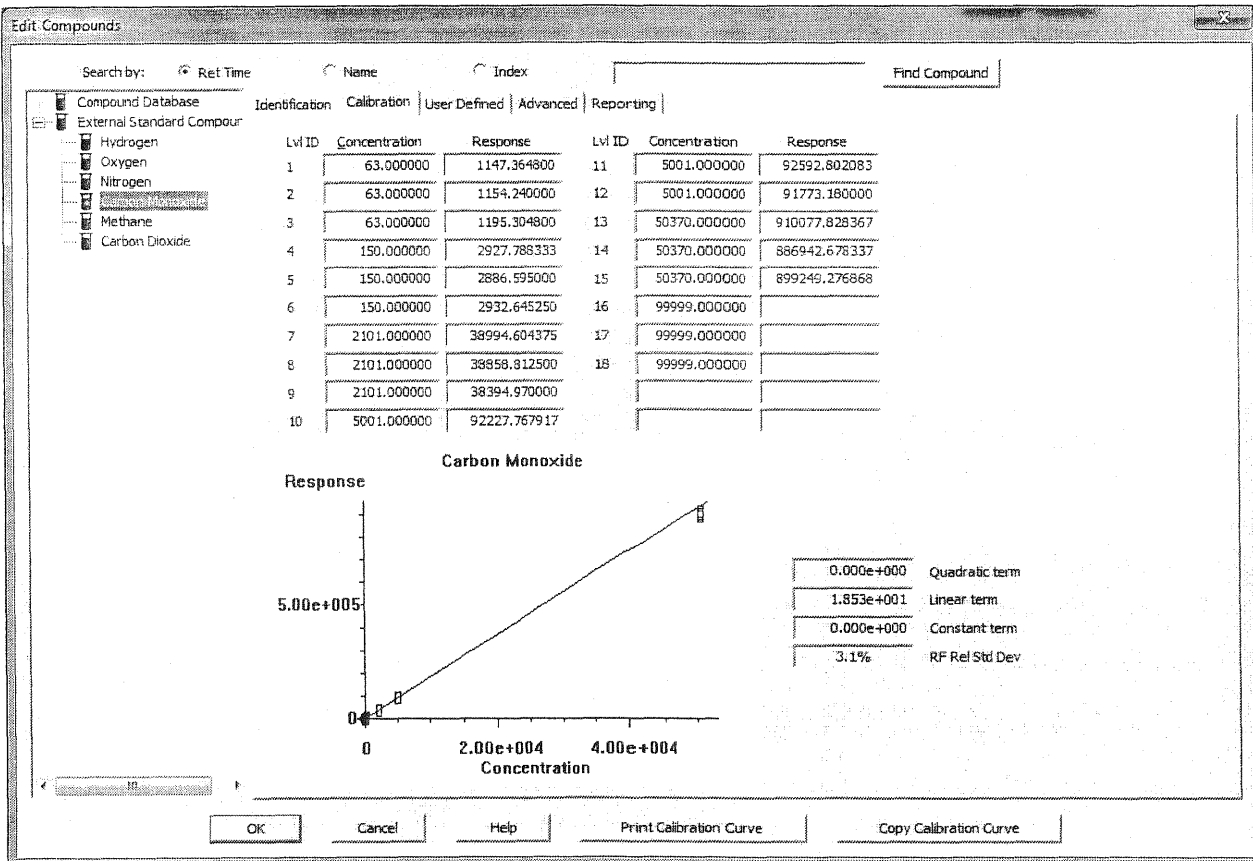
	Compound	1	2	3	4	5	6	Avg	%RSD
1)	Hydrogen	1.526	1.417	1.398	1.390	1.329	1.383	1.381 E1	6.22
2)	Oxygen	1.599	1.968	1.559	1.643	1.790	1.676	1.653 E1	6.33
3)	Nitrogen	1.953	2.133	2.018	2.058	2.099	2.006	1.920 E1	5.33
4)	Carbon Monoxide	1.821	1.832	1.897	1.952	1.924	1.955	1.853 E1	3.06
5)	Methane	1.435	1.340	1.378	1.499	1.440	1.406	1.396 E1	3.12
6)	Carbon Dioxide	2.233	2.138	2.113	2.234	2.287	2.291	2.151 E1	3.66

(#) = Out of Range ### Number of calibration levels exceeded format ###









Edit Compound:

Search by: ☒ Ret Time ☐ Name ☐ Index

Find Compound

Compound Database
External Standard Compound

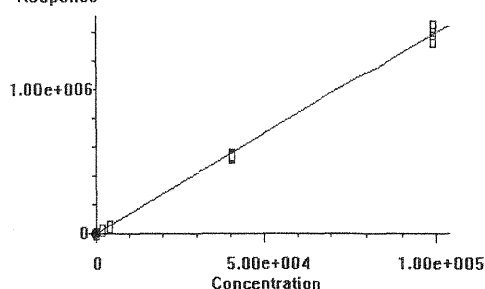
Identification Calibration User Defined Advanced Reporting

Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Carbon Dioxide

Lvl ID	Concentration	Response	Lvl ID	Concentration	Response
1	50.400000	723.140000	11	3997.000000	55752.950000
2	50.400000	675.383200	12	3997.000000	55455.680000
3	50.400000	694.617600	13	40257.800000	546936.063750
4	120.000000	1798.500536	14	40257.800000	533861.842500
5	120.000000	1727.949000	15	40257.800000	540875.842500
6	120.000000	1687.075750	16	99000.000000	1340274.000000
7	1680.000000	23625.609286	17	99000.000000	1390484.000000
8	1680.000000	23724.020000	18	99000.000000	1439175.000000
9	1680.000000	23488.758750			
10	3997.000000	55567.496500			

Response

Methane



0.000e+000	Quadratic term
1.396e+001	Linear term
0.000e+000	Constant term
3.1%	RF Rel Std Dev

OK

Cancel

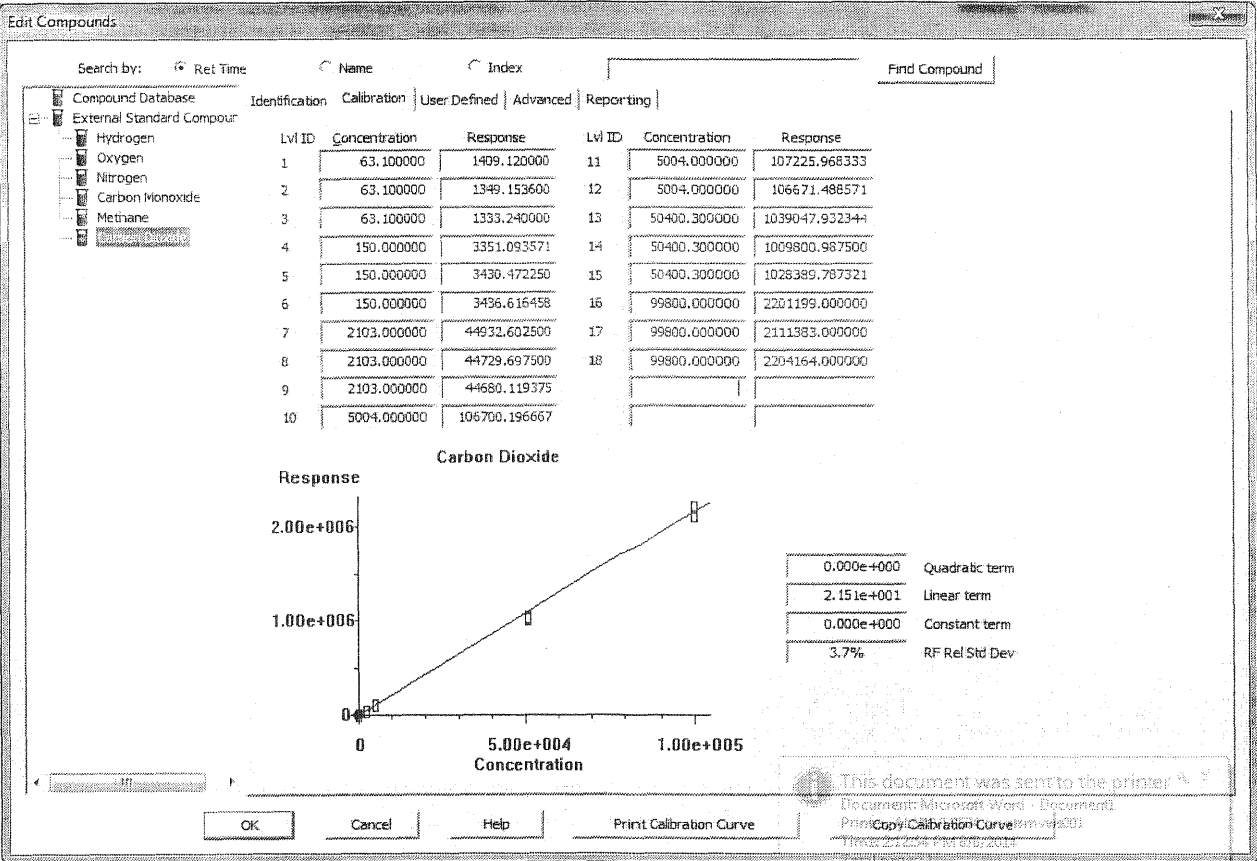
Help

Print Calibration Curve

This document was sent to the printer

Document: Microsoft Word - Document1

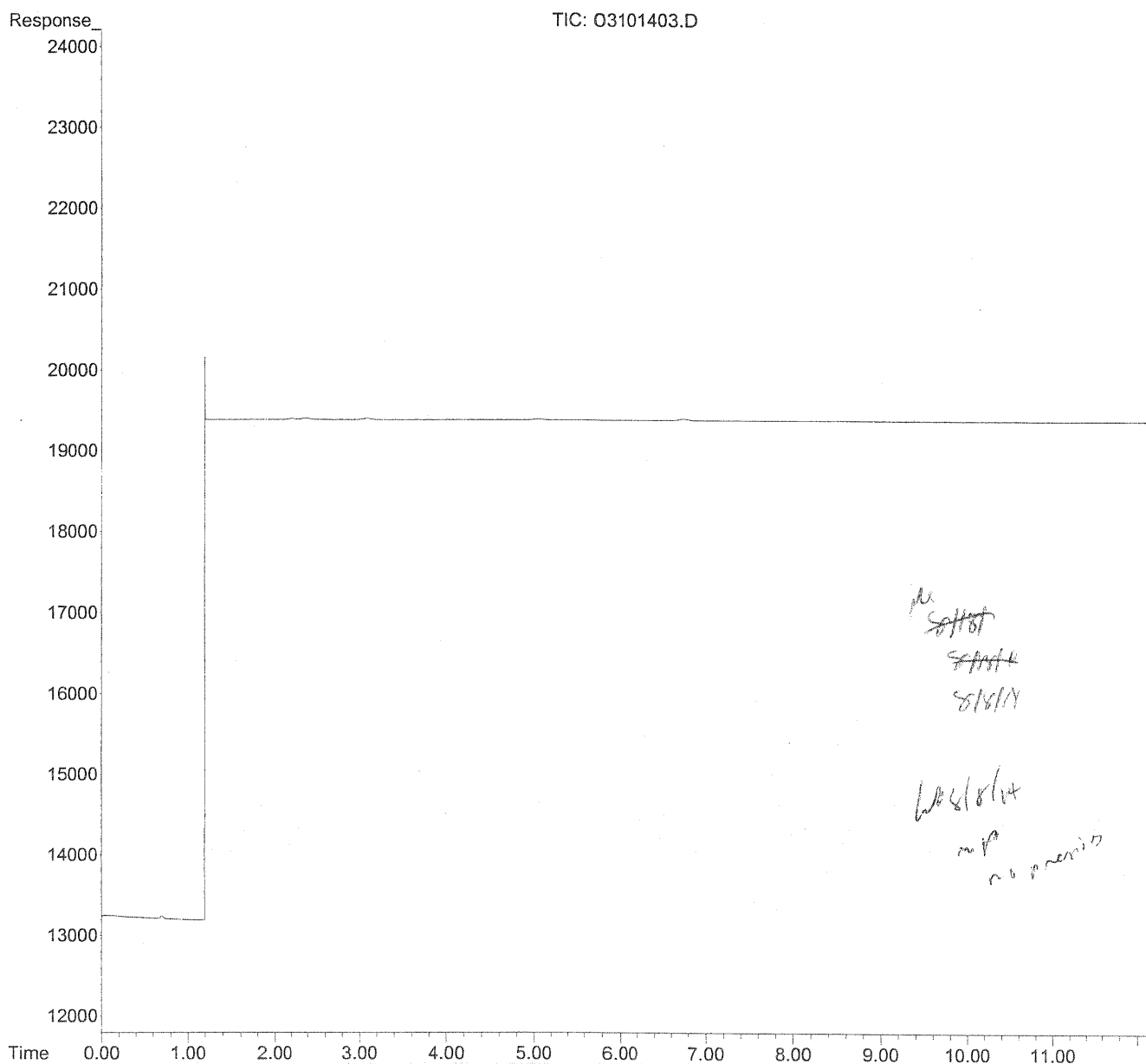
Print Copy Calibration Curve



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.700	769	NoCal	ppm
2) Oxygen	2.227	806	NoCal	ppm m
3) Nitrogen	2.393	1230	NoCal	ppm m
4) Carbon Monoxide	3.092	1147	NoCal	ppm m
5) Methane	5.085	723	NoCal	ppm m
6) Carbon Dioxide	6.748	1409	NoCal	ppm m

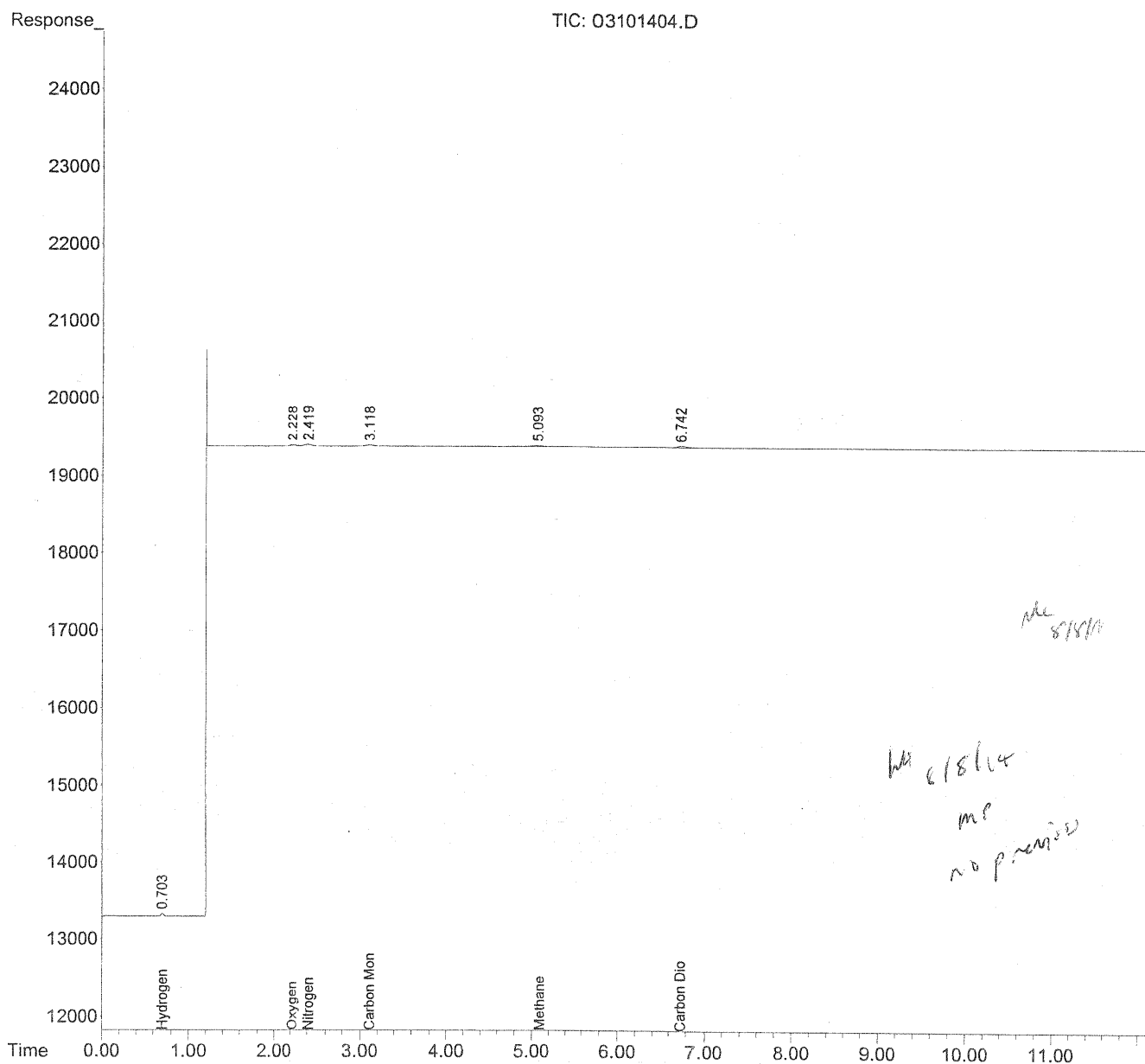
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.704	714	468.016	ppm
2) Oxygen	2.228	992	620.328	ppm m
3) Nitrogen	2.419	1344	687.986	ppm m
4) Carbon Monoxide	3.118	1154	633.775	ppm m
5) Methane	5.093	675	470.715	ppm m
6) Carbon Dioxide	6.742	1349	604.147	ppm m

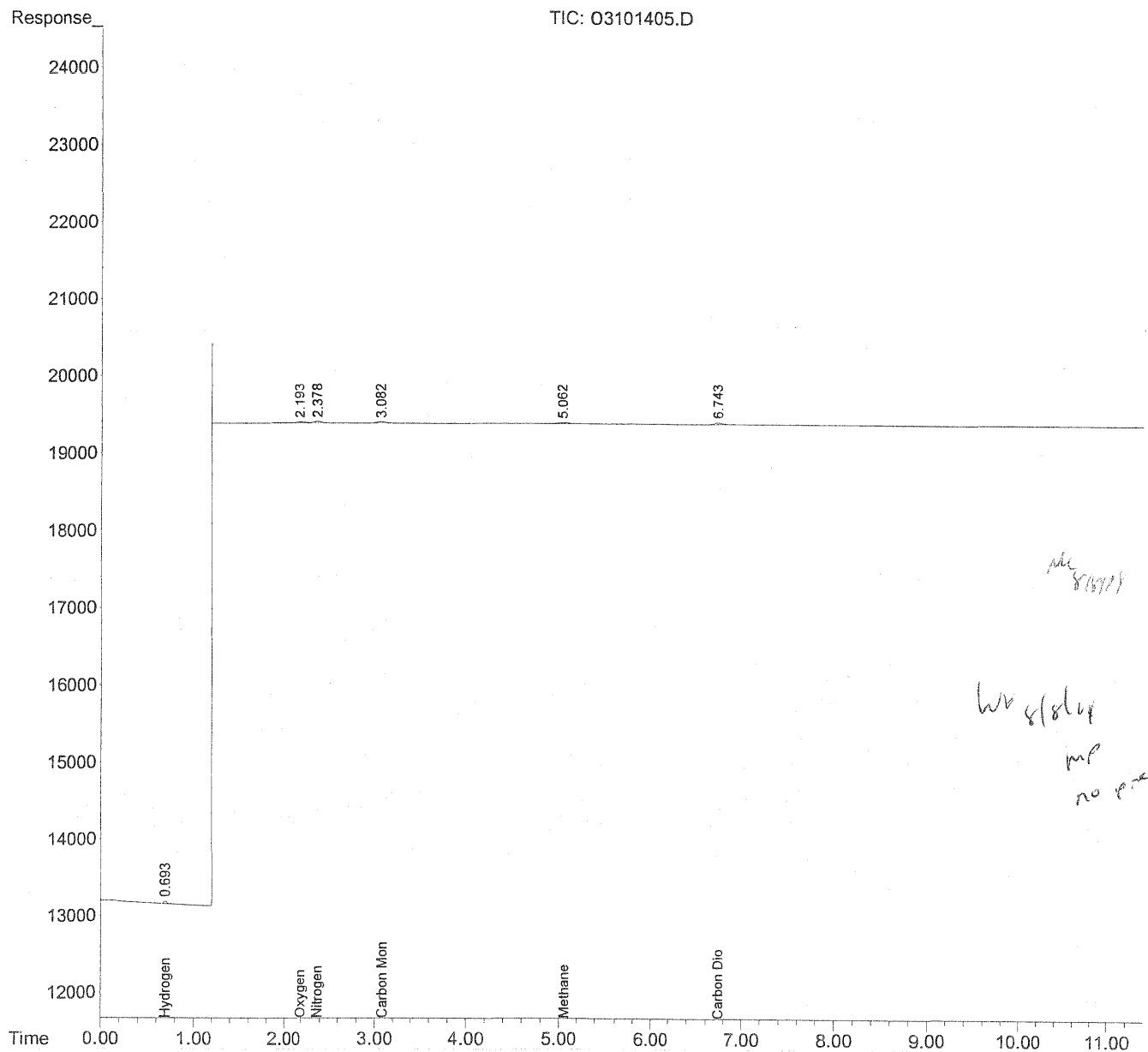
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101405.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:44
Operator : WH
Sample : std 1 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:20 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:15:04 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101405.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:44
Operator : WH
Sample : std 1 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:20 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:15:04 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.695	705	478.957	ppm
2) Oxygen	2.193	786	440.385	ppm m
3) Nitrogen	2.378	1271	592.487	ppm m
4) Carbon Monoxide	3.082	1195	654.363	ppm m
5) Methane	5.062	695	500.653	ppm m
6) Carbon Dioxide	6.743	1333	610.001	ppm m

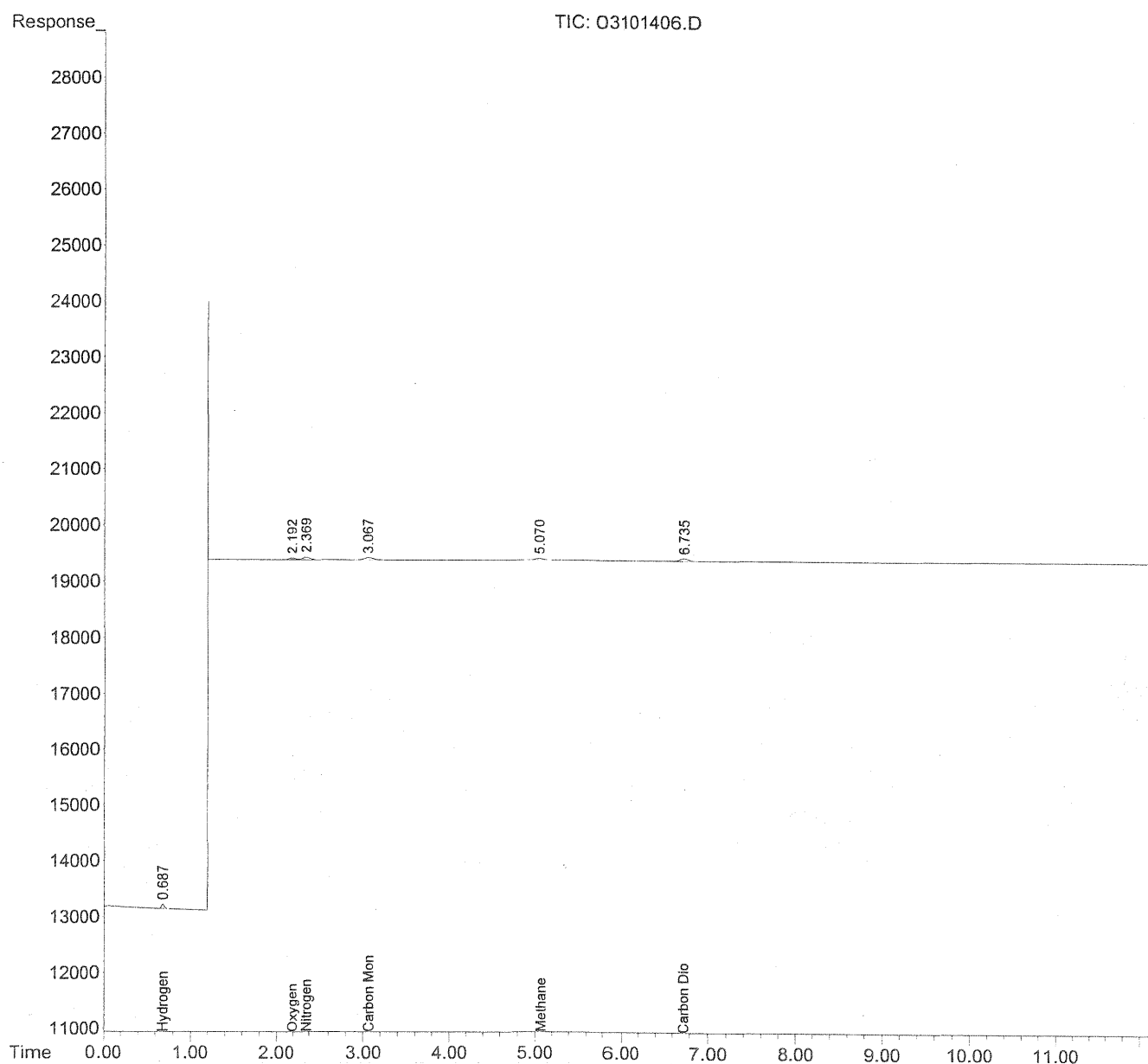
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.688	1667	1152.467 ppm
2) Oxygen	2.195	1972	1154.090 ppm
3) Nitrogen	2.367	3087	1467.876 ppm
4) Carbon Monoxide	3.067	2928	1582.403 ppm
5) Methane	5.070	1799	1299.164 ppm
6) Carbon Dioxide	6.738	3351	1550.434 ppm

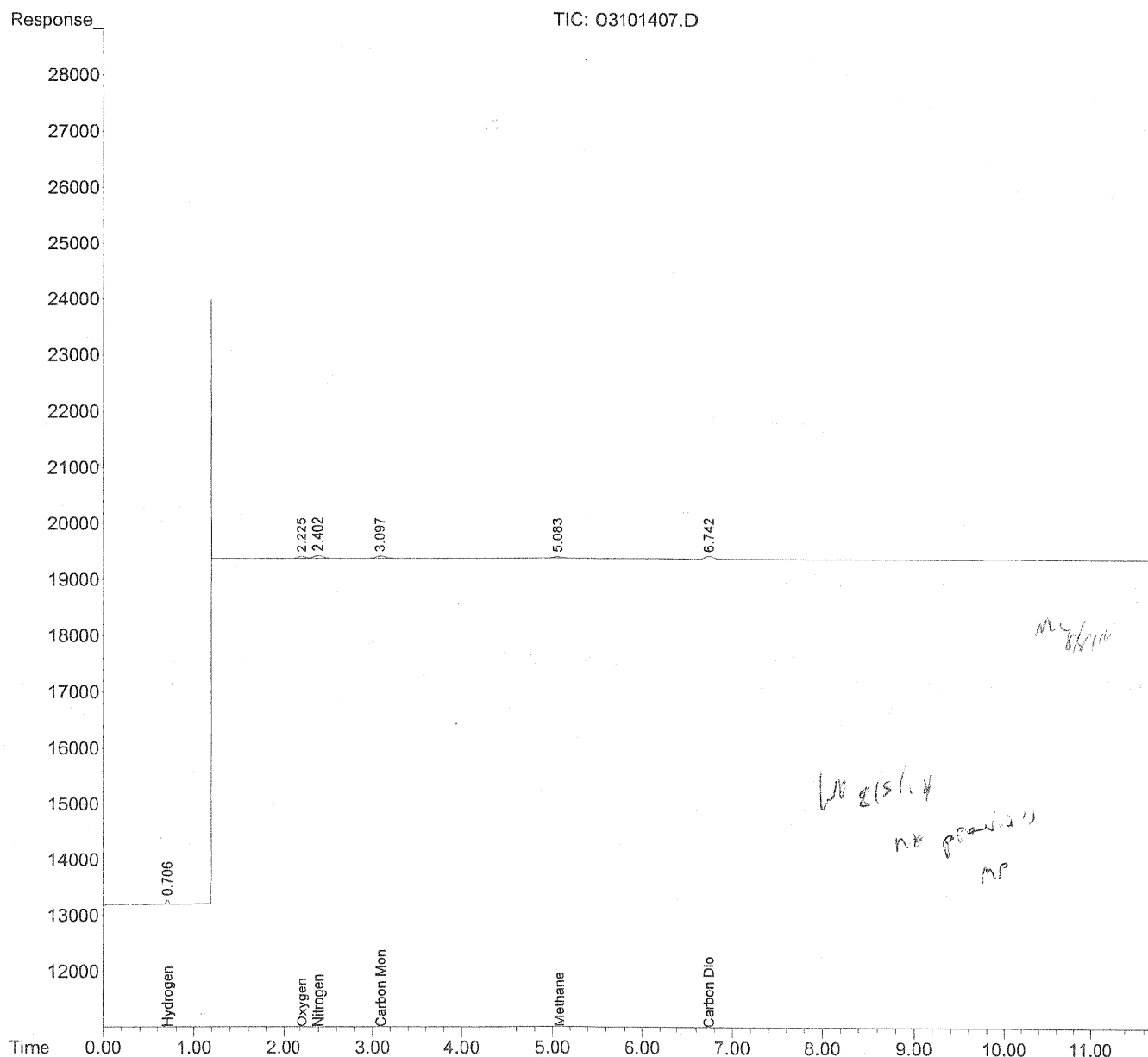
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.708	1595	1113.284	ppm
2) Oxygen	2.225	2148	1269.063	ppm m
3) Nitrogen	2.402	3149	1505.099	ppm m
4) Carbon Monoxide	3.106	2887	1539.002	ppm
5) Methane	5.082	1728	1222.935	ppm
6) Carbon Dioxide	6.744	3430	1573.930	ppm

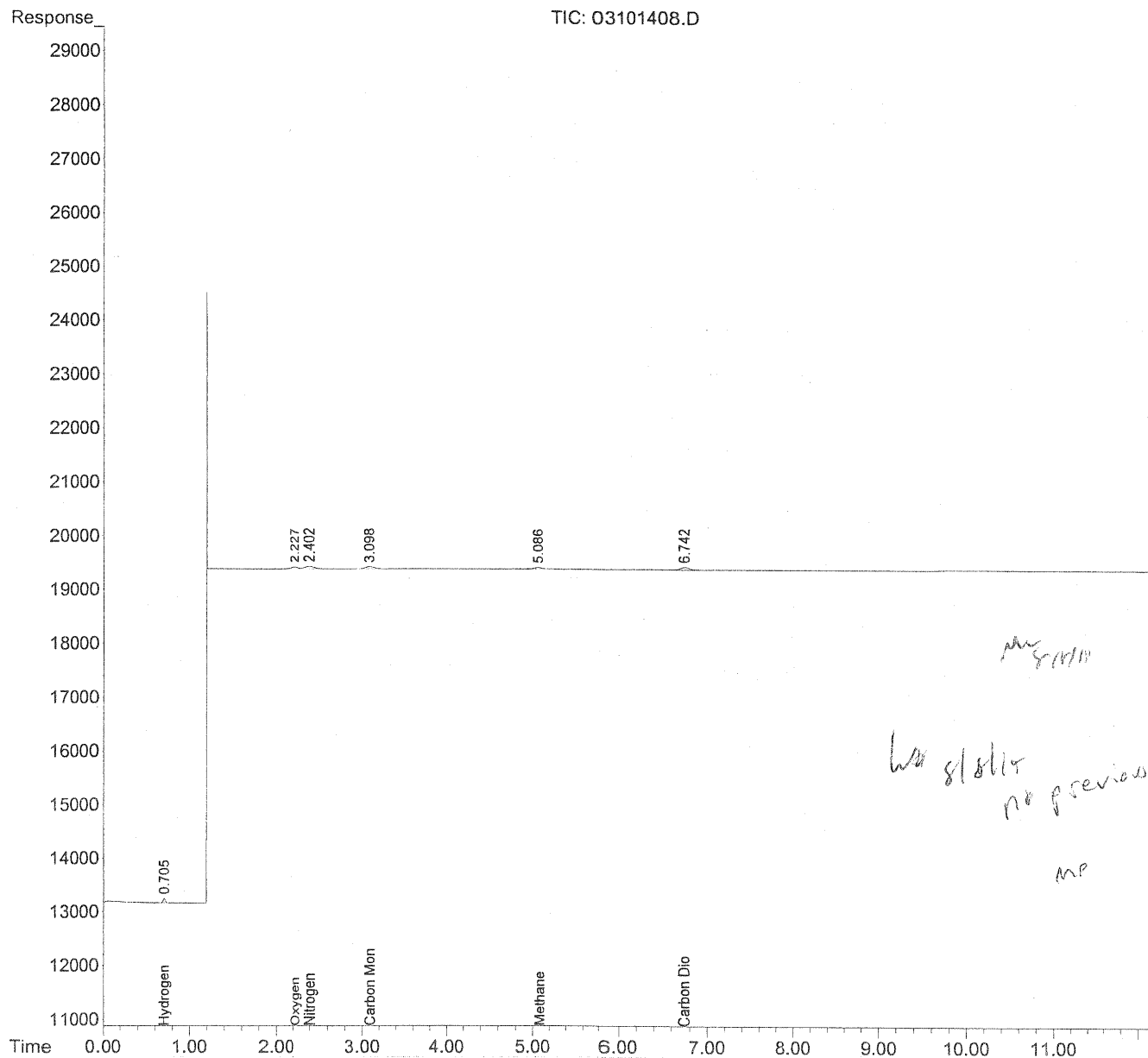
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.707	1659	1175.144	ppm
2) Oxygen	2.227	2011	1175.007	ppm m
3) Nitrogen	2.402	3009	1437.275	ppm m
4) Carbon Monoxide	3.103	2933	1555.465	ppm
5) Methane	5.087	1687	1189.461	ppm
6) Carbon Dioxide	6.745	3437	1561.358	ppm

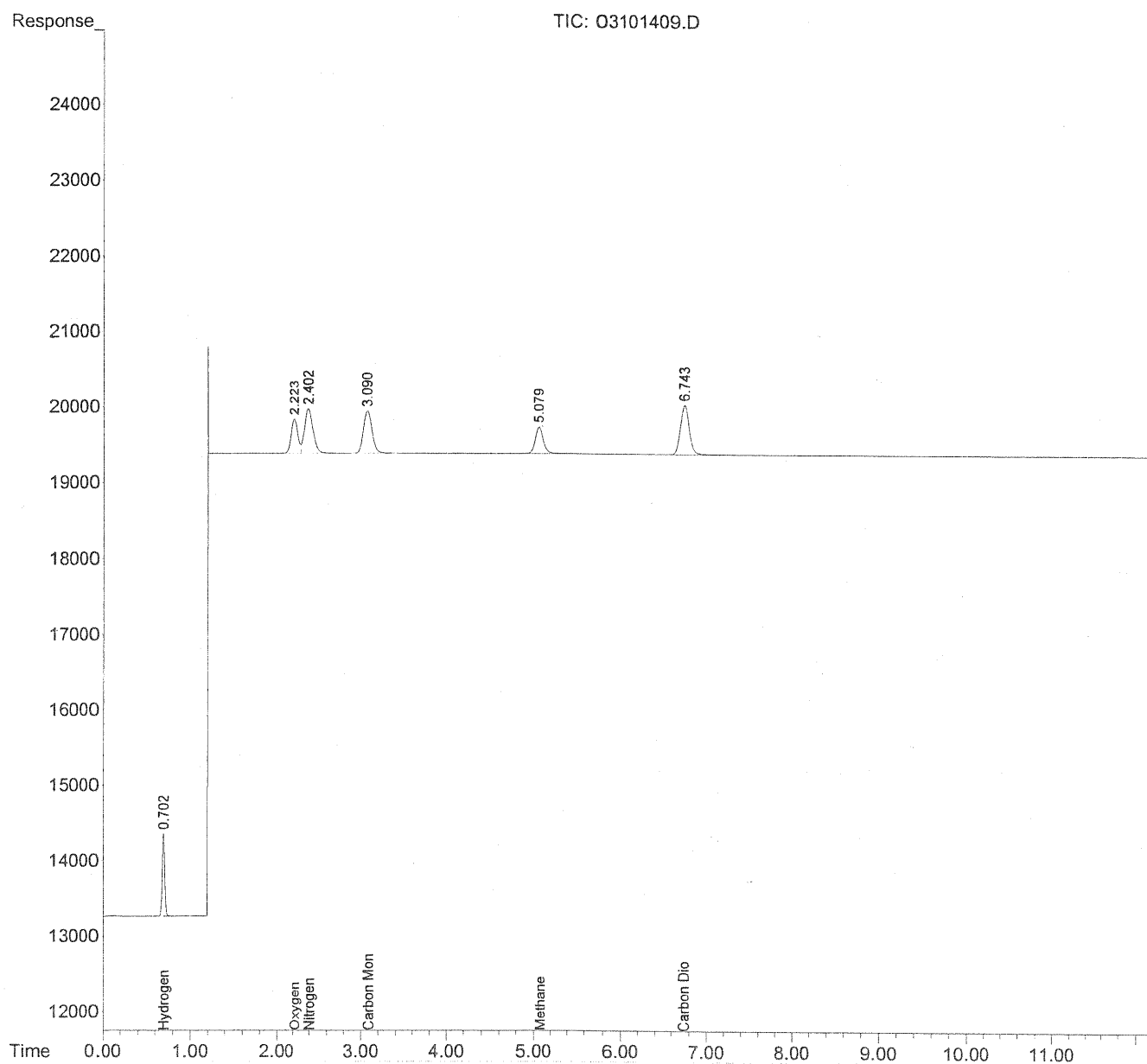
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21765	15469.029 ppm
2) Oxygen	2.225	27580	16167.517 ppm
3) Nitrogen	2.402	39289	18899.954 ppm
4) Carbon Monoxide	3.092	38995	20555.928 ppm
5) Methane	5.081	23626	16681.490 ppm
6) Carbon Dioxide	6.744	44933	20275.995 ppm

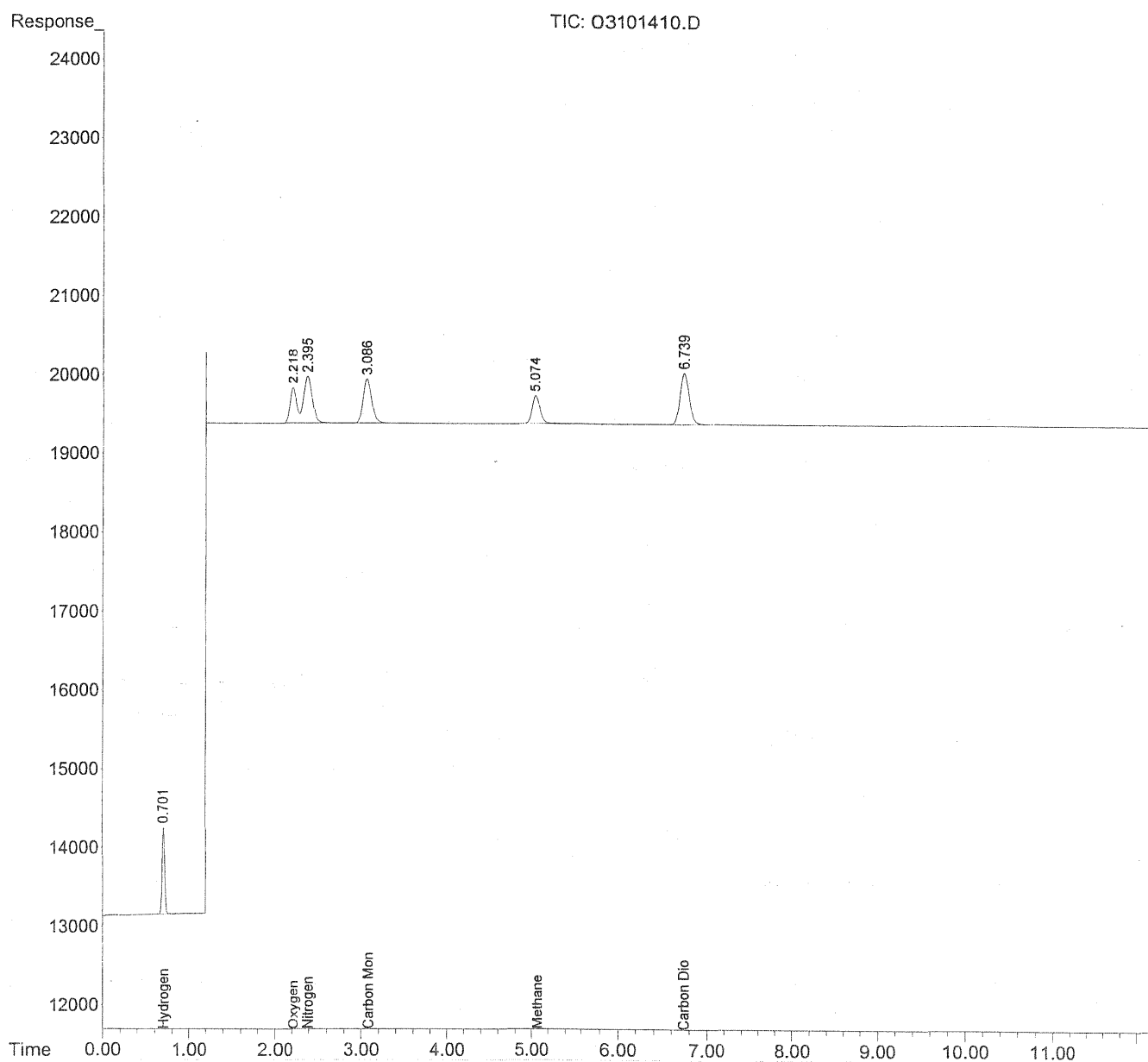
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	21820	15685.875 ppm
2) Oxygen	2.219	27585	16260.158 ppm
3) Nitrogen	2.397	39208	19135.565 ppm
4) Carbon Monoxide	3.087	38859	20547.786 ppm
5) Methane	5.076	23724	16767.873 ppm
6) Carbon Dioxide	6.740	44730	20288.350 ppm

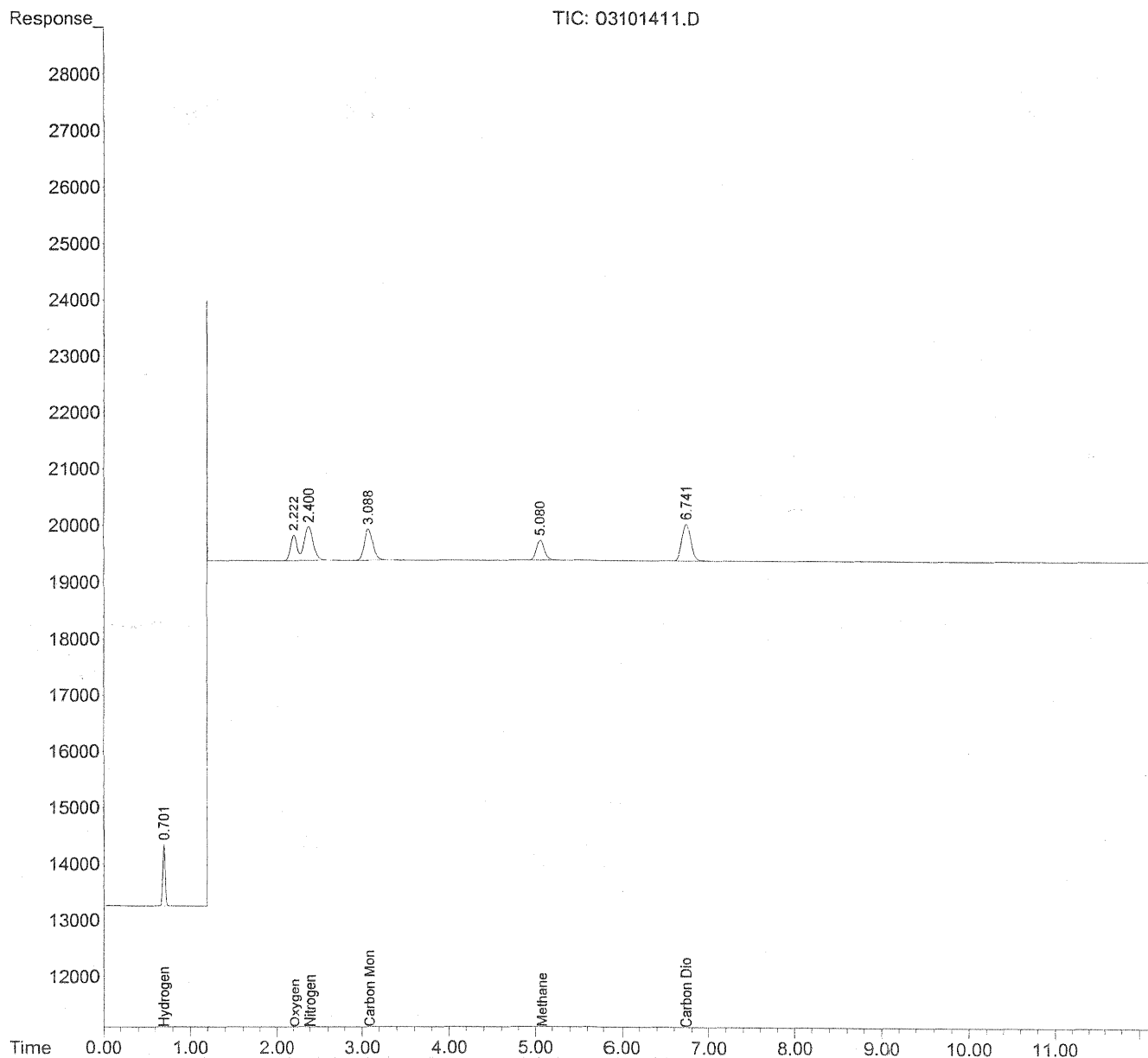
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21730	15751.773 ppm
2) Oxygen	2.224	27609	16342.415 ppm
3) Nitrogen	2.401	39193	19344.177 ppm
4) Carbon Monoxide	3.090	38395	20358.500 ppm
5) Methane	5.081	23489	16605.562 ppm
6) Carbon Dioxide	6.743	44680	20355.596 ppm

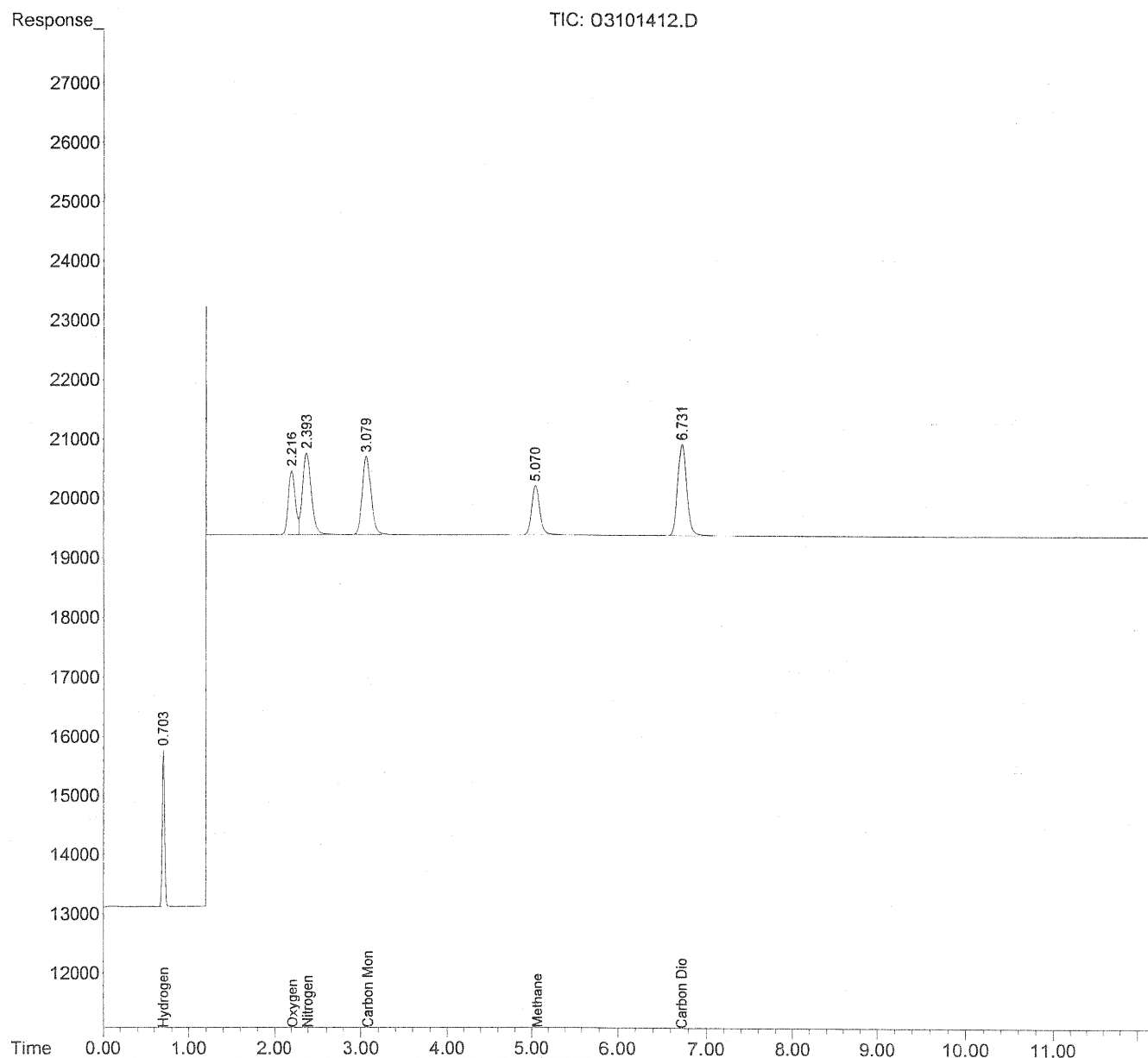
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.705	51993	37952.051 ppm
2) Oxygen	2.217	65602	38954.464 ppm
3) Nitrogen	2.394	92598	46108.575 ppm
4) Carbon Monoxide	3.081	92228	49071.809 ppm
5) Methane	5.072	55567	39334.461 ppm
6) Carbon Dioxide	6.733	106700	48784.847 ppm

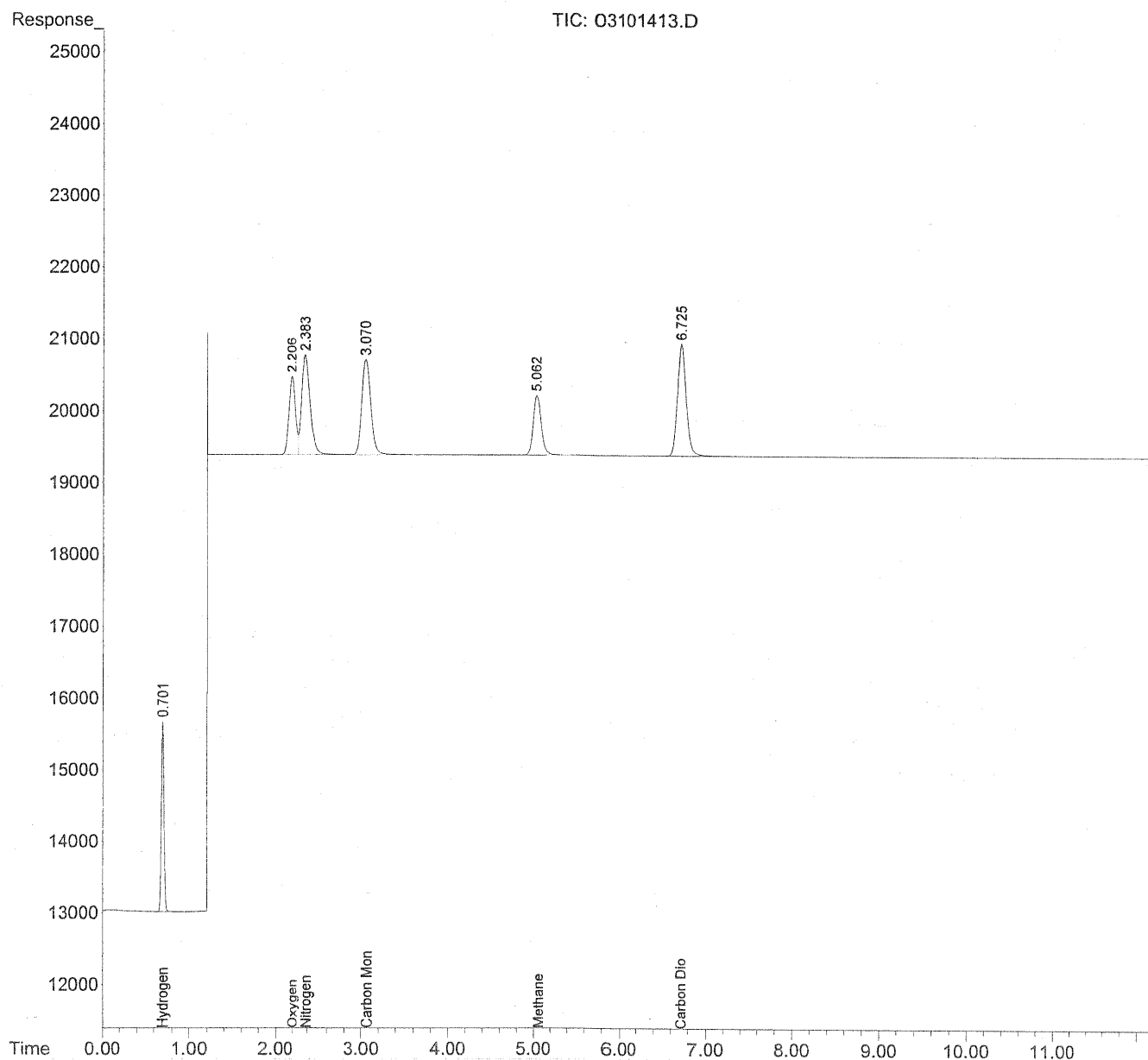
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	52354	38549.354 ppm
2) Oxygen	2.208	65871	39291.954 ppm
3) Nitrogen	2.385	93062	47432.408 ppm
4) Carbon Monoxide	3.072	92593	49417.144 ppm
5) Methane	5.064	55753	39568.314 ppm
6) Carbon Dioxide	6.726	107226	49228.245 ppm

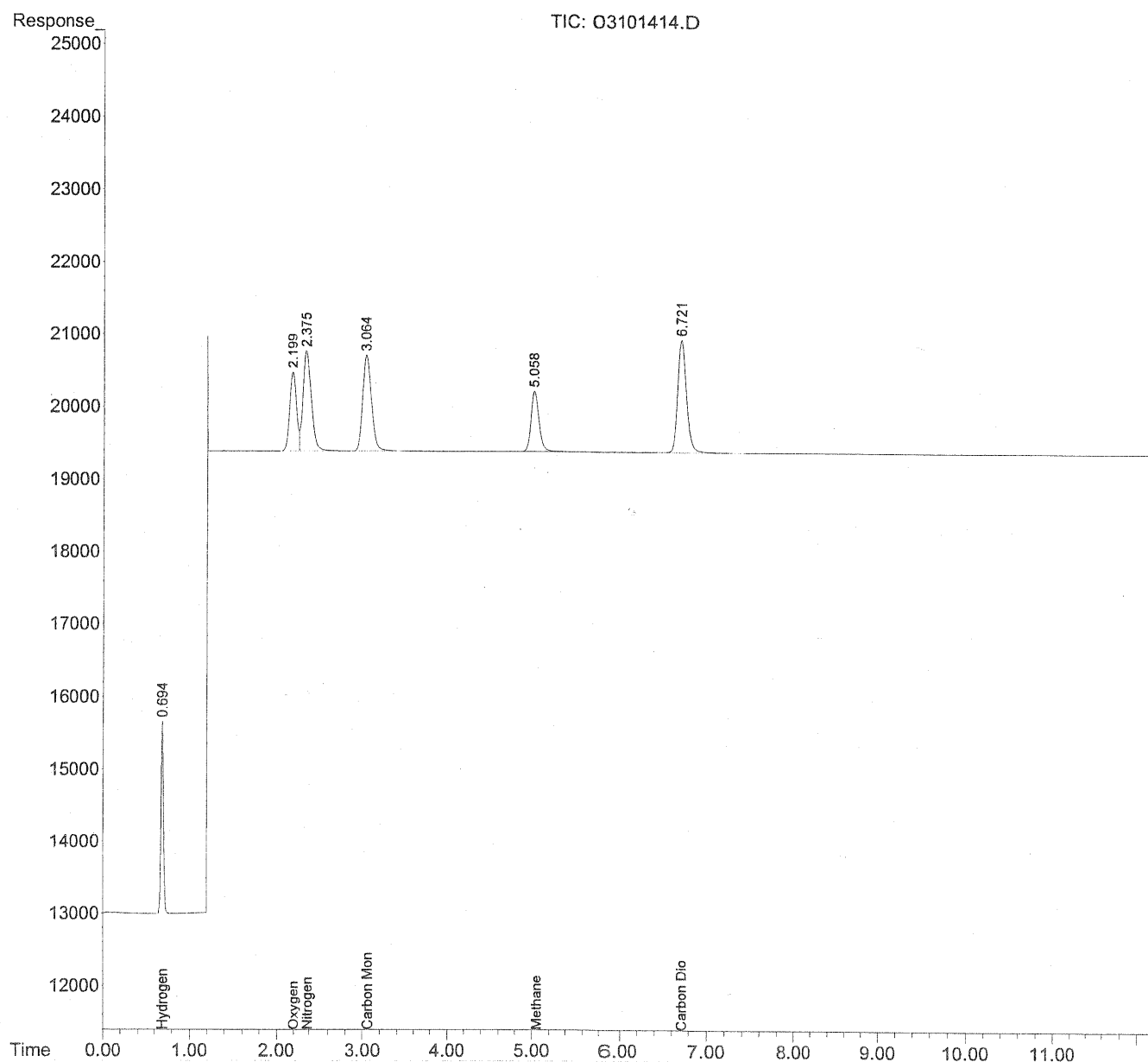
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.696	52056	37688.686 ppm
2) Oxygen	2.200	65583	39685.849 ppm
3) Nitrogen	2.377	92502	48078.649 ppm
4) Carbon Monoxide	3.065	91773	49520.215 ppm
5) Methane	5.059	55456	39726.222 ppm
6) Carbon Dioxide	6.723	106671	49580.495 ppm

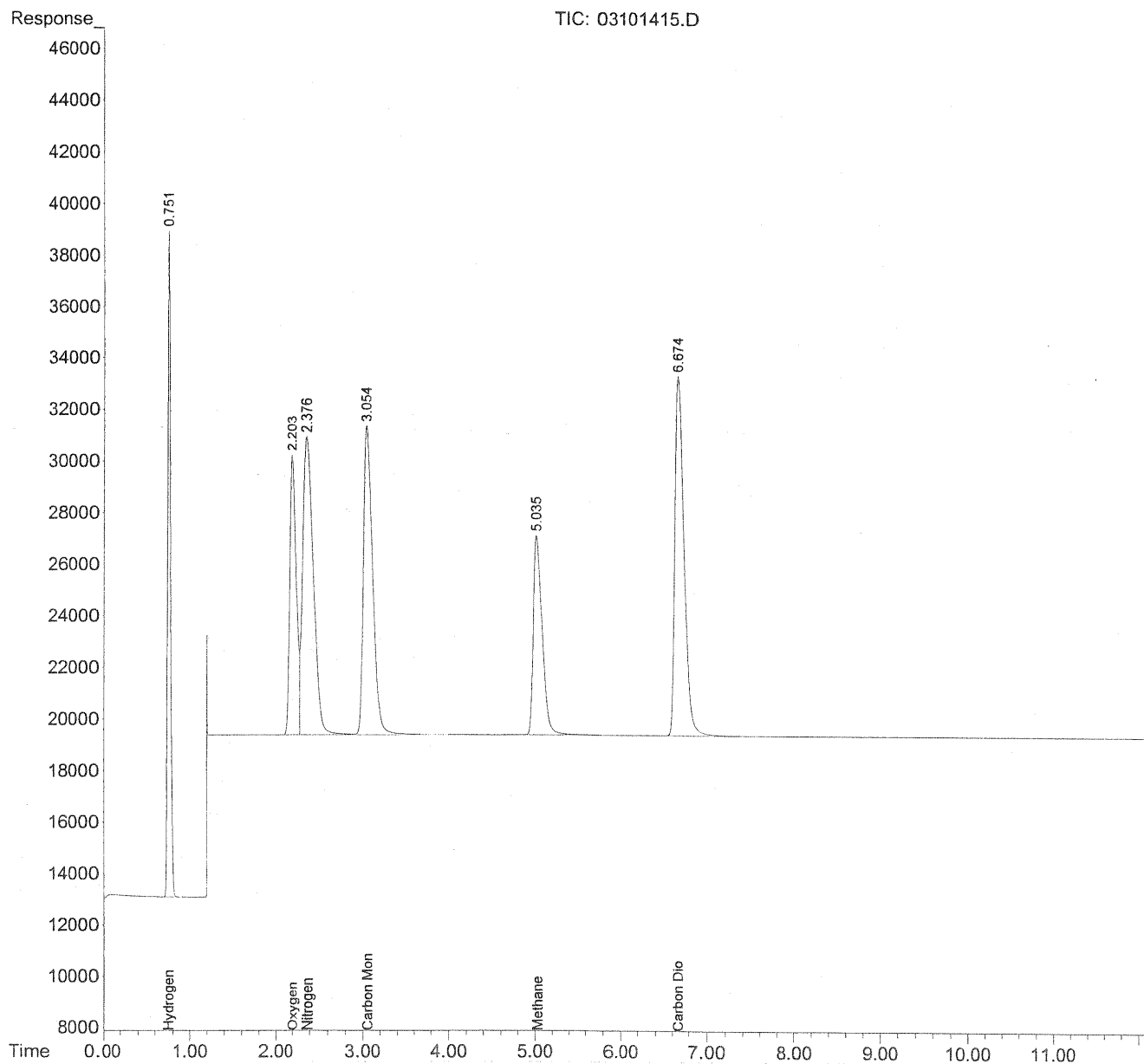
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	609940	450674.500 ppm
2) Oxygen	2.204	639596	382242.968 ppm
3) Nitrogen	2.378	920613	471464.666 ppm
4) Carbon Monoxide	3.056	910078	486547.441 ppm
5) Methane	5.037	546936	388661.341 ppm
6) Carbon Dioxide	6.676	1039048	477883.306 ppm

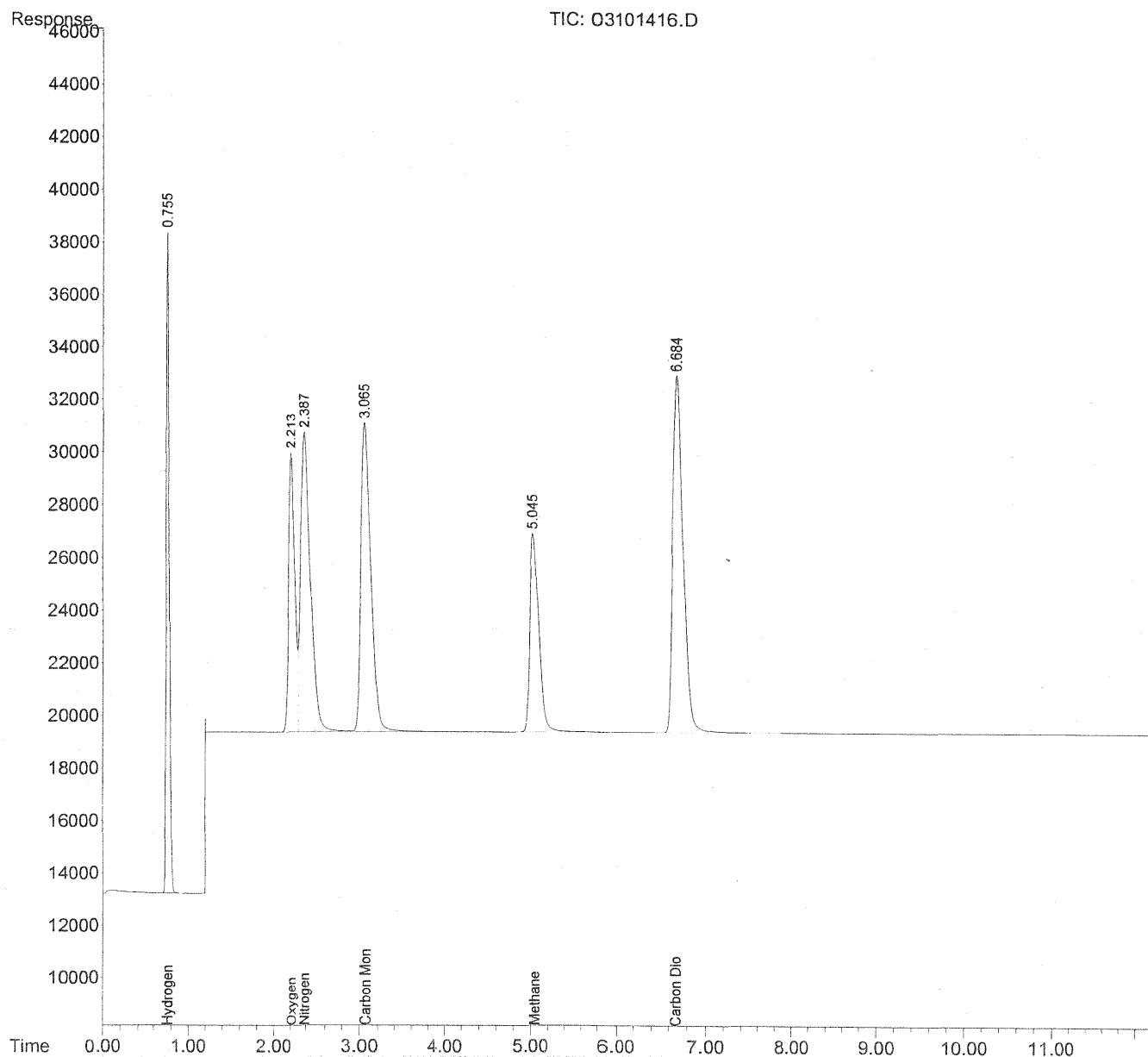
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101416.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 15:34
 Operator : WH
 Sample : std 5 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 16:09:22 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 15:37:00 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.757	592647	433927.352 ppm
2) Oxygen	2.215	625621	375390.705 ppm
3) Nitrogen	2.388	900666	463524.733 ppm
4) Carbon Monoxide	3.067	886943	475424.245 ppm
5) Methane	5.047	533862	380382.085 ppm
6) Carbon Dioxide	6.686	1009801	466290.795 ppm

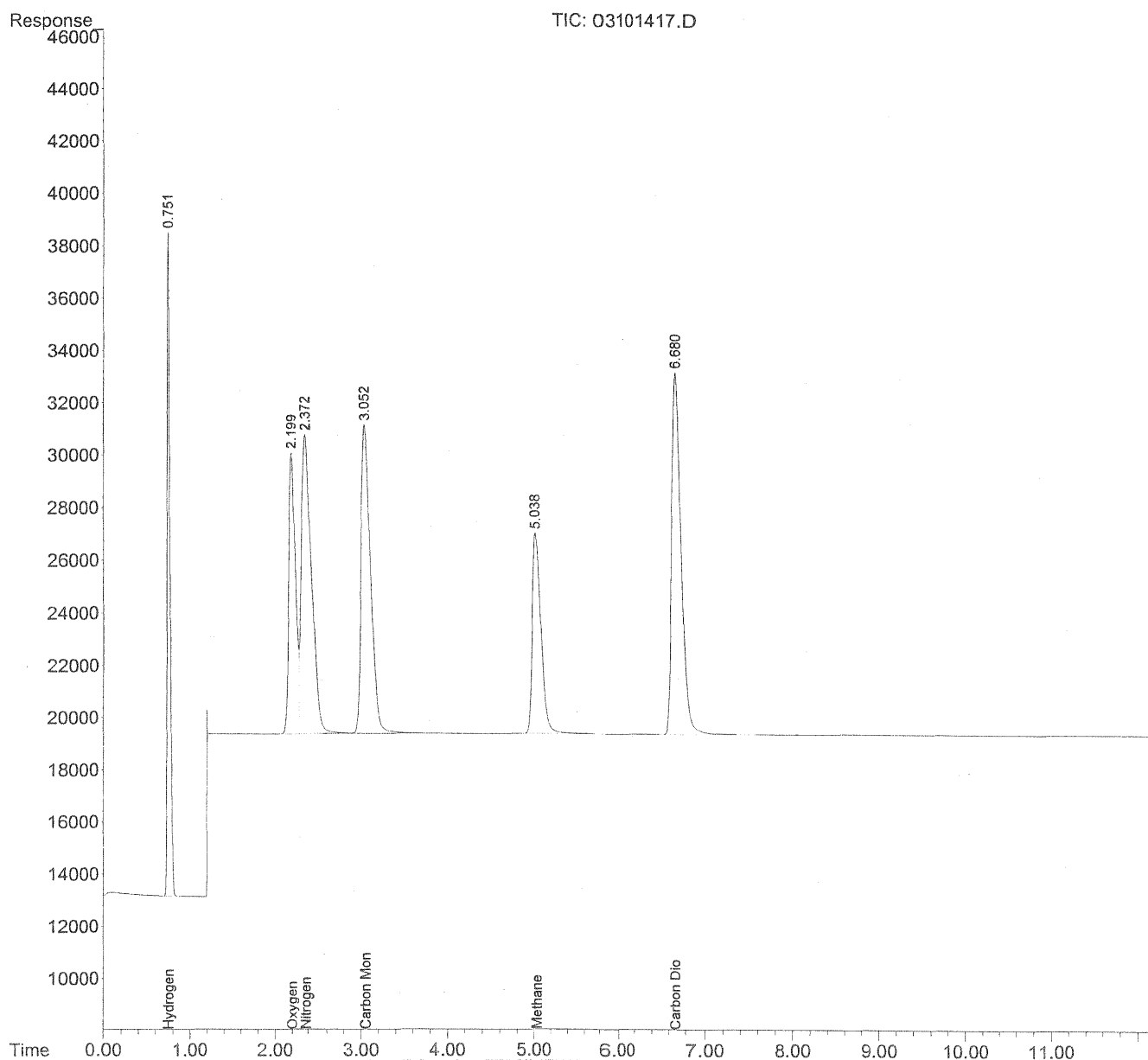
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	600780	437466.065 ppm
2) Oxygen	2.200	633337	381900.857 ppm
3) Nitrogen	2.374	912132	472109.403 ppm
4) Carbon Monoxide	3.054	899249	483961.452 ppm
5) Methane	5.040	540876	386903.325 ppm
6) Carbon Dioxide	6.681	1028390	477426.138 ppm

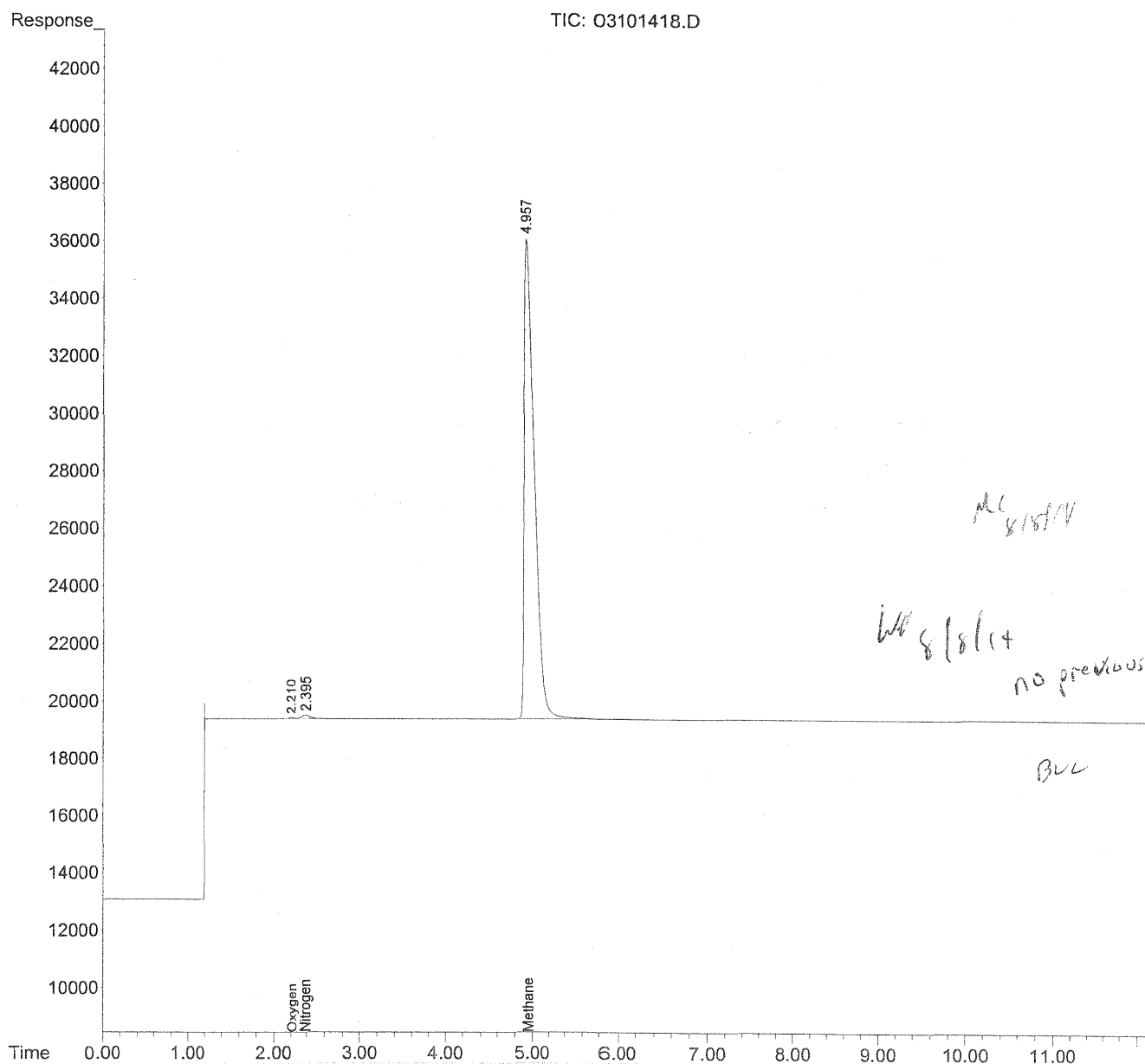
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.225	1686	1020.031 ppm
3) Nitrogen	2.395	7810	4059.131 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.957	1340274	961229.509 ppm m
6) Carbon Dioxide	0.000	0	N.D. ppm

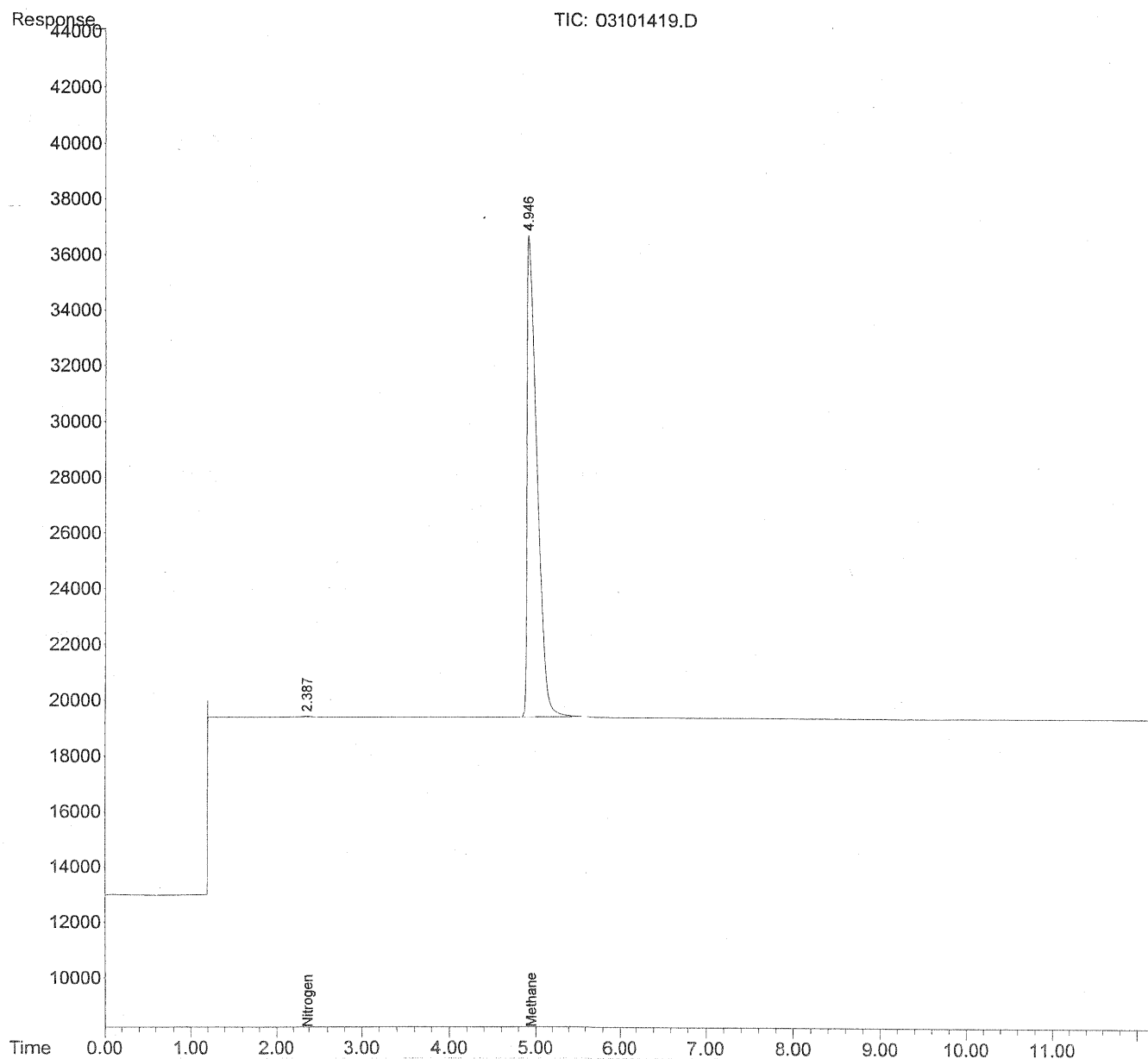
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.389	2357	1225.098 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.948	1390484	997239.566 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

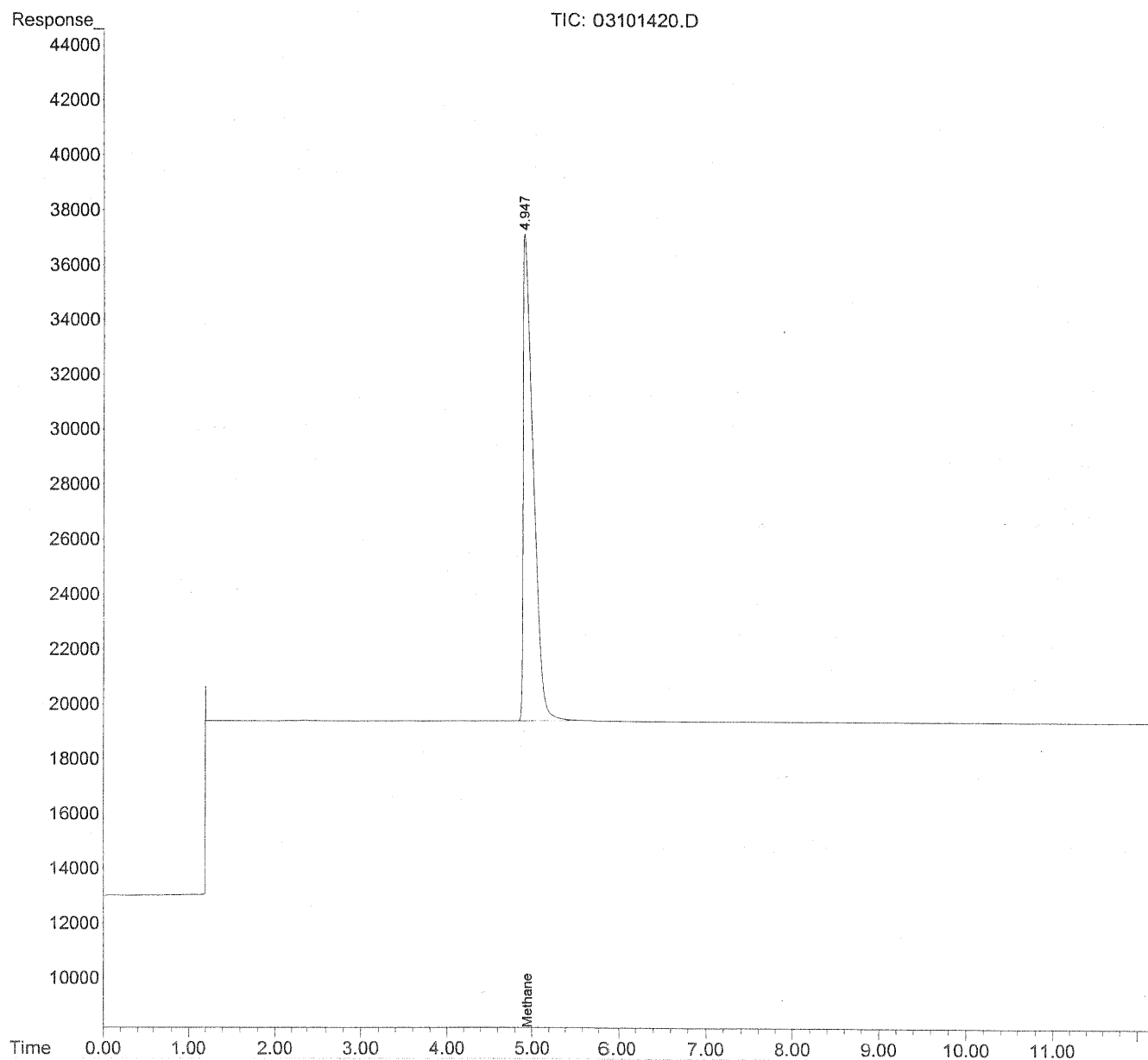
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.949	1439175	1032160.623 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

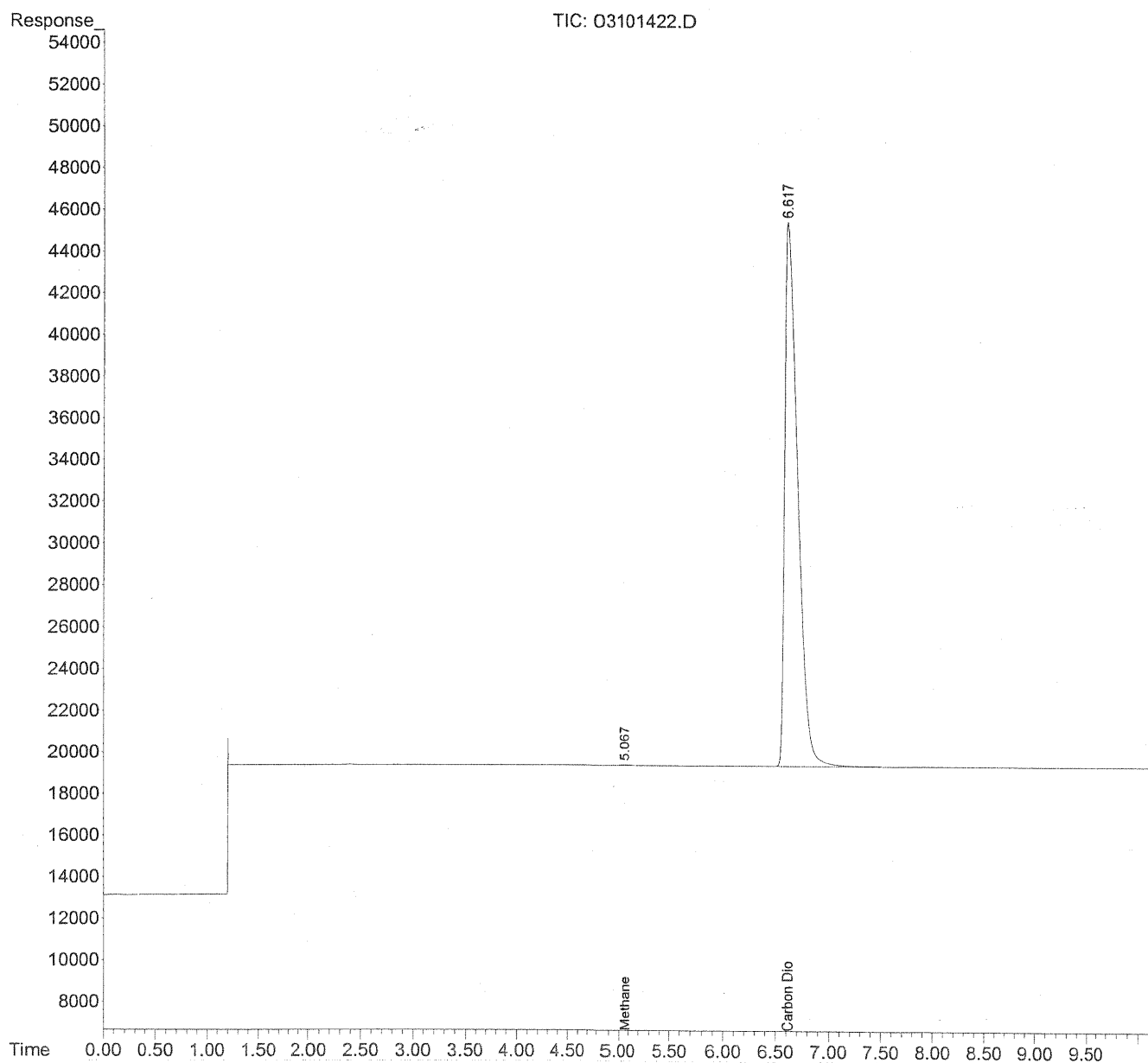
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	1775	1271.240 ppm
6) Carbon Dioxide	6.618	2201199	1025503.777 ppm

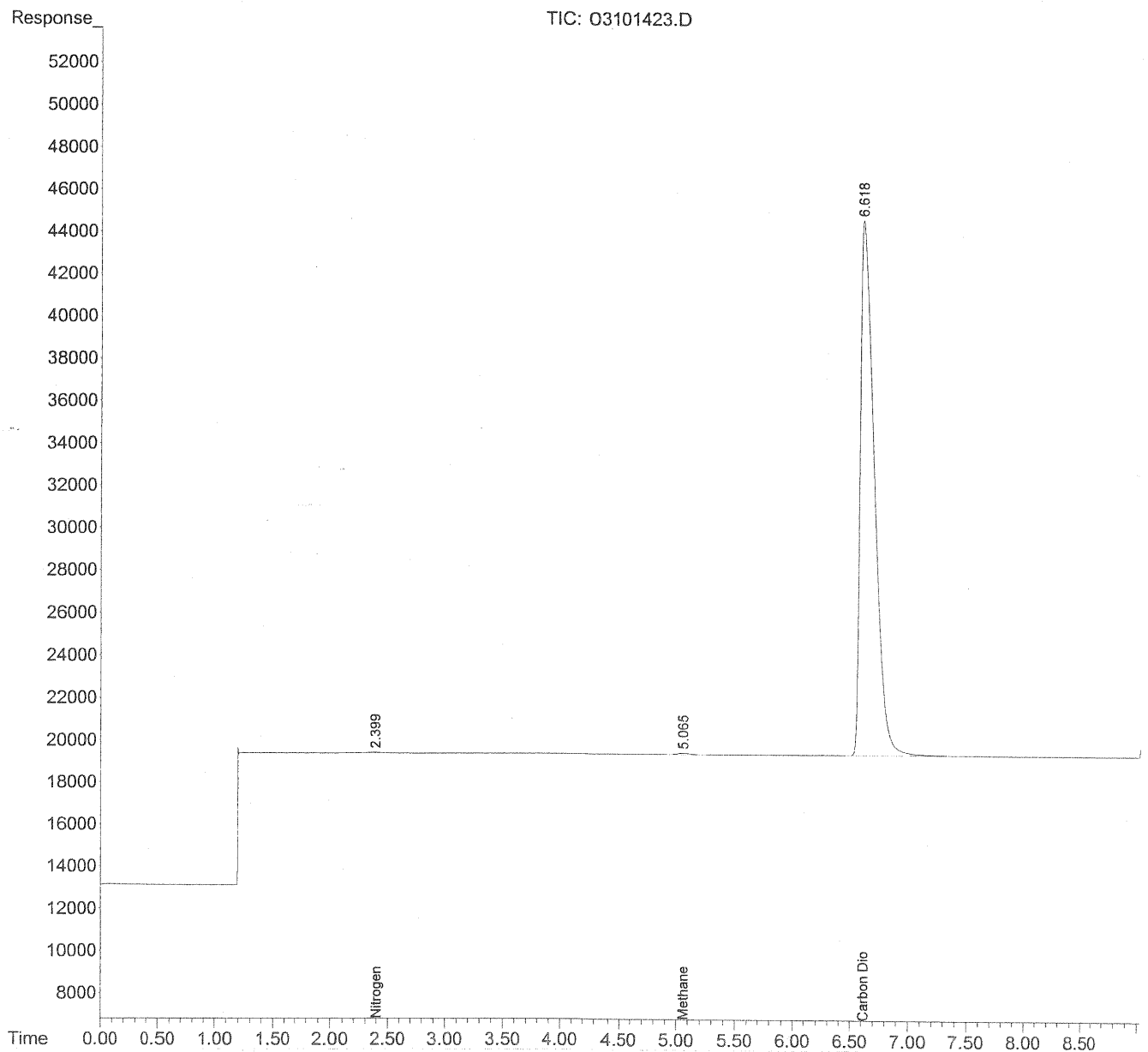
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101423.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 18:19
 Operator : WH
 Sample : std c02 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 18:30:24 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 17:51:34 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.401	2050	1065.315 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	4323	3097.155 ppm
6) Carbon Dioxide	6.619	2111383	983659.786 ppm

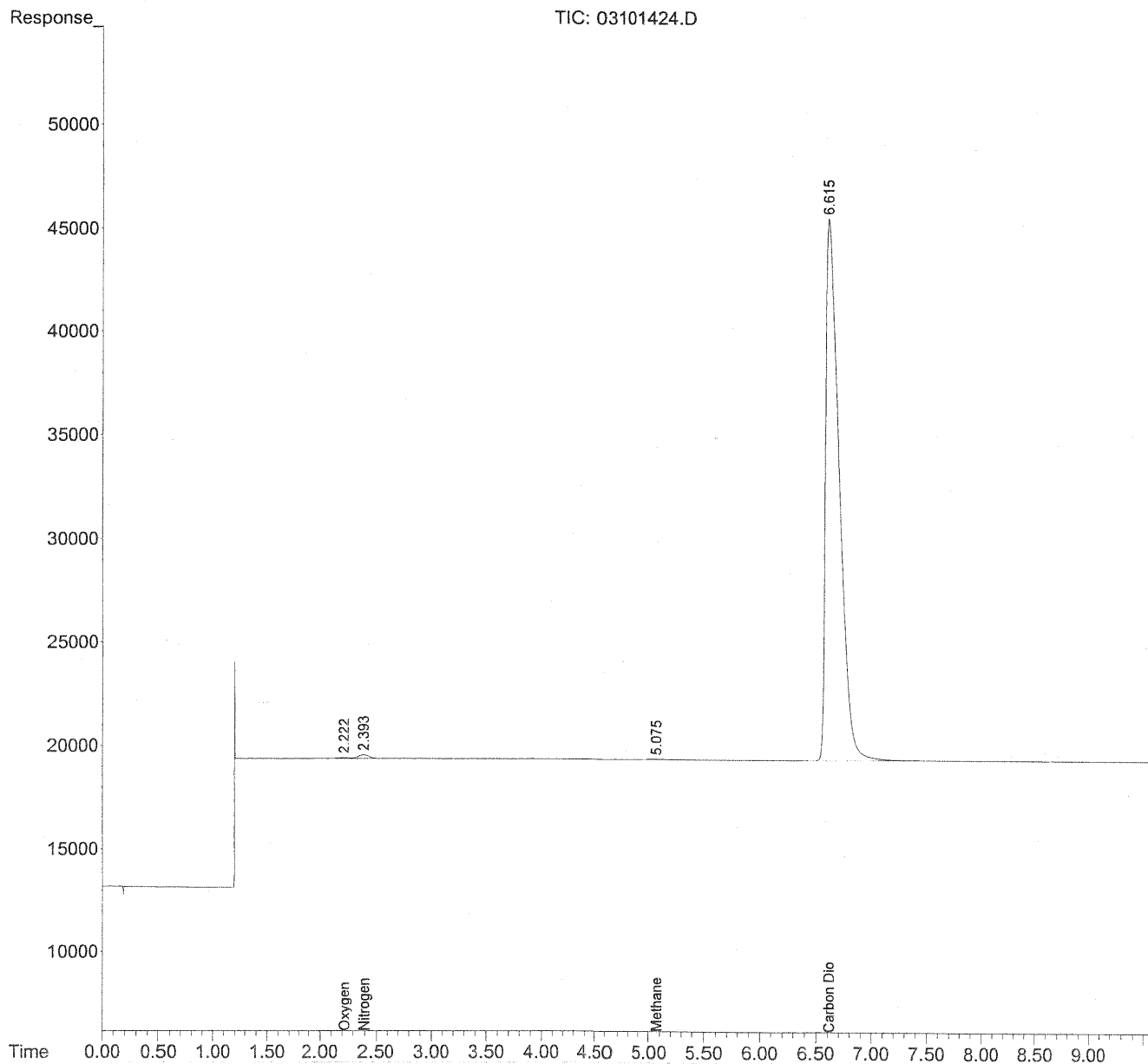
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101424.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 18:32
 Operator : WH
 Sample : std c02 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 18:43:57 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:42:24 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101424.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:32
Operator : WH
Sample : std c02 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:43:57 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:42:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.223	2425	1467.619 ppm
3) Nitrogen	2.396	11513	5983.691 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.076	523	374.374 ppm
6) Carbon Dioxide	6.617	2204164	1026088.843 ppm

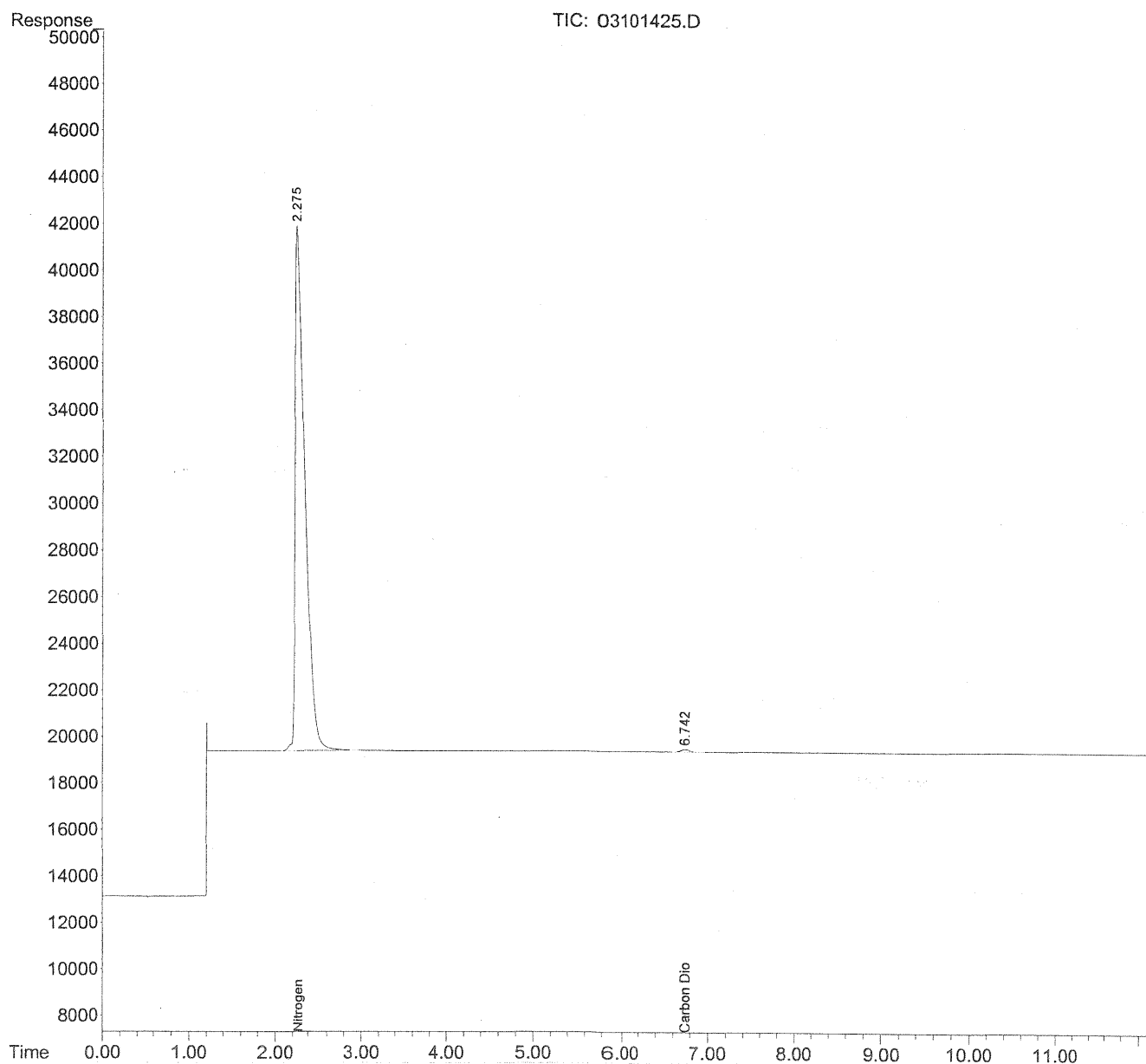
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.277	1907693	991533.750 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.744	7551	3509.651 ppm

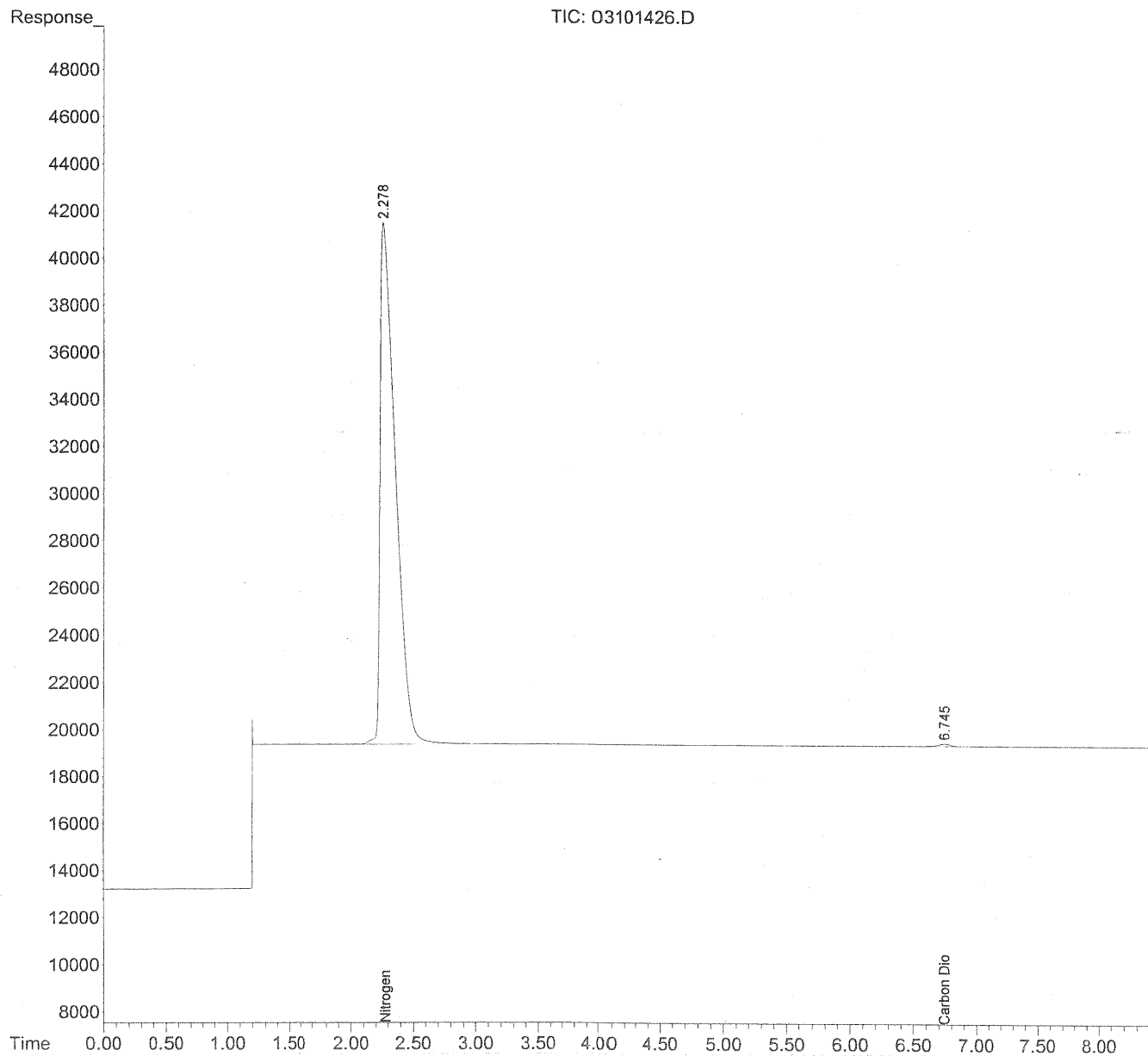
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101426.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:30
 Operator : WH
 Sample : std n2 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 10:40:12 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101426.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:30
 Operator : WH
 Sample : std n2 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 10:40:12 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.280	1857806	965604.527 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.748	7247	3368.284 ppm

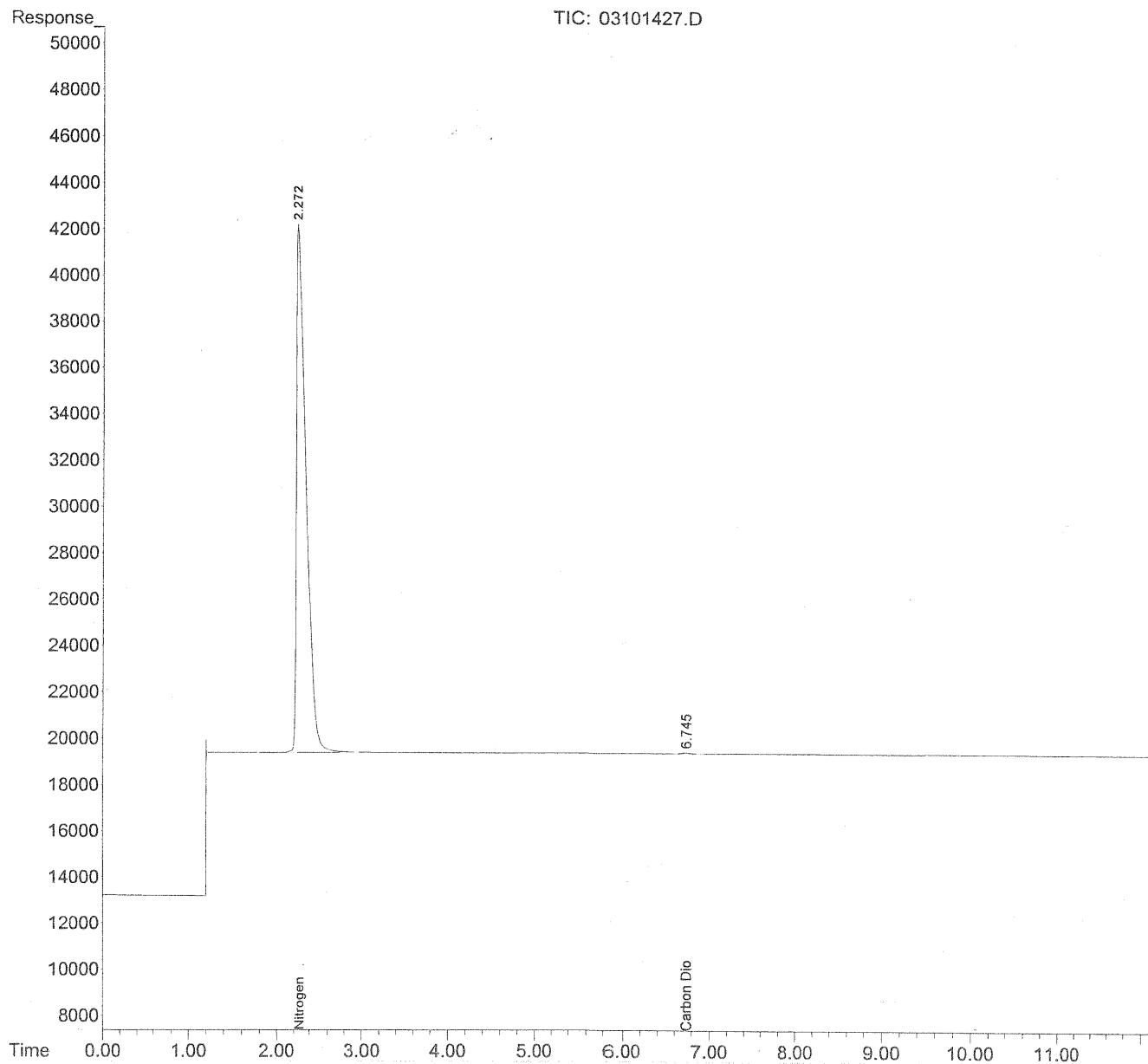
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101427.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:42
Operator : WH
Sample : std n2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:02:52 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101427.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:42
 Operator : WH
 Sample : std n2 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 11:02:52 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.273	1934590	1005513.839 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.747	3210	1492.185 ppm

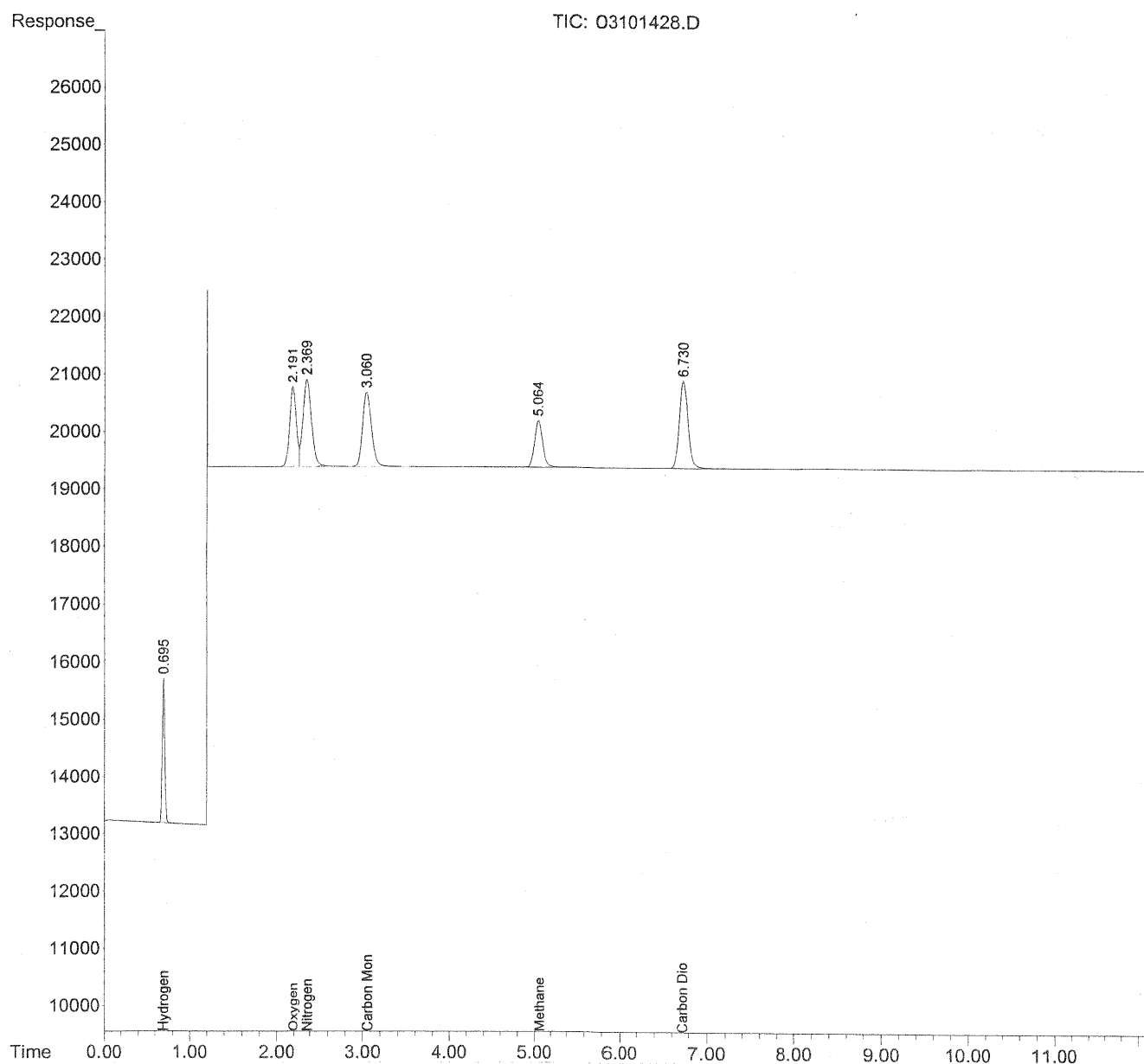
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	Actual ppm	R.T.	Response	Conc Units	% recovery

Target Compounds					
1) Hydrogen	40000	0.696	49944	36159.891 ppm	90.4%
2) Oxygen	50000	2.193	85837	51942.494 ppm	103.9%
3) Nitrogen	50000	2.370	104375	54362.122 ppm	108.7%
4) Carbon Monoxide	50000	3.061	91720	49491.765 ppm	99.0%
5) Methane	40000	5.066	55315	39625.390 ppm	99.1%
6) Carbon Dioxide	50000	6.732	105938	49239.725 ppm	98.5%

(f)=RT Delta > 1/2 Window

(m)=manual int.

WA 8/8/14

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 3/21/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 3/20/2015

PAI Job : P1501103

Sample amount : 100uL

Sample Result

<u>Sample ID</u>	<u>Hydrogen</u>	<u>Oxygen</u>	<u>Nitrogen</u>	<u>Carbon Monoxide</u>	<u>Methane</u>	<u>Carbon Dioxide</u>	
STD S30-01201501	40965	41713	50940	52455	41828	52259	
ACTUAL	39990	40030	50000	50010	39970	50040	
% Difference	2.4%	4.2%	1.9%	4.9%	4.6%	4.4%	
Lab Air		202147	713737			487	
MB							
1103-001		123556	0.0%	736466	0.2%	58670	0.0%
1103-001 - 2		123841	0.2%	739181	0.2%	58794	0.2%
1103-001 - 3		123416	0.2%	738457	0.1%	58515	0.2%
1103-001 - Mean		123604		738035		58660	
1103-003		131412	0.3%	733900	0.6%	52263	0.5%
1103-003 - 2		132029	0.8%	734677	0.7%	52454	0.8%
1103-003 - 3		129575	1.1%	720674	1.2%	51360	1.3%
1103-003 - Mean		131005		729750		52026	
1103-005		129742	0.1%	734762	0.3%	53554	0.3%
1103-005 - 2		129220	0.3%	729850	0.4%	53139	0.5%
1103-005 - 3		129920	0.2%	733800	0.1%	53531	0.2%
1103-005 - Mean		129627		732804		53408	
1103-007		126685	0.1%	736650	0.2%	56066	0.2%
1103-007 - 2		126461	0.1%	733667	0.2%	55936	0.1%
1103-007 - 3		126587	0.0%	735445	0.0%	55932	0.1%
1103-007 - Mean		126578		735254		55978	

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 3/21/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 3/20/2015

PAI Job : P1501103

Sample amount : 100uL

1103-009	130152	0.0%	736054	0.2%	54167	0.1%
1103-009 - 2	130235	0.1%	739935	0.3%	54306	0.1%
1103-009 - 3	129893	0.2%	736272	0.2%	54260	0.0%
1103-009 - Mean	130093		737421		54245	
1103-011	131450	0.1%	733455	0.1%	52136	0.0%
1103-011 - 2	130986	0.3%	730722	0.3%	52059	0.2%
1103-011 - 3	131569	0.2%	734192	0.2%	52223	0.2%
1103-011 - Mean	131335		732789		52139	
1103-013	137388	0.2%	732912	0.2%	48357	0.0%
1103-013 - 2	136804	0.3%	727896	0.5%	48157	0.4%
1103-013 - 3	137265	0.1%	733328	0.3%	48488	0.3%
1103-013 - Mean	137152		731379		48334	
1103-015	134913	1.4%	730426	1.3%	49719	1.4%
1103-015 - 2	132759	0.3%	721917	0.1%	48987	0.1%
1103-015 - 3	131606	1.1%	710640	1.4%	48340	1.4%
1103-015 - Mean	133093		720994		49015	
1103-017	123854	3.5%	667309	3.7%	45007	3.9%
1103-017 - 2	131768	2.6%	711899	2.8%	48273	3.0%
1103-017 - 3	129482	0.9%	699119	0.9%	47264	0.9%
1103-017 - Mean	128368		692776		46848	
STD S30-01201501	37695	38459	47168	48128	38571	47959
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	5.7%	3.9%	5.7%	3.8%	3.5%	4.2%

100
3/21/15

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201501.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:28 am
Operator : NL
Sample : std s30-01201501
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:09:31 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	56581	40965.374 ppm
2) Oxygen	2.208	68933	41713.225 ppm
3) Nitrogen	2.384	97805	50940.406 ppm
4) Carbon Monoxide	3.070	97212	52455.092 ppm
5) Methane	5.060	58389	41827.859 ppm
6) Carbon Dioxide	6.721	112434	52258.976 ppm

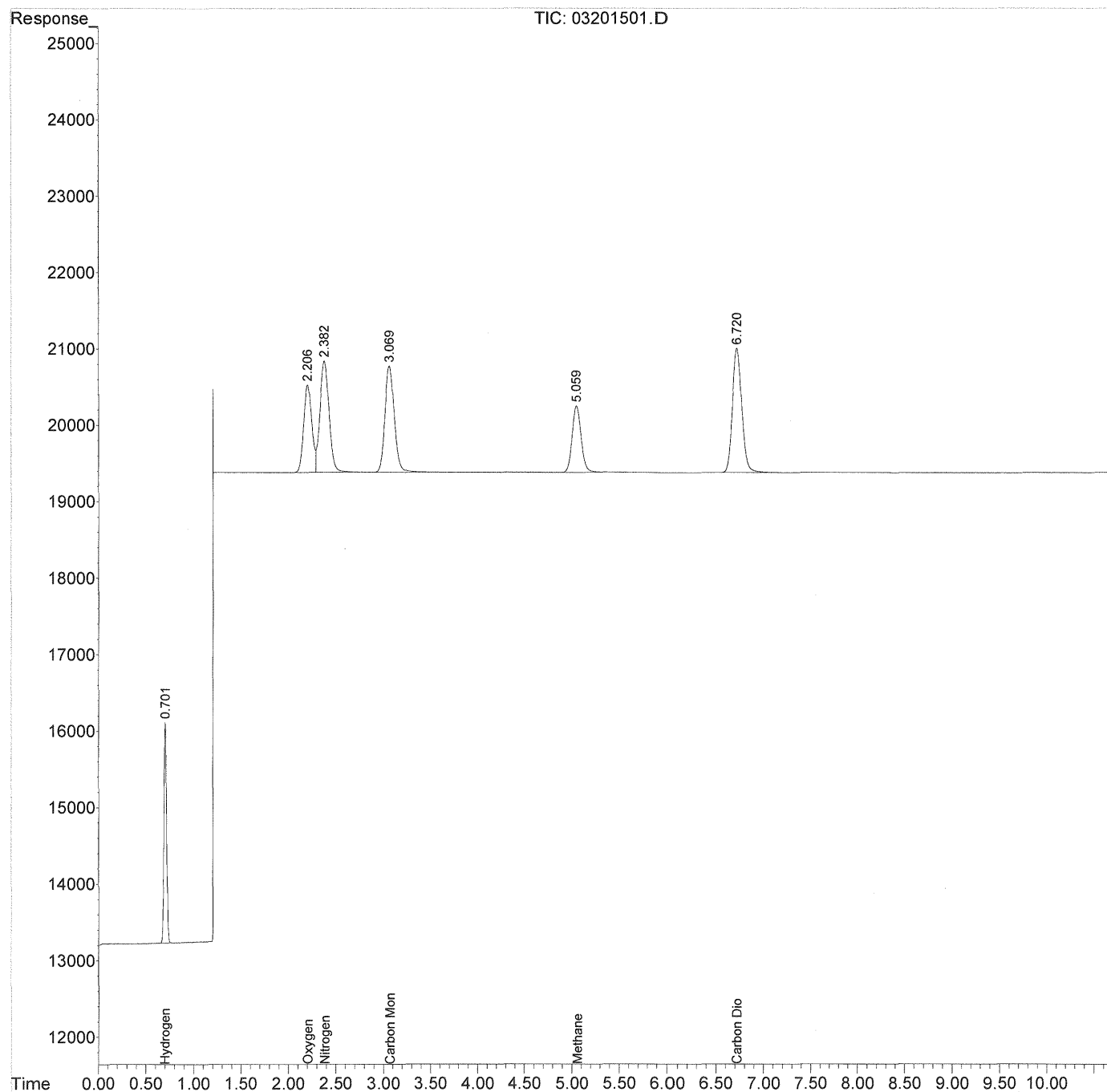
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201501.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 7:28 am
 Operator : NL
 Sample : std s30-01201501
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 08:09:31 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201543.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:28 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:11:09 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	52065	37695.537 ppm
2) Oxygen	2.209	63555	38459.105 ppm
3) Nitrogen	2.384	90562	47167.837 ppm
4) Carbon Monoxide	3.070	89193	48128.133 ppm
5) Methane	5.061	53842	38570.576 ppm
6) Carbon Dioxide	6.722	103184	47959.326 ppm

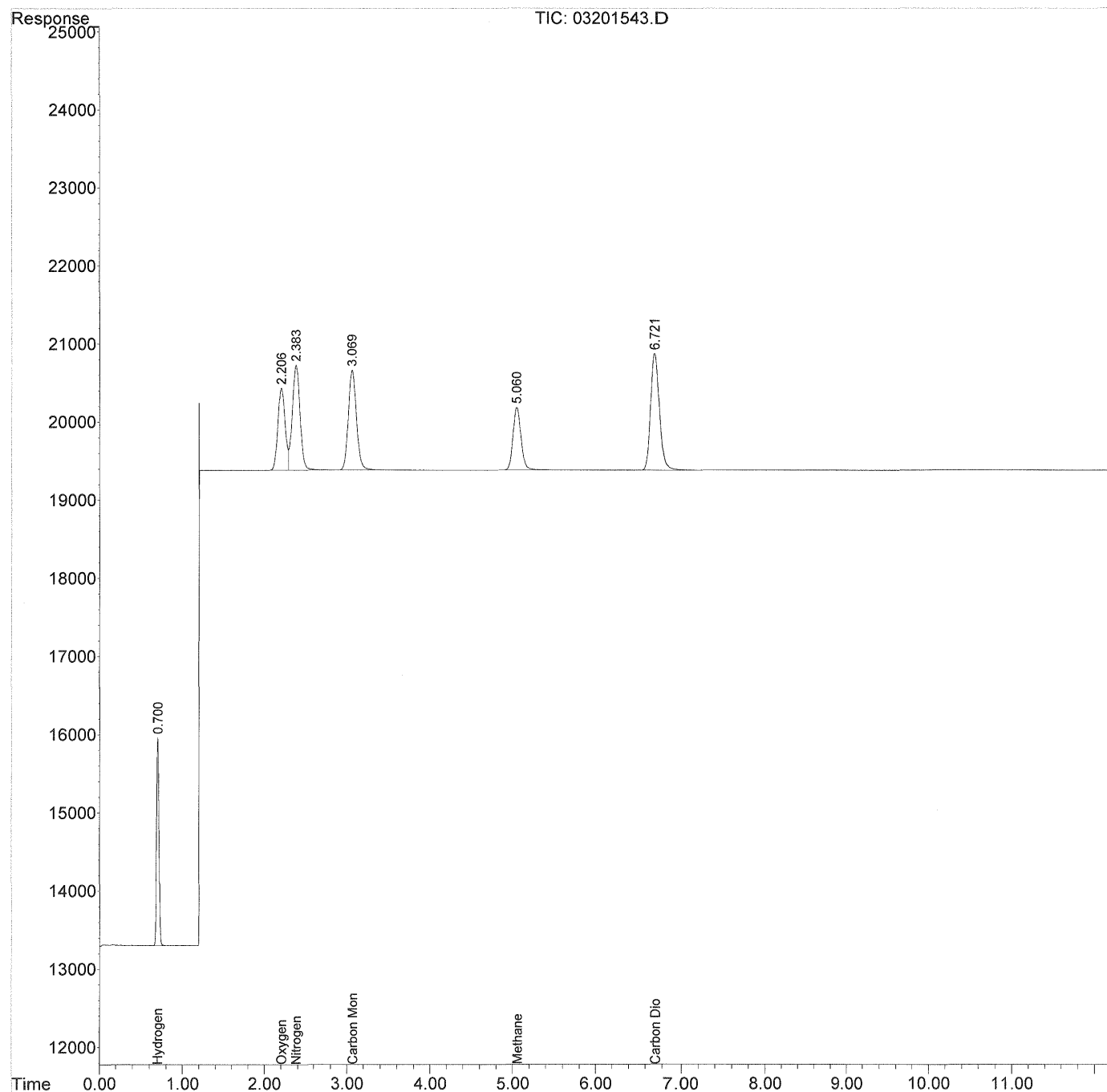
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201543.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:28 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 08:11:09 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Injection Log

Directory: J:\GC01\DATA\FXG\2014_03\10

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	03101401.d	10.	MB		10 Mar 2014 10:27
2	1	03101402.d	10.	xstd 1 1		10 Mar 2014 10:43
3	1	03101403.d	10.	std 1 1		10 Mar 2014 10:59
4	1	03101404.d	10.	std 1 2		10 Mar 2014 11:29
5	1	03101405.d	10.	std 1 3		10 Mar 2014 11:44
6	1	03101406.d	10.	std 2 1		10 Mar 2014 11:59
7	1	03101407.d	10.	std 2 2		10 Mar 2014 12:18
8	1	03101408.d	10.	std 2 3		10 Mar 2014 12:34
9	1	03101409.d	10.	std 3 1		10 Mar 2014 13:05
10	1	03101410.d	10.	std 3 2		10 Mar 2014 13:23
11	1	03101411.d	10.	std 3 3		10 Mar 2014 13:56
12	1	03101412.d	10.	std 4 1		10 Mar 2014 14:15
13	1	03101413.d	10.	std 4 2		10 Mar 2014 14:32
14	1	03101414.d	10.	std 4 3		10 Mar 2014 14:49
15	1	03101415.d	10.	std 5 1		10 Mar 2014 15:08
16	1	03101416.d	10.	std 5 2		10 Mar 2014 15:34
17	1	03101417.d	10.	std 5 3		10 Mar 2014 15:50
18	1	03101418.d	10.	std ch4 1		10 Mar 2014 16:55
19	1	03101419.d	10.	std ch4 2		10 Mar 2014 17:11
20	1	03101420.d	10.	std ch4 3		10 Mar 2014 17:29
21	1	03101421.d	10.	xstd c02 1		10 Mar 2014 17:47
22	1	03101422.d	10.	std c02 1		10 Mar 2014 18:05
23	1	03101423.d	10.	std c02 2		10 Mar 2014 18:19
24	1	03101424.d	10.	std c02 3		10 Mar 2014 18:32
25	1	03101425.d	10.	std n2 1		11 Mar 2014 10:11
26	1	03101426.d	10.	std n2 2		11 Mar 2014 10:30
27	1	03101427.d	10.	std n2 3		11 Mar 2014 10:42
28	1	03101428.d	10.	lcs		11 Mar 2014 11:20
29	1	03101429.d	10.	lab air		11 Mar 2014 11:37

Injection Log

Directory: I:\GC01\DATA\FXG\2015_03\20

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	03201501.d	10.	std s30-01201501		20 Mar 2015 07:28
2	1	03201502.d	10.	mb		20 Mar 2015 07:43
3	1	03201503.d	10.	lab air		20 Mar 2015 07:56
4	1	03201504.d	10.	1103-001		20 Mar 2015 08:10
5	1	03201505.d	10.	1103-001		20 Mar 2015 08:26
6	1	03201506.d	10.	1103-001		20 Mar 2015 08:39
7	1	03201507.d	10.	1103-003		20 Mar 2015 08:54
8	1	03201508.d	10.	1103-003		20 Mar 2015 09:11
9	1	03201509.d	10.	1103-003		20 Mar 2015 09:30
10	1	03201510.d	10.	1103-005		20 Mar 2015 09:46
11	1	03201511.d	10.	1103-005		20 Mar 2015 10:18
12	1	03201512.d	10.	1103-005		20 Mar 2015 10:35
13	1	03201513.d	10.	1103-007		20 Mar 2015 10:52
14	1	03201514.d	10.	1103-007		20 Mar 2015 11:07
15	1	03201515.d	10.	1103-007		20 Mar 2015 11:22
16	1	03201516.d	10.	1103-009		20 Mar 2015 11:42
17	1	03201517.d	10.	1103-009		20 Mar 2015 11:58
18	1	03201518.d	10.	1103-009		20 Mar 2015 12:14
19	1	03201519.d	10.	1103-011		20 Mar 2015 12:27
20	1	03201520.d	10.	1103-011		20 Mar 2015 12:45
21	1	03201521.d	10.	1103-011		20 Mar 2015 12:59
22	1	03201522.d	10.	1103-013		20 Mar 2015 13:16
23	1	03201523.d	10.	1103-013		20 Mar 2015 13:43
24	1	03201524.d	10.	1103-013		20 Mar 2015 13:58
25	1	03201525.d	10.	1103-015		20 Mar 2015 14:12
26	1	03201526.d	10.	x1103-015		20 Mar 2015 14:28
27	1	03201527.d	10.	1103-015		20 Mar 2015 14:44
28	1	03201528.d	10.	1103-015		20 Mar 2015 15:02
29	1	03201529.d	10.	x1103-017		20 Mar 2015 15:20
30	1	03201530.d	10.	1103-017		20 Mar 2015 15:40
31	1	03201531.d	10.	1103-017		20 Mar 2015 15:52
32	1	03201532.d	10.	1103-017		20 Mar 2015 16:11
33	1	03201533.d	10.	1126-001		20 Mar 2015 16:31
34	1	03201534.d	10.	1126-001		20 Mar 2015 16:47
35	1	03201535.d	10.	1126-001		20 Mar 2015 17:03
36	1	03201536.d	10.	1126-003		20 Mar 2015 17:16
37	1	03201537.d	10.	1126-003		20 Mar 2015 17:30
38	1	03201538.d	10.	1126-003		20 Mar 2015 17:45
39	1	03201539.d	10.	1126-005		20 Mar 2015 18:01
40	1	03201540.d	10.	1126-005		20 Mar 2015 18:16
41	1	03201541.d	10.	1126-005		20 Mar 2015 18:44
42	1	03201542.d	10.	std		20 Mar 2015 19:03
43	1	03201543.d	10.	std		20 Mar 2015 19:28

LABORATORY REPORT

April 10, 2015

Min Lee
Air Hygiene, Incorporated
1600 West Tacoma Street
Broken Arrow, OK 74012

RE: qti-15-brokenarrow.ok-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on March 20, 2015. For your reference, these analyses have been assigned our service request number P1501126.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental



By Sue Anderson at 2:30 pm, Apr 10, 2015

For Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated
Project: qti-15-brokenarrow.ok-comp#1

Service Request No: P1501126

CASE NARRATIVE

The samples were received intact under chain of custody on March 20, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Fixed Gases Analysis

The samples were analyzed for fixed gases (oxygen/argon, nitrogen, methane and carbon dioxide) according to modified EPA Method 3C (triplicate injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This procedure is described in laboratory SOP VOA-EPA3C. This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

ALS Simi Valley standard operating procedure states an initial calibration curve shall be performed annually. The curve was generated on 3/10/14 and a new calibration standard has been on order for over 30 days. The EPA 3C method does not provide criteria for how often a calibration curve should be performed. Additionally, the instrument daily quality control parameters are within criteria, documenting the stability and performance of the instrument are acceptable, therefore data has not been affected.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	876241
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 4-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Air Hygiene, Incorporated
Project ID: qti-15-brokenarrow.ok-comp#1

Service Request: P1501126

Date Received: 3/20/2015
Time Received: 09:45

3C Modified - Fxd Gases Bag 2X

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
R7-70-100-70%-Q100	P1501126-001	Air	3/19/2015	09:53	X
R8-70-100-70-Q250	P1501126-003	Air	3/19/2015	11:15	X
R9-70-100-70%-Q100	P1501126-005	Air	3/19/2015	12:44	X

P1501126



Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
(888) 461-8778
www.airhygiene.com

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD

Project Number: qti-15-brokenarrow.ok-comp#1		Laboratory Analysis Requested: Methd 3C						
Person Taking Samples: MSL								
Sample Number	Location	Date	Time	Volume (L)	Analysis Method			
					O ₂	CO ₂	Nitrogen	Methane
1 R7-70-100-70%-Q100	Broken Arrow Rental Facility	19-Mar		10	X	X	X	X
2 R7-70-100-70%-Q100-backup	Broken Arrow Rental Facility	19-Mar	9:53	5	X	X	X	X
3 R8-70-100-70%-Q250	Broken Arrow Rental Facility	19-Mar		10	X	X	X	X
4 R8-70-100-70%-Q1000-backup	Broken Arrow Rental Facility	19-Mar	11:15	5	X	X	X	X
5 R9-70-100-70%-Q100	Broken Arrow Rental Facility	19-Mar		10	X	X	X	X
6 R9-70-100-70%-Q100-backup	Broken Arrow Rental Facility	19-Mar	12:44	5	X	X	X	X
Relinquished by: (Signature) <i>Pen ex</i> Date: 3/19/15 Time: 12:46 Received by: (Signature) <i>K. L...</i> Date: 3/20/15 Time: 0945								

3-brokenarrow.ok-comp#1-coc-q100

ALS Environmental **Sample Acceptance Check Form**

Client: Air Hygiene, Incorporated

Work order: P1501126

Project: qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 3/20/15

Date opened: 3/20/15

by: KKELPE

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	Yes	No	N/A
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Container(s) supplied by ALS ?	☐	☒	☐
3 Did sample containers arrive in good condition?	☒	☐	☐
4 Were chain-of-custody papers used and filled out?	☒	☐	☐
5 Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
6 Was sample volume received adequate for analysis?	☒	☐	☐
7 Are samples within specified holding times?	☒	☐	☐
8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9 Was a trip blank received?	☐	☒	☐
10 Were custody seals on outside of cooler/Box?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
Were custody seals on outside of sample container?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
11 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
12 Tubes: Are the tubes capped and intact?	☐	☐	☒
Do they contain moisture?	☐	☐	☒
13 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1501126-001.01	10 L Tedlar Bag					
P1501126-002.01	5.0 L Tedlar Bag					
P1501126-003.01	10 L Tedlar Bag					
P1501126-004.01	5.0 L Tedlar Bag					
P1501126-005.01	10 L Tedlar Bag					
P1501126-006.01	5.0 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R7-70-100-70%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501126
 ALS Sample ID: P1501126-001

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/19/15
Date Received: 3/20/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.0	0.10	
7727-37-9	Nitrogen	80.0	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.96	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R8-70-100-70-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501126
ALS Sample ID: P1501126-003

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/19/15
Date Received: 3/20/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	15.9	0.10	
7727-37-9	Nitrogen	79.4	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	4.62	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R9-70-100-70%-Q100
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501126
ALS Sample ID: P1501126-005

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 3/19/15
Date Received: 3/20/15
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.6	0.10	
7727-37-9	Nitrogen	79.8	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.60	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Method Blank
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1501126
ALS Sample ID: P150320-MB

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/20/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201533.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 4:31 pm
Operator : NL
Sample : 1126-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:09 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.161	199196	120538.850 ppm
3) Nitrogen	2.289	1316387	685620.676 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.713	109712	50993.861 ppm

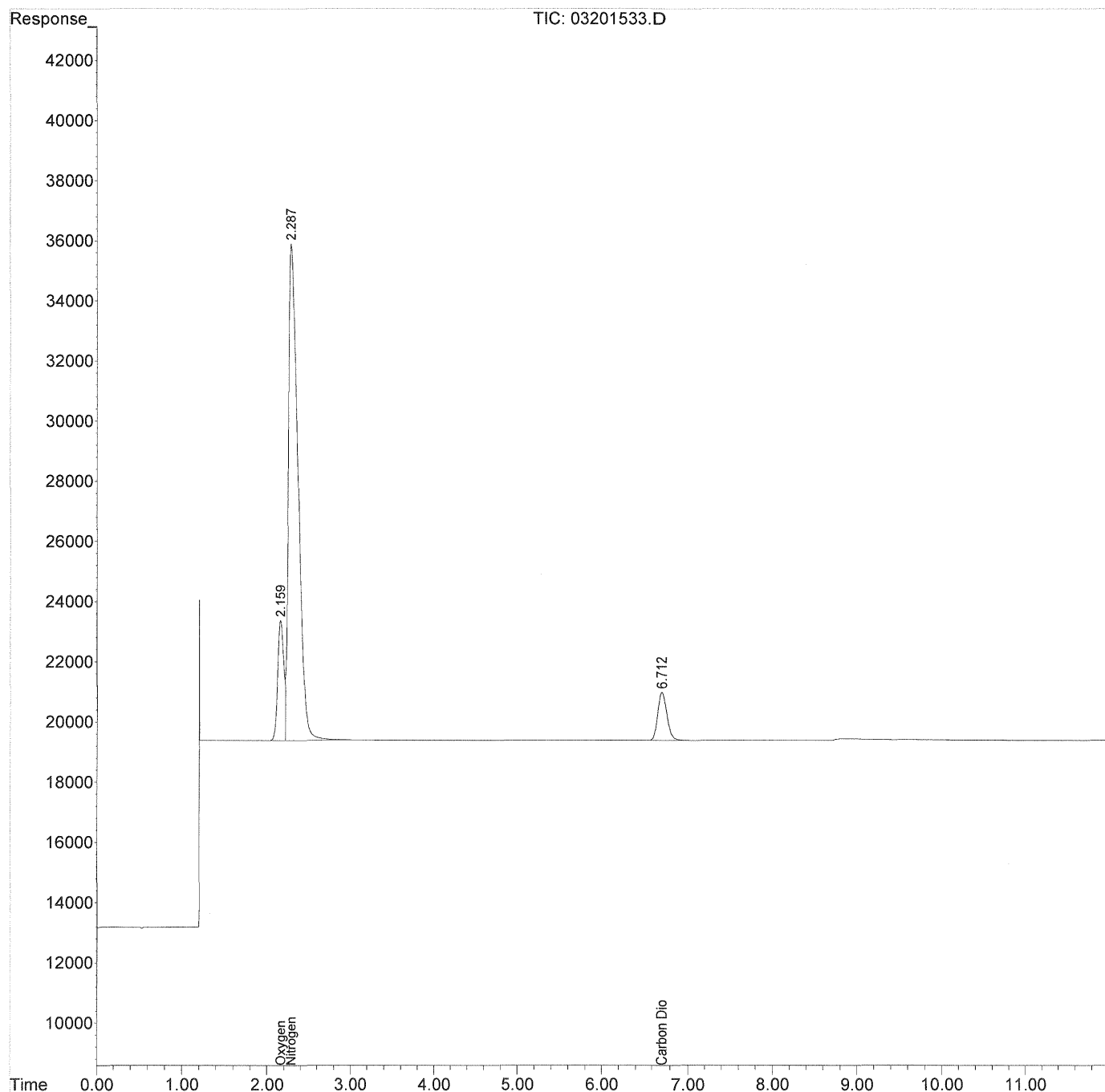
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201533.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 4:31 pm
Operator : NL
Sample : 1126-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:09 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201534.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 4:47 pm
Operator : NL
Sample : 1126-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:13 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.149	202003	122237.578 ppm
3) Nitrogen	2.276	1337022	696368.102 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.710	111552	51848.856 ppm

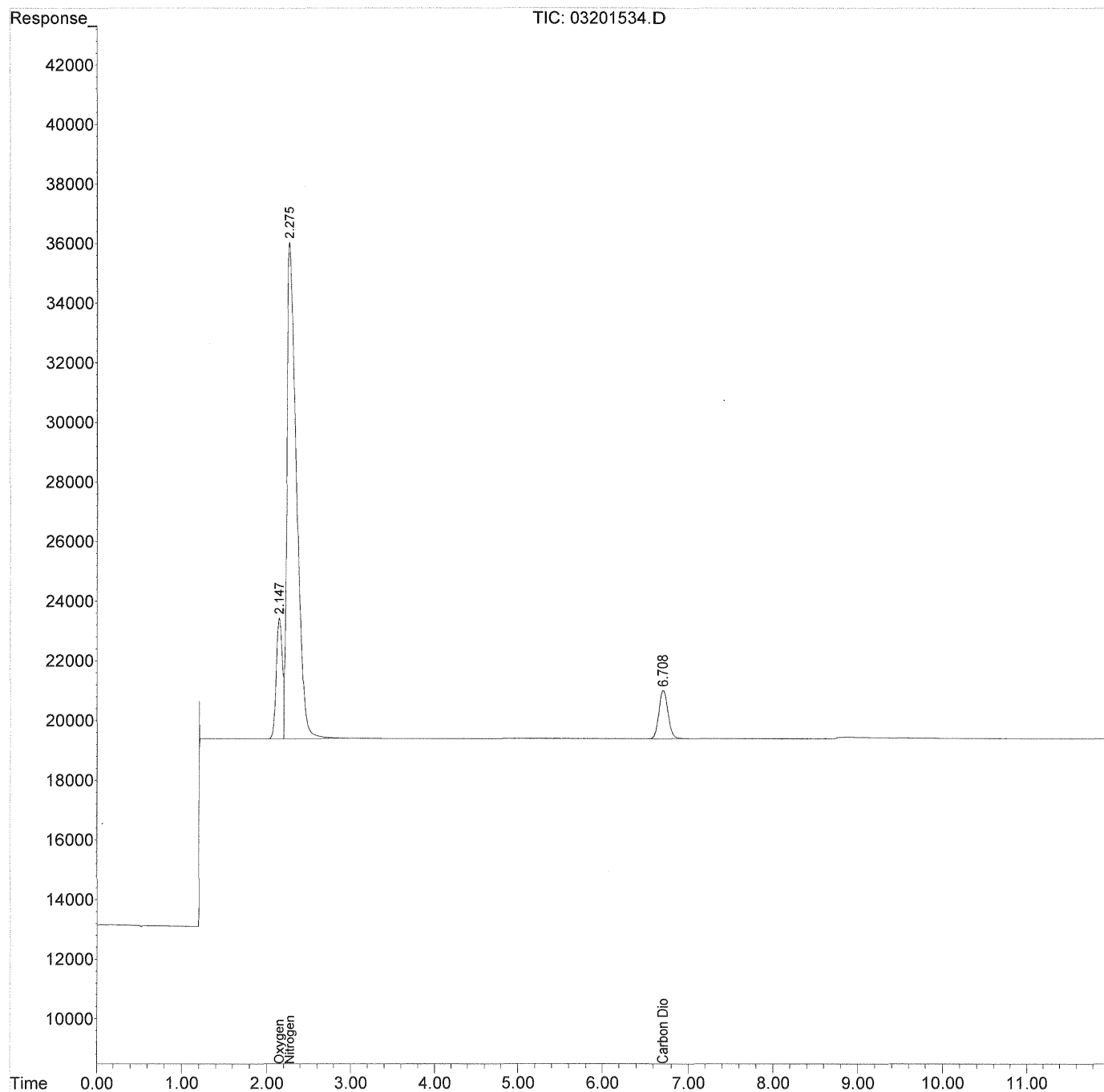
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201534.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 4:47 pm
Operator : NL
Sample : 1126-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:13 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201535.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:03 pm
Operator : NL
Sample : 1126-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:16 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.147	201334	121832.695 ppm
3) Nitrogen	2.275	1333957	694771.834 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.709	111681	51909.049 ppm

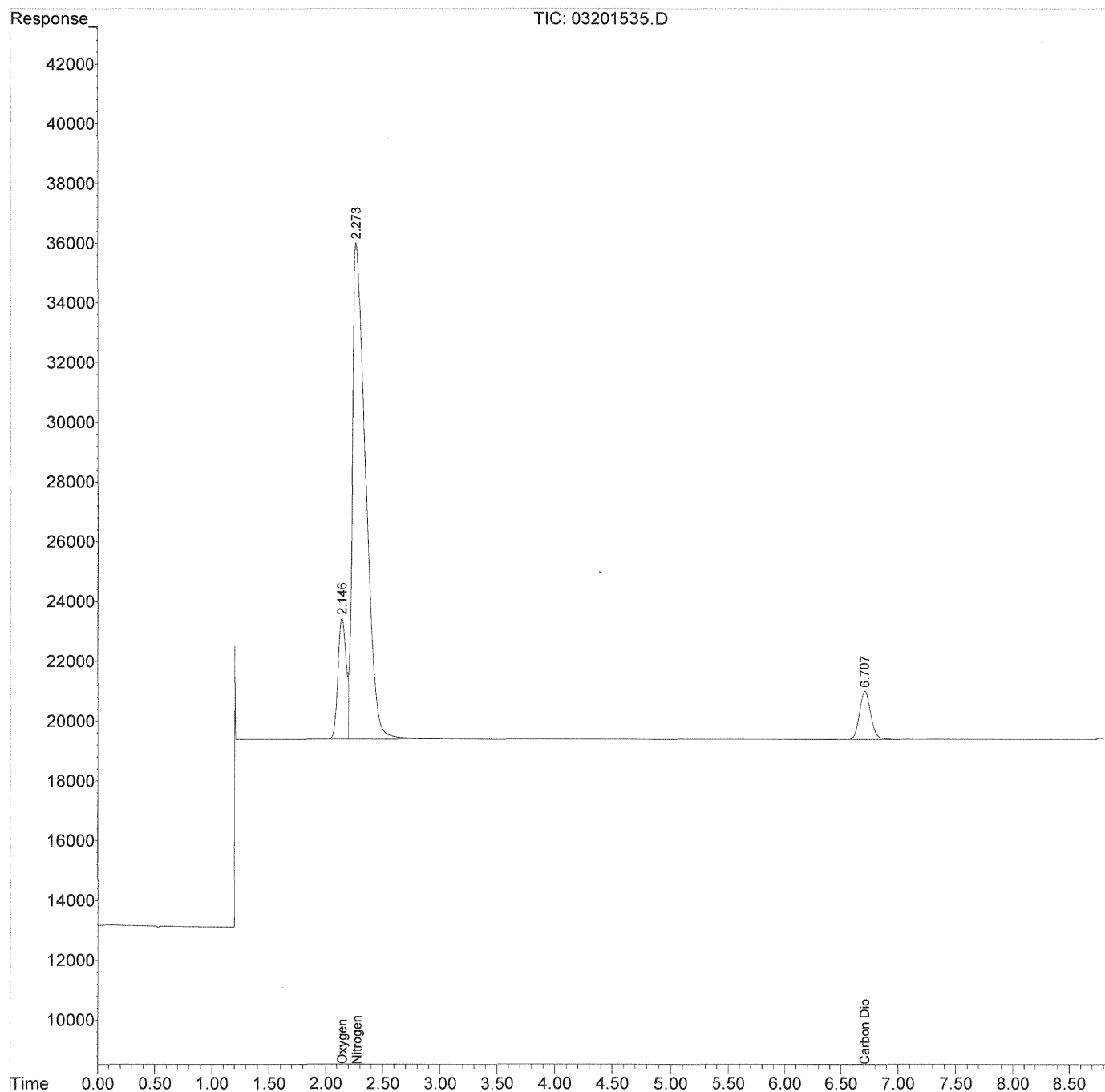
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201535.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:03 pm
Operator : NL
Sample : 1126-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:16 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201536.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:16 pm
Operator : NL
Sample : 1126-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:19 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.146	232125	140464.824 ppm
3) Nitrogen	2.276	1340992	698436.048 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.713	87085	40476.610 ppm

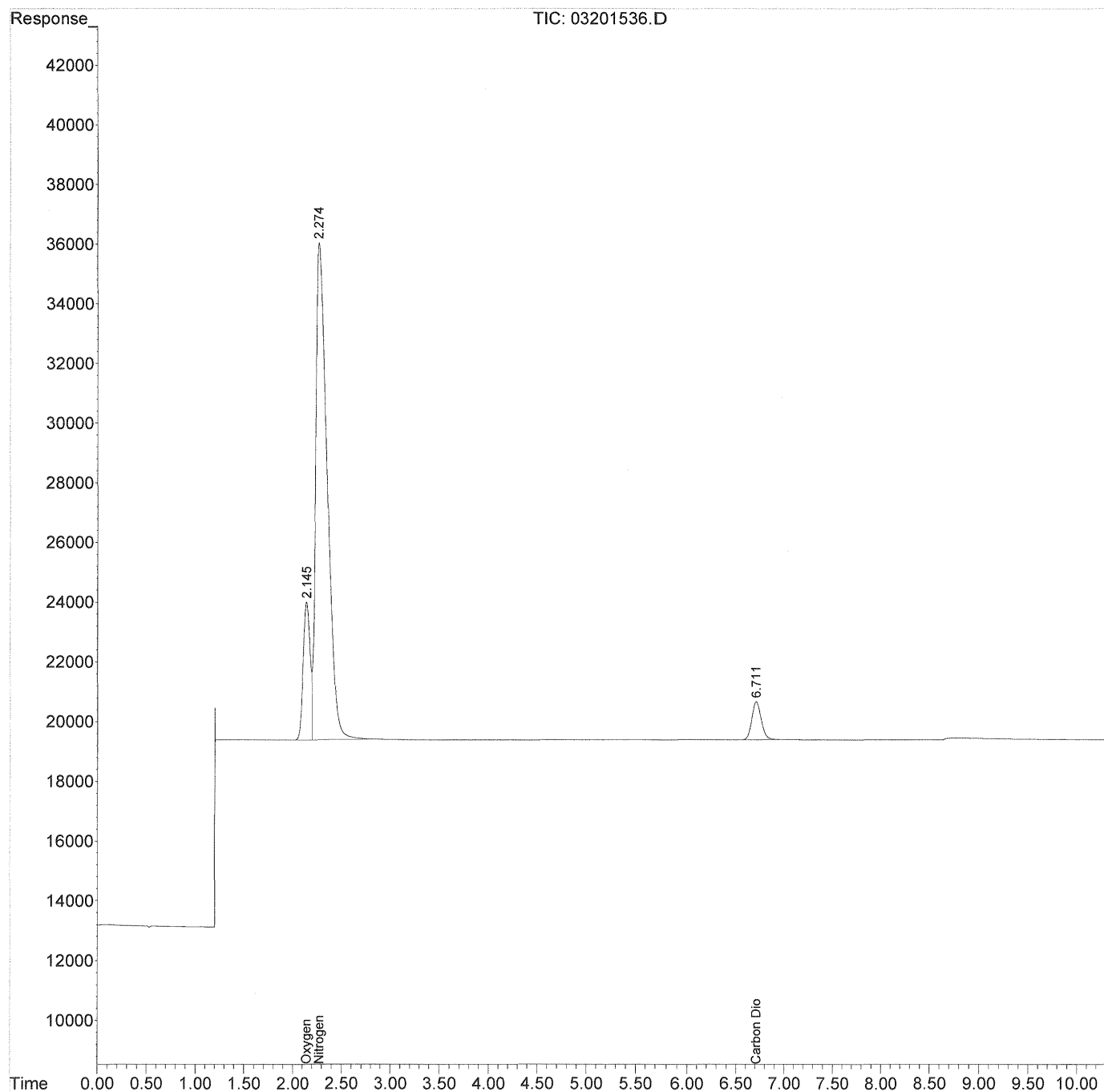
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201536.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:16 pm
Operator : NL
Sample : 1126-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:19 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201537.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:30 pm
Operator : NL
Sample : 1126-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:22 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.144	232710	140818.876 ppm
3) Nitrogen	2.274	1348335	702260.557 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.710	88221	41004.627 ppm

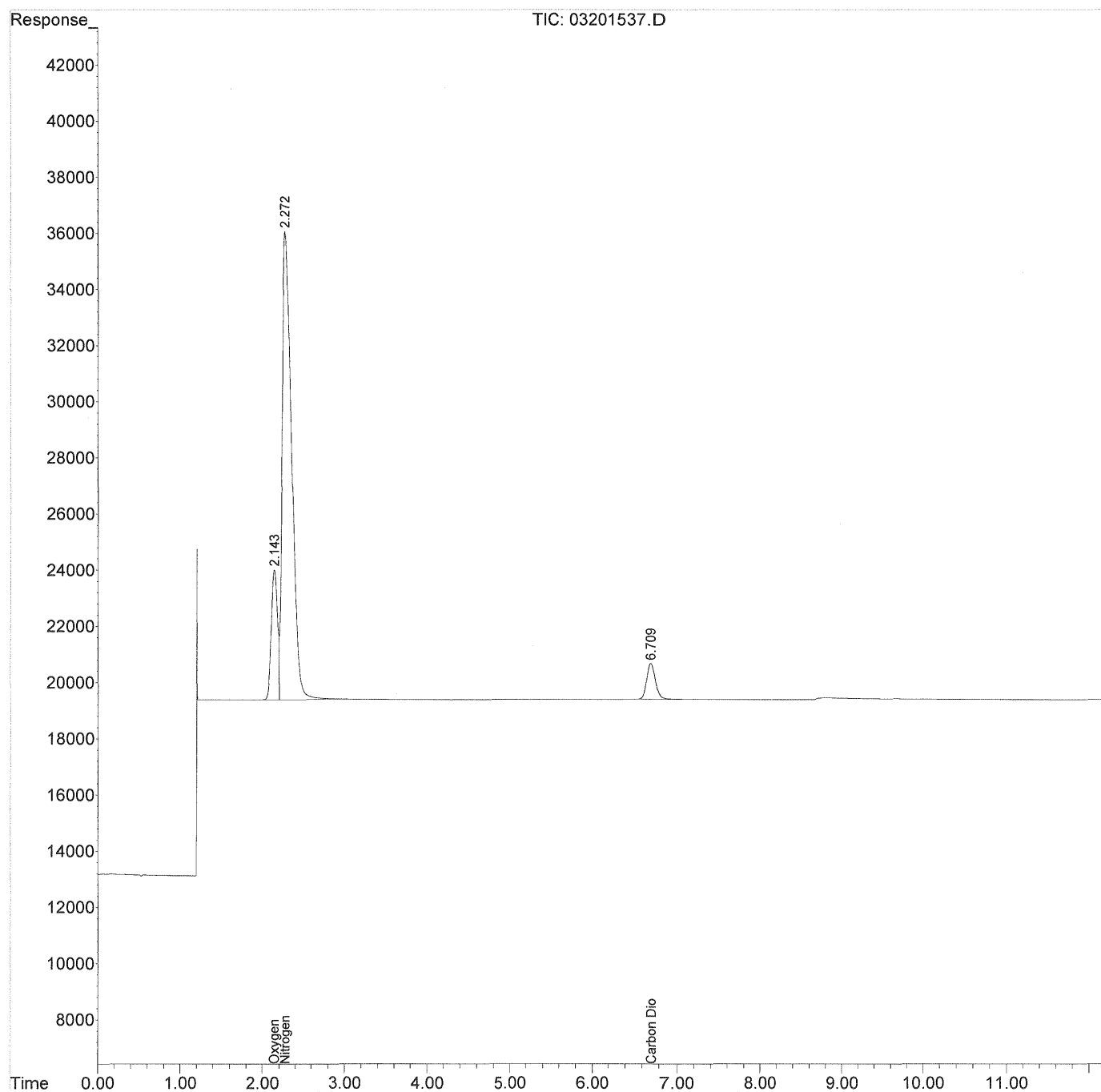
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201537.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:30 pm
Operator : NL
Sample : 1126-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:22 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201538.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:45 pm
Operator : NL
Sample : 1126-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:25 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.123	230853	139695.475 ppm
3) Nitrogen	2.252	1337738	696741.122 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.706	87441	40642.266 ppm

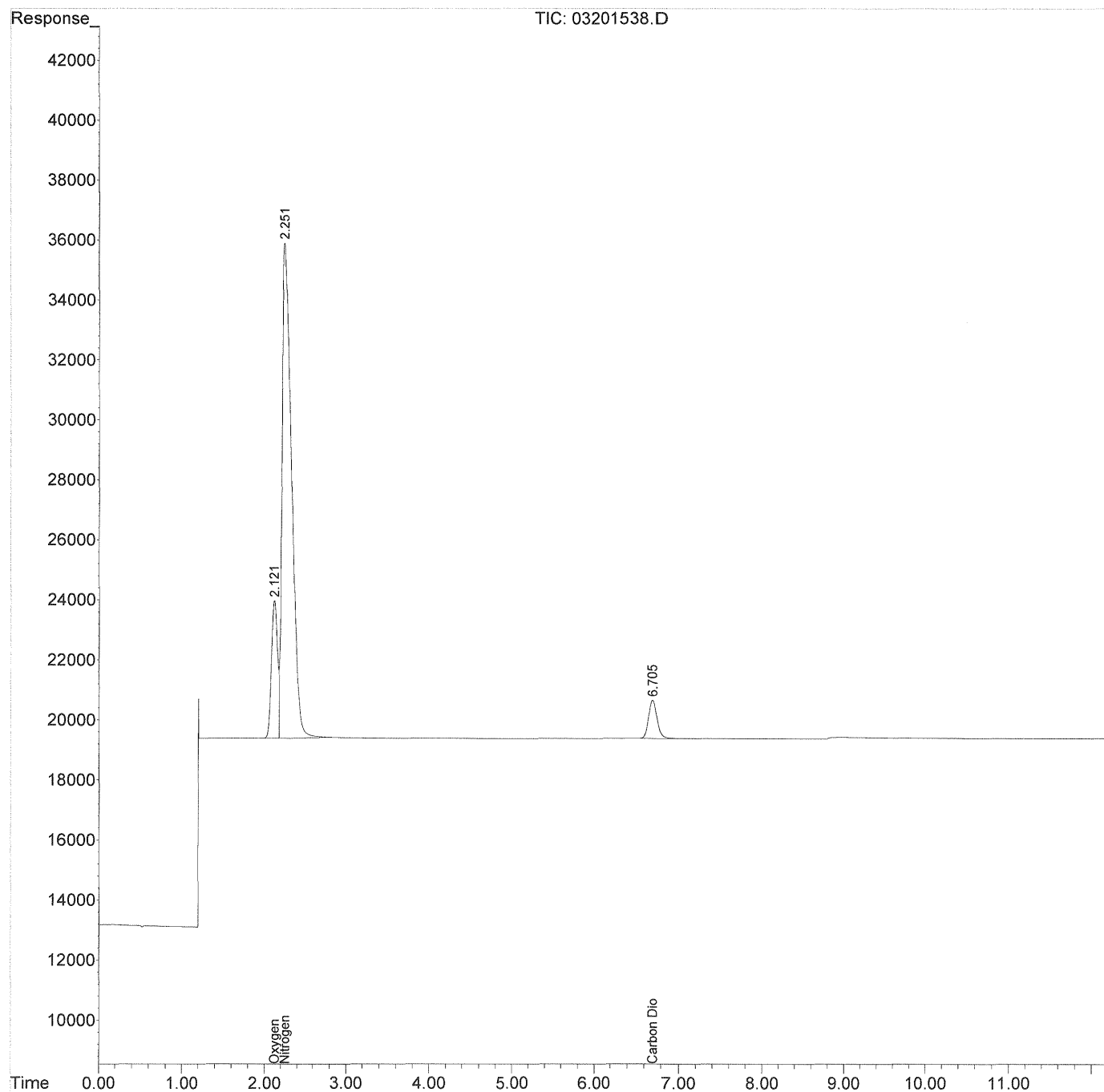
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201538.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 5:45 pm
Operator : NL
Sample : 1126-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:25 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201539.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 6:01 pm
Operator : NL
Sample : 1126-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:28 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.133	207475	125548.446 ppm
3) Nitrogen	2.262	1318196	686563.111 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.705	103630	48166.745 ppm

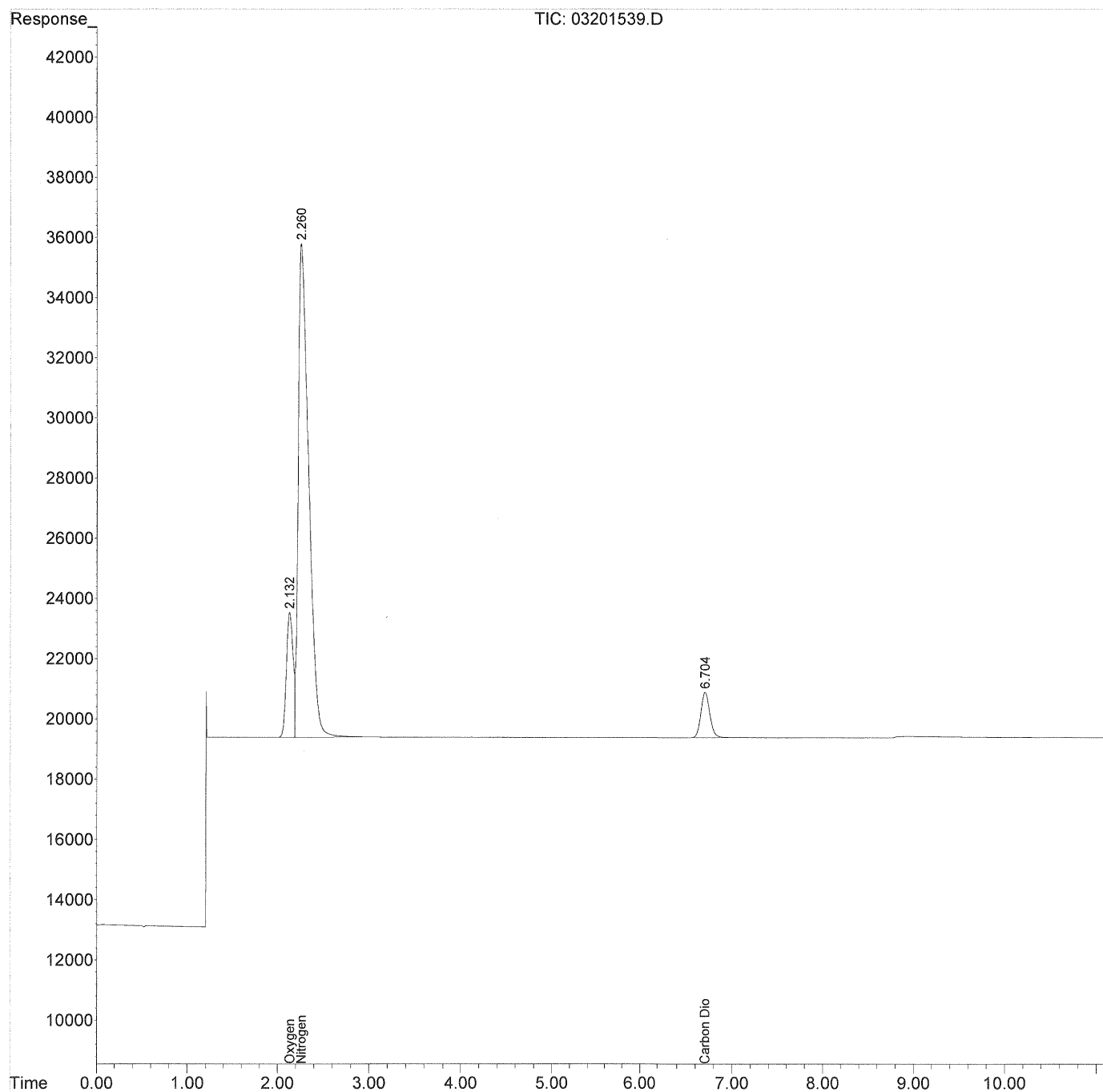
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201539.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 6:01 pm
Operator : NL
Sample : 1126-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:28 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201540.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 6:16 pm
Operator : NL
Sample : 1126-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:32 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.151	211677	128091.707 ppm
3) Nitrogen	2.279	1343539	699762.417 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.710	105763	49158.417 ppm

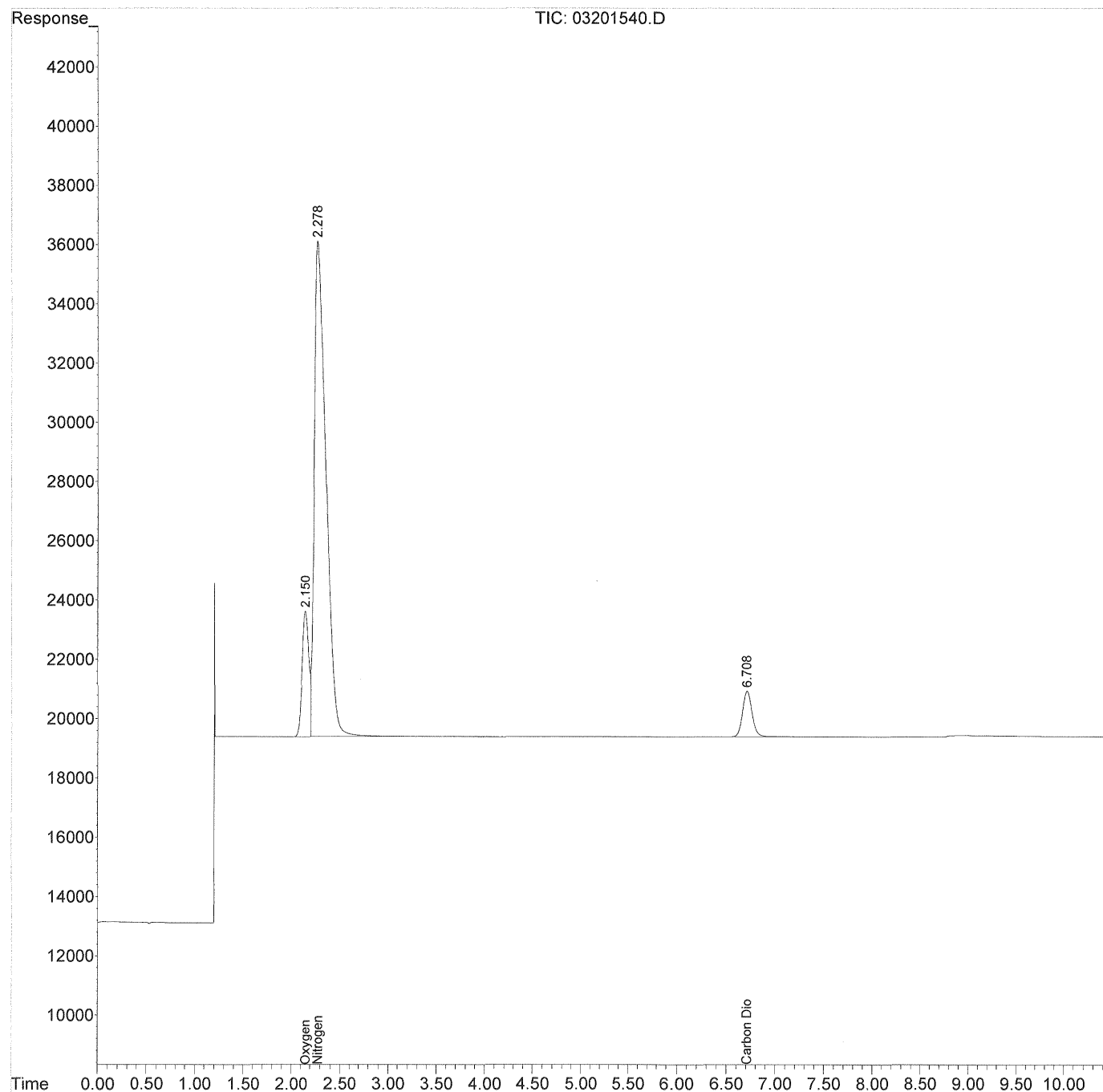
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201540.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 6:16 pm
Operator : NL
Sample : 1126-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:32 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201541.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 6:44 pm
Operator : NL
Sample : 1126-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:36 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.163	211059	127717.254 ppm
3) Nitrogen	2.291	1336777	696240.652 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.717	105051	48827.331 ppm

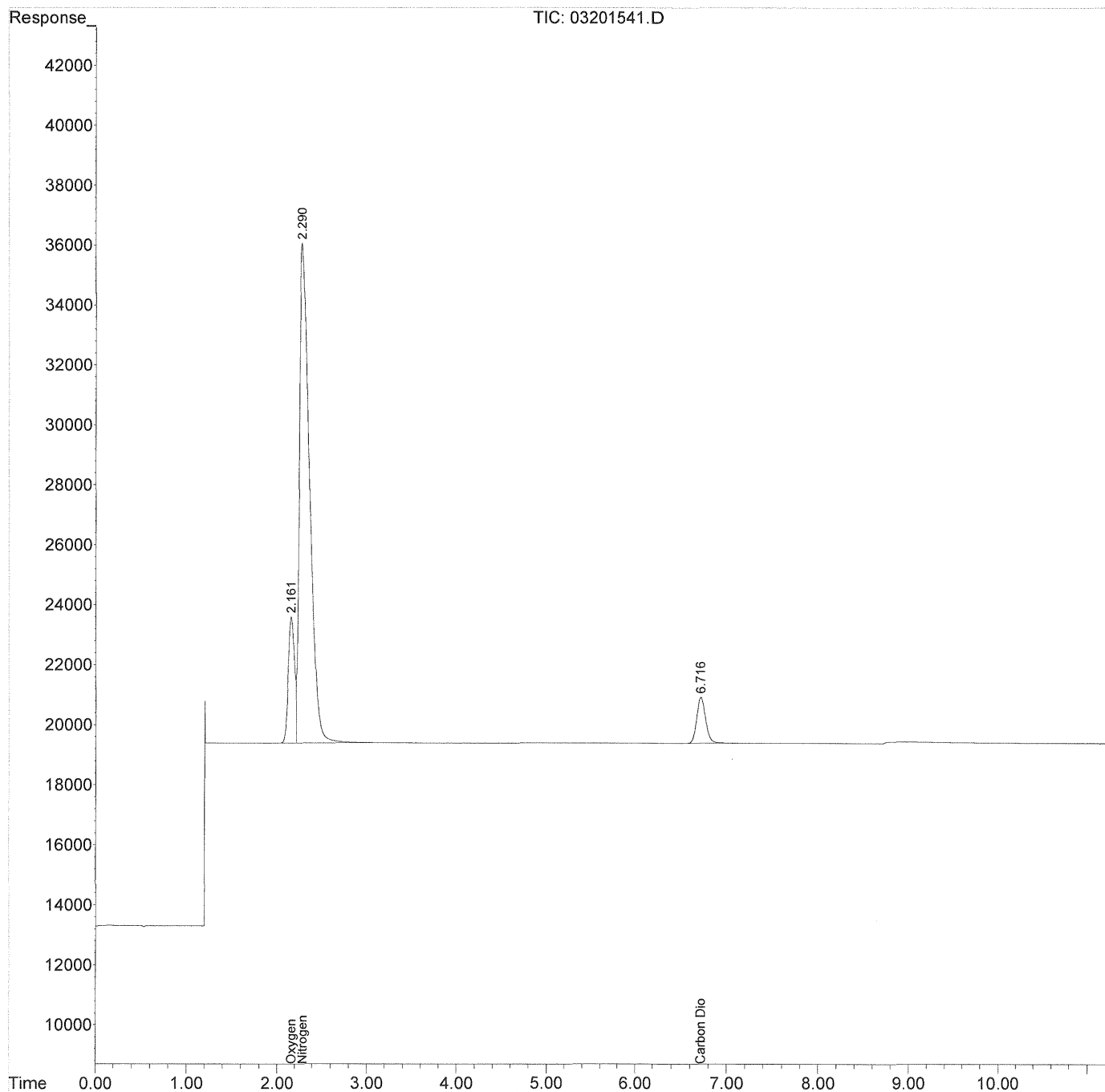
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
 Data File : 03201541.D
 Signal(s) : TCD1A.CH
 Acq On : 20 Mar 2015 6:44 pm
 Operator : NL
 Sample : 1126-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 21 09:38:36 2015
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201502.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:43 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:03 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	0.000	0	N.D.	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	0.000	0	N.D.	ppm

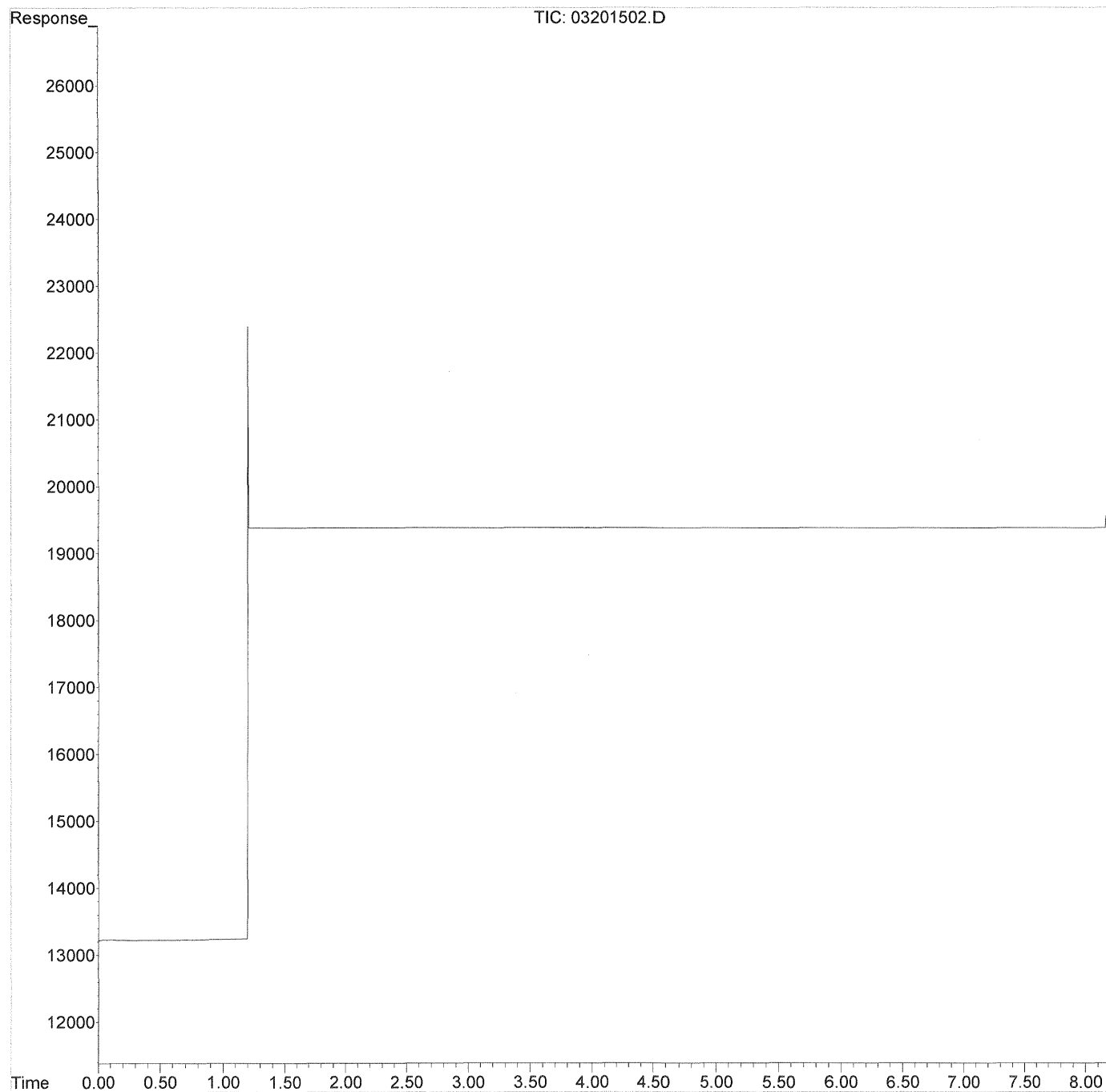
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201502.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:43 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:03 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Method Path : J:\GC01\METHODS\
 Method File : TR031014.M
 Title : EPA 3C GC/TCD Analysis for Fixed Gases
 Last Update : Tue Mar 11 11:04:23 2014
 Response Via : Initial Calibration

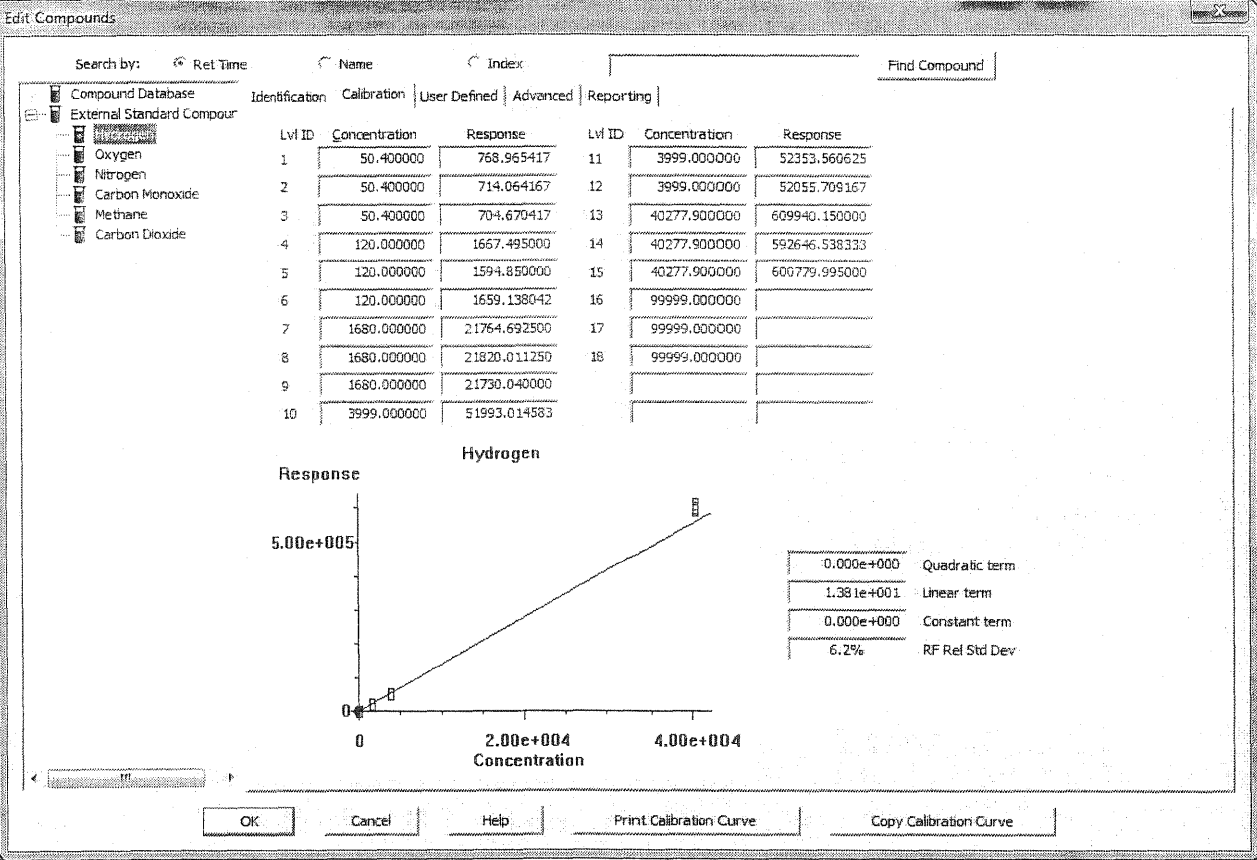
Calibration Files

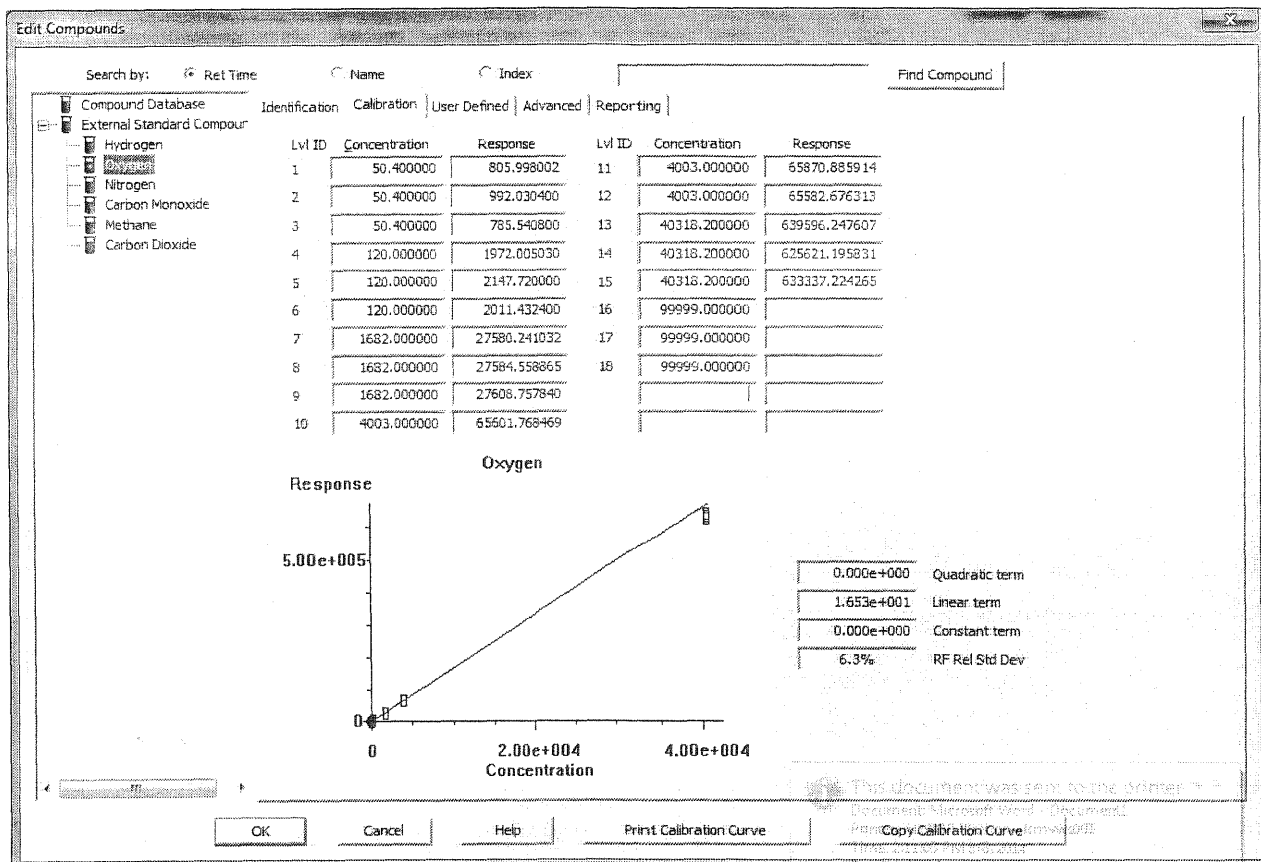
1	=03101403.D	2	=03101404.D	3	=03101405.D
4	=03101406.D	5	=03101407.D	6	=03101408.D

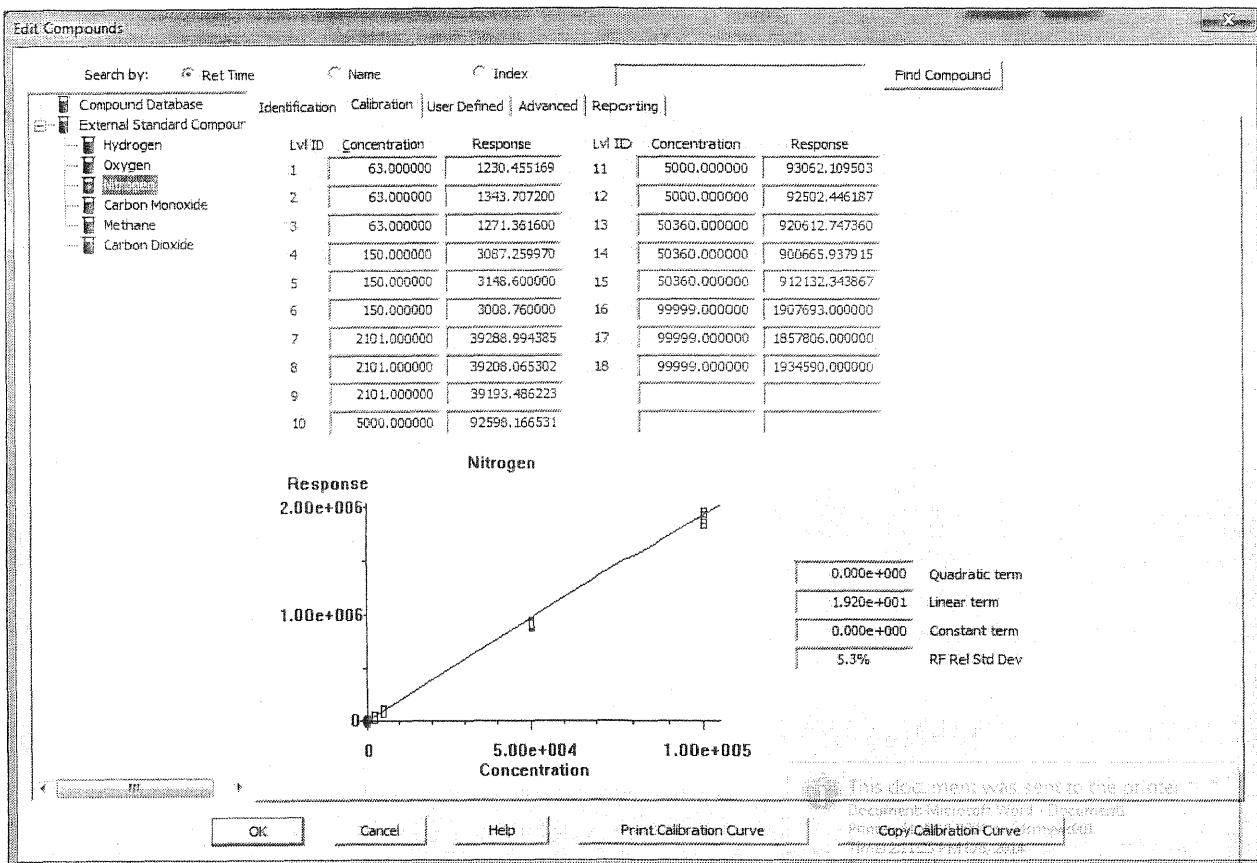
	Compound	1	2	3	4	5	6	Avg		%RSD

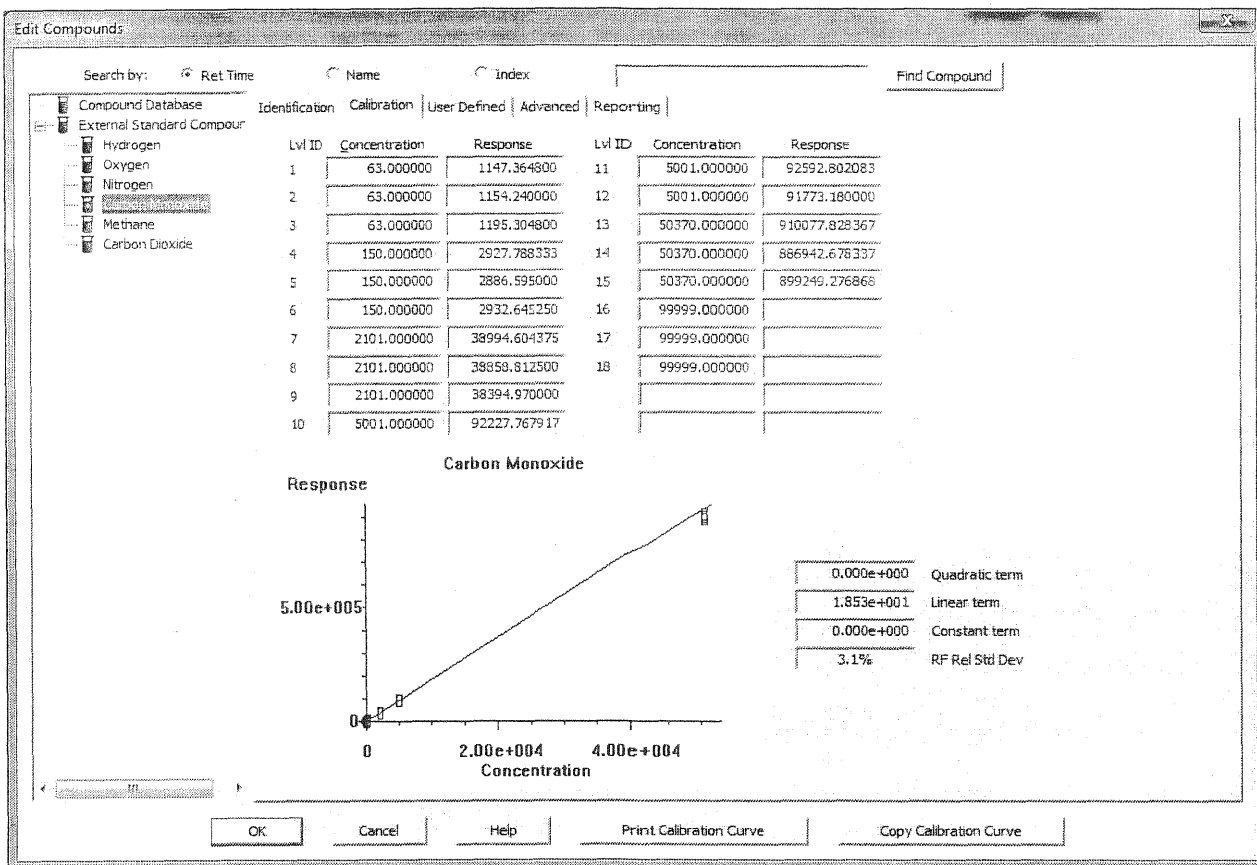
1)	Hydrogen	1.526	1.417	1.398	1.390	1.329	1.383	1.381	E1	6.22
2)	Oxygen	1.599	1.968	1.559	1.643	1.790	1.676	1.653	E1	6.33
3)	Nitrogen	1.953	2.133	2.018	2.058	2.099	2.006	1.920	E1	5.33
4)	Carbon Monoxide	1.821	1.832	1.897	1.952	1.924	1.955	1.853	E1	3.06
5)	Methane	1.435	1.340	1.378	1.499	1.440	1.406	1.396	E1	3.12
6)	Carbon Dioxide	2.233	2.138	2.113	2.234	2.287	2.291	2.151	E1	3.66

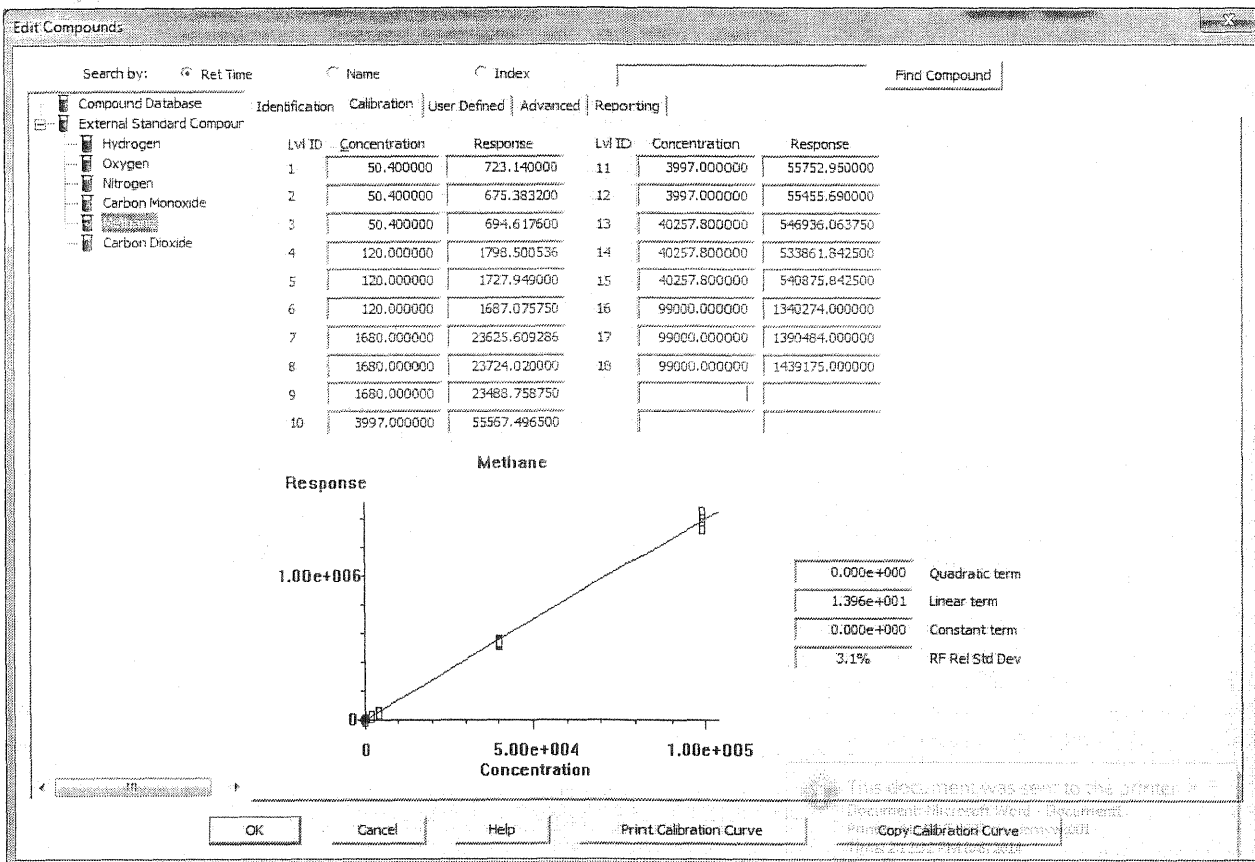
(#) = Out of Range ### Number of calibration levels exceeded format ###

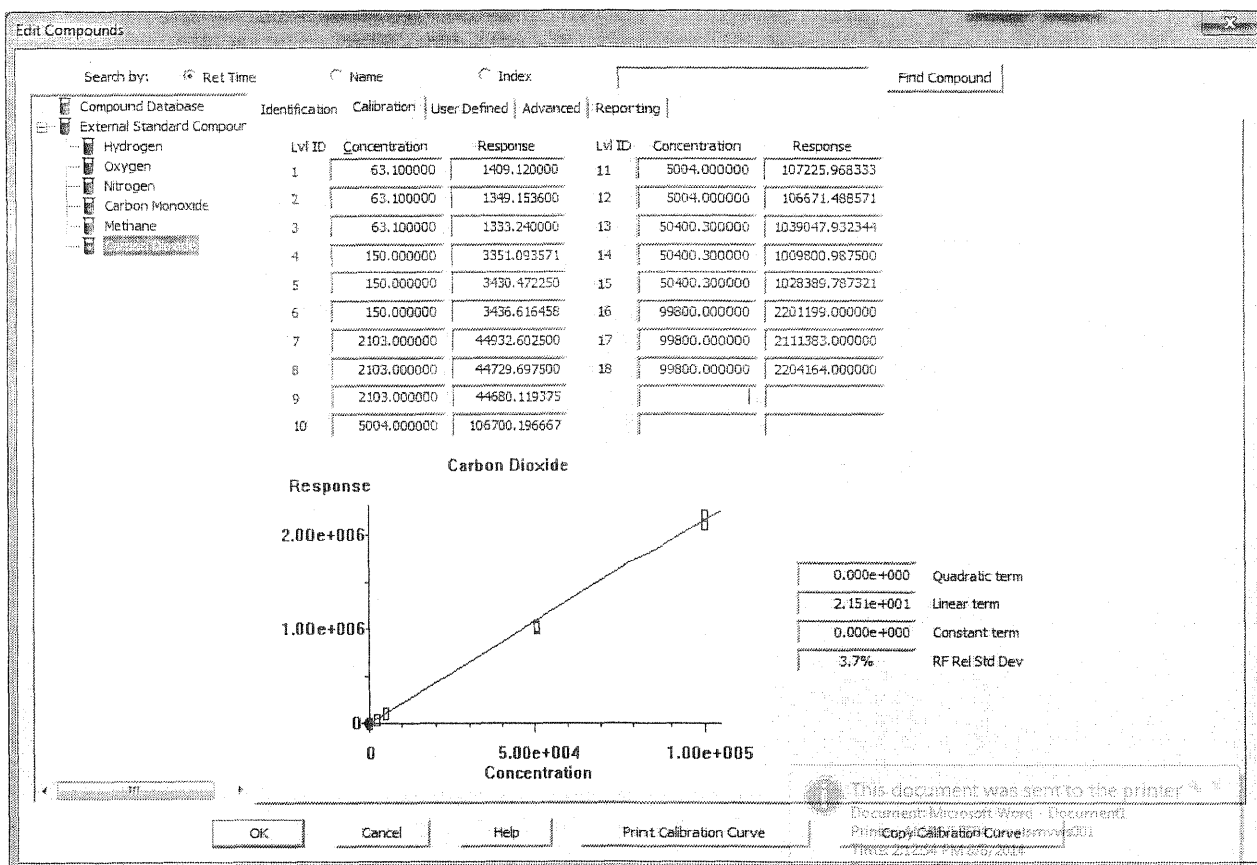








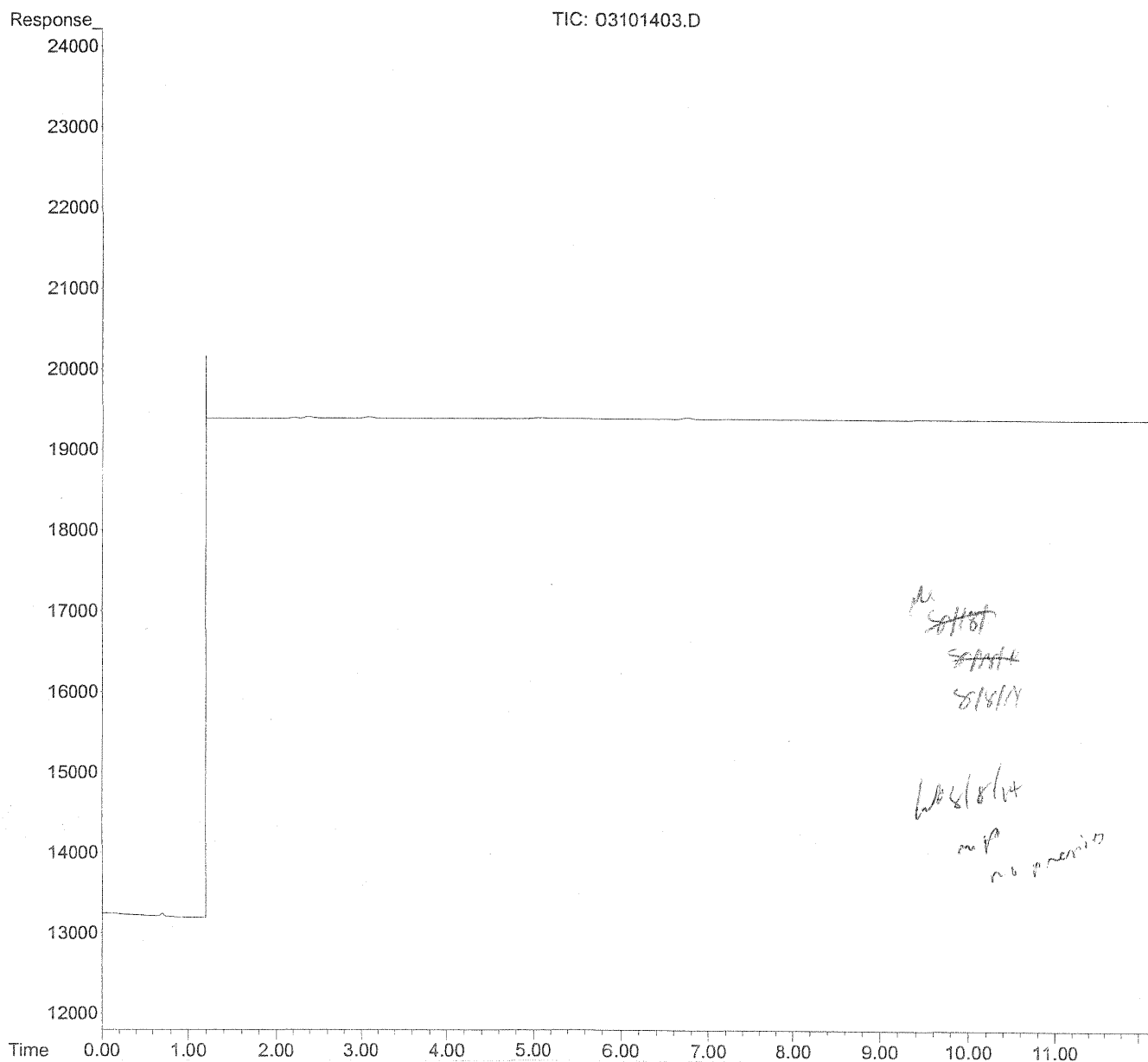




Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.700	769	NoCal	ppm
2) Oxygen	2.227	806	NoCal	ppm m
3) Nitrogen	2.393	1230	NoCal	ppm m
4) Carbon Monoxide	3.092	1147	NoCal	ppm m
5) Methane	5.085	723	NoCal	ppm m
6) Carbon Dioxide	6.748	1409	NoCal	ppm m

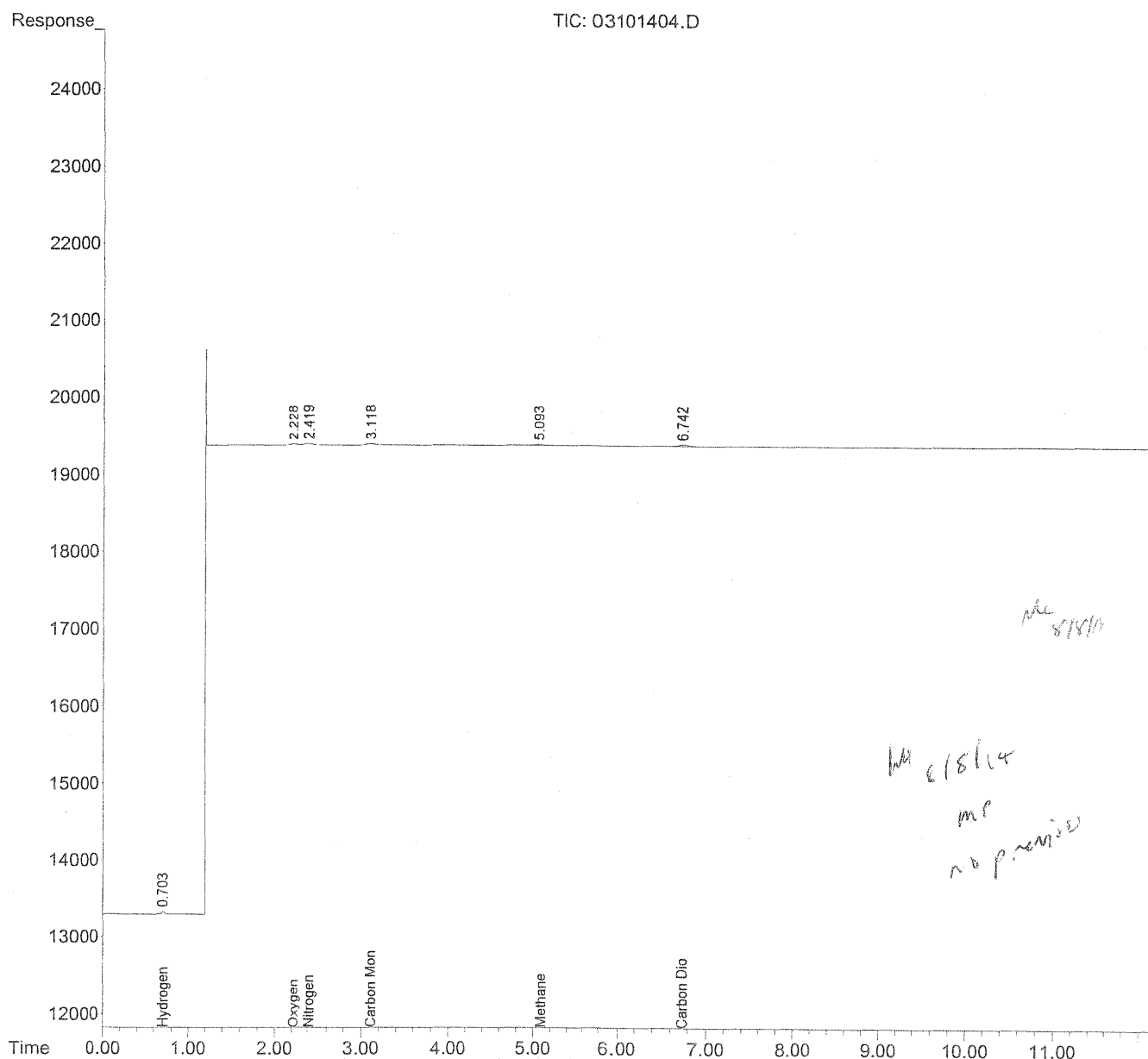
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.704	714	468.016	ppm
2) Oxygen	2.228	992	620.328	ppm m
3) Nitrogen	2.419	1344	687.986	ppm m
4) Carbon Monoxide	3.118	1154	633.775	ppm m
5) Methane	5.093	675	470.715	ppm m
6) Carbon Dioxide	6.742	1349	604.147	ppm m

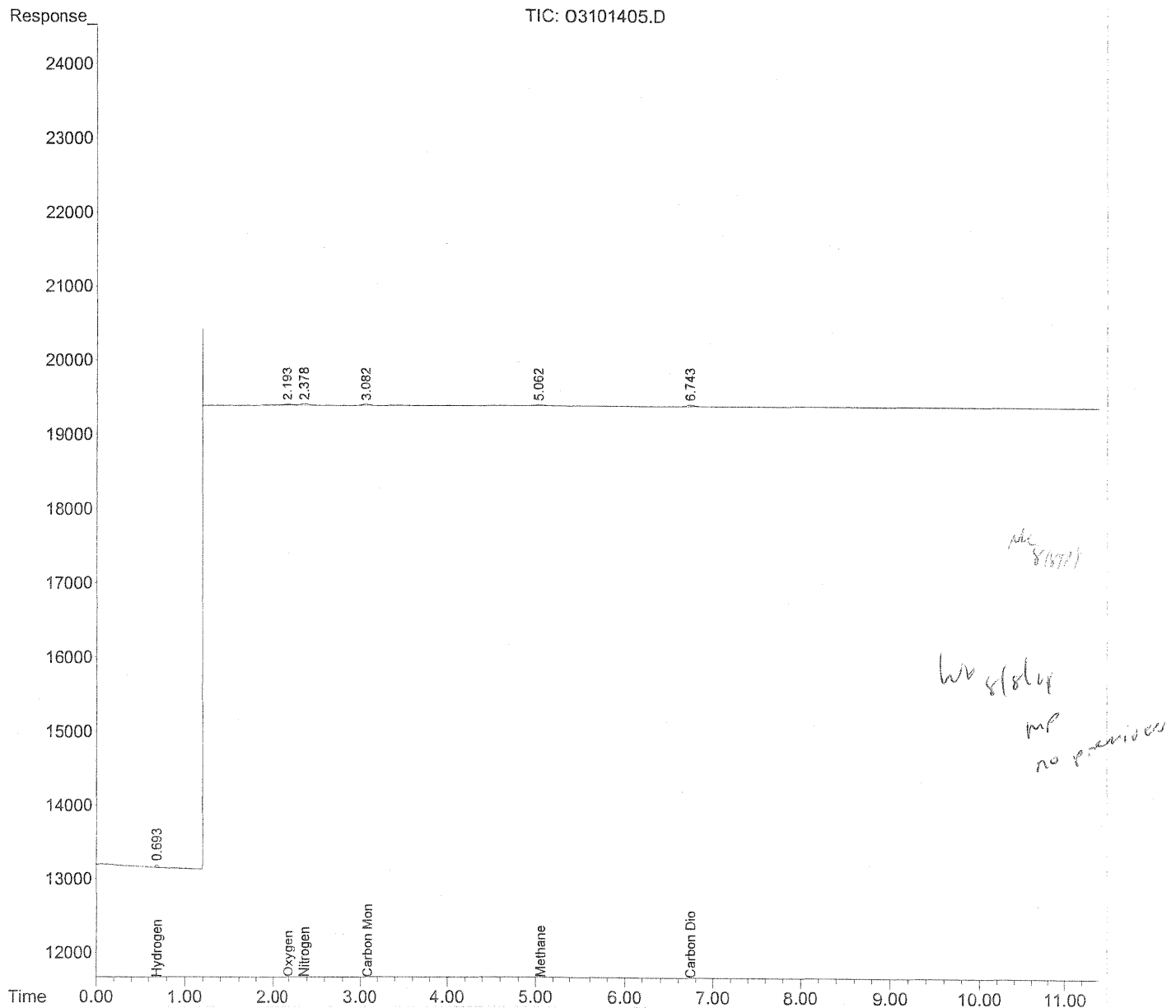
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101405.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:44
Operator : WH
Sample : std 1 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:20 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:15:04 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101405.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:44
Operator : WH
Sample : std 1 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:20 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:15:04 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.695	705	478.957	ppm
2) Oxygen	2.193	786	440.385	ppm m
3) Nitrogen	2.378	1271	592.487	ppm m
4) Carbon Monoxide	3.082	1195	654.363	ppm m
5) Methane	5.062	695	500.653	ppm m
6) Carbon Dioxide	6.743	1333	610.001	ppm m

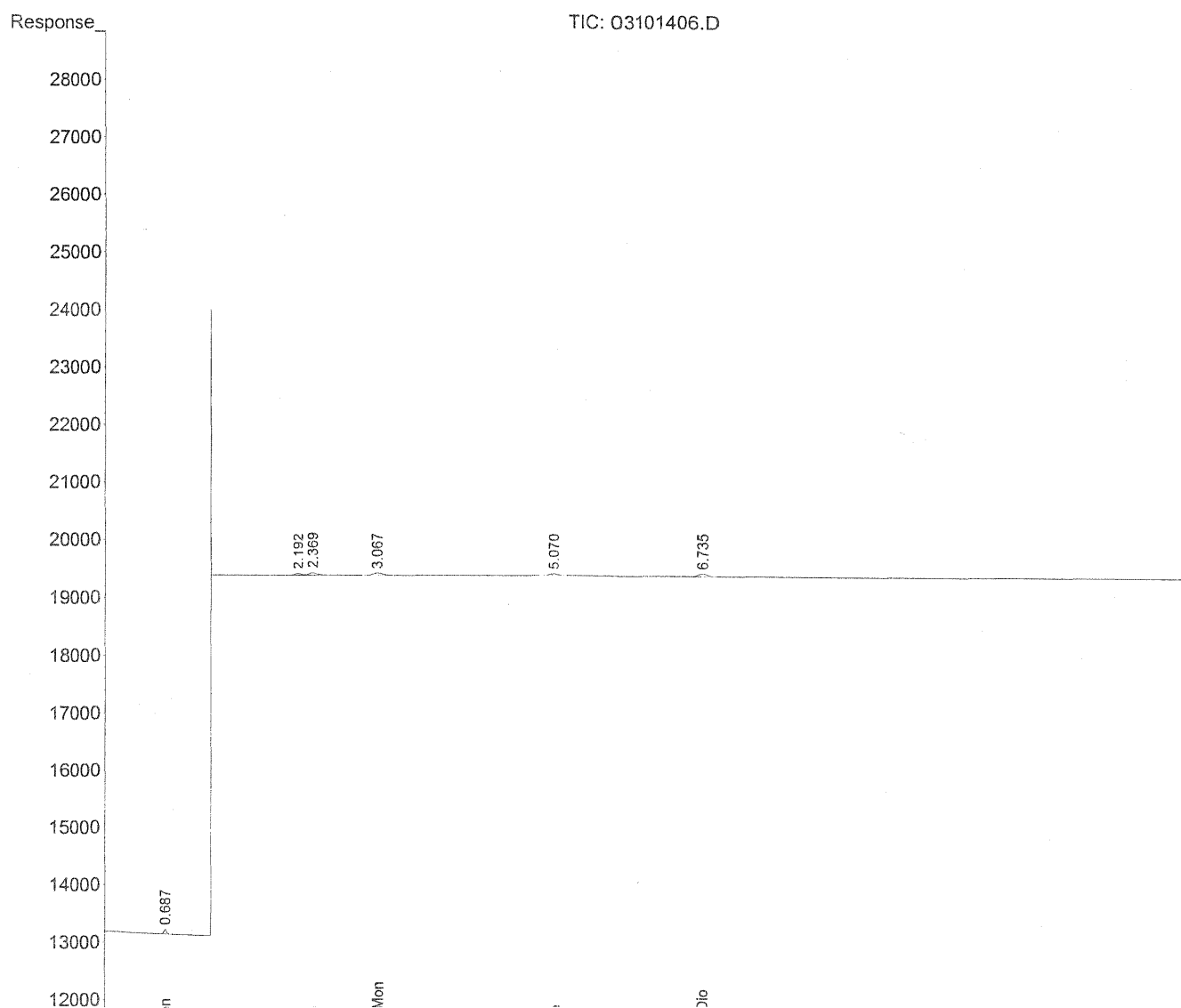
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.688	1667	1152.467 ppm
2) Oxygen	2.195	1972	1154.090 ppm
3) Nitrogen	2.367	3087	1467.876 ppm
4) Carbon Monoxide	3.067	2928	1582.403 ppm
5) Methane	5.070	1799	1299.164 ppm
6) Carbon Dioxide	6.738	3351	1550.434 ppm

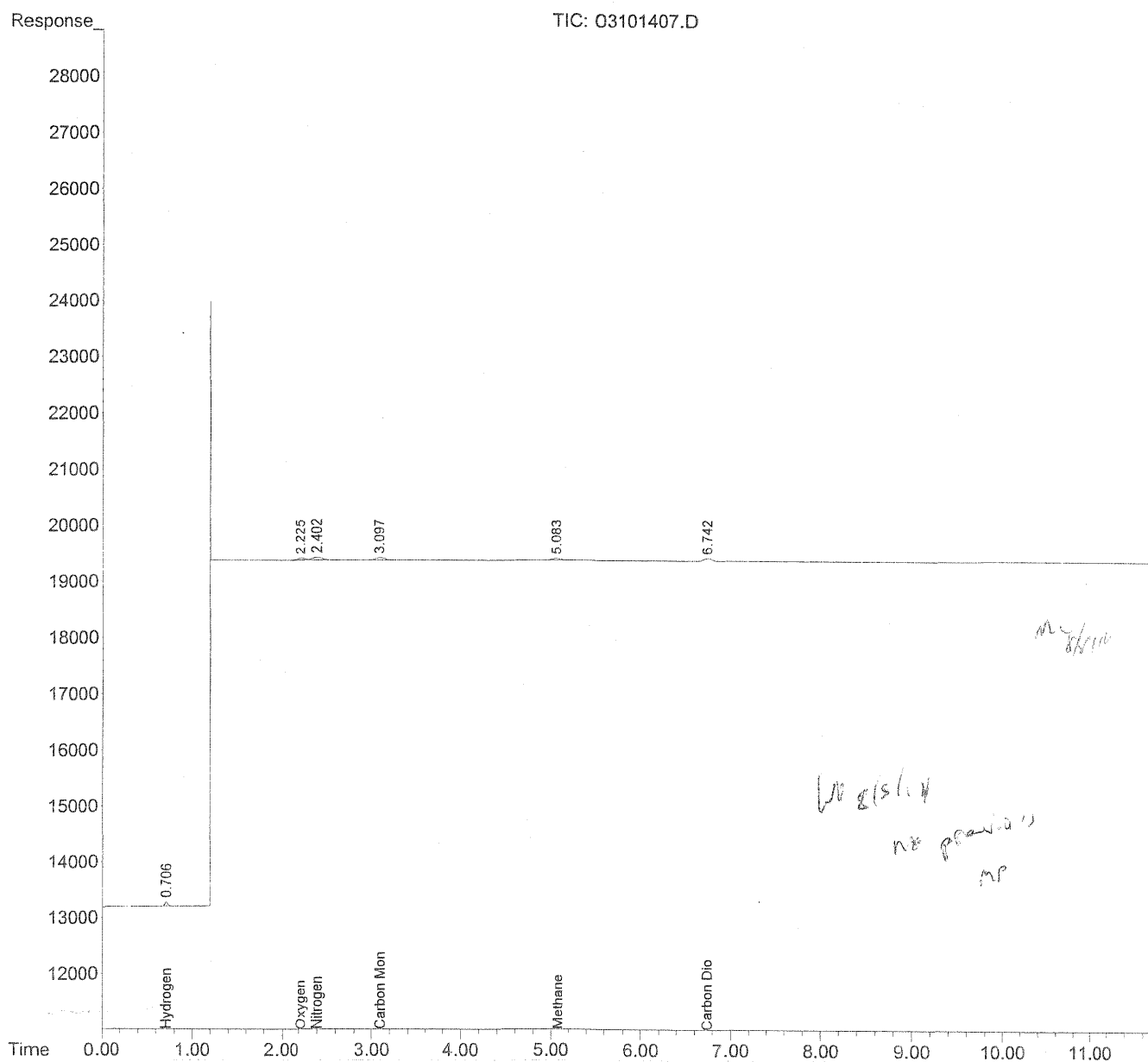
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101407.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 12:18
 Operator : WH
 Sample : std 2 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 13:18:19 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 13:17:31 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.708	1595	1113.284	ppm
2) Oxygen	2.225	2148	1269.063	ppm m
3) Nitrogen	2.402	3149	1505.099	ppm m
4) Carbon Monoxide	3.106	2887	1539.002	ppm
5) Methane	5.082	1728	1222.935	ppm
6) Carbon Dioxide	6.744	3430	1573.930	ppm

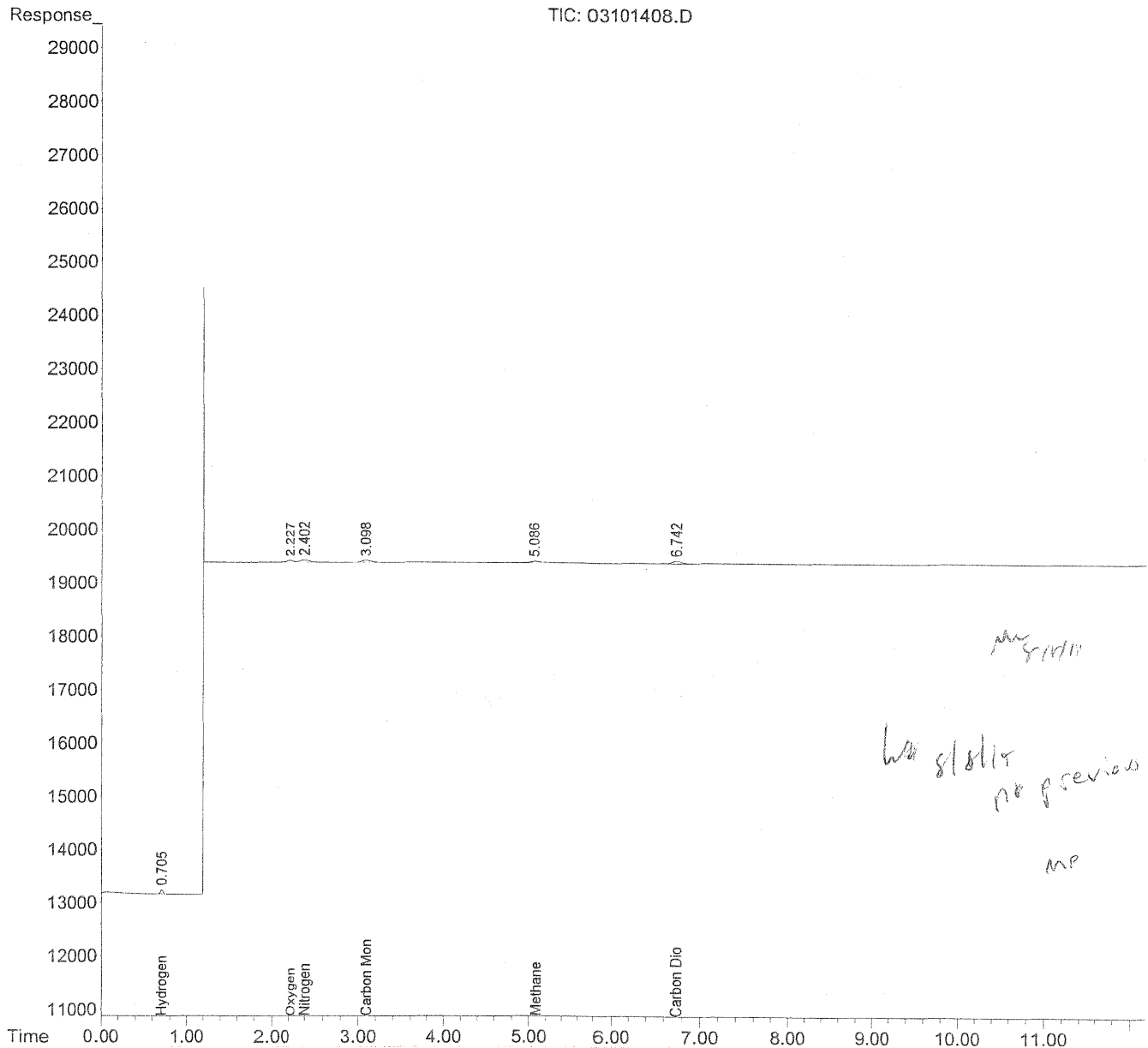
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.707	1659	1175.144	ppm
2) Oxygen	2.227	2011	1175.007	ppm m
3) Nitrogen	2.402	3009	1437.275	ppm m
4) Carbon Monoxide	3.103	2933	1555.465	ppm
5) Methane	5.087	1687	1189.461	ppm
6) Carbon Dioxide	6.745	3437	1561.358	ppm

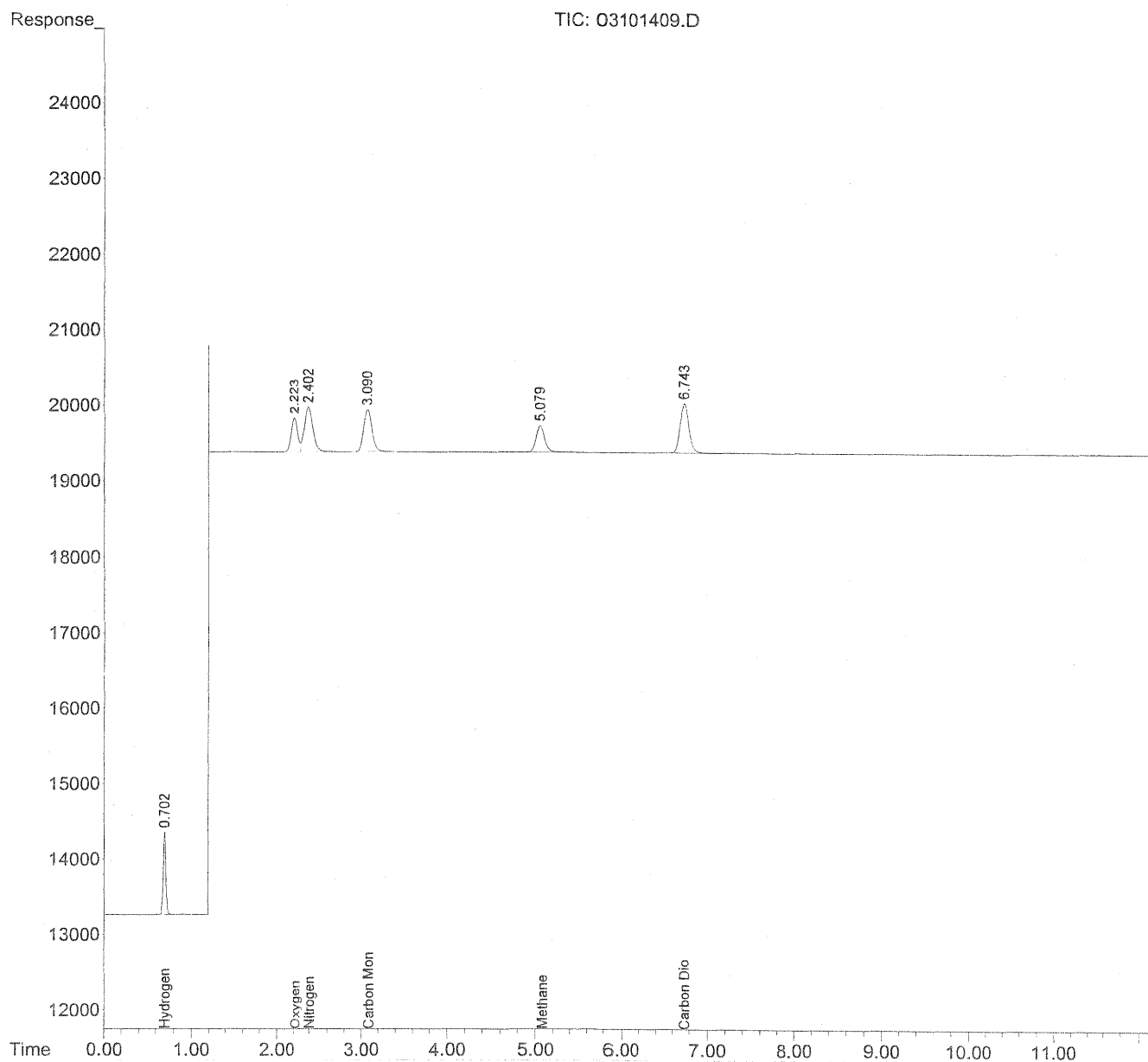
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21765	15469.029 ppm
2) Oxygen	2.225	27580	16167.517 ppm
3) Nitrogen	2.402	39289	18899.954 ppm
4) Carbon Monoxide	3.092	38995	20555.928 ppm
5) Methane	5.081	23626	16681.490 ppm
6) Carbon Dioxide	6.744	44933	20275.995 ppm

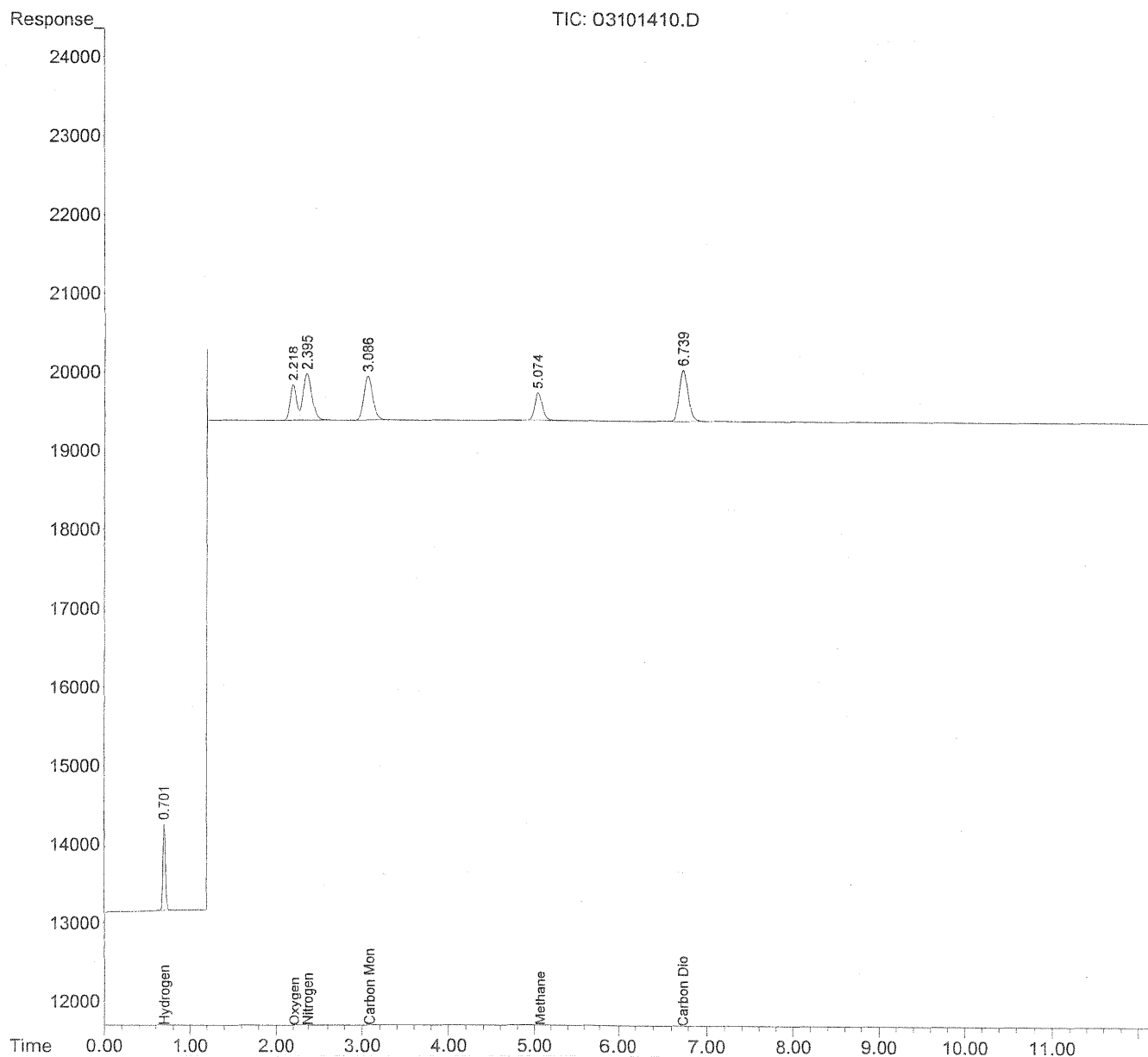
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	21820	15685.875 ppm
2) Oxygen	2.219	27585	16260.158 ppm
3) Nitrogen	2.397	39208	19135.565 ppm
4) Carbon Monoxide	3.087	38859	20547.786 ppm
5) Methane	5.076	23724	16767.873 ppm
6) Carbon Dioxide	6.740	44730	20288.350 ppm

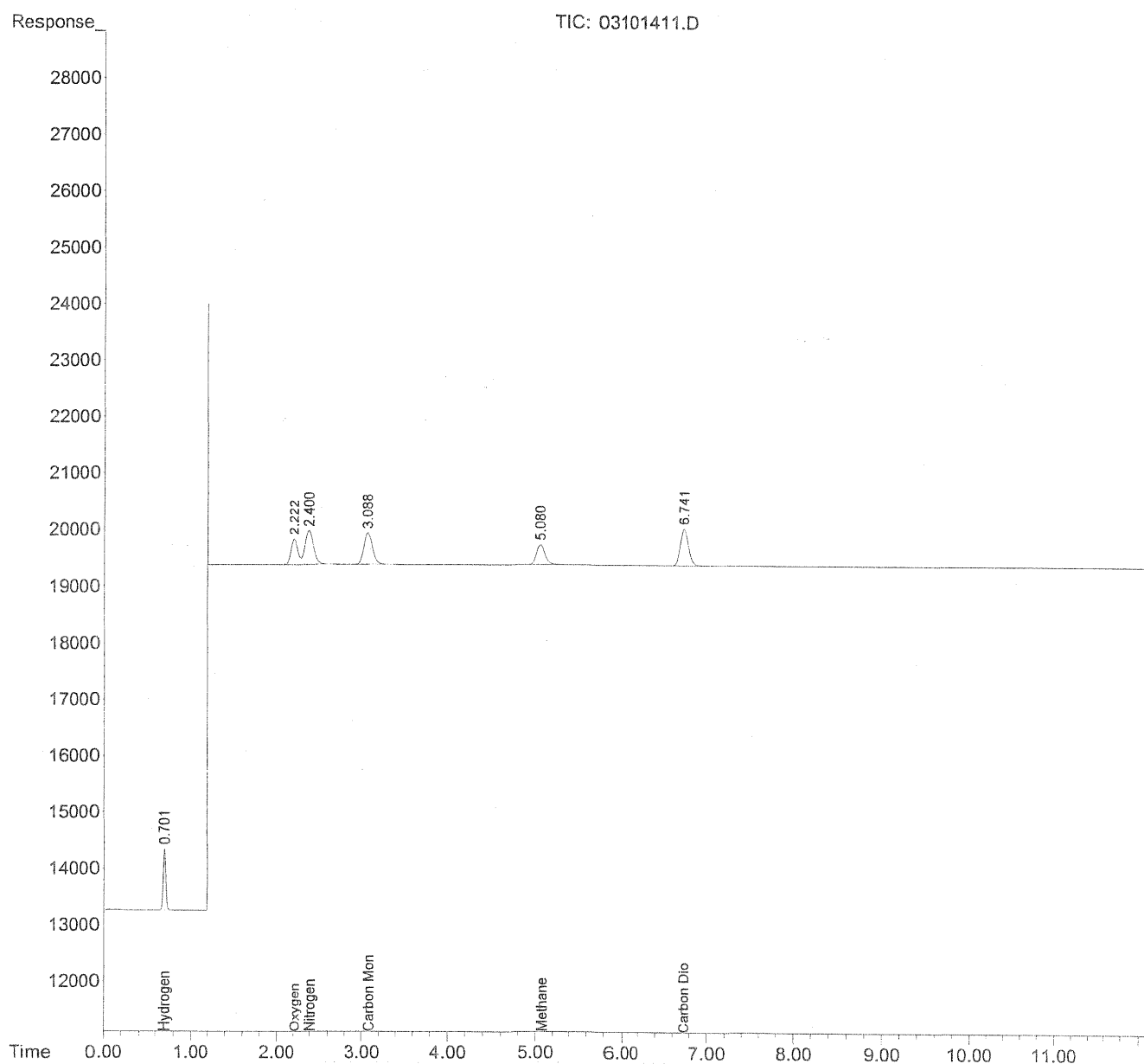
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21730	15751.773 ppm
2) Oxygen	2.224	27609	16342.415 ppm
3) Nitrogen	2.401	39193	19344.177 ppm
4) Carbon Monoxide	3.090	38395	20358.500 ppm
5) Methane	5.081	23489	16605.562 ppm
6) Carbon Dioxide	6.743	44680	20355.596 ppm

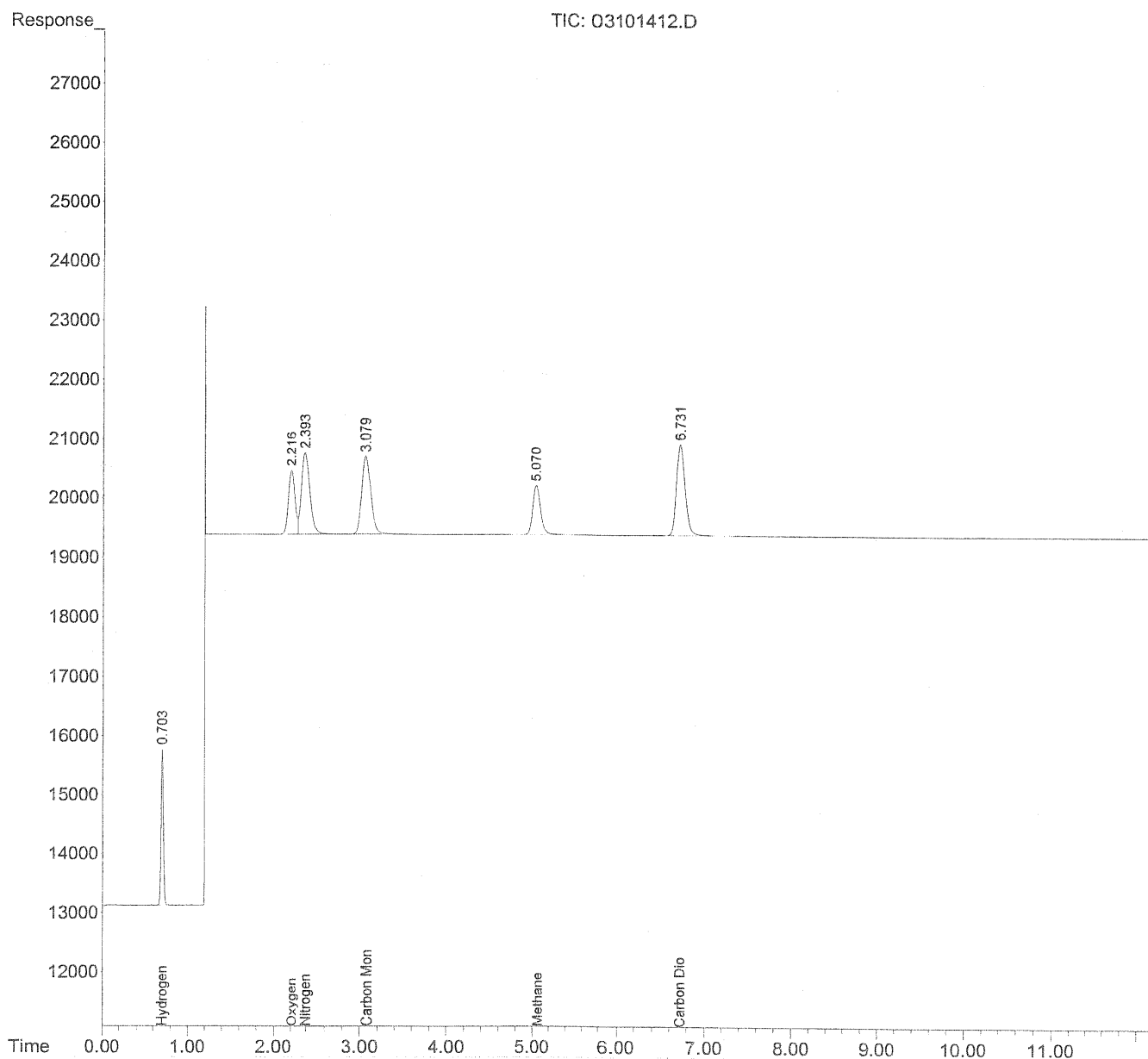
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.705	51993	37952.051 ppm
2) Oxygen	2.217	65602	38954.464 ppm
3) Nitrogen	2.394	92598	46108.575 ppm
4) Carbon Monoxide	3.081	92228	49071.809 ppm
5) Methane	5.072	55567	39334.461 ppm
6) Carbon Dioxide	6.733	106700	48784.847 ppm

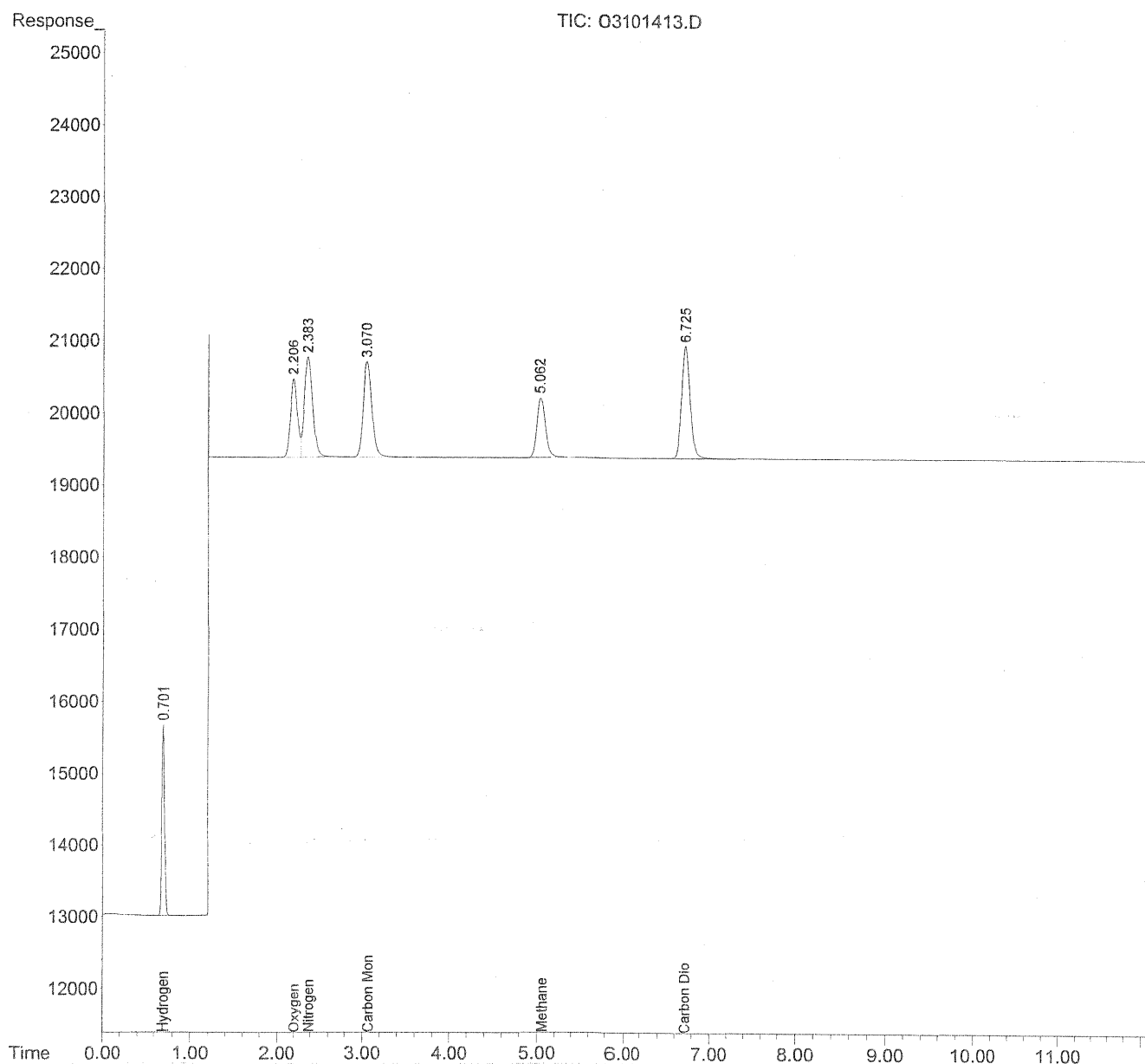
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	52354	38549.354 ppm
2) Oxygen	2.208	65871	39291.954 ppm
3) Nitrogen	2.385	93062	47432.408 ppm
4) Carbon Monoxide	3.072	92593	49417.144 ppm
5) Methane	5.064	55753	39568.314 ppm
6) Carbon Dioxide	6.726	107226	49228.245 ppm

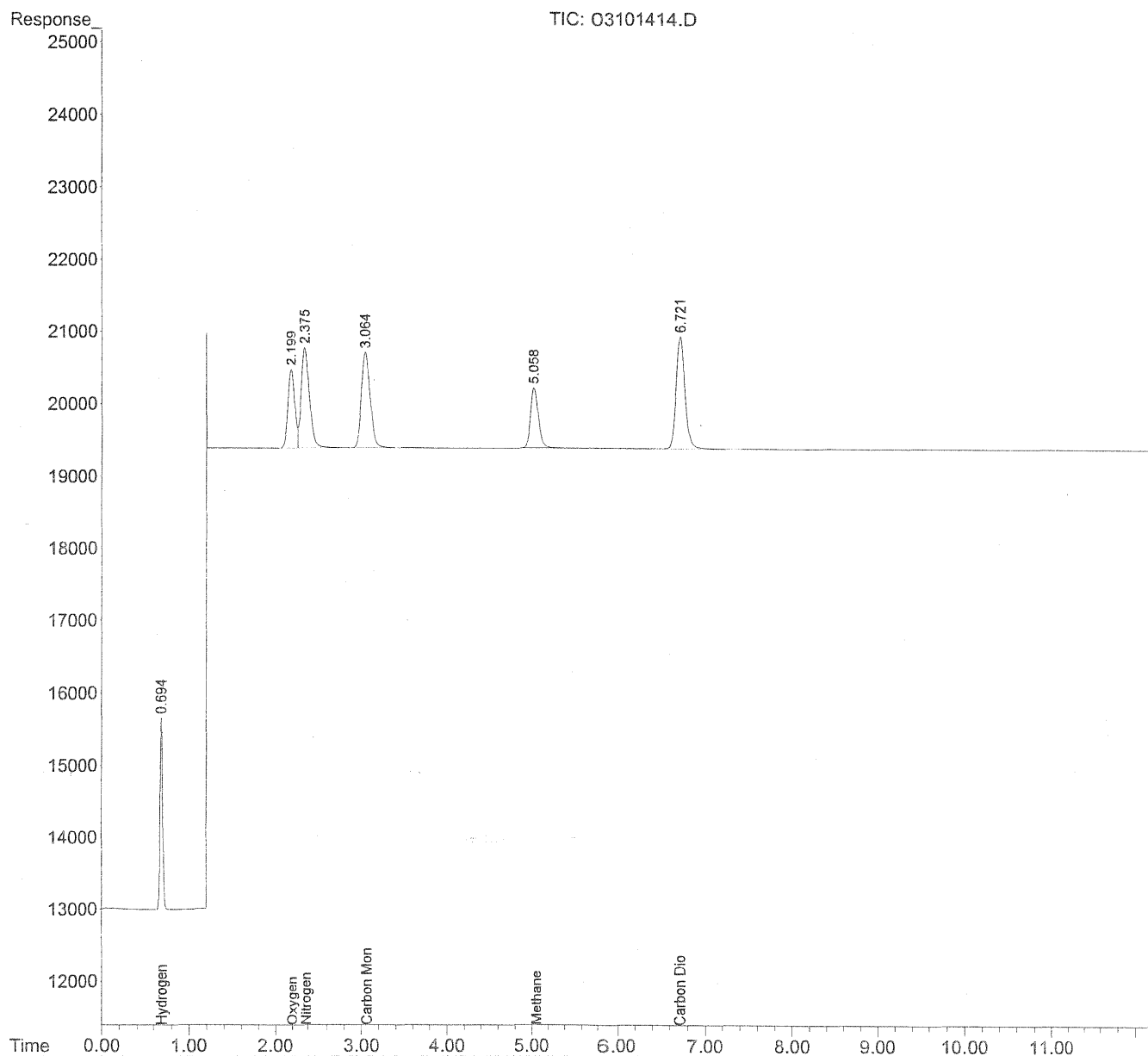
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101414.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 14:49
 Operator : WH
 Sample : std 4 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 18:45:17 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:44:30 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.696	52056	37688.686 ppm
2) Oxygen	2.200	65583	39685.849 ppm
3) Nitrogen	2.377	92502	48078.649 ppm
4) Carbon Monoxide	3.065	91773	49520.215 ppm
5) Methane	5.059	55456	39726.222 ppm
6) Carbon Dioxide	6.723	106671	49580.495 ppm

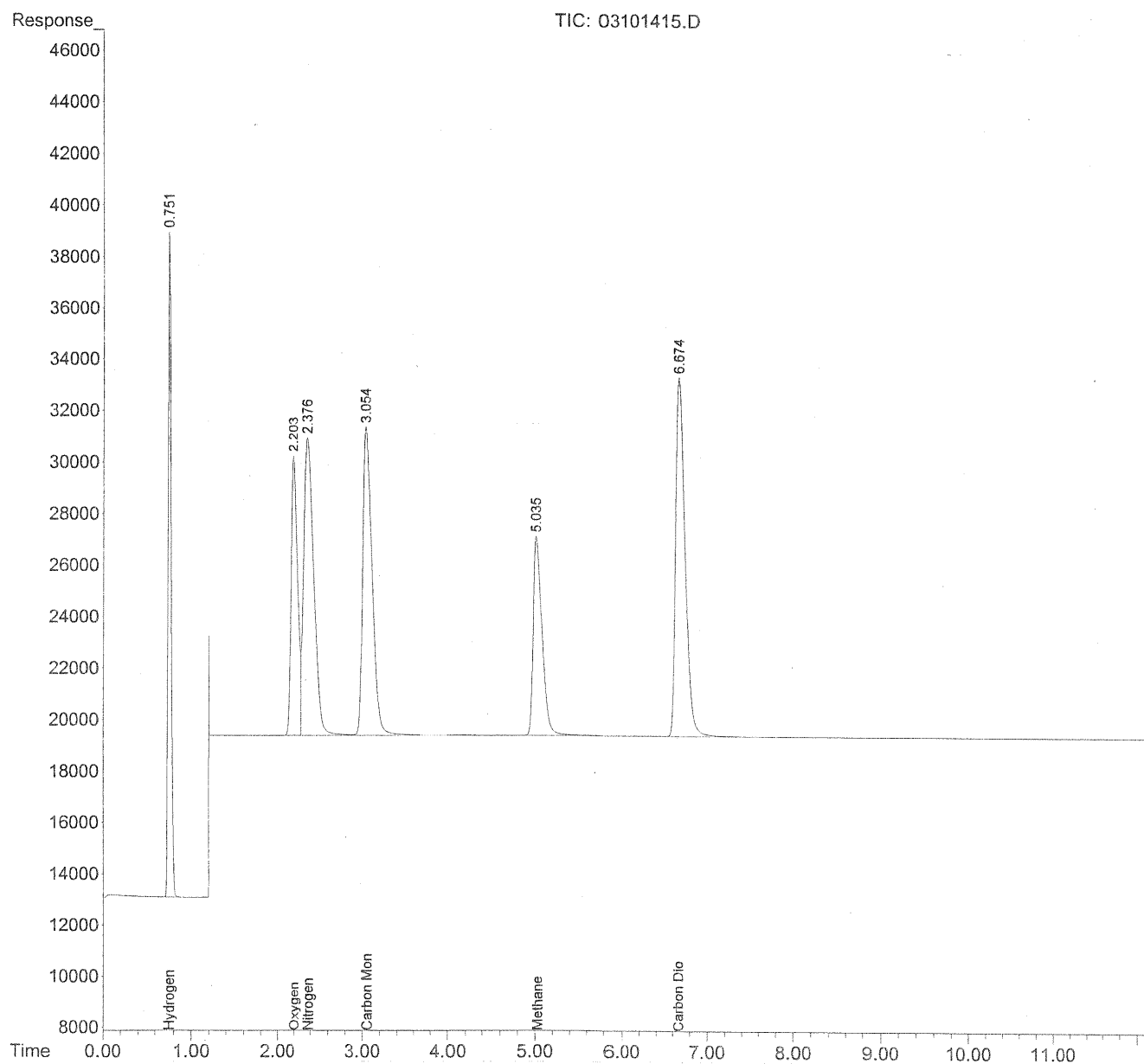
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5-1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	609940	450674.500 ppm
2) Oxygen	2.204	639596	382242.968 ppm
3) Nitrogen	2.378	920613	471464.666 ppm
4) Carbon Monoxide	3.056	910078	486547.441 ppm
5) Methane	5.037	546936	388661.341 ppm
6) Carbon Dioxide	6.676	1039048	477883.306 ppm

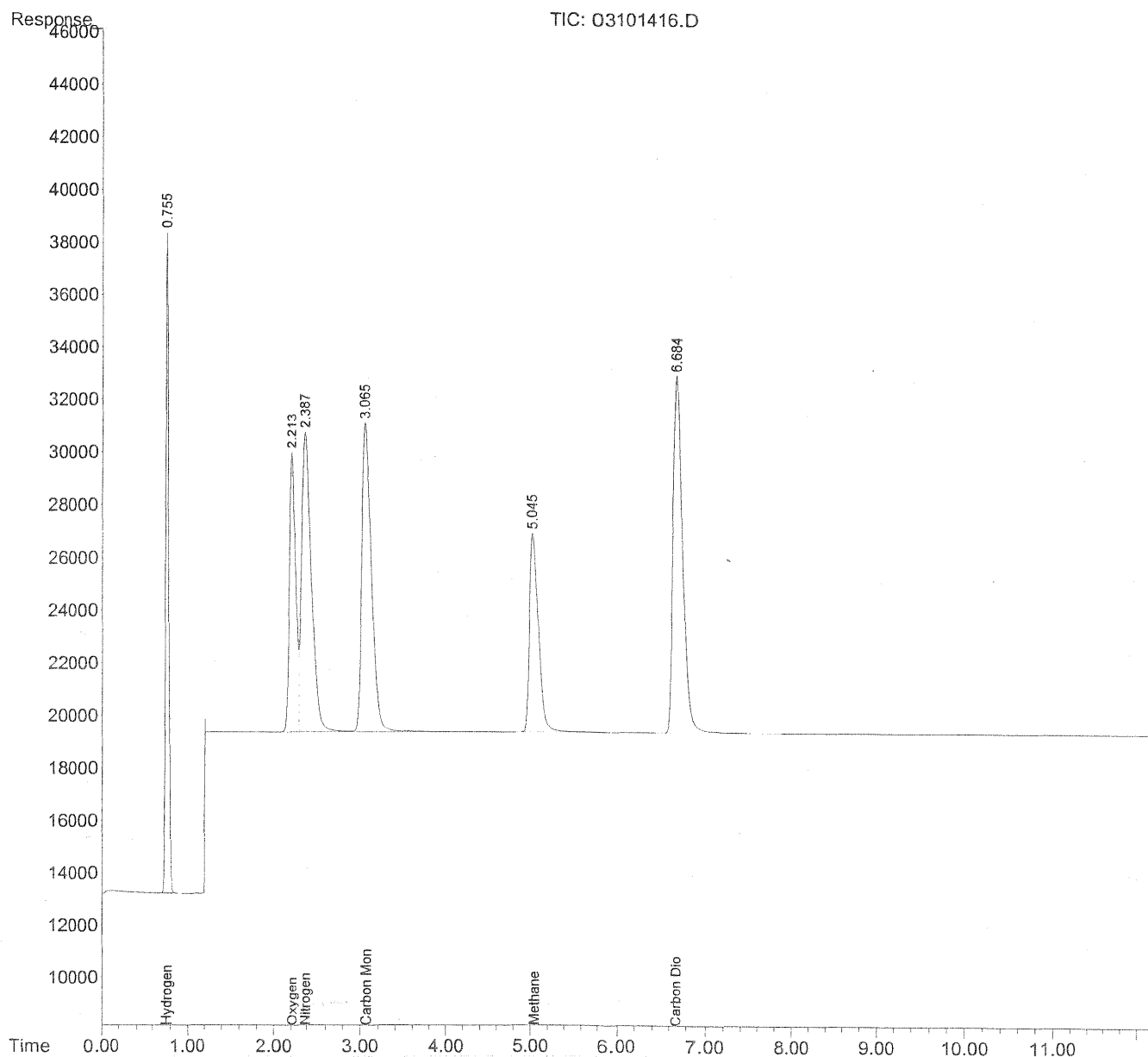
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.757	592647	433927.352 ppm
2) Oxygen	2.215	625621	375390.705 ppm
3) Nitrogen	2.388	900666	463524.733 ppm
4) Carbon Monoxide	3.067	886943	475424.245 ppm
5) Methane	5.047	533862	380382.085 ppm
6) Carbon Dioxide	6.686	1009801	466290.795 ppm

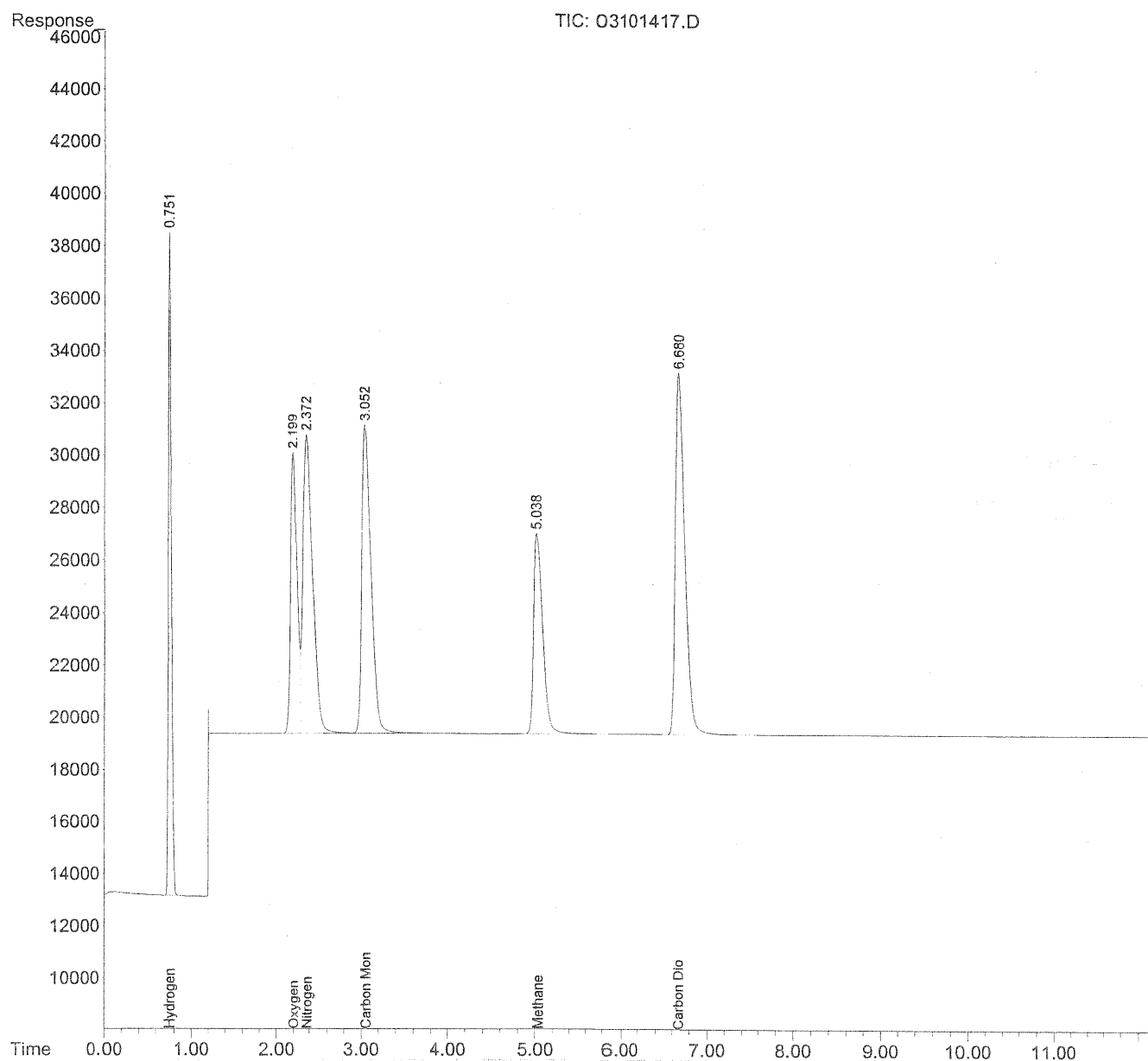
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	600780	437466.065 ppm
2) Oxygen	2.200	633337	381900.857 ppm
3) Nitrogen	2.374	912132	472109.403 ppm
4) Carbon Monoxide	3.054	899249	483961.452 ppm
5) Methane	5.040	540876	386903.325 ppm
6) Carbon Dioxide	6.681	1028390	477426.138 ppm

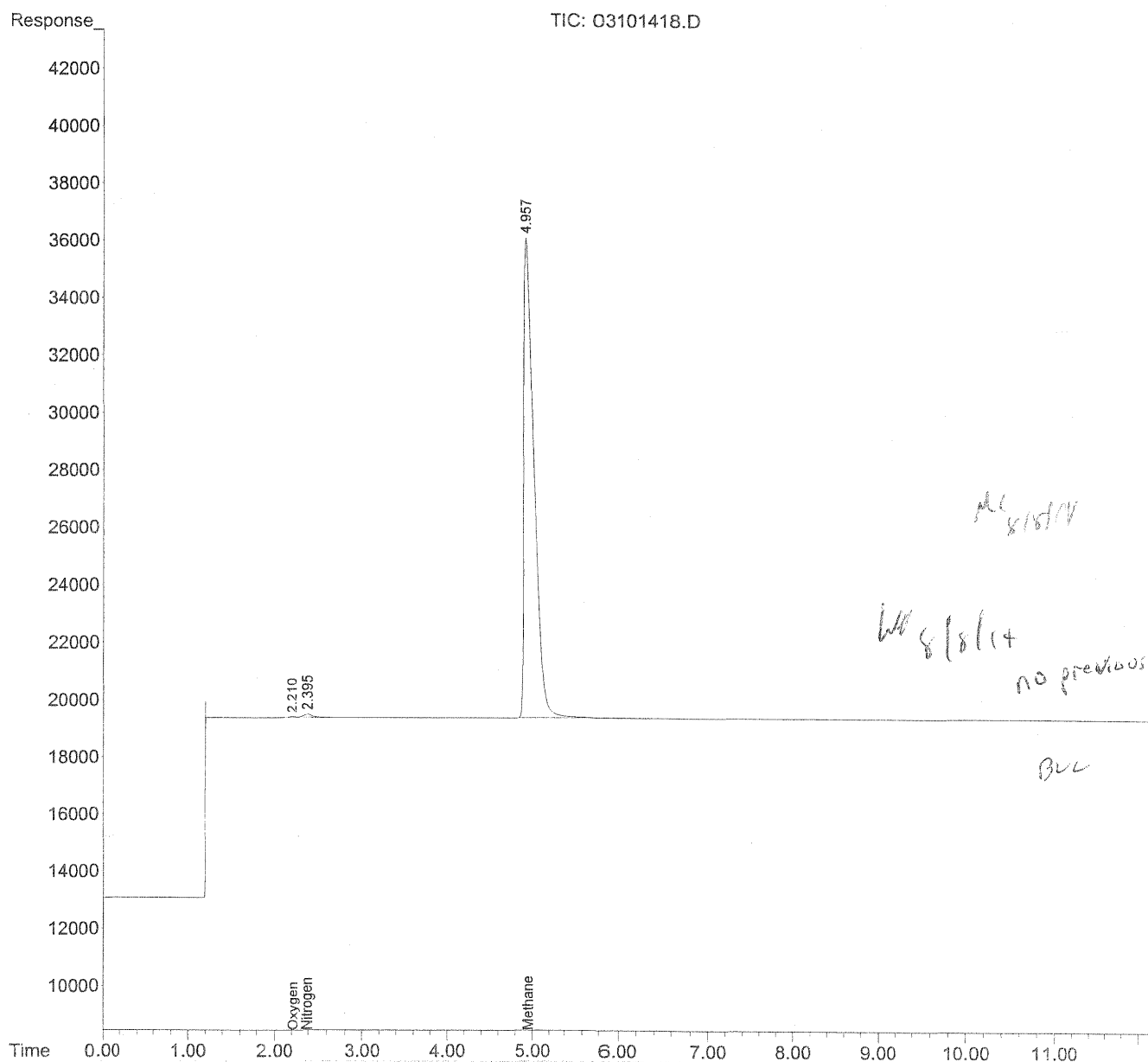
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.225	1686	1020.031 ppm
3) Nitrogen	2.395	7810	4059.131 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.957	1340274	961229.509 ppm m
6) Carbon Dioxide	0.000	0	N.D. ppm

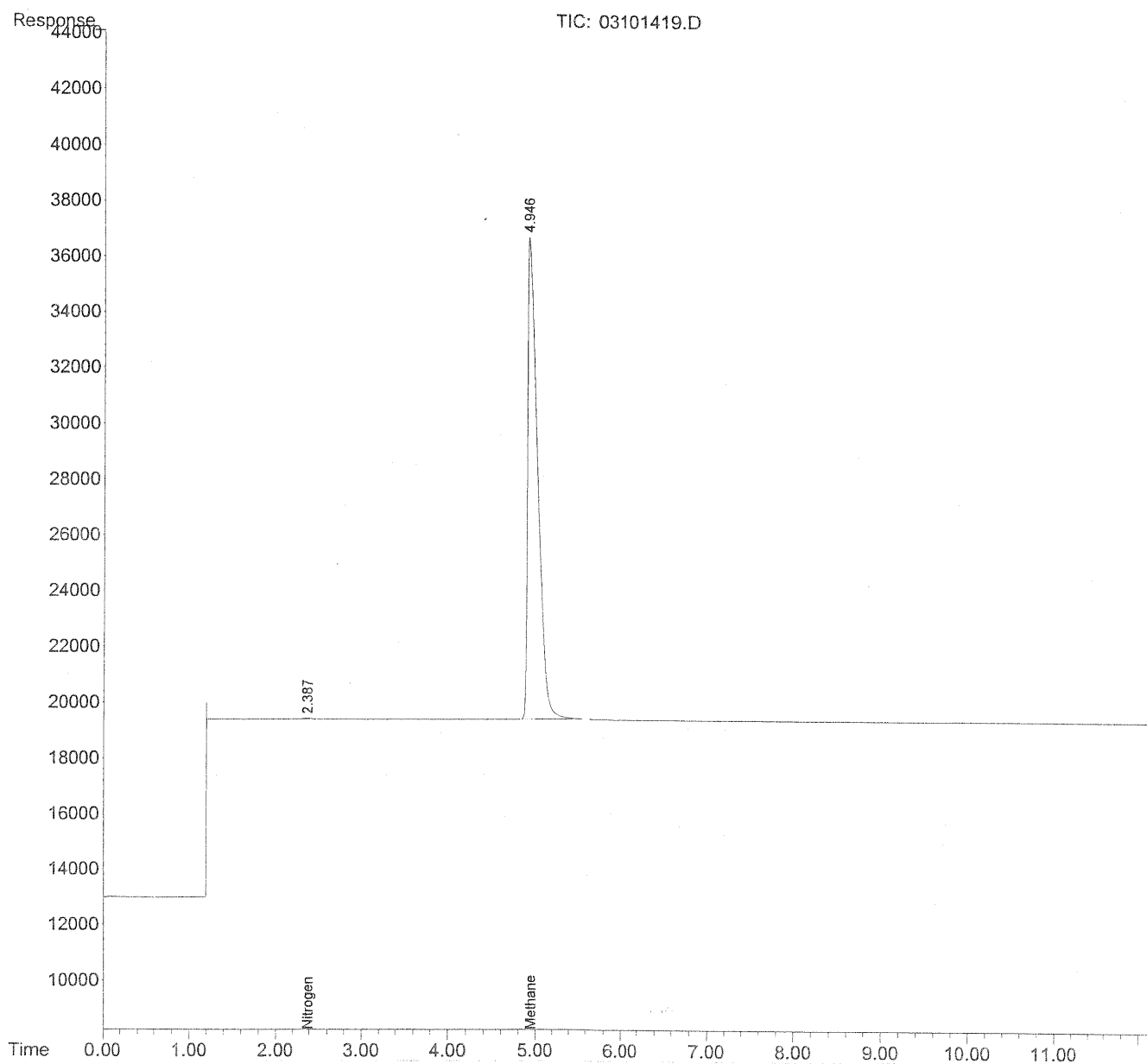
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	2.389	2357	1225.098	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	4.948	1390484	997239.566	ppm
6) Carbon Dioxide	0.000	0	N.D.	ppm

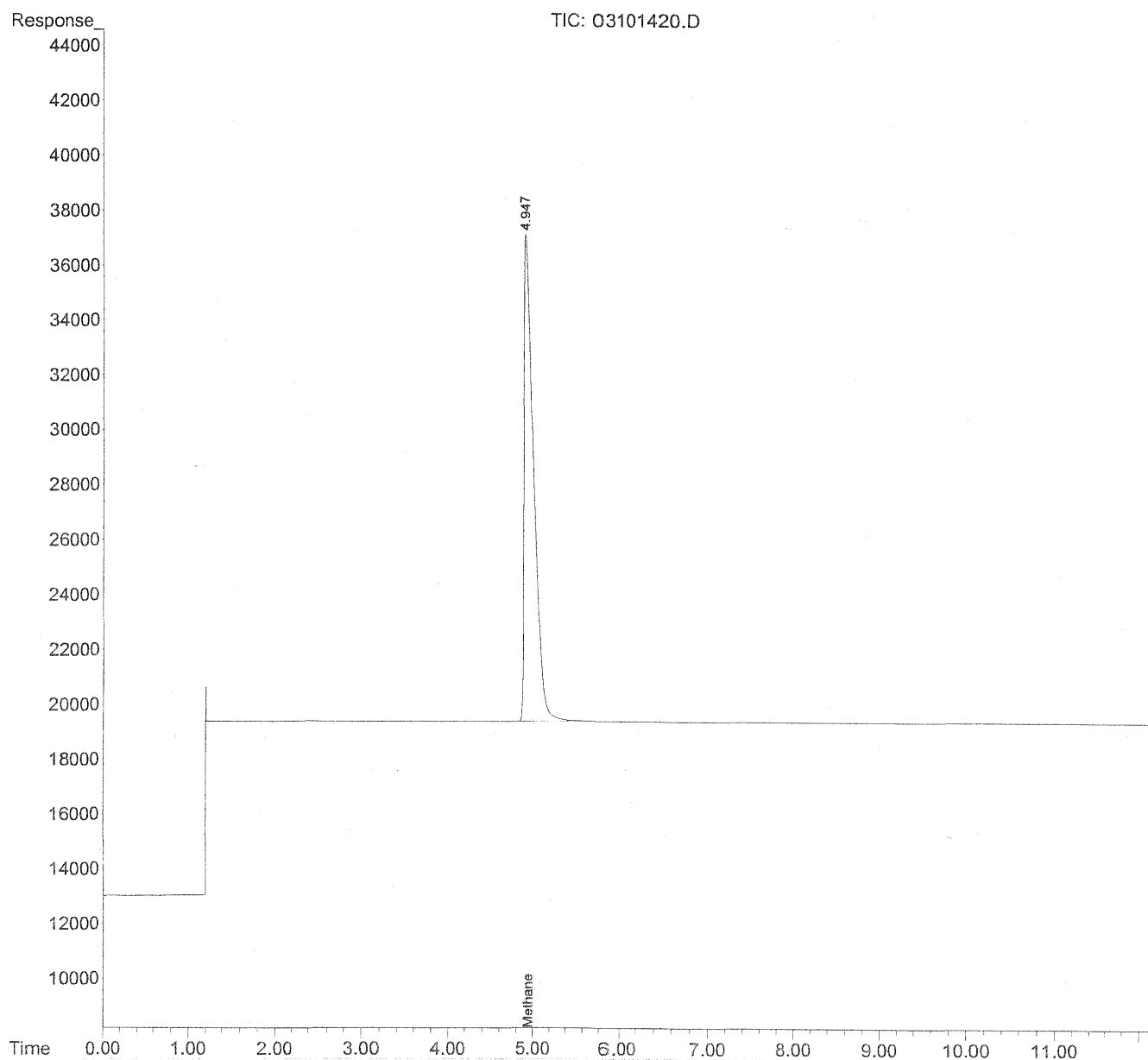
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.949	1439175	1032160.623 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

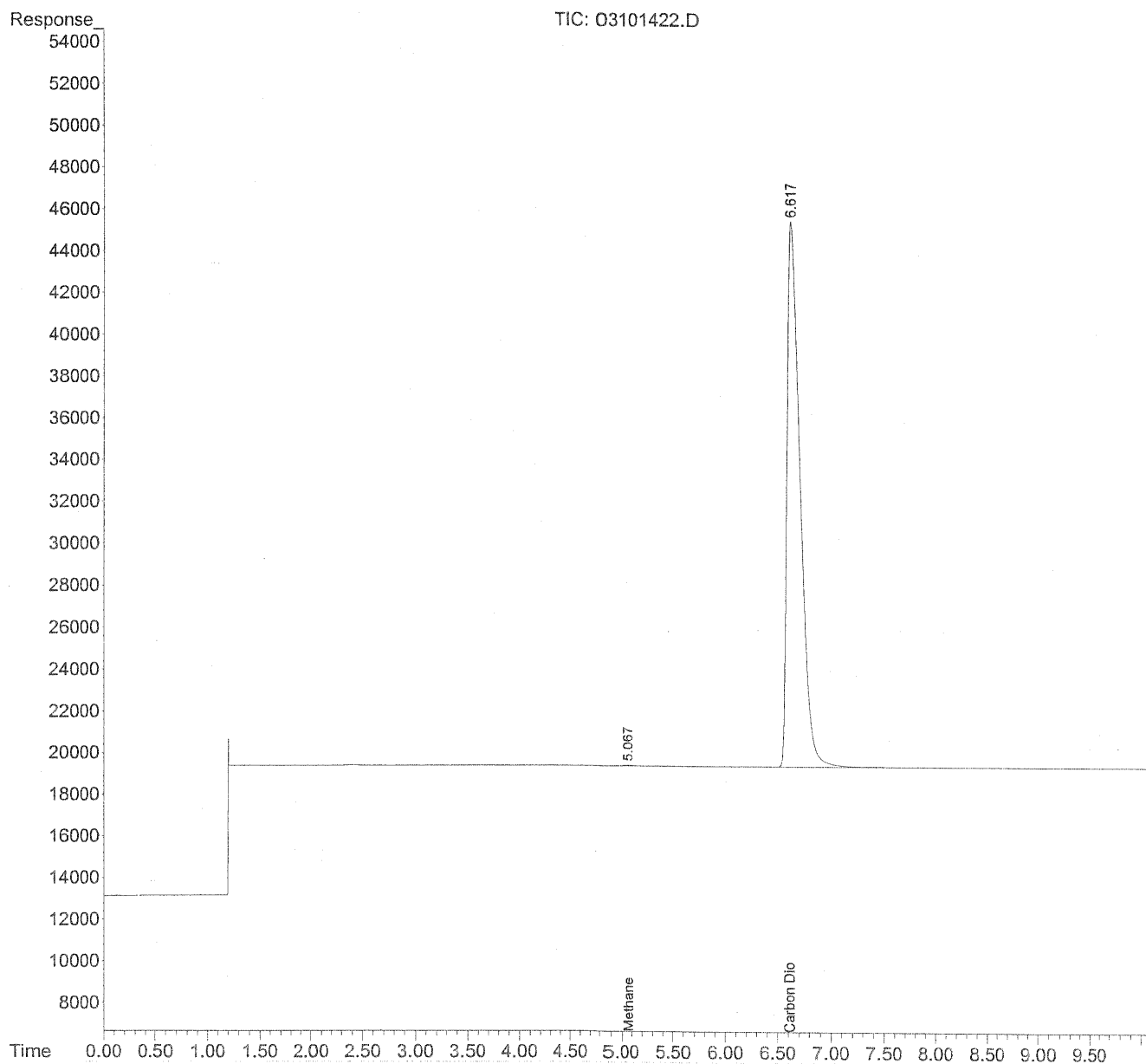
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	0.000	0	N.D.	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	5.069	1775	1271.240	ppm
6) Carbon Dioxide	6.618	2201199	1025503.777	ppm

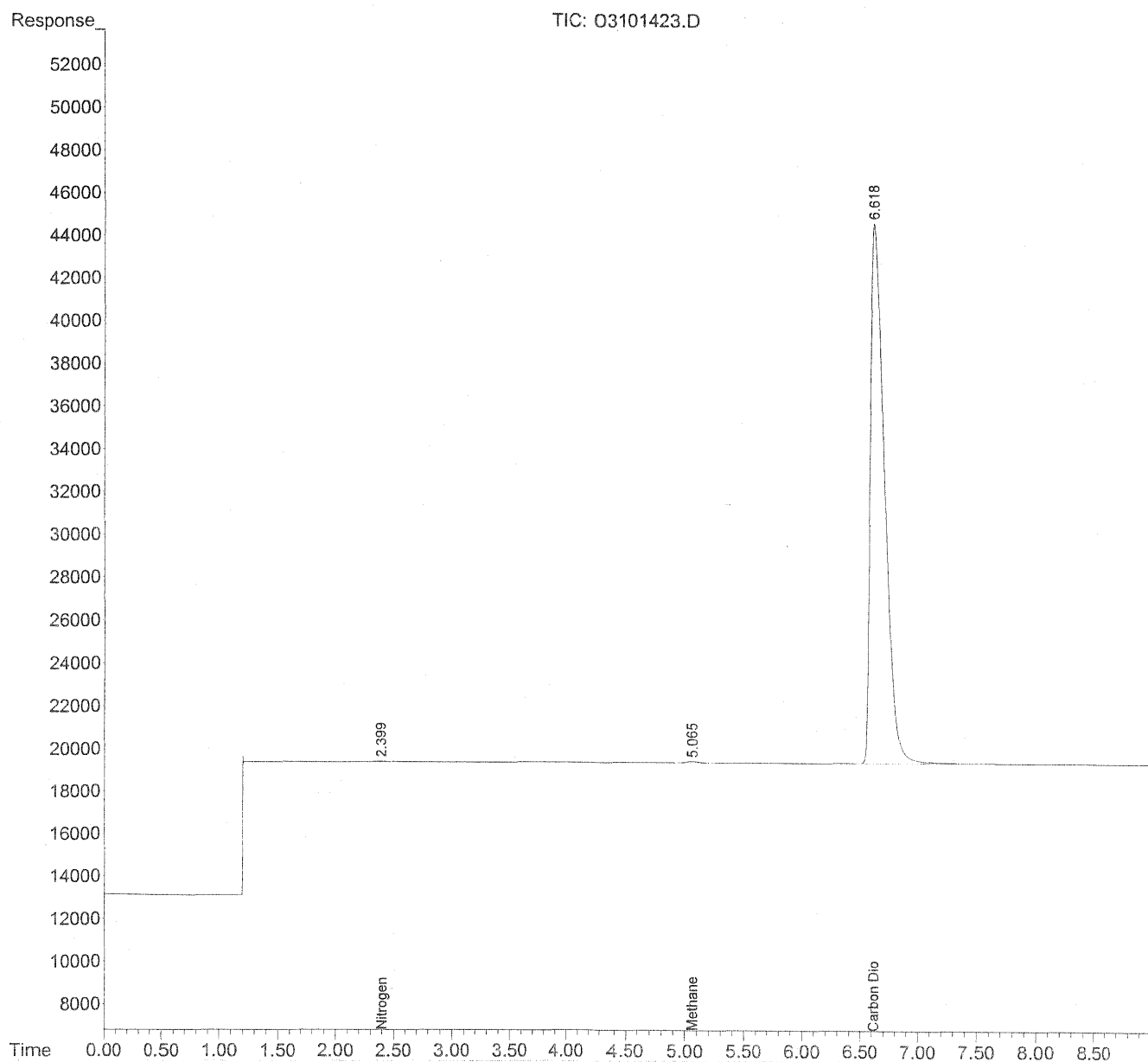
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	2.401	2050	1065.315	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	5.069	4323	3097.155	ppm
6) Carbon Dioxide	6.619	2111383	983659.786	ppm

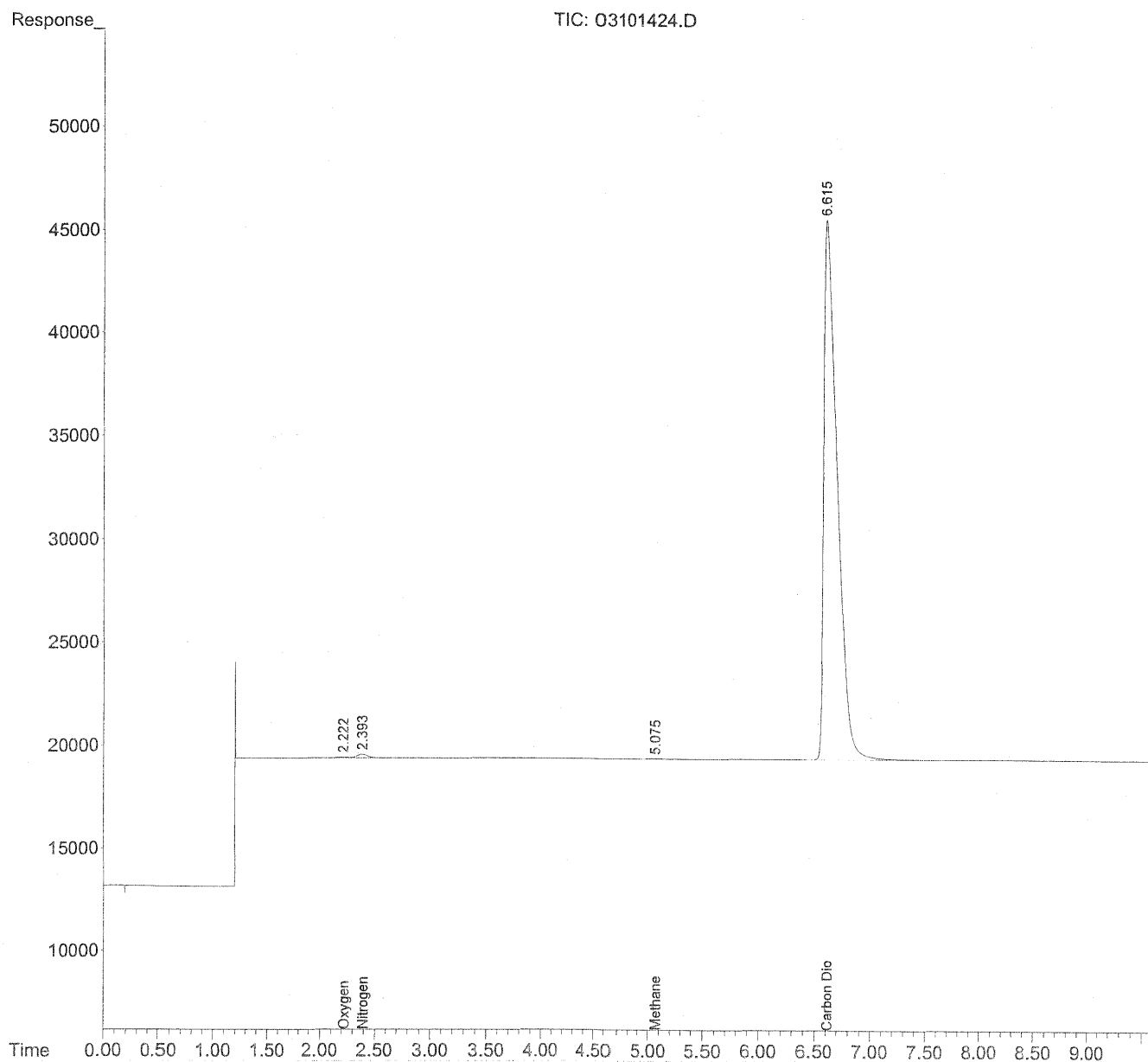
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101424.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:32
Operator : WH
Sample : std c02 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:43:57 2014
Quant Method: J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:42:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101424.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 18:32
 Operator : WH
 Sample : std c02 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 18:43:57 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:42:24 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.223	2425	1467.619 ppm
3) Nitrogen	2.396	11513	5983.691 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.076	523	374.374 ppm
6) Carbon Dioxide	6.617	2204164	1026088.843 ppm

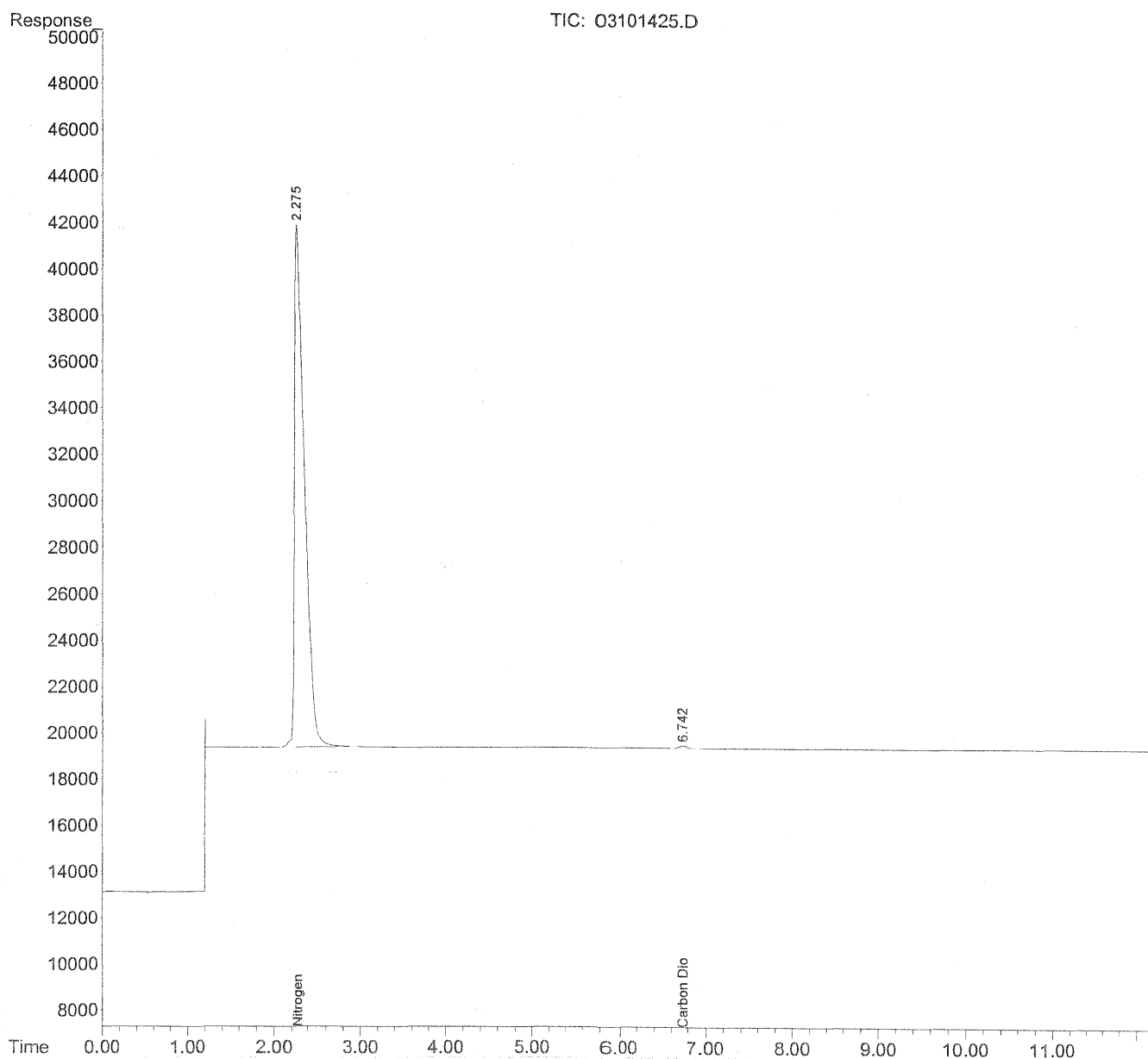
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101425.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:11
 Operator : WH
 Sample : std n2 1
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 10:26:33 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.277	1907693	991533.750 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.744	7551	3509.651 ppm

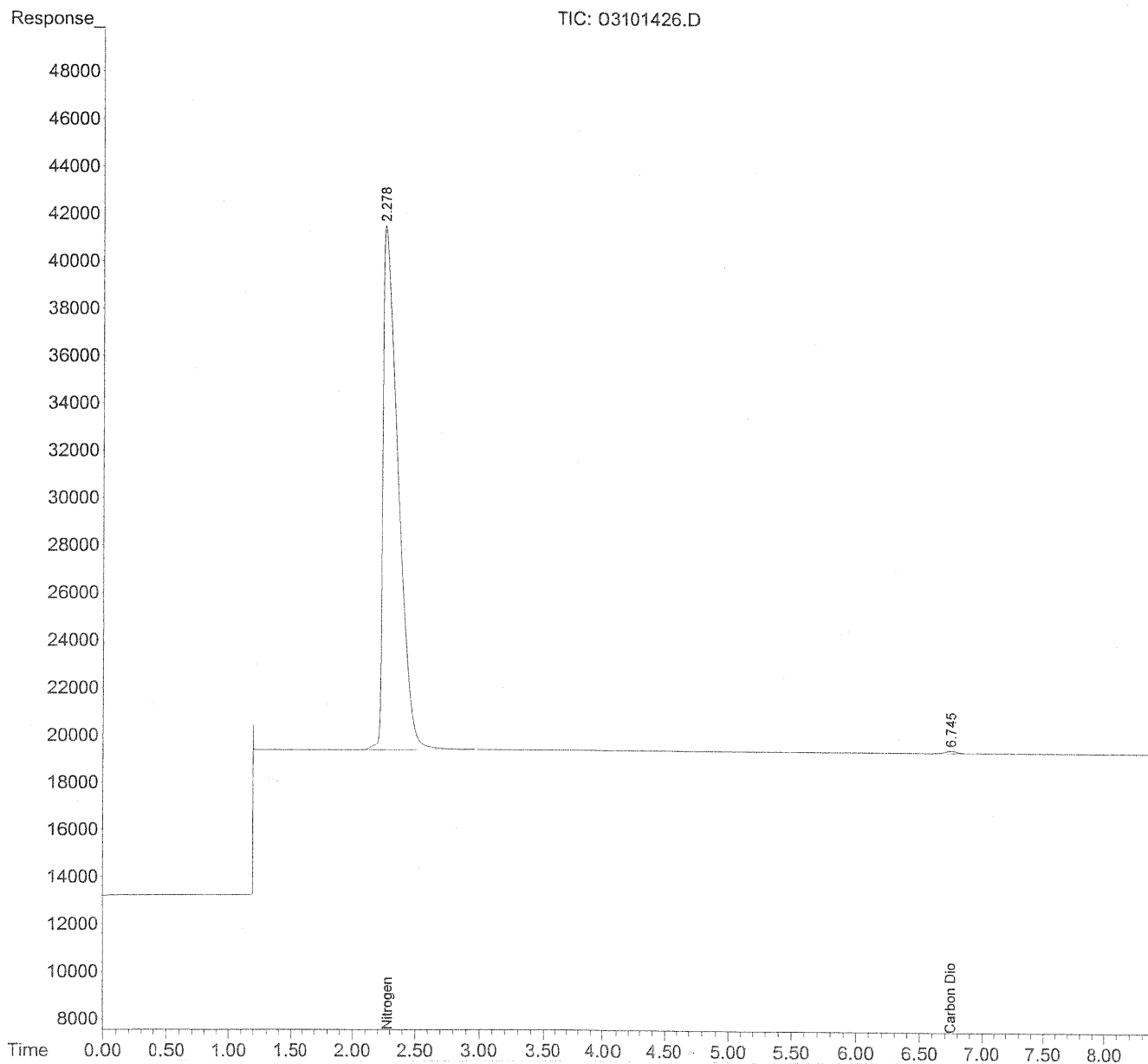
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101426.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:30
 Operator : WH
 Sample : std n2 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 10:40:12 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101426.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:30
 Operator : WH
 Sample : std n2 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 10:40:12 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.280	1857806	965604.527 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.748	7247	3368.284 ppm

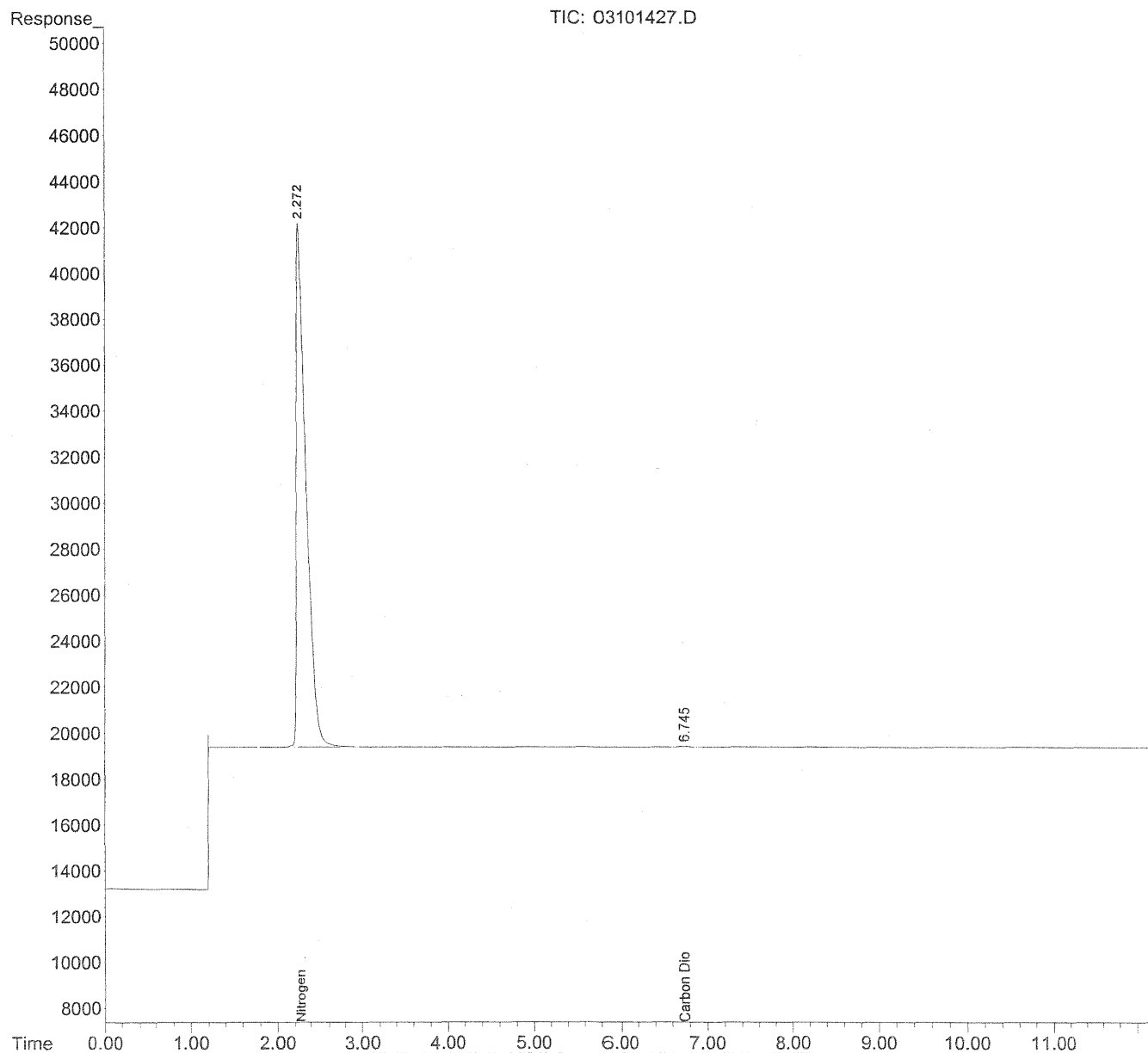
(f)=RT Delta > 1/2 Window

(m)=manual int.

QC INFORMATION REPORT
Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101427.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:42
Operator : WH
Sample : std n2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:02:52 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101427.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:42
 Operator : WH
 Sample : std n2 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 11:02:52 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.273	1934590	1005513.839 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.747	3210	1492.185 ppm

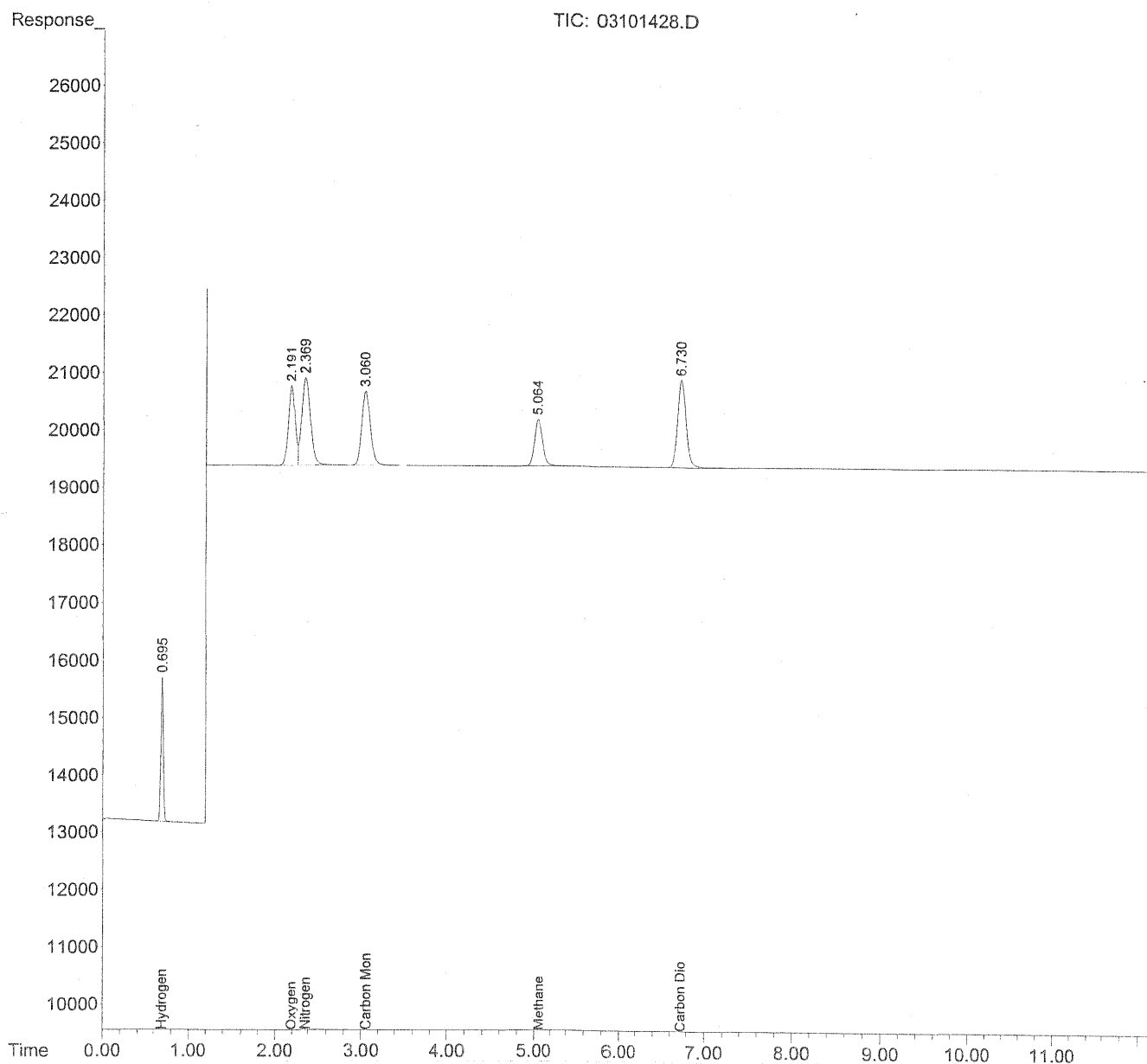
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FKG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	Actual ppm	R.T.	Response	Conc Units	<i>2.</i> <i>(cc/min)</i>

Target Compounds					
1) Hydrogen	<i>40000</i>	0.696	49944	36159.891 ppm	<i>90.47</i>
2) Oxygen	<i>50000</i>	2.193	85837	51942.494 ppm	<i>103.91</i>
3) Nitrogen	<i>50000</i>	2.370	104375	54362.122 ppm	<i>108.7</i>
4) Carbon Monoxide	<i>50000</i>	3.061	91720	49491.765 ppm	<i>99.0</i>
5) Methane	<i>40000</i>	5.066	55315	39625.390 ppm	<i>99.1</i>
6) Carbon Dioxide	<i>50000</i>	6.732	105938	49239.725 ppm	<i>98.5</i>

(f)=RT Delta > 1/2 Window

(m)=manual int.

WA 8/8/14

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

CLIENT : Air Hygiene, Incorporated

Analyst : NL

PAI Job : P1501126

Printed : 3/21/2015

Instrument : GC #1 / TCD #1

Date analyzed : 3/20/2015

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide
STD S30-01201501	40965	41713	50940	52455	41828	52259
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	2.4%	4.2%	1.9%	4.9%	4.6%	4.4%
Lab Air	202147	713737	487			
MB						
1126-001	120539	0.8%	685621	1.0%		50994
1126-001 - 2	122238	0.6%	696368	0.6%		51849
1126-001 - 3	121833	0.2%	694771	0.4%		51909
1126-001 - Mean	121536		692253			51584
1126-003	140465	0.1%	698436	0.1%		40477
1126-003 - 2	140819	0.4%	702261	0.4%		41005
1126-003 - 3	139695	0.4%	696741	0.3%		40642
1126-003 - Mean	140326		699146			40708
1126-005	125548	1.2%	686563	1.1%		48167
1126-005 - 2	128092	0.8%	699762	0.8%		49158
1126-005 - 3	127717	0.5%	696241	0.3%		48827
1126-005 - Mean	127119		694189			48717
STD S30-01201501	37696	38459	47168	48128	38571	47959
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	5.7%	3.9%	5.7%	3.8%	3.5%	4.2%

M
3/2/15

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201501.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:28 am
Operator : NL
Sample : std s30-01201501
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:00 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	56581	40965.374 ppm
2) Oxygen	2.208	68933	41713.225 ppm
3) Nitrogen	2.384	97805	50940.406 ppm
4) Carbon Monoxide	3.070	97212	52455.092 ppm
5) Methane	5.060	58389	41827.859 ppm
6) Carbon Dioxide	6.721	112434	52258.976 ppm

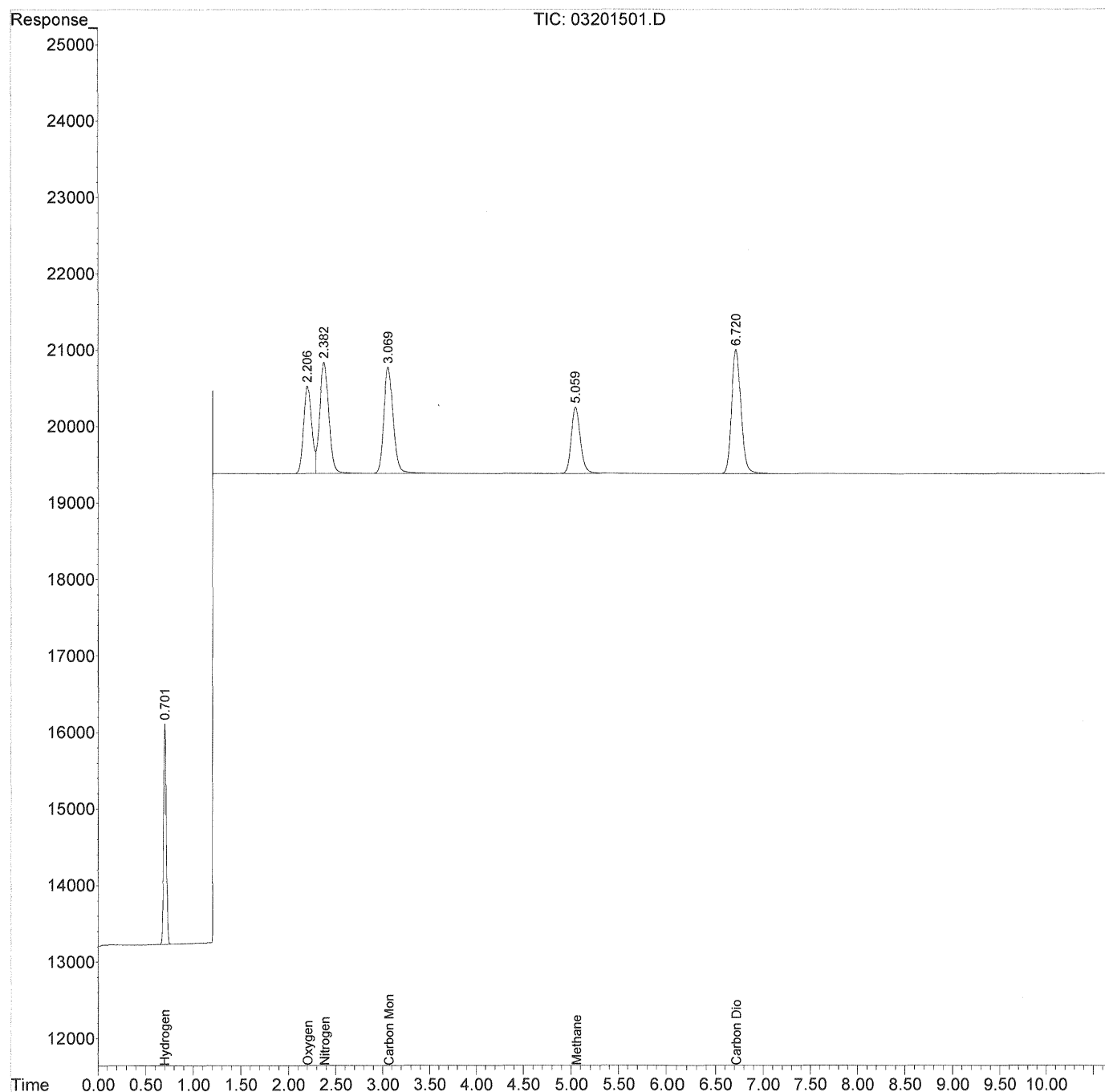
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201501.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:28 am
Operator : NL
Sample : std s30-01201501
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:00 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201543.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:28 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:39 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	52065	37695.537 ppm
2) Oxygen	2.209	63555	38459.105 ppm
3) Nitrogen	2.384	90562	47167.837 ppm
4) Carbon Monoxide	3.070	89193	48128.133 ppm
5) Methane	5.061	53842	38570.576 ppm
6) Carbon Dioxide	6.722	103184	47959.326 ppm

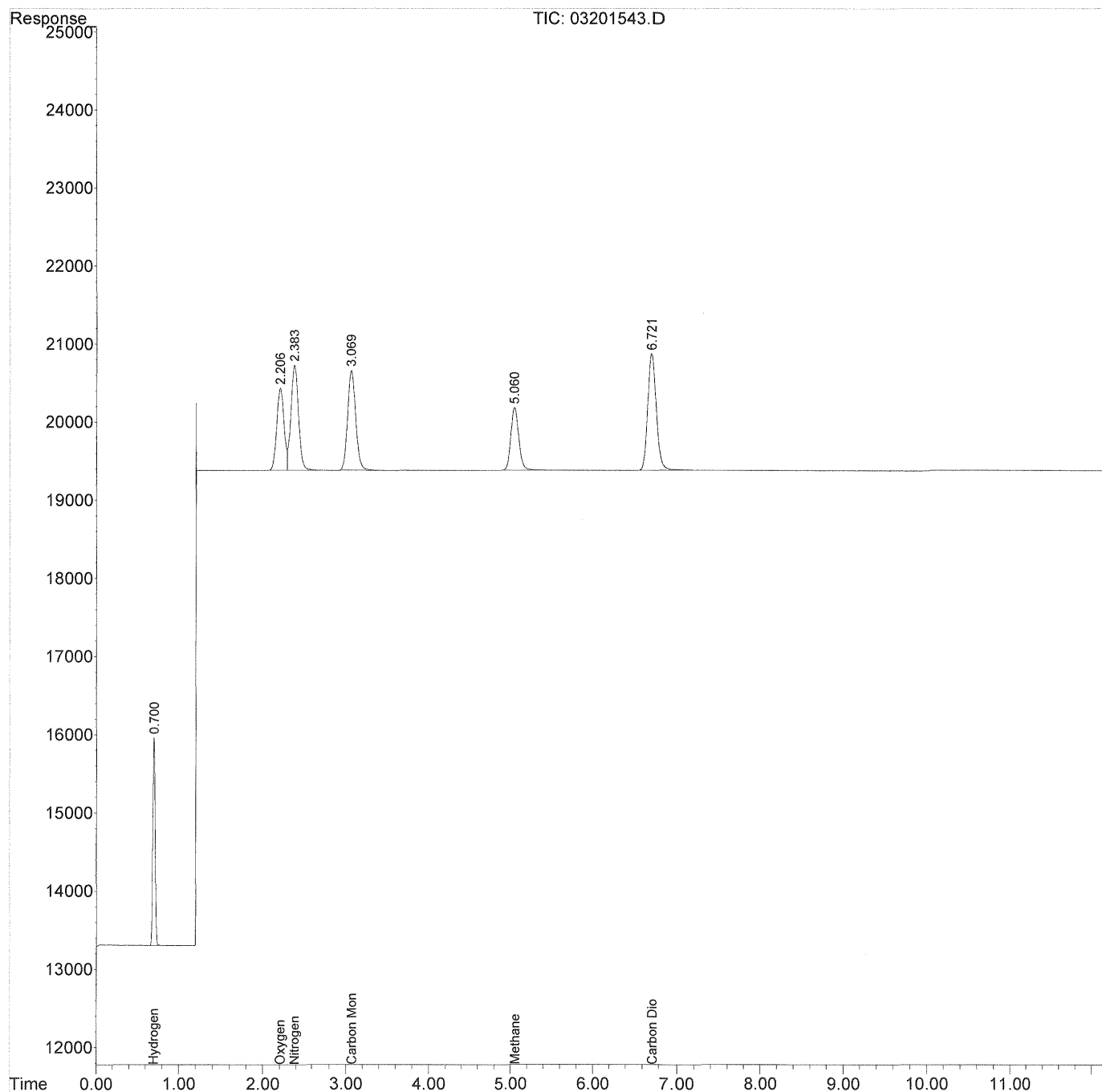
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\20\
Data File : 03201543.D
Signal(s) : TCD1A.CH
Acq On : 20 Mar 2015 7:28 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 21 09:38:39 2015
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	03101401.d	10.	MB		10 Mar 2014 10:27
2	1	03101402.d	10.	xstd 1 1		10 Mar 2014 10:43
3	1	03101403.d	10.	std 1 1		10 Mar 2014 10:59
4	1	03101404.d	10.	std 1 2		10 Mar 2014 11:29
5	1	03101405.d	10.	std 1 3		10 Mar 2014 11:44
6	1	03101406.d	10.	std 2 1		10 Mar 2014 11:59
7	1	03101407.d	10.	std 2 2		10 Mar 2014 12:18
8	1	03101408.d	10.	std 2 3		10 Mar 2014 12:34
9	1	03101409.d	10.	std 3 1		10 Mar 2014 13:05
10	1	03101410.d	10.	std 3 2		10 Mar 2014 13:23
11	1	03101411.d	10.	std 3 3		10 Mar 2014 13:56
12	1	03101412.d	10.	std 4 1		10 Mar 2014 14:15
13	1	03101413.d	10.	std 4 2		10 Mar 2014 14:32
14	1	03101414.d	10.	std 4 3		10 Mar 2014 14:49
15	1	03101415.d	10.	std 5 1		10 Mar 2014 15:08
16	1	03101416.d	10.	std 5 2		10 Mar 2014 15:34
17	1	03101417.d	10.	std 5 3		10 Mar 2014 15:50
18	1	03101418.d	10.	std ch4 1		10 Mar 2014 16:55
19	1	03101419.d	10.	std ch4 2		10 Mar 2014 17:11
20	1	03101420.d	10.	std ch4 3		10 Mar 2014 17:29
21	1	03101421.d	10.	xstd c02 1		10 Mar 2014 17:47
22	1	03101422.d	10.	std c02 1		10 Mar 2014 18:05
23	1	03101423.d	10.	std c02 2		10 Mar 2014 18:19
24	1	03101424.d	10.	std c02 3		10 Mar 2014 18:32
25	1	03101425.d	10.	std n2 1		11 Mar 2014 10:11
26	1	03101426.d	10.	std n2 2		11 Mar 2014 10:30
27	1	03101427.d	10.	std n2 3		11 Mar 2014 10:42
28	1	03101428.d	10.	lcs		11 Mar 2014 11:20
29	1	03101429.d	10.	lab air		11 Mar 2014 11:37

Injection Log

Directory: I:\GC01\DATA\FXG\2015_03\20

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	03201501.d	10.	std s30-01201501		20 Mar 2015 07:28
2	1	03201502.d	10.	mb		20 Mar 2015 07:43
3	1	03201503.d	10.	lab air		20 Mar 2015 07:56
4	1	03201504.d	10.	1103-001		20 Mar 2015 08:10
5	1	03201505.d	10.	1103-001		20 Mar 2015 08:26
6	1	03201506.d	10.	1103-001		20 Mar 2015 08:39
7	1	03201507.d	10.	1103-003		20 Mar 2015 08:54
8	1	03201508.d	10.	1103-003		20 Mar 2015 09:11
9	1	03201509.d	10.	1103-003		20 Mar 2015 09:30
10	1	03201510.d	10.	1103-005		20 Mar 2015 09:46
11	1	03201511.d	10.	1103-005		20 Mar 2015 10:18
12	1	03201512.d	10.	1103-005		20 Mar 2015 10:35
13	1	03201513.d	10.	1103-007		20 Mar 2015 10:52
14	1	03201514.d	10.	1103-007		20 Mar 2015 11:07
15	1	03201515.d	10.	1103-007		20 Mar 2015 11:22
16	1	03201516.d	10.	1103-009		20 Mar 2015 11:42
17	1	03201517.d	10.	1103-009		20 Mar 2015 11:58
18	1	03201518.d	10.	1103-009		20 Mar 2015 12:14
19	1	03201519.d	10.	1103-011		20 Mar 2015 12:27
20	1	03201520.d	10.	1103-011		20 Mar 2015 12:45
21	1	03201521.d	10.	1103-011		20 Mar 2015 12:59
22	1	03201522.d	10.	1103-013		20 Mar 2015 13:16
23	1	03201523.d	10.	1103-013		20 Mar 2015 13:43
24	1	03201524.d	10.	1103-013		20 Mar 2015 13:58
25	1	03201525.d	10.	1103-015		20 Mar 2015 14:12
26	1	03201526.d	10.	x1103-015		20 Mar 2015 14:28
27	1	03201527.d	10.	1103-015		20 Mar 2015 14:44
28	1	03201528.d	10.	1103-015		20 Mar 2015 15:02
29	1	03201529.d	10.	x1103-017		20 Mar 2015 15:20
30	1	03201530.d	10.	1103-017		20 Mar 2015 15:40
31	1	03201531.d	10.	1103-017		20 Mar 2015 15:52
32	1	03201532.d	10.	1103-017		20 Mar 2015 16:11
33	1	03201533.d	10.	1126-001		20 Mar 2015 16:31
34	1	03201534.d	10.	1126-001		20 Mar 2015 16:47
35	1	03201535.d	10.	1126-001		20 Mar 2015 17:03
36	1	03201536.d	10.	1126-003		20 Mar 2015 17:16
37	1	03201537.d	10.	1126-003		20 Mar 2015 17:30
38	1	03201538.d	10.	1126-003		20 Mar 2015 17:45
39	1	03201539.d	10.	1126-005		20 Mar 2015 18:01
40	1	03201540.d	10.	1126-005		20 Mar 2015 18:16
41	1	03201541.d	10.	1126-005		20 Mar 2015 18:44
42	1	03201542.d	10.	std		20 Mar 2015 19:03
43	1	03201543.d	10.	std		20 Mar 2015 19:28

APPENDIX G

Field Data Sheets



AIR HYGIENE

RATA - FIELD DATA SHEET

Company:	QTI		
Location:	Broken Arrow		
Date:	3/19/15		
Unit Make and Model:			
Unit Number:	Q100		
Serial Number:			
Data Recorded By:	MSL		
Truck(s):	N/A		
Trailer(s):	N/A		
On (Day/Time):	6/24/15		
Cal (Day/Time):	07:00		

CYLINDER SERIAL NUMBERS	O ₂	THC	CO	CO ₂
	Low			
	Mid			
High				

RUN INFORMATION	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Run #9	Run #10	Run #11	Run #12
Load (%)	70%	70%	70%									
Time Start (hh:mm:ss)	08:40:10	10:03:10	11:31:10									
Time Stop (hh:mm:ss)	09:50:10	11:13:10	12:41:10									
Barometric Pressure (in. Hg)	30.05	30.06	30.07									
Ambient Temperature (°F)	52	52	52									
Relative Humidity (%)	85	92.3	86.9									

CALIBRATION	O ₂		CO		THC		CO ₂	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.03	0	0.03	0	0.17	0	0.05
Low Gas					3.02	3.12		
Mid Gas	12.06	11.99	9.19	9.18	5.01	5.20	8.87	8.98
High Gas	21.2	21.28	17.3	17.35	8.48	8.47	18.8	18.82

REPORT INFORMATION	
INSTRUMENT	SERIAL #
O ₂	
NOx	
CO	
THC	
CO ₂	
SO ₂	

BIAS	O ₂		CO		THC		CO ₂	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	0.03	11.98	0.33	9.33	0.14	3.03	0.09	8.93
Run #1 / Run #2	0.09	12.02	0.32	9.33	0.09	3.19	0.10	8.90
Run #2 / Run #3	0.07	12.00	0.31	9.31	0.09	3.13	0.11	8.94
Run #3 / Run #4	0.03	11.96	0.31	9.33	0.02	3.13	0.08	8.95
Run #4 / Run #5								
Run #5 / Run #6								
Run #6 / Run #7								
Run #7 / Run #8								
Run #8 / Run #9								
Run #9 / Run #10								
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								

Bias Gas Actual Conc.



AIR HYGIENE

RATA - FIELD DATA SHEET

Company:	QTH		
Location:	Broken Arrow		
Date:	3/17/15		
Unit Make and Model:	Q100		
Unit Number:	MSL		
Serial Number:	MSL		
Data Recorded By:	MSL		
Truck(s):	N/A		
Trailer(s):	N/A		
Tested With AHL Unit(s):	MSL		
LDEQ Warmup/Cal Req:	On (Day/Time):	Cal (Day/Time):	06:50

CYLINDER SERIAL NUMBERS	O ₂			THC	CO	CO ₂
	LOW			22113377		
	Mid			ALMO6528		
High			ALMO3511	2275557		

RUN INFORMATION	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Run #9	Run #10	Run #11	Run #12
Load (%)	90-100%											
Time Start (hh:mm:ss)	09:22:09	10:57:09	12:27:09	14:50:09	16:14:09	17:41:09						
Time Stop (hh:mm:ss)	10:33:09	12:07:09	13:38:09	15:00:09	17:27:09	18:51:09						
Barometric Pressure (in. Hg)	30.16	30.19	30.23	30.20	30.19	30.19						
Ambient Temperature (°F)	58	60	66	62	63	59						
Relative Humidity (%)	70	58.5	57.2	54.5	57	58.9						

CALIBRATION	O ₂		CO		THC		CO ₂	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.03	0	0.07	0	0.11	0	0.06
Low Gas					3.02	3.02		
Mid Gas	12.06	12.06	9.19	9.23	5.01	5.01	8.89	8.95
High Gas	21.2	21.26	17.3	17.39	8.48	8.45	18.8	18.95

REPORT INFORMATION		SERIAL #
O ₂	Servo 1440	02-0011
NOx		N60002
CO	Thermo 430	CO-0029
THC	Thermo 5160	TH-0007
CO ₂	Servo 1440	02-0013

BIAS	O ₂		CO		THC		CO ₂	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	0.07	12.01	0.20	9.21	0.09	3.02	0.11	8.85
Run #1 / Run #2	0.06	11.99	0.26	9.23	0.09	3.25	0.12	8.88
Run #2 / Run #3	0.08	12.03	0.24	9.25	0.05	3.23	0.11	8.91
Run #3 / Run #4	0.04	12.05	0.25	9.27	0.05	3.20	0.09	8.93
Run #4 / Run #5	0.08	12.02	0.21	9.21	-0.02	3.13	0.11	8.92
Run #5 / Run #6	0.09	12.06	0.22	9.19	-0.01	3.15	0.12	8.89
Run #6 / Run #7	0.05	12.01	0.22	9.21	-0.03	3.04	0.12	8.91
Run #7 / Run #8								
Run #8 / Run #9								
Run #9 / Run #10								
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								

Bias Gas Actual Conc.

Surp - we-0026



AIR HYGIENE

RATA - FIELD DATA SHEET

Company: QTI
Location: Broken Arrow
Date: 3/18/15
Unit Make and Model: Q100
Unit Number: Q100
Serial Number: MSL
Data Recorded By: MSL
Truck(s): N/A Trailer(s): N/A
Tested With AHI Unit(s): Q100 Cal (Day/Time): 0:37:00
LDEQ Warmup/Cal Req: On (Day/Time): 2/28/15

CYLINDER SERIAL NUMBERS	O ₂	THC	CO	CO ₂
	Low			
	Mid			
	High			

RUN INFORMATION	Run #4	Run #5	Run #6	Run #4	Run #5	Run #6	Run #7	Run #8	Run #9	Run #10	Run #11	Run #12
Load (%)	—	30.70-30.90	—									
Time Start (hh:mm:ss)	10:05:09	11:36:09	13:00:09									
Time Stop (hh:mm:ss)	11:15:09	12:46:09	14:10:09									
Barometric Pressure (in. Hg)	30.11	30.11	30.08									
Ambient Temperature (°F)	55	54	55									
Relative Humidity (%)	80	85	71									

CALIBRATION	O ₂		CO		THC		CO ₂	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	-0.01	0	0.10	0	0.17	0	0.06
Low Gas	12.06	12.17	9.19	9.33	5.02	3.19	8.87	9.04
Mid Gas	21.02	21.38	17.3	17.34	5.01	5.14	18.8	18.82
High Gas					8.40	8.46		

REPORT INFORMATION	
INSTRUMENT	SERIAL #
O ₂	
NOX	
CO	
THC	
CO ₂	
SO ₂	

BIAS	O ₂		CO		THC		CO ₂	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	12.06	12.01	0.22	9.35	0.11	3.22	0.08	8.90
Run #1 / Run #2	11.0	11.97	0.26	9.24	0.07	3.30	0.12	8.94
Run #2 / Run #3	0.07	11.94	0.26	9.35	0.02	3.27	0.12	8.93
Run #3 / Run #4	0.09	11.98	0.25	9.34	0.03	3.30	0.10	8.92
Run #4 / Run #5								
Run #5 / Run #6								
Run #6 / Run #7								
Run #7 / Run #8								
Run #8 / Run #9								
Run #9 / Run #10								
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								

Bias Gas Actual Conc.

AIR HYGIENE

MOISTURE (EPA METHOD 4) DATA SHEET



Site Info.

Plant Name.
 Sampling Location.
 Unit #
 Date. 3/17/2015

Console Info.

Console.
 Meter Calibration Factor
 Orifice Meter Coefficient

CP-0008
0.883
1.698

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	<u>90-100%</u>	<u>RC-0008</u>	(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		724.9	783.4	565.2	880.9			
Final Value	(Vf),(Wf)		741.8	809.2	571.9	898.2			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	<u>90-100%</u>		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		741.8	809.2	571.9	860.6			
Final Value	(Vf),(Wf)		772.4	827.4	576.3	873.9			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	<u>90-100%</u>		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		772.4	827.4	576.3	848.4			
Final Value	(Vf),(Wf)		807.6	842.9	579.9	859.7			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	<u>0-30%</u>		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		807.6	842.9	579.9	859.7			
Final Value	(Vf),(Wf)		840.5	848.1	582.4	866.7			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	<u>0-30%</u>		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		840.5	848.1	582.4	903.6			
Final Value	(Vf),(Wf)		875.2	854.6	584.9	915.0			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
	<u>0-30%</u>		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		875.2	854.6	584.9	915.0			
Final Value	(Vf),(Wf)		908.3	859.5	585.9	926.8			

AIR HYGIENE

MOISTURE (EPA METHOD 4) DATA SHEET



Site Info.

Plant Name.
 Sampling Location.
 Unit #
 Date. 12/18/2015

Console Info.

Console.
 Meter Calibration Factor
 Orifice Meter Coefficient

CP.0008
 883
 1.698

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
1	30-70%		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		408.5	859.5	585.9	904			
Final Value	(Vf),(Wf)		949.3	864	588.5	917.5			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
2	30-70%		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		949.3	864	588.5	819.5			
Final Value	(Vf),(Wf)		969.5	883.1	589.3	831.2			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
3	30-70%		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		969.5	883.1	589.3	837.6			
Final Value	(Vf),(Wf)		972.6	922.0	591.8	848.1			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
1	70-100%		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		779.6	827.559	591.8	838.2			
Final Value	(Vf),(Wf)		822.2	761.3	594.4	851.9			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
2	70-100%		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		822.2	761.3	594.4	834			
Final Value	(Vf),(Wf)		863.8	766.1	597.2	866.9			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
3	70-100%		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		863.8	766.1	597.2	820.2			
Final Value	(Vf),(Wf)		903.9	770	599.2	833.1			

3/17/15 90/100% Q100

R10 - 28.75

R11 - 19.88

R12 - 12.13

End - 3.54

3/17/15 0-30-0%

R1 - 29.31

R2 - 20.38

R3 - 13.02

End - 3.82

3/18/15 30-70-30%

R4 - 29.17

R5 - 21.23

R6 - 10.82

End - 0.23

3/19/15 70-100-70%

R7 - 29.12

R8 - 20.38

R9 - 11.07

End - 3.78

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end of report**