AIR HYGIENE, INC.

Testing Solutions for a Better World

STACK EMISSIONS STUDY
EPA 40 CFR PART 60 SUBPART OOOO
FOR THE
ENCLOSED COMBUSTOR UNIT, BNECU- PI 48
PREPARED FOR
BIG IRON OILFIELD SERVICE
AT THE
BIG IRON STEEL PLANT
ELMORE CITY, OKLAHOMA
MAY 27-28, 2014



Corporate Headquarters
1600 W Tacoma Street
Broken Arrow, OK 74012

AIR HYGIENE, INC.

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

Remote Testing Offices
Las Vegas, NV 89156
Ft. Worth, TX 76028
Humble, TX 77338
Shreveport, LA 71115
Miami, FL 33101
Philadelphia, PA 19136

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Prepared and Reviewed by:

Pandu Sattvika, PE, QSTI,
Regional Manager-Austin, TX

Patrick K. McGovern, Jr., QSTI,
Regional Manager-Shreveport, LA

Min Sum Lee, QSTI,
Test Manager

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Enclosed Combustor Unit, BNECU- PI 48
Big Iron Oilfield Service
Big Iron Steel Plant
Elmore City, Oklahoma
May 27-28, 2014

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 (H_2O), carbon dioxide (CO_2), and oxygen (O_2) from the exhaust of the Enclosed Combustor Unit, BNECU- PI 48 for Big Iron Oilfield Service at the Big Iron Steel Plant near Elmore City, Oklahoma. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on May 27-28, 2014.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to conduct compliance emission test 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, H_2O, CO_2, and O_2 from the exhaust of Big Iron Oilfield Service's Enclosed Combustor Unit, BNECU- PI 48.

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)
- Big Iron Oilfield Service
- 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
- Big Iron Steel Plant near Elmore City, Oklahoma
- 22940 OK 29 Elmore City, OK 73433

1.2.5 Equipment Tested
- Enclosed Combustor Unit, BNECU- PI 48

1.2.6 Emission Points
- For all gases, three sample points in the exhaust duct from the Enclosed Combustor Unit, BNECU- PI 48, determined according 40 CFR 60 Subpart OOOO
- For all moisture, flow and fixed gas testing, 24 sampling points in the exhaust duct from the Enclosed Combustor Unit, BNECU- PI 48
- For visual emission, one sample visual observation point from the exit of the exhaust duct to the atmosphere from the Enclosed Combustor Unit, BNECU- PI 48

1.2.7 Pollutants Measured

- CO
- THC
- Flow
- Visual Emission
- H_2O
- CO_2
- O_2

1.2.8 Dates of Emission Test

- May 27-28, 2014

1.3 KEY PERSONNEL

Big Iron Oilfield Service:	Shawn Shattuck	405-207-0989
Cordova Flow Controls	Derek Moore	970-573-1053
Air Hygiene	Min Sum Lee	918-307-8865
Air Hygiene:	Tim Page	918-307-8865
Air Hygiene:	Ashwin Ravi	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on Big Iron Oilfield Service's Enclosed Combustor Unit, BNECU- PI 48 located at the Big Iron Steel Plant on May 27-28, 2014 are summarized in the following table and relate only to the items tested.

TABLE 2.1
BNECU-PI 48 0-30-0 LOAD DATA SUMMARY

Parameter	0-30-0 Load, Run - PI 48-R1	0-30-0 Load, Run - PI 48-R2	0-30-0 Load, Run - PI 48-R3	Average
Date (mm/dd/yy)	05/27/14	05/27/14	05/27/14	--
Start Time (hh:mm:ss)	9:37:01	11:38:01	13:05:01	--
End Time (hh:mm:ss)	10:47:01	12:48:01	14:05:01	--
Run Duration (min / run)	71	70	71	71
Bar. Pressure (in. Hg)	29.98	29.97	29.94	29.96
Amb. Temp. (°F)	70	75	74	73
Rel. Humidity (%)	76	67	69	71
Spec. Humidity (lb water / lb air)	0.011885	0.012419	0.012380	0.012228
Wind Speed (mph)	3.0	4.0	4.0	3.7
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-28.72	-18.41	-10.83	--
Inlet Gas Canister Pressure Stop (inHg)	-18.41	-10.83	-2.85	--
Gross Fuel Heating Value (Btu/ft3)	2,548	2,548	2,548	2,548
Stack Flow (M2) (dscfh)	117,856	119,428	124,187	120,490
Stack Moisture (Method 4)	6.1	5.3	4.9	5.4
Gross Fuel Heating Value (Btu/ft^3)	2,547.5	2,547.5	2,547.5	2,547.50
Average Inlet Fuel Flowrate (SCFH)	555.6	556.9	572.9	561.79
Average Inlet Mass Fuel Flowrate (lb/hr)	64.5	64.7	66.5	65.25
% Excess Air	288.1	295.4	295.4	292.99
CO_2 (%) - Modified method 3C	4.75	4.64	4.70	4.70
O_2 (%) - Modified Method 3C	15.60	15.70	15.70	15.67
N_2 (%) - Modified Method 3C	79.60	79.60	79.60	79.60
Visual Emission (mm:ss)	0:00	0:00	0:00	0.00
CO (ppmvd)	1.05	0.38	0.36	0.60
CO (ppm@3%CO_2)	0.67	0.24	0.23	0.38
THC (ppmvw)	0.00	0.00	0.01	0.00
THC (ppm@3%CO_2)	0.00	0.00	0.00	0.00
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
BNECU-PI 48 30-70-30 LOAD DATA SUMMARY

Parameter	30-70-30 Load, Run - PI 48-R4	30-70-30 Load, Run - PI 48-R5	30-70-30 Load, Run - PI 48-R6	Average
Date (mm/dd/yy)	05/28/14	05/28/14	05/28/14	--
Start Time (hh:mm:ss)	7:37:09	9:05:09	10:30:09	--
End Time (hh:mm:ss)	8:47:09	10:15:09	11:45:09	--
Run Duration (min / run)	71	71	76	72
Bar. Pressure (in. Hg)	30.00	30.03	30.02	30.02
Amb. Temp. (°F)	67	69	79	72
Rel. Humidity (%)	78	81	61	73
Spec. Humidity (lb water / lb air)	0.010981	0.012227	0.012896	0.012035
Wind Speed (mph)	4.0	5.0	5.0	4.7
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-28.83	-19.50	-12.10	-20.14
Inlet Gas Canister Pressure Stop (inHg)	-19.50	-12.10	-1.08	-10.89
Gross Fuel Heating Value (Btu/ft3)	2,552	2,552	2,552	2,552
Stack Flow (M2) (dscfh)	121,207	119,081	118,949	119,746
Stack Moisture (Method 4)	5.1	5.6	5.4	5.4
Gross Fuel Heating Value (Btu/ft^3)	2,552.2	2,552.2	2,552.2	2,552.20
Average Inlet Fuel Flowrate (SCFH)	759.7	771.0	880.9	803.86
Average Inlet Mass Fuel Flowrate (lb/hr)	88.2	89.5	102.3	93.36
% Excess Air	312.5	303.0	205.2	273.57
CO_2 (%) - Modified method 3C	4.59	4.63	5.78	5.00
O_2 (%) - Modified Method 3C	15.90	15.80	14.20	15.30
N_2 (%) - Modified Method 3C	79.50	79.60	80.00	79.70
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	0.58	0.26	0.11	0.32
CO (ppm@3%CO_2)	0.38	0.17	0.06	0.20
THC (ppmvw)	0.00	0.00	0.00	0.00
THC (ppm@3%CO_2)	0.00	0.00	0.00	0.00
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
BNECU-PI 48 70-100-70 LOAD DATA SUMMARY

Parameter	70-100-70 Load, Run - PI 48-R7	70-100-70 Load, Run - PI 48-R8	70-100-70 Load, Run - PI 48-R9	Average
Date (mm/dd/yy)	05/28/14	05/28/14	05/28/14	--
Start Time (hh:mm:ss)	12:24:09	13:50:09	15:15:09	--
End Time (hh:mm:ss)	13:34:09	15:00:09	16:25:09	--
Run Duration (min / run)	71	71	70	71
Bar. Pressure (in. Hg)	30.02	30.00	30.00	30.01
Amb. Temp. (°F)	78	90	80	83
Rel. Humidity (%)	59	45	46	50
Spec. Humidity (lb water / lb air)	0.012054	0.013565	0.010010	0.011876
Wind Speed (mph)	4.0	5.0	4.0	4.3
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-28.73	-18.82	-11.45	--
Inlet Gas Canister Pressure Stop (inHg)	-18.82	-11.45	-2.65	--
Gross Fuel Heating Value (Btu/ft3)	2,470	2,470	2,470	2,470
Stack Flow (M2) (dscfh)	127,482	131,099	129,006	129,196
Stack Moisture (Method 4)	5.5	5.8	6.1	5.8
Gross Fuel Heating Value (Btu/ft^3)	2,469.8	2,469.8	2,469.8	2,469.80
Average Inlet Fuel Flowrate (SCFH)	1,179.3	1,170.8	1,171.1	1,173.75
Average Inlet Mass Fuel Flowrate (lb/hr)	136.3	136.0	124.5	132.26
% Excess Air	236.2	241.6	241.6	239.78
CO_2 (%) - Modified method 3C	5.53	5.28	5.33	5.38
O_2 (%) - Modified Method 3C	14.80	14.90	14.90	14.87
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)	0.46	0.54	0.28	0.43
CO (ppm@3%CO_2)	0.25	0.31	0.16	0.24
THC (ppmvw)	0.00	0.40	0.07	0.15
THC (ppm@3%CO_2)	0.00	0.22	0.04	0.09
THC (lb/hr)	0.00	0.01	0.00	0.00
VOC Destruction Efficiency (%)	99.999	99.995	99.999	99.998

TABLE 2.4
BNECU-PI 48 90-100 LOAD DATA SUMMARY

Parameter	90-100 Load, Run - PI 48-R10	90-100 Load, Run - PI 48-R11	90-100 Load, Run - PI 48-R12	Average
Date (mm/dd/yy)	05/28/14	05/28/14	05/28/14	--
Start Time (hh:mm:ss)	16:41:089	18:07:09	19:28:09	--
End Time (hh:mm:ss)	17:41:09	19:17:09	20:38:09	--
Run Duration (min / run)	71	70	71	70
Bar. Pressure (in. Hg)	29.95	29.94	29.94	29.94
Amb. Temp. (°F)	87	79	76	81
Rel. Humidity (%)	40	50	55	48
Spec. Humidity (lb water / lb air)	0.010942	0.010560	0.010519	0.010674
Wind Speed (mph)	4.0	2.0	3.0	3.0
Wind Direction (--)	N	NNW	NW	--
Inlet Gas Canister Pressure Start (inHg)	-28.96	-17.13	-10.62	--
Inlet Gas Canister Pressure Stop (inHg)	-17.13	-10.62	-1.96	--
Gross Fuel Heating Value (Btu/ft3)	2,537	2,537	2,537	2,537
Stack Flow (M2) (dscfh)	129,495	127,425	127,518	128,146
Stack Moisture (Method 4)	5.8	5.6	5.9	5.8
Gross Fuel Heating Value (Btu/ft^3)	2,537.4	2,537.4	2,537.4	2,537.40
Average Inlet Fuel Flowrate (SCFH)	1,236.5	1,246.9	1,245.5	1,242.98
Average Inlet Mass Fuel Flowrate (lb/hr)	143.6	144.0	144.7	144.09
% Excess Air	253.1	224.8	253.1	243.65
CO_2 (%) - Modified method 3C	5.12	5.44	5.10	5.22
O_2 (%) - Modified Method 3C	15.10	14.60	15.10	14.93
N_2 (%) - Modified Method 3C	79.80	79.90	79.80	79.83
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	0.32	0.23	0.36	0.30
CO (ppm@3%CO_2)	0.19	0.13	0.21	0.18
THC (ppmvw)	0.08	0.08	0.03	0.06
THC (ppm@3%CO_2)	0.05	0.04	0.02	0.04
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

Production Flare PI model is design to control hazardous gases for natural oil and gas production and processing operations. It is a pioneer design that equipped with air flow control system to allow optimizing air/fuel mix ratio to reduce carbon monoxide and total hydrocarbon to its minimum.

3.2 SAMPLING LOCATION

The sample ports were located approximately 19 feet above grade level on the exhaust system. The stack had a 47 inches inner diameter and was equipped with two, 3 inch ports oriented at 90 degrees. The ports were 4.5 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 8 pipe diameter, 24 inches upstream from interference. 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 Enclosed Combustor Unit, BNECU- PI 48 at the Big Iron Steel Plant 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 May 27-28, 2014.

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
Visual Emission	EPA Method 22	Visual Observation

Pollutant or Parameter	Sampling Method	Analysis Method
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, ASTM D1945-03, and ASTM D3588-98 .

Figure 4.1 depicts the sample system used for the CO, THC, CO_2, and O_2 tests. A heated stainless steel probe was inserted into the sample port of the stack to extract gas measurements from the emission stream at three points located at 16.7, 50, and 83.3 percent across the stack diameter. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, 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 CO analyzers through rotameters that controlled the flow rate of the sample. Exhaust samples were routed to the THC analyzer prior to gas conditioning.

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

All instruments were housed in an air-conditioned, trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e. 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 and flow testing. An inconel probe with an inconel 3/8 inches tubing, pitots tube 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 and total sample volumes were measured with a dry gas meter. Tedlar bags were collected at the exit of this train.

Three test runs for each of the firing rate 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 Enclosed Combustor Unit, BNECU- PI 48 for CO, THC, CO_2, and O_2.

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 24 inches upstream from gas flow meter.

The stack gas analysis for O_2 and CO_2 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.

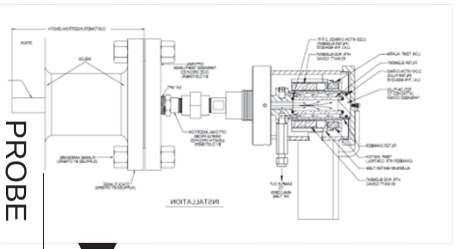
CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

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	VIG 210	User may select up to 10,000 ppm	0.1 ppm	Flame Ionization Detector

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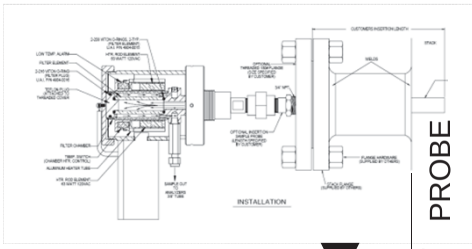
PROBE

HEATED PROBE FILTER

LEGEND

- Heated Teflon Tubing (pre-conditioned sample)
- Unheated Teflon Tubing (conditioned sample)
- Diluted Calibration Gas
- Calibration Gas
- Electronic Input/Output

HEATED PROBE FILTER



PROBE

STACK EXHAUST

PROCESS INLET OR 2ND STACK

dual line heated sample umbilical

TEST TRAILER EXTERIOR

TEST TRAILER INTERIOR

DATA RECORDER



COMPUTER



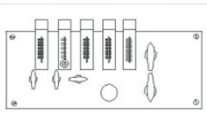
GAS CONDITIONER



dual line heated sample umbilical

MOBILE SECONDARY ANALYZERS

MANIFOLD





GAS DILUTER

THC, VOC



O_2, CO_2, NOx, CO, SO_2



HOT/WET ANALYZERS

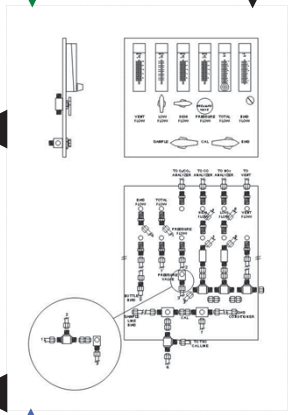
COLD/DRY ANALYZERS



O_2, CO_2, NOx, CO, SO_2

COLD/DRY ANALYZERS HOT/WET





FLOW CONTROL MANIFOLD



FTIR

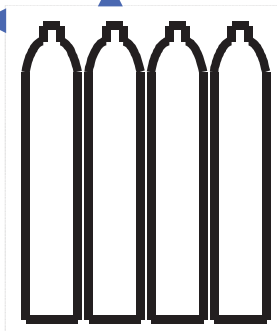
THC, VOC



CONDITIONER

VENT

CALIBRATION/ BIAS GAS BOTTLES



VENT

FIXED PRIMARY ANALYZERS

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

AIR HYGIENE

Figure 4.1
EMISSIONS TESTING LAB

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778

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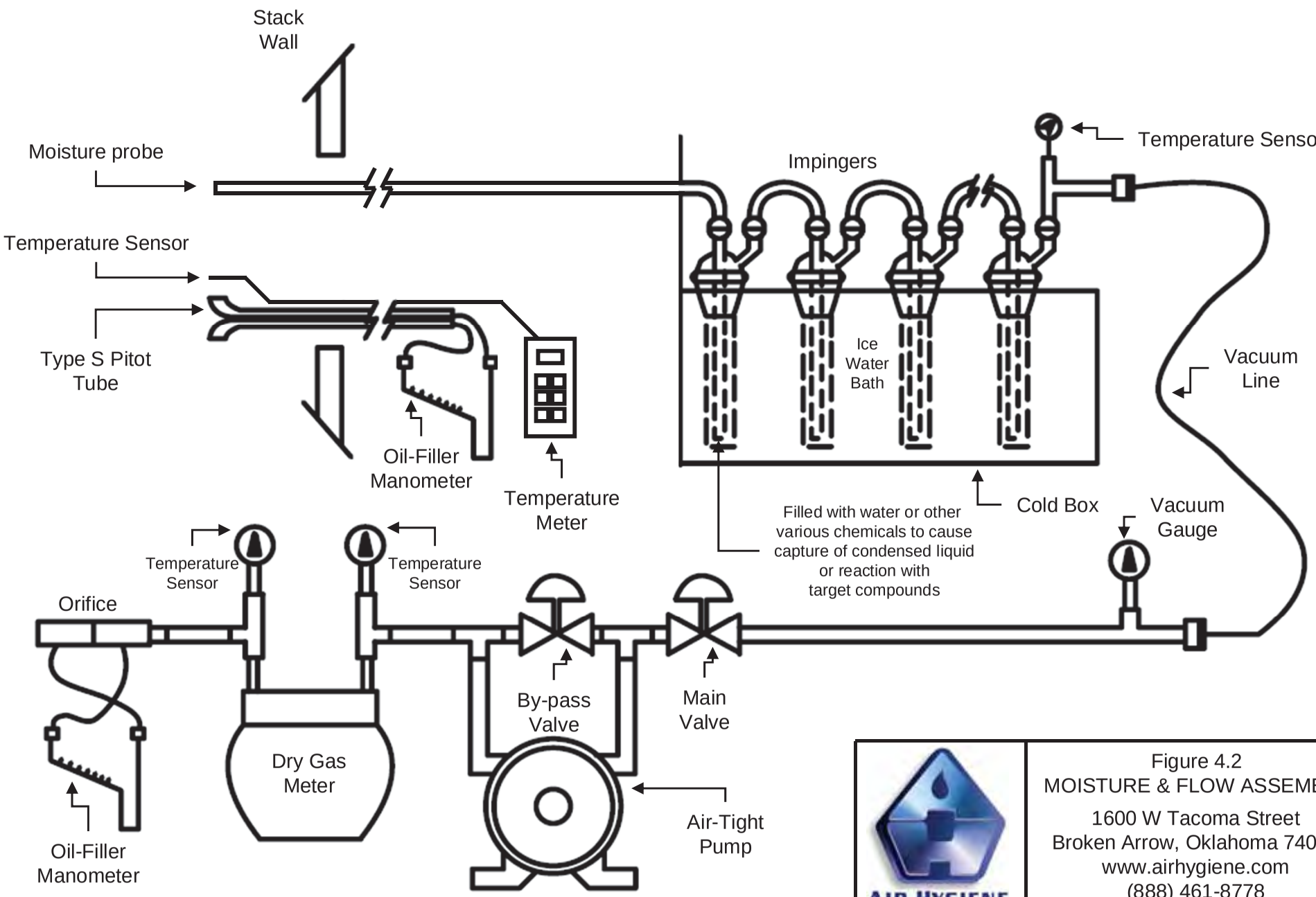


Figure 4.2
MOISTURE & FLOW ASSEMBLY

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778

APPENDIX A

TEST RESULTS AND CALCULATIONS

TABLE A.1:
EMISSIONS TESTING SCHEDULE

Unit	Load	Test Type	Run	Date	Start	Stop	Time Sync
BNECU-PI 48	0-30-0	CO,THC and Fuel Sample	PI 48-R1	05/27/14	9:37:01	10:47:01	CST
BNECU-PI 48	0-30-0	CO,THC and Fuel Sample	PI 48-R2	05/27/14	11:38:01	12:48:01	CST
BNECU-PI 48	0-30-0	CO,THC and Fuel Sample	PI 48-R3	05/27/14	13:05:01	14:05:01	CST
BNECU-PI 48	30-70-30	CO,THC and Fuel Sample	PI 48-R4	05/28/14	7:37:09	8:47:09	CST
BNECU-PI 48	30-70-30	CO,THC and Fuel Sample	PI 48-R5	05/28/14	9:05:09	10:15:09	CST
BNECU-PI 48	30-70-30	CO,THC and Fuel Sample	PI 48-R6	05/28/14	10:30:09	11:45:09	CST
BNECU-PI 48	70-100-70	CO,THC and Fuel Sample	PI 48-R7	05/28/14	12:24:09	13:34:09	CST
BNECU-PI 48	70-100-70	CO,THC and Fuel Sample	PI 48-R8	05/28/14	13:50:09	15:00:09	CST
BNECU-PI 48	70-100-70	CO,THC and Fuel Sample	PI 48-R9	05/28/14	15:15:09	16:25:09	CST
BNECU-PI 48	90-100	CO,THC and Fuel Sample	PI 48-R10	05/28/14	16:41:089	17:41:09	CST
BNECU-PI 48	90-100	CO,THC and Fuel Sample	PI 48-R11	05/28/14	18:07:09	19:17:09	CST
BNECU-PI 48	90-100	CO,THC and Fuel Sample	PI 48-R12	05/28/14	19:28:09	20:38:09	CST
BNECU-PI 48	0-30-0	Fixed gas and Moisture	0-30-0%-1	05/27/14	9:37:00	10:47:00	CST
BNECU-PI 48	0-30-0	Fixed gas and Moisture	0-30-0%-2	05/27/14	11:38:00	12:48:00	CST
BNECU-PI 48	0-30-0	Fixed gas and Moisture	0-30-0%-3	05/27/14	13:05:00	14:15:00	CST
BNECU-PI 48	30-70-30	Fixed gas and Moisture	30-70-30%-4	05/28/14	7:37:00	8:47:00	CST
BNECU-PI 48	30-70-30	Fixed gas and Moisture	30-70-30%-5	05/28/14	9:05:00	10:15:00	CST
BNECU-PI 48	30-70-30	Fixed gas and Moisture	30-70-30%-6	05/28/14	10:30:00	11:40:00	CST
BNECU-PI 48	70-100-70	Fixed gas and Moisture	70-100-70%-7	05/28/14	12:24:00	13:34:00	CST
BNECU-PI 48	70-100-70	Fixed gas and Moisture	70-100-70%-8	05/28/14	13:50:00	14:59:00	CST
BNECU-PI 48	70-100-70	Fixed gas and Moisture	70-100-70%-9	05/28/14	15:15:00	16:15:00	CST
BNECU-PI 48	90-100	Fixed gas and Moisture	90-100%-10	05/18/14	16:41:00	17:51:00	CST
BNECU-PI 48	90-100	Fixed gas and Moisture	90-100%-11	05/18/14	18:07:00	19:17:00	CST
BNECU-PI 48	90-100	Fixed gas and Moisture	90-100%-12	05/18/14	19:28:00	20:38:00	CST

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

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

$$RH_{sp}(lb/lb) = \left[\left(\frac{gr}{lb}\right) \times \frac{lb}{7000\ gr}\right]$$

RH_{sp}= 83.19 gr / lb x 1 lb / 7000 gr = 0.011885 lb H_2O / lb 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)

$$E_P = \frac{C_{Dir(H)} - C_{Dir(Z)}}{C_{V(H)} - C_{V(Z)}} \times C_{Dir(M)} + C_{Dir(Z)}$$

Eq. of a line y=mx+b

E_p = (8.53 ppm - 0.05 ppm) / (8.48 ppm - 0.00 ppm) x 5.04 ppm + 0.05 = 5.09 ppm

$$ACE = \left(\frac{C_{Dir} - C_V}{CS}\right) \times 100$$

Eq. 7E-1

ACE_{THC} = (5.00 ppm - 5.09 ppm) / 5.04 ppm x 100 = -1.79 %

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)

$$SB = \left(\frac{C_S - C_{Dir}}{CS}\right) \times 100$$

Eq. 7E-2

SB = (3.06 ppm - 3.07 ppm) / 10.00 ppm x 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)

$$D = \left|SB_{final} - SB_i\right|$$

Eq. 7E-4

D = | 0.00 % - -0.10 % | = 0.10 %

Alternative Drift and Bias

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

$$SB / D_{Alt} = \left|C_S - C_{Dir}\right|$$

Eq. Section 13.2 and 13.3

SB / D_{Alt} = | 3.06 ppm - 3.07 ppm | = 0.01 ppm

Bias Adjusted Average

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

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

Eq. 7E-5b

C_{Gas} = (0.00 ppm - 0.02 ppm) x (3.04 ppm / (3.07 ppm - 0.02 ppm)) = -0.02 ppm

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

EXAMPLE CALCULATIONS (RUNS)

Diluent-Corrected Pollutant Concentration, CO_2 Based

Calculate the CO_2 corrected pollutant concentration, as follows: (calc for THC gas, Run 1, if applicable)

Uinsg Method 3C fixed gas analysis

$$C_{adj} = 0.00 \text{ ppm} \times \left(\frac{3.00\ \%}{5.90\ \%} \right) = 0.00 \text{ ppm@3\%CO}_2$$

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)

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

$$E_{lb/hr} = \frac{0.00 \text{ ppm}}{10^6 \text{ ppm/part}} \times \frac{120{,}878 \text{ SCFH} \times 44.00 \text{ lb/lb-mol}}{385.23 \text{ SCF/lb-mol}} = \frac{0.000 \text{ lb}}{\text{hr}}$$

VOC Destruction Efficiency

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

$$DE\% = \frac{64.527 - 0.000 \text{ lb/hr}}{64.527 \text{ lb/hr}} \times 100 = 99.999\ \%$$

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.)

$$D(in.) = L_{fw} - L_{nw}$$

D (in.) = 51.00 in. - 4.50 in. = 46.50 in.

Area of Stack (ft^2)

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

A_s (ft^2) = 3.14 x (46.50 in. / 2 x 12in./ft)^2 = 11.79 ft^2

Stack Diameters Downstream

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

B_D (dia.) = 207.00 in. / 46.50 in. = 4.45 diameters

Stack Diameters Upstream

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

A_D (dia.) = 48.00 in. / 46.50 in. = 1.03 diameters

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

Stack Dry Molecular Weight (lb/lb-mole)

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

M_d (lb/lb-mol) = (44 lb/lb-mol / 100 x 4.75 %) +

(32 lb/lb-mol / 100 x 15.60 %) + (28 lb/lb-mol / 100 x [0.00 / 10,000 + 79.60]) = 29.37 lb / lb-mol

Stack Wet Molecular Weight (lb/lb-mole)

$$M_S(lb/lb-mol) = \left[M_d \times \left(1 - \frac{B_{WS}}{100}\right)\right] + \left[MW_{H_2O} \times \frac{B_{WS}}{100}\right]$$

M_S (lb/lb-mol) = { 29.37 lb / lb-mol x (1 - 6.07 % / 100) } + { 18 lb / lb-mol x 6.07 % / 100 } = 28.68 lb / lb-mol

Average Excess Air (%)

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

$(\%EA)_{AVG}$ = 100 x { 15.60 % - (0.5 x 0.000 %) } / (0.264 x 79.60 %) - { 15.60 % - (0.5 x 0.000 %)} = 288.12 %

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)

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

P_s (in. Hg) = 29.98 in. Hg + $\frac{0.00 \text{ in. } H_2O}{13.6 \text{ in. } H_2O/\text{in. Hg}}$ = 29.98 in. Hg

Average Stack Gas Velocity (ft/sec)

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

v_{sl} (ft/sec) =

$$\left(\frac{85.49 \text{ ft (lb/lb-mol)(in. Hg)}}{\sec \quad (^oR)(\text{in. } H_2O)}\right)^{1/2} \times 0.82 \times 0.08 \text{ in.} H_2O^{1/2} \times \sqrt{\frac{732.63 + 460\ ^oR}{29.98 \text{ in. Hg} \times 28.68 \text{ lb/lb-mol}}} = \frac{6.6 \text{ ft}}{\sec}$$

Average Stack Dry Standard Flow Rate (dscfh)

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

Q_{sd} (dscf/hr) = $\frac{3600 \text{ sec}}{\text{hr}}$ x (1 - $\frac{6.07\ \%}{100}$) x $\frac{6.66 \text{ ft}}{\sec}$ x 11.79 ft^2 x $\frac{68.00 + 460\ ^oR}{732.63 + 460\ ^oR}$ x $\frac{29.98 \text{ in. Hg}}{29.92 \text{ in. Hg}}$ = $\frac{117{,}855.88 \text{ dscf}}{\text{hr}}$

Average Stack Wet Flow Rate (acfm)

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

Q_{aw} (acf/min) = $\frac{60 \text{ sec}}{\text{min}}$ x $\frac{6.66 \text{ ft}}{\sec}$ x 11.79 ft^2 = $\frac{4{,}713.88 \text{ acf}}{\text{min}}$

Average Stack Wet Standard Flow Rate (ascfh)

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

Q_{sw} (ascf/hr) = $\frac{60 \text{ min}}{\text{hr}}$ x $\frac{4{,}713.88 \text{ acf}}{\text{min}}$ x $\frac{68.00 + 460\ ^oR}{732.63 + 460\ ^oR}$ x $\frac{29.98 \text{ in. Hg}}{29.92 \text{ in. Hg}}$ = $\frac{125{,}467.09 \text{ ascf}}{\text{hr}}$

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)

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

$V_{wsg(std)}$ = 68.00 g x 0.04715 ft^3/g = 3.210 scf

Standard Meter Volume (dscf)

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

$$V_{m(std)} = \frac{17.65\ {}^{o}R}{\text{in. Hg}} \times 0.97 \times \frac{51.33\ \text{dcf} \times \left(29.98\ \text{in. Hg} + \frac{1.80\ \text{in. } H_2O}{13.6\ \text{in. } H_2O / \text{in. Hg}}\right)}{71.83\ {}^{o}F + 460\ {}^{o}R} = 49.65\ \text{dscf}$$

Calculated Moisture Content (%)

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

$$B_{ws(calc)} = 100 \times \frac{3.21\ \text{dscf}}{3.21\ \text{dscf} + 49.65\ \text{dscf}} = 6.07\ \%$$

Saturated Moisture Content (%)

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

$$B_{ws(svp)} = 100 \times \frac{10^{\left(6.691 - \frac{3144}{732.63\ {}^{o}F + 390.86}\right)}}{29.98\ \text{in. Hg} + \frac{0.00\ \text{in. } H_2O}{13.6\ \text{in. } H_2O / \text{in. Hg}}} \leq 100 = 100.00\ \%$$

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

Nomenclature

- %CO = carbon monoxide concentration (%)
- $\%CO_2$ = carbon dioxide concentration (%)
- $\%N_2$ = nitrogen concentration (%)
- $\%O_2$ = 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
- $[(\Delta p)^{0.5}]_{avg}$ = 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^oC and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)
- 5.02×10^4 = 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.)
- An = Area of nozzle, square feet
- A_s = area of stack (ft^2)
- 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, Dp, and calculated using the actual stack gas temperature, dimensionless
- C_1 = -150.3162 (micropoise)
- C_2 = 18.0614 (micropoise/$K^{0.5}$) = 13.4622 (micropoise/$R^{0.5}$)
- $C_3 = 1.19183 \times 10^6$ (micropoise/K^2) = 3.86153×10^6 (micropoise/R^2)
- C_4 = 0.591123 (micropoise)
- C_5 = 91.9723 (micropoise)
- $C_6 = 4.91705 \times 10^{-5}$ (micropoise/K^2) = 1.51761×10^{-5} (micropoise/R^2)
- 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 PM_{10}, 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.)
- ΔH@ = ΔH @ 0.75 scfm (in. H2O)
- ΔH_{avg} = average orifice pressure (in. H_2O)
- 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. H_2O)
- Δp_1 = velocity head at first current traverse point (in. H_2O)
- $\Delta p'_1$ = velocity head at first preliminary traverse point (in. H_2O)
- Δp_{avg} = average pitot tube differential pressure (in. H_2O)
- Δp_n = velocity head at subsequent current traverse point (in. H_2O)
- Δp_{RM2} = method 2 velocity head (in. H_2O)
- D_s = diameter of stack (in.)
- F_d = fuel f-factor (dscf/MMBtu)
- f_{O2} = stack gas fraction of O_2, by volume, dry basis
- I = Percent isokinetic sampling, dimensionless
- K_1 = standard volume correction, 17.65^oR/in. Hg
- K_4 = isokinetic conversion constant, 0.0945min•in.Hg/sec•^oR
- K_5 = water mass to std water vapor, 0.04715 ft^3/g
- K_p = 85.49, ((ft/sec)/(pounds/mole -^oR))
- 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_{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. H_2O)
- 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 Vm/Q from previous run
- Q_s = Sampling rate for cyclone I to achieve specified D_{50}
- $Q_{s(std)}$ = 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 (^oF)
- t_m = average meter temperature (^oF)
- T_m = Meter box and orifice gas temperature, ^oR
- t_n = Sampling time at point n, min
- t_r = Total projected run time, min
- T_s = Absolute stack gas temperature, ^oR
- T_{std} = standard temperature, 68^oF, 528^oR

Nomenclature

- T_u = absolute temperature offset, 460^{o}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 D_{50} values, dimensionless
- γ = Dry gas meter gamma value, dimensionless
- ΔH = Meter box orifice pressure drop, inches W.C.
- ΔH@ = 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 NOx measured in the spiked sample.
C_{Spike} = Concentration of NOx in the undiluted spike gas.
C_{Calc} = Calculated concentration of NOx 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} = NO_2 to NO converter efficiency, percent.
H = High calibration gas, designator.
L = Low calibration gas, designator.
M = Mid calibration gas, designator.
NOFinal = The average NO concentration observed with the analyzer in the NO mode during the converter efficiency test in Section 16.2.2.
NOxCorr = The NOx concentration corrected for the converter efficiency.
NOxFinal = The final NOx concentration observed during the converter efficiency test in Section 16.2.2.
NOxPeak = The highest NOx 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_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg
P_o = observed combustor inlet absolute pressure at test, mm Hg
H_o = observed humidity of ambient air, g H_2O/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.
$\%_{CO2d}$,$\%_{CO2w}$ = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
E = Pollutant emission rate, ng/J (lb/million Btu).
E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
E_{bi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
E_{bo} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
E_d = Average pollutant rate for each sampling period (e.g.,24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million Btu)
E_{di} = Average inlet 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_{jo},E_{ji} = 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).
$\%_{H2O}$ = Concentration of water from an ultimate analysis of fuel, weight percent.
H_r = 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 scm/kg)/% [(1.53 scf/lb)/%].
K_{cc} = (2.0 scm/kg)/% [(0.321 scf/lb)/%].
K_{hd} = (22.7 scm/kg)/% [(3.64 scf/lb)/%].
K_{hw} = (34.74 scm/kg)/% [(5.57 scf/lb)/%].
K_n = (0.86 scm/kg)/% [(0.14 scf/lb)/%].
K_o = (2.85 scm/kg)/% [(0.46 scf/lb)/%].
K_s = (3.54 scm/kg)/% [(0.57 scf/lb)/%].
K_{sulfur} = $2x10^4$ Btu/wt%-MMBtu
K_w = (1.30 scm/kg)/% [(0.21 scf/lb)/%].
lb = pound
ln = Natural log of indicated value.
L_p,L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
$\%_N$ = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
$M_{\%}$ = mole percent
mol = mole
MW = molecular weight (lb/lb-mol)
MW_{AIR} = molecular weight of air (28.9625 lb/lb-mole)[1]
NCM = net Btu per SCF (constant based on compound)
$\%_O$ = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
$\%_{O2d}$, $\%_{O2w}$ = Concentration of oxygen on a dry and wet basis, respectively, percent.
P_B = barometirc pressure, in Hg
P_s = Potential SO2 emissions, percent.
$\%_S$ = Sulfur content of as-fired fuel lot, dry basis, weight percent.
S_e = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
$\%_{Sf}$ = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
S(wt%) = weight percent of sulfur, per lab analysis by appropriate ASTM standard
S_i = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
S_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, ^0F
W/D Factor = 1.0236 = conv. at 14.696 psia and
68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
X_{CO2}=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*ft^3

Formulas:

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

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

2. Correction to % O_2, 40CFR60, App. A, RM 20, Eq. 20-5 (11/26/02)

$$C_{adj} = C_{Gas(Target)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O2)}} \right)$$

3. Correction to % O_2 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)

$$Q_S = \left(\frac{FFactor \times Q_f \times HHV}{1{,}000{,}000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O2)}} \right)$$

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 (O_2 based)

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d Factor \times Conv_C \times 20.9\%}{20.9\% - C_{Gas(O2)}}$$

8. Emission Concentration in g/hp*hr

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

APPENDIX B

EMISSION DATA RECORDS

Big Iron Oilfield Services, Inc.

Air Permit # :	40 CFR 60 Sub Part OOOO
Plant Name or Location:	Elmore City Plant
Date:	May 21, 2014
Project Number:	stk-elmorecity.ok-comp#1
Manufacturer & Equipment:	BNECU-PI 48
Test Load:	Multiple
Tester(s) / Test Unit(s):	MSL/TP/AR/DI/208

		RUN											
	UNITS	**PI 48-R1**	**PI 48-R2**	**PI 48-R3**	**PI 48-R4**	**PI 48-R5**	**PI 48-R6**	**PI 48-R7**	**PI 48-R8**	**PI 48-R9**	**PI 48-R10**	**PI 48-R11**	**PI 48-R12**
Start Time	hh:mm:ss	09:37:01	11:38:01	13:05:01	07:37:09	09:05:09	10:30:09	12:24:09	13:50:09	15:15:09	16:41:089	18:07:09	19:28:09
End Time	hh:mm:ss	10:47:01	12:48:01	14:05:01	08:47:09	10:15:09	11:45:09	13:34:09	15:00:09	16:25:09	17:41:09	19:17:09	20:38:09
Bar. Pressure	in. Hg	29.98	29.97	29.94	30.00	30.03	30.02	30.02	30.00	30.00	29.95	29.94	29.94
Amb. Temp.	°F	70	75	74	67	69	79	78	90	80	87	79	76
Rel. Humidity	%	76	67	69	78	81	61	59	45	46	40	50	55
Spec. Humidity	lb water / lb air	0.011885	0.012419	0.012380	0.010981	0.012227	0.012896	0.012054	0.013565	0.010010	0.010942	0.010560	0.010519
Date	mm/dd/yy	05/27/14	05/27/14	05/27/14	05/28/14	05/28/14	05/28/14	05/28/14	05/28/14	05/28/14	05/28/14	05/28/14	05/28/14
Unit Number		PI 48	PI 48	PI 48	PI 48	PI 48	PI 48	PI 48	PI 48	PI 48	PI 48	PI 48	PI 48
Load Designator	%	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	90-100	90-100	90-100
Gross Fuel Heating Value	Btu/ft3	2,548	2,548	2,548	2,552	2,552	2,552	2,470	2,470	2,470	2,537	2,537	2,537
Stack Flow (M2)	dscfh	117,856	119,428	124,187	121,207	119,081	118,949	127,482	131,099	129,006	129,495	127,425	127,518
Stack Moisture	Method 4	6.07	5.33	4.85	5.05	5.64	5.42	5.51	5.81	6.11	5.82	5.59	5.87
Wind Speed	mph	3	4	4	4	5	5	4	5	4	4	2	3
Wind Direction	--	N	N	N	N	N	N	N	N	N	N	NNW	NW
CO_2 - Method 3C	%	4.75	4.64	4.70	4.59	4.63	5.78	5.53	5.28	5.33	5.12	5.44	5.10
O_2 - Method 3C	%	15.60	15.70	15.70	15.90	15.80	14.20	14.80	14.90	14.90	15.10	14.60	15.10
N_2 -Method 3C	%	79.60	79.60	79.60	79.50	79.60	80.00	79.80	79.80	79.80	79.80	79.90	79.80
Excess Air	%	288.12	295.42	295.42	312.50	303.01	205.20	236.15	241.60	241.60	253.05	224.84	253.05

METHOD 1 - ISOKINETIC TRAVERSE FOR A CIRCULAR SOURCE

Company	Big Iron Steel & Services, Inc.	**Date**	05/27/14
Plant Name	Big Iron Steel Plant	**Project #**	stk-14-elmorecity.ok-comp#1
Equipment	PI 48	**# of Ports Available**	2
Location	Ports	**# of Ports Used**	2

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	51.00	in.
Distance to Near Wall of Stack	(L_{nw})	4.50	in.
Diameter of Stack	(D)	46.50	in.
Area of Stack	(A_s)	11.79	ft^2

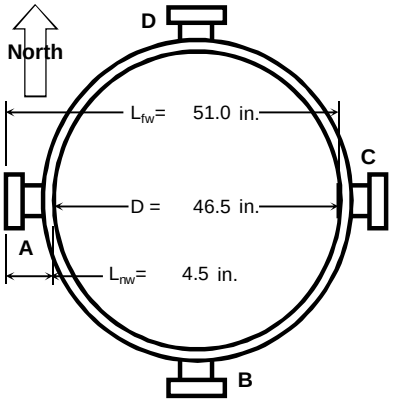
Distance from Disturbances to Port			
Distance Upstream	(A)	48.00	in.
Diameters Upstream	(A_D)	1.03	diameters
Distance Downstream	(B)	207.00	in.
Diameters Downstream	(B_D)	4.45	diameters

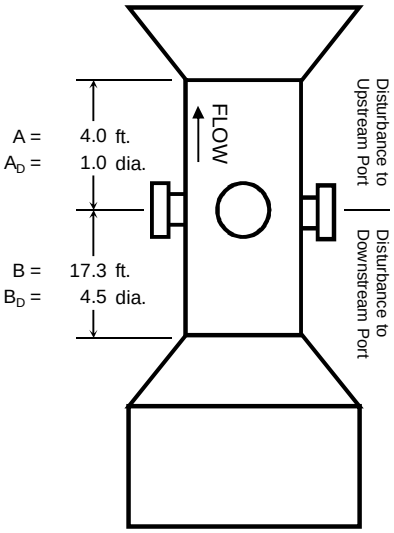
Number of Traverse Points Required					
Diameters to		**Minimum Number of**[1]		Minimum Number of	
Flow Disturbance		**Traverse Points**		Traverse Points	
Down (B_D)	**Up (A_D)**	**Particulate**	Velocity	Comp Stratification	
Stream	**Stream**	**Points**	Points	Criteria	Points
2.00-4.99	0.50-1.24	24	16	○ RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	● OOOO 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
				○ Part75/60	12 RM1 pts
				○ 75 abrv (a)	3 points
				○ 75 abrv (b)	6 points

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

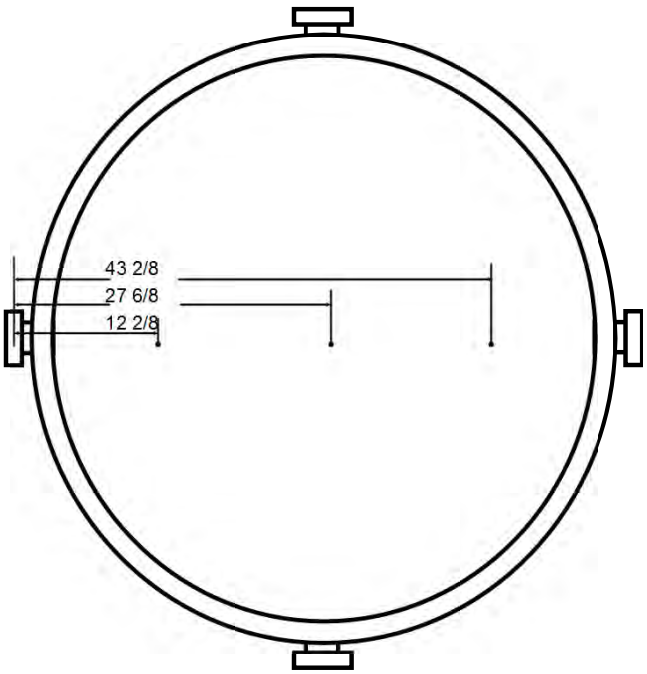
[2] 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used				
2	**Ports by**	3	**Pts / port**	**Gas Sampling**
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%	7 6/8	12 2/8
2	50.0%	23 2/8	27 6/8
3	83.3%	38 6/8	43 2/8
4			
5			
6			
7			
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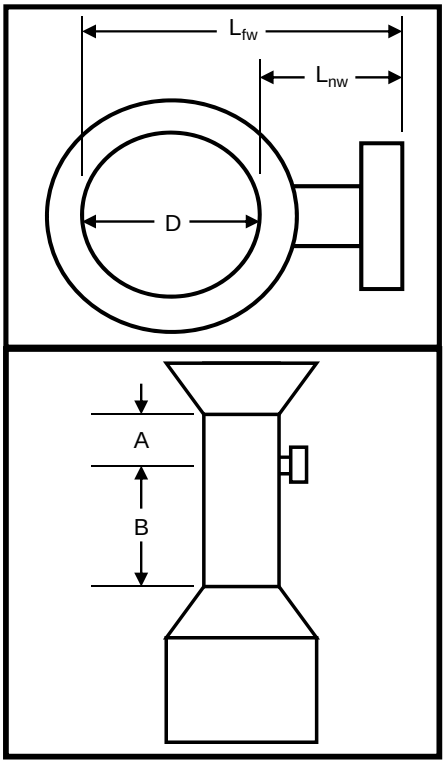


METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Big Iron Steel Plant	**Date**	05/27/14
Sampling Location	PI 48	**Stack Type**	Circular
Operator	TP	**Ports Available**	2
Project #	stk-14-elmorecity.ok-comp#1	**Ports Used**	2
Stack Size	Large (>24 inch diameter)	**Port ID (inches)**	3.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	51.00	in
Distance to Near Wall of Stack	(L_{nw})	4.50	in
Diameter of Stack	(D)	46.50	in
Area of Stack	(A_s)	11.79	ft²

Distance from Port to Disturbances			
Distance Upstream	(A)	48.00	in
Diameters Upstream	(A_D)	1.03	diameters
Distance Downstream	(B)	207.00	in
Diameters Downstream	(B_D)	4.45	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

◉ Method 1 Trav

○ 12 Point PM Trav

○ Velocity

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

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

Traverse Point Number	**Fraction of Stack Diameter**	**Distance from Inside Wall**	**Distance Including Reference Length**
		in	in
1	0.021	1	5 4/8
2	0.067	3 1/8	7 5/8
3	0.118	5 4/8	10
4	0.177	8 2/8	12 6/8
5	0.250	11 5/8	16 1/8
6	0.356	16 4/8	21
7	0.644	30	34 4/8
8	0.750	34 7/8	39 3/8
9	0.823	38 2/8	42 6/8
10	0.882	41	45 4/8
11	0.933	43 3/8	47 7/8
12	0.979	45 4/8	50

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	Big Iron Steel Plant
Sampling Location	PI 48
Fuel Type	Gas, Propene

Test Information			
Project #		stk-14-elmorecity.ok-comp#1	
Operator		TP	
Date for Preliminary Run	(mm/dd/yy)	05/27/14	
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)	05/27/14	05/27/14	05/27/14	
Load	% or w/DB	0-30-0	0-30-0	0-30-0	
Meter Box Number	from ACS	SAMP-CP-0009	SAMP-CP-0009	SAMP-CP-0009	
Meter Calibration Factor	(Y)	0.968	0.968	0.968	
Orifice Meter Coefficient	($\Delta H_@$)	1.796	1.796	1.796	in H_2O
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-FP-0001	SAMP-FP-0001	SAMP-FP-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-0035	SAMP-BC-0035	SAMP-BC-0035	

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	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Historical Data	**0-30-0%-1**	**0-30-0%-2**	**0-30-0%-3**	**Average**	**Units**
Run Start Time	09:37	11:38	13:05		hh:mm
Run Stop Time	10:47	12:48	14:15		hh:mm
Test Date	05/27/14	05/27/14	05/27/14		mm/dd/yy
Meter Calibration Factor	0.968	0.968	0.968		
Pitot Tube Coefficient	0.819	0.819	0.819		
Initial Meter Volume	653.900	705.505	757.535		ft^3
Final Meter Volume	705.230	757.240	809.645		ft^3
Total Meter Volume	51.330	51.735	52.110	51.725	ft^3
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	71.83	78.35	82.65	77.61	°F
Average Stack Temperature	732.63	750.96	768.88	750.82	°F
Barometric Pressure	29.98	29.97	29.94	29.96	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	29.98	29.97	29.94	29.96	in Hg
Average Orifice Pressure Drop	1.80	1.80	1.80	1.80	in H_2O
Absolute Meter Pressure	30.11	30.10	30.07	30.10	in Hg
Avg Square Root Pitot Pressure	0.08	0.08	0.09	0.08	$\sqrt{(in\ H_2O)}$
Moisture Content Data	**0-30-0%-1**	**0-30-0%-2**	**0-30-0%-3**	**Average**	**Units**
Impinger Water Weight Gain	56.00	52.00	45.30	51.10	g
Silica Gel Weight Gain	12.00	7.00	8.00	9.00	g
Total Water Volume Collected	68.12	59.11	53.40	60.21	ml
Standard Water Vapor Volume	3.21	2.78	2.51	2.83	scf
Standard Meter Volume	49.6	49.4	49.3	49.5	dscf
Calculated Stack Moisture	6.07	5.33	4.85	5.41	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	6.07	5.33	4.85	5.41	%
Method 3C Gas Analysis Data	**0-30-0%-1**	**0-30-0%-2**	**0-30-0%-3**	**Average**	**Units**
Carbon Dioxide Content	4.8	4.6	4.7	4.7	%
Oxygen Content	15.6	15.7	15.7	15.7	%
Nitrogen Content	79.6	79.6	79.6	79.6	%
Stack Dry Molecular Weight	29.37	29.35	29.38	29.37	lb/lb-mole
Stack Wet Molecular Weight	28.68	28.75	28.83	28.75	lb/lb-mole
Percent Excess Air	288.1	295.4	295.4	293.0	%
Volumetric Flow Rate Data	**0-30-0%-1**	**0-30-0%-2**	**0-30-0%-3**	**Average**	**Units**
Average Stack Gas Velocity	6.66	6.80	7.15	6.87	ft/sec
Stack Cross-Sectional Area	11.79	11.79	11.79	11.79	ft^2
Actual Stack Flow Rate	4,714	4,814	5,059	4,862	acfm
Wet Standard Stack Flow Rate	125	126	131	127	wkscfh
Dry Standard Stack Flow Rate	117,856	119,428	124,187	120,490	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/27/14		
Sampling Location	PI 48	**Operator**	TP		
Project #	stk-14-elmorecity.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**	05/27/14	**Run Start Time**	09:37		**Run Stop Time**	10:47
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**		**Excess Air**	**Fuel Factor in Range**
	(%CO_2)	(%O_2)	(ppmCO)	(%N_2)	(M_d)	(F_o)$_{avg}$		(%EA)$_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole			%	
01:10	4.8	15.6	0.0	79.6	29.37	1.116		288.1	N/A

Gas Analysis Data									
Run Number	0-30-0%-2		**Date**	05/27/14	**Run Start Time**	11:38		**Run Stop Time**	12:48
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**		**Excess Air**	**Fuel Factor in Range**
	(%CO_2)	(%O_2)	(ppmCO)	(%N_2)	(M_d)	(F_o)$_{avg}$		(%EA)$_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole			%	
01:10	4.6	15.7	0.0	79.6	29.35	1.121		295.4	N/A

Gas Analysis Data									
Run Number	0-30-0%-3		**Date**	05/27/14	**Run Start Time**	13:05		**Run Stop Time**	14:15
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**		**Excess Air**	**Fuel Factor in Range**
	(%CO_2)	(%O_2)	(ppmCO)	(%N_2)	(M_d)	(F_o)$_{avg}$		(%EA)$_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole			%	
01:10	4.7	15.7	0.0	79.6	29.38	1.106		295.4	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/27/14
Sampling Location	PI 48	**Operator**	TP
Project #	stk-14-elmorecity.ok-comp#1	**Ports Used**	2

Moisture Content Data									
Run Number		0-30-0%-1		**Date**	05/27/14	**Start Time**	09:37	**Stop Time**	10:47
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.330	dcf		**Barometric Pressure**	(P_b)	29.98	in Hg
Average Stack Temp		(t_s)$_{avg}$	733	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	72	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	756.60	774.40	560.30	843.50				
Initial Value	(V_i),(W_i)	770.40	712.20	552.70	831.50				
Net Value	(V_n),(W_n)	-13.8	62.2	7.6	12.0				
Results									
Total Weight	(W_t)	68.00	g		**Water Vol Weighed**	($V_{wsg(std)}$)	3.206	scf	
Std Meter Volume	($V_{m(std)}$)	49.646	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	6.07	%		**Final Moisture Content**	(B_{ws})	6.07	%	

Moisture Content Data									
Run Number		0-30-0%-2		**Date**	05/27/14	**Start Time**	11:38	**Stop Time**	12:48
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.735	dcf		**Barometric Pressure**	(P_b)	29.97	in Hg
Average Stack Temp		(t_s)$_{avg}$	751	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	78	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	801.70	767.20	565.20	793.80				
Initial Value	(V_i),(W_i)	763.30	755.80	563.00	786.80				
Net Value	(V_n),(W_n)	38.4	11.4	2.2	7.0				
Results									
Total Weight	(W_t)	59.00	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.782	scf	
Std Meter Volume	($V_{m(std)}$)	49.416	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	5.33	%		**Final Moisture Content**	(B_{ws})	5.33	%	

Moisture Content Data									
Run Number		0-30-0%-3		**Date**	05/27/14	**Start Time**	13:05	**Stop Time**	14:15
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	52.110	dcf		**Barometric Pressure**	(P_b)	29.94	in Hg
Average Stack Temp		(t_s)$_{avg}$	769	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	83	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	793.10	782.10	561.40	851.50				
Initial Value	(V_i),(W_i)	756.60	774.40	560.30	843.50				
Net Value	(V_n),(W_n)	36.5	7.7	1.1	8.0				
Results									
Total Weight	(W_t)	53.30	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.513	scf	
Std Meter Volume	($V_{m(std)}$)	49.331	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	4.85	%		**Final Moisture Content**	(B_{ws})	4.85	%	

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/27/14
Operator	TP
Run Number	0-30-0%-1

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	732.6	°F
Average Meter Temp	(t_m)	71.8	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.08	in H_2O
Stack Moisture Content	(B_{ws})	6.07	%
Stack Dry Molecular Weight	(M_d)	29.37	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
INCOMPLETE	**Post**		ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.15	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.20	in H_2O for	15.0	sec
	Post (+)	0.17	in H_2O for	15.0	sec
	Post (-)	0.14	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4698	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number			
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	29.98	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	29.98	in Hg
Absolute Meter Pressure	(P_m)	30.11	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	09:37	**End**	10:47

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	770.4	712.2	552.7	831.5				
Post	756.6	774.4	560.3	843.5				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	653.900	0.005	1.796	1.80	581	250		61			65	64	3.5	0.07	5.45	2.128		51.076
A-2	2.7	00:02:43	656.070	0.005	1.796	1.80	645	250		55			66	64	3.5	0.07	5.61	4.186		50.229
A-3	5.4	00:05:25	658.170	0.005	1.796	1.80	747	250		54			68	64	3.5	0.07	5.87	6.313		50.502
A-4	8.1	00:08:07	660.345	0.010	1.796	1.80	803	250		57			71	65	3.5	0.10	8.49	8.281		49.684
A-5	10.8	00:10:50	662.365	0.010	1.796	1.80	830	250		58			71	65	3.5	0.10	8.58	10.336		49.614
A-6	13.5	00:13:33	664.475	0.010	1.796	1.80	837	250		58			72	65	3.5	0.10	8.60	12.405		49.618
A-7	16.3	00:16:15	666.600	0.005	1.796	1.80	768	250		58			74	65	3.5	0.07	5.92	14.469		49.608
A-8	19.0	00:18:58	668.725	0.005	1.796	1.80	724	250		59			75	66	3.5	0.07	5.81	16.529		49.588
A-9	21.7	00:21:40	670.850	0.005	1.796	1.80	704	250		60			76	66	3.5	0.07	5.76	18.583		49.555
A-10	24.4	00:24:22	672.970	0.005	1.796	1.80	685	250		60			77	66	3.5	0.07	5.71	20.678		49.628
A-11	27.1	00:27:05	675.135	0.005	1.796	1.80	635	250		60			78	67	3.5	0.07	5.59	22.857		49.869
A-12	29.8	00:29:47	677.390	0.005	1.796	1.80	556	250		60			78	67	3.5	0.07	5.38	24.895		49.790
B-1	32.5	00:32:30	679.500	0.005	1.796	1.80	601	250		65			72	68	3.5	0.07	5.50	26.972		49.794
B-2	35.2	00:35:12	681.640	0.005	1.796	1.80	745	250		60			80	68	3.5	0.07	5.86	29.004		49.722
B-3	37.9	00:37:55	683.750	0.005	1.796	1.80	779	250		60			81	68	3.5	0.07	5.94	31.045		49.671
B-4	40.6	00:40:37	685.870	0.005	1.796	1.80	817	250		61			81	69	3.5	0.07	6.03	33.078		49.617
B-5	43.3	00:43:20	687.985	0.010	1.796	1.80	864	250		61			80	69	3.5	0.10	8.69	35.147		49.620
B-6	46.0	00:46:03	690.135	0.010	1.796	1.80	774	250		62			81	69	3.5	0.10	8.39	37.219		49.626
B-7	48.8	00:48:45	692.290	0.010	1.796	1.80	788	250		63			81	69	3.5	0.10	8.44	39.243		49.570
B-8	51.5	00:51:28	694.395	0.010	1.796	1.80	850	250		63			81	70	3.5	0.10	8.64	41.313		49.576
B-9	54.2	00:54:10	696.550	0.010	1.796	1.80	848	250		63			81	70	3.5	0.10	8.64	43.354		49.548
B-10	56.9	00:56:53	698.675	0.005	1.796	1.80	717	250		63			81	70	3.5	0.07	5.79	45.420		49.549
B-11	59.6	00:59:35	700.825	0.005	1.796	1.80	695	250		63			81	71	3.5	0.07	5.74	47.493		49.557
B-12	62.3	01:02:18	702.985	0.005	1.796	1.80	590	250		63			81	71	3.5	0.07	5.47	49.647		49.647
Last Pt	65.0	01:05:00	705.230																	
Final Val	65.0	01:05:00	705.230											**Max Vac**	3.5	**Final Values**		49.647		
Average Values				0.01		1.80	733	250		60			76	67		0.08	6.66			
													72							

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/27/14
Operator	TP
Run Number	0-30-0%-2

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	751.0	°F
Average Meter Temp	(t_m)	78.4	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.08	in H_2O
Stack Moisture Content	(B_{ws})	5.33	%
Stack Dry Molecular Weight	(M_d)	29.35	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.76	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.12	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.18	in H_2O for	15.0	sec
	Post (+)	0.16	in H_2O for	15.0	sec
	Post (-)	0.20	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4715	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number			
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	29.97	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	29.97	in Hg
Absolute Meter Pressure	(P_m)	30.10	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	11:38	**End**	12:48

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	763.3	755.8	563.0	786.8				
Post	801.7	767.2	565.2	793.8				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	705.505	0.005	1.796	1.80	625	250		64			71	71	4.5	0.07	5.56	2.068		49.621
A-2	2.7	00:02:43	707.640	0.005	1.796	1.80	657	250		62			73	71	4.5	0.07	5.64	4.097		49.168
A-3	5.4	00:05:25	709.740	0.005	1.796	1.80	753	250		65			76	71	4.5	0.07	5.87	6.126		49.010
A-4	8.1	00:08:07	711.845	0.010	1.796	1.80	776	250		66			78	71	4.5	0.10	8.39	8.127		48.764
A-5	10.8	00:10:50	713.925	0.010	1.796	1.80	873	250		66			80	71	4.5	0.10	8.71	10.168		48.806
A-6	13.5	00:13:33	716.050	0.010	1.796	1.80	879	250		65			81	72	5.0	0.10	8.73	12.229		48.914
A-7	16.3	00:16:15	718.200	0.010	1.796	1.80	829	250		63			82	72	5.0	0.10	8.56	14.359		49.232
A-8	19.0	00:18:58	720.425	0.010	1.796	1.80	732	250		61			83	72	5.0	0.10	8.24	16.473		49.420
A-9	21.7	00:21:40	722.635	0.005	1.796	1.80	762	250		60			84	72	5.0	0.07	5.90	18.509		49.358
A-10	24.4	00:24:22	724.765	0.005	1.796	1.80	746	250		59			84	73	5.0	0.07	5.86	20.548		49.315
A-11	27.1	00:27:05	726.900	0.005	1.796	1.80	699	250		59			84	73	5.0	0.07	5.74	22.601		49.312
A-12	29.8	00:29:47	729.050	0.005	1.796	1.80	663	250		59			84	74	5.0	0.07	5.65	24.705		49.410
B-1	32.5	00:32:30	731.255	0.005	1.796	1.80	704	250		61			80	74	5.0	0.07	5.75	26.835		49.542
B-2	35.2	00:35:12	733.480	0.005	1.796	1.80	793	250		58			84	74	5.0	0.07	5.97	28.882		49.512
B-3	37.9	00:37:55	735.625	0.005	1.796	1.80	812	250		58			86	74	5.0	0.07	6.02	30.896		49.433
B-4	40.6	00:40:37	737.740	0.005	1.796	1.80	845	250		58			87	74	5.0	0.07	6.09	32.903		49.355
B-5	43.3	00:43:20	739.850	0.010	1.796	1.80	883	250		58			87	74	5.0	0.10	8.74	34.944		49.333
B-6	46.0	00:46:03	741.995	0.010	1.796	1.80	805	250		58			88	75	5.0	0.10	8.48	36.943		49.257
B-7	48.8	00:48:45	744.100	0.010	1.796	1.80	793	250		58			88	75	5.0	0.10	8.44	39.003		49.268
B-8	51.5	00:51:28	746.270	0.010	1.796	1.80	821	250		59			88	75	5.0	0.10	8.54	41.026		49.231
B-9	54.2	00:54:10	748.400	0.005	1.796	1.80	732	250		59			88	75	5.0	0.07	5.82	43.353		49.546
B-10	56.9	00:56:53	750.850	0.01	1.796	1.80	619	250		60			88	76	5.0	0.07	5.54	45.378		49.504
B-11	59.6	00:59:35	752.985	0.01	1.796	1.80	620	250		60			89	76	5.0	0.07	5.54	47.426		49.488
B-12	62.3	01:02:18	755.145	0.01	1.796	1.80	602	250		60			87	76	5.0	0.07	5.50	49.415		49.415
Last Pt	65.0	01:05:00	757.240																	
Final Val	65.0	01:05:00	757.240											**Max Vac**	5.0	**Final Values**		49.415		
Average Values				0.01		1.80	751	250		61			83	73		0.08	6.80			
													78							

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/27/14
Operator	TP
Run Number	0-30-0%-3

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	768.9	°F
Average Meter Temp	(t_m)	82.6	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.09	in H_2O
Stack Moisture Content	(B_{ws})	4.85	%
Stack Dry Molecular Weight	(M_d)	29.38	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.76	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.21	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.16	in H_2O for	15.0	sec
	Post (+)	0.13	in H_2O for	15.0	sec
	Post (-)	0.15	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4653	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number			
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	29.94	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	29.94	in Hg
Absolute Meter Pressure	(P_m)	30.07	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	13:05	**End**	14:15

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	756.6	774.4	560.3	843.5				
Post	793.1	782.1	561.4	851.5				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	757.535	0.005	1.796	1.80	686	250		63			82	75	4.5	0.07	5.70	2.242		53.803
A-2	2.7	00:02:43	759.885	0.005	1.796	1.80	762	250		56			88	76	4.0	0.07	5.89	4.227		50.729
A-3	5.4	00:05:25	761.980	0.005	1.796	1.80	818	250		55			89	76	4.0	0.07	6.02	6.273		50.182
A-4	8.1	00:08:07	764.140	0.010	1.796	1.80	841	250		55			90	76	4.0	0.10	8.60	8.269		49.614
A-5	10.8	00:10:50	766.250	0.010	1.796	1.80	866	250		55			90	77	4.0	0.10	8.68	10.301		49.445
A-6	13.5	00:13:33	768.400	0.010	1.796	1.80	889	250		56			90	77	4.0	0.10	8.75	12.333		49.333
A-7	16.3	00:16:15	770.550	0.010	1.796	1.80	787	250		56			89	77	4.0	0.10	8.42	14.386		49.324
A-8	19.0	00:18:58	772.720	0.010	1.796	1.80	732	250		56			89	77	4.0	0.10	8.23	16.444		49.332
A-9	21.7	00:21:40	774.895	0.005	1.796	1.80	705	250		56			89	77	4.0	0.07	5.75	18.502		49.337
A-10	24.4	00:24:22	777.070	0.005	1.796	1.80	696	250		57			89	77	4.0	0.07	5.73	20.559		49.342
A-11	27.1	00:27:05	779.245	0.005	1.796	1.80	625	250		57			90	77	4.0	0.07	5.55	22.667		49.455
A-12	29.8	00:29:47	781.475	0.005	1.796	1.80	605	250		57			90	77	4.0	0.07	5.50	24.803		49.606
B-1	32.5	00:32:30	783.735	0.005	1.796	1.80	605	250		58			86	77	4.0	0.07	5.50	26.857		49.582
B-2	35.2	00:35:12	785.900	0.005	1.796	1.80	766	250		57			90	77	4.0	0.07	5.90	28.889		49.524
B-3	37.9	00:37:55	788.050	0.010	1.796	1.80	818	250		57			90	77	4.0	0.10	8.52	30.921		49.474
B-4	40.6	00:40:37	790.200	0.010	1.796	1.80	850	250		57			91	77	4.0	0.10	8.63	32.918		49.378
B-5	43.3	00:43:20	792.315	0.010	1.796	1.80	841	250		58			91	78	4.0	0.10	8.60	34.961		49.357
B-6	46.0	00:46:03	794.480	0.010	1.796	1.80	806	250		57			91	78	4.0	0.10	8.48	37.037		49.382
B-7	48.8	00:48:45	796.680	0.010	1.796	1.80	725	250		58			89	78	4.0	0.10	8.20	39.097		49.386
B-8	51.5	00:51:28	798.860	0.010	1.796	1.80	782	250		58			87	78	4.0	0.10	8.40	41.123		49.348
B-9	54.2	00:54:10	801.000	0.010	1.796	1.80	837	250		58			85	78	4.0	0.10	8.58	43.163		49.329
B-10	56.9	00:56:53	803.150	0.005	1.796	1.80	838	250		58			85	78	4.0	0.07	6.07	45.236		49.348
B-11	59.6	00:59:35	805.335	0.005	1.796	1.80	833	250		58			84	78	4.0	0.07	6.06	47.363		49.422
B-12	62.3	01:02:18	807.575	0.005	1.796	1.80	740	250		58			83	77	4.0	0.07	5.84	49.332		49.332
Last Pt	65.0	01:05:00	809.645																	
Final Val	65.0	01:05:00	809.645											**Max Vac**	4.5	**Final Values**		49.332		
Average Values				0.01		1.80	769	250		57			88	77		0.09	7.15			
													83							

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	6.1	%
Stack Exhaust Flow (M2)	117,856	SCFH

Weather Data

Barometric Pressure	29.98	in. Hg
Relative Humidity	76	%
Ambient Temperature	70	°F
Specific Humidity	0.011885	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R1

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. °F	Fuel Flow SCFH
A1	05/27/14 9:37:01	9750	16.35	2.29	0.05	3.32	4.82	67.40	376.00
	05/27/14 9:37:31	9780	16.35	2.42	0.04	3.29	4.82	67.40	376.00
	05/27/14 9:38:01	9810	16.31	2.26	-0.01	3.33	4.82	67.40	376.00
	05/27/14 9:38:31	9840	16.17	2.14	-0.02	3.45	4.71	67.30	373.00
	05/27/14 9:39:01	9870	16.62	2.14	0.00	3.12	4.71	67.30	373.00
	05/27/14 9:39:31	9900	16.17	2.43	0.00	3.41	6.12	67.30	410.00
	05/27/14 9:40:01	9930	15.85	2.03	0.01	3.53	6.12	67.30	410.00
	05/27/14 9:40:31	9960	13.47	1.44	0.02	5.15	10.77	67.20	662.00
	05/27/14 9:41:01	9990	12.65	0.23	-0.02	5.84	10.77	67.20	662.00
	05/27/14 9:41:31	10020	13.31	0.14	-0.02	5.47	9.85	67.10	631.00
	05/27/14 9:42:01	10050	13.47	0.42	0.00	5.29	9.85	67.10	631.00
	05/27/14 9:42:31	10080	13.54	0.49	0.00	5.25	10.13	67.00	631.00
	05/27/14 9:43:01	10110	13.85	0.65	0.00	5.12	10.13	67.00	631.00
	05/27/14 9:43:31	10140	13.78	0.62	0.00	5.01	9.99	66.90	628.00
	05/27/14 9:44:01	10170	13.20	0.76	0.00	5.48	9.99	66.90	628.00
	05/27/14 9:44:31	10200	13.24	0.48	0.00	5.46	9.88	66.90	625.00
	05/27/14 9:45:01	10230	13.32	0.54	-0.02	5.42	9.88	66.90	625.00
	05/27/14 9:45:31	10260	13.38	0.84	-0.02	5.36	10.13	66.70	626.00
	05/27/14 9:46:01	10290	13.60	0.93	-0.02	5.23	10.13	66.70	626.00
	05/27/14 9:46:31	10320	13.89	1.01	-0.03	5.06	10.16	66.70	626.00
	05/27/14 9:47:01	10350	13.72	1.16	-0.02	5.08	10.16	66.70	626.00
	05/27/14 9:47:31	10380	13.49	1.75	-0.01	5.26	10.02	66.70	626.00
	05/27/14 9:48:01	10410	13.36	1.12	0.00	5.36	10.02	66.70	626.00
	05/27/14 9:48:31	10440	13.31	0.61	0.00	5.42	10.16	66.70	623.00
	05/27/14 9:49:01	10470	13.29	0.52	-0.02	5.42	10.16	66.70	623.00
	05/27/14 9:49:31	10500	13.54	0.78	-0.02	5.29	9.91	66.70	623.00
	05/27/14 9:50:01	10530	13.75	0.68	0.00	5.09	9.91	66.70	623.00
	05/27/14 9:50:31	10560	13.66	0.68	0.00	5.15	10.02	66.70	620.00
	05/27/14 9:51:01	10590	14.07	0.52	-0.01	4.92	10.02	66.70	620.00
	05/27/14 9:51:31	10620	13.73	0.69	-0.01	5.06	10.16	66.70	623.00
	05/27/14 9:52:01	10650	13.57	0.59	0.00	5.23	10.16	66.70	623.00
	05/27/14 9:52:31	10680	13.48	0.69	-0.01	5.27	10.16	66.70	626.00
	05/27/14 9:53:01	10710	13.56	0.64	-0.01	5.24	10.16	66.70	626.00
	05/27/14 9:53:31	10740	14.27	0.92	-0.01	4.88	6.03	66.80	443.00
	05/27/14 9:54:01	10770	15.68	1.99	-0.01	3.87	6.03	66.80	443.00
	05/27/14 9:54:31	10800	16.14	4.27	0.00	3.47	5.12	66.90	382.00
	05/27/14 9:55:01	10830	16.10	3.29	0.00	3.44	5.12	66.90	382.00
	05/27/14 9:55:31	10860	16.02	2.74	-0.01	3.54	4.71	67.00	384.00
	05/27/14 9:56:01	10890	16.02	2.43	-0.02	3.57	4.71	67.00	384.00
	05/27/14 9:56:31	10920	16.25	3.24	-0.02	3.35	5.09	67.00	385.00
	05/27/14 9:57:01	10950	16.13	3.89	-0.01	3.44	5.09	67.00	385.00
	05/27/14 9:57:31	10980	14.43	3.52	-0.01	4.44	9.74	67.10	609.00
	05/27/14 9:58:01	11010	13.54	1.32	-0.04	5.20	9.74	67.10	609.00
	05/27/14 9:58:31	11040	13.60	0.52	-0.03	5.22	10.38	67.20	629.00
	05/27/14 9:59:01	11070	13.44	0.54	-0.01	5.26	10.38	67.20	629.00
	05/27/14 9:59:31	11100	13.31	0.52	0.00	5.43	10.24	67.20	628.00
	05/27/14 10:00:01	11130	13.31	0.28	-0.02	5.38	10.24	67.20	628.00
A2	05/27/14 10:00:31	11160	13.42	0.17	-0.02	5.31	9.96	67.30	625.00
	05/27/14 10:01:01	11190	13.48	0.20	-0.02	5.32	9.96	67.30	625.00
	05/27/14 10:01:31	11220	13.70	0.61	-0.02	5.13	10.21	67.40	625.00
	05/27/14 10:02:01	11250	13.45	0.78	-0.02	5.28	10.21	67.40	625.00
	05/27/14 10:02:31	11280	13.54	0.70	-0.02	5.26	10.21	67.50	625.00
	05/27/14 10:03:01	11310	13.54	0.81	-0.01	5.28	10.21	67.50	625.00
	05/27/14 10:03:31	11340	13.55	0.62	0.00	5.19	10.32	67.50	625.00
	05/27/14 10:04:01	11370	13.57	0.49	-0.02	5.26	10.32	67.50	625.00
	05/27/14 10:04:31	11400	13.70	0.40	-0.02	5.10	10.32	67.60	623.00
	05/27/14 10:05:01	11430	13.27	0.22	-0.02	5.41	10.32	67.60	623.00
	05/27/14 10:05:31	11460	13.23	0.08	-0.02	5.46	10.19	67.80	622.00
	05/27/14 10:06:01	11490	13.20	0.07	0.00	5.47	10.19	67.80	622.00
	05/27/14 10:06:31	11520	13.19	0.09	0.00	5.48	10.30	67.80	625.00
	05/27/14 10:07:01	11550	13.21	0.07	0.01	5.46	10.30	67.80	625.00
	05/27/14 10:07:31	11580	13.17	0.11	0.01	5.51	10.41	68.00	622.00

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	6.1	%
Stack Exhaust Flow (M2)	117,856	SCFH

Weather Data

Barometric Pressure	29.98	in. Hg
Relative Humidity	76	%
Ambient Temperature	70	°F
Specific Humidity	0.011885	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R1

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. °F	Fuel Flow SCFH
	05/27/14 10:08:01	11610	13.28	0.39	-0.02	5.43	10.41	68.00	622.00
	05/27/14 10:08:31	11640	13.33	0.28	-0.02	5.42	10.38	68.00	622.00
	05/27/14 10:09:01	11670	13.46	0.22	0.00	5.29	10.38	68.00	622.00
	05/27/14 10:09:31	11700	13.51	0.31	0.00	5.31	10.49	68.10	625.00
	05/27/14 10:10:01	11730	13.51	0.33	-0.02	5.23	10.49	68.10	625.00
	05/27/14 10:10:31	11760	14.42	0.30	-0.01	4.81	6.62	68.30	467.00
	05/27/14 10:11:01	11790	15.58	1.37	0.01	3.89	6.62	68.30	467.00
	05/27/14 10:11:31	11820	15.99	2.53	0.02	3.65	5.29	68.50	389.00
	05/27/14 10:12:01	11850	16.13	3.59	0.02	3.45	5.29	68.50	389.00
	05/27/14 10:12:31	11880	16.48	2.29	0.02	3.27	4.76	68.70	362.00
	05/27/14 10:13:01	11910	16.51	1.86	-0.02	3.14	4.76	68.70	362.00
	05/27/14 10:13:31	11940	16.49	1.60	-0.01	3.20	4.73	68.90	359.00
	05/27/14 10:14:01	11970	16.63	1.59	-0.02	3.10	4.73	68.90	359.00
	05/27/14 10:14:31	12000	16.32	1.97	-0.01	3.16	7.03	69.20	484.00
	05/27/14 10:15:01	12030	14.02	1.14	0.00	4.77	7.03	69.20	484.00
	05/27/14 10:15:31	12060	13.61	0.24	0.00	5.17	10.24	69.50	617.00
	05/27/14 10:16:01	12090	13.45	0.15	-0.02	5.30	10.24	69.50	617.00
	05/27/14 10:16:31	12120	13.49	-0.01	-0.02	5.32	10.08	69.90	611.00
	05/27/14 10:17:01	12150	13.68	0.06	0.02	5.15	10.08	69.90	611.00
	05/27/14 10:17:31	12180	13.67	0.17	0.03	5.10	10.44	70.50	611.00
	05/27/14 10:18:01	12210	13.48	0.20	-0.02	5.27	10.44	70.50	611.00
	05/27/14 10:18:31	12240	13.43	0.20	-0.02	5.32	10.63	71.00	611.00
	05/27/14 10:19:01	12270	13.25	0.30	-0.02	5.45	10.63	71.00	611.00
	05/27/14 10:19:31	12300	13.44	0.47	-0.02	5.30	10.57	71.50	613.00
	05/27/14 10:20:01	12330	13.48	0.32	0.00	5.29	10.57	71.50	613.00
	05/27/14 10:20:31	12360	13.40	0.17	0.00	5.33	10.41	71.90	612.00
	05/27/14 10:21:01	12390	13.54	0.09	-0.01	5.28	10.41	71.90	612.00
	05/27/14 10:21:31	12420	13.31	0.26	-0.01	5.36	10.49	72.10	612.00
	05/27/14 10:22:01	12450	13.36	0.26	0.01	5.40	10.49	72.10	612.00
	05/27/14 10:22:31	12480	13.47	0.40	0.01	5.28	10.57	72.20	612.00
	05/27/14 10:23:01	12510	13.24	0.37	-0.02	5.46	10.57	72.20	612.00
	05/27/14 10:23:31	12540	13.30	0.07	-0.03	5.42	10.41	72.30	614.00
A3	05/27/14 10:24:01	12570	13.64	0.02	-0.02	5.21	10.41	72.30	614.00
	05/27/14 10:24:31	12600	13.62	0.46	-0.02	5.18	10.35	72.30	617.00
	05/27/14 10:25:01	12630	13.58	0.67	0.00	5.22	10.35	72.30	617.00
	05/27/14 10:25:31	12660	13.47	0.59	-0.01	5.28	10.46	72.50	614.00
	05/27/14 10:26:01	12690	13.33	0.52	-0.01	5.39	10.46	72.50	614.00
	05/27/14 10:26:31	12720	13.37	0.52	0.00	5.35	10.55	72.60	617.00
	05/27/14 10:27:01	12750	13.21	0.31	0.00	5.47	10.55	72.60	617.00
	05/27/14 10:27:31	12780	13.25	0.29	0.00	5.45	10.52	72.80	617.00
	05/27/14 10:28:01	12810	13.27	0.20	-0.01	5.41	10.52	72.80	617.00
	05/27/14 10:28:31	12840	14.10	0.38	-0.02	5.01	6.89	73.00	455.00
	05/27/14 10:29:01	12870	15.43	1.30	0.00	4.01	6.89	73.00	455.00
	05/27/14 10:29:31	12900	15.82	2.80	0.00	3.73	5.43	73.20	386.00
	05/27/14 10:30:01	12930	15.99	3.01	0.00	3.57	5.43	73.20	386.00
	05/27/14 10:30:31	12960	16.34	2.02	0.00	3.33	4.48	73.50	358.00
	05/27/14 10:31:01	12990	16.87	2.70	0.01	2.98	4.48	73.50	358.00
	05/27/14 10:31:31	13020	16.95	3.57	0.02	2.91	4.18	73.90	328.00
	05/27/14 10:32:01	13050	17.16	4.15	0.17	2.78	4.18	73.90	328.00
	05/27/14 10:32:31	13080	17.38	4.26	0.06	2.60	7.78	74.10	464.00
	05/27/14 10:33:01	13110	14.96	3.40	0.04	4.00	7.78	74.10	464.00
	05/27/14 10:33:31	13140	13.72	1.17	0.04	5.07	10.74	74.30	626.00
	05/27/14 10:34:01	13170	13.64	0.16	-0.02	5.17	10.74	74.30	626.00
	05/27/14 10:34:31	13200	14.12	0.13	-0.02	4.81	10.19	74.50	614.00
	05/27/14 10:35:01	13230	13.95	0.06	-0.02	4.96	10.19	74.50	614.00
	05/27/14 10:35:31	13260	13.97	0.27	-0.02	4.90	10.41	74.60	615.00
	05/27/14 10:36:01	13290	13.80	0.36	-0.01	5.05	10.41	74.60	615.00
	05/27/14 10:36:31	13320	13.58	0.24	0.00	5.26	10.27	74.70	617.00
	05/27/14 10:37:01	13350	14.31	0.29	-0.01	4.70	10.27	74.70	617.00
	05/27/14 10:37:31	13380	13.91	0.41	-0.02	5.01	10.49	74.80	614.00
	05/27/14 10:38:01	13410	14.10	0.46	0.00	4.81	10.49	74.80	614.00
	05/27/14 10:38:31	13440	13.93	0.27	0.00	4.99	10.05	75.20	619.00

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	6.1	%
Stack Exhaust Flow (M2)	117,856	SCFH

Weather Data

Barometric Pressure	29.98	in. Hg
Relative Humidity	76	%
Ambient Temperature	70	°F
Specific Humidity	0.011885	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. °F	Fuel Flow SCFH
05/27/14 10:39:01	13470	13.91	0.20	-0.02	4.96	10.05	75.20	619.00
05/27/14 10:39:31	13500	14.03	0.40	-0.02	4.89	10.55	75.50	622.00
05/27/14 10:40:01	13530	14.50	0.29	-0.02	4.61	10.55	75.50	622.00
05/27/14 10:40:31	13560	14.03	0.38	-0.02	4.91	10.13	75.90	613.00
05/27/14 10:41:01	13590	14.10	0.32	0.00	4.87	10.13	75.90	613.00
05/27/14 10:41:31	13620	14.28	0.30	0.00	4.72	10.74	76.30	629.00
05/27/14 10:42:01	13650	14.43	0.61	0.04	4.63	10.74	76.30	629.00
05/27/14 10:42:31	13680	14.40	0.42	0.04	4.63	10.57	76.60	620.00
05/27/14 10:43:01	13710	14.04	0.18	-0.02	4.87	10.57	76.60	620.00
05/27/14 10:43:31	13740	14.27	-0.04	-0.02	4.77	10.13	76.90	611.00
05/27/14 10:44:01	13770	14.29	0.03	-0.02	4.68	10.13	76.90	611.00
05/27/14 10:44:31	13800	14.00	0.14	-0.02	4.98	6.06	77.20	432.00
05/27/14 10:45:01	13830	14.26	0.21	0.00	4.73	6.06	77.20	432.00
05/27/14 10:45:31	13860	15.11	0.13	0.00	4.32	4.73	77.40	364.00
05/27/14 10:46:01	13890	15.96	0.79	0.00	3.59	4.73	77.40	364.00
05/27/14 10:46:31	13920	16.72	1.52	-0.01	3.11	4.46	77.50	326.00
05/27/14 10:47:01	13950	16.79	1.79	-0.02	3.00	4.46	77.50	326.00
RAW AVERAGE		**14.27**	**0.96**	**0.00**	**4.74**	**8.88**	**70.28**	**555.57**

		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(°F)	(SCFH)
Bias	Initial Zero	0.05	-0.07	0.01	0.60			
	Final Zero	0.01	-0.10	0.03	0.08			
	Avg. Zero	0.03	-0.09	0.02	0.34			
	Initial UpScale	12.13	8.93	3.06	8.72			
	Final UpScale	12.15	8.80	3.07	8.77			
	Avg. UpScale	12.14	8.87	3.07	8.75			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	14.35	1.05	0.00	4.59
Corrected Raw Average (ppm/% wet basis)	13.48	0.99	0.00	4.29
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	119,428	SCFH

Weather Data

Barometric Pressure	29.97	in. Hg
Relative Humidity	67	%
Ambient Temperature	75	^{o}F
Specific Humidity	0.012419	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R2

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/27/14 11:38:01	17010	15.93	1.59	0.00	3.61	5.20	86.40	387.00
	05/27/14 11:38:31	17040	16.24	2.21	0.00	3.37	5.20	86.40	387.00
	05/27/14 11:39:01	17070	16.59	2.38	-0.02	3.15	5.29	86.40	382.00
	05/27/14 11:39:31	17100	16.75	2.67	-0.01	3.02	5.29	86.40	382.00
	05/27/14 11:40:01	17130	16.71	2.42	-0.02	2.97	5.12	86.40	376.00
	05/27/14 11:40:31	17160	16.24	2.61	-0.03	3.33	5.12	86.40	376.00
	05/27/14 11:41:01	17190	16.10	2.38	-0.02	3.46	9.27	86.40	568.00
	05/27/14 11:41:31	17220	15.16	1.22	-0.02	3.91	9.27	86.40	568.00
	05/27/14 11:42:01	17250	13.63	0.60	-0.02	5.11	10.02	86.60	614.00
	05/27/14 11:42:31	17280	13.56	0.29	-0.03	5.18	10.02	86.60	614.00
	05/27/14 11:43:01	17310	13.59	0.09	-0.02	5.18	9.99	86.60	611.00
	05/27/14 11:43:31	17340	13.68	0.10	-0.02	5.13	9.99	86.60	611.00
	05/27/14 11:44:01	17370	13.48	0.20	0.01	5.25	10.21	86.70	608.00
	05/27/14 11:44:31	17400	13.99	0.16	0.02	4.97	10.21	86.70	608.00
	05/27/14 11:45:01	17430	14.09	0.13	-0.01	4.87	10.19	86.60	611.00
	05/27/14 11:45:31	17460	13.78	0.11	-0.01	5.01	10.19	86.60	611.00
	05/27/14 11:46:01	17490	13.88	0.09	-0.01	4.95	10.32	86.50	609.00
	05/27/14 11:46:31	17520	13.97	0.17	0.00	4.98	10.32	86.50	609.00
	05/27/14 11:47:01	17550	13.80	0.19	0.03	4.96	10.16	86.60	611.00
	05/27/14 11:47:31	17580	13.66	0.14	0.03	5.15	10.16	86.60	611.00
	05/27/14 11:48:01	17610	13.72	0.24	-0.04	5.06	9.99	86.90	613.00
	05/27/14 11:48:31	17640	13.55	0.40	-0.04	5.18	9.99	86.90	613.00
	05/27/14 11:49:01	17670	13.20	0.22	-0.01	5.43	9.85	87.40	610.00
	05/27/14 11:49:31	17700	13.25	-0.03	0.00	5.41	9.85	87.40	610.00
	05/27/14 11:50:01	17730	13.24	-0.06	-0.03	5.39	9.94	87.90	607.00
	05/27/14 11:50:31	17760	13.43	-0.05	-0.02	5.37	9.94	87.90	607.00
	05/27/14 11:51:01	17790	13.66	0.06	-0.02	5.11	10.16	88.50	609.00
	05/27/14 11:51:31	17820	13.67	0.14	-0.02	5.11	10.16	88.50	609.00
	05/27/14 11:52:01	17850	13.51	0.26	-0.03	5.22	10.24	89.00	611.00
	05/27/14 11:52:31	17880	13.65	0.26	-0.02	5.16	10.24	89.00	611.00
	05/27/14 11:53:01	17910	13.39	0.07	-0.01	5.28	9.02	89.20	567.00
	05/27/14 11:53:31	17940	13.48	-0.01	-0.01	5.26	9.02	89.20	567.00
	05/27/14 11:54:01	17970	13.64	0.09	0.00	5.22	5.18	89.50	377.00
	05/27/14 11:54:31	18000	15.50	0.57	-0.01	4.03	5.18	89.50	377.00
	05/27/14 11:55:01	18030	16.14	1.19	0.02	3.42	5.01	89.90	374.00
	05/27/14 11:55:31	18060	16.00	1.23	0.02	3.53	5.01	89.90	374.00
	05/27/14 11:56:01	18090	16.44	1.16	-0.02	3.27	5.09	90.10	369.00
	05/27/14 11:56:31	18120	16.62	1.44	-0.02	3.05	5.09	90.10	369.00
	05/27/14 11:57:01	18150	16.29	2.03	0.00	3.31	5.04	90.10	366.00
	05/27/14 11:57:31	18180	16.52	2.51	0.00	3.15	5.04	90.10	366.00
	05/27/14 11:58:01	18210	16.64	2.46	0.00	3.07	6.34	90.10	430.00
	05/27/14 11:58:31	18240	16.78	2.99	0.03	3.01	6.34	90.10	430.00
	05/27/14 11:59:01	18270	16.16	2.29	-0.01	3.26	10.08	90.00	605.00
	05/27/14 11:59:31	18300	14.24	0.74	0.00	4.63	10.08	90.00	605.00
	05/27/14 12:00:01	18330	13.64	-0.08	-0.02	5.10	10.46	89.70	624.00
	05/27/14 12:00:31	18360	13.38	-0.21	-0.02	5.28	10.46	89.70	624.00
	05/27/14 12:01:01	18390	13.17	-0.21	0.01	5.48	10.82	89.50	625.00
A2	05/27/14 12:01:31	18420	13.20	-0.24	0.01	5.47	10.82	89.50	625.00
	05/27/14 12:02:01	18450	13.13	-0.24	-0.01	5.45	10.57	89.20	627.00
	05/27/14 12:02:31	18480	13.13	-0.18	-0.01	5.52	10.57	89.20	627.00
	05/27/14 12:03:01	18510	13.65	-0.14	0.00	5.11	10.30	89.00	627.00
	05/27/14 12:03:31	18540	13.24	-0.14	0.00	5.40	10.30	89.00	627.00
	05/27/14 12:04:01	18570	13.07	-0.11	0.02	5.55	10.55	88.80	628.00
	05/27/14 12:04:31	18600	13.17	0.02	0.03	5.47	10.55	88.80	628.00
	05/27/14 12:05:01	18630	13.10	-0.07	-0.02	5.50	10.44	88.50	623.00
	05/27/14 12:05:31	18660	13.19	-0.22	-0.01	5.44	10.44	88.50	623.00
	05/27/14 12:06:01	18690	13.02	-0.18	-0.02	5.58	10.44	88.30	623.00
	05/27/14 12:06:31	18720	13.29	-0.22	-0.02	5.39	10.44	88.30	623.00
	05/27/14 12:07:01	18750	13.42	-0.23	-0.03	5.31	10.30	88.10	623.00
	05/27/14 12:07:31	18780	13.22	-0.12	-0.04	5.42	10.30	88.10	623.00

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	119,428	SCFH

Weather Data

Barometric Pressure	29.97	in. Hg
Relative Humidity	67	%
Ambient Temperature	75	^{o}F
Specific Humidity	0.012419	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R2

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/27/14 12:08:01	18810	13.16	-0.04	-0.02	5.47	10.44	87.90	623.00
	05/27/14 12:08:31	18840	13.68	-0.13	-0.02	5.18	10.44	87.90	623.00
	05/27/14 12:09:01	18870	13.31	-0.12	0.00	5.33	10.32	87.70	623.00
	05/27/14 12:09:31	18900	13.16	-0.22	0.00	5.47	10.32	87.70	623.00
	05/27/14 12:10:01	18930	13.42	-0.29	0.00	5.37	10.19	87.60	623.00
	05/27/14 12:10:31	18960	13.95	-0.10	0.00	4.93	10.19	87.60	623.00
	05/27/14 12:11:01	18990	13.54	-0.06	-0.03	5.12	8.25	87.50	544.00
	05/27/14 12:11:31	19020	13.43	-0.21	-0.02	5.34	8.25	87.50	544.00
	05/27/14 12:12:01	19050	14.42	0.06	-0.01	4.73	5.37	87.50	412.00
	05/27/14 12:12:31	19080	15.66	1.07	0.00	3.88	5.37	87.50	412.00
	05/27/14 12:13:01	19110	16.21	1.55	-0.01	3.36	4.98	87.80	391.00
	05/27/14 12:13:31	19140	16.15	1.41	-0.01	3.43	4.98	87.80	391.00
	05/27/14 12:14:01	19170	16.49	1.22	-0.02	3.17	5.26	88.10	399.00
	05/27/14 12:14:31	19200	16.49	1.59	-0.01	3.20	5.26	88.10	399.00
	05/27/14 12:15:01	19230	16.36	1.24	0.00	3.15	10.08	88.30	612.00
	05/27/14 12:15:31	19260	14.29	0.93	0.00	4.54	10.08	88.30	612.00
	05/27/14 12:16:01	19290	13.87	0.19	0.00	4.94	10.46	88.30	623.00
	05/27/14 12:16:31	19320	13.50	-0.04	0.00	5.24	10.46	88.30	623.00
	05/27/14 12:17:01	19350	14.04	-0.23	-0.03	4.90	10.46	88.10	623.00
	05/27/14 12:17:31	19380	13.66	-0.09	-0.03	5.10	10.46	88.10	623.00
	05/27/14 12:18:01	19410	13.59	-0.07	0.02	5.16	10.35	88.00	623.00
	05/27/14 12:18:31	19440	13.58	0.03	0.01	5.17	10.35	88.00	623.00
	05/27/14 12:19:01	19470	13.78	0.06	-0.02	5.08	10.60	88.00	623.00
	05/27/14 12:19:31	19500	13.58	0.18	-0.02	5.15	10.60	88.00	623.00
	05/27/14 12:20:01	19530	13.71	-0.05	0.00	5.15	10.35	87.90	620.00
	05/27/14 12:20:31	19560	13.71	-0.29	0.00	5.07	10.35	87.90	620.00
	05/27/14 12:21:01	19590	13.92	-0.36	-0.02	5.01	10.35	88.00	620.00
	05/27/14 12:21:31	19620	13.88	-0.34	-0.03	4.91	10.35	88.00	620.00
	05/27/14 12:22:01	19650	13.58	-0.26	0.02	5.15	10.35	88.20	620.00
	05/27/14 12:22:31	19680	13.75	-0.23	0.02	5.07	10.35	88.20	620.00
	05/27/14 12:23:01	19710	13.45	-0.32	-0.03	5.28	10.21	88.30	622.00
	05/27/14 12:23:31	19740	13.43	-0.35	-0.02	5.21	10.21	88.30	622.00
	05/27/14 12:24:01	19770	13.24	-0.30	0.03	5.45	10.21	88.30	622.00
	05/27/14 12:24:31	19800	13.55	-0.33	0.03	5.26	10.21	88.30	622.00
A3	05/27/14 12:25:01	19830	13.36	-0.28	0.01	5.30	10.60	88.30	623.00
	05/27/14 12:25:31	19860	13.25	-0.29	0.01	5.43	10.60	88.30	623.00
	05/27/14 12:26:01	19890	13.24	-0.28	0.00	5.40	10.32	88.30	620.00
	05/27/14 12:26:31	19920	13.16	-0.29	0.00	5.46	10.32	88.30	620.00
	05/27/14 12:27:01	19950	13.29	-0.29	-0.01	5.39	10.46	88.20	618.00
	05/27/14 12:27:31	19980	13.30	-0.23	0.00	5.36	10.46	88.20	618.00
	05/27/14 12:28:01	20010	13.32	-0.21	-0.03	5.37	8.08	88.10	533.00
	05/27/14 12:28:31	20040	13.25	-0.29	-0.03	5.41	8.08	88.10	533.00
	05/27/14 12:29:01	20070	14.55	-0.12	0.00	4.71	5.87	88.10	431.00
	05/27/14 12:29:31	20100	15.34	0.67	0.00	4.00	5.87	88.10	431.00
	05/27/14 12:30:01	20130	15.66	0.68	-0.03	3.80	4.95	88.10	380.00
	05/27/14 12:30:31	20160	15.93	0.83	-0.02	3.57	4.95	88.10	380.00
	05/27/14 12:31:01	20190	16.38	0.88	0.02	3.43	5.20	88.00	401.00
	05/27/14 12:31:31	20220	17.62	0.73	0.03	2.33	5.20	88.00	401.00
	05/27/14 12:32:01	20250	16.94	0.55	-0.01	2.85	7.20	88.00	459.00
	05/27/14 12:32:31	20280	17.36	0.85	0.01	2.67	7.20	88.00	459.00
	05/27/14 12:33:01	20310	16.86	0.97	0.00	2.81	10.46	87.90	623.00
	05/27/14 12:33:31	20340	15.79	0.41	0.01	3.73	10.46	87.90	623.00
	05/27/14 12:34:01	20370	16.14	-0.28	0.00	3.42	10.71	87.80	634.00
	05/27/14 12:34:31	20400	15.04	-0.43	0.00	4.09	10.71	87.80	634.00
	05/27/14 12:35:01	20430	15.23	-0.40	-0.01	4.05	10.60	87.80	634.00
	05/27/14 12:35:31	20460	15.02	-0.31	0.00	4.24	10.60	87.80	634.00
	05/27/14 12:36:01	20490	15.65	-0.23	0.01	3.70	10.74	87.80	629.00
	05/27/14 12:36:31	20520	14.29	-0.43	0.00	4.73	10.74	87.80	629.00
	05/27/14 12:37:01	20550	15.16	-0.46	0.01	4.11	10.60	87.80	634.00
	05/27/14 12:37:31	20580	14.58	-0.43	0.00	4.55	10.60	87.80	634.00

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.3	%
Stack Exhaust Flow (M2)	119,428	SCFH

Weather Data

Barometric Pressure	29.97	in. Hg
Relative Humidity	67	%
Ambient Temperature	75	^{o}F
Specific Humidity	0.012419	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/27/14 12:38:01	20610	14.78	-0.44	-0.03	4.34	10.60	87.80	634.00
05/27/14 12:38:31	20640	15.69	-0.46	-0.04	3.83	10.60	87.80	634.00
05/27/14 12:39:01	20670	15.34	-0.43	0.00	3.95	10.74	87.80	632.00
05/27/14 12:39:31	20700	15.69	-0.45	0.00	3.78	10.74	87.80	632.00
05/27/14 12:40:01	20730	15.45	-0.39	0.03	3.87	10.60	87.80	632.00
05/27/14 12:40:31	20760	15.36	-0.39	0.02	3.99	10.60	87.80	632.00
05/27/14 12:41:01	20790	15.72	-0.38	-0.02	3.69	10.49	87.90	629.00
05/27/14 12:41:31	20820	15.75	-0.39	-0.02	3.78	10.49	87.90	629.00
05/27/14 12:42:01	20850	15.38	-0.42	0.00	3.87	10.60	88.00	631.00
05/27/14 12:42:31	20880	14.87	-0.42	0.00	4.21	10.60	88.00	631.00
05/27/14 12:43:01	20910	14.81	-0.43	-0.03	4.43	10.60	88.30	631.00
05/27/14 12:43:31	20940	15.25	-0.42	-0.02	4.04	10.60	88.30	631.00
05/27/14 12:44:01	20970	14.60	-0.40	-0.01	4.43	8.50	88.60	549.00
05/27/14 12:44:31	21000	14.93	-0.41	-0.01	4.28	8.50	88.60	549.00
05/27/14 12:45:01	21030	14.82	-0.45	-0.05	4.40	5.45	89.10	401.00
05/27/14 12:45:31	21060	16.33	-0.41	-0.02	3.37	5.45	89.10	401.00
05/27/14 12:46:01	21090	16.08	-0.29	-0.01	3.48	4.65	89.60	368.00
05/27/14 12:46:31	21120	17.30	0.25	-0.01	2.67	4.65	89.60	368.00
05/27/14 12:47:01	21150	17.17	0.91	0.02	2.71	4.87	90.00	394.00
05/27/14 12:47:31	21180	17.23	1.28	0.02	2.71	4.87	90.00	394.00
05/27/14 12:48:01	21210	17.24	1.04	0.01	2.65	5.79	90.50	405.00
RAW AVERAGE		**14.60**	**0.29**	**-0.01**	**4.48**	**8.93**	**88.15**	**556.89**

		O_2	CO	THC	CO_2	Press. Trans (in. H_2O)	Temp. Trans. (^{o}F)	F-Flow Trans. (SCFH)
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
Bias	**Initial Zero**	0.01	-0.10	0.03	0.08			
	Final Zero	0.01	-0.07	-0.03	0.05			
	Avg. Zero	0.01	-0.09	0.00	0.07			
	Initial UpScale	12.15	8.80	3.07	8.77			
	Final UpScale	12.10	8.81	3.08	8.73			
	Avg. UpScale	12.13	8.81	3.08	8.75			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	14.69	0.38	0.00	4.46
Corrected Raw Average (ppm/% wet basis)	13.91	0.36	0.00	4.22
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	4.9	%
Stack Exhaust Flow (M2)	124,187	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	69	%
Ambient Temperature	74	^{o}F
Specific Humidity	0.012380	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R3

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/27/14 13:05:01	22230	16.15	0.80	-0.02	3.45	4.87	89.20	384.00
	05/27/14 13:05:31	22260	16.20	0.96	-0.02	3.32	4.87	89.20	384.00
	05/27/14 13:06:01	22290	15.99	1.69	0.01	3.53	4.62	89.00	382.00
	05/27/14 13:06:31	22320	16.05	2.06	0.01	3.48	4.62	89.00	382.00
	05/27/14 13:07:01	22350	16.18	1.66	0.00	3.40	4.76	88.70	385.00
	05/27/14 13:07:31	22380	16.09	0.87	0.00	3.42	4.76	88.70	385.00
	05/27/14 13:08:01	22410	15.97	0.87	0.00	3.46	10.02	88.40	612.00
	05/27/14 13:08:31	22440	13.86	0.58	0.00	4.82	10.02	88.40	612.00
	05/27/14 13:09:01	22470	13.27	-0.05	-0.01	5.35	10.32	88.10	631.00
	05/27/14 13:09:31	22500	13.12	-0.24	0.00	5.48	10.32	88.10	631.00
	05/27/14 13:10:01	22530	13.33	-0.36	0.01	5.39	10.35	87.80	634.00
	05/27/14 13:10:31	22560	13.99	-0.14	0.00	4.91	10.35	87.80	634.00
	05/27/14 13:11:01	22590	13.85	0.04	-0.02	4.97	10.49	87.60	634.00
	05/27/14 13:11:31	22620	13.75	-0.11	-0.02	5.04	10.49	87.60	634.00
	05/27/14 13:12:01	22650	13.81	-0.12	0.01	5.02	10.13	87.30	634.00
	05/27/14 13:12:31	22680	13.83	-0.10	0.01	4.97	10.13	87.30	634.00
	05/27/14 13:13:01	22710	13.85	-0.13	0.00	5.00	10.44	87.10	637.00
	05/27/14 13:13:31	22740	13.93	-0.04	0.00	4.92	10.44	87.10	637.00
	05/27/14 13:14:01	22770	13.88	-0.07	-0.01	4.95	10.32	86.90	635.00
	05/27/14 13:14:31	22800	13.92	-0.11	-0.01	4.93	10.32	86.90	635.00
	05/27/14 13:15:01	22830	13.98	0.04	-0.03	4.89	10.35	86.70	638.00
	05/27/14 13:15:31	22860	13.92	0.04	-0.02	4.90	10.35	86.70	638.00
	05/27/14 13:16:01	22890	13.79	-0.09	0.01	5.01	10.24	86.60	635.00
	05/27/14 13:16:31	22920	13.85	-0.07	0.00	4.98	10.24	86.60	635.00
	05/27/14 13:17:01	22950	14.11	-0.13	0.01	4.80	10.27	86.40	635.00
	05/27/14 13:17:31	22980	13.91	-0.06	0.01	4.95	10.27	86.40	635.00
	05/27/14 13:18:01	23010	14.05	0.10	0.01	4.85	10.44	86.20	636.00
	05/27/14 13:18:31	23040	13.99	-0.02	0.01	4.87	10.44	86.20	636.00
	05/27/14 13:19:01	23070	13.82	-0.13	0.00	5.00	10.32	86.00	633.00
	05/27/14 13:19:31	23100	13.85	-0.14	0.00	4.96	10.32	86.00	633.00
	05/27/14 13:20:01	23130	13.96	-0.14	0.03	4.92	8.39	85.70	552.00
	05/27/14 13:20:31	23160	13.96	-0.12	0.04	4.89	8.39	85.70	552.00
	05/27/14 13:21:01	23190	15.04	-0.01	0.03	4.35	5.54	85.60	432.00
	05/27/14 13:21:31	23220	15.92	0.40	0.04	3.60	5.54	85.60	432.00
	05/27/14 13:22:01	23250	16.06	0.57	0.02	3.47	5.31	85.40	411.00
	05/27/14 13:22:31	23280	16.14	0.65	0.02	3.43	5.31	85.40	411.00
	05/27/14 13:23:01	23310	16.26	0.74	0.00	3.31	5.09	85.30	411.00
	05/27/14 13:23:31	23340	16.32	0.73	0.01	3.26	5.09	85.30	411.00
	05/27/14 13:24:01	23370	16.19	0.70	0.00	3.36	7.34	85.10	488.00
	05/27/14 13:24:31	23400	16.24	0.69	-0.01	3.32	7.34	85.10	488.00
	05/27/14 13:25:01	23430	15.75	0.69	0.00	3.54	10.10	84.80	624.00
	05/27/14 13:25:31	23460	14.14	0.41	0.01	4.71	10.10	84.80	624.00
	05/27/14 13:26:01	23490	13.92	0.10	-0.02	4.93	10.27	84.40	632.00
	05/27/14 13:26:31	23520	14.01	0.18	-0.03	4.91	10.27	84.40	632.00
	05/27/14 13:27:01	23550	14.17	0.00	0.02	4.72	10.19	84.00	633.00
	05/27/14 13:27:31	23580	14.09	-0.08	0.02	4.81	10.19	84.00	633.00
	05/27/14 13:28:01	23610	13.96	-0.15	0.00	4.89	10.35	83.40	636.00
	05/27/14 13:28:31	23640	13.84	-0.18	0.00	4.98	10.35	83.40	636.00
	05/27/14 13:29:01	23670	14.07	-0.15	0.00	4.85	10.13	83.00	636.00
	05/27/14 13:29:31	23700	14.19	-0.17	0.00	4.74	10.13	83.00	636.00
	05/27/14 13:30:01	23730	13.91	-0.14	0.03	4.94	10.19	82.50	645.00
	05/27/14 13:30:31	23760	13.86	-0.11	0.02	4.94	10.19	82.50	645.00
	05/27/14 13:31:01	23790	13.76	-0.16	0.00	5.06	10.38	82.10	646.00
	05/27/14 13:31:31	23820	14.12	-0.22	0.00	4.81	10.38	82.10	646.00
	05/27/14 13:32:01	23850	13.99	-0.19	0.03	4.90	10.30	81.70	646.00
	05/27/14 13:32:31	23880	13.92	-0.17	0.03	4.96	10.30	81.70	646.00
	05/27/14 13:33:01	23910	13.91	-0.18	-0.03	4.91	10.21	81.40	646.00
	05/27/14 13:33:31	23940	13.93	-0.06	-0.02	4.93	10.21	81.40	646.00
	05/27/14 13:34:01	23970	13.86	-0.13	0.00	4.95	10.38	81.20	647.00
	05/27/14 13:34:31	24000	13.86	-0.15	-0.01	5.02	10.38	81.20	647.00

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	4.9	%
Stack Exhaust Flow (M2)	124,187	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	69	%
Ambient Temperature	74	^{o}F
Specific Humidity	0.012380	lb H_2O / lb air

0-30-0 Load, Run - PI 48-R3

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/27/14 13:35:01	24030	13.85	-0.23	0.01	4.94	10.30	80.80	647.00
A2	05/27/14 13:35:31	24060	13.89	-0.23	0.01	4.95	10.30	80.80	647.00
	05/27/14 13:36:01	24090	13.76	-0.25	-0.01	5.05	10.46	80.70	645.00
	05/27/14 13:36:31	24120	13.80	-0.19	-0.01	5.03	10.46	80.70	645.00
	05/27/14 13:37:01	24150	14.24	-0.07	-0.01	4.73	10.38	80.50	642.00
	05/27/14 13:37:31	24180	13.75	-0.17	0.00	5.02	10.38	80.50	642.00
	05/27/14 13:38:01	24210	13.88	-0.27	-0.01	4.98	10.27	80.40	642.00
	05/27/14 13:38:31	24240	13.88	-0.24	-0.01	4.95	10.27	80.40	642.00
	05/27/14 13:39:01	24270	13.91	-0.26	-0.01	4.98	5.76	80.40	445.00
	05/27/14 13:39:31	24300	15.32	-0.07	-0.01	4.12	5.76	80.40	445.00
	05/27/14 13:40:01	24330	15.94	0.40	0.01	3.59	5.65	80.40	418.00
	05/27/14 13:40:31	24360	16.11	0.56	0.01	3.46	5.65	80.40	418.00
	05/27/14 13:41:01	24390	16.47	0.61	0.00	3.19	5.04	80.30	415.00
	05/27/14 13:41:31	24420	16.59	0.67	0.10	3.08	5.04	80.30	415.00
	05/27/14 13:42:01	24450	16.33	1.04	-0.04	3.24	5.07	80.40	407.00
	05/27/14 13:42:31	24480	16.48	0.68	-0.03	3.16	5.07	80.40	407.00
	05/27/14 13:43:01	24510	16.52	0.61	0.00	3.15	10.41	80.30	637.00
	05/27/14 13:43:31	24540	14.38	0.36	0.00	4.40	10.41	80.30	637.00
	05/27/14 13:44:01	24570	13.98	-0.14	-0.01	4.88	10.71	80.20	646.00
	05/27/14 13:44:31	24600	13.91	-0.22	-0.01	4.94	10.71	80.20	646.00
	05/27/14 13:45:01	24630	13.89	-0.18	-0.02	4.94	10.60	80.10	643.00
	05/27/14 13:45:31	24660	13.75	-0.23	-0.02	5.06	10.60	80.10	643.00
	05/27/14 13:46:01	24690	13.94	-0.24	0.00	4.93	10.49	80.10	643.00
	05/27/14 13:46:31	24720	14.04	-0.24	0.00	4.85	10.49	80.10	643.00
	05/27/14 13:47:01	24750	13.85	-0.24	0.00	4.97	10.77	80.00	644.00
	05/27/14 13:47:31	24780	13.85	-0.24	-0.01	5.00	10.77	80.00	644.00
	05/27/14 13:48:01	24810	14.04	-0.27	-0.01	4.84	10.38	80.00	643.00
	05/27/14 13:48:31	24840	14.07	-0.25	0.00	4.85	10.38	80.00	643.00
	05/27/14 13:49:01	24870	13.96	-0.24	-0.02	4.91	10.66	79.90	644.00
	05/27/14 13:49:31	24900	14.18	-0.24	-0.02	4.78	10.66	79.90	644.00
	05/27/14 13:50:01	24930	14.04	-0.26	-0.01	4.84	10.66	79.90	644.00
	05/27/14 13:50:31	24960	14.50	-0.23	0.00	4.58	10.66	79.90	644.00
	05/27/14 13:51:01	24990	14.57	-0.28	0.00	4.47	10.41	79.90	643.00
	05/27/14 13:51:31	25020	14.66	-0.29	0.00	4.57	10.41	79.90	643.00
	05/27/14 13:52:01	25050	14.32	-0.24	-0.01	4.58	10.68	80.00	641.00
	05/27/14 13:52:31	25080	14.37	-0.25	-0.04	4.66	10.68	80.00	641.00
	05/27/14 13:53:01	25110	14.60	-0.26	0.09	4.63	10.82	80.10	641.00
	05/27/14 13:53:31	25140	14.53	-0.32	0.12	4.47	10.82	80.10	641.00
	05/27/14 13:54:01	25170	14.10	0.00	0.00	4.77	10.68	80.10	641.00
	05/27/14 13:54:31	25200	14.60	0.03	0.01	4.55	10.68	80.10	641.00
	05/27/14 13:55:01	25230	14.87	0.03	0.00	4.29	10.68	80.10	641.00
A3	05/27/14 13:55:31	25260	14.03	0.07	0.00	4.87	10.68	80.10	641.00
	05/27/14 13:56:01	25290	14.21	0.61	0.02	4.73	6.14	80.10	459.00
	05/27/14 13:56:31	25320	15.03	1.12	0.02	4.34	6.14	80.10	459.00
	05/27/14 13:57:01	25350	16.50	2.59	0.04	3.27	5.23	80.10	394.00
	05/27/14 13:57:31	25380	16.74	2.77	0.06	3.00	5.23	80.10	394.00
	05/27/14 13:58:01	25410	16.79	2.40	0.00	2.99	5.37	80.00	421.00
	05/27/14 13:58:31	25440	17.03	1.62	0.00	2.82	5.37	80.00	421.00
	05/27/14 13:59:01	25470	16.97	1.35	0.00	2.87	5.51	79.70	421.00
	05/27/14 13:59:31	25500	17.12	1.31	0.01	2.73	5.51	79.70	421.00
	05/27/14 14:00:01	25530	16.86	1.48	0.01	2.96	9.69	79.30	611.00
	05/27/14 14:00:31	25560	15.79	1.20	0.01	3.47	9.69	79.30	611.00
	05/27/14 14:01:01	25590	14.19	0.48	0.00	4.72	9.85	78.80	617.00
	05/27/14 14:01:31	25620	14.74	0.20	0.00	4.45	9.85	78.80	617.00
	05/27/14 14:02:01	25650	15.18	0.11	-0.01	4.17	10.13	78.20	615.00
	05/27/14 14:02:31	25680	15.16	0.04	-0.01	4.13	10.13	78.20	615.00
	05/27/14 14:03:01	25710	15.18	0.06	0.03	4.08	9.80	77.70	618.00
	05/27/14 14:03:31	25740	15.10	0.01	0.03	4.24	9.80	77.70	618.00
	05/27/14 14:04:01	25770	15.19	0.09	0.00	4.03	9.72	77.20	618.00
	05/27/14 14:04:31	25800	15.29	0.08	0.00	4.01	9.72	77.20	618.00

Big Iron Oilfield Services, Inc.
May 27, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	4.9	%
Stack Exhaust Flow (M2)	124,187	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	69	%
Ambient Temperature	74	^{o}F
Specific Humidity	0.012380	lb H_2O / lb air

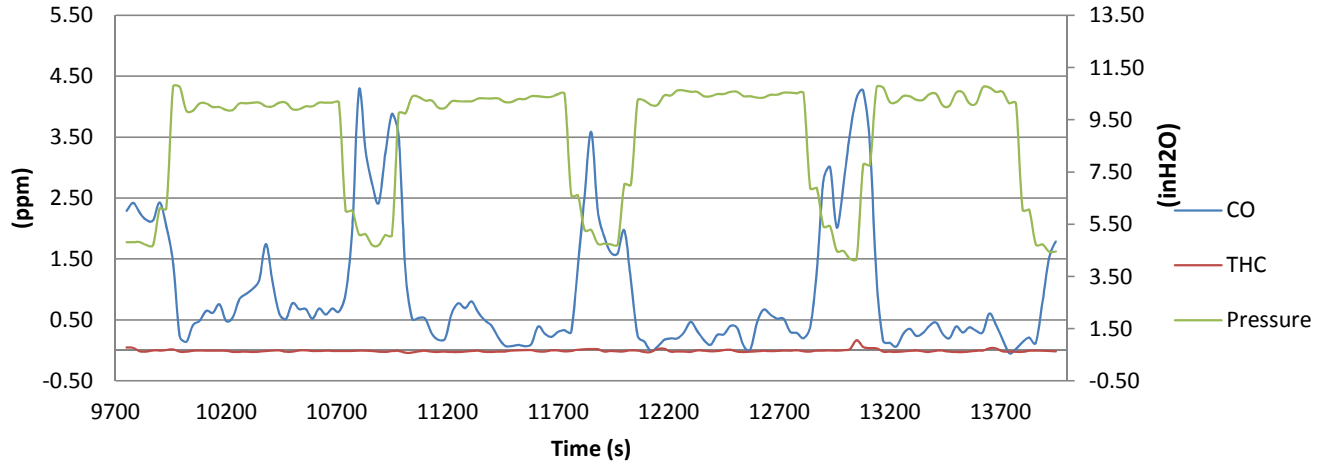
0-30-0 Load, Run - PI 48-R3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/27/14 14:05:01	25830	14.96	0.13	0.00	4.33	9.63	76.80	616.00
05/27/14 14:05:31	25860	14.54	0.20	0.00	4.45	9.63	76.80	616.00
05/27/14 14:06:01	25890	15.04	0.19	-0.03	4.34	10.08	76.50	620.00
05/27/14 14:06:31	25920	15.14	0.20	-0.03	4.07	10.08	76.50	620.00
05/27/14 14:07:01	25950	14.57	0.20	0.00	4.49	9.60	76.10	617.00
05/27/14 14:07:31	25980	14.65	0.33	0.01	4.49	9.60	76.10	617.00
05/27/14 14:08:01	26010	15.30	0.19	-0.01	4.01	9.83	75.50	618.00
05/27/14 14:08:31	26040	14.96	0.30	-0.01	4.30	9.83	75.50	618.00
05/27/14 14:09:01	26070	14.92	0.25	0.02	4.30	9.85	75.20	618.00
05/27/14 14:09:31	26100	15.04	0.14	0.02	4.17	9.85	75.20	618.00
05/27/14 14:10:01	26130	14.98	0.24	-0.01	4.29	9.63	74.90	621.00
05/27/14 14:10:31	26160	15.16	0.26	-0.01	4.05	9.63	74.90	621.00
05/27/14 14:11:01	26190	14.95	0.16	-0.03	4.32	5.54	74.50	439.00
05/27/14 14:11:31	26220	14.99	0.21	-0.03	4.19	5.54	74.50	439.00
05/27/14 14:12:01	26250	14.57	0.28	0.02	4.55	4.93	74.30	411.00
05/27/14 14:12:31	26280	15.93	0.38	0.02	3.68	4.93	74.30	411.00
05/27/14 14:13:01	26310	16.54	0.95	0.00	3.27	5.23	74.10	415.00
05/27/14 14:13:31	26340	17.04	1.16	0.00	2.76	5.23	74.10	415.00
05/27/14 14:14:01	26370	16.90	1.15	0.03	2.98	5.04	73.80	415.00
05/27/14 14:14:31	26400	17.06	1.21	0.03	2.75	5.04	73.80	415.00
05/27/14 14:15:01	26430	17.17	1.07	-0.01	2.74	4.65	89.60	368.00
RAW AVERAGE		**14.79**	**0.25**	**0.00**	**4.35**	**8.88**	**81.70**	**572.91**

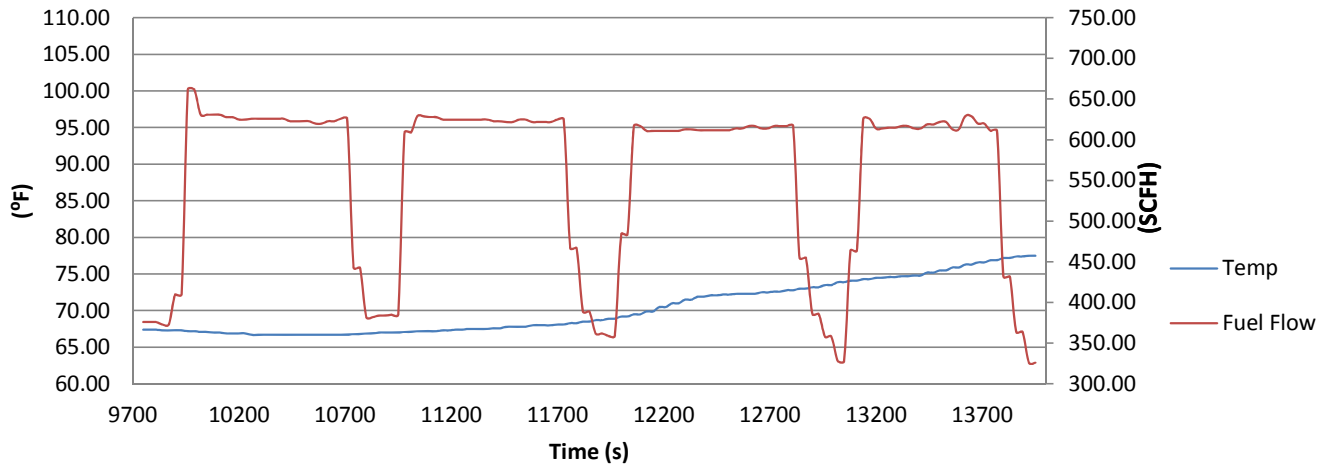
		CO_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.01	-0.07	-0.03	0.05			
	Final Zero	-0.04	-0.14	0.02	0.05			
	Avg. Zero	-0.02	-0.11	-0.01	0.05			
	Initial UpScale	12.10	8.81	3.08	8.73			
	Final UpScale	12.10	9.11	3.07	8.74			
	Avg. UpScale	12.10	8.96	3.08	8.74			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	14.91	0.36	0.01	4.34
Corrected Raw Average (ppm/% wet basis)	14.18	0.35	0.01	4.13
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

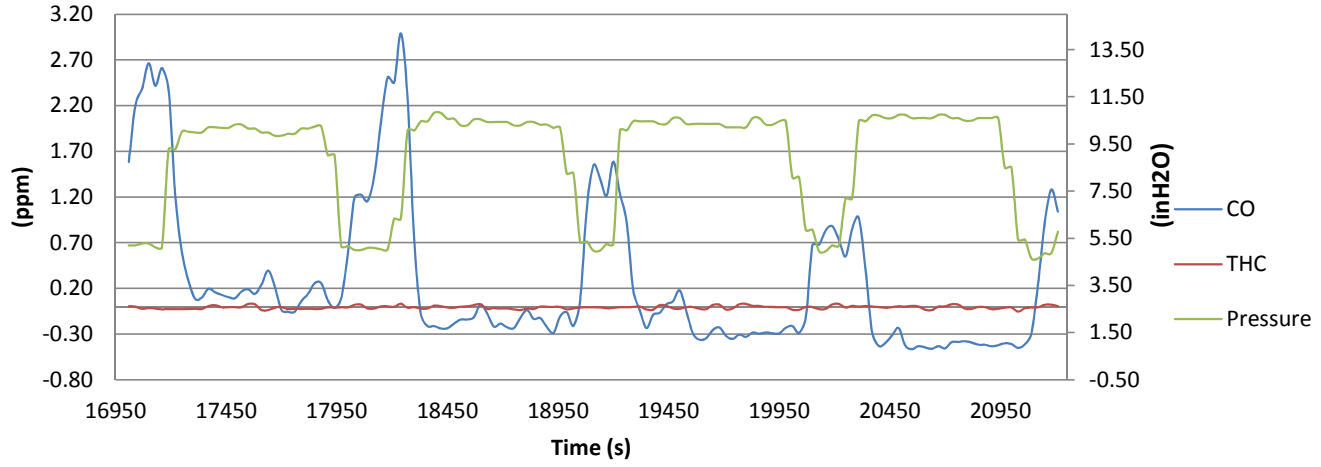
PI 48-R1



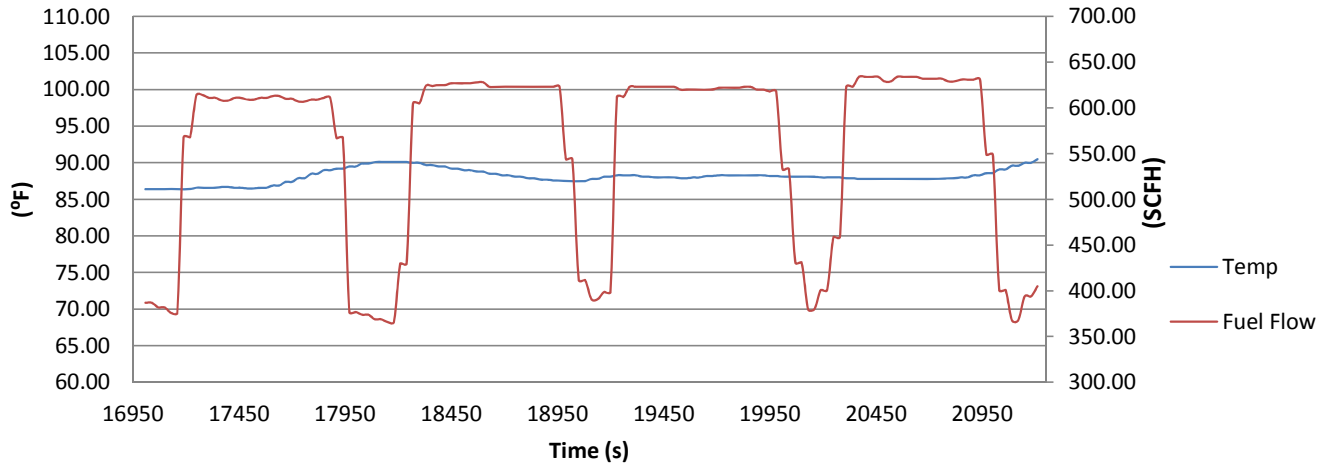
PI 48-R1



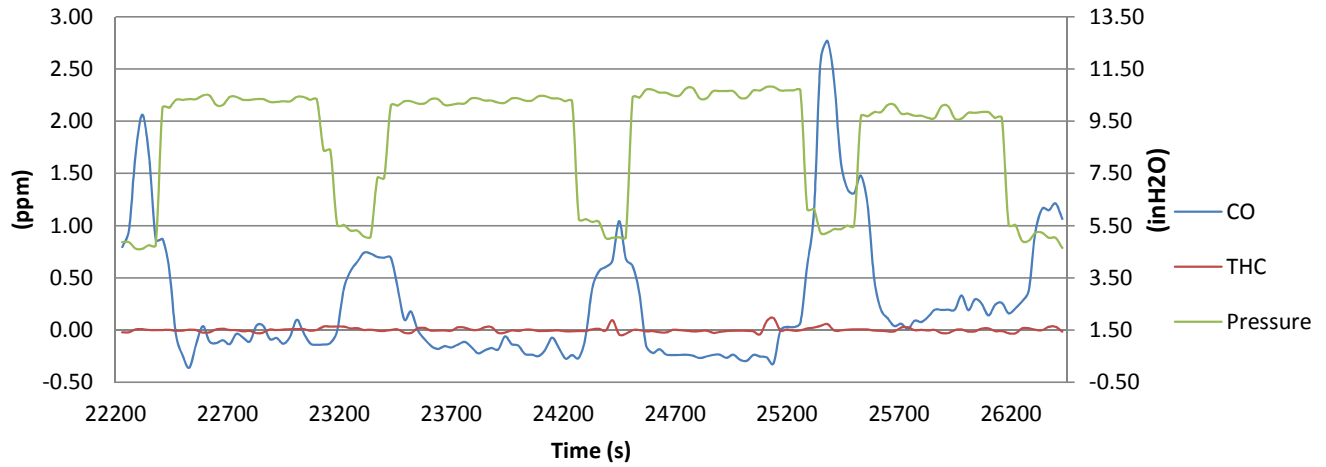
PI 48-R2



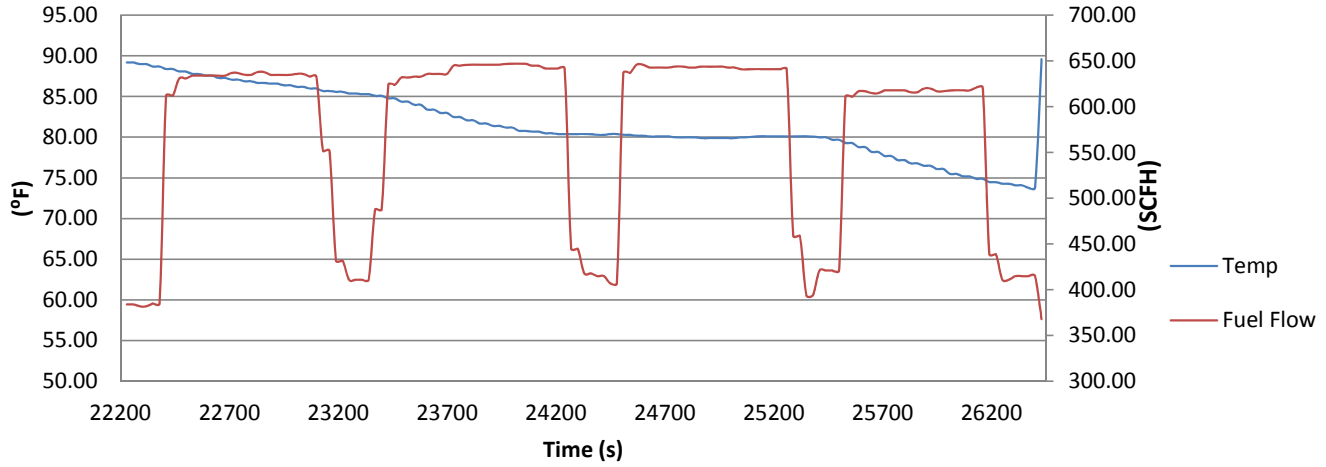
PI 48-R2

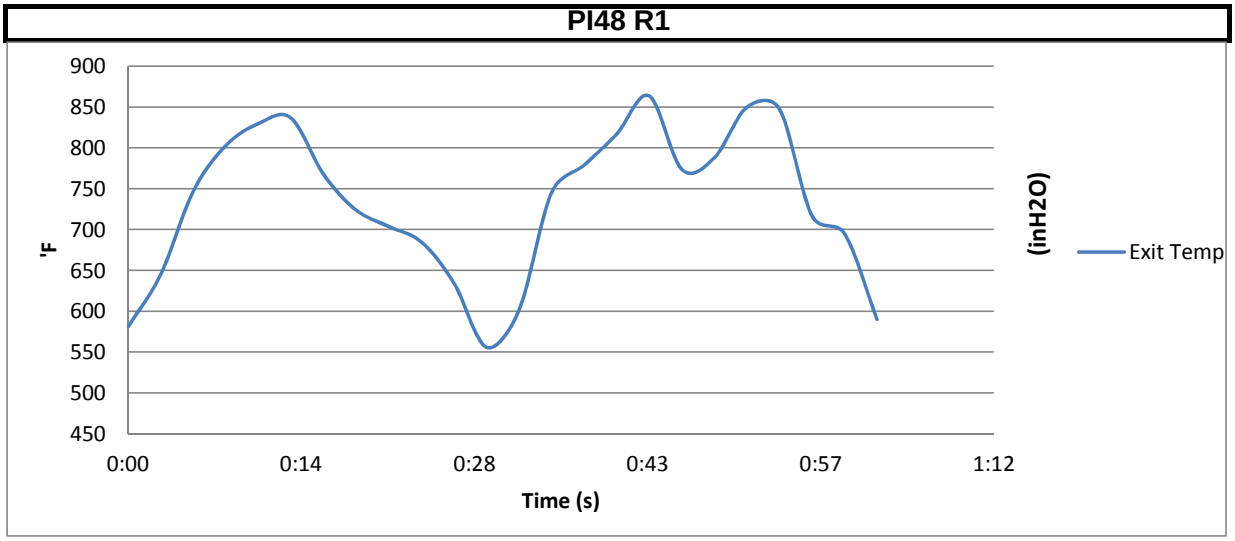


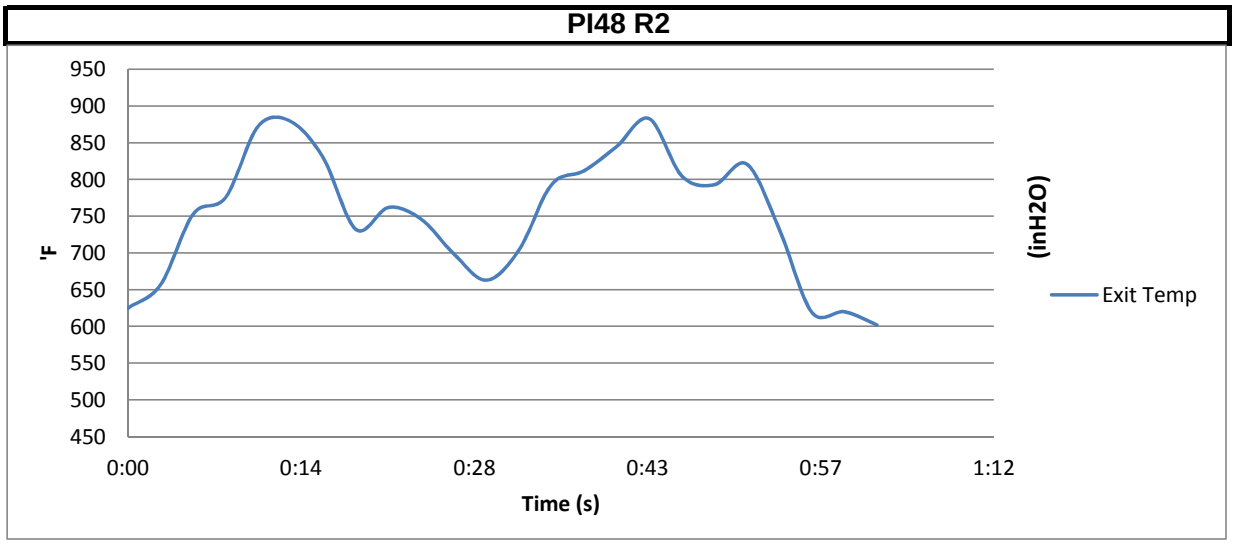
PI 48-R3

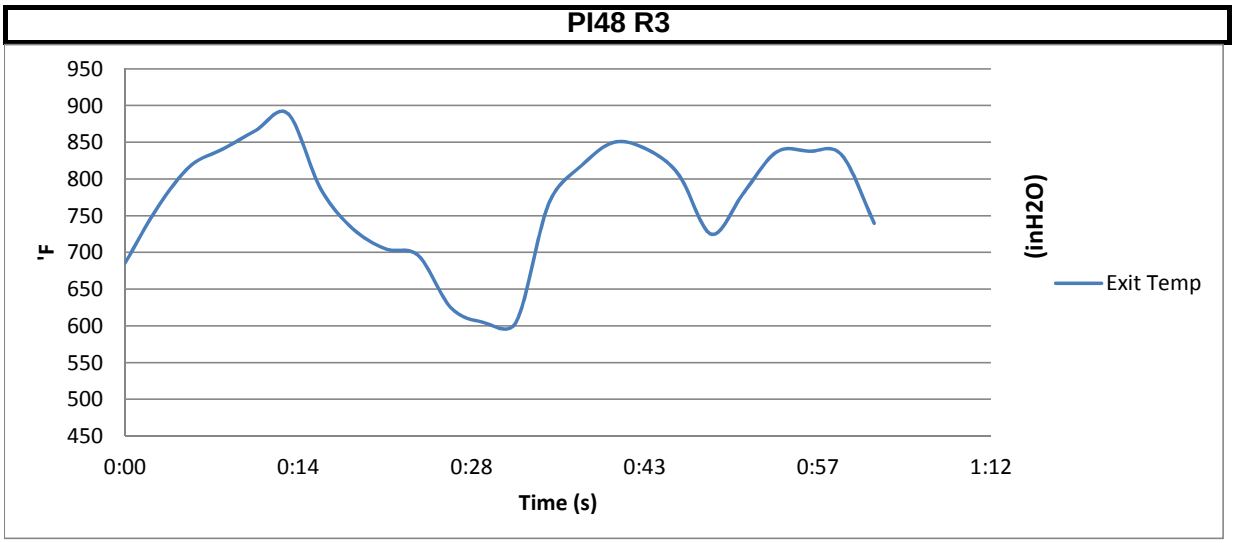


PI 48-R3




PI48 R1
900
850
800
750
700
650
600
550
500
450
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI48 R2
950
900
850
800
750
700
650
600
550
500
450
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI48 R3
950
900
850
800
750
700
650
600
550
500
450
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp

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	Big Iron Steel Plant
Sampling Location	PI 48
Fuel Type	Gas, Propene

Test Information			
Project #		stk-14-elmorecity.ok-comp#1	
Operator		TP	
Date for Preliminary Run	(mm/dd/yy)	05/28/14	
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)	05/28/14	05/28/14	05/28/14	
Load	% or w/DB	30-70-30	30-70-30	30-70-30	
Meter Box Number	from ACS	SAMP-CP-0009	SAMP-CP-0009	SAMP-CP-0009	
Meter Calibration Factor	(Y)	0.968	0.968	0.968	
Orifice Meter Coefficient	($\Delta H_@$)	1.796	1.796	1.796	in H_2O
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-FP-0001	SAMP-FP-0001	SAMP-FP-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-0035	SAMP-BC-0035	SAMP-BC-0035	

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	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Historical Data	**30-70-30%-4**	**30-70-30%-5**	**30-70-30%-6**	**Average**	**Units**
Run Start Time	07:37	09:05	10:30		hh:mm
Run Stop Time	08:47	10:15	11:40		hh:mm
Test Date	05/28/14	05/28/14	05/28/14		mm/dd/yy
Meter Calibration Factor	0.968	0.968	0.968		
Pitot Tube Coefficient	0.819	0.819	0.819		
Stack Test Data	**30-70-30%-4**	**30-70-30%-5**	**30-70-30%-6**	**Average**	**Units**
Initial Meter Volume	810.060	861.835	913.740		ft^3
Final Meter Volume	861.600	913.490	965.255		ft^3
Total Meter Volume	51.540	51.655	51.515	51.570	ft^3
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	72.90	78.58	80.65	77.38	°F
Average Stack Temperature	831.25	828.38	880.46	846.69	°F
Barometric Pressure	30.00	30.03	30.02	30.02	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	30.00	30.03	30.02	30.02	in Hg
Average Orifice Pressure Drop	1.80	1.80	1.80	1.80	in H_2O
Absolute Meter Pressure	30.13	30.16	30.15	30.15	in Hg
Avg Square Root Pitot Pressure	0.09	0.08	0.09	0.09	$\sqrt{(in\ H_2O)}$
Moisture Content Data	**30-70-30%-4**	**30-70-30%-5**	**30-70-30%-6**	**Average**	**Units**
Impinger Water Weight Gain	45.20	51.90	51.90	49.67	g
Silica Gel Weight Gain	10.90	10.70	7.70	9.77	g
Total Water Volume Collected	56.20	62.71	59.71	59.54	ml
Standard Water Vapor Volume	2.65	2.95	2.81	2.80	scf
Standard Meter Volume	49.8	49.4	49.1	49.4	dscf
Calculated Stack Moisture	5.05	5.64	5.42	5.37	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	5.05	5.64	5.42	5.37	%
Gas Analysis Data	**30-70-30%-4**	**30-70-30%-5**	**30-70-30%-6**	**Average**	**Units**
Carbon Dioxide Content	4.6	4.6	5.8	5.0	%
Oxygen Content	15.9	15.8	14.2	15.3	%
Nitrogen Content	79.5	79.6	80.0	79.7	%
Stack Dry Molecular Weight	29.37	29.38	29.49	29.41	lb/lb-mole
Stack Wet Molecular Weight	28.79	28.74	28.87	28.80	lb/lb-mole
Percent Excess Air	312.5	303.0	205.2	273.6	%
Volumetric Flow Rate Data	**30-70-30%-4**	**30-70-30%-5**	**30-70-30%-6**	**Average**	**Units**
Average Stack Gas Velocity	7.33	7.23	7.50	7.35	ft/sec
Stack Cross-Sectional Area	11.79	11.79	11.79	11.79	ft^2
Actual Stack Flow Rate	5,189	5,113	5,303	5,202	acfm
Wet Standard Stack Flow Rate	128	126	126	127	wkscfh
Dry Standard Stack Flow Rate	121,207	119,081	118,949	119,746	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/28/14		
Sampling Location	PI 48	**Operator**	TP		
Project #	stk-14-elmorecity.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**	05/28/14	**Run Start Time**	07:37	**Run Stop Time**	08:47
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	4.6	15.9	0.0	79.5	29.37	1.089	312.5	N/A

Gas Analysis Data

Run Number	30-70-30%-5		**Date**	05/28/14	**Run Start Time**	09:05	**Run Stop Time**	10:15
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	4.6	15.8	0.0	79.6	29.38	1.102	303.0	N/A

Gas Analysis Data

Run Number	30-70-30%-6		**Date**	05/28/14	**Run Start Time**	10:30	**Run Stop Time**	11:40
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.8	14.2	0.0	80.0	29.49	1.159	205.2	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/28/14
Sampling Location	PI 48	**Operator**	TP
Project #	stk-14-elmorecity.ok-comp#1	**Ports Used**	2

Moisture Content Data									
Run Number		30-70-30%-4		**Date**	05/28/14	**Start Time**	07:37	**Stop Time**	08:47
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume	(V_m)	51.540	dcf			**Barometric Pressure**	(P_b)	30.00	in Hg
Average Stack Temp	(t_s)$_{avg}$	831	°F			**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp	(t_m)$_{avg}$	73	°F			**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	834.20	776.40	568.70	789.60				
Initial Value	(V_i),(W_i)	801.70	767.20	565.20	778.70				
Net Value	(V_n),(W_n)	32.5	9.2	3.5	10.9				
Results									
Total Weight	(W_t)	56.10	g			**Water Vol Weighed**	($V_{wsg(std)}$)	2.645	scf
Std Meter Volume	($V_{m(std)}$)	49.783	dscf			**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%
Calc Moisture Content	($B_{ws(calc)}$)	5.05	%			**Final Moisture Content**	(B_{ws})	5.05	%

Moisture Content Data									
Run Number		30-70-30%-5		**Date**	05/28/14	**Start Time**	09:05	**Stop Time**	10:15
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume	(V_m)	51.655	dcf			**Barometric Pressure**	(P_b)	30.03	in Hg
Average Stack Temp	(t_s)$_{avg}$	828	°F			**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp	(t_m)$_{avg}$	79	°F			**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	831.60	792.30	564.60	840.20				
Initial Value	(V_i),(W_i)	793.10	782.10	561.40	829.50				
Net Value	(V_n),(W_n)	38.5	10.2	3.2	10.7				
Results									
Total Weight	(W_t)	62.60	g			**Water Vol Weighed**	($V_{wsg(std)}$)	2.952	scf
Std Meter Volume	($V_{m(std)}$)	49.417	dscf			**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%
Calc Moisture Content	($B_{ws(calc)}$)	5.64	%			**Final Moisture Content**	(B_{ws})	5.64	%

Moisture Content Data									
Run Number		30-70-30%-6		**Date**	05/28/14	**Start Time**	10:30	**Stop Time**	11:40
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume	(V_m)	51.515	dcf			**Barometric Pressure**	(P_b)	30.02	in Hg
Average Stack Temp	(t_s)$_{avg}$	880	°F			**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp	(t_m)$_{avg}$	81	°F			**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	876.60	785.30	569.30	797.30				
Initial Value	(V_i),(W_i)	834.20	776.40	568.70	789.60				
Net Value	(V_n),(W_n)	42.4	8.9	0.6	7.7				
Results									
Total Weight	(W_t)	59.60	g			**Water Vol Weighed**	($V_{wsg(std)}$)	2.810	scf
Std Meter Volume	($V_{m(std)}$)	49.078	dscf			**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%
Calc Moisture Content	($B_{ws(calc)}$)	5.42	%			**Final Moisture Content**	(B_{ws})	5.42	%

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	30-70-30%-4

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	831.3	°F
Average Meter Temp	(t_m)	72.9	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.09	in H_2O
Stack Moisture Content	(B_{ws})	5.05	%
Stack Dry Molecular Weight	(M_d)	29.37	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.160	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.190	in H_2O for	15.0	sec
	Post (+)	0.200	in H_2O for	15.0	sec
	Post (-)	0.140	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4723	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	30.00	in Hg
Absolute Meter Pressure	(P_m)	30.13	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	07:37	**End**	08:47

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	801.7	767.2	565.2	778.7				
Post	834.2	776.4	568.7	789.6				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	810.060	0.005	1.796	1.80	730	250		60			66	65	3.5	0.07	5.81	2.096		50.308
A-2	2.7	00:02:43	812.200	0.005	1.796	1.80	742	250		64			68	65	3.5	0.07	5.84	4.174		50.084
A-3	5.4	00:05:25	814.325	0.005	1.796	1.80	805	250		68			71	65	3.5	0.07	5.99	6.245		49.962
A-4	8.1	00:08:07	816.450	0.010	1.796	1.80	902	250		71			72	66	3.5	0.10	8.79	8.581		51.483
A-5	10.8	00:10:50	818.850	0.010	1.796	1.80	935	250		65			74	66	3.5	0.10	8.90	10.406		49.950
A-6	13.5	00:13:33	820.730	0.010	1.796	1.80	969	250		59			75	66	3.5	0.10	9.01	12.182		48.728
A-7	16.3	00:16:15	822.560	0.010	1.796	1.80	845	250		54			77	66	3.5	0.10	8.61	14.569		49.952
A-8	19.0	00:18:58	825.025	0.010	1.796	1.80	834	250		54			78	67	3.5	0.10	8.57	16.599		49.797
A-9	21.7	00:21:40	827.125	0.010	1.796	1.80	879	250		52			78	68	3.5	0.10	8.72	18.579		49.544
A-10	24.4	00:24:22	829.175	0.010	1.796	1.80	860	250		52			78	68	3.5	0.10	8.66	20.655		49.572
A-11	27.1	00:27:05	831.325	0.005	1.796	1.80	790	250		52			78	68	3.5	0.07	5.96	22.973		50.123
A-12	29.8	00:29:47	833.725	0.005	1.796	1.80	658	250		52			78	68	3.5	0.07	5.63	25.040		50.079
B-1	32.5	00:32:30	835.865	0.005	1.796	1.80	703	250		54			74	68	3.5	0.07	5.74	27.109		50.048
B-2	35.2	00:35:12	838.000	0.005	1.796	1.80	854	250		50			80	68	3.5	0.07	6.11	29.278		50.191
B-3	37.9	00:37:55	840.250	0.005	1.796	1.80	888	250		51			81	69	3.5	0.07	6.18	31.491		50.385
B-4	40.6	00:40:37	842.550	0.010	1.796	1.80	916	250		52			81	69	3.5	0.10	8.84	33.559		50.339
B-5	43.3	00:43:20	844.700	0.010	1.796	1.80	877	250		52			81	69	3.5	0.10	8.71	35.325		49.870
B-6	46.0	00:46:03	846.535	0.010	1.796	1.80	849	250		52			82	69	3.5	0.10	8.62	37.372		49.830
B-7	48.8	00:48:45	848.665	0.010	1.796	1.80	939	250		52			82	70	3.5	0.10	8.91	39.447		49.827
B-8	51.5	00:51:28	850.825	0.010	1.796	1.80	930	250		53			82	70	3.5	0.10	8.88	41.482		49.779
B-9	54.2	00:54:10	852.945	0.005	1.796	1.80	895	250		53			82	70	3.5	0.07	6.20	43.643		49.878
B-10	56.9	00:56:53	855.195	0.005	1.796	1.80	795	250		54			82	71	3.5	0.07	5.97	45.596		49.741
B-11	59.6	00:59:35	857.230	0.005	1.796	1.80	710	250		53			83	71	3.5	0.07	5.76	47.676		49.748
B-12	62.3	01:02:18	859.400	0.005	1.796	1.80	645	250		53			83	71	3.5	0.07	5.60	49.784		49.784
Last Pt	65.0	01:05:00	861.600																	
Final Val	65.0	01:05:00	861.600											**Max Vac**	3.5	**Final Values**		49.784		
Average Values				0.01		1.80	831	250		56			78	68		0.09	7.33			
													73							

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	30-70-30%-5

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	828.4	°F
Average Meter Temp	(t_m)	78.6	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.08	in H_2O
Stack Moisture Content	(B_{ws})	5.64	%
Stack Dry Molecular Weight	(M_d)	29.38	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.77	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.16	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.10	in H_2O for	15.0	sec
	Post (+)	0.21	in H_2O for	15.0	sec
	Post (-)	0.18	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4761	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	30.03	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	30.03	in Hg
Absolute Meter Pressure	(P_m)	30.16	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	09:05	**End**	10:15

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	793.1	782.1	561.4	829.5				
Post	831.6	792.3	564.6	840.2				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	861.835	0.005	1.796	1.80	740	250		56			81	71	3.5	0.07	5.84	2.076		49.833
A-2	2.7	00:02:43	863.995	0.005	1.796	1.80	759	250		54			84	71	3.5	0.07	5.88	4.094		49.130
A-3	5.4	00:05:25	866.100	0.005	1.796	1.80	834	250		53			84	71	3.5	0.07	6.06	6.246		49.970
A-4	8.1	00:08:07	868.345	0.005	1.796	1.80	864	250		54			85	71	3.5	0.07	6.13	8.109		48.654
A-5	10.8	00:10:50	870.290	0.010	1.796	1.80	919	250		54			85	72	3.5	0.10	8.85	10.094		48.453
A-6	13.5	00:13:33	872.365	0.010	1.796	1.80	974	250		55			84	72	3.5	0.10	9.03	12.110		48.441
A-7	16.3	00:16:15	874.470	0.010	1.796	1.80	875	250		55			84	72	3.5	0.10	8.71	14.222		48.761
A-8	19.0	00:18:58	876.675	0.010	1.796	1.80	844	250		55			84	72	3.5	0.10	8.61	16.219		48.657
A-9	21.7	00:21:40	878.760	0.010	1.796	1.80	832	250		55			84	72	3.5	0.10	8.57	18.268		48.716
A-10	24.4	00:24:22	880.900	0.005	1.796	1.80	790	250		56			84	73	3.5	0.07	5.96	20.373		48.896
A-11	27.1	00:27:05	883.100	0.005	1.796	1.80	733	250		56			84	73	3.5	0.07	5.82	22.450		48.981
A-12	29.8	00:29:47	885.270	0.005	1.796	1.80	668	250		57			85	73	3.5	0.07	5.66	24.572		49.144
B-1	32.5	00:32:30	887.490	0.005	1.796	1.80	716	250		63			79	73	3.5	0.07	5.78	26.614		49.134
B-2	35.2	00:35:12	889.615	0.005	1.796	1.80	870	250		60			82	73	3.5	0.07	6.15	28.637		49.092
B-3	37.9	00:37:55	891.725	0.005	1.796	1.80	881	250		57			85	73	3.5	0.07	6.17	30.774		49.238
B-4	40.6	00:40:37	893.960	0.010	1.796	1.80	933	250		58			84	74	3.5	0.10	8.90	32.805		49.207
B-5	43.3	00:43:20	896.085	0.010	1.796	1.80	967	250		60			84	74	3.5	0.10	9.00	34.870		49.228
B-6	46.0	00:46:03	898.245	0.010	1.796	1.80	879	250		60			85	74	3.5	0.10	8.72	36.923		49.231
B-7	48.8	00:48:45	900.395	0.010	1.796	1.80	879	250		61			84	74	3.5	0.10	8.72	39.031		49.302
B-8	51.5	00:51:28	902.600	0.010	1.796	1.80	908	250		61			86	74	3.5	0.10	8.82	41.130		49.356
B-9	54.2	00:54:10	904.800	0.010	1.796	1.80	935	250		61			87	74	3.5	0.10	8.90	43.203		49.375
B-10	56.9	00:56:53	906.975	0.005	1.796	1.80	772	250		62			87	74	3.5	0.07	5.92	45.224		49.336
B-11	59.6	00:59:35	909.095	0.005	1.796	1.80	700	250		62			87	74	3.5	0.07	5.74	47.293		49.349
B-12	62.3	01:02:18	911.265	0.005	1.796	1.80	609	250		62			86	74	3.5	0.07	5.51	49.416		49.416
Last Pt	65.0	01:05:00	913.490																	
Final Val	65.0	01:05:00	913.490											**Max Vac**	3.5	**Final Values**		49.416		
Average Values				0.01		1.80	828	250		58			84	73		0.08	7.23			
													79							

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	30-70-30%-6

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	880.5	°F
Average Meter Temp	(t_m)	80.6	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)	0.09	in H_2O
Stack Moisture Content	(B_{ws})	5.42	%
Stack Dry Molecular Weight	(M_d)	29.49	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.76	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
INCOMPLETE	**Post**		ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.022	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.019	in H_2O for	15.0	sec
	Post (+)	0.020	in H_2O for	15.0	sec
	Post (-)	0.015	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4766	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	30.02	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	30.02	in Hg
Absolute Meter Pressure	(P_m)	30.15	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	10:30	**End**	11:40

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	834.2	776.4	568.7	789.6				
Post	876.6	785.3	569.3	797.3				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	913.740	0.005	1.796	1.80	770	250		63			75	74	4.5	0.07	5.90	2.072		49.725
A-2	2.7	00:02:43	915.890	0.005	1.796	1.80	809	250		60			77	74	4.5	0.07	5.99	4.077		48.928
A-3	5.4	00:05:25	917.975	0.010	1.796	1.80	937	250		64			81	74	4.5	0.10	8.89	6.085		48.679
A-4	8.1	00:08:07	920.070	0.010	1.796	1.80	974	250		65			83	74	4.5	0.10	9.01	8.113		48.676
A-5	10.8	00:10:50	922.190	0.010	1.796	1.80	1029	250		66			84	74	4.5	0.10	9.18	10.148		48.711
A-6	13.5	00:13:33	924.320	0.020	1.796	1.80	1052	250		66			85	74	4.5	0.14	13.08	12.177		48.708
A-7	16.3	00:16:15	926.445	0.010	1.796	1.80	943	250		66			86	74	4.5	0.10	8.91	14.252		48.862
A-8	19.0	00:18:58	928.620	0.010	1.796	1.80	880	250		66			86	74	4.5	0.10	8.71	16.317		48.950
A-9	21.7	00:21:40	930.785	0.005	1.796	1.80	932	250		66			86	75	4.5	0.07	6.27	18.394		49.051
A-10	24.4	00:24:22	932.965	0.005	1.796	1.80	816	250		66			87	75	4.5	0.07	6.01	20.451		49.081
A-11	27.1	00:27:05	935.125	0.005	1.796	1.80	637	250		66			87	75	4.5	0.07	5.57	22.555		49.210
A-12	29.8	00:29:47	937.335	0.005	1.796	1.80	603	250		66			87	75	4.5	0.07	5.48	24.649		49.298
B-1	32.5	00:32:30	939.535	0.005	1.796	1.80	772	250		68			80	75	4.5	0.07	5.90	26.705		49.301
B-2	35.2	00:35:12	941.680	0.005	1.796	1.80	907	250		63			86	75	4.5	0.07	6.22	28.692		49.186
B-3	37.9	00:37:55	943.765	0.005	1.796	1.80	947	250		61			87	75	4.5	0.07	6.31	30.667		49.067
B-4	40.6	00:40:37	945.840	0.005	1.796	1.80	983	250		60			88	75	4.5	0.07	6.39	32.722		49.083
B-5	43.3	00:43:20	948.000	0.005	1.796	1.80	953	250		59			89	76	4.5	0.07	6.32	34.758		49.071
B-6	46.0	00:46:03	950.145	0.010	1.796	1.80	982	250		58			89	76	4.5	0.10	9.03	36.809		49.079
B-7	48.8	00:48:45	952.305	0.010	1.796	1.80	1037	250		58			89	76	4.5	0.10	9.20	38.846		49.068
B-8	51.5	00:51:28	954.450	0.015	1.796	1.80	979	250		59			89	77	4.5	0.12	11.05	40.885		49.062
B-9	54.2	00:54:10	956.600	0.010	1.796	1.80	972	250		59			90	77	4.5	0.10	9.00	42.899		49.027
B-10	56.9	00:56:53	958.725	0.005	1.796	1.80	870	250		59			91	77	4.5	0.07	6.13	44.864		48.942
B-11	59.6	00:59:35	960.800	0.005	1.796	1.80	717	250		59			92	77	4.5	0.07	5.77	47.120		49.168
B-12	62.3	01:02:18	963.185	0.005	1.796	1.80	630	250		58			92	77	4.5	0.07	5.55	49.078		49.078
Last Pt	65.0	01:05:00	965.255																	
Final Val	65.0	01:05:00	965.255											**Max Vac**	4.5	**Final Values**		49.078		
Average Values				0.01		1.80	880	250		63			86	75		0.09	7.50			
													81							

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.1	%
Stack Exhaust Flow (M2)	121,207	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	78	%
Ambient Temperature	67	^{o}F
Specific Humidity	0.010981	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R4

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 7:37:09	3930	15.16	0.54	0.05	4.20	10.44	67.00	544.00
	05/28/14 7:37:39	3960	15.15	0.53	0.07	4.21	10.44	67.00	544.00
	05/28/14 7:38:09	3990	15.17	0.46	0.04	4.16	10.30	67.10	546.00
	05/28/14 7:38:39	4020	15.31	0.50	0.04	4.10	10.30	67.10	546.00
	05/28/14 7:39:09	4050	15.21	0.49	0.03	4.11	10.38	67.20	546.00
	05/28/14 7:39:39	4080	15.19	0.49	0.00	4.16	10.38	67.20	546.00
	05/28/14 7:40:09	4110	15.31	0.50	0.07	4.09	10.49	67.40	546.00
	05/28/14 7:40:39	4140	15.36	0.50	0.05	4.03	10.49	67.40	546.00
	05/28/14 7:41:09	4170	15.11	0.53	0.02	4.19	10.35	67.50	546.00
	05/28/14 7:41:39	4200	15.12	0.58	0.02	4.20	10.35	67.50	546.00
	05/28/14 7:42:09	4230	15.40	0.59	0.05	4.06	17.27	67.60	673.00
	05/28/14 7:42:39	4260	14.81	0.57	0.03	4.27	17.27	67.60	673.00
	05/28/14 7:43:09	4290	15.20	0.55	-0.02	4.24	24.08	67.80	890.00
	05/28/14 7:43:39	4320	14.69	0.79	0.00	4.46	24.08	67.80	890.00
	05/28/14 7:44:09	4350	14.48	0.65	0.03	4.62	24.33	67.90	899.00
	05/28/14 7:44:39	4380	14.48	0.69	0.02	4.65	24.33	67.90	899.00
	05/28/14 7:45:09	4410	14.43	0.82	0.01	4.67	24.16	68.00	899.00
	05/28/14 7:45:39	4440	14.49	0.92	0.01	4.62	24.16	68.00	899.00
	05/28/14 7:46:09	4470	14.42	1.02	-0.02	4.66	24.28	68.20	901.00
	05/28/14 7:46:39	4500	14.48	1.10	-0.01	4.65	24.28	68.20	901.00
	05/28/14 7:47:09	4530	14.39	1.12	0.01	4.68	24.39	68.40	904.00
	05/28/14 7:47:39	4560	14.35	1.17	0.01	4.71	24.39	68.40	904.00
	05/28/14 7:48:09	4590	14.39	1.25	0.00	4.68	24.22	68.60	901.00
	05/28/14 7:48:39	4620	14.34	1.22	-0.02	4.71	24.22	68.60	901.00
	05/28/14 7:49:09	4650	14.36	1.26	0.07	4.73	24.33	68.70	903.00
	05/28/14 7:49:39	4680	14.35	1.31	0.07	4.73	24.33	68.70	903.00
	05/28/14 7:50:09	4710	14.42	1.21	0.01	4.68	24.16	68.90	900.00
	05/28/14 7:50:39	4740	14.51	1.25	0.00	4.60	24.16	68.90	900.00
	05/28/14 7:51:09	4770	14.38	1.25	0.01	4.67	24.28	69.00	900.00
	05/28/14 7:51:39	4800	14.46	1.21	0.00	4.65	24.28	69.00	900.00
	05/28/14 7:52:09	4830	14.77	1.24	-0.02	4.54	11.49	69.10	579.00
	05/28/14 7:52:39	4860	15.78	1.31	-0.01	3.65	11.49	69.10	579.00
	05/28/14 7:53:09	4890	15.17	1.00	0.01	4.20	10.55	69.20	547.00
	05/28/14 7:53:39	4920	15.07	0.86	0.01	4.25	10.55	69.20	547.00
	05/28/14 7:54:09	4950	15.44	0.79	0.01	3.97	10.52	69.40	550.00
	05/28/14 7:54:39	4980	15.14	0.72	-0.02	4.17	10.52	69.40	550.00
	05/28/14 7:55:09	5010	15.22	0.68	0.03	4.15	10.49	69.50	547.00
	05/28/14 7:55:39	5040	15.51	0.63	0.05	4.00	10.49	69.50	547.00
	05/28/14 7:56:09	5070	15.15	0.55	-0.01	4.09	10.35	69.70	549.00
	05/28/14 7:56:39	5100	15.01	0.55	0.00	4.27	10.35	69.70	549.00
	05/28/14 7:57:09	5130	14.93	0.55	0.01	4.28	21.56	69.80	834.00
	05/28/14 7:57:39	5160	14.23	0.43	0.01	4.83	21.56	69.80	834.00
	05/28/14 7:58:09	5190	14.65	0.59	0.00	4.50	23.72	69.90	886.00
	05/28/14 7:58:39	5220	14.53	0.62	0.00	4.59	23.72	69.90	886.00
	05/28/14 7:59:09	5250	14.63	0.65	-0.02	4.54	23.72	69.90	886.00
	05/28/14 7:59:39	5280	14.66	0.73	-0.02	4.50	23.72	69.90	886.00
	05/28/14 8:00:09	5310	14.65	0.73	0.01	4.52	23.69	69.90	889.00
	05/28/14 8:00:39	5340	14.58	0.76	0.00	4.55	23.69	69.90	889.00
	05/28/14 8:01:09	5370	14.49	0.75	-0.02	4.63	23.69	69.90	886.00
	05/28/14 8:01:39	5400	14.56	0.73	-0.02	4.57	23.69	69.90	886.00
	05/28/14 8:02:09	5430	14.55	0.69	0.00	4.59	23.80	70.00	889.00
	05/28/14 8:02:39	5460	14.52	0.66	0.01	4.58	23.80	70.00	889.00
	05/28/14 8:03:09	5490	14.65	0.66	0.03	4.52	23.67	70.10	888.00
	05/28/14 8:03:39	5520	14.55	0.70	0.04	4.59	23.67	70.10	888.00
	05/28/14 8:04:09	5550	14.62	0.66	0.01	4.54	23.78	70.10	889.00
	05/28/14 8:04:39	5580	14.58	0.69	0.01	4.55	23.78	70.10	889.00
	05/28/14 8:05:09	5610	14.62	0.67	-0.02	4.54	23.89	70.10	889.00
	05/28/14 8:05:39	5640	14.52	0.66	-0.02	4.59	23.89	70.10	889.00
	05/28/14 8:06:09	5670	14.63	0.63	-0.03	4.54	23.75	70.20	888.00
	05/28/14 8:06:39	5700	14.59	0.66	-0.02	4.54	23.75	70.20	888.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.1	%
Stack Exhaust Flow (M2)	121,207	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	78	%
Ambient Temperature	67	^{o}F
Specific Humidity	0.010981	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R4

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 8:07:09	5730	14.66	0.64	-0.01	4.52	23.86	70.30	888.00
A2	05/28/14 8:07:39	5760	14.60	0.65	-0.01	4.54	23.86	70.30	888.00
	05/28/14 8:08:09	5790	14.51	0.63	0.00	4.59	23.72	70.40	891.00
	05/28/14 8:08:39	5820	14.57	0.60	0.00	4.58	23.72	70.40	891.00
	05/28/14 8:09:09	5850	14.48	0.57	0.00	4.61	18.02	70.50	750.00
	05/28/14 8:09:39	5880	14.87	0.51	0.00	4.47	18.02	70.50	750.00
	05/28/14 8:10:09	5910	15.72	0.80	0.08	3.69	10.63	70.50	554.00
	05/28/14 8:10:39	5940	15.03	0.52	0.08	4.36	10.63	70.50	554.00
	05/28/14 8:11:09	5970	15.14	0.51	-0.01	4.16	10.60	70.70	551.00
	05/28/14 8:11:39	6000	15.15	0.46	0.00	4.16	10.60	70.70	551.00
	05/28/14 8:12:09	6030	15.11	0.43	0.02	4.22	10.60	70.90	551.00
	05/28/14 8:12:39	6060	14.97	0.39	0.02	4.30	10.60	70.90	551.00
	05/28/14 8:13:09	6090	15.05	0.34	-0.03	4.28	10.71	71.10	551.00
	05/28/14 8:13:39	6120	15.25	0.35	-0.03	4.11	10.71	71.10	551.00
	05/28/14 8:14:09	6150	15.25	0.28	-0.01	4.08	10.41	71.30	547.00
	05/28/14 8:14:39	6180	15.13	0.29	-0.01	4.19	10.41	71.30	547.00
	05/28/14 8:15:09	6210	15.33	0.32	0.00	4.09	13.23	71.60	584.00
	05/28/14 8:15:39	6240	15.36	0.30	0.00	4.02	13.23	71.60	584.00
	05/28/14 8:16:09	6270	14.78	0.29	0.00	4.32	22.64	71.90	847.00
	05/28/14 8:16:39	6300	14.57	0.08	0.00	4.62	22.64	71.90	847.00
	05/28/14 8:17:09	6330	14.62	0.35	-0.01	4.53	24.03	72.00	886.00
	05/28/14 8:17:39	6360	14.57	0.29	-0.01	4.57	24.03	72.00	886.00
	05/28/14 8:18:09	6390	14.58	0.32	-0.01	4.56	23.89	72.20	883.00
	05/28/14 8:18:39	6420	14.55	0.35	-0.01	4.57	23.89	72.20	883.00
	05/28/14 8:19:09	6450	14.42	0.32	-0.01	4.66	24.00	72.20	885.00
	05/28/14 8:19:39	6480	14.44	0.26	-0.01	4.64	24.00	72.20	885.00
	05/28/14 8:20:09	6510	14.54	0.26	-0.02	4.59	23.83	72.30	885.00
	05/28/14 8:20:39	6540	14.56	0.30	-0.02	4.57	23.83	72.30	885.00
	05/28/14 8:21:09	6570	14.55	0.31	0.01	4.58	23.80	72.30	885.00
	05/28/14 8:21:39	6600	14.58	0.33	0.00	4.56	23.80	72.30	885.00
	05/28/14 8:22:09	6630	14.53	0.30	0.00	4.60	23.80	72.30	888.00
	05/28/14 8:22:39	6660	14.54	0.30	0.01	4.58	23.80	72.30	888.00
	05/28/14 8:23:09	6690	14.45	0.26	-0.04	4.64	23.67	72.30	887.00
	05/28/14 8:23:39	6720	14.52	0.24	-0.04	4.61	23.67	72.30	887.00
	05/28/14 8:24:09	6750	14.56	0.27	0.02	4.58	23.50	72.40	887.00
	05/28/14 8:24:39	6780	14.55	0.27	0.02	4.58	23.50	72.40	887.00
	05/28/14 8:25:09	6810	14.48	0.29	-0.01	4.61	23.75	72.70	887.00
	05/28/14 8:25:39	6840	15.26	0.26	0.10	4.37	23.75	72.70	887.00
	05/28/14 8:26:09	6870	16.15	0.21	0.04	3.30	19.35	72.90	781.00
	05/28/14 8:26:39	6900	15.19	0.25	0.02	4.18	19.35	72.90	781.00
	05/28/14 8:27:09	6930	15.86	0.43	-0.01	3.70	11.82	73.10	591.00
A3	05/28/14 8:27:39	6960	14.95	0.33	0.00	4.29	11.82	73.10	591.00
	05/28/14 8:28:09	6990	16.03	0.06	0.04	3.56	10.24	73.40	542.00
	05/28/14 8:28:39	7020	15.74	0.19	0.01	3.71	10.24	73.40	542.00
	05/28/14 8:29:09	7050	15.26	0.23	0.00	4.13	10.46	73.80	548.00
	05/28/14 8:29:39	7080	15.87	0.28	0.01	3.74	10.46	73.80	548.00
	05/28/14 8:30:09	7110	15.46	0.26	0.01	3.89	10.44	74.10	542.00
	05/28/14 8:30:39	7140	16.10	0.30	0.06	3.52	10.44	74.10	542.00
	05/28/14 8:31:09	7170	16.11	0.24	0.03	3.54	10.52	74.40	542.00
	05/28/14 8:31:39	7200	15.96	0.27	0.00	3.55	10.52	74.40	542.00
	05/28/14 8:32:09	7230	15.49	0.31	-0.02	3.83	21.51	74.60	826.00
	05/28/14 8:32:39	7260	14.69	0.17	-0.01	4.51	21.51	74.60	826.00
	05/28/14 8:33:09	7290	15.56	0.30	0.05	3.94	24.08	74.70	890.00
	05/28/14 8:33:39	7320	15.51	0.23	0.04	3.95	24.08	74.70	890.00
	05/28/14 8:34:09	7350	15.33	0.23	0.01	3.97	24.05	74.80	887.00
	05/28/14 8:34:39	7380	14.77	0.31	0.00	4.45	24.05	74.80	887.00
	05/28/14 8:35:09	7410	15.52	0.31	0.04	4.00	23.89	75.00	886.00
	05/28/14 8:35:39	7440	14.89	0.21	0.02	4.25	23.89	75.00	886.00
	05/28/14 8:36:09	7470	15.13	0.29	0.03	4.19	23.86	75.10	889.00
	05/28/14 8:36:39	7500	14.68	0.31	0.02	4.49	23.86	75.10	889.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.1	%
Stack Exhaust Flow (M2)	121,207	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	78	%
Ambient Temperature	67	^{o}F
Specific Humidity	0.010981	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R4

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 8:37:09	7530	14.56	0.33	-0.01	4.57	24.11	75.50	886.00
05/28/14 8:37:39	7560	14.55	0.29	-0.01	4.60	24.11	75.50	886.00
05/28/14 8:38:09	7590	14.60	0.31	0.00	4.53	24.30	75.90	888.00
05/28/14 8:38:39	7620	15.30	0.34	0.02	4.12	24.30	75.90	888.00
05/28/14 8:39:09	7650	14.90	0.30	-0.01	4.33	24.00	76.00	888.00
05/28/14 8:39:39	7680	14.85	0.38	-0.02	4.40	24.00	76.00	888.00
05/28/14 8:40:09	7710	14.82	0.35	-0.02	4.38	23.86	76.00	887.00
05/28/14 8:40:39	7740	15.10	0.26	-0.02	4.25	23.86	76.00	887.00
05/28/14 8:41:09	7770	15.24	0.28	0.03	4.10	23.83	76.10	884.00
05/28/14 8:41:39	7800	15.08	0.26	0.02	4.26	23.83	76.10	884.00
05/28/14 8:42:09	7830	14.95	0.32	-0.02	4.28	23.80	76.10	884.00
05/28/14 8:42:39	7860	14.93	0.32	-0.02	4.33	23.80	76.10	884.00
05/28/14 8:43:09	7890	15.01	0.32	0.00	4.29	11.85	76.10	591.00
05/28/14 8:43:39	7920	14.94	0.29	0.00	4.41	11.85	76.10	591.00
05/28/14 8:44:09	7950	15.30	0.23	0.04	4.01	10.93	76.20	557.00
05/28/14 8:44:39	7980	15.78	0.53	0.04	3.72	10.93	76.20	557.00
05/28/14 8:45:09	8010	14.87	0.39	-0.01	4.36	11.04	76.40	557.00
05/28/14 8:45:39	8040	15.17	0.21	-0.01	4.23	11.04	76.40	557.00
05/28/14 8:46:09	8070	15.37	0.36	0.02	4.03	10.63	76.40	556.00
05/28/14 8:46:39	8100	15.86	0.36	0.02	3.68	10.63	76.40	556.00
05/28/14 8:47:09	8130	15.49	0.41	0.00	3.94	10.88	76.50	556.00
RAW AVERAGE		**14.93**	**0.52**	**0.01**	**4.32**	**18.85**	**71.50**	**759.73**

		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
						(in. H_2O)	**(^{o}F)**	**(SCFH)**
Bias	**Initial Zero**	0.08	-0.05	0.01	0.04			
	Final Zero	0.09	-0.05	0.02	0.05			
	Avg. Zero	0.09	-0.05	0.02	0.05			
	Initial UpScale	12.23	8.80	3.01	8.74			
	Final UpScale	12.23	8.75	3.16	8.73			
	Avg. UpScale	12.23	8.78	3.09	8.74			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	14.92	0.58	0.00	4.32
Corrected Raw Average (ppm/% wet basis)	14.16	0.56	0.00	4.10
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.6	%
Stack Exhaust Flow (M2)	119,081	SCFH

Weather Data

Barometric Pressure	30.03	in. Hg
Relative Humidity	81	%
Ambient Temperature	69	^{o}F
Specific Humidity	0.012227	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R5

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 9:05:09	9210	15.04	0.37	0.02	4.27	10.93	77.80	555.00
	05/28/14 9:05:39	9240	14.94	0.32	0.01	4.30	10.93	77.80	555.00
	05/28/14 9:06:09	9270	14.86	0.29	0.00	4.38	10.80	78.00	555.00
	05/28/14 9:06:39	9300	14.91	0.28	0.01	4.38	10.80	78.00	555.00
	05/28/14 9:07:09	9330	15.24	0.30	0.00	4.14	11.04	78.30	555.00
	05/28/14 9:07:39	9360	15.03	0.33	0.00	4.24	11.04	78.30	555.00
	05/28/14 9:08:09	9390	14.89	0.30	0.02	4.35	11.02	78.60	557.00
	05/28/14 9:08:39	9420	14.99	0.31	0.02	4.32	11.02	78.60	557.00
	05/28/14 9:09:09	9450	14.90	0.27	-0.01	4.33	14.62	79.00	657.00
	05/28/14 9:09:39	9480	14.94	0.27	-0.01	4.29	14.62	79.00	657.00
	05/28/14 9:10:09	9510	14.47	0.19	-0.01	4.69	23.69	79.30	873.00
	05/28/14 9:10:39	9540	14.66	0.43	0.01	4.47	23.69	79.30	873.00
	05/28/14 9:11:09	9570	14.49	0.38	-0.03	4.63	24.05	79.60	890.00
	05/28/14 9:11:39	9600	14.53	0.30	-0.02	4.61	24.05	79.60	890.00
	05/28/14 9:12:09	9630	14.40	0.29	0.02	4.67	24.28	79.70	890.00
	05/28/14 9:12:39	9660	14.43	0.26	0.02	4.68	24.28	79.70	890.00
	05/28/14 9:13:09	9690	14.45	0.29	-0.01	4.65	24.00	79.90	889.00
	05/28/14 9:13:39	9720	14.39	0.26	-0.01	4.68	24.00	79.90	889.00
	05/28/14 9:14:09	9750	14.48	0.32	-0.02	4.64	24.11	80.00	890.00
	05/28/14 9:14:39	9780	14.42	0.31	-0.02	4.68	24.11	80.00	890.00
	05/28/14 9:15:09	9810	14.42	0.26	-0.01	4.66	24.08	80.10	889.00
	05/28/14 9:15:39	9840	14.43	0.28	0.00	4.67	24.08	80.10	889.00
	05/28/14 9:16:09	9870	14.38	0.31	-0.03	4.70	24.05	80.30	889.00
	05/28/14 9:16:39	9900	14.48	0.32	-0.03	4.64	24.05	80.30	889.00
	05/28/14 9:17:09	9930	14.37	0.29	0.02	4.71	23.89	80.50	888.00
	05/28/14 9:17:39	9960	14.46	0.31	0.02	4.65	23.89	80.50	888.00
	05/28/14 9:18:09	9990	14.45	0.31	-0.01	4.63	23.86	80.60	891.00
	05/28/14 9:18:39	10020	14.44	0.32	-0.02	4.66	23.86	80.60	891.00
	05/28/14 9:19:09	10050	14.48	0.34	-0.01	4.63	23.97	80.70	885.00
	05/28/14 9:19:39	10080	14.44	0.30	-0.01	4.67	23.97	80.70	885.00
	05/28/14 9:20:09	10110	14.60	0.32	0.01	4.56	18.60	80.80	758.00
	05/28/14 9:20:39	10140	14.67	0.33	0.02	4.55	18.60	80.80	758.00
	05/28/14 9:21:09	10170	15.32	0.53	0.01	3.99	10.80	80.90	549.00
	05/28/14 9:21:39	10200	14.81	0.28	0.02	4.50	10.80	80.90	549.00
	05/28/14 9:22:09	10230	14.97	0.26	0.00	4.27	10.88	81.10	552.00
	05/28/14 9:22:39	10260	14.86	0.26	0.00	4.39	10.88	81.10	552.00
	05/28/14 9:23:09	10290	15.00	0.26	0.00	4.29	10.71	81.20	551.00
	05/28/14 9:23:39	10320	14.90	0.21	-0.01	4.36	10.71	81.20	551.00
	05/28/14 9:24:09	10350	14.80	0.21	0.01	4.42	10.82	81.20	551.00
	05/28/14 9:24:39	10380	14.89	0.21	0.01	4.37	10.82	81.20	551.00
	05/28/14 9:25:09	10410	14.92	0.21	-0.01	4.36	22.25	81.20	842.00
	05/28/14 9:25:39	10440	14.12	0.16	-0.01	4.76	22.25	81.20	842.00
	05/28/14 9:26:09	10470	14.63	0.06	0.00	4.61	23.80	81.10	879.00
	05/28/14 9:26:39	10500	14.49	0.22	0.00	4.64	23.80	81.10	879.00
	05/28/14 9:27:09	10530	14.51	0.21	-0.01	4.62	23.67	81.10	878.00
	05/28/14 9:27:39	10560	14.47	0.21	-0.01	4.66	23.67	81.10	878.00
	05/28/14 9:28:09	10590	14.53	0.21	-0.03	4.60	23.89	81.00	882.00
	05/28/14 9:28:39	10620	14.41	0.19	-0.02	4.68	23.89	81.00	882.00
	05/28/14 9:29:09	10650	14.44	0.18	0.00	4.67	23.50	81.00	881.00
	05/28/14 9:29:39	10680	14.45	0.20	0.00	4.66	23.50	81.00	881.00
	05/28/14 9:30:09	10710	14.36	0.19	-0.01	4.69	23.47	81.00	878.00
	05/28/14 9:30:39	10740	14.27	0.16	-0.01	4.78	23.47	81.00	878.00
	05/28/14 9:31:09	10770	14.20	0.14	0.00	4.82	23.86	81.00	879.00
	05/28/14 9:31:39	10800	14.20	0.09	0.00	4.82	23.86	81.00	879.00
	05/28/14 9:32:09	10830	14.21	0.11	0.00	4.82	23.72	81.20	878.00
	05/28/14 9:32:39	10860	14.17	0.10	-0.04	4.83	23.72	81.20	878.00
	05/28/14 9:33:09	10890	14.24	0.11	-0.01	4.79	23.56	81.30	878.00
	05/28/14 9:33:39	10920	14.19	0.12	-0.01	4.81	23.56	81.30	878.00
	05/28/14 9:34:09	10950	14.20	0.12	0.02	4.82	23.67	81.50	881.00
	05/28/14 9:34:39	10980	14.16	0.12	0.02	4.84	23.67	81.50	881.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.6	%
Stack Exhaust Flow (M2)	119,081	SCFH

Weather Data

Barometric Pressure	30.03	in. Hg
Relative Humidity	81	%
Ambient Temperature	69	^{o}F
Specific Humidity	0.012227	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R5

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 9:35:09	11010	14.20	0.11	0.00	4.82	23.53	81.80	880.00
A2	05/28/14 9:35:39	11040	14.20	0.10	0.00	4.82	23.53	81.80	880.00
	05/28/14 9:36:09	11070	14.22	0.09	0.00	4.81	23.78	82.00	877.00
	05/28/14 9:36:39	11100	14.17	0.14	0.00	4.84	23.78	82.00	877.00
	05/28/14 9:37:09	11130	14.24	0.09	-0.04	4.79	23.47	82.40	879.00
	05/28/14 9:37:39	11160	14.19	0.09	-0.04	4.83	23.47	82.40	879.00
	05/28/14 9:38:09	11190	14.23	0.11	0.02	4.81	17.72	82.70	727.00
	05/28/14 9:38:39	11220	14.70	0.14	0.03	4.65	17.72	82.70	727.00
	05/28/14 9:39:09	11250	15.57	0.61	-0.02	3.76	10.52	83.10	546.00
	05/28/14 9:39:39	11280	15.01	0.26	-0.02	4.33	10.52	83.10	546.00
	05/28/14 9:40:09	11310	15.08	0.12	-0.02	4.22	10.74	83.50	538.00
	05/28/14 9:40:39	11340	15.48	0.14	-0.01	3.99	10.74	83.50	538.00
	05/28/14 9:41:09	11370	15.21	0.11	0.00	4.12	10.44	84.10	537.00
	05/28/14 9:41:39	11400	14.88	0.15	-0.01	4.35	10.44	84.10	537.00
	05/28/14 9:42:09	11430	14.85	0.15	0.00	4.39	10.77	84.60	537.00
	05/28/14 9:42:39	11460	15.12	0.17	0.00	4.23	10.77	84.60	537.00
	05/28/14 9:43:09	11490	15.13	0.18	0.01	4.23	21.65	85.10	824.00
	05/28/14 9:43:39	11520	14.26	0.12	0.01	4.68	21.65	85.10	824.00
	05/28/14 9:44:09	11550	14.34	0.04	0.01	4.71	23.69	85.50	871.00
	05/28/14 9:44:39	11580	14.17	0.18	0.01	4.83	23.69	85.50	871.00
	05/28/14 9:45:09	11610	14.19	0.10	0.00	4.83	23.64	85.60	871.00
	05/28/14 9:45:39	11640	14.20	0.11	0.00	4.81	23.64	85.60	871.00
	05/28/14 9:46:09	11670	14.21	0.15	-0.03	4.81	23.86	85.60	877.00
	05/28/14 9:46:39	11700	14.20	0.11	-0.03	4.82	23.86	85.60	877.00
	05/28/14 9:47:09	11730	14.23	0.14	-0.01	4.79	23.69	85.40	874.00
	05/28/14 9:47:39	11760	14.21	0.11	-0.01	4.79	23.69	85.40	874.00
	05/28/14 9:48:09	11790	14.22	0.11	0.00	4.81	23.56	85.40	877.00
	05/28/14 9:48:39	11820	14.31	0.17	0.01	4.76	23.56	85.40	877.00
	05/28/14 9:49:09	11850	14.26	0.16	-0.03	4.78	23.53	85.30	877.00
	05/28/14 9:49:39	11880	14.21	0.14	-0.03	4.80	23.53	85.30	877.00
	05/28/14 9:50:09	11910	14.27	0.11	0.01	4.79	23.75	85.30	880.00
	05/28/14 9:50:39	11940	14.25	0.10	0.01	4.78	23.75	85.30	880.00
	05/28/14 9:51:09	11970	14.22	0.07	0.00	4.81	23.75	85.60	877.00
	05/28/14 9:51:39	12000	14.22	0.07	0.00	4.80	23.75	85.60	877.00
	05/28/14 9:52:09	12030	14.18	0.11	-0.01	4.83	23.97	85.80	880.00
	05/28/14 9:52:39	12060	14.21	0.13	-0.01	4.81	23.97	85.80	880.00
	05/28/14 9:53:09	12090	14.26	0.12	-0.01	4.79	23.80	86.10	879.00
	05/28/14 9:53:39	12120	14.22	0.15	-0.01	4.78	23.80	86.10	879.00
	05/28/14 9:54:09	12150	14.18	0.17	-0.01	4.83	23.78	86.50	875.00
	05/28/14 9:54:39	12180	14.09	0.12	-0.01	4.89	23.78	86.50	875.00
	05/28/14 9:55:09	12210	14.18	0.06	0.00	4.83	12.10	86.90	598.00
A3	05/28/14 9:55:39	12240	15.36	0.23	0.00	4.15	12.10	86.90	598.00
	05/28/14 9:56:09	12270	14.42	0.32	-0.01	4.60	10.49	87.30	539.00
	05/28/14 9:56:39	12300	14.92	0.04	0.01	4.39	10.49	87.30	539.00
	05/28/14 9:57:09	12330	15.43	0.17	0.02	4.14	10.71	87.70	542.00
	05/28/14 9:57:39	12360	15.65	0.09	0.00	3.69	10.71	87.70	542.00
	05/28/14 9:58:09	12390	15.12	0.20	0.04	4.21	10.68	88.10	536.00
	05/28/14 9:58:39	12420	15.28	0.17	0.03	4.10	10.68	88.10	536.00
	05/28/14 9:59:09	12450	15.14	0.31	0.01	4.16	10.38	88.50	538.00
	05/28/14 9:59:39	12480	15.16	0.32	0.00	4.18	10.38	88.50	538.00
	05/28/14 10:00:09	12510	15.22	0.36	0.01	4.17	22.86	88.80	845.00
	05/28/14 10:00:39	12540	13.94	0.25	0.01	4.95	22.86	88.80	845.00
	05/28/14 10:01:09	12570	14.49	0.04	-0.01	4.60	24.14	89.00	878.00
	05/28/14 10:01:39	12600	14.65	0.16	-0.01	4.55	24.14	89.00	878.00
	05/28/14 10:02:09	12630	14.43	0.16	-0.03	4.64	24.08	89.40	880.00
	05/28/14 10:02:39	12660	14.71	0.09	-0.02	4.51	24.08	89.40	880.00
	05/28/14 10:03:09	12690	14.71	0.16	0.01	4.47	24.44	89.70	883.00
	05/28/14 10:03:39	12720	14.48	0.24	0.01	4.63	24.44	89.70	883.00
	05/28/14 10:04:09	12750	14.56	0.22	0.00	4.59	24.28	90.10	882.00
	05/28/14 10:04:39	12780	14.77	0.16	0.00	4.47	24.28	90.10	882.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.6	%
Stack Exhaust Flow (M2)	119,081	SCFH

Weather Data

Barometric Pressure	30.03	in. Hg
Relative Humidity	81	%
Ambient Temperature	69	^{o}F
Specific Humidity	0.012227	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R5

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 10:05:09	12810	14.67	0.11	0.00	4.49	24.08	90.40	881.00
05/28/14 10:05:39	12840	14.55	0.23	0.00	4.57	24.08	90.40	881.00
05/28/14 10:06:09	12870	14.62	0.26	-0.02	4.55	24.00	91.00	880.00
05/28/14 10:06:39	12900	14.64	0.25	-0.02	4.53	24.00	91.00	880.00
05/28/14 10:07:09	12930	14.51	0.21	-0.03	4.61	24.22	91.10	880.00
05/28/14 10:07:39	12960	14.38	0.13	-0.03	4.70	24.22	91.10	880.00
05/28/14 10:08:09	12990	14.47	0.12	-0.02	4.66	24.33	91.20	880.00
05/28/14 10:08:39	13020	14.48	0.17	-0.03	4.65	24.33	91.20	880.00
05/28/14 10:09:09	13050	14.53	0.17	0.00	4.62	24.03	91.20	879.00
05/28/14 10:09:39	13080	14.54	0.17	-0.01	4.60	24.03	91.20	879.00
05/28/14 10:10:09	13110	14.42	0.15	-0.04	4.67	23.86	91.10	879.00
05/28/14 10:10:39	13140	14.58	0.16	-0.04	4.61	23.86	91.10	879.00
05/28/14 10:11:09	13170	14.50	0.28	0.00	4.59	11.79	91.20	585.00
05/28/14 10:11:39	13200	14.54	0.49	0.00	4.60	11.79	91.20	585.00
05/28/14 10:12:09	13230	14.58	0.39	-0.02	4.57	10.71	91.50	546.00
05/28/14 10:12:39	13260	15.38	0.37	-0.02	4.00	10.71	91.50	546.00
05/28/14 10:13:09	13290	14.80	0.19	-0.02	4.49	10.82	91.70	549.00
05/28/14 10:13:39	13320	14.72	-0.01	-0.02	4.47	10.82	91.70	549.00
05/28/14 10:14:09	13350	14.77	0.06	-0.01	4.42	10.80	91.70	546.00
05/28/14 10:14:39	13380	14.89	0.09	-0.01	4.38	10.80	91.70	546.00
05/28/14 10:15:09	13410	15.02	0.11	-0.01	4.28	10.80	91.60	549.00
RAW AVERAGE		**14.59**	**0.20**	**0.00**	**4.56**	**19.54**	**84.31**	**770.97**

		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	**(ppmvd)**	**(ppmvw)**	**(%)**	**(in. H_2O)**	**(^{o}F)**	**(SCFH)**
Bias	**Initial Zero**	0.09	-0.05	0.02	0.05			
	Final Zero	0.07	-0.06	-0.01	0.07			
	Avg. Zero	0.08	-0.06	0.01	0.06			
	Initial UpScale	12.23	8.75	3.16	8.73			
	Final UpScale	12.22	8.67	3.14	8.74			
	Avg. UpScale	12.23	8.71	3.15	8.74			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	14.57	0.26	0.00	4.55
Corrected Raw Average (ppm/% wet basis)	13.75	0.25	0.00	4.29
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.4	%
Stack Exhaust Flow (M2)	118,949	SCFH

Weather Data

Barometric Pressure	30.02	in. Hg
Relative Humidity	61	%
Ambient Temperature	79	^{o}F
Specific Humidity	0.012896	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R6

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 10:30:09	14310	13.97	-0.05	0.03	4.94	10.49	91.20	627.00
	05/28/14 10:30:39	14340	14.06	0.01	0.02	4.93	10.49	91.20	627.00
	05/28/14 10:31:09	14370	14.25	-0.01	-0.03	4.76	10.49	91.20	630.00
	05/28/14 10:31:39	14400	13.91	0.02	-0.04	4.98	10.49	91.20	630.00
	05/28/14 10:32:09	14430	13.82	-0.01	-0.02	5.08	10.52	91.30	627.00
	05/28/14 10:32:39	14460	13.81	0.02	-0.02	5.11	10.52	91.30	627.00
	05/28/14 10:33:09	14490	13.71	0.00	-0.01	5.12	10.38	91.40	630.00
	05/28/14 10:33:39	14520	13.89	0.02	-0.01	5.04	10.38	91.40	630.00
	05/28/14 10:34:09	14550	13.82	-0.01	0.00	5.07	16.80	91.40	813.00
	05/28/14 10:34:39	14580	13.75	0.00	0.01	5.12	16.80	91.40	813.00
	05/28/14 10:35:09	14610	10.96	-0.11	0.06	6.74	24.28	91.40	1,029.00
	05/28/14 10:35:39	14640	11.88	-0.24	0.02	6.70	24.28	91.40	1,029.00
	05/28/14 10:36:09	14670	13.44	-0.01	0.00	5.37	23.89	91.30	1,025.00
	05/28/14 10:36:39	14700	13.42	0.11	-0.01	5.33	23.89	91.30	1,025.00
	05/28/14 10:37:09	14730	13.51	0.17	-0.02	5.31	23.89	91.30	1,025.00
	05/28/14 10:37:39	14760	13.47	0.23	-0.02	5.31	23.89	91.30	1,025.00
	05/28/14 10:38:09	14790	13.40	0.21	-0.03	5.37	23.92	91.40	1,031.00
	05/28/14 10:38:39	14820	13.48	0.25	-0.05	5.30	23.92	91.40	1,031.00
	05/28/14 10:39:09	14850	13.52	0.35	0.04	5.31	23.89	91.70	1,030.00
	05/28/14 10:39:39	14880	13.37	0.20	0.05	5.39	23.89	91.70	1,030.00
	05/28/14 10:40:09	14910	13.35	0.16	0.02	5.41	23.89	92.10	1,029.00
	05/28/14 10:40:39	14940	13.63	0.17	0.04	5.22	23.89	92.10	1,029.00
	05/28/14 10:41:09	14970	13.49	0.22	-0.01	5.30	24.28	92.60	1,029.00
	05/28/14 10:41:39	15000	13.51	0.22	0.00	5.31	24.28	92.60	1,029.00
	05/28/14 10:42:09	15030	13.41	0.23	-0.03	5.36	23.97	93.10	1,030.00
	05/28/14 10:42:39	15060	13.48	0.23	-0.04	5.32	23.97	93.10	1,030.00
	05/28/14 10:43:09	15090	13.52	0.23	-0.01	5.29	24.19	93.40	1,030.00
	05/28/14 10:43:39	15120	13.60	0.24	0.00	5.24	24.19	93.40	1,030.00
	05/28/14 10:44:09	15150	13.55	0.21	0.00	5.27	22.20	93.40	988.00
	05/28/14 10:44:39	15180	13.46	0.22	0.00	5.31	22.20	93.40	988.00
	05/28/14 10:45:09	15210	13.94	0.22	0.00	5.13	11.54	93.40	666.00
	05/28/14 10:45:39	15240	14.64	0.41	0.01	4.46	11.54	93.40	666.00
	05/28/14 10:46:09	15270	13.95	0.21	0.00	4.98	10.46	93.40	627.00
	05/28/14 10:46:39	15300	13.85	0.10	-0.01	5.05	10.46	93.40	627.00
	05/28/14 10:47:09	15330	14.46	0.06	0.02	4.74	10.32	93.60	622.00
	05/28/14 10:47:39	15360	14.59	0.08	0.04	4.53	10.32	93.60	622.00
	05/28/14 10:48:09	15390	14.23	0.07	0.01	4.79	10.16	94.00	619.00
	05/28/14 10:48:39	15420	14.34	0.06	0.01	4.74	10.16	94.00	619.00
	05/28/14 10:49:09	15450	14.41	0.03	-0.01	4.69	10.52	94.10	622.00
	05/28/14 10:49:39	15480	14.34	0.08	-0.02	4.73	10.52	94.10	622.00
	05/28/14 10:50:09	15510	14.42	0.06	0.02	4.63	23.36	94.10	1,000.00
	05/28/14 10:50:39	15540	11.69	-0.10	0.02	6.46	23.36	94.10	1,000.00
	05/28/14 10:51:09	15570	13.70	-0.17	0.00	5.26	24.25	94.00	1,018.00
	05/28/14 10:51:39	15600	13.63	0.00	0.00	5.21	24.25	94.00	1,018.00
	05/28/14 10:52:09	15630	13.66	-0.02	-0.03	5.19	23.83	93.90	1,020.00
	05/28/14 10:52:39	15660	13.66	-0.02	-0.03	5.19	23.83	93.90	1,020.00
	05/28/14 10:53:09	15690	13.56	-0.01	-0.02	5.25	23.69	93.90	1,023.00
	05/28/14 10:53:39	15720	13.62	-0.03	-0.02	5.20	23.69	93.90	1,023.00
	05/28/14 10:54:09	15750	13.68	-0.02	-0.01	5.19	23.94	93.70	1,024.00
	05/28/14 10:54:39	15780	13.56	-0.03	-0.01	5.28	23.94	93.70	1,024.00
	05/28/14 10:55:09	15810	13.62	0.00	0.00	5.22	23.67	93.60	1,023.00
	05/28/14 10:55:39	15840	13.56	-0.02	-0.01	5.27	23.67	93.60	1,023.00
	05/28/14 10:56:09	15870	13.54	0.01	0.01	5.26	23.67	93.50	1,021.00
	05/28/14 10:56:39	15900	13.47	0.02	0.00	5.30	23.67	93.50	1,021.00
	05/28/14 10:57:09	15930	13.28	-0.09	-0.01	5.46	23.78	93.40	1,021.00
	05/28/14 10:57:39	15960	13.22	-0.17	-0.02	5.51	23.78	93.40	1,021.00
	05/28/14 10:58:09	15990	13.29	-0.16	0.01	5.43	23.64	93.40	1,023.00
	05/28/14 10:58:39	16020	13.29	-0.19	0.03	5.45	23.64	93.40	1,023.00
	05/28/14 10:59:09	16050	13.23	-0.19	0.01	5.49	23.64	93.60	1,020.00
	05/28/14 10:59:39	16080	13.22	-0.18	0.00	5.51	23.64	93.60	1,020.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.4	%
Stack Exhaust Flow (M2)	118,949	SCFH

Weather Data

Barometric Pressure	30.02	in. Hg
Relative Humidity	61	%
Ambient Temperature	79	^{o}F
Specific Humidity	0.012896	lb H_2O / lb air

30-70-30 Load, Run - PI 48-R6

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 11:00:09	16110	13.21	-0.18	-0.01	5.51	23.89	93.80	1,023.00
A2	05/28/14 11:00:39	16140	13.21	-0.15	-0.01	5.49	23.89	93.80	1,023.00
	05/28/14 11:01:09	16170	13.21	-0.20	0.01	5.52	23.86	93.90	1,020.00
	05/28/14 11:01:39	16200	13.28	-0.17	0.01	5.44	23.86	93.90	1,020.00
	05/28/14 11:02:09	16230	13.20	-0.17	-0.02	5.51	23.72	93.80	1,020.00
	05/28/14 11:02:39	16260	13.10	-0.16	-0.02	5.59	23.72	93.80	1,020.00
	05/28/14 11:03:09	16290	13.39	-0.22	0.02	5.50	10.85	93.80	649.00
	05/28/14 11:03:39	16320	15.07	0.19	0.03	4.21	10.85	93.80	649.00
	05/28/14 11:04:09	16350	13.72	0.07	0.00	5.13	10.44	93.80	643.00
	05/28/14 11:04:39	16380	13.54	-0.16	0.00	5.28	10.44	93.80	643.00
	05/28/14 11:05:09	16410	13.67	-0.23	0.01	5.20	10.82	93.60	638.00
	05/28/14 11:05:39	16440	14.11	-0.22	0.04	4.90	10.82	93.60	638.00
	05/28/14 11:06:09	16470	13.84	-0.23	0.02	5.02	10.68	93.50	633.00
	05/28/14 11:06:39	16500	13.88	-0.23	0.01	5.11	10.68	93.50	633.00
	05/28/14 11:07:09	16530	14.57	-0.21	0.05	4.65	10.57	93.30	633.00
	05/28/14 11:07:39	16560	14.19	-0.20	0.02	4.73	10.57	93.30	633.00
	05/28/14 11:08:09	16590	13.73	-0.24	-0.01	5.21	10.68	93.20	633.00
	05/28/14 11:08:39	16620	14.02	-0.23	0.00	4.90	10.68	93.20	633.00
	05/28/14 11:09:09	16650	13.84	-0.19	0.02	5.03	10.57	93.10	631.00
	05/28/14 11:09:39	16680	13.30	-0.23	-0.01	5.45	10.57	93.10	631.00
	05/28/14 11:10:09	16710	13.44	-0.23	-0.02	5.35	20.29	92.80	904.00
	05/28/14 11:10:39	16740	11.89	-0.31	0.00	6.27	20.29	92.80	904.00
	05/28/14 11:11:09	16770	13.74	-0.25	0.01	5.32	24.36	92.70	1,027.00
	05/28/14 11:11:39	16800	13.32	-0.03	0.01	5.38	24.36	92.70	1,027.00
	05/28/14 11:12:09	16830	13.13	-0.14	-0.02	5.57	23.58	92.50	1,014.00
	05/28/14 11:12:39	16860	13.19	-0.17	-0.02	5.52	23.58	92.50	1,014.00
	05/28/14 11:13:09	16890	13.31	-0.16	-0.01	5.45	23.58	92.50	1,017.00
	05/28/14 11:13:39	16920	13.21	-0.16	-0.01	5.50	23.58	92.50	1,017.00
	05/28/14 11:14:09	16950	13.20	-0.16	-0.01	5.50	23.72	92.50	1,017.00
	05/28/14 11:14:39	16980	13.19	-0.18	0.00	5.53	23.72	92.50	1,017.00
	05/28/14 11:15:09	17010	13.11	-0.21	0.00	5.58	23.58	92.50	1,019.00
	05/28/14 11:15:39	17040	13.23	-0.21	0.00	5.51	23.58	92.50	1,019.00
	05/28/14 11:16:09	17070	13.09	-0.17	-0.01	5.58	23.61	92.70	1,019.00
	05/28/14 11:16:39	17100	13.14	-0.18	0.00	5.57	23.61	92.70	1,019.00
	05/28/14 11:17:09	17130	13.06	-0.21	0.00	5.62	23.58	93.00	1,021.00
	05/28/14 11:17:39	17160	13.15	-0.20	-0.01	5.56	23.58	93.00	1,021.00
	05/28/14 11:18:09	17190	13.22	-0.17	-0.02	5.52	23.72	93.10	1,019.00
	05/28/14 11:18:39	17220	13.12	-0.19	-0.02	5.57	23.72	93.10	1,019.00
	05/28/14 11:19:09	17250	13.17	-0.18	-0.03	5.53	23.58	93.40	1,021.00
	05/28/14 11:19:39	17280	13.14	-0.18	-0.02	5.57	23.58	93.40	1,021.00
	05/28/14 11:20:09	17310	12.99	-0.22	0.02	5.64	18.19	93.40	865.00
A3	05/28/14 11:20:39	17340	13.33	-0.23	0.02	5.56	18.19	93.40	865.00
	05/28/14 11:21:09	17370	14.42	0.13	-0.03	4.59	13.18	93.50	716.00
	05/28/14 11:21:39	17400	12.69	-0.09	-0.03	5.81	13.18	93.50	716.00
	05/28/14 11:22:09	17430	12.64	-0.35	-0.01	5.87	12.26	93.50	691.00
	05/28/14 11:22:39	17460	12.49	-0.36	0.00	5.98	12.26	93.50	691.00
	05/28/14 11:23:09	17490	12.75	-0.39	-0.03	5.87	10.68	93.40	636.00
	05/28/14 11:23:39	17520	13.50	-0.32	-0.02	5.34	10.68	93.40	636.00
	05/28/14 11:24:09	17550	13.42	-0.22	-0.02	5.35	15.53	93.30	778.00
	05/28/14 11:24:39	17580	13.43	-0.24	-0.02	5.38	15.53	93.30	778.00
	05/28/14 11:25:09	17610	12.55	-0.23	0.07	6.01	23.56	93.30	986.00
	05/28/14 11:25:39	17640	14.96	-0.22	0.04	4.42	23.56	93.30	986.00
	05/28/14 11:26:09	17670	14.66	-0.02	0.03	4.48	23.94	93.30	1,022.00
	05/28/14 11:26:39	17700	14.29	-0.10	0.04	4.76	23.94	93.30	1,022.00
	05/28/14 11:27:09	17730	14.18	-0.11	0.02	4.82	23.94	93.40	1,016.00
	05/28/14 11:27:39	17760	13.69	-0.08	0.02	5.18	23.94	93.40	1,016.00
	05/28/14 11:28:09	17790	13.93	-0.09	0.02	4.99	23.67	93.50	1,021.00
	05/28/14 11:28:39	17820	13.62	-0.09	0.01	5.23	23.67	93.50	1,021.00
	05/28/14 11:29:09	17850	13.83	-0.07	0.01	5.10	23.67	93.70	1,020.00
	05/28/14 11:29:39	17880	13.80	-0.03	0.01	5.08	23.67	93.70	1,020.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.4	%
Stack Exhaust Flow (M2)	118,949	SCFH

Weather Data

Barometric Pressure	30.02	in. Hg
Relative Humidity	61	%
Ambient Temperature	79	^{o}F
Specific Humidity	0.012896	lb H_2O / lb air

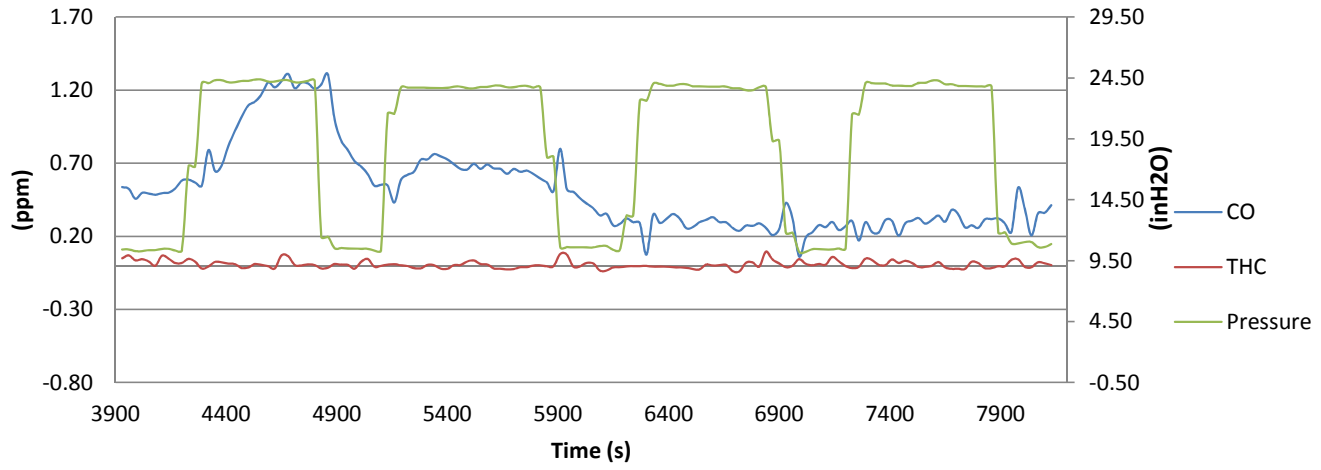
30-70-30 Load, Run - PI 48-R6

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 11:30:09	17910	13.89	-0.09	0.03	5.10	23.92	94.10	1,026.00
05/28/14 11:30:39	17940	13.89	-0.05	0.03	5.04	23.92	94.10	1,026.00
05/28/14 11:31:09	17970	13.82	-0.09	-0.02	5.05	23.72	94.60	1,024.00
05/28/14 11:31:39	18000	13.66	-0.12	-0.03	5.22	23.72	94.60	1,024.00
05/28/14 11:32:09	18030	13.82	-0.10	0.00	5.13	23.83	95.00	1,021.00
05/28/14 11:32:39	18060	13.90	-0.09	0.00	4.99	23.83	95.00	1,021.00
05/28/14 11:33:09	18090	13.81	-0.07	0.01	5.10	24.36	95.20	1,027.00
05/28/14 11:33:39	18120	13.87	0.00	0.02	5.09	24.36	95.20	1,027.00
05/28/14 11:34:09	18150	13.87	0.03	0.01	5.04	24.33	95.30	1,027.00
05/28/14 11:34:39	18180	14.43	0.05	0.09	4.72	24.33	95.30	1,027.00
05/28/14 11:35:09	18210	13.96	0.00	0.03	4.92	18.52	95.20	866.00
05/28/14 11:35:39	18240	13.85	0.00	0.03	5.09	18.52	95.20	866.00
05/28/14 11:36:09	18270	13.86	0.05	0.04	5.05	11.13	95.20	650.00
05/28/14 11:36:39	18300	14.32	0.01	0.04	4.87	11.13	95.20	650.00
05/28/14 11:37:09	18330	15.02	0.41	0.04	4.18	10.74	95.10	631.00
05/28/14 11:37:39	18360	14.61	0.24	0.11	4.60	10.74	95.10	631.00
05/28/14 11:38:09	18390	14.18	0.00	0.04	4.81	10.35	94.70	623.00
05/28/14 11:38:39	18420	14.17	-0.02	0.02	4.84	10.35	94.70	623.00
05/28/14 11:39:09	18450	14.12	0.01	0.02	4.85	10.35	94.40	621.00
05/28/14 11:39:39	18480	14.07	0.01	0.02	4.96	10.35	94.40	621.00
05/28/14 11:40:09	18510	14.13	0.04	0.02	4.85	10.35	94.10	624.00
RAW AVERAGE		**13.61**	**0.00**	**0.00**	**5.23**	**19.04**	**93.30**	**880.88**

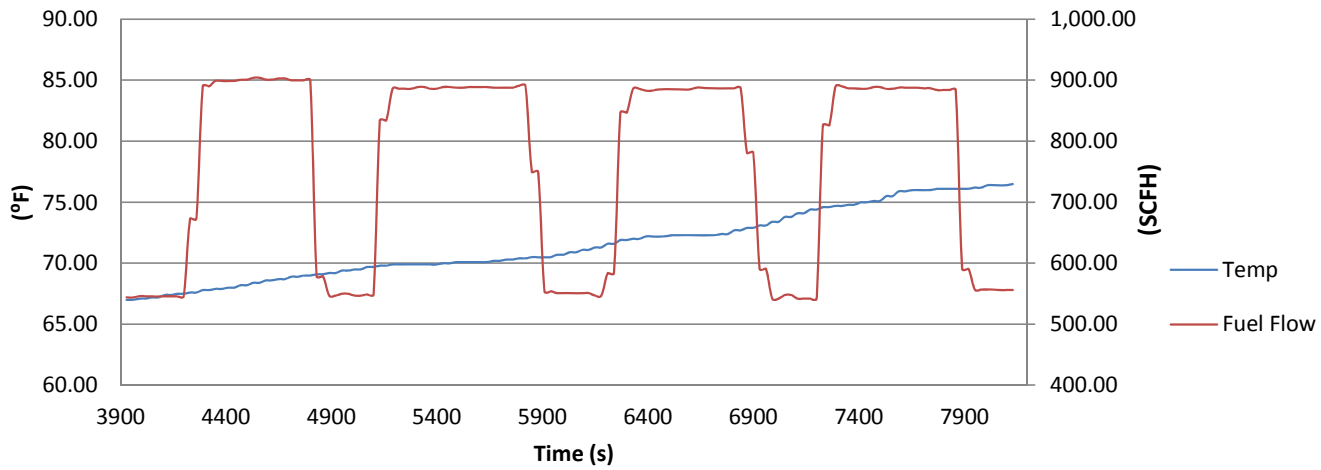
		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.07	-0.06	-0.01	0.07			
	Final Zero	0.11	-0.16	0.02	0.08			
	Avg. Zero	0.09	-0.11	0.01	0.08			
	Initial UpScale	12.22	8.67	3.14	8.74			
	Final UpScale	12.20	8.96	3.10	8.73			
	Avg. UpScale	12.21	8.82	3.12	8.74			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.61	0.11	0.00	5.22
Corrected Raw Average (ppm/% wet basis)	12.87	0.11	0.00	4.93
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

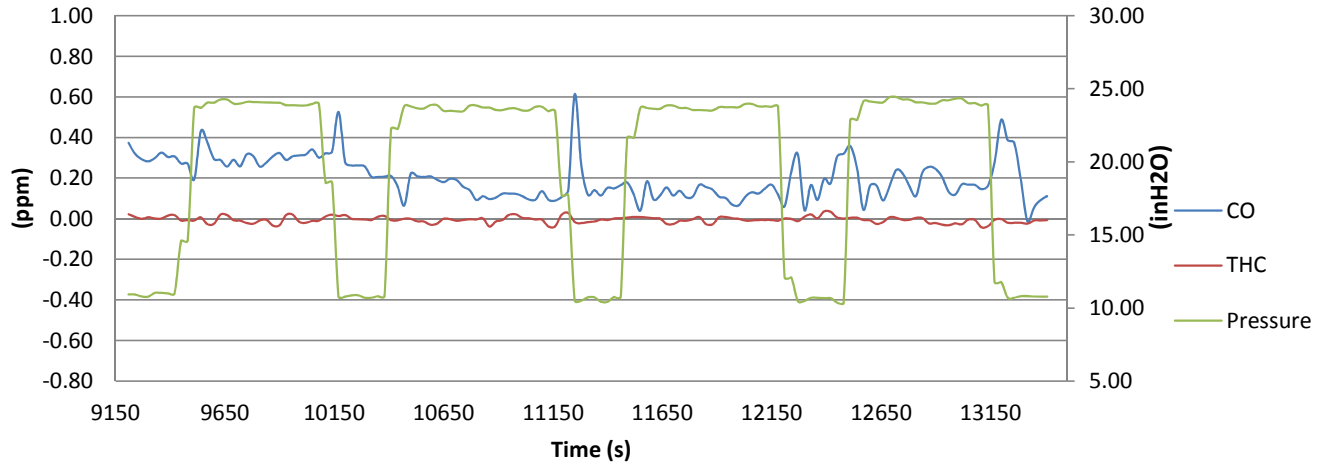
PI 48-R4



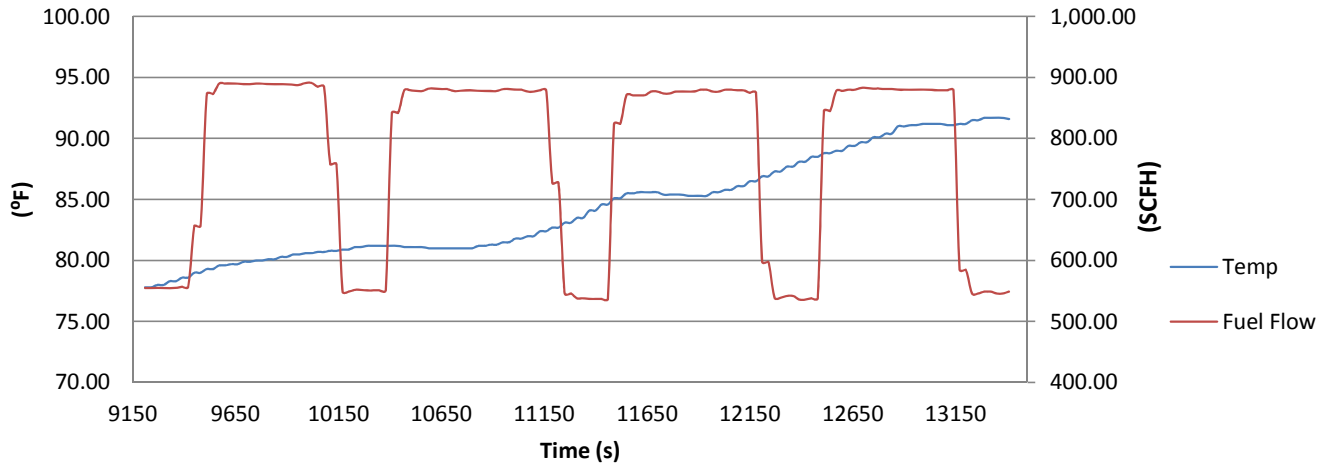
PI 48-R4



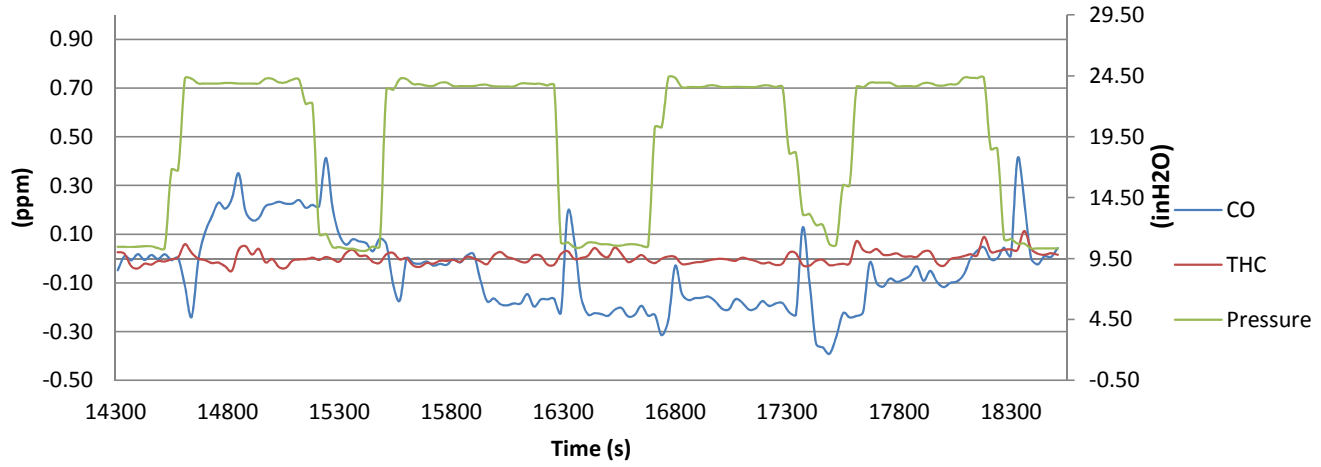
PI 48-R5



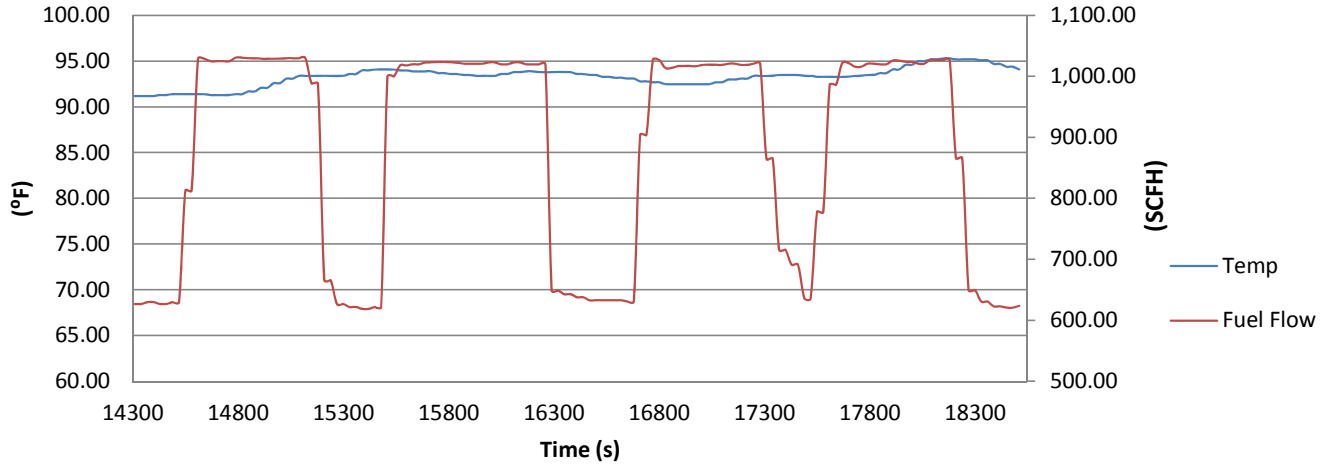
PI 48-R5

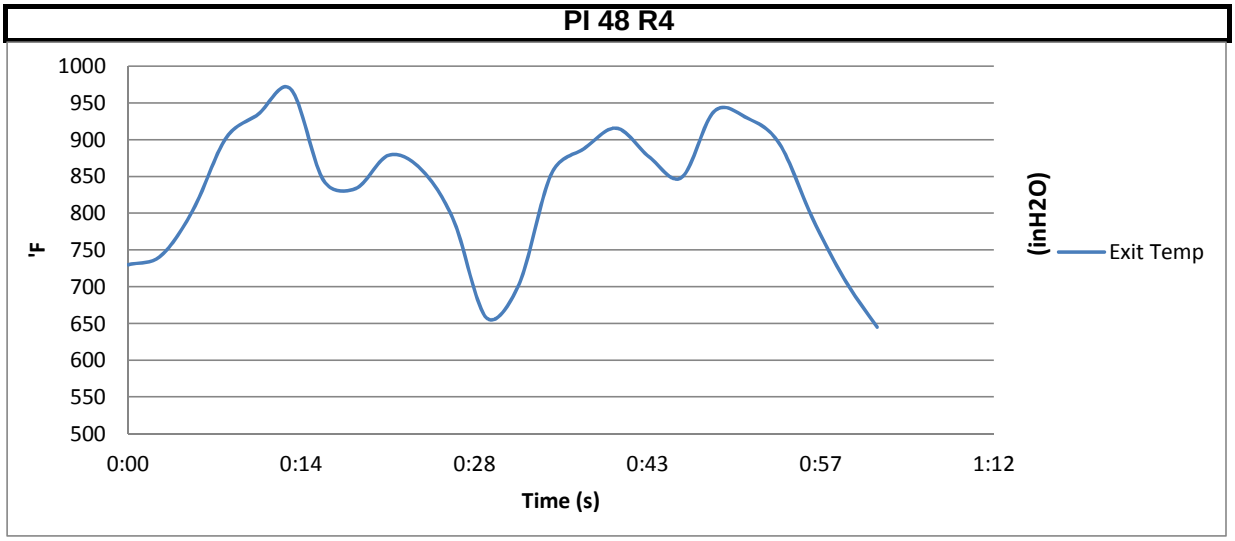


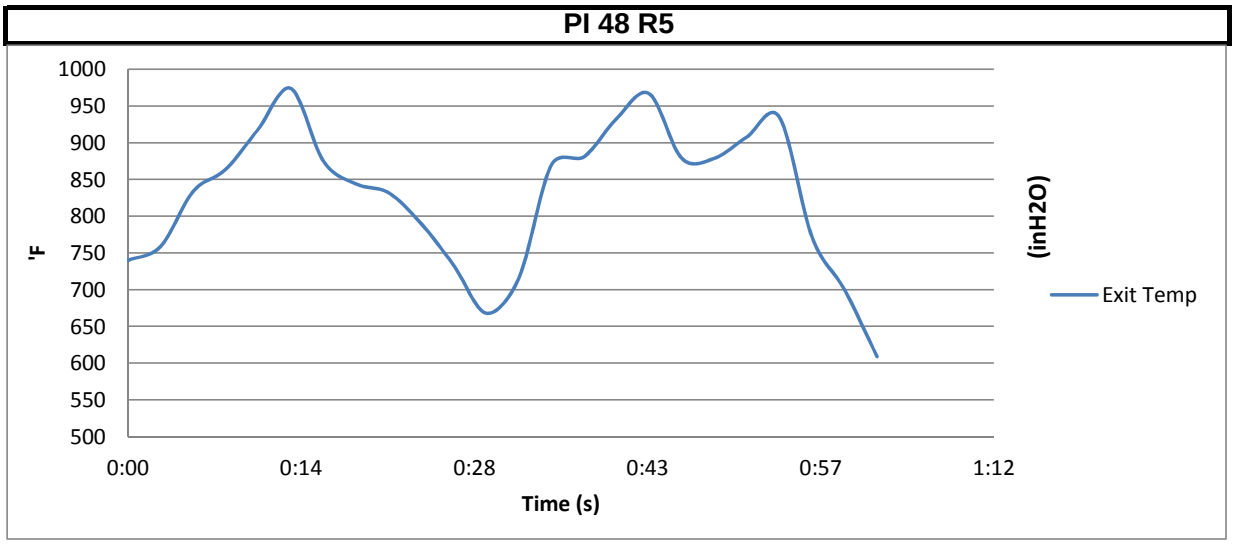
PI 48-R6

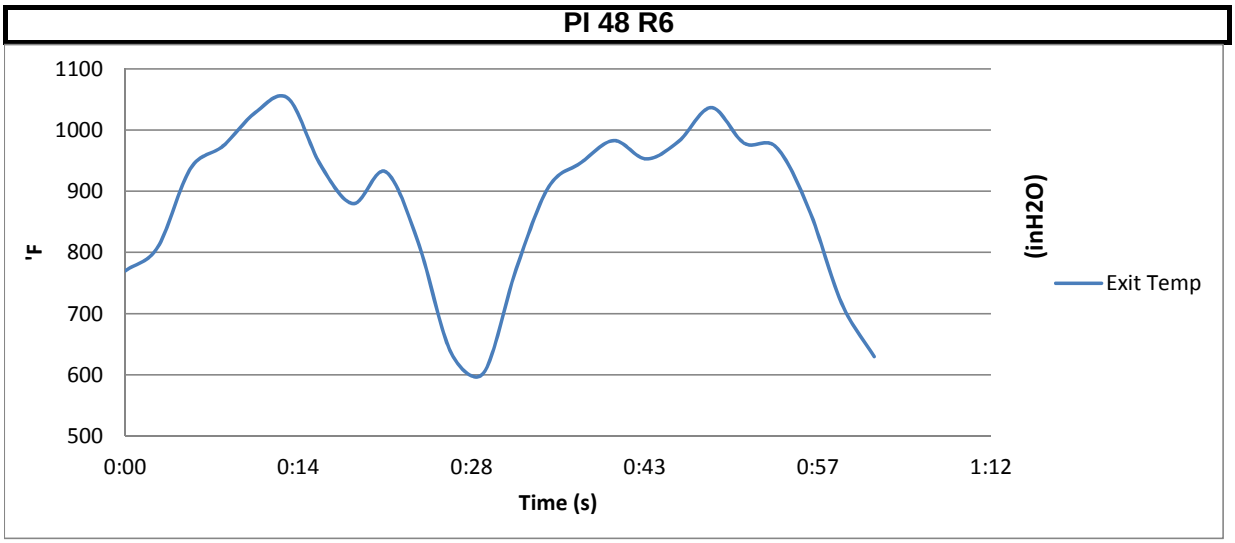


PI 48-R6




PI 48 R4
1000
950
900
850
800
750
700
650
600
550
500
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI 48 R5
1000
950
900
850
800
750
700
650
600
550
500
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI 48 R6
1100
1000
900
800
700
600
500
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp

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	Big Iron Steel Plant
Sampling Location	PI 48
Fuel Type	Gas, Propene

Test Information			
Project #		stk-14-elmorecity.ok-comp#1	
Operator		TP	
Date for Preliminary Run	(mm/dd/yy)	05/28/14	
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)	05/28/14	05/28/14	05/28/14	
Load	% or w/DB	70-100-70	70-100-70	70-100-70	
Meter Box Number	from ACS	SAMP-CP-0009	SAMP-CP-0009	SAMP-CP-0009	
Meter Calibration Factor	(Y)	0.968	0.968	0.968	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.796	1.796	1.796	in H_2O
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-FP-0001	SAMP-FP-0001	SAMP-FP-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-0035	SAMP-BC-0035	SAMP-BC-0035	

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	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Historical Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	**Average**	**Units**
Run Start Time	12:24	13:50	15:15		hh:mm
Run Stop Time	13:34	14:59	16:15		hh:mm
Test Date	05/28/14	05/28/14	05/28/14		mm/dd/yy
Meter Calibration Factor	0.968	0.968	0.968		
Pitot Tube Coefficient	0.819	0.819	0.819		
Stack Test Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	**Average**	**Units**
Initial Meter Volume	965.495	17.045	69.050		ft^3
Final Meter Volume	1016.835	68.820	120.810		ft^3
Total Meter Volume	51.340	51.775	51.760	51.625	ft^3
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	85.48	87.90	89.88	87.75	°F
Average Stack Temperature	957.50	986.63	978.54	974.22	°F
Barometric Pressure	30.02	30.00	30.00	30.01	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	30.02	30.00	30.00	30.01	in Hg
Average Orifice Pressure Drop	1.80	1.80	1.80	1.80	in H_2O
Absolute Meter Pressure	30.15	30.13	30.13	30.14	in Hg
Avg Square Root Pitot Pressure	0.09	0.10	0.10	0.10	$\sqrt{(in\ H_2O)}$
Moisture Content Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	**Average**	**Units**
Impinger Water Weight Gain	49.90	57.50	52.60	53.33	g
Silica Gel Weight Gain	10.10	6.10	14.30	10.17	g
Total Water Volume Collected	60.11	63.71	67.02	63.61	ml
Standard Water Vapor Volume	2.83	3.00	3.15	2.99	scf
Standard Meter Volume	48.5	48.6	48.5	48.5	dscf
Calculated Stack Moisture	5.51	5.81	6.11	5.81	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	5.51	5.81	6.11	5.81	%
Gas Analysis Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	**Average**	**Units**
Carbon Dioxide Content	5.5	5.3	5.3	5.4	%
Oxygen Content	14.8	14.9	14.9	14.9	%
Nitrogen Content	79.8	79.8	79.8	79.8	%
Stack Dry Molecular Weight	29.51	29.44	29.46	29.47	lb/lb-mole
Stack Wet Molecular Weight	28.88	28.77	28.76	28.80	lb/lb-mole
Percent Excess Air	236.2	241.6	241.6	239.8	%
Volumetric Flow Rate Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	**Average**	**Units**
Average Stack Gas Velocity	8.50	8.96	8.79	8.75	ft/sec
Stack Cross-Sectional Area	11.79	11.79	11.79	11.79	ft^2
Actual Stack Flow Rate	6,017	6,339	6,223	6,193	acfm
Wet Standard Stack Flow Rate	135	139	137	137	wkscfh
Dry Standard Stack Flow Rate	127,482	131,099	129,006	129,196	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/28/14		
Sampling Location	PI 48	**Operator**	TP		
Project #	stk-14-elmorecity.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**	05/28/14	**Run Start Time**	12:24	**Run Stop Time**	13:34
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	(%CO_2)	(%O_2)	(ppmCO)	(%N_2)	(M_d)	(F_o)$_{avg}$	(%EA)$_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.5	14.8	0.0	79.8	29.51	1.103	236.2	N/A

Gas Analysis Data								
Run Number	70-100-70%-8		**Date**	05/28/14	**Run Start Time**	13:50	**Run Stop Time**	14:59
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	(%CO_2)	(%O_2)	(ppmCO)	(%N_2)	(M_d)	(F_o)$_{avg}$	(%EA)$_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:09	5.3	14.9	0.0	79.8	29.44	1.136	241.6	N/A

Gas Analysis Data								
Run Number	70-100-70%-9		**Date**	05/28/14	**Run Start Time**	15:15	**Run Stop Time**	16:15
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	(%CO_2)	(%O_2)	(ppmCO)	(%N_2)	(M_d)	(F_o)$_{avg}$	(%EA)$_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:00	5.3	14.9	0.0	79.8	29.46	1.126	241.6	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/28/14
Sampling Location	PI 48	**Operator**	TP
Project #	stk-14-elmorecity.ok-comp#1	**Ports Used**	2

Moisture Content Data									
Run Number		70-100-70%-7		**Date**	05/28/14	**Start Time**	12:24	**Stop Time**	13:34
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.340	dcf		**Barometric Pressure**	(P_b)	30.02	in Hg
Average Stack Temp		(t_s)$_{avg}$	958	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	85	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	872.30	799.80	566.30	850.30				
Initial Value	(V_i),(W_i)	831.60	792.30	564.60	840.20				
Net Value	(V_n),(W_n)	40.7	7.5	1.7	10.1				
Results									
Total Weight	(W_t)	60.00	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.829	scf	
Std Meter Volume	($V_{m(std)}$)	48.478	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	5.51	%		**Final Moisture Content**	(B_{ws})	5.51	%	

Moisture Content Data									
Run Number		70-100-70%-8		**Date**	05/28/14	**Start Time**	13:50	**Stop Time**	14:59
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.775	dcf		**Barometric Pressure**	(P_b)	30.00	in Hg
Average Stack Temp		(t_s)$_{avg}$	987	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	88	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	921.00	796.00	571.70	803.40				
Initial Value	(V_i),(W_i)	876.60	785.30	569.30	797.30				
Net Value	(V_n),(W_n)	44.4	10.7	2.4	6.1				
Results									
Total Weight	(W_t)	63.60	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.999	scf	
Std Meter Volume	($V_{m(std)}$)	48.641	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	5.81	%		**Final Moisture Content**	(B_{ws})	5.81	%	

Moisture Content Data									
Run Number		70-100-70%-9		**Date**	05/28/14	**Start Time**	15:15	**Stop Time**	16:15
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.760	dcf		**Barometric Pressure**	(P_b)	30.00	in Hg
Average Stack Temp		(t_s)$_{avg}$	979	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	90	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	913.40	809.40	568.20	884.80				
Initial Value	(V_i),(W_i)	872.30	799.80	566.30	870.50				
Net Value	(V_n),(W_n)	41.1	9.6	1.9	14.3				
Results									
Total Weight	(W_t)	66.90	g		**Water Vol Weighed**	($V_{wsg(std)}$)	3.154	scf	
Std Meter Volume	($V_{m(std)}$)	48.452	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	6.11	%		**Final Moisture Content**	(B_{ws})	6.11	%	

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	70-100-70%-7

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	957.5	°F
Average Meter Temp	(t_m)	85.5	
Orifice Meter Coefficient	(ΔH@)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}{}_{avg}$)	0.09	in H_2O
Stack Moisture Content	(B_{ws})	5.51	%
Stack Dry Molecular Weight	(M_d)	29.51	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.15	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.18	in H_2O for	15.0	sec
	Post (+)	0.15	in H_2O for	15.0	sec
	Post (-)	0.16	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4659	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	30.02	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	30.02	in Hg
Absolute Meter Pressure	(P_m)	30.15	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	12:24	**End**	13:34

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	831.6	792.3	564.6	840.2				
Post	872.3	799.8	566.3	850.3				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	965.495	0.005	1.796	1.80	889	250		68			79	78	4.0	0.07	6.18	2.013		48.322
A-2	2.7	00:02:43	967.600	0.005	1.796	1.80	945	250		66			82	78	4.0	0.07	6.30	4.031		48.370
A-3	5.4	00:05:25	969.715	0.010	1.796	1.80	1014	250		66			87	78	4.0	0.10	9.13	5.982		47.855
A-4	8.1	00:08:07	971.770	0.010	1.796	1.80	1048	250		68			89	78	4.0	0.10	9.23	8.053		48.316
A-5	10.8	00:10:50	973.955	0.020	1.796	1.80	1088	250		63			92	79	4.0	0.14	13.23	10.021		48.102
A-6	13.5	00:13:33	976.040	0.015	1.796	1.80	1100	250		63			92	79	4.0	0.12	11.50	12.042		48.168
A-7	16.3	00:16:15	978.180	0.015	1.796	1.80	1099	250		61			93	80	4.0	0.12	11.50	14.073		48.250
A-8	19.0	00:18:58	980.335	0.010	1.796	1.80	1026	250		60			94	80	4.0	0.10	9.17	16.112		48.335
A-9	21.7	00:21:40	982.500	0.010	1.796	1.80	978	250		60			94	80	4.0	0.10	9.02	18.193		48.514
A-10	24.4	00:24:22	984.710	0.005	1.796	1.80	842	250		59			93	81	4.0	0.07	6.07	20.264		48.634
A-11	27.1	00:27:05	986.910	0.005	1.796	1.80	854	250		58			93	81	4.0	0.07	6.10	22.345		48.753
A-12	29.8	00:29:47	989.120	0.005	1.796	1.80	782	250		59			92	81	4.0	0.07	5.93	24.452		48.903
B-1	32.5	00:32:30	991.355	0.005	1.796	1.80	931	250		66			85	80	4.0	0.07	6.27	26.536		48.989
B-2	35.2	00:35:12	993.550	0.005	1.796	1.80	944	250		58			92	80	4.0	0.07	6.30	28.540		48.926
B-3	37.9	00:37:55	995.675	0.005	1.796	1.80	987	250		59			92	80	4.0	0.07	6.40	30.606		48.970
B-4	40.6	00:40:37	997.865	0.010	1.796	1.80	998	250		60			92	80	4.0	0.10	9.08	32.451		48.676
B-5	43.3	00:43:20	999.820	0.010	1.796	1.80	1038	250		61			92	80	4.0	0.10	9.20	34.601		48.849
B-6	46.0	00:46:03	1002.100	0.010	1.796	1.80	1045	250		61			93	80	4.0	0.10	9.23	36.279		48.372
B-7	48.8	00:48:45	1003.880	0.010	1.796	1.80	1057	250		61			94	80	4.0	0.10	9.26	38.370		48.467
B-8	51.5	00:51:28	1006.100	0.010	1.796	1.80	1050	250		61			95	80	4.0	0.10	9.24	40.392		48.471
B-9	54.2	00:54:10	1008.250	0.010	1.796	1.80	986	250		62			95	80	4.0	0.10	9.04	42.321		48.367
B-10	56.9	00:56:53	1010.300	0.01	1.796	1.80	860	250		63			93	81	4.0	0.10	8.64	44.336		48.366
B-11	59.6	00:59:35	1012.440	0.01	1.796	1.80	739	250		62			92	81	4.0	0.10	8.23	47.079		49.125
B-12	62.3	01:02:18	1015.350	0.02	1.796	1.80	680	250		62			92	81	4.0	0.12	9.83	48.478		48.478
Last Pt	65.0	01:05:00	1016.835																	
Final Val	65.0	01:05:00	1016.835											**Max Vac**	4.0	**Final Values**		48.478		
Average Values				0.01		1.80	958	250		62			91	80		0.09	8.50			
													85							

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	70-100-70%-8

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	986.6	°F
Average Meter Temp	(t_m)	87.9	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.10	in H_2O
Stack Moisture Content	(B_{ws})	5.81	%
Stack Dry Molecular Weight	(M_d)	29.44	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.20	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.22	in H_2O for	15.0	sec
	Post (+)	0.14	in H_2O for	15.0	sec
	Post (-)	0.16	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4611	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	30.00	in Hg
Absolute Meter Pressure	(P_m)	30.13	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	13:50	**End**	14:59

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	876.6	785.3	569.3	797.3				
Post	921.0	796.0	571.7	803.4				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	17.045	0.005	1.796	1.80	893	250		68			87	80	4.5	0.07	6.20	1.994		47.846
A-2	2.7	00:02:43	19.150	0.005	1.796	1.80	919	250		64			92	80	5.0	0.07	6.26	3.997		47.963
A-3	5.4	00:05:25	21.275	0.010	1.796	1.80	1001	250		65			93	80	5.0	0.10	9.11	5.998		47.987
A-4	8.1	00:08:07	23.400	0.010	1.796	1.80	1052	250		65			94	81	5.0	0.10	9.27	8.001		48.005
A-5	10.8	00:10:50	25.530	0.015	1.796	1.80	1064	250		65			94	81	5.0	0.12	11.39	10.088		48.422
A-6	13.5	00:13:33	27.750	0.020	1.796	1.80	1097	250		66			94	81	5.0	0.14	13.30	12.109		48.437
A-7	16.3	00:16:15	29.900	0.015	1.796	1.80	1070	250		67			94	81	5.0	0.12	11.42	14.055		48.190
A-8	19.0	00:18:58	31.970	0.015	1.796	1.80	1057	250		68			94	81	5.0	0.12	11.37	16.086		48.258
A-9	21.7	00:21:40	34.130	0.010	1.796	1.80	1032	250		68			94	81	5.0	0.10	9.21	18.136		48.362
A-10	24.4	00:24:22	36.310	0.010	1.796	1.80	972	250		61			95	81	5.0	0.10	9.02	20.282		48.677
A-11	27.1	00:27:05	38.595	0.010	1.796	1.80	956	250		60			95	81	5.0	0.10	8.97	22.339		48.740
A-12	29.8	00:29:47	40.785	0.005	1.796	1.80	805	250		60			96	81	5.0	0.07	5.99	24.385		48.770
B-1	32.5	00:32:30	42.965	0.005	1.796	1.80	978	250		68			88	81	5.0	0.07	6.39	26.479		48.884
B-2	35.2	00:35:12	45.180	0.005	1.796	1.80	965	250		61			95	81	5.0	0.07	6.36	28.376		48.645
B-3	37.9	00:37:55	47.200	0.005	1.796	1.80	991	250		62			96	81	5.0	0.07	6.42	30.389		48.622
B-4	40.6	00:40:37	49.345	0.010	1.796	1.80	1011	250		63			96	82	5.0	0.10	9.14	32.381		48.572
B-5	43.3	00:43:20	51.470	0.010	1.796	1.80	1049	250		63			97	82	5.0	0.10	9.26	34.325		48.459
B-6	46.0	00:46:03	53.545	0.010	1.796	1.80	1053	250		62			96	83	5.0	0.10	9.27	36.381		48.508
B-7	48.8	00:48:45	55.740	0.015	1.796	1.80	1068	250		62			96	83	5.0	0.12	11.41	38.358		48.452
B-8	51.5	00:51:28	57.850	0.015	1.796	1.80	1053	250		61			95	83	5.0	0.12	11.35	40.388		48.465
B-9	54.2	00:54:10	60.015	0.020	1.796	1.80	993	250		62			95	83	5.0	0.14	12.85	42.408		48.466
B-10	56.9	00:56:53	62.170	0.010	1.796	1.80	970	250		61			95	83	5.0	0.10	9.01	44.424		48.462
B-11	59.6	00:59:35	64.320	0.005	1.796	1.80	873	250		63			95	83	5.0	0.07	6.15	46.487		48.508
B-12	62.3	01:02:18	66.520	0.005	1.796	1.80	757	250		63			96	83	5.0	0.07	5.88	48.641		48.641
Last Pt	65.0	01:05:00	68.820																	
Final Val	65.0	01:05:00	68.820											**Max Vac**	5.0	**Final Values**		48.641		
Average Values				0.01		1.80	987	250		64			94	82		0.10	8.96			
													88							

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

Plant Name	Big Iron Steel Plant
Sampling Location	PI 48
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	70-100-70%-9

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	978.5	°F
Average Meter Temp	(t_m)	89.9	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.10	in H_2O
Stack Moisture Content	(B_{ws})	6.11	%
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	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.20	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.22	in H_2O for	15.0	sec
	Post (+)	0.16	in H_2O for	15.0	sec
	Post (-)	0.10	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4622	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	30.00	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	30.00	in Hg
Absolute Meter Pressure	(P_m)	30.13	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	15:15	**End**	16:15

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	872.3	799.8	566.3	870.5				
Post	913.4	809.4	568.2	884.8				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	69.050	0.005	1.796	1.80	906	250		68			86	83	3.5	0.07	6.23	2.056		49.346
A-2	2.7	00:02:43	71.225	0.005	1.796	1.80	963	250		66			91	83	3.5	0.07	6.36	4.136		49.629
A-3	5.4	00:05:25	73.435	0.010	1.796	1.80	963	250		63			93	83	3.5	0.10	8.99	6.183		49.467
A-4	8.1	00:08:07	75.615	0.010	1.796	1.80	1018	250		61			96	83	3.5	0.10	9.16	8.090		48.538
A-5	10.8	00:10:50	77.650	0.010	1.796	1.80	1054	250		61			98	84	3.5	0.10	9.28	10.112		48.538
A-6	13.5	00:13:33	79.815	0.015	1.796	1.80	1067	250		61			98	84	3.5	0.12	11.41	12.079		48.314
A-7	16.3	00:16:15	81.920	0.015	1.796	1.80	1076	250		60			98	84	3.5	0.12	11.44	14.092		48.314
A-8	19.0	00:18:58	84.075	0.015	1.796	1.80	1062	250		60			98	84	3.5	0.12	11.39	16.152		48.455
A-9	21.7	00:21:40	86.280	0.015	1.796	1.80	1036	250		60			98	84	3.5	0.12	11.29	18.169		48.452
A-10	24.4	00:24:22	88.440	0.010	1.796	1.80	986	250		60			98	84	3.5	0.10	9.06	20.187		48.449
A-11	27.1	00:27:05	90.600	0.005	1.796	1.80	872	250		60			98	84	3.5	0.07	6.15	22.203		48.443
A-12	29.8	00:29:47	92.758	0.005	1.796	1.80	753	250		60			98	84	3.5	0.07	5.87	24.354		48.707
B-1	32.5	00:32:30	95.060	0.005	1.796	1.80	911	250		68			88	84	3.5	0.07	6.24	26.371		48.685
B-2	35.2	00:35:12	97.200	0.005	1.796	1.80	994	250		61			96	84	3.5	0.07	6.43	28.336		48.577
B-3	37.9	00:37:55	99.300	0.010	1.796	1.80	1012	250		61			96	84	3.5	0.10	9.15	30.302		48.483
B-4	40.6	00:40:37	101.400	0.010	1.796	1.80	1048	250		62			95	84	3.5	0.10	9.26	32.358		48.537
B-5	43.3	00:43:20	103.595	0.010	1.796	1.80	1043	250		62			97	84	3.5	0.10	9.24	34.373		48.526
B-6	46.0	00:46:03	105.750	0.010	1.796	1.80	1073	250		63			96	84	3.5	0.10	9.33	36.399		48.532
B-7	48.8	00:48:45	107.915	0.015	1.796	1.80	1106	250		63			96	84	3.5	0.12	11.55	38.425		48.537
B-8	51.5	00:51:28	110.080	0.015	1.796	1.80	1048	250		64			96	84	3.5	0.12	11.34	40.423		48.508
B-9	54.2	00:54:10	112.215	0.010	1.796	1.80	997	250		65			97	84	3.5	0.10	9.10	42.223		48.255
B-10	56.9	00:56:53	114.140	0.015	1.796	1.80	940	250		65			98	84	3.5	0.12	10.92	44.264		48.288
B-11	59.6	00:59:35	116.325	0.005	1.796	1.80	853	250		66			98	84	3.5	0.07	6.11	46.362		48.377
B-12	62.3	01:02:18	118.570	0.005	1.796	1.80	704	250		66			99	84	3.5	0.07	5.75	48.452		48.452
Last Pt	65.0	01:05:00	120.810																	
Final Val	65.0	01:05:00	120.810											**Max Vac**	3.5	**Final Values**		48.452		
Average Values				0.01		1.80	979	250		63			96	84		0.10	8.79			
													90							

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.5	%
Stack Exhaust Flow (M2)	127,482	SCFH

Weather Data

Barometric Pressure	30.02	in. Hg
Relative Humidity	59	%
Ambient Temperature	78	^{o}F
Specific Humidity	0.012054	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R7

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 12:24:09	21150	13.41	-0.17	-0.01	5.37	24.69	93.20	1,040.00
	05/28/14 12:24:39	21180	13.35	-0.15	-0.01	5.41	24.69	93.10	1,040.00
	05/28/14 12:25:09	21210	13.62	-0.15	-0.02	5.21	24.69	93.10	1,040.00
	05/28/14 12:25:39	21240	13.40	-0.17	-0.02	5.38	24.69	93.10	1,040.00
	05/28/14 12:26:09	21270	13.43	-0.16	-0.02	5.36	24.69	93.10	1,040.00
	05/28/14 12:26:39	21300	13.51	-0.14	-0.01	5.31	24.69	93.20	1,043.00
	05/28/14 12:27:09	21330	13.38	-0.15	-0.02	5.39	24.69	93.20	1,043.00
	05/28/14 12:27:39	21360	13.49	-0.15	-0.01	5.31	29.67	93.30	1,149.00
	05/28/14 12:28:09	21390	12.60	-0.19	0.00	5.96	29.67	93.30	1,149.00
	05/28/14 12:28:39	21420	14.04	-0.10	0.00	4.95	34.90	93.40	1,257.00
	05/28/14 12:29:09	21450	14.18	0.06	0.01	4.89	34.90	93.40	1,257.00
	05/28/14 12:29:39	21480	14.22	0.11	0.01	4.80	34.90	93.40	1,259.00
	05/28/14 12:30:09	21510	14.23	0.11	-0.02	4.79	34.90	93.40	1,259.00
	05/28/14 12:30:39	21540	14.23	0.15	-0.02	4.82	34.90	93.50	1,259.00
	05/28/14 12:31:09	21570	14.19	0.17	-0.03	4.80	34.90	93.50	1,259.00
	05/28/14 12:31:39	21600	14.28	0.16	0.00	4.80	34.90	93.70	1,261.00
	05/28/14 12:32:09	21630	14.35	0.19	0.00	4.71	34.90	93.70	1,261.00
	05/28/14 12:32:39	21660	14.23	0.16	0.00	4.80	34.74	94.00	1,260.00
	05/28/14 12:33:09	21690	14.31	0.14	-0.01	4.76	34.74	94.00	1,260.00
	05/28/14 12:33:39	21720	14.31	0.13	0.00	4.75	34.99	94.20	1,263.00
	05/28/14 12:34:09	21750	14.26	0.13	-0.02	4.79	34.99	94.20	1,263.00
	05/28/14 12:34:39	21780	14.29	0.30	-0.02	4.78	34.96	94.30	1,260.00
	05/28/14 12:35:09	21810	14.24	0.53	-0.02	4.79	34.96	94.30	1,260.00
	05/28/14 12:35:39	21840	14.24	0.27	-0.03	4.80	34.93	94.40	1,263.00
	05/28/14 12:36:09	21870	14.30	0.12	-0.02	4.76	34.93	94.40	1,263.00
	05/28/14 12:36:39	21900	14.13	0.16	-0.02	4.85	34.79	94.30	1,259.00
	05/28/14 12:37:09	21930	14.18	0.12	-0.02	4.83	34.79	94.30	1,259.00
	05/28/14 12:37:39	21960	14.17	0.07	-0.01	4.85	34.90	94.30	1,260.00
	05/28/14 12:38:09	21990	14.23	0.09	-0.01	4.80	34.90	94.30	1,260.00
	05/28/14 12:38:39	22020	14.24	0.07	0.00	4.80	34.77	94.20	1,260.00
	05/28/14 12:39:09	22050	14.26	0.14	0.01	4.79	34.77	94.20	1,260.00
	05/28/14 12:39:39	22080	14.23	0.08	0.00	4.80	35.15	94.10	1,261.00
	05/28/14 12:40:09	22110	14.19	0.05	0.01	4.87	35.15	94.10	1,261.00
	05/28/14 12:40:39	22140	14.34	0.26	0.01	4.62	25.80	94.10	1,071.00
	05/28/14 12:41:09	22170	13.16	-0.05	0.00	5.54	25.80	94.10	1,071.00
	05/28/14 12:41:39	22200	13.29	-0.25	-0.01	5.45	23.94	94.20	1,025.00
	05/28/14 12:42:09	22230	13.44	-0.25	0.00	5.35	23.94	94.20	1,025.00
	05/28/14 12:42:39	22260	13.33	-0.25	-0.01	5.42	24.19	94.20	1,029.00
	05/28/14 12:43:09	22290	13.40	-0.25	-0.03	5.37	24.19	94.20	1,029.00
	05/28/14 12:43:39	22320	13.36	-0.28	-0.02	5.41	24.30	94.30	1,032.00
	05/28/14 12:44:09	22350	13.35	-0.27	0.01	5.41	24.30	94.30	1,032.00
	05/28/14 12:44:39	22380	13.08	-0.01	0.01	5.51	30.48	94.40	1,162.00
	05/28/14 12:45:09	22410	13.59	0.08	0.00	5.43	30.48	94.40	1,162.00
	05/28/14 12:45:39	22440	14.30	0.46	0.00	4.72	33.60	94.40	1,237.00
	05/28/14 12:46:09	22470	14.17	0.48	0.00	4.83	33.60	94.40	1,237.00
	05/28/14 12:46:39	22500	14.00	0.46	0.00	4.95	34.66	94.50	1,256.00
	05/28/14 12:47:09	22530	14.06	0.46	-0.01	4.91	34.66	94.50	1,256.00
	05/28/14 12:47:39	22560	14.03	0.48	0.00	4.93	34.90	94.50	1,257.00
	05/28/14 12:48:09	22590	14.14	0.43	-0.02	4.88	34.90	94.50	1,257.00
	05/28/14 12:48:39	22620	14.15	0.45	-0.01	4.85	34.63	94.40	1,256.00
	05/28/14 12:49:09	22650	13.98	0.47	-0.01	4.94	34.63	94.40	1,256.00
	05/28/14 12:49:39	22680	13.55	0.39	-0.01	5.24	34.49	94.40	1,256.00
	05/28/14 12:50:09	22710	13.65	0.35	-0.02	5.20	34.49	94.40	1,256.00
	05/28/14 12:50:39	22740	13.54	0.41	-0.02	5.25	34.74	94.20	1,257.00
	05/28/14 12:51:09	22770	13.58	1.05	-0.02	5.25	34.74	94.20	1,257.00
	05/28/14 12:51:39	22800	13.44	1.28	-0.03	5.33	34.88	94.10	1,260.00
	05/28/14 12:52:09	22830	13.41	0.63	0.00	5.34	34.88	94.10	1,260.00
	05/28/14 12:52:39	22860	13.54	0.53	0.00	5.29	34.49	94.00	1,257.00
	05/28/14 12:53:09	22890	13.56	0.71	-0.02	5.24	34.49	94.00	1,257.00
	05/28/14 12:53:39	22920	13.55	0.60	-0.02	5.27	34.49	94.00	1,259.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.5	%
Stack Exhaust Flow (M2)	127,482	SCFH

Weather Data

Barometric Pressure	30.02	in. Hg
Relative Humidity	59	%
Ambient Temperature	78	^{o}F
Specific Humidity	0.012054	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R7

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 12:54:09	22950	13.47	0.51	-0.01	5.30	34.49	94.00	1,259.00
A2	05/28/14 12:54:39	22980	13.51	0.42	0.00	5.29	34.60	94.20	1,259.00
	05/28/14 12:55:09	23010	13.42	0.46	0.00	5.36	34.60	94.20	1,259.00
	05/28/14 12:55:39	23040	13.52	0.49	0.00	5.30	34.85	94.40	1,262.00
	05/28/14 12:56:09	23070	13.54	0.51	0.00	5.27	34.85	94.40	1,262.00
	05/28/14 12:56:39	23100	13.42	0.61	0.00	5.35	30.78	94.70	1,176.00
	05/28/14 12:57:09	23130	14.01	0.56	-0.03	5.06	30.78	94.70	1,176.00
	05/28/14 12:57:39	23160	13.49	2.16	-0.02	5.15	24.97	95.00	1,051.00
	05/28/14 12:58:09	23190	12.91	0.72	0.01	5.72	24.97	95.00	1,051.00
	05/28/14 12:58:39	23220	13.00	0.20	0.00	5.64	24.03	95.40	1,026.00
	05/28/14 12:59:09	23250	12.98	0.63	0.00	5.67	24.03	95.40	1,026.00
	05/28/14 12:59:39	23280	12.93	0.68	0.00	5.66	24.00	95.80	1,023.00
	05/28/14 13:00:09	23310	12.95	0.17	-0.03	5.68	24.00	95.80	1,023.00
	05/28/14 13:00:39	23340	12.95	0.11	-0.03	5.66	24.11	96.00	1,022.00
	05/28/14 13:01:09	23370	12.94	0.36	-0.01	5.67	24.11	96.00	1,022.00
	05/28/14 13:01:39	23400	12.43	0.61	-0.02	5.90	32.25	96.10	1,204.00
	05/28/14 13:02:09	23430	12.55	0.19	0.03	6.15	32.25	96.10	1,204.00
	05/28/14 13:02:39	23460	13.88	0.41	0.01	5.06	32.47	96.00	1,208.00
	05/28/14 13:03:09	23490	13.77	0.52	0.00	5.08	32.47	96.00	1,208.00
	05/28/14 13:03:39	23520	13.72	0.54	0.01	5.16	33.52	95.90	1,230.00
	05/28/14 13:04:09	23550	13.71	0.54	-0.02	5.10	33.52	95.90	1,230.00
	05/28/14 13:04:39	23580	13.57	0.50	-0.01	5.26	33.77	95.70	1,234.00
	05/28/14 13:05:09	23610	13.66	0.46	-0.01	5.18	33.77	95.70	1,234.00
	05/28/14 13:05:39	23640	13.73	0.52	-0.01	5.14	33.11	95.60	1,230.00
	05/28/14 13:06:09	23670	13.68	0.52	0.01	5.15	33.11	95.60	1,230.00
	05/28/14 13:06:39	23700	13.68	0.48	0.01	5.17	33.35	95.50	1,231.00
	05/28/14 13:07:09	23730	13.63	0.49	0.02	5.19	33.35	95.50	1,231.00
	05/28/14 13:07:39	23760	13.76	0.48	0.02	5.12	33.22	95.70	1,230.00
	05/28/14 13:08:09	23790	13.74	0.54	-0.03	5.10	33.22	95.70	1,230.00
	05/28/14 13:08:39	23820	13.77	0.57	-0.02	5.12	33.47	96.00	1,233.00
	05/28/14 13:09:09	23850	13.66	0.56	-0.01	5.16	33.47	96.00	1,233.00
	05/28/14 13:09:39	23880	13.72	0.54	-0.01	5.14	33.44	96.50	1,231.00
	05/28/14 13:10:09	23910	13.66	0.50	0.01	5.19	33.44	96.50	1,231.00
	05/28/14 13:10:39	23940	13.68	0.51	0.00	5.16	33.55	96.80	1,234.00
	05/28/14 13:11:09	23970	13.64	0.46	-0.03	5.18	33.55	96.80	1,234.00
	05/28/14 13:11:39	24000	13.76	0.51	-0.03	5.12	33.13	96.90	1,232.00
	05/28/14 13:12:09	24030	13.66	0.54	0.02	5.17	33.13	96.90	1,232.00
	05/28/14 13:12:39	24060	13.65	0.51	0.02	5.20	33.49	97.20	1,230.00
	05/28/14 13:13:09	24090	13.59	0.44	-0.01	5.23	33.49	97.20	1,230.00
	05/28/14 13:13:39	24120	13.73	0.50	0.00	5.14	33.49	97.60	1,232.00
	05/28/14 13:14:09	24150	13.75	0.51	0.00	5.15	33.49	97.60	1,232.00
A3	05/28/14 13:14:39	24180	14.12	0.65	0.00	4.76	25.16	98.00	1,059.00
	05/28/14 13:15:09	24210	12.88	0.41	0.00	5.75	25.16	98.00	1,059.00
	05/28/14 13:15:39	24240	13.34	0.22	0.00	5.45	24.19	98.30	1,026.00
	05/28/14 13:16:09	24270	13.84	0.38	0.00	5.15	24.19	98.30	1,026.00
	05/28/14 13:16:39	24300	14.56	0.63	0.00	4.54	24.16	98.40	1,029.00
	05/28/14 13:17:09	24330	14.20	0.68	-0.02	4.80	24.16	98.40	1,029.00
	05/28/14 13:17:39	24360	14.18	0.60	-0.02	4.86	24.14	98.40	1,026.00
	05/28/14 13:18:09	24390	14.23	0.65	-0.03	4.78	24.14	98.40	1,026.00
	05/28/14 13:18:39	24420	14.51	0.65	-0.02	4.59	24.25	98.30	1,029.00
	05/28/14 13:19:09	24450	14.11	0.70	0.02	4.81	24.25	98.30	1,029.00
	05/28/14 13:19:39	24480	13.16	0.56	0.02	5.48	32.66	98.20	1,217.00
	05/28/14 13:20:09	24510	14.20	0.47	-0.03	4.97	32.66	98.20	1,217.00
	05/28/14 13:20:39	24540	14.57	1.03	-0.04	4.57	33.58	98.10	1,236.00
	05/28/14 13:21:09	24570	14.63	0.86	-0.03	4.54	33.58	98.10	1,236.00
	05/28/14 13:21:39	24600	14.56	0.82	-0.03	4.57	33.55	98.10	1,239.00
	05/28/14 13:22:09	24630	14.56	0.76	-0.01	4.57	33.55	98.10	1,239.00
	05/28/14 13:22:39	24660	14.53	0.84	-0.02	4.59	33.55	98.00	1,237.00
	05/28/14 13:23:09	24690	14.53	0.79	-0.03	4.62	33.55	98.00	1,237.00
	05/28/14 13:23:39	24720	14.53	0.78	-0.02	4.58	33.66	97.90	1,240.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data			Weather Data		
Meas. Stack Moisture	5.5	%	Barometric Pressure	30.02	in. Hg
Stack Exhaust Flow (M2)	127,482	SCFH	Relative Humidity	59	%
			Ambient Temperature	78	^{o}F
			Specific Humidity	0.012054	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R7

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 13:24:09	24750	14.48	0.73	0.02	4.64	33.66	97.90	1,240.00
05/28/14 13:24:39	24780	14.59	0.74	0.03	4.57	33.66	98.10	1,239.00
05/28/14 13:25:09	24810	14.56	0.73	-0.03	4.62	33.66	98.10	1,239.00
05/28/14 13:25:39	24840	14.66	0.80	-0.02	4.47	33.49	99.00	1,237.00
05/28/14 13:26:09	24870	14.48	0.80	-0.02	4.63	33.49	99.00	1,237.00
05/28/14 13:26:39	24900	14.47	0.75	-0.02	4.64	33.33	99.60	1,241.00
05/28/14 13:27:09	24930	14.55	0.76	-0.03	4.58	33.33	99.60	1,241.00
05/28/14 13:27:39	24960	14.59	0.79	-0.02	4.58	33.82	99.90	1,239.00
05/28/14 13:28:09	24990	14.47	0.83	-0.03	4.63	33.82	99.90	1,239.00
05/28/14 13:28:39	25020	14.80	0.78	-0.03	4.48	33.94	99.90	1,244.00
05/28/14 13:29:09	25050	14.58	0.73	-0.01	4.52	33.94	99.90	1,244.00
05/28/14 13:29:39	25080	14.53	0.74	-0.01	4.59	30.48	99.80	1,167.00
05/28/14 13:30:09	25110	14.61	0.71	0.01	4.56	30.48	99.80	1,167.00
05/28/14 13:30:39	25140	14.50	0.75	0.01	4.60	25.30	99.70	1,053.00
05/28/14 13:31:09	25170	14.73	0.80	-0.04	4.45	25.30	99.70	1,053.00
05/28/14 13:31:39	25200	14.01	0.82	-0.04	4.94	23.69	99.70	1,025.00
05/28/14 13:32:09	25230	13.89	0.52	-0.01	5.01	23.69	99.70	1,025.00
05/28/14 13:32:39	25260	13.89	0.45	0.00	5.04	24.50	99.60	1,027.00
05/28/14 13:33:09	25290	13.88	0.64	-0.01	5.00	24.50	99.60	1,027.00
05/28/14 13:33:39	25320	13.94	0.48	0.00	5.05	24.08	99.60	1,024.00
05/28/14 13:34:09	25350	14.02	0.49	0.01	4.90	24.08	99.60	1,024.00
RAW AVERAGE		**13.86**	**0.42**	**0.00**	**5.05**	**31.05**	**95.89**	**1,179.29**

		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.11	-0.16	0.02	0.08			
	Final Zero	0.08	0.07	0.01	0.05			
	Avg. Zero	0.10	-0.05	0.02	0.07			
	Initial UpScale	12.20	8.96	3.10	8.73			
	Final UpScale	12.19	9.03	3.01	8.74			
	Avg. UpScale	12.20	9.00	3.06	8.74			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.88	0.46	0.00	5.04
Corrected Raw Average (ppm/% wet basis)	13.11	0.44	0.00	4.76
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	131,099	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	45	%
Ambient Temperature	90	^{o}F
Specific Humidity	0.013565	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R8

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 13:50:09	26310	13.65	0.42	0.00	5.20	24.25	101.00	1,029.00
	05/28/14 13:50:39	26340	13.67	0.50	-0.01	5.18	24.25	101.00	1,029.00
	05/28/14 13:51:09	26370	13.62	0.54	0.00	5.19	24.22	101.40	1,029.00
	05/28/14 13:51:39	26400	13.67	0.48	0.00	5.16	24.22	101.40	1,029.00
	05/28/14 13:52:09	26430	13.79	0.36	0.00	5.13	24.05	101.50	1,031.00
	05/28/14 13:52:39	26460	13.65	0.44	0.13	5.16	24.05	101.50	1,031.00
	05/28/14 13:53:09	26490	13.74	0.41	0.23	5.14	24.44	101.40	1,029.00
	05/28/14 13:53:39	26520	13.76	0.44	0.23	5.12	24.44	101.40	1,029.00
	05/28/14 13:54:09	26550	13.57	0.40	0.25	5.20	28.37	101.20	1,116.00
	05/28/14 13:54:39	26580	13.38	0.39	0.26	5.31	28.37	101.20	1,116.00
	05/28/14 13:55:09	26610	13.39	0.29	0.26	5.48	34.18	101.00	1,251.00
	05/28/14 13:55:39	26640	14.12	0.52	0.26	4.85	34.18	101.00	1,251.00
	05/28/14 13:56:09	26670	14.07	0.62	0.25	4.90	33.91	101.00	1,245.00
	05/28/14 13:56:39	26700	14.05	0.59	0.23	4.90	33.91	101.00	1,245.00
	05/28/14 13:57:09	26730	14.00	0.59	0.26	4.97	33.91	101.10	1,247.00
	05/28/14 13:57:39	26760	14.20	0.59	0.28	4.81	33.91	101.10	1,247.00
	05/28/14 13:58:09	26790	14.09	0.69	0.24	4.89	33.91	101.10	1,244.00
	05/28/14 13:58:39	26820	14.19	0.70	0.24	4.81	33.91	101.10	1,244.00
	05/28/14 13:59:09	26850	14.14	0.72	0.23	4.86	34.02	101.20	1,247.00
	05/28/14 13:59:39	26880	14.15	0.62	0.23	4.86	34.02	101.20	1,247.00
	05/28/14 14:00:09	26910	14.21	0.66	0.22	4.81	33.91	101.10	1,258.00
	05/28/14 14:00:39	26940	14.17	0.62	0.23	4.83	33.91	101.10	1,258.00
	05/28/14 14:01:09	26970	14.04	0.64	0.26	4.90	33.91	101.00	1,245.00
	05/28/14 14:01:39	27000	14.18	0.62	0.26	4.84	33.91	101.00	1,245.00
	05/28/14 14:02:09	27030	14.12	0.60	0.24	4.86	33.91	100.90	1,245.00
	05/28/14 14:02:39	27060	14.06	0.62	0.26	4.89	33.91	100.90	1,245.00
	05/28/14 14:03:09	27090	13.99	0.64	0.28	4.95	33.94	101.00	1,247.00
	05/28/14 14:03:39	27120	14.12	0.55	0.26	4.88	33.94	101.00	1,247.00
	05/28/14 14:04:09	27150	14.16	0.62	0.24	4.84	33.80	101.40	1,246.00
	05/28/14 14:04:39	27180	14.18	0.63	0.24	4.83	33.80	101.40	1,246.00
	05/28/14 14:05:09	27210	14.20	0.62	0.28	4.85	21.15	101.80	965.00
	05/28/14 14:05:39	27240	15.16	0.81	0.30	4.24	21.15	101.80	965.00
	05/28/14 14:06:09	27270	14.41	0.89	0.29	4.59	24.05	102.20	1,035.00
	05/28/14 14:06:39	27300	13.74	0.60	0.28	5.07	24.05	102.20	1,035.00
	05/28/14 14:07:09	27330	13.64	0.41	0.26	5.22	24.33	102.60	1,035.00
	05/28/14 14:07:39	27360	13.70	0.43	0.26	5.12	24.33	102.60	1,035.00
	05/28/14 14:08:09	27390	13.61	0.41	0.24	5.23	24.33	102.70	1,029.00
	05/28/14 14:08:39	27420	13.60	0.39	0.25	5.23	24.33	102.70	1,029.00
	05/28/14 14:09:09	27450	13.69	0.40	0.28	5.17	24.22	102.60	1,032.00
	05/28/14 14:09:39	27480	13.65	0.40	0.27	5.20	24.22	102.60	1,032.00
	05/28/14 14:10:09	27510	13.65	0.49	0.27	5.18	27.65	102.60	1,108.00
	05/28/14 14:10:39	27540	13.64	0.46	0.27	5.20	27.65	102.60	1,108.00
	05/28/14 14:11:09	27570	13.21	0.49	0.31	5.41	32.27	102.50	1,201.00
	05/28/14 14:11:39	27600	13.67	0.34	0.31	5.31	32.27	102.50	1,201.00
	05/28/14 14:12:09	27630	14.04	0.54	0.32	4.92	34.90	102.50	1,263.00
	05/28/14 14:12:39	27660	14.00	0.62	0.30	4.93	34.90	102.50	1,263.00
	05/28/14 14:13:09	27690	13.96	0.61	0.29	5.00	34.24	102.70	1,247.00
	05/28/14 14:13:39	27720	14.14	0.64	0.29	4.85	34.24	102.70	1,247.00
	05/28/14 14:14:09	27750	14.05	0.64	0.35	4.88	34.07	103.00	1,246.00
	05/28/14 14:14:39	27780	14.03	0.60	0.33	4.92	34.07	103.00	1,246.00
	05/28/14 14:15:09	27810	13.91	0.60	0.33	5.01	34.21	103.40	1,246.00
	05/28/14 14:15:39	27840	13.93	0.58	0.34	5.01	34.21	103.40	1,246.00
	05/28/14 14:16:09	27870	14.05	0.61	0.32	4.93	34.43	103.70	1,248.00
	05/28/14 14:16:39	27900	13.97	0.62	0.33	4.95	34.43	103.70	1,248.00
	05/28/14 14:17:09	27930	13.96	0.58	0.33	4.96	34.27	104.00	1,244.00
	05/28/14 14:17:39	27960	13.95	0.65	0.34	4.97	34.27	104.00	1,244.00
	05/28/14 14:18:09	27990	13.87	0.57	0.34	5.03	34.24	104.20	1,247.00
	05/28/14 14:18:39	28020	14.01	0.61	0.34	4.98	34.24	104.20	1,247.00
	05/28/14 14:19:09	28050	14.14	0.66	0.37	4.82	34.07	104.20	1,249.00
	05/28/14 14:19:39	28080	14.13	0.66	0.34	4.89	34.07	104.20	1,249.00
	05/28/14 14:20:09	28110	14.01	0.65	0.31	4.91	34.32	104.30	1,249.00

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	131,099	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	45	%
Ambient Temperature	90	°F
Specific Humidity	0.013565	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R8

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. °F	Fuel Flow SCFH
A2	05/28/14 14:20:39	28140	13.96	0.61	0.38	4.97	34.32	104.30	1,249.00
	05/28/14 14:21:09	28170	13.98	0.57	0.37	4.96	34.16	104.50	1,248.00
	05/28/14 14:21:39	28200	14.06	0.58	0.33	4.92	34.16	104.50	1,248.00
	05/28/14 14:22:09	28230	14.12	0.59	0.37	4.87	29.51	104.70	1,144.00
	05/28/14 14:22:39	28260	14.11	0.71	0.40	4.86	29.51	104.70	1,144.00
	05/28/14 14:23:09	28290	14.54	0.68	0.39	4.67	24.72	104.80	1,042.00
	05/28/14 14:23:39	28320	13.81	0.74	0.44	4.96	24.72	104.80	1,042.00
	05/28/14 14:24:09	28350	13.47	0.44	0.42	5.29	24.83	104.90	1,040.00
	05/28/14 14:24:39	28380	13.55	0.39	0.43	5.26	24.83	104.90	1,040.00
	05/28/14 14:25:09	28410	13.47	0.39	0.47	5.31	24.66	104.70	1,040.00
	05/28/14 14:25:39	28440	13.69	0.40	0.48	5.17	24.66	104.70	1,040.00
	05/28/14 14:26:09	28470	13.49	0.45	0.58	5.29	24.77	104.60	1,040.00
	05/28/14 14:26:39	28500	13.43	0.39	0.53	5.34	24.77	104.60	1,040.00
	05/28/14 14:27:09	28530	13.63	0.37	0.54	5.22	29.40	104.80	1,141.00
	05/28/14 14:27:39	28560	13.49	0.39	0.56	5.27	29.40	104.80	1,141.00
	05/28/14 14:28:09	28590	12.82	0.33	0.63	5.71	34.79	105.00	1,252.00
	05/28/14 14:28:39	28620	14.07	0.41	0.63	4.98	34.79	105.00	1,252.00
	05/28/14 14:29:09	28650	13.93	0.66	0.64	4.98	34.52	105.10	1,251.00
	05/28/14 14:29:39	28680	14.07	0.64	0.64	4.91	34.52	105.10	1,251.00
	05/28/14 14:30:09	28710	14.07	0.68	0.61	4.88	34.49	105.40	1,250.00
	05/28/14 14:30:39	28740	13.93	0.63	0.60	4.99	34.49	105.40	1,250.00
	05/28/14 14:31:09	28770	13.93	0.61	0.64	4.97	34.32	105.60	1,252.00
	05/28/14 14:31:39	28800	13.91	0.59	0.65	5.01	34.32	105.60	1,252.00
	05/28/14 14:32:09	28830	13.98	0.61	0.66	4.94	34.43	105.80	1,249.00
	05/28/14 14:32:39	28860	13.81	0.59	0.66	5.07	34.43	105.80	1,249.00
	05/28/14 14:33:09	28890	13.88	0.56	0.67	5.03	34.54	106.10	1,251.00
	05/28/14 14:33:39	28920	14.05	0.59	0.66	4.92	34.54	106.10	1,251.00
	05/28/14 14:34:09	28950	14.08	0.63	0.68	4.90	34.52	106.30	1,251.00
	05/28/14 14:34:39	28980	14.03	0.66	0.69	4.89	34.52	106.30	1,251.00
	05/28/14 14:35:09	29010	14.03	0.61	0.68	4.93	34.49	106.50	1,250.00
	05/28/14 14:35:39	29040	14.04	0.67	0.69	4.90	34.49	106.50	1,250.00
	05/28/14 14:36:09	29070	13.88	0.62	0.65	5.01	34.46	106.80	1,250.00
	05/28/14 14:36:39	29100	14.03	0.61	0.66	4.95	34.46	106.80	1,250.00
	05/28/14 14:37:09	29130	14.06	0.62	0.70	4.89	34.30	107.10	1,249.00
	05/28/14 14:37:39	29160	14.00	0.63	0.65	4.94	34.30	107.10	1,249.00
	05/28/14 14:38:09	29190	14.00	0.64	0.61	4.95	34.27	107.20	1,248.00
	05/28/14 14:38:39	29220	13.84	0.66	0.65	5.06	34.27	107.20	1,248.00
	05/28/14 14:39:09	29250	13.86	0.67	0.63	5.02	32.27	107.30	1,202.00
	05/28/14 14:39:39	29280	14.10	0.64	0.59	4.91	32.27	107.30	1,202.00
	05/28/14 14:40:09	29310	14.35	0.70	0.57	4.76	25.88	107.10	1,065.00
A3	05/28/14 14:40:39	29340	13.89	0.80	0.58	4.92	25.88	107.10	1,065.00
	05/28/14 14:41:09	29370	13.62	0.50	0.59	5.25	24.03	106.70	1,024.00
	05/28/14 14:41:39	29400	13.67	0.46	0.59	5.17	24.03	106.70	1,024.00
	05/28/14 14:42:09	29430	13.85	0.48	0.60	5.09	23.75	106.30	1,019.00
	05/28/14 14:42:39	29460	14.12	0.47	0.62	4.84	23.75	106.30	1,019.00
	05/28/14 14:43:09	29490	13.89	0.49	0.60	5.01	23.50	106.10	1,021.00
	05/28/14 14:43:39	29520	13.95	0.52	0.61	4.97	23.50	106.10	1,021.00
	05/28/14 14:44:09	29550	13.96	0.54	0.61	4.96	26.16	105.80	1,074.00
	05/28/14 14:44:39	29580	13.96	0.52	0.58	5.00	26.16	105.80	1,074.00
	05/28/14 14:45:09	29610	13.63	0.50	0.60	5.12	30.81	105.50	1,177.00
	05/28/14 14:45:39	29640	14.54	0.50	0.57	4.74	30.81	105.50	1,177.00
	05/28/14 14:46:09	29670	14.81	0.84	0.59	4.39	33.99	105.20	1,246.00
	05/28/14 14:46:39	29700	14.48	0.83	0.55	4.58	33.99	105.20	1,246.00
	05/28/14 14:47:09	29730	14.48	0.77	0.53	4.65	34.41	105.00	1,254.00
	05/28/14 14:47:39	29760	14.55	0.82	0.55	4.60	34.41	105.00	1,254.00
	05/28/14 14:48:09	29790	14.66	0.82	0.63	4.54	34.16	104.80	1,253.00
	05/28/14 14:48:39	29820	14.54	0.81	0.60	4.56	34.16	104.80	1,253.00
	05/28/14 14:49:09	29850	14.40	0.84	0.54	4.70	34.30	104.60	1,254.00
	05/28/14 14:49:39	29880	14.51	0.84	0.55	4.62	34.30	104.60	1,254.00
	05/28/14 14:50:09	29910	14.40	0.81	0.55	4.68	34.18	104.30	1,252.00
	05/28/14 14:50:39	29940	14.41	0.80	0.55	4.69	34.18	104.30	1,252.00

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	131,099	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	45	%
Ambient Temperature	90	^{o}F
Specific Humidity	0.013565	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R8

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 14:51:09	29970	14.48	0.79	0.56	4.64	34.35	104.10	1,255.00
05/28/14 14:51:39	30000	14.57	0.81	0.56	4.57	34.35	104.10	1,255.00
05/28/14 14:52:09	30030	14.52	0.82	0.57	4.60	34.35	104.20	1,255.00
05/28/14 14:52:39	30060	14.57	0.80	0.56	4.54	34.35	104.20	1,255.00
05/28/14 14:53:09	30090	14.49	0.79	0.57	4.65	34.24	104.70	1,254.00
05/28/14 14:53:39	30120	14.58	0.82	0.56	4.57	34.24	104.70	1,254.00
05/28/14 14:54:09	30150	14.43	0.85	0.59	4.66	34.38	105.10	1,256.00
05/28/14 14:54:39	30180	14.48	0.81	0.61	4.65	34.38	105.10	1,256.00
05/28/14 14:55:09	30210	14.59	0.81	0.53	4.55	34.24	105.30	1,252.00
05/28/14 14:55:39	30240	14.54	0.82	0.53	4.60	34.24	105.30	1,252.00
05/28/14 14:56:09	30270	14.60	0.82	0.54	4.55	24.55	105.60	1,041.00
05/28/14 14:56:39	30300	14.63	0.79	0.52	4.55	24.55	105.60	1,041.00
05/28/14 14:57:09	30330	14.63	0.77	0.52	4.48	24.03	106.10	1,028.00
05/28/14 14:57:39	30360	15.21	0.83	0.55	4.19	24.03	106.10	1,028.00
05/28/14 14:58:09	30390	14.05	0.88	0.51	4.82	24.14	106.60	1,024.00
05/28/14 14:58:39	30420	14.07	0.51	0.53	4.89	24.14	106.60	1,024.00
05/28/14 14:59:09	30450	13.95	0.53	0.54	5.00	24.25	107.00	1,024.00
05/28/14 14:59:39	30480	14.10	0.51	0.55	4.89	24.25	107.00	1,024.00
RAW AVERAGE		**14.03**	**0.60**	**0.43**	**4.93**	**30.65**	**104.02**	**1,170.84**

		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.08	0.07	0.01	0.05			
	Final Zero	0.09	0.07	0.02	0.06			
	Avg. Zero	0.09	0.07	0.02	0.06			
	Initial UpScale	12.19	9.03	3.01	8.74			
	Final UpScale	12.20	8.94	3.05	8.73			
	Avg. UpScale	12.20	8.99	3.03	8.74			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	14.05	0.54	0.42	4.92
Corrected Raw Average (ppm/% wet basis)	13.23	0.50	0.40	4.64
Emission Rate (lb/hr)	N/A	0.01	0.01	N/A

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	6.1	%
Stack Exhaust Flow (M2)	129,006	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	46	%
Ambient Temperature	80	^{o}F
Specific Humidity	0.010010	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R9

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 15:15:09	31410	13.84	0.30	0.09	5.05	23.69	107.60	1,016.00
	05/28/14 15:15:39	31440	13.78	0.31	0.10	5.11	23.69	107.60	1,016.00
	05/28/14 15:16:09	31470	13.89	0.28	0.11	5.03	23.83	107.40	1,022.00
	05/28/14 15:16:39	31500	13.90	0.31	0.13	4.99	23.83	107.40	1,022.00
	05/28/14 15:17:09	31530	13.63	0.27	0.15	5.20	23.86	107.30	1,028.00
	05/28/14 15:17:39	31560	13.62	0.24	0.13	5.19	23.86	107.30	1,028.00
	05/28/14 15:18:09	31590	13.77	0.28	0.08	5.11	23.89	107.20	1,028.00
	05/28/14 15:18:39	31620	13.61	0.31	0.09	5.20	23.89	107.20	1,028.00
	05/28/14 15:19:09	31650	13.77	0.24	0.11	5.12	29.87	107.30	1,166.00
	05/28/14 15:19:39	31680	13.47	0.24	0.10	5.26	29.87	107.30	1,166.00
	05/28/14 15:20:09	31710	12.71	0.10	0.14	5.76	35.18	107.30	1,264.00
	05/28/14 15:20:39	31740	12.69	-0.01	0.15	5.94	35.18	107.30	1,264.00
	05/28/14 15:21:09	31770	14.07	0.20	0.14	4.95	34.41	107.30	1,254.00
	05/28/14 15:21:39	31800	14.17	0.41	0.14	4.82	34.41	107.30	1,254.00
	05/28/14 15:22:09	31830	14.08	0.40	0.15	4.90	34.27	107.30	1,253.00
	05/28/14 15:22:39	31860	14.26	0.43	0.17	4.76	34.27	107.30	1,253.00
	05/28/14 15:23:09	31890	14.15	0.44	0.15	4.86	34.54	107.40	1,254.00
	05/28/14 15:23:39	31920	14.08	0.41	0.13	4.88	34.54	107.40	1,254.00
	05/28/14 15:24:09	31950	14.06	0.39	0.12	4.90	34.30	107.40	1,253.00
	05/28/14 15:24:39	31980	14.08	0.39	0.12	4.89	34.30	107.40	1,253.00
	05/28/14 15:25:09	32010	14.01	0.38	0.13	4.94	34.54	107.50	1,254.00
	05/28/14 15:25:39	32040	14.27	0.35	0.15	4.78	34.54	107.50	1,254.00
	05/28/14 15:26:09	32070	14.17	0.41	0.16	4.82	34.27	107.80	1,258.00
	05/28/14 15:26:39	32100	14.09	0.39	0.14	4.85	34.27	107.80	1,258.00
	05/28/14 15:27:09	32130	14.03	0.36	0.14	4.94	34.41	108.00	1,255.00
	05/28/14 15:27:39	32160	14.17	0.47	0.14	4.84	34.41	108.00	1,255.00
	05/28/14 15:28:09	32190	14.10	0.51	0.12	4.86	34.66	108.20	1,255.00
	05/28/14 15:28:39	32220	13.96	0.35	0.12	4.96	34.66	108.20	1,255.00
	05/28/14 15:29:09	32250	14.00	0.35	0.14	4.92	34.77	108.00	1,253.00
	05/28/14 15:29:39	32280	14.02	0.43	0.13	4.95	34.77	108.00	1,253.00
	05/28/14 15:30:09	32310	14.12	0.53	0.14	4.88	26.30	107.60	1,081.00
	05/28/14 15:30:39	32340	14.41	0.43	0.13	4.75	26.30	107.60	1,081.00
	05/28/14 15:31:09	32370	13.77	0.44	0.12	4.95	24.83	107.20	1,046.00
	05/28/14 15:31:39	32400	13.36	0.17	0.12	5.39	24.83	107.20	1,046.00
	05/28/14 15:32:09	32430	13.41	0.14	0.11	5.36	24.97	106.70	1,042.00
	05/28/14 15:32:39	32460	13.50	0.13	0.10	5.28	24.97	106.70	1,042.00
	05/28/14 15:33:09	32490	13.49	0.11	0.08	5.30	24.58	106.30	1,045.00
	05/28/14 15:33:39	32520	13.56	0.18	0.09	5.23	24.58	106.30	1,045.00
	05/28/14 15:34:09	32550	13.65	0.17	0.11	5.21	24.75	106.10	1,043.00
	05/28/14 15:34:39	32580	13.48	0.18	0.10	5.28	24.75	106.10	1,043.00
	05/28/14 15:35:09	32610	13.53	0.16	0.16	5.28	28.73	106.20	1,128.00
	05/28/14 15:35:39	32640	13.40	0.16	0.17	5.30	28.73	106.20	1,128.00
	05/28/14 15:36:09	32670	13.34	0.08	0.09	5.51	34.43	106.30	1,251.00
	05/28/14 15:36:39	32700	14.01	0.28	0.08	4.92	34.43	106.30	1,251.00
	05/28/14 15:37:09	32730	14.03	0.36	0.09	4.91	33.91	106.50	1,243.00
	05/28/14 15:37:39	32760	14.16	0.37	0.09	4.85	33.91	106.50	1,243.00
	05/28/14 15:38:09	32790	14.10	0.36	0.09	4.86	33.91	106.70	1,243.00
	05/28/14 15:38:39	32820	14.11	0.38	0.10	4.87	33.91	106.70	1,243.00
	05/28/14 15:39:09	32850	14.08	0.44	0.08	4.87	33.91	106.60	1,243.00
	05/28/14 15:39:39	32880	14.14	0.39	0.10	4.84	33.91	106.60	1,243.00
	05/28/14 15:40:09	32910	14.05	0.44	0.07	4.90	33.91	106.30	1,241.00
	05/28/14 15:40:39	32940	14.08	0.41	0.08	4.87	33.91	106.30	1,241.00
	05/28/14 15:41:09	32970	14.08	0.36	0.10	4.88	34.05	105.70	1,243.00
	05/28/14 15:41:39	33000	13.78	0.37	0.11	5.06	34.05	105.70	1,243.00
	05/28/14 15:42:09	33030	13.60	0.32	0.09	5.21	33.80	105.20	1,243.00
	05/28/14 15:42:39	33060	13.52	0.29	0.08	5.27	33.80	105.20	1,243.00
	05/28/14 15:43:09	33090	13.56	0.28	0.08	5.24	34.07	104.80	1,245.00
	05/28/14 15:43:39	33120	13.37	0.31	0.09	5.36	34.07	104.80	1,245.00
	05/28/14 15:44:09	33150	13.61	0.31	0.08	5.25	33.82	104.70	1,244.00
	05/28/14 15:44:39	33180	13.50	0.31	0.08	5.26	33.82	104.70	1,244.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	6.1	%
Stack Exhaust Flow (M2)	129,006	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	46	%
Ambient Temperature	80	^{o}F
Specific Humidity	0.010010	lb H_2O / lb air

70-100-70 Load, Run - PI 48-R9

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 15:45:09	33210	13.46	0.32	0.08	5.30	33.96	104.80	1,242.00
A2	05/28/14 15:45:39	33240	13.60	0.33	0.07	5.22	33.96	104.80	1,242.00
	05/28/14 15:46:09	33270	13.54	0.34	0.11	5.27	33.71	104.80	1,244.00
	05/28/14 15:46:39	33300	13.60	0.33	0.08	5.21	33.71	104.80	1,244.00
	05/28/14 15:47:09	33330	13.52	0.35	0.10	5.27	33.99	105.00	1,244.00
	05/28/14 15:47:39	33360	13.50	0.30	0.10	5.28	33.99	105.00	1,244.00
	05/28/14 15:48:09	33390	13.46	0.28	0.07	5.31	24.44	104.90	1,076.00
	05/28/14 15:48:39	33420	14.09	0.30	0.08	5.02	24.44	104.90	1,076.00
	05/28/14 15:49:09	33450	13.58	0.42	0.09	5.08	23.67	104.70	1,019.00
	05/28/14 15:49:39	33480	13.17	0.13	0.10	5.51	23.67	104.70	1,019.00
	05/28/14 15:50:09	33510	13.25	0.13	0.06	5.46	23.42	104.50	1,016.00
	05/28/14 15:50:39	33540	13.30	0.14	0.08	5.43	23.42	104.50	1,016.00
	05/28/14 15:51:09	33570	13.35	0.15	0.09	5.38	23.42	104.10	1,017.00
	05/28/14 15:51:39	33600	13.28	0.11	0.09	5.45	23.42	104.10	1,017.00
	05/28/14 15:52:09	33630	13.28	0.14	0.08	5.45	23.44	103.80	1,015.00
	05/28/14 15:52:39	33660	13.30	0.16	0.09	5.42	23.44	103.80	1,015.00
	05/28/14 15:53:09	33690	13.05	0.16	0.11	5.47	34.07	103.30	1,243.00
	05/28/14 15:53:39	33720	13.05	0.07	0.11	5.72	34.07	103.30	1,243.00
	05/28/14 15:54:09	33750	13.49	0.21	0.11	5.30	34.10	103.00	1,252.00
	05/28/14 15:54:39	33780	13.62	0.29	0.13	5.21	34.10	103.00	1,252.00
	05/28/14 15:55:09	33810	13.51	0.31	0.09	5.26	34.24	103.00	1,252.00
	05/28/14 15:55:39	33840	13.45	0.33	0.09	5.33	34.24	103.00	1,252.00
	05/28/14 15:56:09	33870	13.52	0.32	0.08	5.24	33.85	103.10	1,251.00
	05/28/14 15:56:39	33900	13.36	0.30	0.09	5.38	33.85	103.10	1,251.00
	05/28/14 15:57:09	33930	13.52	0.39	0.12	5.29	34.13	103.30	1,251.00
	05/28/14 15:57:39	33960	13.62	0.41	0.13	5.18	34.13	103.30	1,251.00
	05/28/14 15:58:09	33990	13.45	0.46	0.10	5.30	34.27	103.50	1,251.00
	05/28/14 15:58:39	34020	13.39	0.32	0.09	5.34	34.27	103.50	1,251.00
	05/28/14 15:59:09	34050	13.33	0.27	0.09	5.41	34.27	103.70	1,253.00
	05/28/14 15:59:39	34080	13.39	0.26	0.07	5.36	34.27	103.70	1,253.00
	05/28/14 16:00:09	34110	13.44	0.28	0.09	5.32	34.27	103.80	1,250.00
	05/28/14 16:00:39	34140	13.53	0.30	0.08	5.27	34.27	103.80	1,250.00
	05/28/14 16:01:09	34170	13.64	0.34	0.09	5.18	33.99	103.80	1,250.00
	05/28/14 16:01:39	34200	13.39	0.31	0.07	5.34	33.99	103.80	1,250.00
	05/28/14 16:02:09	34230	13.45	0.30	0.08	5.31	34.27	103.60	1,248.00
	05/28/14 16:02:39	34260	13.47	0.28	0.08	5.31	34.27	103.60	1,248.00
	05/28/14 16:03:09	34290	13.46	0.28	0.08	5.32	34.13	103.30	1,248.00
	05/28/14 16:03:39	34320	13.52	0.26	0.08	5.26	34.13	103.30	1,248.00
	05/28/14 16:04:09	34350	13.43	0.30	0.06	5.32	34.02	103.00	1,251.00
	05/28/14 16:04:39	34380	13.39	0.25	0.08	5.36	34.02	103.00	1,251.00
	05/28/14 16:05:09	34410	13.68	0.25	0.08	5.23	25.16	102.70	1,061.00
A3	05/28/14 16:05:39	34440	13.54	0.35	0.06	5.12	25.16	102.70	1,061.00
	05/28/14 16:06:09	34470	13.05	0.13	0.08	5.61	24.25	102.50	1,032.00
	05/28/14 16:06:39	34500	13.08	0.08	0.05	5.60	24.25	102.50	1,032.00
	05/28/14 16:07:09	34530	13.15	0.09	0.09	5.52	24.14	102.20	1,032.00
	05/28/14 16:07:39	34560	13.15	0.11	0.09	5.53	24.14	102.20	1,032.00
	05/28/14 16:08:09	34590	13.16	0.11	0.06	5.52	24.16	101.90	1,030.00
	05/28/14 16:08:39	34620	13.16	0.12	0.07	5.53	24.16	101.90	1,030.00
	05/28/14 16:09:09	34650	14.51	0.12	0.15	4.74	24.33	101.50	1,032.00
	05/28/14 16:09:39	34680	13.71	0.18	0.07	5.02	24.33	101.50	1,032.00
	05/28/14 16:10:09	34710	13.56	0.24	0.07	5.25	28.32	101.00	1,123.00
	05/28/14 16:10:39	34740	13.30	0.21	0.05	5.36	28.32	101.00	1,123.00
	05/28/14 16:11:09	34770	12.98	0.05	0.10	5.62	33.11	100.60	1,230.00
	05/28/14 16:11:39	34800	12.61	-0.01	0.12	5.84	33.11	100.60	1,230.00
	05/28/14 16:12:09	34830	13.25	-0.06	0.09	5.63	33.13	100.20	1,231.00
	05/28/14 16:12:39	34860	14.36	0.30	0.07	4.71	33.13	100.20	1,231.00
	05/28/14 16:13:09	34890	14.21	0.53	0.09	4.79	33.16	99.80	1,231.00
	05/28/14 16:13:39	34920	14.30	0.47	0.10	4.75	33.16	99.80	1,231.00
	05/28/14 16:14:09	34950	14.26	0.53	0.08	4.78	33.33	99.60	1,235.00
	05/28/14 16:14:39	34980	14.33	0.64	0.09	4.71	33.33	99.60	1,235.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	6.1	%
Stack Exhaust Flow (M2)	129,006	SCFH

Weather Data

Barometric Pressure	30.00	in. Hg
Relative Humidity	46	%
Ambient Temperature	80	^{o}F
Specific Humidity	0.010010	lb H_2O / lb air

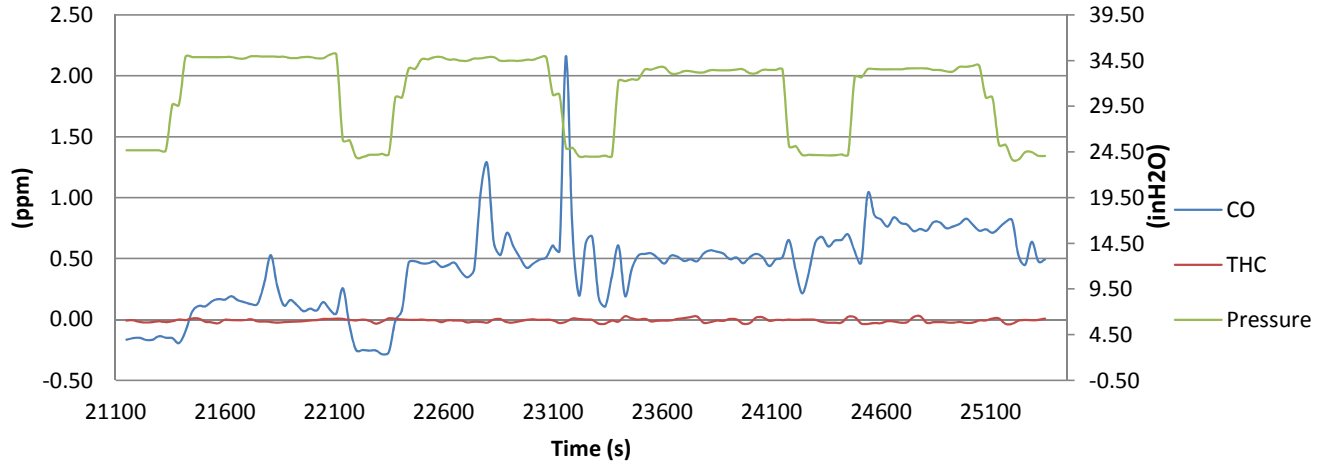
70-100-70 Load, Run - PI 48-R9

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 16:15:09	35010	14.22	0.47	0.11	4.78	33.49	99.70	1,238.00
05/28/14 16:15:39	35040	14.25	0.49	0.12	4.77	33.49	99.70	1,238.00
05/28/14 16:16:09	35070	14.23	0.52	0.08	4.79	33.52	100.30	1,240.00
05/28/14 16:16:39	35100	14.46	0.58	0.10	4.66	33.52	100.30	1,240.00
05/28/14 16:17:09	35130	14.14	0.50	0.08	4.79	33.38	100.70	1,238.00
05/28/14 16:17:39	35160	14.05	0.43	0.08	4.91	33.38	100.70	1,238.00
05/28/14 16:18:09	35190	14.06	0.53	0.09	4.89	33.35	101.10	1,237.00
05/28/14 16:18:39	35220	13.83	0.46	0.09	4.99	33.35	101.10	1,237.00
05/28/14 16:19:09	35250	13.92	0.39	0.14	5.03	33.49	101.30	1,234.00
05/28/14 16:19:39	35280	13.94	0.46	0.13	4.99	33.49	101.30	1,234.00
05/28/14 16:20:09	35310	13.88	0.41	0.08	5.00	33.47	101.70	1,236.00
05/28/14 16:20:39	35340	13.98	0.42	0.09	4.97	33.47	101.70	1,236.00
05/28/14 16:21:09	35370	13.91	0.53	0.06	4.99	24.33	101.90	1,036.00
05/28/14 16:21:39	35400	14.06	0.46	0.06	4.91	24.33	101.90	1,036.00
05/28/14 16:22:09	35430	14.02	0.48	0.05	4.91	24.33	102.30	1,035.00
05/28/14 16:22:39	35460	14.47	0.48	0.04	4.72	24.33	102.30	1,035.00
05/28/14 16:23:09	35490	13.40	0.53	0.06	5.20	24.30	102.60	1,027.00
05/28/14 16:23:39	35520	13.39	0.14	0.07	5.37	24.30	102.60	1,027.00
05/28/14 16:24:09	35550	13.43	0.19	0.08	5.33	24.16	102.60	1,026.00
05/28/14 16:24:39	35580	13.45	0.20	0.08	5.32	24.16	102.60	1,026.00
05/28/14 16:25:09	35610	13.46	0.17	0.07	5.31	24.14	102.40	1,024.00
RAW AVERAGE		**13.69**	**0.30**	**0.10**	**5.15**	**30.54**	**104.40**	**1,171.11**

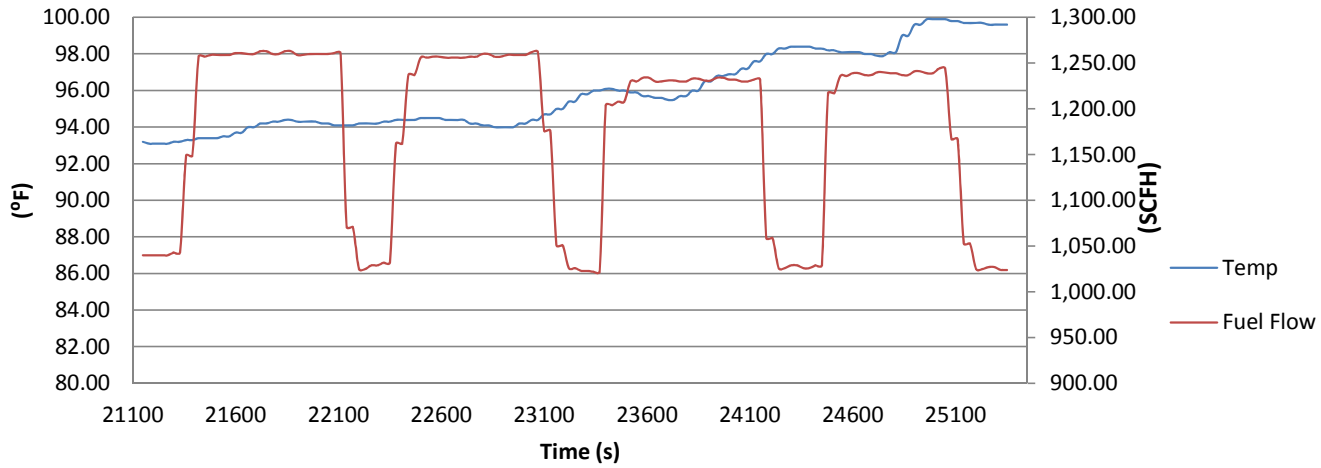
		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.09	0.07	0.02	0.06			
	Final Zero	0.07	-0.01	0.03	0.05			
	Avg. Zero	0.08	0.03	0.03	0.06			
	Initial UpScale	12.20	8.94	3.05	8.73			
	Final UpScale	12.17	8.81	3.12	8.71			
	Avg. UpScale	12.19	8.88	3.09	8.72			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.72	0.28	0.07	5.16
Corrected Raw Average (ppm/% wet basis)	12.88	0.26	0.07	4.84
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

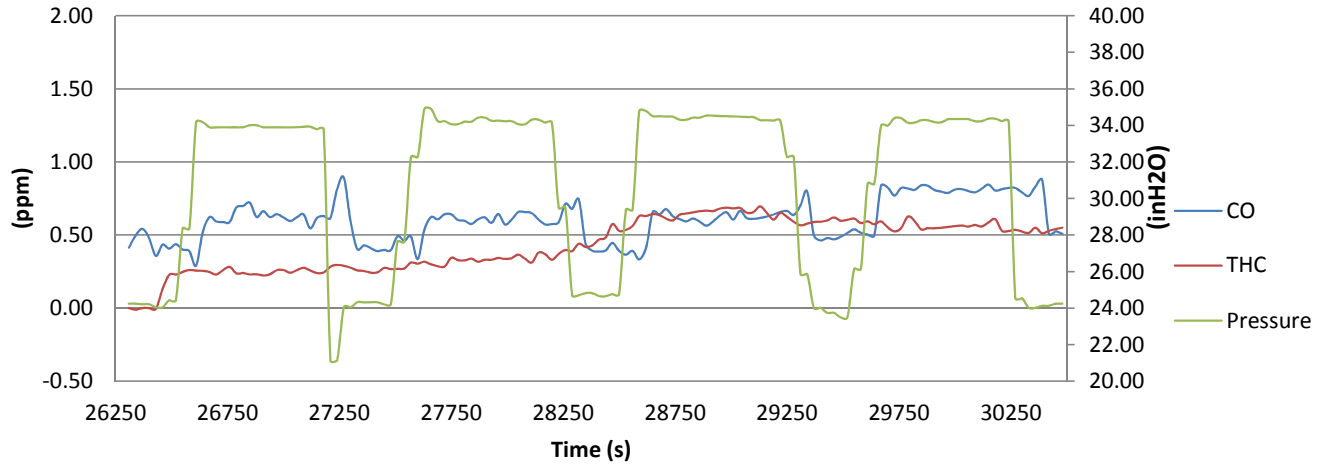
PI 48-R7



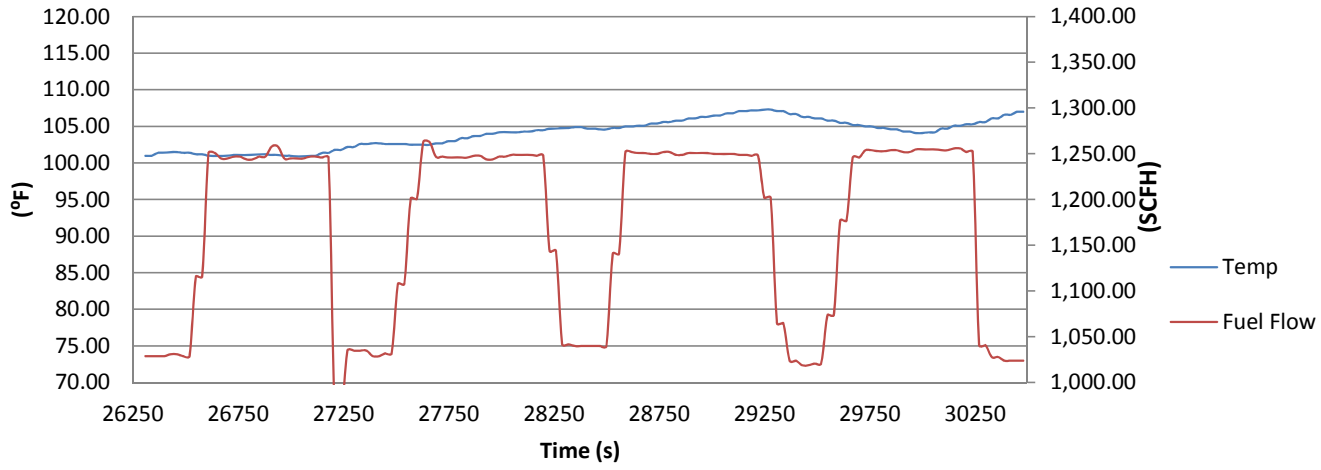
PI 48-R7



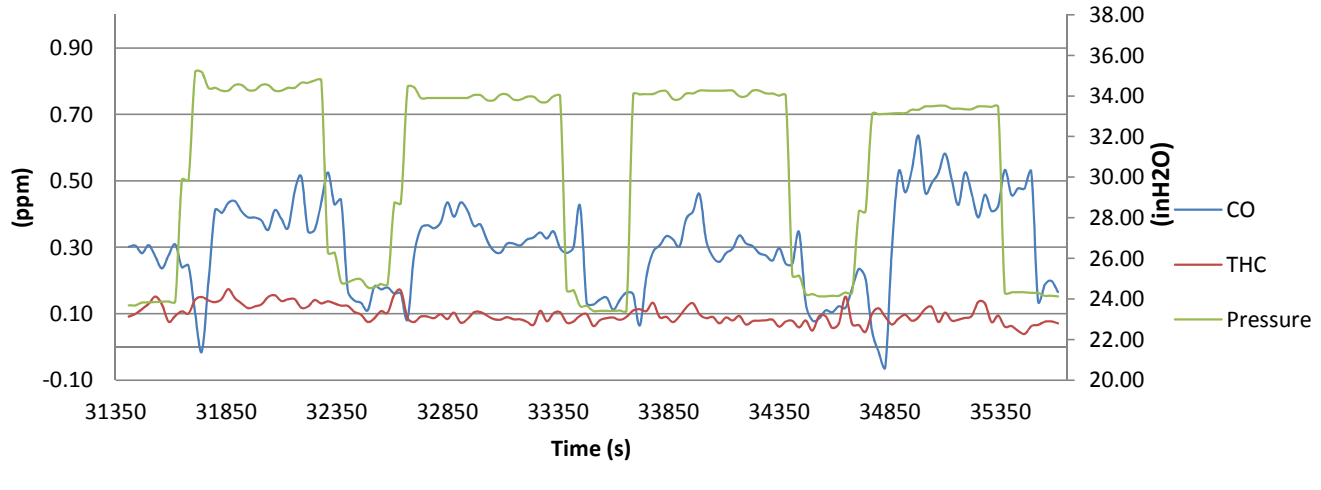
PI 48-R8



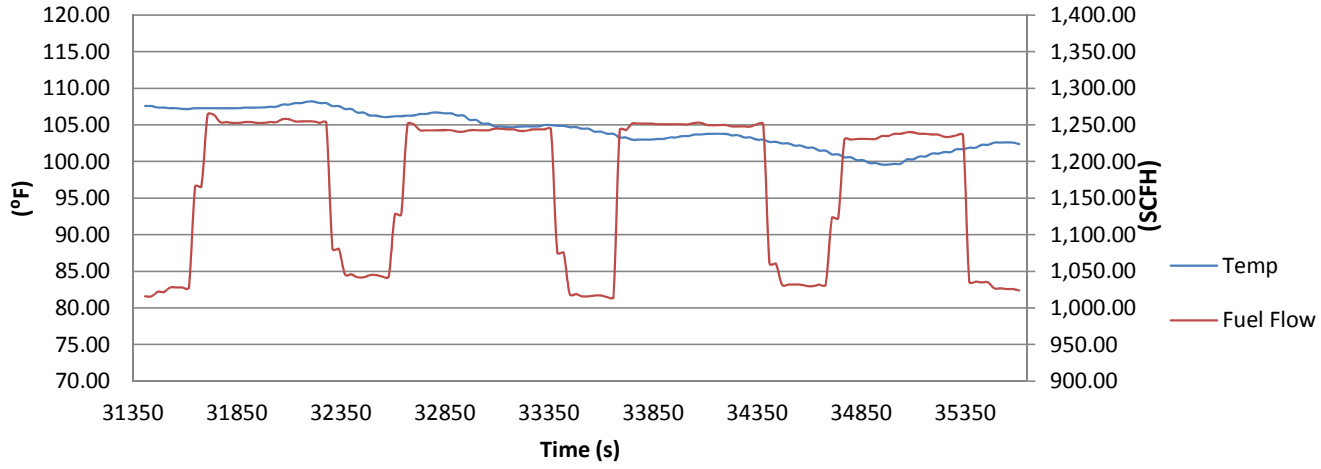
PI 48-R8

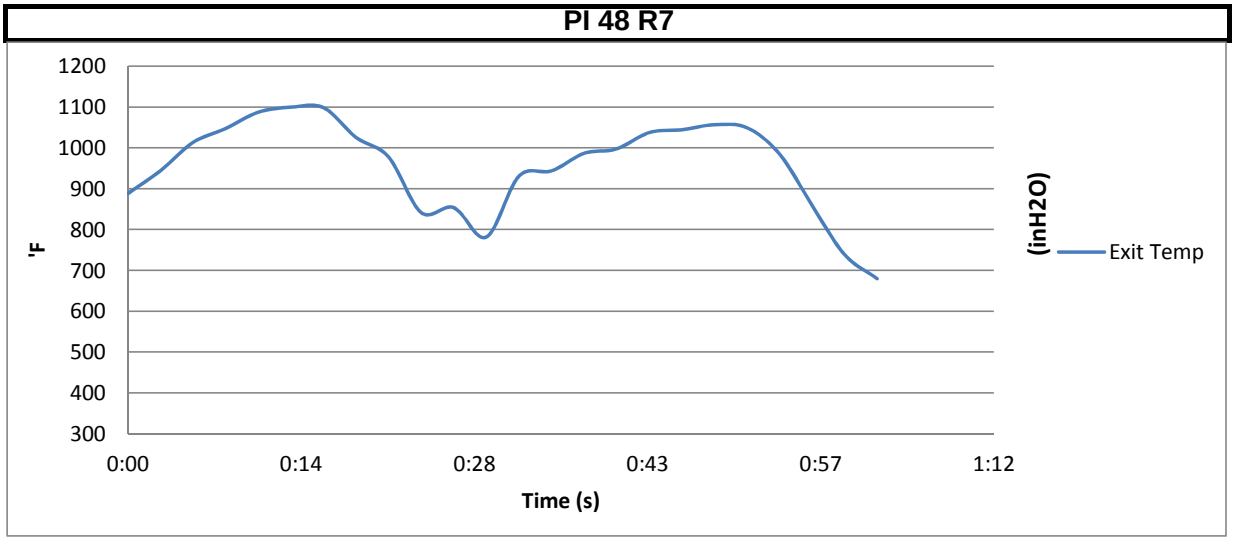


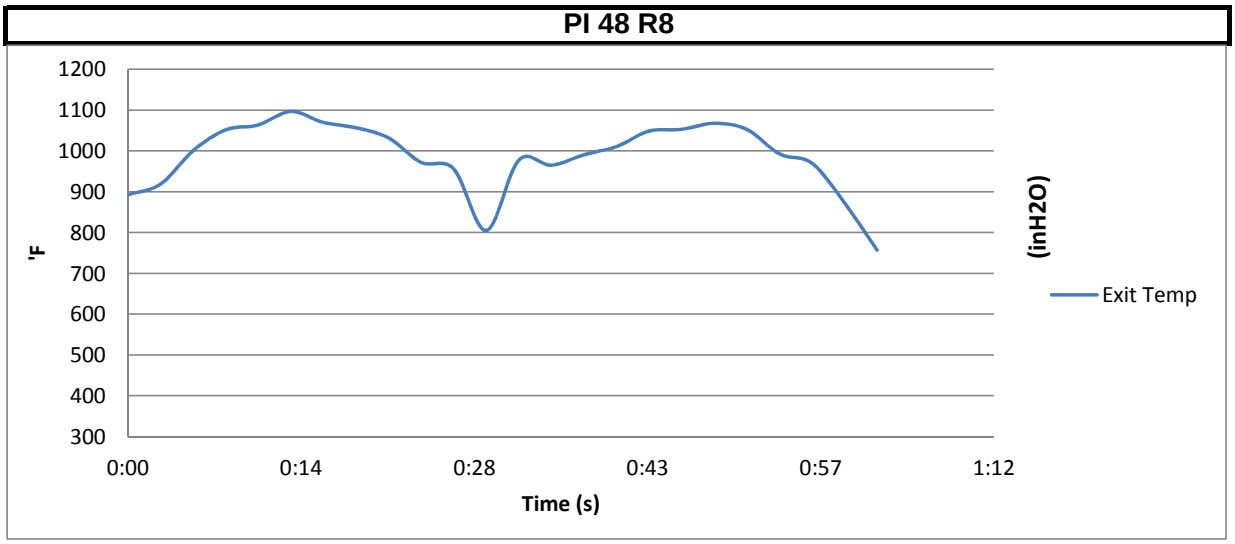
PI 48-R9

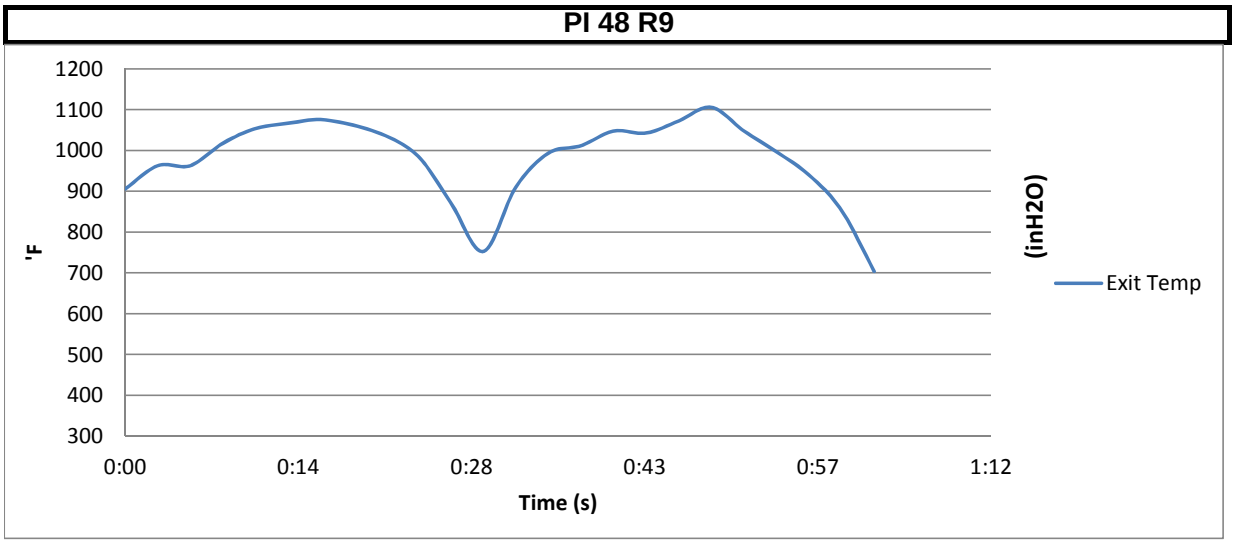


PI 48-R9




PI 48 R7
1200
1100
1000
900
800
700
600
500
400
300
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI 48 R8
1200
1100
1000
900
800
700
600
500
400
300
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI 48 R9
1200
1100
1000
900
800
700
600
500
400
300
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp

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	Big Iron Steel Plant
Sampling Location	Unit 48D
Fuel Type	Gas, Propene

Test Information			
Project #		stk-14-elmorecity.ok-comp#1	
Operator		TP	
Date for Preliminary Run	(mm/dd/yy)	05/28/14	
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)	05/28/14	05/28/14	05/28/14	
Load	% or w/DB	90-100	90-100	90-100	
Meter Box Number	from ACS	SAMP-CP-0009	SAMP-CP-0009	SAMP-CP-0009	
Meter Calibration Factor	(Y)	0.968	0.968	0.968	
Orifice Meter Coefficient	($\Delta H_@$)	1.796	1.796	1.796	in H_2O
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-FP-0001	SAMP-FP-0001	SAMP-FP-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-0035	SAMP-BC-0035	SAMP-BC-0035	

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	Big Iron Steel Plant
Sampling Location	Unit 48D
Project #	stk-14-elmorecity.ok-comp#1

Historical Data	**90-100%-10**	**90-100%-11**	**90-100%-12**	**Average**	**Units**
Run Start Time	16:41	18:07	19:28		hh:mm
Run Stop Time	17:51	19:17	20:38		hh:mm
Test Date	05/28/14	05/28/14	05/28/14		mm/dd/yy
Meter Calibration Factor	0.968	0.968	0.968		
Pitot Tube Coefficient	0.819	0.819	0.819		
Stack Test Data	**90-100%-10**	**90-100%-11**	**90-100%-12**	**Average**	**Units**
Initial Meter Volume	121.045	173.145	225.100		ft^3
Final Meter Volume	172.895	224.825	276.500		ft^3
Total Meter Volume	51.850	51.680	51.400	51.643	ft^3
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	91.48	92.46	91.94	91.96	°F
Average Stack Temperature	979.75	980.08	992.71	984.18	°F
Barometric Pressure	29.95	29.94	29.94	29.94	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H_2O
Absolute Stack Pressure	29.95	29.94	29.94	29.94	in Hg
Average Orifice Pressure Drop	1.80	1.80	1.80	1.80	in H_2O
Absolute Meter Pressure	30.08	30.07	30.07	30.08	in Hg
Avg Square Root Pitot Pressure	0.10	0.10	0.10	0.10	$\sqrt{(in\ H_2O)}$
Moisture Content Data	**90-100%-10**	**90-100%-11**	**90-100%-12**	**Average**	**Units**
Impinger Water Weight Gain	51.20	49.50	53.40	51.37	g
Silica Gel Weight Gain	12.10	10.80	9.90	10.93	g
Total Water Volume Collected	63.41	60.41	63.41	62.41	ml
Standard Water Vapor Volume	2.98	2.84	2.98	2.94	scf
Standard Meter Volume	48.3	48.1	47.8	48.1	dscf
Calculated Stack Moisture	5.82	5.59	5.87	5.76	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	5.82	5.59	5.87	5.76	%
Gas Analysis Data	**90-100%-10**	**90-100%-11**	**90-100%-12**	**Average**	**Units**
Carbon Dioxide Content	5.1	5.4	5.1	5.2	%
Oxygen Content	15.1	14.6	15.1	14.9	%
Nitrogen Content	79.8	79.9	79.8	79.8	%
Stack Dry Molecular Weight	29.43	29.44	29.42	29.43	lb/lb-mole
Stack Wet Molecular Weight	28.76	28.80	28.75	28.77	lb/lb-mole
Percent Excess Air	253.1	224.8	253.1	243.6	%
Volumetric Flow Rate Data	**90-100%-10**	**90-100%-11**	**90-100%-12**	**Average**	**Units**
Average Stack Gas Velocity	8.82	8.66	8.77	8.75	ft/sec
Stack Cross-Sectional Area	11.79	11.79	11.79	11.79	ft^2
Actual Stack Flow Rate	6,242	6,131	6,208	6,194	acfm
Wet Standard Stack Flow Rate	137	135	135	136	wkscfh
Dry Standard Stack Flow Rate	129,495	127,425	127,518	128,146	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/28/14		
Sampling Location	Unit 48D	**Operator**	TP		
Project #	stk-14-elmorecity.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**	05/28/14	**Run Start Time**	16:41	**Run Stop Time**	17:51
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.1	15.1	0.0	79.8	29.43	1.133	253.1	N/A

Gas Analysis Data								
Run Number	90-100%-11		**Date**	05/28/14	**Run Start Time**	18:07	**Run Stop Time**	19:17
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.4	14.6	0.0	79.9	29.44	1.158	224.8	N/A

Gas Analysis Data								
Run Number	90-100%-12		**Date**	05/28/14	**Run Start Time**	19:28	**Run Stop Time**	20:38
Sample Analysis Time	**CO_2 Conc.**	**O_2 Conc.**	**Methane Conc.**	**N_2 Conc.**	**Dry Molecular Weight**	**Calculated Fuel Factor**	**Excess Air**	**Fuel Factor in Range**
	($\%CO_2$)	($\%O_2$)	(ppmCO)	($\%N_2$)	(M_d)	$(F_o)_{avg}$	$(\%EA)_{avg}$	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.1	15.1	0.0	79.8	29.42	1.137	253.1	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Big Iron Steel Plant	**Preliminary Date**	05/28/14
Sampling Location	Unit 48D	**Operator**	TP
Project #	stk-14-elmorecity.ok-comp#1	**Ports Used**	2

Moisture Content Data									
Run Number		90-100%-10		**Date**	05/28/14	**Start Time**	16:41	**Stop Time**	17:51
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.850	dcf		**Barometric Pressure**	(P_b)	29.95	in Hg
Average Stack Temp		(t_s)$_{avg}$	980	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	91	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	951.60	814.70	573.60	857.80				
Initial Value	(V_i),(W_i)	921.00	796.00	571.70	845.70				
Net Value	(V_n),(W_n)	30.6	18.7	1.9	12.1				
Results									
Total Weight	(W_t)	63.30	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.985	scf	
Std Meter Volume	($V_{m(std)}$)	48.315	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		90-100%-11		**Date**	05/28/14	**Start Time**	18:07	**Stop Time**	19:17
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.680	dcf		**Barometric Pressure**	(P_b)	29.94	in Hg
Average Stack Temp		(t_s)$_{avg}$	980	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	92	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	914.00	856.50	570.00	895.60				
Initial Value	(V_i),(W_i)	913.40	809.40	568.20	884.80				
Net Value	(V_n),(W_n)	0.6	47.1	1.8	10.8				
Results									
Total Weight	(W_t)	60.30	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.843	scf	
Std Meter Volume	($V_{m(std)}$)	48.055	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	5.59	%		**Final Moisture Content**	(B_{ws})	5.59	%	

Moisture Content Data									
Run Number		90-100%-12		**Date**	05/28/14	**Start Time**	19:28	**Stop Time**	20:38
Meter Box Number		SAMP-CP-0009				**Meter Cal Factor**	(Y)	0.968	
Total Meter Volume		(V_m)	51.400	dcf		**Barometric Pressure**	(P_b)	29.94	in Hg
Average Stack Temp		(t_s)$_{avg}$	993	°F		**Stack Static Pressure**	(P_{static})	0.00	in H_2O
Average Meter Temp		(t_m)$_{avg}$	92	°F		**Avg Orifice Pressure**	(ΔH)$_{avg}$	1.80	in H_2O
		Impinger 1	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 6**	**Impinger 7**	**Impinger 8**
		(g)	(g)	(g)	(g)				
Contents		H_2O	H_2O	-	Sil Gel				
Final Value	(V_f),(W_f)	786.90	706.20	576.40	867.70				
Initial Value	(V_i),(W_i)	744.80	697.70	573.60	857.80				
Net Value	(V_n),(W_n)	42.1	8.5	2.8	9.9				
Results									
Total Weight	(W_t)	63.30	g		**Water Vol Weighed**	($V_{wsg(std)}$)	2.985	scf	
Std Meter Volume	($V_{m(std)}$)	47.840	dscf		**Sat. Moisture Content**	($B_{ws(svp)}$)	100.00	%	
Calc Moisture Content	($B_{ws(calc)}$)	5.87	%		**Final Moisture Content**	(B_{ws})	5.87	%	

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

Plant Name	Big Iron Steel Plant
Sampling Location	Unit 48D
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	90-100%-10

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	979.8	°F
Average Meter Temp	(t_m)	91.5	
Orifice Meter Coefficient	(ΔH@)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.10	in H_2O
Stack Moisture Content	(B_{ws})	5.82	%
Stack Dry Molecular Weight	(M_d)	29.43	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.12	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.20	in H_2O for	15.0	sec
	Post (+)	0.14	in H_2O for	15.0	sec
	Post (-)	0.16	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4617	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	29.95	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	29.95	in Hg
Absolute Meter Pressure	(P_m)	30.08	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	16:41	**End**	17:51

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	921.0	796.0	571.7	845.7				
Post	951.6	814.7	573.6	857.8				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	121.045	0.005	1.796	1.80	892	250		66			86	84	5.0	0.07	6.20	1.938		46.504
A-2	2.7	00:02:43	123.100	0.015	1.796	1.80	942	250		61			93	84	5.0	0.12	10.94	3.840		46.074
A-3	5.4	00:05:25	125.130	0.005	1.796	1.80	999	250		60			96	84	5.0	0.07	6.44	5.760		46.076
A-4	8.1	00:08:07	127.185	0.010	1.796	1.80	1030	250		62			98	84	5.0	0.10	9.21	7.681		46.085
A-5	10.8	00:10:50	129.245	0.015	1.796	1.80	1086	250		63			98	84	5.0	0.12	11.49	9.677		46.448
A-6	13.5	00:13:33	131.385	0.015	1.796	1.80	1113	250		63			98	84	5.0	0.12	11.59	11.761		47.044
A-7	16.3	00:16:15	133.620	0.015	1.796	1.80	1114	250		63			98	85	5.0	0.12	11.59	13.792		47.288
A-8	19.0	00:18:58	135.800	0.015	1.796	1.80	1082	250		63			98	85	5.0	0.12	11.47	15.842		47.527
A-9	21.7	00:21:40	138.000	0.010	1.796	1.80	961	250		63			98	85	5.0	0.10	8.99	17.846		47.588
A-10	24.4	00:24:22	140.150	0.010	1.796	1.80	866	250		63			99	85	5.0	0.10	8.69	19.908		47.778
A-11	27.1	00:27:05	142.365	0.010	1.796	1.80	809	250		63			99	85	5.0	0.10	8.50	21.956		47.903
A-12	29.8	00:29:47	144.565	0.005	1.796	1.80	792	250		64			99	86	5.0	0.07	5.97	24.058		48.115
B-1	32.5	00:32:30	146.825	0.005	1.796	1.80	1013	250		68			91	85	5.0	0.07	6.47	26.125		48.231
B-2	35.2	00:35:12	149.030	0.005	1.796	1.80	973	250		63			98	85	5.0	0.07	6.39	28.147		48.253
B-3	37.9	00:37:55	151.200	0.010	1.796	1.80	987	250		64			98	85	5.0	0.10	9.07	30.137		48.219
B-4	40.6	00:40:37	153.335	0.010	1.796	1.80	1038	250		65			99	86	5.0	0.10	9.23	32.127		48.191
B-5	43.3	00:43:20	155.475	0.010	1.796	1.80	1053	250		65			99	86	5.0	0.10	9.28	34.150		48.212
B-6	46.0	00:46:03	157.650	0.015	1.796	1.80	1096	250		66			100	86	5.0	0.12	11.52	36.143		48.191
B-7	48.8	00:48:45	159.795	0.010	1.796	1.80	1102	250		66			100	86	5.0	0.10	9.43	38.118		48.149
B-8	51.5	00:51:28	161.920	0.010	1.796	1.80	1058	250		67			100	86	5.0	0.10	9.29	40.120		48.145
B-9	54.2	00:54:10	164.075	0.010	1.796	1.80	1022	250		63			100	86	5.0	0.10	9.18	42.128		48.146
B-10	56.9	00:56:53	166.235	0.0100	1.796	1.80	947	250		61			100	86	5.0	0.10	8.95	44.130		48.142
B-11	59.6	00:59:35	168.390	0.0050	1.796	1.80	814	250		60			101	86	5.0	0.07	6.02	46.247		48.258
B-12	62.3	01:02:18	170.670	0.0050	1.796	1.80	725	250		60			101	86	5.0	0.07	5.81	48.313		48.313
Last Pt	65.0	01:05:00	172.895																	
Final Val	65.0	01:05:00	172.895											**Max Vac**	5.0	**Final Values**		48.313		
Average Values				0.01		1.80	980	250		63			98	85		0.10	8.82			
													91							

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

Plant Name	Big Iron Steel Plant
Sampling Location	Unit 48D
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	90-100%-11

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	980.1	°F
Average Meter Temp	(t_m)	92.5	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.10	in H_2O
Stack Moisture Content	(B_{ws})	5.59	%
Stack Dry Molecular Weight	(M_d)	29.44	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.74	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.15	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.19	in H_2O for	15.0	sec
	Post (+)	0.22	in H_2O for	15.0	sec
	Post (-)	0.16	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4616	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	29.94	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	29.94	in Hg
Absolute Meter Pressure	(P_m)	30.07	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	18:07	**End**	19:17

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	913.4	809.4	568.2	884.8				
Post	914.0	856.5	570.0	895.6				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	173.145	0.005	1.796	1.80	898	250		67			95	86	4.0	0.07	6.21	1.997		47.927
A-2	2.7	00:02:43	175.285	0.005	1.796	1.80	951	250		60			100	86	4.0	0.07	6.33	3.976		47.707
A-3	5.4	00:05:25	177.415	0.005	1.796	1.80	998	250		58			100	87	4.0	0.07	6.44	5.971		47.768
A-4	8.1	00:08:07	179.565	0.010	1.796	1.80	1022	250		60			100	87	4.0	0.10	9.18	7.953		47.715
A-5	10.8	00:10:50	181.700	0.020	1.796	1.80	1048	250		61			100	87	4.0	0.14	13.09	9.943		47.728
A-6	13.5	00:13:33	183.845	0.015	1.796	1.80	1080	250		61			101	87	4.0	0.12	11.46	11.956		47.822
A-7	16.3	00:16:15	186.015	0.015	1.796	1.80	1088	250		63			100	87	4.0	0.12	11.49	13.951		47.832
A-8	19.0	00:18:58	188.165	0.015	1.796	1.80	1077	250		63			100	87	4.0	0.12	11.45	15.970		47.909
A-9	21.7	00:21:40	190.340	0.010	1.796	1.80	1027	250		63			100	87	4.0	0.10	9.19	18.007		48.018
A-10	24.4	00:24:22	192.535	0.010	1.796	1.80	941	250		65			100	87	4.0	0.10	8.92	20.081		48.195
A-11	27.1	00:27:05	194.770	0.005	1.796	1.80	845	250		65			100	87	4.0	0.07	6.09	22.081		48.177
A-12	29.8	00:29:47	196.925	0.005	1.796	1.80	737	250		65			99	87	4.0	0.07	5.83	24.120		48.240
B-1	32.5	00:32:30	199.120	0.005	1.796	1.80	915	250		68			93	86	4.0	0.07	6.25	26.242		48.447
B-2	35.2	00:35:12	201.390	0.005	1.796	1.80	989	250		66			97	86	4.0	0.07	6.42	28.138		48.236
B-3	37.9	00:37:55	203.425	0.010	1.796	1.80	1021	250		67			98	86	4.0	0.10	9.18	30.069		48.110
B-4	40.6	00:40:37	205.500	0.010	1.796	1.80	1065	250		63			99	86	4.0	0.10	9.31	31.998		47.997
B-5	43.3	00:43:20	207.575	0.015	1.796	1.80	1090	250		61			99	86	4.0	0.12	11.50	33.928		47.898
B-6	46.0	00:46:03	209.650	0.015	1.796	1.80	1103	250		59			99	86	4.0	0.12	11.55	35.861		47.815
B-7	48.8	00:48:45	211.730	0.015	1.796	1.80	1098	250		58			99	86	4.0	0.12	11.53	37.842		47.800
B-8	51.5	00:51:28	213.860	0.010	1.796	1.80	1058	250		56			97	86	4.0	0.10	9.29	39.845		47.814
B-9	54.2	00:54:10	216.010	0.010	1.796	1.80	1013	250		55			97	86	4.0	0.10	9.15	41.838		47.815
B-10	56.9	00:56:53	218.150	0.005	1.796	1.80	935	250		55			98	85	4.0	0.07	6.30	43.915		47.907
B-11	59.6	00:59:35	220.380	0.005	1.796	1.80	829	250		54			98	85	4.0	0.07	6.05	45.983		47.982
B-12	62.3	01:02:18	222.600	0.005	1.796	1.80	694	250		54			98	85	4.0	0.07	5.73	48.056		48.056
Last Pt	65.0	01:05:00	224.825																	
Final Val	65.0	01:05:00	224.825											**Max Vac**	4.0	**Final Values**		48.056		
Average Values				0.01		1.80	980	250		61			99	86		0.10	8.66			
													92							

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

Plant Name	Big Iron Steel Plant
Sampling Location	Unit 48D
Project #	stk-14-elmorecity.ok-comp#1

Date	05/28/14
Operator	TP
Run Number	90-100%-12

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C_p)	0.819	
Average Stack Temp	(t_s)	992.7	°F
Average Meter Temp	(t_m)	91.9	
Orifice Meter Coefficient	($\Delta H@$)	1.796	in H_2O
Square Root ΔP	($\Delta p^{1/2}_{avg}$)	0.10	in H_2O
Stack Moisture Content	(B_{ws})	5.87	%
Stack Dry Molecular Weight	(M_d)	29.42	lb/lb-mole
Estimated Orifice Flow Rate	(Q_m)	0.74	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	**Pre**	0.000	ft³/min@	15.0	in Hg
PASS	**Post**	0.000	ft³/min@	15.0	in Hg
Pitot	**Pre (+)**	0.23	in H_2O for	15.0	sec
< 3.0	**Pre (-)**	0.18	in H_2O for	15.0	sec
	Post (+)	0.13	in H_2O for	15.0	sec
	Post (-)	0.10	in H_2O for	15.0	sec

Sampling Equipment			
Meter Box Number	SAMP-CP-0009		
Meter Cal Factor	(Y)	0.968	
Low Flow Manometer	SAMP-MN-0001		
Average Nozzle Diameter	(D_{na})		in
Suggested Nozzle Diameter	(D_{ni})	0.4605	in
Probe Number	SAMP-FP-0001		in
Probe Length	60		in
Liner Material	inconel		
Sample Case / Oven Number	SAMP-BC-0012		
Impinger Case Number	SAMP-BC-0035		

Pressures			
Barometric Pressure	(P_b)	29.94	in Hg
Stack Static Pressure	(P_{static})	0.00	in H_2O
Absolute Stack Pressure	(P_s)	29.94	in Hg
Absolute Meter Pressure	(P_m)	30.07	in Hg

Nozzle Measurements				
Pre				**PASS**
Post				**PASS**

Run Time			
Start	19:28	**End**	20:38

Weights	**Imp 1**	**Imp 2**	**Imp 3**	**Imp 4**	**Imp 5**	**Imp 6**	**Imp 7**	**Imp 8**
Pre	744.8	697.7	573.6	857.8				
Post	786.9	706.2	576.4	867.7				

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 (≤68°F)**	**Cond. Temp (≤--°F)**	**CPM Filter Temp (--±--°F)**	**Meter Inlet Temp (t_{mi})**	**Meter Outlet Temp (t_{mo})**	**Pump Vacuum**	**Square Root ΔP ($\Delta p^{1/2}$)**	**Local Stack Velocity (v_s)$_l$**	**Cumul. Meter Volume (V_m)$_{std}$**	**Cumul. Percent IsoKinetic (I)**	**Est-Run Meter Volume (V_m)$_{std}$**
	min	hh:mm:ss	ft³	in H_2O	in H_2O	in H_2O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H_2O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	225.100	0.005	1.796	1.80	906	250		60			93	84	4.0	0.07	6.24	1.920		46.079
A-2	2.7	00:02:43	227.150	0.005	1.796	1.80	975	250		55			98	84	4.0	0.07	6.39	3.831		45.975
A-3	5.4	00:05:25	229.200	0.010	1.796	1.80	1011	250		55			98	84	4.0	0.10	9.15	5.742		45.940
A-4	8.1	00:08:07	231.250	0.010	1.796	1.80	1065	250		55			98	84	4.5	0.10	9.32	7.663		45.978
A-5	10.8	00:10:50	233.310	0.010	1.796	1.80	1070	250		55			99	84	4.5	0.10	9.33	9.652		46.328
A-6	13.5	00:13:33	235.445	0.015	1.796	1.80	1104	250		56			99	85	4.5	0.12	11.56	11.639		46.554
A-7	16.3	00:16:15	237.580	0.015	1.796	1.80	1104	250		56			99	85	4.5	0.12	11.56	13.653		46.812
A-8	19.0	00:18:58	239.745	0.020	1.796	1.80	1081	250		56			99	85	4.5	0.14	13.25	15.654		46.963
A-9	21.7	00:21:40	241.895	0.010	1.796	1.80	1028	250		56			98	85	4.5	0.10	9.21	17.708		47.222
A-10	24.4	00:24:22	244.100	0.005	1.796	1.80	977	250		56			99	85	4.5	0.07	6.40	19.816		47.558
A-11	27.1	00:27:05	246.365	0.005	1.796	1.80	861	250		57			100	85	4.5	0.07	6.13	21.824		47.617
A-12	29.8	00:29:47	248.525	0.005	1.796	1.80	773	250		57			100	85	4.5	0.07	5.93	23.842		47.684
B-1	32.5	00:32:30	250.695	0.005	1.796	1.80	943	250		60			93	85	4.5	0.07	6.32	25.760		47.557
B-2	35.2	00:35:12	252.745	0.005	1.796	1.80	981	250		55			100	86	4.5	0.07	6.41	27.669		47.433
B-3	37.9	00:37:55	254.800	0.005	1.796	1.80	1001	250		56			100	86	4.5	0.07	6.45	29.815		47.704
B-4	40.6	00:40:37	257.110	0.010	1.796	1.80	1032	250		57			100	86	4.5	0.10	9.22	31.803		47.705
B-5	43.3	00:43:20	259.250	0.010	1.796	1.80	1044	250		57			100	86	4.5	0.10	9.26	33.800		47.718
B-6	46.0	00:46:03	261.400	0.010	1.796	1.80	1082	250		57			100	86	4.5	0.10	9.37	35.751		47.668
B-7	48.8	00:48:45	263.500	0.015	1.796	1.80	1105	250		57			99	86	4.5	0.12	11.56	37.750		47.684
B-8	51.5	00:51:28	265.650	0.015	1.796	1.80	1076	250		57			99	86	4.5	0.12	11.46	39.735		47.682
B-9	54.2	00:54:10	267.785	0.020	1.796	1.80	1034	250		57			99	86	4.5	0.14	13.05	41.725		47.686
B-10	56.9	00:56:53	269.925	0.015	1.796	1.80	963	250		57			99	86	4.5	0.12	11.03	43.719		47.694
B-11	59.6	00:59:35	272.070	0.005	1.796	1.80	920	250		57			99	86	4.5	0.07	6.27	45.835		47.827
B-12	62.3	01:02:18	274.345	0.005	1.796	1.80	689	250		57			99	86	4.5	0.07	5.72	47.838		47.838
Last Pt	65.0	01:05:00	276.500																	
Final Val	65.0	01:05:00	276.500											**Max Vac**	4.5	**Final Values**		47.838		
Average Values				0.01		1.80	993	250		57			99	85		0.10	8.77			
													92							

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	129,495	SCFH

Weather Data

Barometric Pressure	29.95	in. Hg
Relative Humidity	40	%
Ambient Temperature	87	^{o}F
Specific Humidity	0.010942	lb H_2O / lb air

90-100 Load, Run - PI 48-R10

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 16:41:09	36570	13.81	0.36	0.14	5.04	30.01	104.10	1,162.00
	05/28/14 16:41:39	36600	14.15	0.34	0.12	4.85	29.98	104.20	1,161.00
	05/28/14 16:42:09	36630	13.98	0.35	0.14	4.91	29.98	104.20	1,161.00
	05/28/14 16:42:39	36660	13.92	0.38	0.15	4.96	30.12	104.40	1,167.00
	05/28/14 16:43:09	36690	13.99	0.34	0.14	4.93	30.12	104.40	1,167.00
	05/28/14 16:43:39	36720	13.86	0.38	0.13	5.01	30.09	104.60	1,166.00
	05/28/14 16:44:09	36750	13.85	0.33	0.16	5.03	30.09	104.60	1,166.00
	05/28/14 16:44:39	36780	14.00	0.33	0.13	4.94	30.20	104.70	1,167.00
	05/28/14 16:45:09	36810	13.99	0.40	0.13	4.93	30.20	104.70	1,167.00
	05/28/14 16:45:39	36840	14.02	0.38	0.12	4.92	30.06	104.50	1,166.00
	05/28/14 16:46:09	36870	13.94	0.40	0.11	4.94	30.06	104.50	1,166.00
	05/28/14 16:46:39	36900	13.96	0.32	0.10	4.98	30.03	104.50	1,161.00
	05/28/14 16:47:09	36930	13.98	0.36	0.11	4.93	30.03	104.50	1,161.00
	05/28/14 16:47:39	36960	14.07	0.36	0.09	4.90	30.14	104.50	1,164.00
	05/28/14 16:48:09	36990	14.04	0.42	0.12	4.89	30.14	104.50	1,164.00
	05/28/14 16:48:39	37020	14.05	0.41	0.11	4.88	30.01	104.60	1,164.00
	05/28/14 16:49:09	37050	13.99	0.38	0.11	4.93	30.01	104.60	1,164.00
	05/28/14 16:49:39	37080	14.05	0.39	0.11	4.87	30.12	104.70	1,166.00
	05/28/14 16:50:09	37110	14.00	0.40	0.14	4.91	30.12	104.70	1,166.00
	05/28/14 16:50:39	37140	13.81	0.32	0.13	5.09	30.25	104.70	1,167.00
	05/28/14 16:51:09	37170	14.24	0.35	0.11	4.79	30.25	104.70	1,167.00
	05/28/14 16:51:39	37200	14.16	0.51	0.13	4.80	31.69	104.60	1,198.00
	05/28/14 16:52:09	37230	13.81	0.42	0.11	5.00	31.69	104.60	1,198.00
	05/28/14 16:52:39	37260	14.00	0.35	0.10	4.96	34.46	104.60	1,252.00
	05/28/14 16:53:09	37290	13.98	0.48	0.09	4.94	34.46	104.60	1,252.00
	05/28/14 16:53:39	37320	14.06	0.51	0.07	4.89	34.18	104.50	1,251.00
	05/28/14 16:54:09	37350	14.10	0.53	0.11	4.85	34.18	104.50	1,251.00
	05/28/14 16:54:39	37380	14.05	0.44	0.12	4.89	34.43	104.40	1,255.00
	05/28/14 16:55:09	37410	14.04	0.49	0.20	4.93	34.43	104.40	1,255.00
	05/28/14 16:55:39	37440	13.94	0.52	0.18	4.98	34.43	104.40	1,255.00
	05/28/14 16:56:09	37470	14.04	0.42	0.10	4.91	34.43	104.40	1,255.00
	05/28/14 16:56:39	37500	13.93	0.38	0.13	4.97	34.43	104.40	1,252.00
	05/28/14 16:57:09	37530	14.15	0.43	0.10	4.83	34.43	104.40	1,252.00
	05/28/14 16:57:39	37560	14.09	0.55	0.10	4.86	34.54	104.40	1,255.00
	05/28/14 16:58:09	37590	14.07	0.47	0.13	4.88	34.54	104.40	1,255.00
	05/28/14 16:58:39	37620	13.95	0.36	0.15	4.97	34.54	104.50	1,252.00
	05/28/14 16:59:09	37650	13.93	0.36	0.16	4.94	34.54	104.50	1,252.00
	05/28/14 16:59:39	37680	14.04	0.41	0.12	4.92	34.41	104.50	1,252.00
	05/28/14 17:00:09	37710	13.92	0.38	0.10	4.96	34.41	104.50	1,252.00
	05/28/14 17:00:39	37740	14.03	0.36	0.10	4.88	34.41	104.60	1,252.00
	05/28/14 17:01:09	37770	13.81	0.29	0.13	5.04	34.41	104.60	1,252.00
	05/28/14 17:01:39	37800	13.93	0.29	0.11	5.01	34.41	104.60	1,249.00
	05/28/14 17:02:09	37830	14.11	0.38	0.11	4.84	34.41	104.60	1,249.00
	05/28/14 17:02:39	37860	13.92	0.43	0.12	4.95	34.27	104.60	1,251.00
	05/28/14 17:03:09	37890	14.07	0.32	0.13	4.89	34.27	104.60	1,251.00
	05/28/14 17:03:39	37920	13.94	0.35	0.13	4.97	34.54	104.50	1,252.00
	05/28/14 17:04:09	37950	13.93	0.31	0.13	4.98	34.54	104.50	1,252.00
	05/28/14 17:04:39	37980	14.07	0.32	0.13	4.88	34.57	104.50	1,250.00
	05/28/14 17:05:09	38010	14.09	0.34	0.17	4.86	34.57	104.50	1,250.00
	05/28/14 17:05:39	38040	14.00	0.31	0.13	4.91	34.30	104.40	1,249.00
	05/28/14 17:06:09	38070	14.06	0.32	0.12	4.89	34.30	104.40	1,249.00
	05/28/14 17:06:39	38100	13.58	0.27	0.12	5.16	34.18	104.00	1,249.00
	05/28/14 17:07:09	38130	13.39	0.23	0.12	5.35	34.18	104.00	1,249.00
	05/28/14 17:07:39	38160	13.50	0.28	0.13	5.28	34.07	103.60	1,247.00
	05/28/14 17:08:09	38190	13.42	0.25	0.12	5.33	34.07	103.60	1,247.00
	05/28/14 17:08:39	38220	13.34	0.18	0.11	5.35	34.24	103.10	1,249.00
	05/28/14 17:09:09	38250	13.29	0.17	0.12	5.42	34.24	103.10	1,249.00
	05/28/14 17:09:39	38280	13.49	0.24	0.11	5.29	34.10	102.80	1,252.00
	05/28/14 17:10:09	38310	13.58	0.36	0.14	5.24	34.10	102.80	1,252.00
	05/28/14 17:10:39	38340	13.38	0.32	0.14	5.32	34.02	102.70	1,252.00
	05/28/14 17:11:09	38370	13.60	0.24	0.14	5.21	34.02	102.70	1,252.00

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	129,495	SCFH

Weather Data

Barometric Pressure	29.95	in. Hg
Relative Humidity	40	%
Ambient Temperature	87	^{o}F
Specific Humidity	0.010942	lb H_2O / lb air

90-100 Load, Run - PI 48-R10

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 17:11:39	38400	13.53	0.29	0.15	5.22	34.16	102.70	1,250.00
A2	05/28/14 17:12:09	38430	13.28	0.23	0.09	5.42	34.16	102.70	1,250.00
	05/28/14 17:12:39	38460	13.56	0.25	0.09	5.25	34.18	102.80	1,250.00
	05/28/14 17:13:09	38490	13.35	0.28	0.12	5.33	34.18	102.80	1,250.00
	05/28/14 17:13:39	38520	13.44	0.25	0.12	5.30	34.21	102.80	1,252.00
	05/28/14 17:14:09	38550	13.36	0.22	0.10	5.38	34.21	102.80	1,252.00
	05/28/14 17:14:39	38580	13.33	0.19	0.10	5.37	34.07	102.70	1,249.00
	05/28/14 17:15:09	38610	13.37	0.21	0.10	5.35	34.07	102.70	1,249.00
	05/28/14 17:15:39	38640	13.40	0.21	0.11	5.33	33.99	102.60	1,247.00
	05/28/14 17:16:09	38670	13.35	0.23	0.09	5.37	33.99	102.60	1,247.00
	05/28/14 17:16:39	38700	13.46	0.26	0.09	5.30	34.13	102.70	1,250.00
	05/28/14 17:17:09	38730	13.43	0.30	0.09	5.32	34.13	102.70	1,250.00
	05/28/14 17:17:39	38760	13.42	0.27	0.10	5.32	34.30	102.60	1,248.00
	05/28/14 17:18:09	38790	13.30	0.23	0.11	5.39	34.30	102.60	1,248.00
	05/28/14 17:18:39	38820	13.30	0.14	0.11	5.40	34.16	102.50	1,247.00
	05/28/14 17:19:09	38850	13.40	0.21	0.09	5.34	34.16	102.50	1,247.00
	05/28/14 17:19:39	38880	13.31	0.21	0.10	5.40	34.18	102.30	1,251.00
	05/28/14 17:20:09	38910	13.34	0.23	0.10	5.38	34.18	102.30	1,251.00
	05/28/14 17:20:39	38940	13.43	0.22	0.11	5.31	34.07	102.20	1,248.00
	05/28/14 17:21:09	38970	13.36	0.21	0.12	5.36	34.07	102.20	1,248.00
	05/28/14 17:21:39	39000	13.43	0.22	0.13	5.31	34.07	102.00	1,248.00
	05/28/14 17:22:09	39030	13.39	0.26	0.08	5.34	34.07	102.00	1,248.00
	05/28/14 17:22:39	39060	13.39	0.23	0.07	5.36	34.21	101.90	1,249.00
	05/28/14 17:23:09	39090	13.32	0.21	0.10	5.38	34.21	101.90	1,249.00
	05/28/14 17:23:39	39120	13.50	0.23	0.09	5.27	34.21	101.80	1,249.00
	05/28/14 17:24:09	39150	13.44	0.28	0.12	5.30	34.21	101.80	1,249.00
	05/28/14 17:24:39	39180	13.58	0.30	0.10	5.21	34.24	101.70	1,249.00
	05/28/14 17:25:09	39210	13.31	0.26	0.11	5.33	34.24	101.70	1,249.00
	05/28/14 17:25:39	39240	13.25	0.16	0.11	5.46	34.24	101.70	1,249.00
	05/28/14 17:26:09	39270	13.35	0.24	0.08	5.37	34.24	101.70	1,249.00
	05/28/14 17:26:39	39300	13.33	0.20	0.08	5.37	34.24	101.60	1,250.00
	05/28/14 17:27:09	39330	13.24	0.25	0.11	5.44	34.24	101.60	1,250.00
	05/28/14 17:27:39	39360	13.26	0.18	0.10	5.44	34.24	101.60	1,250.00
	05/28/14 17:28:09	39390	13.33	0.20	0.15	5.39	34.24	101.60	1,250.00
	05/28/14 17:28:39	39420	13.25	0.16	0.11	5.43	34.10	101.60	1,249.00
	05/28/14 17:29:09	39450	13.44	0.20	0.11	5.33	34.10	101.60	1,249.00
	05/28/14 17:29:39	39480	13.36	0.23	0.11	5.35	34.10	101.60	1,249.00
	05/28/14 17:30:09	39510	13.31	0.23	0.13	5.38	34.10	101.60	1,249.00
	05/28/14 17:30:39	39540	13.25	0.19	0.12	5.45	34.49	101.60	1,250.00
	05/28/14 17:31:09	39570	13.30	0.21	0.11	5.38	34.49	101.60	1,250.00
	05/28/14 17:31:39	39600	13.38	0.32	0.08	5.33	34.74	101.60	1,248.00
A3	05/28/14 17:32:09	39630	13.36	0.23	0.06	5.40	34.74	101.60	1,248.00
	05/28/14 17:32:39	39660	14.08	0.26	0.08	4.95	34.46	101.60	1,250.00
	05/28/14 17:33:09	39690	14.08	0.38	0.10	4.83	34.46	101.60	1,250.00
	05/28/14 17:33:39	39720	14.16	0.39	0.09	4.82	34.60	101.60	1,251.00
	05/28/14 17:34:09	39750	14.19	0.42	0.09	4.80	34.60	101.60	1,251.00
	05/28/14 17:34:39	39780	14.43	0.42	0.06	4.65	34.57	101.70	1,248.00
	05/28/14 17:35:09	39810	14.55	0.53	0.08	4.57	34.57	101.70	1,248.00
	05/28/14 17:35:39	39840	14.42	0.52	0.09	4.64	34.71	101.60	1,251.00
	05/28/14 17:36:09	39870	14.35	0.51	0.08	4.67	34.71	101.60	1,251.00
	05/28/14 17:36:39	39900	14.40	0.48	0.09	4.67	34.57	101.50	1,251.00
	05/28/14 17:37:09	39930	14.40	0.48	0.09	4.64	34.57	101.50	1,251.00
	05/28/14 17:37:39	39960	14.37	0.51	0.07	4.67	34.43	101.60	1,250.00
	05/28/14 17:38:09	39990	14.31	0.53	0.07	4.72	34.43	101.60	1,250.00
	05/28/14 17:38:39	40020	14.42	0.52	0.09	4.64	34.43	101.60	1,250.00
	05/28/14 17:39:09	40050	14.32	0.49	0.11	4.72	34.43	101.60	1,250.00
	05/28/14 17:39:39	40080	14.33	0.46	0.11	4.69	34.54	101.60	1,251.00
	05/28/14 17:40:09	40110	14.21	0.46	0.10	4.76	34.54	101.60	1,251.00
	05/28/14 17:40:39	40140	14.40	0.44	0.08	4.67	34.54	101.70	1,256.00
	05/28/14 17:41:09	40170	14.50	0.48	0.11	4.59	34.54	101.70	1,256.00
	05/28/14 17:41:39	40200	14.48	0.55	0.11	4.59	34.41	101.80	1,250.00

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.8	%
Stack Exhaust Flow (M2)	129,495	SCFH

Weather Data

Barometric Pressure	29.95	in. Hg
Relative Humidity	40	%
Ambient Temperature	87	^{o}F
Specific Humidity	0.010942	lb H_2O / lb air

90-100 Load, Run - PI 48-R10

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 17:42:09	40230	14.37	0.54	0.12	4.66	34.41	101.80	1,250.00
05/28/14 17:42:39	40260	14.47	0.46	0.14	4.61	34.52	101.80	1,250.00
05/28/14 17:43:09	40290	14.28	0.50	0.09	4.72	34.52	101.80	1,250.00
05/28/14 17:43:39	40320	14.37	0.57	0.07	4.68	34.63	101.90	1,250.00
05/28/14 17:44:09	40350	14.32	0.67	0.10	4.71	34.63	101.90	1,250.00
05/28/14 17:44:39	40380	14.40	0.60	0.10	4.65	34.49	101.90	1,250.00
05/28/14 17:45:09	40410	14.24	0.46	0.10	4.74	34.49	101.90	1,250.00
05/28/14 17:45:39	40440	14.47	0.56	0.07	4.62	34.35	101.80	1,250.00
05/28/14 17:46:09	40470	14.42	0.59	0.08	4.64	34.35	101.80	1,250.00
05/28/14 17:46:39	40500	14.44	0.50	0.08	4.62	34.35	101.80	1,250.00
05/28/14 17:47:09	40530	14.41	0.55	0.06	4.65	34.35	101.80	1,250.00
05/28/14 17:47:39	40560	14.34	0.54	0.07	4.67	34.46	101.70	1,250.00
05/28/14 17:48:09	40590	14.44	0.44	0.11	4.66	34.46	101.70	1,250.00
05/28/14 17:48:39	40620	14.43	0.53	0.09	4.63	34.32	101.60	1,250.00
05/28/14 17:49:09	40650	14.42	0.46	0.12	4.63	34.32	101.60	1,250.00
05/28/14 17:49:39	40680	14.46	0.50	0.11	4.63	34.32	101.60	1,250.00
05/28/14 17:50:09	40710	14.45	0.49	0.09	4.60	34.32	101.60	1,250.00
05/28/14 17:50:39	40740	14.41	0.48	0.09	4.67	33.27	101.60	1,231.00
05/28/14 17:51:09	40770	14.44	0.51	0.11	4.61	33.27	101.60	1,231.00
RAW AVERAGE		**13.87**	**0.36**	**0.11**	**5.01**	**33.65**	**102.95**	**1,236.52**

		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.07	-0.01	0.03	0.05			
	Final Zero	0.09	0.10	0.01	0.06			
	Avg. Zero	0.08	0.05	0.02	0.06			
	Initial UpScale	12.17	8.81	3.12	8.71			
	Final UpScale	12.13	8.76	3.08	8.72			
	Avg. UpScale	12.15	8.79	3.10	8.72			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.94	0.32	0.09	5.02
Corrected Raw Average (ppm/% wet basis)	13.12	0.30	0.08	4.72
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.6	%
Stack Exhaust Flow (M2)	127,425	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	50	%
Ambient Temperature	79	^{o}F
Specific Humidity	0.010560	lb H_2O / lb air

90-100 Load, Run - PI 48-R11

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 18:07:09	41730	13.87	0.25	0.09	5.03	30.50	100.50	1,179.00
	05/28/14 18:07:39	41760	13.81	0.25	0.07	5.04	30.50	100.50	1,179.00
	05/28/14 18:08:09	41790	13.90	0.27	0.11	4.98	30.67	100.20	1,183.00
	05/28/14 18:08:39	41820	13.69	0.25	0.15	5.12	30.67	100.20	1,183.00
	05/28/14 18:09:09	41850	13.70	0.18	0.11	5.14	30.59	100.00	1,183.00
	05/28/14 18:09:39	41880	13.78	0.22	0.12	5.06	30.59	100.00	1,183.00
	05/28/14 18:10:09	41910	13.77	0.21	0.08	5.08	30.86	100.00	1,184.00
	05/28/14 18:10:39	41940	13.79	0.25	0.08	5.07	30.86	100.00	1,184.00
	05/28/14 18:11:09	41970	13.81	0.19	0.11	5.05	30.48	99.90	1,183.00
	05/28/14 18:11:39	42000	13.71	0.20	0.09	5.09	30.48	99.90	1,183.00
	05/28/14 18:12:09	42030	13.87	0.18	0.10	5.02	30.64	100.00	1,183.00
	05/28/14 18:12:39	42060	13.76	0.21	0.11	5.09	30.64	100.00	1,183.00
	05/28/14 18:13:09	42090	13.71	0.19	0.09	5.12	30.92	100.00	1,184.00
	05/28/14 18:13:39	42120	13.90	0.18	0.11	5.02	30.92	100.00	1,184.00
	05/28/14 18:14:09	42150	13.84	0.21	0.11	5.02	30.78	100.00	1,183.00
	05/28/14 18:14:39	42180	13.84	0.21	0.09	5.04	30.78	100.00	1,183.00
	05/28/14 18:15:09	42210	13.83	0.27	0.10	5.02	30.67	99.90	1,181.00
	05/28/14 18:15:39	42240	13.90	0.19	0.10	5.01	30.67	99.90	1,181.00
	05/28/14 18:16:09	42270	13.77	0.23	0.13	5.08	30.81	99.80	1,181.00
	05/28/14 18:16:39	42300	13.94	0.19	0.12	4.97	30.81	99.80	1,181.00
	05/28/14 18:17:09	42330	13.94	0.23	0.10	4.99	32.41	99.70	1,213.00
	05/28/14 18:17:39	42360	13.75	0.21	0.11	5.07	32.41	99.70	1,213.00
	05/28/14 18:18:09	42390	13.63	0.18	0.11	5.17	34.90	99.50	1,265.00
	05/28/14 18:18:39	42420	13.67	0.13	0.11	5.20	34.90	99.50	1,265.00
	05/28/14 18:19:09	42450	13.91	0.18	0.13	4.99	34.41	99.30	1,255.00
	05/28/14 18:19:39	42480	13.98	0.23	0.11	4.96	34.41	99.30	1,255.00
	05/28/14 18:20:09	42510	14.07	0.28	0.13	4.88	34.41	99.00	1,259.00
	05/28/14 18:20:39	42540	14.05	0.28	0.13	4.92	34.41	99.00	1,259.00
	05/28/14 18:21:09	42570	14.00	0.26	0.09	4.91	34.57	98.80	1,260.00
	05/28/14 18:21:39	42600	13.87	0.26	0.09	5.01	34.57	98.80	1,260.00
	05/28/14 18:22:09	42630	13.93	0.23	0.10	4.98	34.71	98.80	1,263.00
	05/28/14 18:22:39	42660	13.92	0.29	0.10	4.97	34.71	98.80	1,263.00
	05/28/14 18:23:09	42690	13.97	0.24	0.10	4.99	34.60	98.70	1,260.00
	05/28/14 18:23:39	42720	14.13	0.28	0.09	4.83	34.60	98.70	1,260.00
	05/28/14 18:24:09	42750	14.15	0.30	0.10	4.88	34.60	98.70	1,263.00
	05/28/14 18:24:39	42780	14.52	0.29	0.12	4.88	34.60	98.70	1,263.00
	05/28/14 18:25:09	42810	14.52	0.30	0.13	4.90	34.63	98.80	1,260.00
	05/28/14 18:25:39	42840	14.32	0.24	0.13	5.04	34.63	98.80	1,260.00
	05/28/14 18:26:09	42870	14.41	0.21	0.10	4.99	34.77	98.80	1,260.00
	05/28/14 18:26:39	42900	14.47	0.25	0.10	4.95	34.77	98.80	1,260.00
	05/28/14 18:27:09	42930	14.49	0.24	0.11	4.92	34.63	98.80	1,260.00
	05/28/14 18:27:39	42960	14.56	0.28	0.12	4.90	34.63	98.80	1,260.00
	05/28/14 18:28:09	42990	14.51	0.24	0.10	4.92	34.63	98.80	1,257.00
	05/28/14 18:28:39	43020	14.43	0.25	0.10	4.99	34.63	98.80	1,257.00
	05/28/14 18:29:09	43050	14.42	0.24	0.12	4.97	34.77	98.90	1,257.00
	05/28/14 18:29:39	43080	14.46	0.23	0.12	4.96	34.77	98.90	1,257.00
	05/28/14 18:30:09	43110	14.27	0.20	0.09	5.08	34.77	99.00	1,257.00
	05/28/14 18:30:39	43140	14.22	0.19	0.10	5.10	34.77	99.00	1,257.00
	05/28/14 18:31:09	43170	14.27	0.16	0.13	5.09	34.90	98.90	1,258.00
	05/28/14 18:31:39	43200	14.36	0.18	0.13	5.03	34.90	98.90	1,258.00
	05/28/14 18:32:09	43230	14.28	0.23	0.12	5.06	34.63	98.80	1,257.00
	05/28/14 18:32:39	43260	14.21	0.20	0.10	5.13	34.63	98.80	1,257.00
	05/28/14 18:33:09	43290	14.13	0.17	0.08	5.18	34.90	98.70	1,258.00
	05/28/14 18:33:39	43320	14.33	0.17	0.09	5.08	34.90	98.70	1,258.00
	05/28/14 18:34:09	43350	14.48	0.25	0.12	4.94	34.90	98.60	1,258.00
	05/28/14 18:34:39	43380	14.40	0.25	0.12	5.00	34.90	98.60	1,258.00
	05/28/14 18:35:09	43410	14.46	0.29	0.12	4.93	34.66	98.60	1,258.00
	05/28/14 18:35:39	43440	13.80	0.23	0.12	5.41	34.66	98.60	1,258.00
	05/28/14 18:36:09	43470	13.94	0.17	0.10	5.32	34.77	98.60	1,258.00
	05/28/14 18:36:39	43500	13.89	0.18	0.11	5.34	34.77	98.60	1,258.00
	05/28/14 18:37:09	43530	13.90	0.17	0.13	5.36	35.04	98.60	1,259.00

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.6	%
Stack Exhaust Flow (M2)	127,425	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	50	%
Ambient Temperature	79	^{o}F
Specific Humidity	0.010560	lb H_2O / lb air

90-100 Load, Run - PI 48-R11

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 18:37:39	43560	13.96	0.18	0.12	5.30	35.04	98.60	1,259.00
A2	05/28/14 18:38:09	43590	13.85	0.19	0.13	5.38	34.77	98.70	1,258.00
	05/28/14 18:38:39	43620	13.44	0.06	0.14	5.44	34.77	98.70	1,258.00
	05/28/14 18:39:09	43650	13.37	0.18	0.12	5.35	35.04	98.60	1,259.00
	05/28/14 18:39:39	43680	13.40	0.20	0.11	5.34	35.04	98.60	1,259.00
	05/28/14 18:40:09	43710	13.39	0.17	0.11	5.35	35.04	98.70	1,259.00
	05/28/14 18:40:39	43740	13.26	0.19	0.12	5.44	35.04	98.70	1,259.00
	05/28/14 18:41:09	43770	13.33	0.14	0.11	5.40	35.02	98.70	1,259.00
	05/28/14 18:41:39	43800	13.33	0.24	0.09	5.39	35.02	98.70	1,259.00
	05/28/14 18:42:09	43830	13.38	0.20	0.09	5.37	34.88	98.70	1,258.00
	05/28/14 18:42:39	43860	13.39	0.17	0.08	5.35	34.88	98.70	1,258.00
	05/28/14 18:43:09	43890	13.45	0.20	0.07	5.31	34.74	98.70	1,258.00
	05/28/14 18:43:39	43920	13.39	0.21	0.05	5.34	34.74	98.70	1,258.00
	05/28/14 18:44:09	43950	13.42	0.20	0.08	5.34	35.02	98.70	1,258.00
	05/28/14 18:44:39	43980	13.46	0.21	0.11	5.32	35.02	98.70	1,258.00
	05/28/14 18:45:09	44010	13.34	0.21	0.07	5.37	34.74	98.70	1,258.00
	05/28/14 18:45:39	44040	13.41	0.20	0.09	5.33	34.74	98.70	1,258.00
	05/28/14 18:46:09	44070	13.46	0.25	0.08	5.28	34.88	98.70	1,258.00
	05/28/14 18:46:39	44100	13.10	0.19	0.09	5.51	34.88	98.70	1,258.00
	05/28/14 18:47:09	44130	13.33	0.14	0.10	5.44	34.74	98.70	1,258.00
	05/28/14 18:47:39	44160	13.33	0.19	0.07	5.37	34.74	98.70	1,258.00
	05/28/14 18:48:09	44190	13.33	0.20	0.08	5.40	34.99	98.70	1,258.00
	05/28/14 18:48:39	44220	13.28	0.22	0.06	5.41	34.99	98.70	1,258.00
	05/28/14 18:49:09	44250	13.31	0.28	0.08	5.42	34.60	98.70	1,254.00
	05/28/14 18:49:39	44280	13.29	0.20	0.09	5.42	34.60	98.70	1,254.00
	05/28/14 18:50:09	44310	13.41	0.19	0.09	5.34	35.13	98.60	1,262.00
	05/28/14 18:50:39	44340	13.35	0.17	0.08	5.39	35.13	98.60	1,262.00
	05/28/14 18:51:09	44370	13.39	0.21	0.10	5.35	35.13	98.60	1,262.00
	05/28/14 18:51:39	44400	13.22	0.23	0.09	5.46	35.13	98.60	1,262.00
	05/28/14 18:52:09	44430	13.42	0.16	0.09	5.33	35.13	98.60	1,256.00
	05/28/14 18:52:39	44460	13.37	0.22	0.11	5.35	35.13	98.60	1,256.00
	05/28/14 18:53:09	44490	13.40	0.24	0.05	5.35	34.71	98.60	1,258.00
	05/28/14 18:53:39	44520	13.38	0.24	0.06	5.36	34.71	98.60	1,258.00
	05/28/14 18:54:09	44550	13.27	0.21	0.07	5.41	34.99	98.60	1,259.00
	05/28/14 18:54:39	44580	13.30	0.19	0.08	5.41	34.99	98.60	1,259.00
	05/28/14 18:55:09	44610	13.26	0.18	0.09	5.44	34.71	98.50	1,258.00
	05/28/14 18:55:39	44640	13.34	0.19	0.11	5.38	34.71	98.50	1,258.00
	05/28/14 18:56:09	44670	13.31	0.18	0.05	5.41	34.71	98.50	1,258.00
	05/28/14 18:56:39	44700	13.42	0.25	0.07	5.32	34.71	98.50	1,258.00
	05/28/14 18:57:09	44730	13.43	0.26	0.04	5.32	34.85	98.50	1,258.00
	05/28/14 18:57:39	44760	13.46	0.24	0.04	5.32	34.85	98.50	1,258.00
A3	05/28/14 18:58:09	44790	13.91	0.25	0.09	5.08	34.85	98.50	1,258.00
	05/28/14 18:58:39	44820	14.54	0.32	0.09	4.56	34.85	98.50	1,258.00
	05/28/14 18:59:09	44850	14.17	0.40	0.05	4.81	34.85	98.50	1,256.00
	05/28/14 18:59:39	44880	14.28	0.42	0.07	4.76	34.85	98.50	1,256.00
	05/28/14 19:00:09	44910	14.12	0.41	0.08	4.86	34.85	98.40	1,256.00
	05/28/14 19:00:39	44940	14.29	0.41	0.08	4.76	34.85	98.40	1,256.00
	05/28/14 19:01:09	44970	14.30	0.45	0.07	4.71	34.85	98.40	1,259.00
	05/28/14 19:01:39	45000	14.22	0.42	0.08	4.80	34.85	98.40	1,259.00
	05/28/14 19:02:09	45030	14.24	0.43	0.05	4.78	34.60	98.30	1,258.00
	05/28/14 19:02:39	45060	14.25	0.43	0.05	4.73	34.60	98.30	1,258.00
	05/28/14 19:03:09	45090	14.26	0.39	0.05	4.76	34.60	98.30	1,258.00
	05/28/14 19:03:39	45120	14.02	0.44	0.04	4.88	34.60	98.30	1,258.00
	05/28/14 19:04:09	45150	14.00	0.36	0.04	4.95	34.88	98.20	1,259.00
	05/28/14 19:04:39	45180	13.90	0.35	0.06	5.00	34.88	98.20	1,259.00
	05/28/14 19:05:09	45210	14.01	0.37	0.08	4.90	35.15	98.20	1,260.00
	05/28/14 19:05:39	45240	13.90	0.36	0.08	4.97	35.15	98.20	1,260.00
	05/28/14 19:06:09	45270	13.99	0.33	0.08	4.97	34.49	98.10	1,258.00
	05/28/14 19:06:39	45300	14.10	0.43	0.09	4.87	34.49	98.10	1,258.00
	05/28/14 19:07:09	45330	14.02	0.48	0.07	4.91	34.77	98.00	1,257.00
	05/28/14 19:07:39	45360	13.84	0.35	0.07	5.03	34.77	98.00	1,257.00

Big Iron Oilfield Services, Inc.
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.6	%
Stack Exhaust Flow (M2)	127,425	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	50	%
Ambient Temperature	79	^{o}F
Specific Humidity	0.010560	lb H_2O / lb air

90-100 Load, Run - PI 48-R11

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 19:08:09	45390	14.00	0.38	0.09	4.92	34.77	97.90	1,259.00
05/28/14 19:08:39	45420	13.90	0.40	0.10	4.97	34.77	97.90	1,259.00
05/28/14 19:09:09	45450	13.99	0.39	0.08	4.94	34.66	97.80	1,259.00
05/28/14 19:09:39	45480	13.87	0.38	0.08	5.01	34.66	97.80	1,259.00
05/28/14 19:10:09	45510	13.89	0.32	0.09	5.02	34.79	97.50	1,261.00
05/28/14 19:10:39	45540	13.89	0.34	0.09	5.02	34.79	97.50	1,261.00
05/28/14 19:11:09	45570	13.85	0.34	0.07	5.04	34.54	97.40	1,257.00
05/28/14 19:11:39	45600	13.90	0.37	0.09	4.98	34.54	97.40	1,257.00
05/28/14 19:12:09	45630	13.89	0.34	0.07	4.99	34.54	97.30	1,257.00
05/28/14 19:12:39	45660	13.90	0.30	0.07	5.00	34.54	97.30	1,257.00
05/28/14 19:13:09	45690	13.99	0.38	0.06	4.95	34.68	97.30	1,258.00
05/28/14 19:13:39	45720	13.89	0.36	0.10	4.99	34.68	97.30	1,258.00
05/28/14 19:14:09	45750	13.94	0.46	0.08	4.99	34.82	97.20	1,259.00
05/28/14 19:14:39	45780	14.01	0.43	0.08	4.94	34.82	97.20	1,259.00
05/28/14 19:15:09	45810	14.04	0.47	0.09	4.89	34.68	97.10	1,258.00
05/28/14 19:15:39	45840	13.92	0.40	0.08	4.98	34.68	97.10	1,258.00
05/28/14 19:16:09	45870	13.97	0.37	0.06	4.94	34.82	97.10	1,259.00
05/28/14 19:16:39	45900	13.96	0.37	0.04	4.97	34.82	97.10	1,259.00
05/28/14 19:17:09	45930	13.87	0.33	0.07	5.01	33.27	101.60	1,231.00
RAW AVERAGE		**13.85**	**0.26**	**0.09**	**5.10**	**34.16**	**98.72**	**1,246.90**

		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.09	0.10	0.01	0.06			
	Final Zero	0.08	-0.03	0.01	0.07			
	Avg. Zero	0.09	0.04	0.01	0.07			
	Initial UpScale	12.13	8.76	3.08	8.72			
	Final UpScale	12.19	8.81	3.03	8.71			
	Avg. UpScale	12.16	8.79	3.06	8.72			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.91	0.23	0.08	5.11
Corrected Raw Average (ppm/% wet basis)	13.13	0.22	0.08	4.82
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.9	%
Stack Exhaust Flow (M2)	127,518	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	55	%
Ambient Temperature	76	^{o}F
Specific Humidity	0.010519	lb H_2O / lb air

90-100 Load, Run - PI 48-R12

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
A1	05/28/14 19:28:09	46590	13.78	0.31	0.08	5.10	30.86	95.90	1,182.00
	05/28/14 19:28:39	46620	13.80	0.30	0.08	5.06	30.86	95.90	1,182.00
	05/28/14 19:29:09	46650	13.72	0.29	0.06	5.13	31.17	95.60	1,188.00
	05/28/14 19:29:39	46680	13.71	0.28	0.07	5.14	31.17	95.60	1,188.00
	05/28/14 19:30:09	46710	13.61	0.28	0.05	5.20	31.17	95.40	1,189.00
	05/28/14 19:30:39	46740	13.79	0.25	0.05	5.09	31.17	95.40	1,189.00
	05/28/14 19:31:09	46770	13.80	0.27	0.08	5.07	31.06	95.20	1,189.00
	05/28/14 19:31:39	46800	13.78	0.30	0.06	5.08	31.06	95.20	1,189.00
	05/28/14 19:32:09	46830	13.69	0.30	0.05	5.11	31.08	95.10	1,189.00
	05/28/14 19:32:39	46860	13.62	0.27	0.05	5.22	31.08	95.10	1,189.00
	05/28/14 19:33:09	46890	13.63	0.26	0.06	5.17	31.22	95.00	1,190.00
	05/28/14 19:33:39	46920	13.76	0.28	0.07	5.12	31.22	95.00	1,190.00
	05/28/14 19:34:09	46950	13.87	0.33	0.05	5.02	31.11	94.80	1,190.00
	05/28/14 19:34:39	46980	13.73	0.32	0.05	5.10	31.11	94.80	1,190.00
	05/28/14 19:35:09	47010	13.78	0.33	0.04	5.10	31.25	94.70	1,188.00
	05/28/14 19:35:39	47040	13.89	0.29	0.05	5.00	31.25	94.70	1,188.00
	05/28/14 19:36:09	47070	13.85	0.27	0.03	5.05	31.03	94.60	1,187.00
	05/28/14 19:36:39	47100	13.85	0.28	0.02	5.03	31.03	94.60	1,187.00
	05/28/14 19:37:09	47130	14.21	0.36	0.03	4.80	32.61	94.40	1,225.00
	05/28/14 19:37:39	47160	14.25	0.33	0.00	4.80	32.61	94.40	1,225.00
	05/28/14 19:38:09	47190	14.27	0.38	0.01	4.77	34.46	94.20	1,256.00
	05/28/14 19:38:39	47220	14.25	0.41	0.04	4.77	34.46	94.20	1,256.00
	05/28/14 19:39:09	47250	14.28	0.40	0.04	4.74	34.07	94.10	1,247.00
	05/28/14 19:39:39	47280	14.18	0.39	0.00	4.81	34.07	94.10	1,247.00
	05/28/14 19:40:09	47310	14.19	0.39	0.00	4.82	34.35	93.80	1,248.00
	05/28/14 19:40:39	47340	14.25	0.35	0.03	4.79	34.35	93.80	1,248.00
	05/28/14 19:41:09	47370	14.34	0.46	0.03	4.74	34.24	93.50	1,249.00
	05/28/14 19:41:39	47400	14.22	0.38	0.00	4.79	34.24	93.50	1,249.00
	05/28/14 19:42:09	47430	14.30	0.36	0.01	4.76	34.24	93.40	1,252.00
	05/28/14 19:42:39	47460	14.27	0.44	0.03	4.76	34.24	93.40	1,252.00
	05/28/14 19:43:09	47490	14.23	0.41	0.04	4.79	33.99	93.20	1,249.00
	05/28/14 19:43:39	47520	14.25	0.32	0.03	4.78	33.99	93.20	1,249.00
	05/28/14 19:44:09	47550	14.21	0.36	0.03	4.79	34.24	93.10	1,253.00
	05/28/14 19:44:39	47580	14.21	0.34	0.01	4.81	34.24	93.10	1,253.00
	05/28/14 19:45:09	47610	14.22	0.41	0.01	4.79	34.38	92.90	1,253.00
	05/28/14 19:45:39	47640	14.30	0.32	0.02	4.77	34.38	92.90	1,253.00
	05/28/14 19:46:09	47670	14.21	0.50	0.14	4.79	34.41	92.70	1,256.00
	05/28/14 19:46:39	47700	14.20	0.60	0.13	4.84	34.41	92.70	1,256.00
	05/28/14 19:47:09	47730	14.17	0.49	0.13	4.84	34.68	92.60	1,255.00
	05/28/14 19:47:39	47760	14.26	0.41	0.11	4.77	34.68	92.60	1,255.00
	05/28/14 19:48:09	47790	14.25	0.47	0.12	4.77	34.16	92.40	1,251.00
	05/28/14 19:48:39	47820	14.22	0.45	0.19	4.80	34.16	92.40	1,251.00
	05/28/14 19:49:09	47850	14.24	0.48	0.15	4.81	34.68	92.20	1,250.00
	05/28/14 19:49:39	47880	14.39	0.51	-0.01	4.68	34.68	92.20	1,250.00
	05/28/14 19:50:09	47910	14.20	0.40	-0.01	4.81	34.57	92.20	1,255.00
	05/28/14 19:50:39	47940	14.14	0.41	0.01	4.85	34.57	92.20	1,255.00
	05/28/14 19:51:09	47970	14.32	0.45	0.01	4.73	34.32	92.00	1,252.00
	05/28/14 19:51:39	48000	14.17	0.47	-0.01	4.82	34.32	92.00	1,252.00
	05/28/14 19:52:09	48030	14.32	0.52	0.00	4.75	34.46	92.00	1,256.00
	05/28/14 19:52:39	48060	14.29	0.45	-0.02	4.76	34.46	92.00	1,256.00
	05/28/14 19:53:09	48090	14.20	0.36	-0.02	4.81	34.35	91.80	1,253.00
	05/28/14 19:53:39	48120	14.22	0.36	0.00	4.82	34.35	91.80	1,253.00
	05/28/14 19:54:09	48150	14.25	0.41	0.00	4.78	34.49	91.80	1,256.00
	05/28/14 19:54:39	48180	14.20	0.47	0.01	4.82	34.49	91.80	1,256.00
	05/28/14 19:55:09	48210	14.21	0.36	0.00	4.80	34.49	91.70	1,256.00
	05/28/14 19:55:39	48240	14.25	0.33	-0.03	4.80	34.49	91.70	1,256.00
	05/28/14 19:56:09	48270	14.27	0.38	-0.03	4.77	34.38	91.60	1,256.00
	05/28/14 19:56:39	48300	14.25	0.41	0.00	4.77	34.38	91.60	1,256.00
	05/28/14 19:57:09	48330	14.28	0.40	0.00	4.74	34.52	91.40	1,254.00
	05/28/14 19:57:39	48360	14.18	0.39	-0.03	4.81	34.52	91.40	1,254.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.9	%
Stack Exhaust Flow (M2)	127,518	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	55	%
Ambient Temperature	76	^{o}F
Specific Humidity	0.010519	lb H_2O / lb air

90-100 Load, Run - PI 48-R12

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
	05/28/14 19:58:09	48390	14.19	0.39	-0.03	4.82	34.41	91.30	1,257.00
A2	05/28/14 19:58:39	48420	14.25	0.35	-0.01	4.79	34.41	91.30	1,257.00
	05/28/14 19:59:09	48450	14.34	0.46	-0.01	4.74	34.54	91.10	1,255.00
	05/28/14 19:59:39	48480	14.22	0.38	-0.03	4.79	34.54	91.10	1,255.00
	05/28/14 20:00:09	48510	14.30	0.36	-0.02	4.76	34.30	91.10	1,252.00
	05/28/14 20:00:39	48540	14.27	0.44	0.00	4.76	34.30	91.10	1,252.00
	05/28/14 20:01:09	48570	14.23	0.41	0.00	4.79	34.43	91.00	1,255.00
	05/28/14 20:01:39	48600	13.39	0.29	0.05	5.36	34.43	91.00	1,255.00
	05/28/14 20:02:09	48630	13.49	0.27	0.04	5.29	34.60	90.80	1,256.00
	05/28/14 20:02:39	48660	13.42	0.25	0.08	5.34	34.60	90.80	1,256.00
	05/28/14 20:03:09	48690	13.47	0.24	0.07	5.32	34.60	90.80	1,253.00
	05/28/14 20:03:39	48720	13.41	0.28	0.06	5.35	34.60	90.80	1,253.00
	05/28/14 20:04:09	48750	13.45	0.38	0.11	5.33	34.21	90.60	1,255.00
	05/28/14 20:04:39	48780	13.46	0.30	0.10	5.33	34.21	90.60	1,255.00
	05/28/14 20:05:09	48810	13.39	0.28	0.06	5.35	34.49	90.50	1,254.00
	05/28/14 20:05:39	48840	13.35	0.25	0.09	5.39	34.49	90.50	1,254.00
	05/28/14 20:06:09	48870	13.44	0.35	0.07	5.33	34.52	90.40	1,254.00
	05/28/14 20:06:39	48900	13.47	0.38	0.06	5.29	34.52	90.40	1,254.00
	05/28/14 20:07:09	48930	13.34	0.33	0.05	5.40	34.38	90.30	1,254.00
	05/28/14 20:07:39	48960	13.46	0.22	0.08	5.32	34.38	90.30	1,254.00
	05/28/14 20:08:09	48990	13.48	0.29	0.09	5.29	34.68	90.20	1,255.00
	05/28/14 20:08:39	49020	13.36	0.38	0.09	5.38	34.68	90.20	1,255.00
	05/28/14 20:09:09	49050	13.39	0.32	0.08	5.37	34.54	90.10	1,255.00
	05/28/14 20:09:39	49080	13.39	0.23	0.07	5.36	34.54	90.10	1,255.00
	05/28/14 20:10:09	49110	13.39	0.28	0.06	5.35	34.43	89.90	1,255.00
	05/28/14 20:10:39	49140	13.39	0.34	0.07	5.36	34.43	89.90	1,255.00
	05/28/14 20:11:09	49170	13.36	0.32	0.10	5.39	34.57	89.80	1,255.00
	05/28/14 20:11:39	49200	13.44	0.20	0.09	5.34	34.57	89.80	1,255.00
	05/28/14 20:12:09	49230	13.41	0.25	0.07	5.36	34.46	89.70	1,253.00
	05/28/14 20:12:39	49260	13.39	0.32	0.08	5.35	34.46	89.70	1,253.00
	05/28/14 20:13:09	49290	13.41	0.30	0.09	5.38	34.35	89.50	1,255.00
	05/28/14 20:13:39	49320	13.40	0.28	0.09	5.37	34.35	89.50	1,255.00
	05/28/14 20:14:09	49350	13.40	0.26	0.09	5.35	34.63	89.40	1,254.00
	05/28/14 20:14:39	49380	13.38	0.21	0.10	5.38	34.63	89.40	1,254.00
	05/28/14 20:15:09	49410	13.33	0.19	0.13	5.38	34.52	89.20	1,254.00
	05/28/14 20:15:39	49440	13.39	0.21	0.11	5.39	34.52	89.20	1,254.00
	05/28/14 20:16:09	49470	13.38	0.27	0.12	5.36	34.41	89.10	1,257.00
	05/28/14 20:16:39	49500	13.45	0.30	0.13	5.33	34.41	89.10	1,257.00
	05/28/14 20:17:09	49530	13.39	0.26	0.12	5.35	34.41	88.90	1,257.00
	05/28/14 20:17:39	49560	13.34	0.18	0.14	5.42	34.41	88.90	1,257.00
	05/28/14 20:18:09	49590	13.40	0.21	0.12	5.36	34.43	88.70	1,255.00
A3	05/28/14 20:18:39	49620	13.37	0.26	0.12	5.37	34.43	88.70	1,255.00
	05/28/14 20:19:09	49650	13.39	0.23	0.16	5.37	34.57	88.60	1,253.00
	05/28/14 20:19:39	49680	13.48	0.25	0.13	5.31	34.57	88.60	1,253.00
	05/28/14 20:20:09	49710	13.42	0.24	0.13	5.32	34.46	88.40	1,256.00
	05/28/14 20:20:39	49740	13.87	0.21	0.13	5.11	34.46	88.40	1,256.00
	05/28/14 20:21:09	49770	14.15	0.42	0.14	4.83	34.38	88.10	1,253.00
	05/28/14 20:21:39	49800	14.21	0.50	0.14	4.79	34.38	88.10	1,253.00
	05/28/14 20:22:09	49830	14.20	0.60	0.13	4.84	34.52	87.90	1,254.00
	05/28/14 20:22:39	49860	14.17	0.49	0.13	4.84	34.52	87.90	1,254.00
	05/28/14 20:23:09	49890	14.26	0.41	0.11	4.77	34.54	87.80	1,254.00
	05/28/14 20:23:39	49920	14.25	0.47	0.12	4.77	34.54	87.80	1,254.00
	05/28/14 20:24:09	49950	14.22	0.45	0.19	4.80	34.57	87.60	1,255.00
	05/28/14 20:24:39	49980	14.24	0.48	0.15	4.81	34.57	87.60	1,255.00
	05/28/14 20:25:09	50010	14.39	0.51	-0.01	4.68	34.46	87.40	1,255.00
	05/28/14 20:25:39	50040	14.20	0.40	-0.01	4.81	34.46	87.40	1,255.00
	05/28/14 20:26:09	50070	14.14	0.41	0.01	4.85	34.35	87.20	1,255.00
	05/28/14 20:26:39	50100	14.32	0.45	0.01	4.73	34.35	87.20	1,255.00
	05/28/14 20:27:09	50130	14.17	0.47	-0.01	4.82	34.52	87.10	1,256.00
	05/28/14 20:27:39	50160	14.32	0.52	0.00	4.75	34.52	87.10	1,256.00

Big Iron Oilfield Services, Inc.
May 28, 2014
BNECU-PI 48
Elmore City Plant

Unit Data

Meas. Stack Moisture	5.9	%
Stack Exhaust Flow (M2)	127,518	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	55	%
Ambient Temperature	76	^{o}F
Specific Humidity	0.010519	lb H_2O / lb air

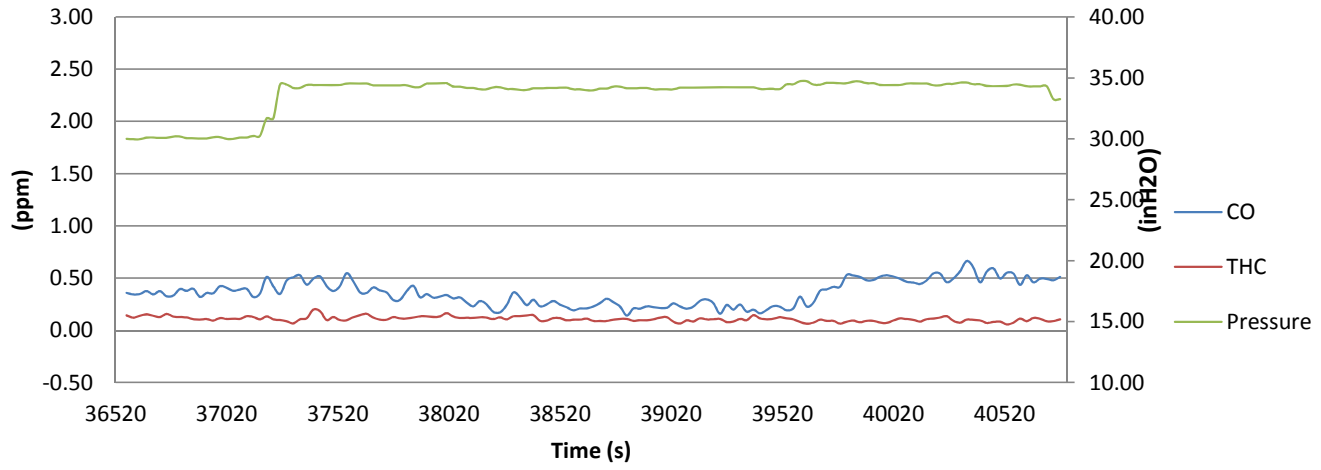
90-100 Load, Run - PI 48-R12

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O_2 (%)	CO (ppmvd)	THC (ppmvw)	CO_2 (%)	Fuel Pressure in. H_2O	Fuel Temp. ^{o}F	Fuel Flow SCFH
05/28/14 20:28:09	50190	14.29	0.45	-0.02	4.76	34.41	86.90	1,256.00
05/28/14 20:28:39	50220	14.20	0.36	-0.02	4.81	34.41	86.90	1,256.00
05/28/14 20:29:09	50250	14.22	0.36	0.00	4.82	34.32	86.60	1,256.00
05/28/14 20:29:39	50280	14.25	0.41	0.00	4.78	34.32	86.60	1,256.00
05/28/14 20:30:09	50310	14.20	0.47	0.01	4.82	34.60	86.40	1,255.00
05/28/14 20:30:39	50340	14.21	0.36	0.00	4.80	34.60	86.40	1,255.00
05/28/14 20:31:09	50370	14.25	0.33	-0.03	4.80	34.63	86.30	1,258.00
05/28/14 20:31:39	50400	14.27	0.38	-0.03	4.77	34.63	86.30	1,258.00
05/28/14 20:32:09	50430	14.25	0.41	0.00	4.77	34.52	86.10	1,255.00
05/28/14 20:32:39	50460	14.28	0.40	0.00	4.74	34.52	86.10	1,255.00
05/28/14 20:33:09	50490	14.18	0.39	-0.03	4.81	34.41	86.00	1,258.00
05/28/14 20:33:39	50520	14.19	0.39	-0.03	4.82	34.41	86.00	1,258.00
05/28/14 20:34:09	50550	14.25	0.35	-0.01	4.79	34.68	85.80	1,254.00
05/28/14 20:34:39	50580	14.34	0.46	-0.01	4.74	34.68	85.80	1,254.00
05/28/14 20:35:09	50610	14.22	0.38	-0.03	4.79	34.57	85.70	1,256.00
05/28/14 20:35:39	50640	14.30	0.36	-0.02	4.76	34.57	85.70	1,256.00
05/28/14 20:36:09	50670	14.27	0.44	0.00	4.76	34.60	85.50	1,254.00
05/28/14 20:36:39	50700	14.23	0.41	0.00	4.79	34.60	85.50	1,254.00
05/28/14 20:37:09	50730	14.25	0.32	-0.01	4.78	34.46	85.40	1,257.00
05/28/14 20:37:39	50760	14.21	0.36	-0.01	4.79	34.46	85.40	1,257.00
05/28/14 20:38:09	50790	14.21	0.34	-0.03	4.81	35.15	85.20	1,268.00
RAW AVERAGE		**13.95**	**0.36**	**0.05**	**4.98**	**34.00**	**90.63**	**1,245.50**

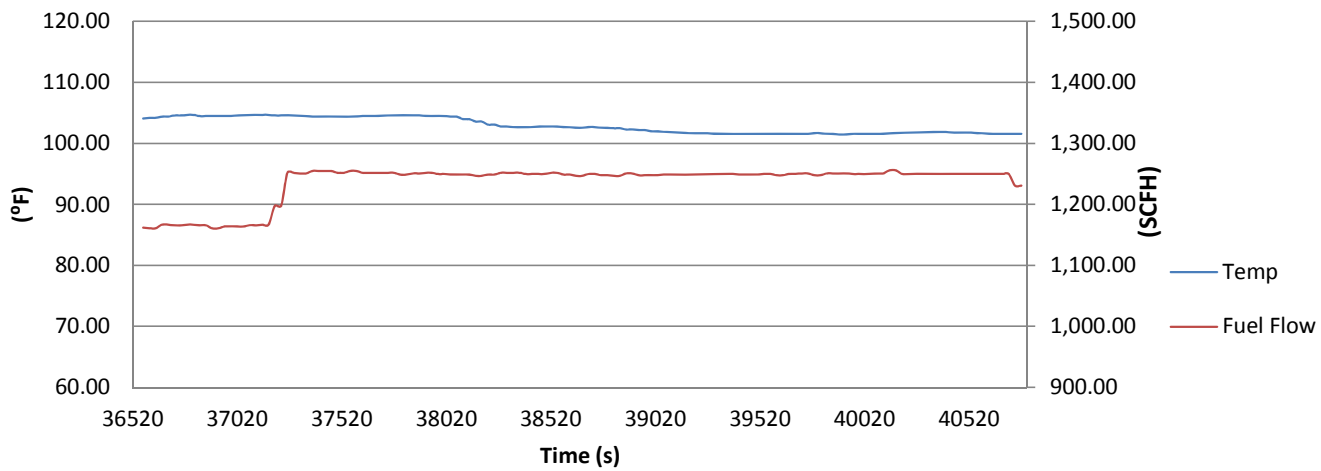
		O_2	CO	THC	CO_2	Press. Trans	Temp. Trans.	F-Flow Trans.
	Serial Number:	INST-22-0005	INST-CO-0034	INST-VC-0006	INST-22-0005	PT-1318080	TT-1318080	FT-1318080
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H_2O)	(^{o}F)	(SCFH)
Bias	Initial Zero	0.08	-0.03	0.01	0.07			
	Final Zero	0.10	0.06	0.01	0.09			
	Avg. Zero	0.09	0.02	0.01	0.08			
	Initial UpScale	12.19	8.81	3.03	8.71			
	Final UpScale	12.19	8.66	3.02	8.73			
	Avg. UpScale	12.19	8.74	3.03	8.72			
Upscale Cal Gas		12.20	9.00	3.04	8.77			

EMISSIONS DATA	O_2	CO	THC	CO_2
Corrected Raw Average (ppm/% dry basis)	13.98	0.36	0.04	4.97
Corrected Raw Average (ppm/% wet basis)	13.15	0.33	0.03	4.68
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

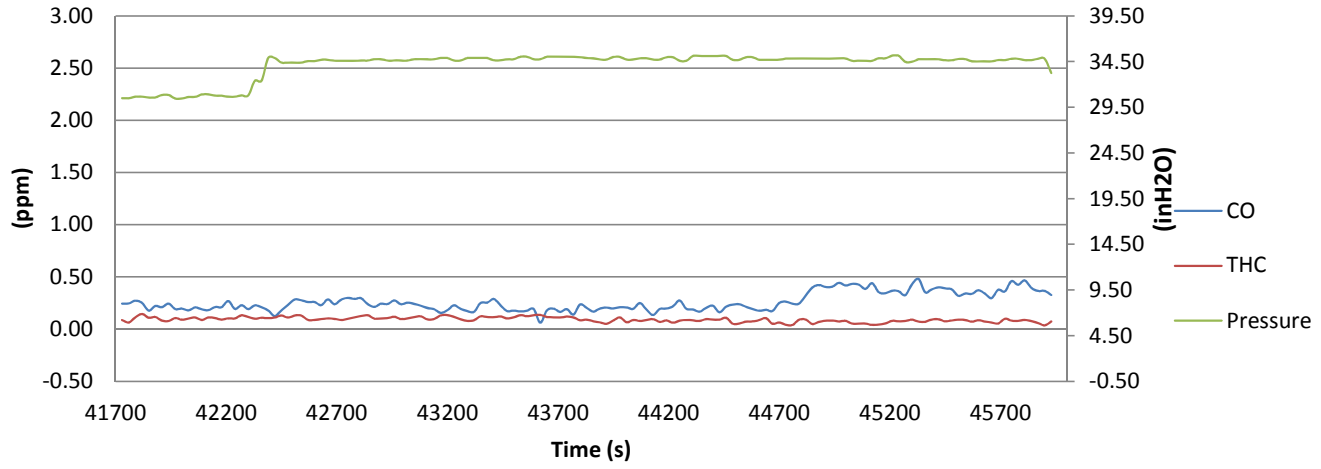
PI 48-R10



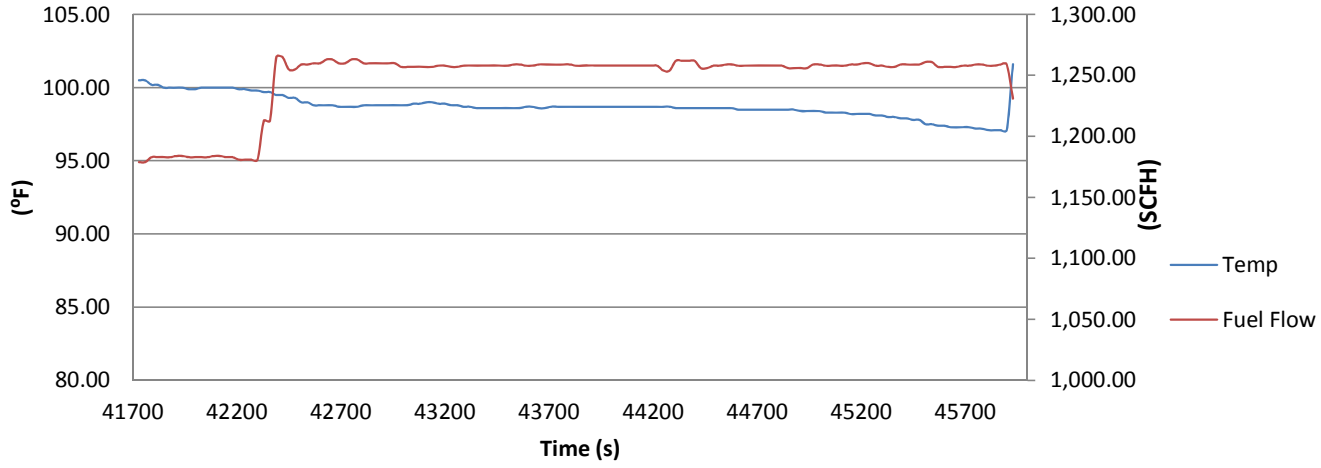
PI 48-R10



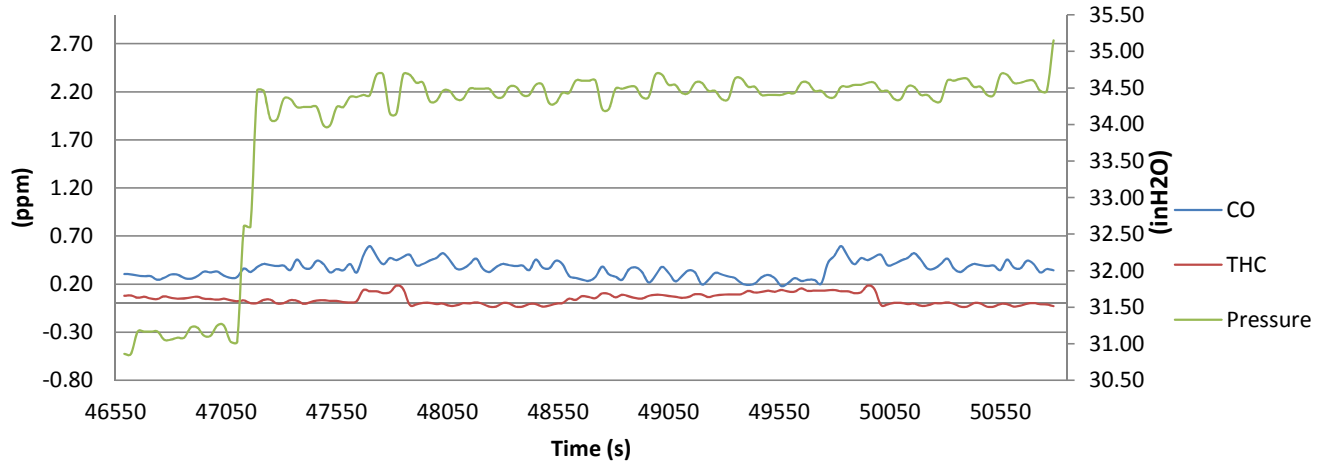
PI 48-R11



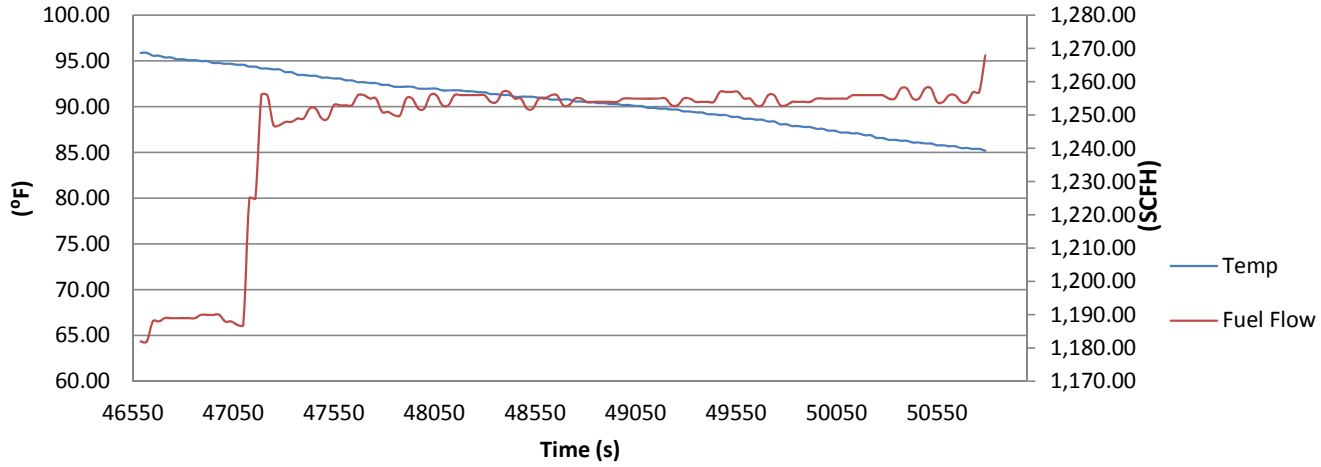
PI 48-R11

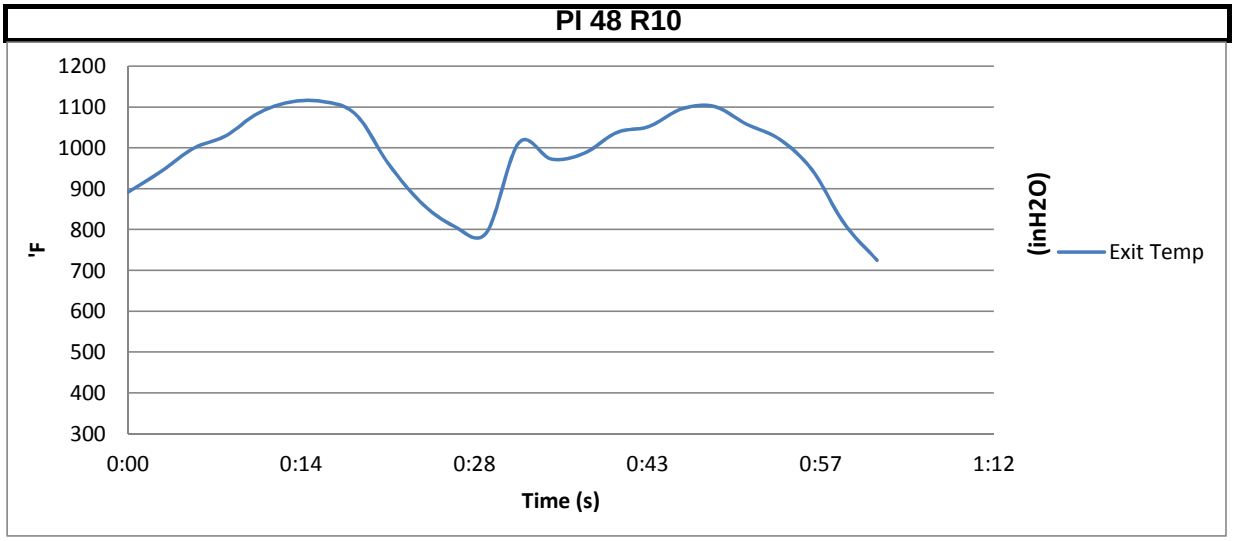


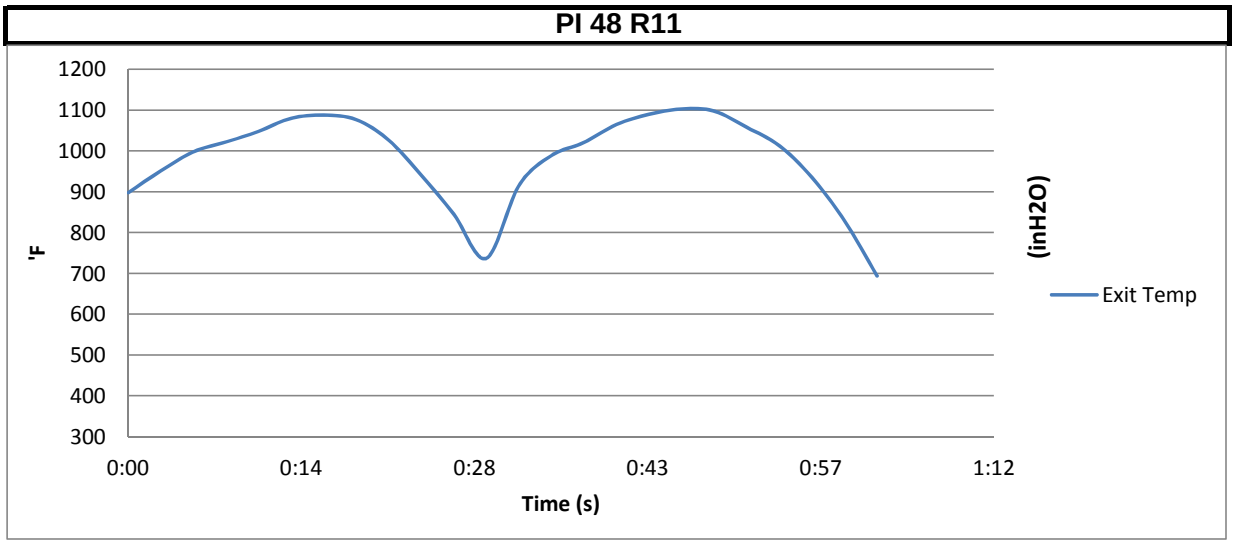
PI 48-R12

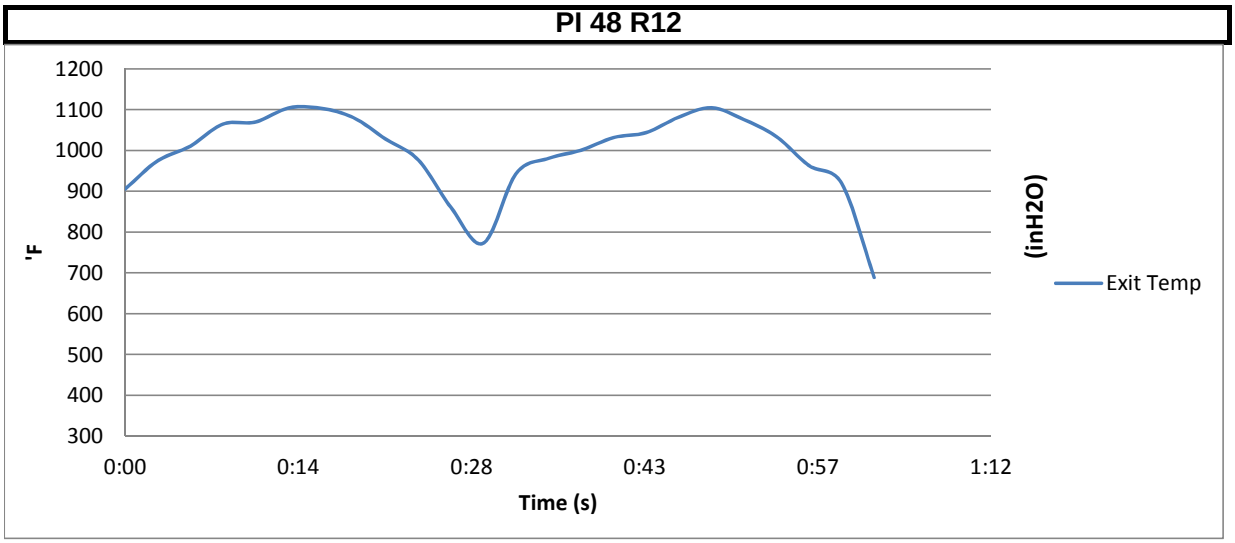


PI 48-R12




PI 48 R10
1200
1100
1000
900
800
700
600
500
400
300
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI 48 R11
1200
1100
1000
900
800
700
600
500
400
300
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp


PI 48 R12
1200
1100
1000
900
800
700
600
500
400
300
'F
0:00
0:14
0:28
0:43
0:57
1:12
Time (s)
(inH2O)
Exit Temp

EMISSION DATA RECORDS

VISUAL EMISSION DATA RECORD

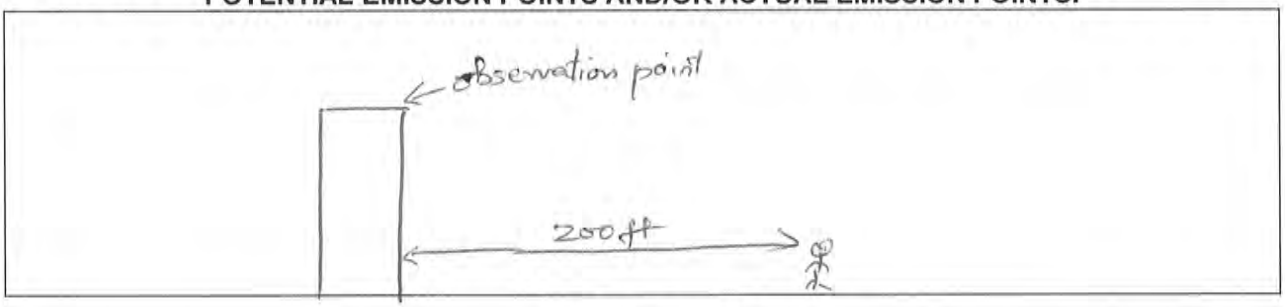
R1

METHOD 22
FUGITIVE OR SMOKE EMISSION INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin Rani **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-27-14
SKY CONDITIONS: Cloudy/grey **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 3 MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PJ 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
9:37	20:00	00:00	North of flare
9:57	5:00 (break)	00:00	
10:02	20:00	00:00	
10:22	5:00 (break)	00:00	
10:27	20:00	00:00	
10:47			

pic @ 10:02

SIGNATURE

Run 1



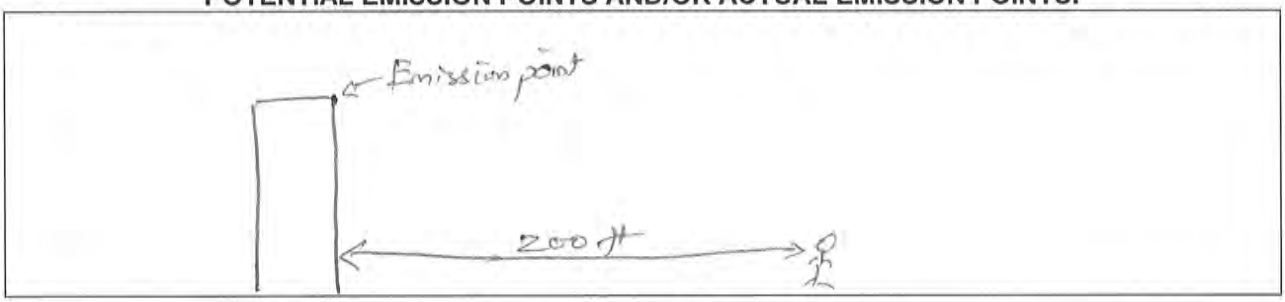
R2

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-27-14
SKY CONDITIONS: cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4 MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
11:38	20:00	00:00	north of stack
11:58	5:00 (break)	00:00	
12:03	20:00	00:00	
12:23	5:00 (break)	00:00	
12:28	20:00	00:00	
12:48			

pic @ 12:03

ASh

SIGNATURE

Run 2



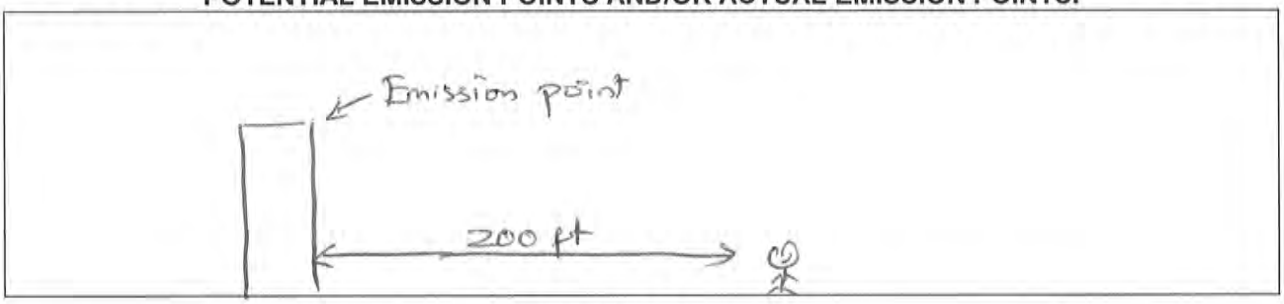
R3

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin Ravi **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-27-14
SKY CONDITIONS: Cloudy / gray **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
13:05	20:00	00:00	north of flare
13:25	5:00 (break)	00:00	
13:30	20:00	00:00	
13:50	5:00 (break)	00:00	
13:55	20:00	00:00	
14:15	5:00 (break)	00:00	

pic @ 13:30

SIGNATURE

Run 3



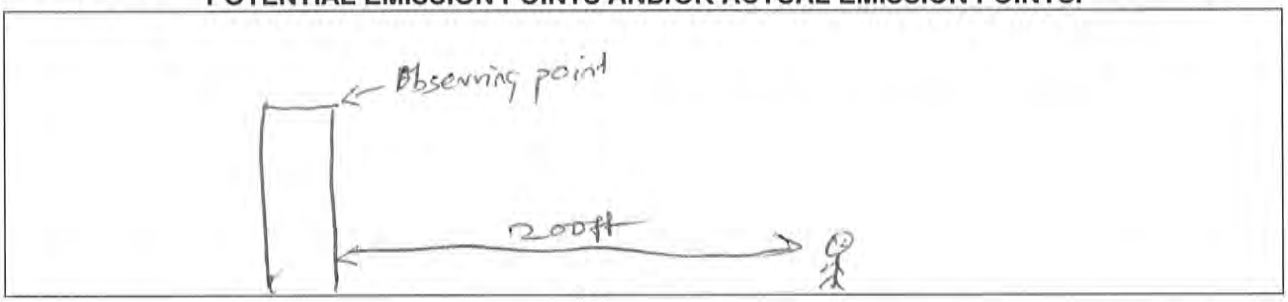
RY

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER** Ashwin Ravi, **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: Cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4 MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
7:37	20:00	00:00	north of plant
7:57	5:00 (break)	00:00	
8:02	20:00	00:00	
8:22	5:00 (break)	00:00	
8:27	20:00	00:00	
8:47			

pic @ 8:02

SIGNATURE

Run 4



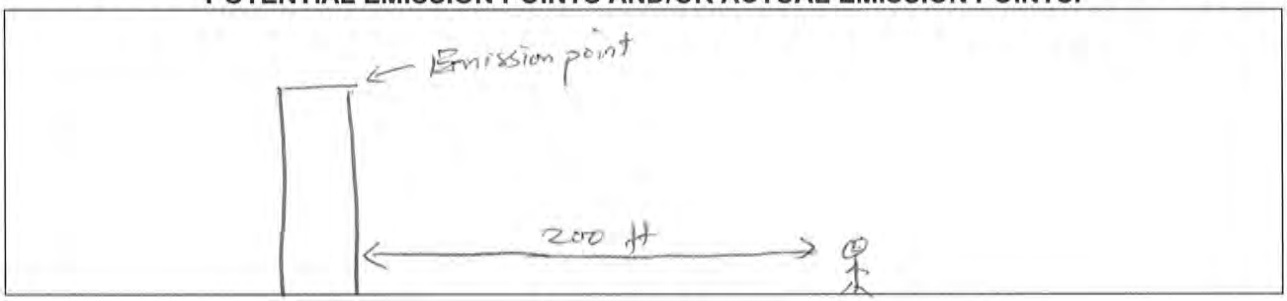
R5

METHOD 22
FUGITIVE OR SMOKE EMISSION INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin Ravi **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: Cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 5MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
9:05	20:00	00:00	north of stack
9:25	5:00 (break)	00:00	
9:30	20:00	00:00	
9:50	5:00 (break)	00:00	
9:55	20:00	00:00	
10:15			

pic @ 9:30

SIGNATURE

Run5



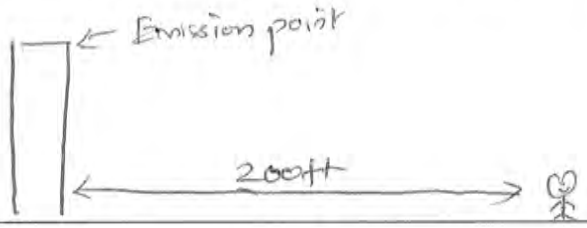
R6

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 5MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
10:30	20:00	00:00	north of flare
10:50	5:00 (break)	00:00	
10:55	20:00	00:00	
11:15	5:00 (break)	00:00	
11:20	20:00	00:00	
11:40			

pic @ 10:55

SIGNATURE

Run 6



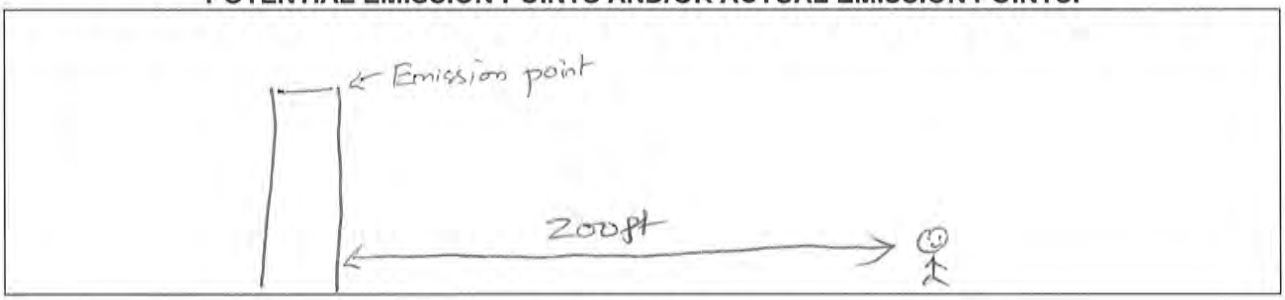
R7

AIR HYGIENE

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: Cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
11:24	20:00	00:00	north of flare
11:44	5:00 (break)	00:00	
11:49	20:00	00:00	
12:09	5:00 (break)	00:00	
12:14	20:00	00:00	
12:34			

pic @ 11:49

SIGNATURE

Run 7



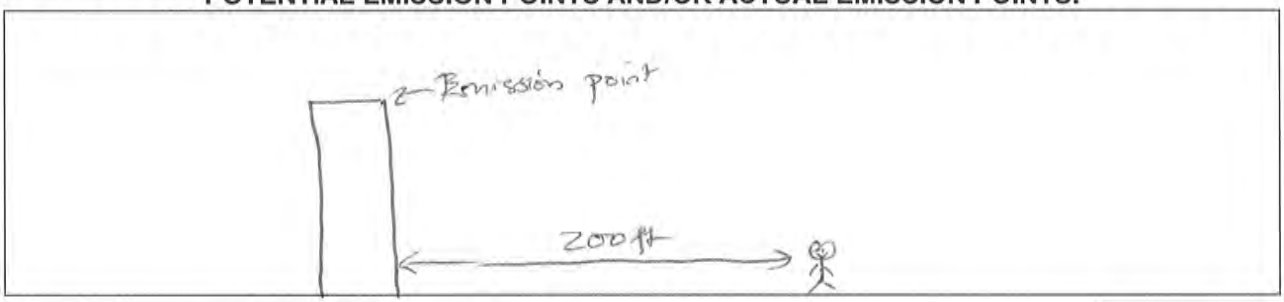
R8

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER** Ashwin Ravi **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: Cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 5 MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
13:50	20:00	00:00	north of flax
14:10	5:00 (break)	00:00	
14:15	20:00	00:00	
14:35	5:00 (break)	00:00	
14:40	20:00	00:00	
15:00			

pic @ 14:15

Ashwin

SIGNATURE

Run 8



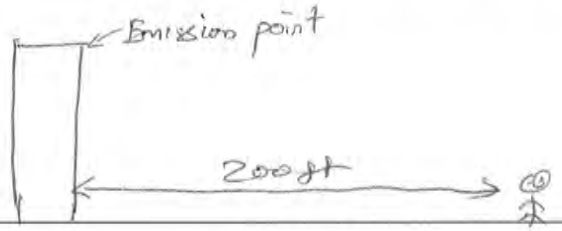
R9

AIR HYGIENE

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** ....Ashwin Ravi **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: Cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4 MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** RI-48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
15:15	20:00	00:00	north of flare
15:35	5:00 (break)	00:00	
15:40	20:00	00:00	
16:00	5:00 (break)	00:00	
16:05	20:00	00:00	
16:25			

pic @ 15:40

SIGNATURE

Run 9



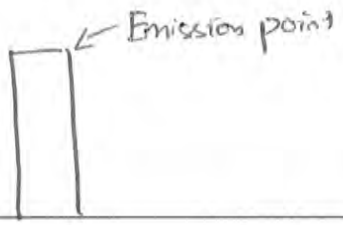
R10

AIR HYGIENE

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin Rai **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4 MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
16:01	20:00	00:00	northof plant
16:21	5:00 (break)	00:00	
16:26	20:00	00:00	
16:46	5:00 (break	00:00	
16:51	20:00	00:00	
17:11			

pic @ 16:26

SIGNATURE

Run 10



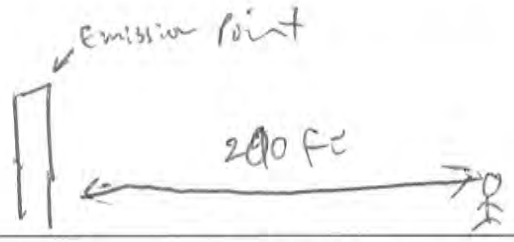
R11

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Min Sun Lee **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: cloudy/white blue **PRECIPITATION:** none	**WIND DIRECTION:** NW **WIND SPEED:** 2 mph
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
18:07	20:00	00:00	north plane
18:27	5:00	Break	
18:32	20:00	0:00	
18:52	5:00	Break	
18:57	20:00	0:00	
19:17			

Pic @ 18:40

SIGNATURE

Run 11



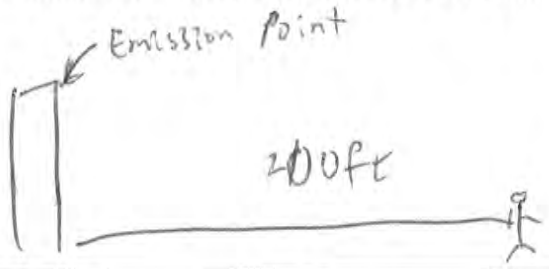
R12

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Min Sun Lee **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: ~~cloudy~~ clear **PRECIPITATION:** None	**WIND DIRECTION:** NW **WIND SPEED:** 3mph
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
19:28:~~09~~	20:00	00:00	North Plane
19:48	5:00	Break	
19:53	20:00	00:00	
20:13	5:00	Break	
20:18	20:00	00:00	
20:38			

Pic @ 20:05

SIGNATURE

Run 12



APPENDIX C

CALIBRATION GAS CERTIFICATIONS

AIR LIQUIDE Air Liquide America Specialty Gases LLC

Intertek

Shipped From: 8832 DICE ROAD
SANTA FE SPRINGS CA 90670-2516
Phone: 800-323-2212 Fax: 562-464-5262

CERTIFICATE OF ANALYSIS

ALA-CYL-TULSA OK (LOC 84231)

1319 NORTH PEORIA
TRANSFER ACCOUNT
TULSA OK 74106
US

DOCUMENT#:53436505 -002
PO#: MT'S ON 53379330
ITEM #: 7501-30AL
DATE: 07Jan2014

CYLINDER #: ALM001736
FILL PRESSURE: 02000 PSIG

PURE MATERIAL: NITROGEN CAS# 7727-37-9

GRADE: ACID RAIN CEM 0

PURITY: 99.9995%

IMPURITY	MAXIMUM CONCENTRATIONS	ACTUAL CONCENTRATIONS
SOX	0.1 PPM	<0.1 PPM
NOX	0.1 PPM	<0.1 PPM
CO	0.5 PPM	<0.1 PPM
CO2	1 PPM	<0.1 PPM
THC	0.1 PPM	<0.1 PPM
H2O	2 PPM	0.6 PPM
O2	0.5 PPM	0.3 PPM

LOT # : SBO0084338

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

ANALYST: JMU

AIR LIQUIDE Air Liquide America Specialty Gases LLC | Scott

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%	
CARBON MONOXIDE	17.3	PPM	+/- 1%	Direct NIST and VSL
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)

NITRIC OXIDE

First Triad Analysis			Second Triad Analysis			Calibration Curve	
Date: 21Mar2012	Response Unit: PPM		Date: 28Mar2012	Response Unit: PPM		Concentration = A + Bx + Cx2 + Dx3 + Ex4	
Z1 = 0.00000	R1 = 19.55000	T1 = 18.10000	Z1 = 0.00000	R1 = 19.75000	T1 = 18.25000	r = 0.9999927	
R2 = 19.55000	Z2 = 0.00000	T2 = 18.10000	R2 = 19.60000	Z2 = 0.00000	T2 = 18.12000	Constants:	A = 0.043392918
Z3 = 0.00000	T3 = 18.15000	R3 = 19.50000	Z3 = 0.00000	T3 = 18.12000	R3 = 19.55000	B = 1.016595028	C =
Avg. Concentration:	18.39	PPM	Avg. Concentration:	18.34	PPM	D =	E =

CARBON MONOXIDE

Date: 20Mar2012	Response Unit: PPM		Date: 27Mar2012	Response Unit: PPM		Concentration = A + Bx + Cx2 + Dx3 + Ex4	
Z1 = -0.00994	R1 = 25.52915	T1 = 17.22629	Z1 = -0.00936	R1 = 25.54199	T1 = 17.30803	r = 9.99995E-1	
R2 = 25.59899	Z2 = -0.00458	T2 = 17.28559	R2 = 25.56195	Z2 = 0.00050	T2 = 17.30976	Constants:	A = -9.34270E+2
Z3 = -0.00378	T3 = 17.29797	R3 = 25.61528	Z3 = 0.01579	T3 = 17.33766	R3 = 25.57913	B = 1.76177E+0	C = 0.00000E+0
Avg. Concentration:	17.24	PPM	Avg. Concentration:	17.30	PPM	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

AIR LIQUIDE | Air Liquide America Specialty Gases LLC | Scott™

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: A22013
AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

Document # : 51330940-001
P.O. No.:
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. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: AAL8247
Cylinder Pressure: 1950 PSIG
Certification Date: 16Jul2013
Exp. Date: 17Jul2016
Batch No: TRO0087292

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
NITRIC OXIDE	9.15 PPM	0.1 PPM / 1.2 %
CARBON MONOXIDE	9.00 PPM	0.08 PPM / 0.7 %
NITROGEN - OXYGEN FREE	BALANCE	
TOTAL OXIDES OF NITROGEN	9.16 PPM	Reference Value Only

TRACEABILITY

REFERENCE STANDARD

COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
NITRIC OXIDE	20.34 PPM	0.250 PPM	KAL004232	NTRM 2629	31May2016
CARBON MONOXIDE	25.54 PPM	0.180 PPM	AAL073274	NTRM 2635	01Jun2016

ANALYTICAL METHOD

1st Analysis: 09Jul2013

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	CAI/600/X11041	CHEMI	12Jul2013	9.150 PPM
CARBON MONOXIDE	MKS/2030/0928621	FOURIER-TRANSFORM IR	03Jul2013	9.000 PPM

2nd Analysis: 16Jul2013

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
NITRIC OXIDE	CAI/600/X11041	CHEMI	12Jul2013	9.150 PPM

Special Notes: AH071 LIST ITEM AH071 ON CERTS AND TAGS

APPROVED BY: _____
HILARY THATCHER

AIR LIQUIDE Air Liquide America Specialty Gases LLC

Scott

RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083 Phone: 248-589-2950 Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22012

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

P.O. No.: 48529652
Document # : 48529652-002

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	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
PROPANE	8.48 PPM	+/- 1%	Direct NIST and VSL
AIR	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 1668	12Jul2018	ALM038653	98.80 PPM	PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/7506	01Nov2012	TCD/FID

ANALYZER READINGS

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

First Triad Analysis

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

Second Triad Analysis

Calibration Curve

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 LESNIAK

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RATA CLASS

Guaranteed +/- 1% Accuracy

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CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22014
AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.: MAX
Document # : 54740879-001

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
Cylinder Pressure: 1950 PSIG
Certification Date: 21Apr2014
Exp. Date: 22Apr2022
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 Air Liquide America Specialty Gases LLC

Scott

RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083 Phone: 248-589-2950 Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22012

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

P.O. No.: 48529652
Document # : 48529652-004

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: ALM066309
Cylinder Pressure*:** 2000 PSIG
Certification Date: 19Nov2012
Exp. Date: 20Nov2020
Batch No: TRO0070134

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
PROPANE	3.04 PPM	+/- 1%	Direct NIST and VSL
AIR	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 1668	12Jul2018	ALM038653	98.80 PPM	PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/7506	01Nov2012	TCD/FID

ANALYZER READINGS

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

First Triad Analysis

PROPANE
Date: 19Nov2012 Response Unit: AREA
Z1 = 0.00000 R1 = 2561613. T1 = 78649.00
R2 = 2563611. Z2 = 0.00000 T2 = 78557.00
Z3 = 0.00000 T3 = 78234.00 R3 = 2564288.
Avg. Concentration: 3.040 PPM

Second Triad Analysis

Calibration Curve

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 LESNIAK

AIR LIQUIDE Air Liquide America Specialty Gases LLC

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RATA CLASS

Dual-Analyzed Calibration Standard

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CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22013

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

P.O. No.:
Document # : 50818051-001
Folio #:AH095

Customer
AIR HYGIENE

MIKE SCOTT
1600 WEST TACOMA ST
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : CO2,O2,BALN

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

Cylinder Number: ALM014772 **Certification Date:** 03Jun2013 **Exp. Date:** 04Jun2021
Cylinder Pressure*:** 2000 PSIG **Batch No:** TRO0084573

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
OXYGEN	21.1	%	+/- 1%	Direct NIST and VSL
CARBON DIOXIDE	19.0	%	+/- 1%	Direct NIST and VSL
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 2350 23	04Jan2018	K024582	23.20 %	OXYGEN
NTRM 2300	17Aug2016	K026052	23.04 %	CARBON DIOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
CAI/110P/V03018	03Jun2013	PARAMAGNETIC
PIR/2000/609015	28May2013	NDIR

ANALYZER READINGS

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

First Triad Analysis

OXYGEN

Date: 04Jun2013 Response Unit: %
Z1 = 0.00000 R1 = 23.20000 T1 = 21.13000
R2 = 23.20000 Z2 = 0.00000 T2 = 21.13000
Z3 = 0.00000 T3 = 21.13000 R3 = 23.20000
Avg. Concentration: 21.12 %

CARBON DIOXIDE

Date: 04Jun2013 Response Unit: MV
Z1 = 0.00000 R1 = 95.30000 T1 = 85.86000
R2 = 95.30000 Z2 = 0.00000 T2 = 85.86000
Z3 = 0.00000 T3 = 85.86000 R3 = 95.30000
Avg. Concentration: 18.98 %

Second Triad Analysis

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999999
Constants: A = -0.01175669
B = 1.000226328 C = 0
D = 0 E = 0

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999998
Constants: A = -0.00478797
B = 0.127855111 C = 8.006E-05
D = 0.000011465 E = 0

Special Notes: AH095 LIST ITEM AH095 ON CERTS AND TAGS

APPROVED BY: _____
JEFF CROTEAU

AIR LIQUIDE Air Liquide America Specialty Gases LLC | Scott

RATA CLASS

Guaranteed +/- 1% Accuracy

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CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22013
AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.:
Document # : 53091142-001
Folio #:AH094

Customer
AIR HYGIENE
MIKE SCOTT
1600 WEST TACOMA ST
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : CO2,O2,BALN

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: ALM028644 **Certification Date:** 17Dec2013 **Exp. Date:** 18Dec2021
Cylinder Pressure: 2000 PSIG **Batch No:** TRO0099354

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
OXYGEN	12.2 %	0.05 % / 0.4 %
CARBON DIOXIDE	8.77 %	0.07 % / 0.8 %
NITROGEN	BALANCE	

TRACEABILITY

REFERENCE STANDARD

COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
OXYGEN	23.2000 %	0.0900 %	K024582	NTRM 2350	04Jan2018
CARBON DIOXIDE	13.9400 %	0.0800 %	K012342	NTRM 1675	05Jan2018

ANALYTICAL METHOD

1st Analysis: 17Dec2013

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
OXYGEN	CAI/110P/V03018	PARAMAGNETIC	02Dec2013	12.20 %
CARBON DIOXIDE	PIR/2000/609015	NDIR	17Dec2013	8.770 %

Special Notes: AH094 LIST ITEM AH094 ON CERTS AND TAGS

APPROVED BY: _____
JEFF CROTEAU

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: May 27-28, 2014
Company: Big Iron Oilfield Service
Location: Elmore City, Oklahoma
Techs: MSL, TP, BS

Sample System Leak Check

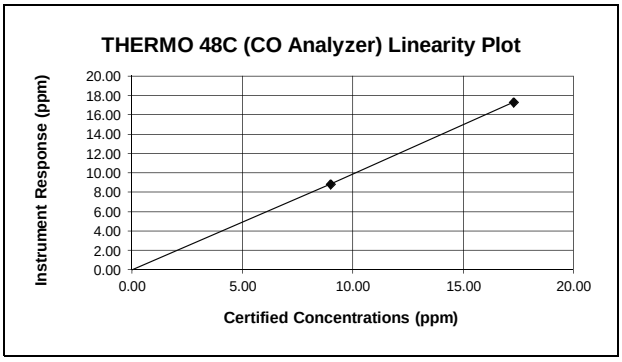
Date	Sample System	Leak Rate (l/min)
May 27-28, 2014	1	0

stk-14-elmorecity#1-unit PI48-rpt

Calibration Date: May 20, 2014
Client: Big Iron Oilfield Services, Inc.

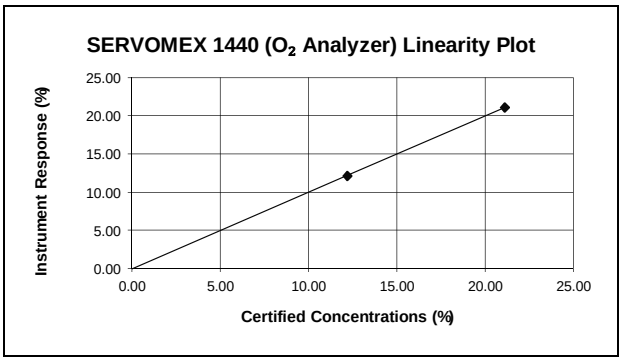
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	-0.01	-0.06	0.01	YES (%)
9.00	8.84	-0.92	0.16	YES (%)
17.30	17.29	-0.06	0.01	YES (%)
Linearity = 1.000				



O_2 Span (%) = 21.10

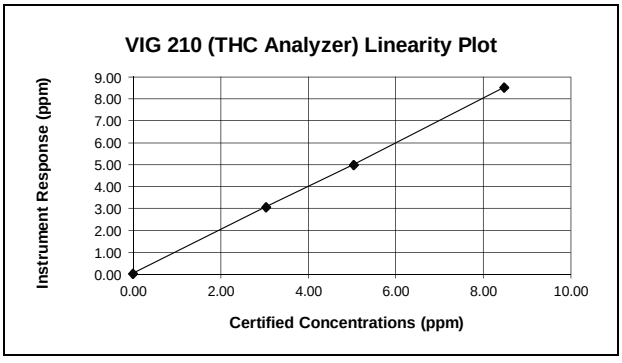
SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	-0.05	-0.24	0.05	YES (%)
12.20	12.14	-0.28	0.06	YES (%)
21.10	21.09	-0.05	0.01	YES (%)
Linearity = 0.998				



THC Range (ppm) = 10

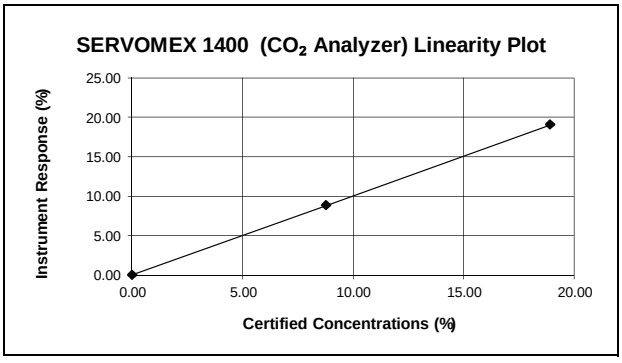
VIG 210 (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2,5%)[1]
0.00	0.05	0.50	N/A	YES
3.04	3.07	-0.66	3.09	YES
5.04	5.00	-1.79	5.09	YES
8.48	8.53	0.50	N/A	YES
Linearity = 0.994				

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



CO_2 Span (%) = 18.90

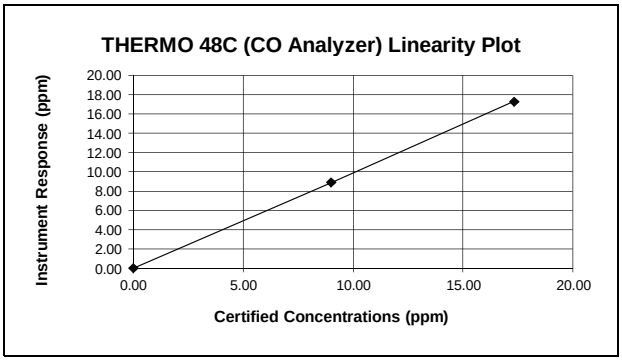
SERVOMEX 1400 (CO_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.05	0.26	0.05	YES (%)
8.77	8.82	0.26	0.05	YES (%)
18.90	19.05	0.79	0.15	YES (%)
Linearity = 0.995				



Calibration Date: May 28, 2014
Client: Big Iron Oilfield Services, Inc.

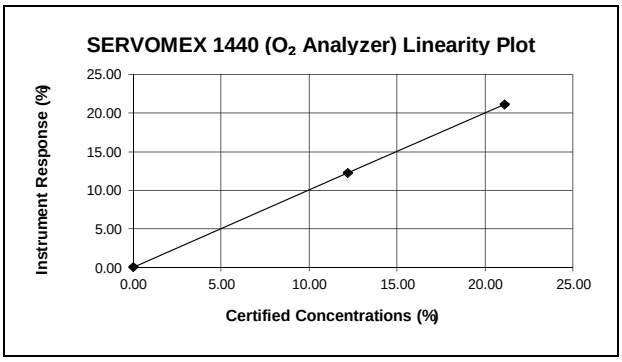
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.01	0.06	0.01	YES (%)
9.00	8.90	-0.58	0.10	YES (%)
17.30	17.28	-0.12	0.02	YES (%)
Linearity = 1.002				



O2 Span (%) = 21.10

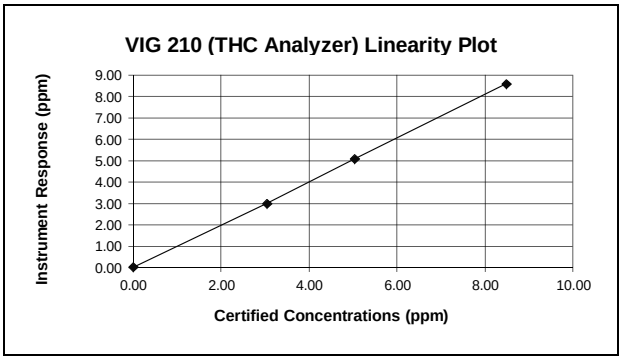
SERVOMEX 1440 (O_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.04	0.19	0.04	YES (%)
12.20	12.25	0.24	0.05	YES (%)
21.10	21.11	0.05	0.01	YES (%)
Linearity = 1.001				



THC Range (ppm) = 10

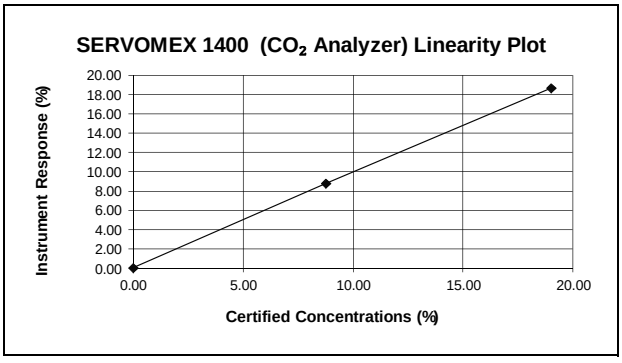
VIG 210 (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2,5%)[1]
0.00	0.03	0.30	N/A	YES
3.04	3.00	-3.01	3.09	YES
5.04	5.09	-0.31	5.11	YES
8.48	8.57	0.90	N/A	YES
Linearity = 0.978				

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



CO2 Span (%) = 19.00

SERVOMEX 1400 (CO_2 Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.04	0.21	0.04	YES (%)
8.77	8.80	0.16	0.03	YES (%)
19.00	18.66	-1.79	0.34	YES (%)
Linearity = 1.021				



DRIFT AND BIAS CHECK				
0-30-0 Load, Run - PI 48-R1	O_2	CO	THC	CO_2
Raw Average	14.27	0.96	0.00	4.74
Corrected Average	14.35	1.05	0.00	4.59
Initial Zero	0.05	-0.07	0.01	0.60
Final Zero	0.01	-0.10	0.03	0.08
Avg. Zero	0.03	-0.09	0.02	0.34
Initial UpScale	12.13	8.93	3.06	8.72
Final UpScale	12.15	8.80	3.07	8.77
Avg. UpScale	12.14	8.87	3.07	8.75
Sys Resp (Zero)	-0.05	-0.01	0.05	0.05
Sys Resp (Upscale)	12.14	8.84	3.07	8.82
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.47%	-0.35%	-0.40%	2.90%
Final Zero Bias	0.28%	-0.52%	-0.20%	0.16%
Zero Drift	0.19%	0.17%	0.20%	2.74%
Initial Upscale Bias	-0.05%	0.52%	-0.10%	-0.53%
Final Upscale Bias	0.05%	-0.23%	0.00%	-0.26%
Upscale Drift	0.09%	0.75%	0.10%	0.26%
Alternative Specification Abs Diff: Initial Zero	0.10	0.06	--	0.55
Alternative Specification Abs Diff: Final Zero	0.06	0.09	--	0.03
Alternative Specification Abs Diff: Initial Upscale	0.01	0.09	--	0.10
Alternative Specification Abs Diff: Final Upscale	0.01	0.04	--	0.05
Calibration Span	21.10	17.30	10.00	18.95
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - PI 48-R2	O_2	CO	THC	CO_2
Raw Average	14.60	0.29	-0.01	4.48
Corrected Average	14.69	0.38	0.00	4.46
Initial Zero	0.01	-0.10	0.03	0.08
Final Zero	0.01	-0.07	-0.03	0.05
Avg. Zero	0.01	-0.09	0.00	0.07
Initial UpScale	12.15	8.80	3.07	8.77
Final UpScale	12.10	8.81	3.08	8.73
Avg. UpScale	12.13	8.81	3.08	8.75
Sys Resp (Zero)	-0.05	-0.01	0.05	0.05
Sys Resp (Upscale)	12.14	8.84	3.07	8.82
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.28%	-0.52%	-0.20%	0.16%
Final Zero Bias	0.28%	-0.35%	-0.80%	0.00%
Zero Drift	0.00%	0.17%	0.60%	0.16%
Initial Upscale Bias	0.05%	-0.23%	0.00%	-0.26%
Final Upscale Bias	-0.19%	-0.17%	0.10%	-0.47%
Upscale Drift	0.24%	0.06%	0.10%	0.21%
Alternative Specification Abs Diff: Initial Zero	0.06	0.09	--	0.03
Alternative Specification Abs Diff: Final Zero	0.06	0.06	--	0.00
Alternative Specification Abs Diff: Initial Upscale	0.01	0.04	--	0.05
Alternative Specification Abs Diff: Final Upscale	0.04	0.03	--	0.09
Calibration Span	21.10	17.30	10.00	18.95
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - PI 48-R3	O_2	CO	THC	CO_2
Raw Average	14.79	0.25	0.00	4.35
Corrected Average	14.91	0.36	0.01	4.34
Initial Zero	0.01	-0.07	-0.03	0.05
Final Zero	-0.04	-0.14	0.02	0.05
Avg. Zero	-0.02	-0.11	-0.01	0.05
Initial UpScale	12.10	8.81	3.08	8.73
Final UpScale	12.10	9.11	3.07	8.74
Avg. UpScale	12.10	8.96	3.08	8.74
Sys Resp (Zero)	-0.05	-0.01	0.05	0.05
Sys Resp (Upscale)	12.14	8.84	3.07	8.82
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.28%	-0.35%	-0.80%	0.00%
Final Zero Bias	0.05%	-0.75%	-0.30%	0.00%
Zero Drift	0.24%	0.40%	0.50%	0.00%
Initial Upscale Bias	-0.19%	-0.17%	0.10%	-0.47%
Final Upscale Bias	-0.19%	1.56%	0.00%	-0.42%
Upscale Drift	0.00%	1.73%	0.10%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.06	0.06	--	0.00
Alternative Specification Abs Diff: Final Zero	0.01	0.13	--	0.00
Alternative Specification Abs Diff: Initial Upscale	0.04	0.03	--	0.09
Alternative Specification Abs Diff: Final Upscale	0.04	0.27	--	0.08
Calibration Span	21.10	17.30	10.00	18.95
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - PI 48-R4	O_2	CO	THC	CO_2
Raw Average	14.93	0.52	0.01	4.32
Corrected Average	14.92	0.58	0.00	4.32
Initial Zero	0.08	-0.05	0.01	0.04
Final Zero	0.09	-0.05	0.02	0.05
Avg. Zero	0.09	-0.05	0.02	0.05
Initial UpScale	12.23	8.80	3.01	8.74
Final UpScale	12.23	8.75	3.16	8.73
Avg. UpScale	12.23	8.78	3.09	8.74
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.19%	-0.35%	-0.20%	0.00%
Final Zero Bias	0.24%	-0.35%	-0.10%	0.05%
Zero Drift	0.05%	0.00%	0.10%	0.05%
Initial Upscale Bias	-0.09%	-0.58%	0.10%	-0.32%
Final Upscale Bias	-0.09%	-0.87%	1.60%	-0.37%
Upscale Drift	0.00%	0.29%	1.50%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.04	0.06	--	0.00
Alternative Specification Abs Diff: Final Zero	0.05	0.06	--	0.01
Alternative Specification Abs Diff: Initial Upscale	0.02	0.10	--	0.06
Alternative Specification Abs Diff: Final Upscale	0.02	0.15	--	0.07
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - PI 48-R5	O_2	CO	THC	CO_2
Raw Average	14.59	0.20	0.00	4.56
Corrected Average	14.57	0.26	0.00	4.55
Initial Zero	0.09	-0.05	0.02	0.05
Final Zero	0.07	-0.06	-0.01	0.07
Avg. Zero	0.08	-0.06	0.01	0.06
Initial UpScale	12.23	8.75	3.16	8.73
Final UpScale	12.22	8.67	3.14	8.74
Avg. UpScale	12.23	8.71	3.15	8.74
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.24%	-0.35%	-0.10%	0.05%
Final Zero Bias	0.14%	-0.40%	-0.40%	0.16%
Zero Drift	0.09%	0.06%	0.30%	0.11%
Initial Upscale Bias	-0.09%	-0.87%	1.60%	-0.37%
Final Upscale Bias	-0.14%	-1.33%	1.40%	-0.32%
Upscale Drift	0.05%	0.46%	0.20%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.05	0.06	--	0.01
Alternative Specification Abs Diff: Final Zero	0.03	0.07	--	0.03
Alternative Specification Abs Diff: Initial Upscale	0.02	0.15	--	0.07
Alternative Specification Abs Diff: Final Upscale	0.03	0.23	--	0.06
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - PI 48-R6	O_2	CO	THC	CO_2
Raw Average	13.61	0.00	0.00	5.23
Corrected Average	13.61	0.11	0.00	5.22
Initial Zero	0.07	-0.06	-0.01	0.07
Final Zero	0.11	-0.16	0.02	0.08
Avg. Zero	0.09	-0.11	0.01	0.08
Initial UpScale	12.22	8.67	3.14	8.74
Final UpScale	12.20	8.96	3.10	8.73
Avg. UpScale	12.21	8.82	3.12	8.74
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.14%	-0.40%	-0.40%	0.16%
Final Zero Bias	0.33%	-0.98%	-0.10%	0.21%
Zero Drift	0.19%	0.58%	0.30%	0.05%
Initial Upscale Bias	-0.14%	-1.33%	1.40%	-0.32%
Final Upscale Bias	-0.24%	0.35%	1.00%	-0.37%
Upscale Drift	0.09%	1.68%	0.40%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.03	0.07	--	0.03
Alternative Specification Abs Diff: Final Zero	0.07	0.17	--	0.04
Alternative Specification Abs Diff: Initial Upscale	0.03	0.23	--	0.06
Alternative Specification Abs Diff: Final Upscale	0.05	0.06	--	0.07
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - PI 48-R7	O_2	CO	THC	CO_2
Raw Average	13.86	0.42	0.00	5.05
Corrected Average	13.88	0.46	0.00	5.04
Initial Zero	0.11	-0.16	0.02	0.08
Final Zero	0.08	0.07	0.01	0.05
Avg. Zero	0.10	-0.05	0.02	0.07
Initial UpScale	12.20	8.96	3.10	8.73
Final UpScale	12.19	9.03	3.01	8.74
Avg. UpScale	12.20	9.00	3.06	8.74
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.33%	-0.98%	-0.10%	0.21%
Final Zero Bias	0.19%	0.35%	-0.20%	0.05%
Zero Drift	0.14%	1.33%	0.10%	0.16%
Initial Upscale Bias	-0.24%	0.35%	1.00%	-0.37%
Final Upscale Bias	-0.28%	0.75%	0.10%	-0.32%
Upscale Drift	0.05%	0.40%	0.90%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.07	0.17	--	0.04
Alternative Specification Abs Diff: Final Zero	0.04	0.06	--	0.01
Alternative Specification Abs Diff: Initial Upscale	0.05	0.06	--	0.07
Alternative Specification Abs Diff: Final Upscale	0.06	0.13	--	0.06
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - PI 48-R8	O_2	CO	THC	CO_2
Raw Average	14.03	0.60	0.43	4.93
Corrected Average	14.05	0.54	0.42	4.92
Initial Zero	0.08	0.07	0.01	0.05
Final Zero	0.09	0.07	0.02	0.06
Avg. Zero	0.09	0.07	0.02	0.06
Initial UpScale	12.19	9.03	3.01	8.74
Final UpScale	12.20	8.94	3.05	8.73
Avg. UpScale	12.20	8.99	3.03	8.74
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.19%	0.35%	-0.20%	0.05%
Final Zero Bias	0.24%	0.35%	-0.10%	0.11%
Zero Drift	0.05%	0.00%	0.10%	0.05%
Initial Upscale Bias	-0.28%	0.75%	0.10%	-0.32%
Final Upscale Bias	-0.24%	0.23%	0.50%	-0.37%
Upscale Drift	0.05%	0.52%	0.40%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.04	0.06	--	0.01
Alternative Specification Abs Diff: Final Zero	0.05	0.06	--	0.02
Alternative Specification Abs Diff: Initial Upscale	0.06	0.13	--	0.06
Alternative Specification Abs Diff: Final Upscale	0.05	0.04	--	0.07
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - PI 48-R9	O_2	CO	THC	CO_2
Raw Average	13.69	0.30	0.10	5.15
Corrected Average	13.72	0.28	0.07	5.16
Initial Zero	0.09	0.07	0.02	0.06
Final Zero	0.07	-0.01	0.03	0.05
Avg. Zero	0.08	0.03	0.03	0.06
Initial UpScale	12.20	8.94	3.05	8.73
Final UpScale	12.17	8.81	3.12	8.71
Avg. UpScale	12.19	8.88	3.09	8.72
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.24%	0.35%	-0.10%	0.11%
Final Zero Bias	0.14%	-0.12%	0.00%	0.05%
Zero Drift	0.09%	0.46%	0.10%	0.05%
Initial Upscale Bias	-0.24%	0.23%	0.50%	-0.37%
Final Upscale Bias	-0.38%	-0.52%	1.20%	-0.47%
Upscale Drift	0.14%	0.75%	0.70%	0.11%
Alternative Specification Abs Diff: Initial Zero	0.05	0.06	--	0.02
Alternative Specification Abs Diff: Final Zero	0.03	0.02	--	0.01
Alternative Specification Abs Diff: Initial Upscale	0.05	0.04	--	0.07
Alternative Specification Abs Diff: Final Upscale	0.08	0.09	--	0.09
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
90-100 Load, Run - PI 48-R10	O_2	CO	THC	CO_2
Raw Average	13.87	0.36	0.11	5.01
Corrected Average	13.94	0.32	0.09	5.02
Initial Zero	0.07	-0.01	0.03	0.05
Final Zero	0.09	0.10	0.01	0.06
Avg. Zero	0.08	0.05	0.02	0.06
Initial UpScale	12.17	8.81	3.12	8.71
Final UpScale	12.13	8.76	3.08	8.72
Avg. UpScale	12.15	8.79	3.10	8.72
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.14%	-0.12%	0.00%	0.05%
Final Zero Bias	0.24%	0.52%	-0.20%	0.11%
Zero Drift	0.09%	0.64%	0.20%	0.05%
Initial Upscale Bias	-0.38%	-0.52%	1.20%	-0.47%
Final Upscale Bias	-0.57%	-0.81%	0.80%	-0.42%
Upscale Drift	0.19%	0.29%	0.40%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.03	0.02	--	0.01
Alternative Specification Abs Diff: Final Zero	0.05	0.09	--	0.02
Alternative Specification Abs Diff: Initial Upscale	0.08	0.09	--	0.09
Alternative Specification Abs Diff: Final Upscale	0.12	0.14	--	0.08
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
90-100 Load, Run - PI 48-R11	O_2	CO	THC	CO_2
Raw Average	13.85	0.26	0.09	5.10
Corrected Average	13.91	0.23	0.08	5.11
Initial Zero	0.09	0.10	0.01	0.06
Final Zero	0.08	-0.03	0.01	0.07
Avg. Zero	0.09	0.04	0.01	0.07
Initial UpScale	12.13	8.76	3.08	8.72
Final UpScale	12.19	8.81	3.03	8.71
Avg. UpScale	12.16	8.79	3.06	8.72
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.24%	0.52%	-0.20%	0.11%
Final Zero Bias	0.19%	-0.23%	-0.20%	0.16%
Zero Drift	0.05%	0.75%	0.00%	0.05%
Initial Upscale Bias	-0.57%	-0.81%	0.80%	-0.42%
Final Upscale Bias	-0.28%	-0.52%	0.30%	-0.47%
Upscale Drift	0.28%	0.29%	0.50%	0.05%
Alternative Specification Abs Diff: Initial Zero	0.05	0.09	--	0.02
Alternative Specification Abs Diff: Final Zero	0.04	0.04	--	0.03
Alternative Specification Abs Diff: Initial Upscale	0.12	0.14	--	0.08
Alternative Specification Abs Diff: Final Upscale	0.06	0.09	--	0.09
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

DRIFT AND BIAS CHECK				
90-100 Load, Run - PI 48-R12	O_2	CO	THC	CO_2
Raw Average	13.95	0.36	0.05	4.98
Corrected Average	13.98	0.36	0.04	4.97
Initial Zero	0.08	-0.03	0.01	0.07
Final Zero	0.10	0.06	0.01	0.09
Avg. Zero	0.09	0.02	0.01	0.08
Initial UpScale	12.19	8.81	3.03	8.71
Final UpScale	12.19	8.66	3.02	8.73
Avg. UpScale	12.19	8.74	3.03	8.72
Sys Resp (Zero)	0.04	0.01	0.03	0.04
Sys Resp (Upscale)	12.25	8.90	3.00	8.80
Upscale Cal Gas	12.20	9.00	3.04	8.77
Initial Zero Bias	0.19%	-0.23%	-0.20%	0.16%
Final Zero Bias	0.28%	0.29%	-0.20%	0.26%
Zero Drift	0.09%	0.52%	0.00%	0.11%
Initial Upscale Bias	-0.28%	-0.52%	0.30%	-0.47%
Final Upscale Bias	-0.28%	-1.39%	0.20%	-0.37%
Upscale Drift	0.00%	0.87%	0.10%	0.11%
Alternative Specification Abs Diff: Initial Zero	0.04	0.04	--	0.03
Alternative Specification Abs Diff: Final Zero	0.06	0.05	--	0.05
Alternative Specification Abs Diff: Initial Upscale	0.06	0.09	--	0.09
Alternative Specification Abs Diff: Final Upscale	0.06	0.24	--	0.07
Calibration Span	21.10	17.30	10.00	19.00
3% of Cal. Span (drift)	0.63	0.52	0.30	0.57
5% of Cal. Span (bias)	1.06	0.87	0.50	0.95

METERING SYSTEM DRY GAS METER CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0009

Filename: Y:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0009 Calibration 8-28-13.xls]Original (5 point)
Make: Thermo Environmental
Model #: MST-C1
Serial #: 90698

Date: 08/28/13
Barometric Pressure: 29.48 (in. Hg)
Theoretical Critical Vacuum: 13.91 (in. Hg)

DRY GAS METER READINGS

ΔH	Time	Volume			Initial Temperature	
		Initial	Final	Total	Inlet	Outlet
(in. H2O)	(min)	(ft^3)	(ft^3)	(ft^3)	(°F)	(°F)
0.27	17.00	122.630	128.010	5.380	75.0	72.0
0.58	12.00	128.010	133.440	5.430	74.0	72.0
1.10	10.00	133.440	139.570	6.130	77.0	72.0
2.10	10.00	139.570	147.870	8.300	78.0	72.0
3.60	10.00	147.870	158.730	10.860	80.0	73.0

Final Temperature		Orifice	K' Orifice	Actual	Ambient Temperature		
Inlet	Outlet	Serial#	Coefficient	Vacuum	Initial	Final	Average
(°F)	(°F)	(number)	(see above)	(in. Hg)	(°F)	(°F)	(°F)
74.0	72.0	40	0.2346	16.0	72.3	72.8	72.6
77.0	72.0	48	0.3355	16.0	72.8	72.8	72.8
78.0	72.0	55	0.4522	16.0	72.8	72.6	72.7
80.0	72.0	63	0.6118	16.0	72.8	72.8	72.8
83.0	74.0	73	0.8022	14.5	72.8	72.6	72.7

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)
5.250	148.68	5.095	144.3	5.217
5.298	150.04	5.142	145.6	5.268
5.978	169.29	5.776	163.6	5.917
8.102	229.46	7.814	221.3	8.006
10.601	300.23	10.246	290.2	10.496

DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR ΔH@		
Variation (number)	Value (number)	Value (in. H2O)	Value (mm H2O)	Variation (in. H2O)
0.003	0.970	1.654	42.00	-0.142
0.003	0.971	1.738	44.14	-0.058
-0.001	0.966	1.814	46.07	0.018
-0.003	0.964	1.892	48.06	0.096
-0.001	0.967	1.881	47.77	0.085
AVERAGE:	**0.968**	**1.796**	45.61	**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 dH@, the orifice differential pressure in inches of H_20 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: 08/28/13 08/28/13

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Pre-Test Calibration
Air Hygiene Assett ID: samp-cp-0009

Filename: Y:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0009 Calibration 8-28-13.xls]Original (5 point)
Make: Thermo Environmental
Model #: MST-C1
Serial #: 90698

Date: 08/28/13
Barometric Pressure: 29.48 (in. Hg)
Temperature (ASTM cal): 72.10 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	100.00	0.00	599.00	0.17	1198.00	0.17
Probe	100.00	0.00	599.00	0.17	1198.00	0.17
Filter	100.00	0.00	599.00	0.17	1198.00	0.17
Dryer	100.00	0.00	599.00	0.17	1198.00	0.17
Aux.	100.00	0.00	599.00	0.17	1198.00	0.17

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	72.10 (°F)	
	Reading	(±°F)
DGM In	72.0	0.10
DGM Out	72.0	0.10

Note: Calibrated against ASTM Reference Thermometer.

SIGNATURE: Craig McCarty DATE: 08/28/13 08/28/13

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 Assett ID(s): **Probe:** samp-hp-0066 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0037

Filename: Y:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0009 Calibration 8-28-13.xls]Original (5 point)

Barometric Pressure: 29.48

Thermo-couples		Temps (°F)	Signature		Date	
Stack	Ref	72.30	Craig McCarty		08/28/13	08/28/13
	Read	72.00				
	±°F	0.30				
Filter	Ref	72.30	Craig McCarty		08/28/13	08/28/13
	Read	72.00				
	±°F	0.30				
Exit	Ref	72.30	Craig McCarty		08/28/13	08/28/13
	Read	73.00				
	±°F	0.70				

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 Assett ID: samp-cp-0009

Filename: Y:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0009 Calibration 8-28-13.xls]6-2-14 (3 point)
Make: Thermo Environmental
Model #: MST-C1
Serial #: 90698

Date: 06/02/14
Barometric Pressure: 29.37 (in. Hg)
Theoretical Critical Vacuum: 13.85 (in. Hg)

DRY GAS METER READINGS

ΔH (in. H2O)	Time (min)	Volume Initial (ft³)	Volume Final (ft³)	Volume Total (ft³)	Initial Temperature Inlet (°F)	Initial Temperature Outlet (°F)
2.00	10.00	7.950	16.360	8.410	79.0	69.0
2.00	10.00	16.360	24.770	8.410	80.0	70.0
2.00	10.00	24.770	33.200	8.430	81.0	71.0

Final Temperature Inlet (°F)	Final Temperature Outlet (°F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in. Hg)	Ambient Temperature Initial (°F)	Ambient Temperature Final (°F)	Ambient Temperature Average (°F)
80.0	70.0	63	0.6099	16.0	69.8	70.1	70.0
81.0	71.0	63	0.6099	16.0	69.4	69.9	69.7
81.0	72.0	63	0.6099	16.0	69.9	70.1	70.0

RESULTS

DRY GAS METER VOLUME CORRECTED Vm(std) (ft³)	DRY GAS METER VOLUME CORRECTED Vm(std) (liters)	ORIFICE VOLUME CORRECTED Vcr(std) (ft³)	ORIFICE VOLUME CORRECTED Vcr(std) (liters)	ORIFICE VOLUME NOMINAL Vcr (ft³)
8.193	232.01	7.781	220.4	7.959
8.177	231.58	7.783	220.4	7.957
8.185	231.81	7.781	220.4	7.960

DRY GAS METER CALIBRATION FACTOR Y Variation (number)	DRY GAS METER CALIBRATION FACTOR Y Value (number)	ORIFICE CALIBRATION FACTOR ΔH@ Value (in. H2O)	ORIFICE CALIBRATION FACTOR ΔH@ Value (mm H2O)	ORIFICE CALIBRATION FACTOR ΔH@ Variation (in. H2O)
-0.001	0.950	1.819	46.20	0.004
0.001	0.952	1.814	46.08	-0.001
0.000	0.951	1.812	46.03	-0.003
AVERAGE:	**0.951**	**1.815**	46.10	**PASSED**
LAST 5-PT:	**0.968**	**1.796**	**PASSED**	5-PT Date:
% DIFF:	**1.8%**	**1.1%**		08/28/13

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

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

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter,acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H_20 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: 06/02/14 06/02/14

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET
EPA Reference Method
Metering System Post-Test Calibration
Air Hygiene Assett ID: samp-cp-0009

Filename: Y:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0009 Calibration 8-28-13.xls]6-2-14 (3 point)
Make: Thermo Environmental
Model #: MST-C1
Serial #: 90698

Date: 06/02/14
Barometric Pressure: 29.37 (in. Hg)
Temperature (ASTM cal): 69.60 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	100.00	0.00	604.00	0.67	1208.00	0.67
Probe	100.00	0.00	604.00	0.67	1208.00	0.67
Filter	100.00	0.00	604.00	0.67	1208.00	0.67
Dryer	100.00	0.00	604.00	0.67	1208.00	0.67
Aux.	100.00	0.00	604.00	0.67	1208.00	0.67

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	69.60 (°F)	
	Reading	(±°F)
DGM In	70.0	0.40
DGM Out	70.0	0.40

Note: Calibrated against ASTM Reference Thermometer.

SIGNATURE: Craig McCarty DATE: 06/02/14 06/02/14

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 Post-Test Calibration

Air Hygiene Assett ID(s): **Probe:** samp-hp-0033 **Hotbox:** samp-bh-0012 **Gooseneck:** samp-ad-0010

Filename: Y:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0009 Calibration 8-28-13.xls]6-2-14 (3 point)

Barometric Pressure: 29.37

Thermo-couples		Temps (°F)	Signature		Date	
Stack	Ref	69.60	Craig McCarty		06/02/14	06/02/14
	Read	69.00				
	±°F	0.60				
Filter	Ref	69.60	Craig McCarty		06/02/14	06/02/14
	Read	69.00				
	±°F	0.60				
Exit	Ref	69.60	Craig McCarty		06/02/14	06/02/14
	Read	70.00				
	±°F	0.40				

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**.

APEX SOURCE TESTING EQUIPMENT INSTRUMENTS

Apex Instruments, Inc.
204 Technology Park Lane
Fuquay-Varina, NC 27526

S-TYPE PITOT TUBE CALIBRATION SHEET

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

PITOT SERIAL#	4174	**CALIBRATION DATE:**	11-Jan-13
PITOT TYPE:	S-Type	**BAROMETRIC PRESSURE:**	29.88 in Hg
STD. PITOT TYPE:	Ellipsoidal	**STATIC PRESSURE**	1.4 in H_20
Cp(std):	0.990	**BLOCKAGE %:**	N/A
PROBE SERIAL#	NICK	**CORRECTION FACTOR:**	1.00

	SIDE "A" CALIBRATION			
RUN NO.	**Δ Pstd in H_2O**	**Δ Ps in H_2O**	**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)

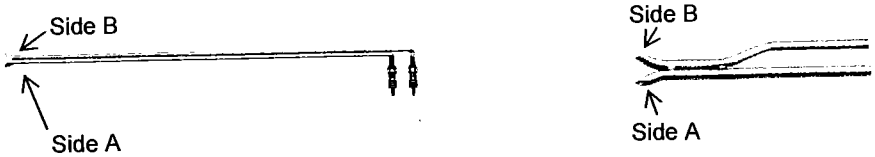
	SIDE "B" CALIBRATION			
RUN NO.	**Δ Pstd in H_2O**	**Δ Ps in H_2O**	**Cp(s)**	**DEVIATION Cp(s) - avg.Cp(s)**
1	0.560	0.815	0.821	0.000
2	0.560	0.815	0.821	0.000
3	0.560	0.815	0.821	0.000
		"B" AVERAGE	0.821	0.0000 (must be ≤ 0.01)

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

WEATHER STATION CALIBRATION SHEET
Temperature, Barometric Pressure, and Relative Humidity Periodic Calibration
Air Hygiene Asset ID: samp-we-0021

Filename: \\SERVER2\public\Shared\QAQC\Calibrations\Weather Stations\2013\[Weather Station Calibration_samp-we-0021.xlsm]100913
Make: Kestrel
Model #: 4000
Serial #: 686543
NIST ID 21470653
NIST S/N 21470653
Cal Due 10/9/2014

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.50	0.50	29.44	29.28	0.16

Sean Barnes _____ 10/09/13
(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	29.44	29.27	0.17

Sean Barnes _____ 10/09/13
(signature) *(date)*

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.50	0.50	29.44	29.28	0.16

Sean Barnes _____ 10/09/13
(signature) *(date)*

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.60	0.60	29.44	29.28	0.16

Sean Barnes _____ 10/09/13
(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 ±2F**.

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.

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 : KOONS GAS MEASUREMENT (GAS)
PO No. : 2896
Badge No. : NONE

Date Printed : 06 26 2014
Bill of Material 057478-100
Model : 3M175
Serial No. : 1318080
Accessory S/N UC273887
Sales Order No. 206853-1
Spec. Req. No.
Prover Used : 50 cu. ft.
WME :

Unit Description

3M175 SERIES B3 ROOTS METER WITH
IMC/W2-PTZ+LOG, SINGLE PULSE OUTPUT
CIRCULAR CONNECTOR, 180 GAUGE,
INTERNAL PRESSURE AND TEMPERATURE

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	2993.2	99.8	100.09	0.09	1.16			
2	303.1	10.1	99.78	-0.22	0.04			

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 26-June-14 by BUSHART, DAVID

IMCW2 ASSEMBLY/TEST/SHIPPING CHECKLIST

Date: 06/11/14	Meter Serial #: 13 1808 0
Customer & Work Order #:	Instrument Serial #: 1401029847
	Micro Corrector Serial #:
Configuration Code:	
	Customer Special Req. Eng. Spec#:

TEST CHECKLIST		Mfg QA Initials (as applicable)
DISPLAY TEST	**PASS / FAIL**	
TEMPERATURE TEST	**PASS / FAIL**	
IMCW TEMP:_____ REFERENCE TEMP:_____ DIF (IMCW T – REF T):_____		
PRESSURE TEST – ABSOLUTE Tx	**PASS / FAIL**	
20 PSI: IMCW P_____ Reference (Atm P + 20/xx) _____ Difference_____		
40 PSI: IMCW P_____ Reference (Atm P + 40/xx) _____ Difference_____		
T		
PRESSURE TEST – Gauge Tx	**PASS / FAIL** 6,26,14 RWB	
20 PSI: IMCW P 20.45 Reference P 20.28 Difference +.17		
40 PSI: IMCW P 40.60 Reference P 40.27 Difference +.33		
VOLUME TEST	**PASS / FAIL** (Include test sheet)	
PULSE OUTPUT TEST	**PASS / FAIL** (Include test sheet)	
LEAK TEST	**PASS / FAIL**	
TEST TECHNICIAN INITIALS_____	PLACE TEST STAMP ON BACK OF IMCW2	

SHIPPING/QA CHECKLIST	Mfg QA Initials (as applicable)	Final QA Initials (as applicable)
Verify Test Stamp on back of IMCW2		
Verify Tamper Evidence label is in place		
Verify 3mm Allen wrench provided, Qty 1		
Verify spacers (4) and drilled-head M4 screws (3)		
Verify mag pickup has mark on connector indicating testing		
Verify meter & IMCW2 specs to work order config code specs or customer specs		
Perform scroll test		
Mfg QA Only: 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		
Final QA: Verify Prover data and datasheet.		
Q. A. STAMP		

Volume Certification

Instrument

Type:	IMC/W2	
Firmware:	1.95	
Serial Number:	12/13/133012 (UK)	1401029847 (US)

Configuration

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

Test Conditions

Test Date:	06-11-2014	Time: 13:09:44
Fixture:	E-0108	
Temperature:	72.1 °F.	
Line Pressure:	0.05 psi G	PASS
Battery:	5.70 Volts	PASS
Flow Rate:	3000 cfh	
Test Volume:	100.0 cu.ft. (uncorrected)	
Correction Factor:	0.94554	

Results: **PASS**

VOLUME (CU.FT.)

	Uncorrected	Corrected
Initial:	37641.8884	36080.5584
Final:	37741.8946	36175.1081
Accumulated:	100.0063	94.5497
Calculated:	100.0000	94.5541
Error:	0.01 %	-0.00 %

	HF (Unc.)	Corrected (Prove)
Comms Pulses:	PASS	PASS

PULSE OUTPUTS

	Uncorrected	Corrected	Fault
Multiplier:	1.0	1.0	-
Expected (±1):	100	95	-
Received (Ch.A):	100	94	-
Error:	0	-1	-
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

Volume Certification

Instrument

Type:	IMC/W2	
Firmware:	1.95	
Serial Number:	12/13/133012 (UK)	1401029847 (US)

Configuration

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

Test Conditions

Test Date:	03-26-2014	Time: 04:32:25
Fixture:	E-0108	
Temperature:	71.1 °F.	
Line Pressure:	0.05 psi G	PASS
Battery:	5.70 Volts	PASS
Flow Rate:	3000 cfh	
Test Volume:	100.0 cu.ft. (uncorrected)	
Correction Factor:	0.96205	

Results: **PASS**

VOLUME (CU.FT.)

	Uncorrected	Corrected
Initial:	0.0000	0.0000
Final:	100.0063	96.2029
Accumulated:	100.0063	96.2029
Calculated:	100.0000	96.2047
Error:	0.01 %	-0.00 %

	HF (Unc.)	Corrected (Prove)
Comms Pulses:	PASS	PASS

PULSE OUTPUTS

	Uncorrected	Corrected	Fault
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

Meter Configuration Report

Time & Date	04:21:11 AM , 03/26/2014

Volume Configuration

Meter Type	Series B
Meter Size	3M
Rev / Unit Vol	40.000 rev/ft³
Meter/Site ID	0
Flow Sense	Forward + Reverse
Corrected Volume	0 ft³
Uncorrected Volume	0 ft³
Corrected Multiplier	x100
Uncorrected Multiplier	x100
Corrected No. Digits	6
Uncorrected No. Digits	6
Enable U / C on LCD	Yes
Corrected Pulse Output	10 ft³
Uncorrected Pulse Output	10 ft³
Pulse Width	125 ms
Pulse Output 1	Uncorrected
Pulse Output 2	Corrected
Pulse Output 3	Fault

Corrections Configuration

Temperature Units	°F
Base Temperature	60.0
Temperature Mode	Live Measurement
Fixed Temperature	N/A
Pressure Units	PSI
Base Pressure	14.700
Atmospheric Pressure	14.400
Pressure Mode	Live Measurement
Fixed Pressure Reference	N/A
Fixed Line Pressure	N/A
Fixed Pressure Factor	N/A
Fixed Supercompressibility (F_{pv}^2)	N/A
Supercompressibility Mode	Live Measurement
Supercompressibility Method	AGA 8 Gross Method 2
Heating Value	N/A

Roots Meters & Instruments
16240 Port Northwest Dr., Suite 100
Houston, TX 77041-2645
Phone: 832.590.2303
Fax: 832.590.2494
Toll Free Phone: 800.521.1114
Toll Free Fax: 800.335.5224

Customer Information
Name : KOONS GAS MEASUREMENT (GAS)
PO No. : 2056
Badge No. : NONE

Unit Description

3M175 SERIES B3 ROOTS METER, COUNTER WITH PULSER, ICPWS, WITH CONDUIT PORT.

Date Printed : 04 09 2013
Bill of Material 057258-132
Model : 3M175
Serial No. : 1318080
Accessory S/N UC273887
Sales Order No. 198449-1
Spec. Req. No.
Prover Used : 50 cu. ft. (A)

MIN STATIC TEST PRESSURE	MIN LEAK TEST PRESSURE	MAX ALLOWABLE OPER PRESSURE
350 psig	219 psig	175 psig

TC Acc at (deg F)	Accuracy	Proof	% Error

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	3036.1	101.2	100.06	0.06	1.07			
2	299.9	10.0	99.87	-0.13	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 08-April-13 by RIOS, JOEL

Roots Meters & Instruments
16240 Port Northwest Dr., Suite 100
Houston, TX 77041-2645
Phone: 832.590.2303
Fax: 832.590.2494
Toll Free Phone: 800.521.1114
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Serial No. : 1318080
Accessory S/N UC273887
Sales Order No. 198449-1
Spec. Req. No.
Prover Used : 50 cu. ft. (A)

MIN STATIC TEST PRESSURE	MIN LEAK TEST PRESSURE	MAX ALLOWABLE OPER PRESSURE
350 psig	219 psig	175 psig

TC Acc at (deg F)	Accuracy	Proof	% Error

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	3036.1	101.2	100.06	0.06	1.07			
2	299.9	10.0	99.87	-0.13	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 08-April-13 by RIOS, JOEL

Specific Gravity	0.6000
%CO2	0.0000% mol
%N2	0.0000% mol
%H2	N/A

Battery Type

Battery Selection	Lithium

Display Configuration

Corrected Volume	On Default
Uncorrected Volume	On
Flow Rate	On
Correction Factor	On
Meter Size	On
Line Pressure	On
Temperature	On
Uncorrected Volume Under Fault	On
Corrected Residual	On
Uncorrected Residual	On
Firmware version	On
Atmospheric Pressure	On
Base Pressure	On
Pressure Factor	On
Supercompressibility	On
Battery Voltage	On
Current Date	On
Current Time	On
Accumulated Corrected Volume previous day	Off
Accumulated Corrected Volume current day	Off
Accumulated Corrected Volume current month	Off

Alarms

High Pressure Alarm	261.00
Low Pressure Alarm	-5.00
High Temperature Alarm	140.0
Low Temperature Alarm	-40.0
High Flow Rate Alarm	3750 ft^3/h
Low Flow Rate Alarm	-750 ft^3/h
High Monitor Pressure Limit	N/A
Low Monitor Pressure Limit	N/A
Pressure Alarm On LCD	Yes

Sample Date 4/21/2014 **Truck/Trailer No.:** 44612

Property	Result	Specification
Methane, PPM Wgt.	BDL	Note (1)
Ethane, PPM Wgt.	15	Note (1)
Ethylene, PPM Wgt.	BDL	100 max.
Propane, Wgt. %	0.48	0.5 max.
Propylene, Wgt. %	99.50	99.5 min.
Total Saturated C4's, PPM Mole	184	Note (1)
Propadiene, PPM Wgt.	BDL	5 max.
Methyl Acetylene, PPM Wgt.	BDL	7 max.
Acetylene, PPM Wgt.	BDL	3 max.
Total Butadienes, PPM Wgt.	BDL	10 max.
Total Butenes, PPM Wgt.	0.7	100 max.
1-Butyne, PPM Wgt.	BDL	7 max.
2-Butyne, PPM Wgt.	BDL	7 max.
Cyclopropane, PPM Wgt.	BDL	1 max.
3-Methyl 1-Butene, PPM Wgt	BDL	1 max.
Total > C5, PPM Wgt.	3.2	20 max.
Carbon Monoxide, PPM Wgt.	BDL	0.033 max.
Carbon Dioxide, PPM Wgt.	0.3	2 max.
Carbonyl Sulfide, PPM Wgt.	BDL	0.043 max.
Hydrogen Sulfide, PPM Wgt.	BDL	1 max.
Total Sulfur, PPM Wgt.	BDL	1 max.
Arsine, PPM Wgt.	BDL	0.056 max.
Phosphine, PPM Wgt.	BDL	0.1 max.
Methanol, PPM Wgt.	BDL	4 max.
2-Propanol, PPM Wgt.	BDL	7 max.
Water, PPM Wgt.	<0.1	2 max.
Hydrogen, PPM Wgt.	BDL	1 max.
Oxygen, PPM Wgt.*	BDL	2 max.
Nitrogen, PPM Wgt.	BDL	Note (1)
Ammonia, PPM Wgt.	BDL	0.2 max.

REF ID# CT31552
SOURCE Tank 5

by/for EGH
Robert D. Freeman
Laboratory Manager

Note (1) Total Non-Propane Inerts = 1000 Wt. ppm max

revised 09/09/13

APPENDIX E

FUEL ANALYSIS RECORDS

LABORATORY REPORT

June 16, 2014

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

RE: STK Flare / stk-14-elmorecity.ok-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on June 2, 2014. For your reference, these analyses have been assigned our service request number P1402189.

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 3:36 pm, Jun 16, 2014

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated Service Request No: P1402189
Project: STK Flare / stk-14-elmorecity.ok-comp#1

CASE NARRATIVE

The samples were received intact under chain of custody on June 2, 2014 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 ASTM D1945-03 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 ASTM D1945-03 (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 5504-08 using a gas 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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	643428
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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 Service Request: P1402189

Project ID: STK Flare / stk-14-elmorecity.ok-comp#1

Date Received: 6/2/2014

Time Received: 09:30

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
STK-0-30-0%-Can-PI48	P1402189-001	Air	5/27/2014	14:10	SSC00249	-1.49	1.03	X	X	X
STK-30-70-30%-Can-PI48	P1402189-002	Air	5/28/2014	11:59	SSC00252	-0.39	1.11	X	X	X
STK-70-100-70%-Can-PI48	P1402189-003	Air	5/28/2014	16:30	SSC00085	-1.80	1.22	X	X	X
STK-90-100%-Can-PI48	P1402189-004	Air	5/28/2014	20:40	SSC00054	-1.54	1.14	X	X	X

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

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

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No: P1402189

Company Name & Address (Reporting Information): Big Iron Oilfield Services Inc

Project Name: STK flare

Project Number: stk-14-elmore city-oh-comp#1

Project Manager: Min Seon Lee

P.O. # / Billing Information

Phone: 918-565-5379

Fax:

Email Address for Result Reporting: mlee@airhygiene.com / lab@airhygiene.com

Sampler (Print & Sign):

ALS Contact:

Analysis Method

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	ASTM D1945-03	ASTM D3588-98	Comments e.g. Actual Preservative or specific instructions
STK-0-30-0%-Can-P148	1-1.42	5/28/14	14:10	SSC00249	SOA00031	-28.72	-2.85		X	X	
STK-30-70-30%-Can-P148	2-0.33	5/28/14	11:59	SSC00252	SOA00030	-28.83	-1.08		X	X	
STK-70-90-70%-Can-P148	3-1.75	5/28/14	16:30	SSC00085	SOA00152	-28.96	-2.65				
STK-90-100%-Can-P148	4-1.49	5/28/14	20:40	SSC00054	SOA00018	28.96	-1.96				

Report Tier Levels - please select

Tier I - Results (Default in not specified) _____
Tier II (Results + QC Summaries _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Date Validation Package) 10% Surcharge _____

EDD required YES / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/29	07:00 AM		5/29/14	0930
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature _____°C

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402189

Project: STK Flare / stk-14-elmorecity.ok-comp#1

Sample(s) received on: 6/2/14 Date opened: 6/2/14 by: MZAMORA

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 if necessary 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
P1402189-001.01	6.0 L Silonite Can					
P1402189-002.01	6.0 L Silonite Can					
P1402189-003.01	6.0 L Silonite Can					
P1402189-004.01	6.0 L Silonite Can					

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

Client: **Air Hygiene, Incorporated**
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Project ID: P1402189

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: 5/27 - 5/28/14
Date Received: 6/2/14
Date Analyzed: 6/4/14

Client Sample ID	ALS Sample ID	Canister Dilution Factor	Injection Volume ml(s)	**Result ppmV**	MRL ppmV	Data Qualifier
STK-0-30-0%-Can-PI48	P1402189-001	1.19	0.050	ND	14	
STK-30-70-30%-Can-PI48	P1402189-002	1.10	0.050	ND	13	
STK-70-100-70%-Can-PI48	P1402189-003	1.23	0.050	ND	15	
STK-90-100%-Can-PI48	P1402189-004	1.20	0.050	ND	14	
Method Blank	P140604-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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P140604-LCS

Test Code: ASTM D1945-03 Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Wade Henton Date Analyzed: 6/04/14
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

Compound	Spike Amount ppmV	**Result ppmV**	**% Recovery**	ALS Acceptance Limits	Data Qualifier
Benzene	137	**133**	**97**	50-150	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-0-30-0%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-001

Test Code: ASTM D3588-98
Analyst: Mike Conejo/Nalini Lall Date Collected: 5/27/14
Sample Type: 6.0 L Silonite Canister Date Received: 6/2/14
Test Notes:
Container ID: SSC00249

Initial Pressure (psig): -1.49 Final Pressure (psig): 1.03

Canister Dilution Factor: 1.19

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	**0.06**	**0.04**	
Nitrogen	**0.43**	**0.27**	
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	**99.50**	**99.67**	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
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	**27.25**	**81.46**
Hydrogen	**72.66**	**18.23**
Oxygen + Argon	< 0.10	< 0.10
Nitrogen	< 0.10	**0.27**
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		**1.5198**
Specific Volume	ft3/lb	**8.62**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,547.5**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,343.8**
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,459.9**
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,263.2**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**21,962.6**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**20,206.4**
Compressibility Factor "Z" (60 F, 14.696 psia)		**0.9828**

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-30-70-30%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-002

Test Code: ASTM D3588-98
Analyst: Mike Conejo/Nalini Lall Date Collected: 5/28/14
Sample Type: 6.0 L Silonite Canister Date Received: 6/2/14
Test Notes:
Container ID: SSC00252

Initial Pressure (psig): -0.39 Final Pressure (psig): 1.11

Canister Dilution Factor: 1.10

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	**0.05**	**0.03**	
Nitrogen	**0.26**	**0.17**	
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	**99.68**	**99.78**	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
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	**27.26**	**81.55**
Hydrogen	**72.69**	**18.25**
Oxygen + Argon	< 0.10	< 0.10
Nitrogen	< 0.10	**0.17**
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		**1.5208**
Specific Volume	ft3/lb	**8.62**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,552.2**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,348.1**
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,464.3**
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,267.3**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**21,988.8**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**20,230.5**
Compressibility Factor "Z" (60 F, 14.696 psia)		**0.9827**

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-70-100-70%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-003

Test Code: ASTM D3588-98
Analyst: Mike Conejo/Nalini Lall Date Collected: 5/28/14
Sample Type: 6.0 L Silonite Canister Date Received: 6/2/14
Test Notes:
Container ID: SSC00085

Initial Pressure (psig): -1.80 Final Pressure (psig): 1.22

Canister Dilution Factor: 1.23

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	**0.69**	**0.51**	
Nitrogen	**2.74**	**1.76**	
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	**96.55**	**97.71**	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
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	**27.10**	**79.86**
Hydrogen	**72.26**	**17.87**
Oxygen + Argon	**0.13**	**0.51**
Nitrogen	**0.51**	**1.76**
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		**1.5043**
Specific Volume	ft3/lb	**8.71**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,469.8**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,272.3**
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,387.1**
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,196.2**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**21,512.1**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**19,791.9**
Compressibility Factor "Z" (60 F, 14.696 psia)		**0.9836**

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-90-100%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-004

Test Code: ASTM D3588-98
Analyst: Mike Conejo/Nalini Lall Date Collected: 5/28/14
Sample Type: 6.0 L Silonite Canister Date Received: 6/2/14
Test Notes:
Container ID: SSC00054

Initial Pressure (psig): -1.54 Final Pressure (psig): 1.14

Canister Dilution Factor: 1.20

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	**0.16**	**0.12**	
Nitrogen	**0.71**	**0.45**	
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	**99.11**	**99.42**	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
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	**27.23**	**81.25**
Hydrogen	**72.61**	**18.18**
Oxygen + Argon	< 0.10	**0.12**
Nitrogen	**0.13**	**0.45**
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		**1.5178**
Specific Volume	ft3/lb	**8.63**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,537.4**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	**2,334.5**
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,450.5**
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	**2,254.6**
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**21,903.9**
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	**20,152.4**
Compressibility Factor "Z" (60 F, 14.696 psia)		**0.9829**

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-0-30-0%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-001

Test Code: ASTM D1945-03 Date Collected: 5/27/14
Instrument ID: HP5890 II/GC1/TCD Date Received: 6/2/14
Analyst: Nalini Lall Date Analyzed: 6/3/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.10 ml(s)
Test Notes:
Container ID: SSC00249

Initial Pressure (psig): -1.49 Final Pressure (psig): 1.03

Canister Dilution Factor: 1.19

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	ND	0.12	
7727-37-9	**Nitrogen**	**0.426**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-30-70-30%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-002

Test Code: ASTM D1945-03 Date Collected: 5/28/14
Instrument ID: HP5890 II/GC1/TCD Date Received: 6/2/14
Analyst: Nalini Lall Date Analyzed: 6/3/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.10 ml(s)
Test Notes:
Container ID: SSC00252

Initial Pressure (psig): -0.39 Final Pressure (psig): 1.11

Canister Dilution Factor: 1.10

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.11	
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.11	
7727-37-9	**Nitrogen**	**0.263**	0.11	
630-08-0	Carbon Monoxide	ND	0.11	
124-38-9	Carbon Dioxide	ND	0.11	

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-70-100-70%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-003

Test Code: ASTM D1945-03 Date Collected: 5/28/14
Instrument ID: HP5890 II/GC1/TCD Date Received: 6/2/14
Analyst: Nalini Lall Date Analyzed: 6/3/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.10 ml(s)
Test Notes:
Container ID: SSC00085

Initial Pressure (psig): -1.80 Final Pressure (psig): 1.22

Canister Dilution Factor: 1.23

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**	**0.693**	0.12	
7727-37-9	**Nitrogen**	**2.74**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-90-100%-Can-PI48** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P1402189-004

Test Code: ASTM D1945-03 Date Collected: 5/28/14
Instrument ID: HP5890 II/GC1/TCD Date Received: 6/2/14
Analyst: Nalini Lall Date Analyzed: 6/3/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.10 ml(s)
Test Notes:
Container ID: SSC00054

Initial Pressure (psig): -1.54 Final Pressure (psig): 1.14

Canister Dilution Factor: 1.20

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**	**0.163**	0.12	
7727-37-9	**Nitrogen**	**0.708**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P140603-MB

Test Code: ASTM D1945-03 Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 6/03/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P140603-LCS

Test Code: ASTM D1945-03 Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 6/03/14
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	**35,200**	**88**	84-110	
7782-44-7	Oxygen +					
7440-37-1	Argon	50,000	**50,700**	**101**	88-114	
7727-37-9	Nitrogen	50,000	**56,900**	**114**	88-114	
630-08-0	Carbon Monoxide	50,000	**48,200**	**96**	88-113	
124-38-9	Carbon Dioxide	50,000	**47,800**	**96**	84-109	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-0-30-0%-Can-PI48**
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1**

ALS Project ID: P1402189
ALS Sample ID: P1402189-001

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC8/FID
Analyst: Nalini Lall
Sampling Media: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00249

Date Collected: 5/27/14
Date Received: 6/2/14
Date Analyzed: 6/4/14
Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -1.49 Final Pressure (psig): 1.03

Canister Dilution Factor: 1.19

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	12	
C_2 as Ethane	**43**	12	
C_3 as Propane	**990,000**	12	
C_4 as n-Butane	ND	12	
C_5 as n-Pentane	ND	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-30-70-30%-Can-PI48**
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1**

ALS Project ID: P1402189
ALS Sample ID: P1402189-002

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC8/FID
Analyst: Nalini Lall
Sampling Media: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00252

Date Collected: 5/28/14
Date Received: 6/2/14
Date Analyzed: 6/4/14
Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -0.39 Final Pressure (psig): 1.11

Canister Dilution Factor: 1.10

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	11	
C_2 as Ethane	**41**	11	
C_3 as Propane	**1,000,000**	11	
C_4 as n-Butane	ND	11	
C_5 as n-Pentane	ND	11	
C_6 as n-Hexane	ND	11	
C_6+ as n-Hexane	ND	22	

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-70-100-70%-Can-PI48**
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1**

ALS Project ID: P1402189
ALS Sample ID: P1402189-003

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC8/FID
Analyst: Nalini Lall
Sampling Media: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00085

Date Collected: 5/28/14
Date Received: 6/2/14
Date Analyzed: 6/4/14
Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -1.80 Final Pressure (psig): 1.22

Canister Dilution Factor: 1.23

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	12	
C_2 as Ethane	**40**	12	
C_3 as Propane	**970,000**	12	
C_4 as n-Butane	ND	12	
C_5 as n-Pentane	ND	12	
C_6 as n-Hexane	ND	12	
C_6+ as n-Hexane	ND	25	

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **STK-90-100%-Can-PI48**
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1**

ALS Project ID: P1402189
ALS Sample ID: P1402189-004

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC8/FID
Analyst: Nalini Lall
Sampling Media: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00054

Date Collected: 5/28/14
Date Received: 6/2/14
Date Analyzed: 6/4/14
Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -1.54 Final Pressure (psig): 1.14

Canister Dilution Factor: 1.20

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	12	
C_2 as Ethane	**38**	12	
C_3 as Propane	**990,000**	12	
C_4 as n-Butane	ND	12	
C_5 as n-Pentane	ND	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P140604-MB

Test Code: ASTM D1945-03 Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Nalini Lall Date Analyzed: 6/04/14
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1402189
Client Project ID: **STK Flare / stk-14-elmorecity.ok-comp#1** ALS Sample ID: P140604-LCS

Test Code: ASTM D1945-03 Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Nalini Lall Date Analyzed: 6/04/14
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

Compound	Spike Amount ppmV	**Result ppmV**	**% Recovery**	ALS Acceptance Limits	Data Qualifier
Methane	1,020	**957**	**94**	83-120	
Ethane	1,010	**950**	**94**	85-122	
Propane	1,010	**938**	**93**	84-121	
n-Butane	1,010	**886**	**88**	79-114	
n-Pentane	1,010	**922**	**91**	80-121	
n-Hexane	1,020	**879**	**86**	73-121	

APPENDIX F

METHOD 3C RESULTS

LABORATORY REPORT

May 30, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on May 28, 2014. For your reference, these analyses have been assigned our service request number P1402097.

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 3:22 pm, May 30, 2014

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated Service Request No: P1402097
Project: stk-14-elmorecity.ik-comp#1

CASE NARRATIVE

The samples were received intact under chain of custody on May 28, 2014 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.

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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	643428
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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
Service Request: P1402097
Project ID: stk-14-elmorecity.ik-comp#1

Date Received: 5/28/2014
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag 2X
R1-0-30-0%PI 48	P1402097-001	Air	5/27/2014	00:00	X
R2-0-30-0%PI 48	P1402097-003	Air	5/27/2014	00:00	X
R3-0-30-0%PI 48	P1402097-005	Air	5/27/2014	00:00	X

P1402097

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:	stk-14-elmorecity.ik-comp#1	Laboratory Analysis Requested:	Method 3C
Person Taking Samples:	BS/TP		

Sample Number	Location	Date	Volume (L)	Analysis Method			
				O_2	CO_2	N_2	Methane
R1-0-30-0%PI 48	Big Iron Elmore City Plant	27-May	10	X	X	X	X
R1-0-30-0%PI 48 Back Up	Big Iron Elmore City Plant	27-May	5	X	X	X	X
R2-0-30-0%PI 48	Big Iron Elmore City Plant	27-May	10	X	X	X	X
R2-0-30-0%PI 48 Back Up	Big Iron Elmore City Plant	27-May	5	X	X	X	X
R3-0-30-0%PI 48	Big Iron Elmore City Plant	27-May	10	X	X	X	X
R3-0-30-0%PI 48 Back Up	Big Iron Elmore City Plant	27-May	5	X	X	X	X

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/27/14	4:40 pm		5/28/14	0420
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402097

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/28/14 Date opened: 5/28/14 by: MZAMORA

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 if necessary 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
P1402097-001.01	10 L Tedlar Bag					
P1402097-002.01	5.0 L Tedlar Bag					
P1402097-003.01	10 L Tedlar Bag					
P1402097-004.01	5.0 L Tedlar Bag					
P1402097-005.01	10 L Tedlar Bag					
P1402097-006.01	5.0 L Tedlar Bag					

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R1-0-30-0%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402097
ALS Sample ID: P1402097-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/27/14
Date Received: 5/28/14
Date Analyzed: 5/29/14
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**	**15.6**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.75**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R2-0-30-0%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402097
ALS Sample ID: P1402097-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/27/14
Date Received: 5/28/14
Date Analyzed: 5/29/14
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**	**15.7**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.64**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R3-0-30-0%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402097
ALS Sample ID: P1402097-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/27/14
Date Received: 5/28/14
Date Analyzed: 5/29/14
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**	**15.7**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.70**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402097
Client Project ID: **stk-14-elmorecity.ik-comp#1** ALS Sample ID: P140529-MB

Test Code: EPA Method 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 5/29/14
Sample Type: 10 L Tedlar Bag Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

May 30, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on May 29, 2014. For your reference, these analyses have been assigned our service request number P1402122.

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

Kelly Horiuchi
By Kelly Horiuchi at 5:22 pm, May 30, 2014

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Air Hygiene, Incorporated
Project: stk-14-elmorecity.ik-comp#1

Service Request No: P1402122

CASE NARRATIVE

The samples were received intact under chain of custody on May 29, 2014 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.

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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

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	L11-203
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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	494864
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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
Service Request: P1402122
Project ID: stk-14-elmorecity.ik-comp#1

Date Received: 5/29/2014
Time Received: 09:25

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag 2X
R4-30-70-30%PI 48	P1402122-001	Air	5/28/2014	00:00	X
R5-30-70-30%PI 48	P1402122-003	Air	5/28/2014	00:00	X
R6-30-70-30%PI 48	P1402122-005	Air	5/28/2014	00:00	X
R7-70-100-70%PI 48	P1402122-007	Air	5/28/2014	00:00	X
R8-70-100-70%PI 48	P1402122-009	Air	5/28/2014	00:00	X
R9-70-100-70%PI 48	P1402122-011	Air	5/28/2014	00:00	X

P1402122

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:	stk-14-elmorecity.ik-comp#1	Laboratory Analysis Requested:	Method 3C
Person Taking Samples:	BS/TP		

	Sample Number	Location	Date	Volume (L)	Analysis Method			
					O_2	CO_2	N_2	Methane
1	R4-30-70-30%PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
2	R4-30-70-30%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
3	R5-30-70-30%PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
4	R5-30-70-30%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
5	R6-30-70-30%PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
6	R6-30-70-30%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
7	R7-70-100-700%-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
8	R7-70-100-70%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
9	R8-70-100-700%-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
10	R8-70-100-70%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
11	R9-70-100-700%-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
12	R9-70-100-70%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/28/14	16:30			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

oc-52714

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402122

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/29/14 Date opened: 5/29/14 by: MZAMORA

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 if necessary 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
P1402122-001.01	10 L Tedlar Bag					
P1402122-002.01	5.0 L Tedlar Bag					
P1402122-003.01	10 L Tedlar Bag					
P1402122-004.01	5.0 L Tedlar Bag					
P1402122-005.01	10 L Tedlar Bag					
P1402122-006.01	5.0 L Tedlar Bag					
P1402122-007.01	10 L Tedlar Bag					
P1402122-008.01	5.0 L Tedlar Bag					

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

Samples -007 thru -012 have an ID of 70-100-700% on the COC, and 70-100-70% on the container label.

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402122

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/29/14 Date opened: 5/29/14 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1402122-009.01	10 L Tedlar Bag					
P1402122-010.01	5.0 L Tedlar Bag					
P1402122-011.01	10 L Tedlar Bag					
P1402122-012.01	5.0 L Tedlar Bag					

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R4-30-70-30%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**79.5**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.59**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R5-30-70-30%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**15.8**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.63**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R6-30-70-30%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**5.78**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R7-70-100-70%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-007

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**5.33**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R8-70-100-70%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-009

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/30/14
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**	**14.9**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.28**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R9-70-100-70%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-011

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/30/14
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**	**14.9**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.33**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402122
Client Project ID: **stk-14-elmorecity.ik-comp#1** ALS Sample ID: P140529-MB

Test Code: EPA Method 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 5/29/14
Sample Type: 10 L Tedlar Bag Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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.

LABORATORY REPORT

June 3, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on May 30, 2014. For your reference, these analyses have been assigned our service request number P1402149.

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 3:14 pm, Jun 03, 2014

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated Service Request No: P1402149
Project: stk-14-elmorecity.ik-comp#1

CASE NARRATIVE

The samples were received intact under chain of custody on May 30, 2014 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.

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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	643428
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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
Service Request: P1402149
Project ID: stk-14-elmorecity.ik-comp#1

Date Received: 5/30/2014
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag 2X
R10-90-100-PI 48	P1402149-001	Air	5/29/2014	00:00	X
R11-90-100-PI 48	P1402149-003	Air	5/29/2014	00:00	X
R12-90-100-PI 48	P1402149-005	Air	5/29/2014	00:00	X
R1-0-30-0%-PI 36	P1402149-007	Air	5/29/2014	00:00	X
R2-0-30-0%-PI 36	P1402149-009	Air	5/29/2014	00:00	X

PI-40 2149

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:	stk-14-elmorecity.ik-comp#1	Laboratory Analysis Requested:	Method 3C
Person Taking Samples:	BS/TP		

	Sample Number	Location	Date	Volume (L)	Analysis Method			
					O_2	CO_2	N_2	Methane
1	R10-90-100-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
2	R10-90-100-PI 48 Backup	Big Iron Elmore City Plant	28-May	5	X	X	X	X
3	R11-90-100-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
4	R11-90-100-PI 48 Backup	Big Iron Elmore City Plant	28-May	5	X	X	X	X
5	R12-90-100-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
6	R12-90-100-PI 48 Backup	Big Iron Elmore City Plant	28-May	5	X	X	X	X
7	R1-0-30-0%-PI 36	Big Iron Elmore City Plant	29-May	10	X	X	X	X
8	R1-0-30-0%-PI 36 Back Up	Big Iron Elmore City Plant	29-May	5	X	X	X	X
9	R2-0-30-0%-PI 36	Big Iron Elmore City Plant	29-May	10	X	X	X	X
10	R2-0-30-0%-PI 36 Back Up	Big Iron Elmore City Plant	29-May	5	X	X	X	X

Relinquished by: (Signature)	5/29/14 Date:	11:45:00 Time:	Received by: (Signature)	Date:	0930 Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

coc-52714

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402149

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/30/14 Date opened: 5/30/14 by: MZAMORA

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 if necessary 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
P1402149-001.01	10 L Tedlar Bag					
P1402149-002.01	5.0 L Tedlar Bag					
P1402149-003.01	10 L Tedlar Bag					
P1402149-004.01	5.0 L Tedlar Bag					
P1402149-005.01	10 L Tedlar Bag					
P1402149-006.01	5.0 L Tedlar Bag					
P1402149-007.01	10 L Tedlar Bag					
P1402149-008.01	5.0 L Tedlar Bag					

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

Chain of Custody is missing time collected

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402149

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/30/14 Date opened: 5/30/14 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1402149-009.01	10 L Tedlar Bag					
P1402149-010.01	5.0 L Tedlar Bag					

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R10-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**15.1**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.12**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R11-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**79.9**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.44**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R12-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**15.1**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.10**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402149
Client Project ID: **stk-14-elmorecity.ik-comp#1** ALS Sample ID: P140530-MB

Test Code: EPA Method 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 5/30/14
Sample Type: 10 L Tedlar Bag Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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.

APPENDIX G

Field Data Sheets

Unit PI48

0-30-0%-can 5/27/14

-28.72

-18.41

-10.83

-2.85

30-70-30%-can 5/28/14

-28.83

-19.50

-12.10

-1.08

PI48

70-100-70%. 5/28/14

-28.73

-18.82

-11.45

-2.65

90-100% 5/28/14

-28.96

-17.13

-10.62

AIR HYGIENE

RATA - FIELD DATA SHEET

Company:	Big Iron Oilfield Services
Location:	Elmore City Plant
Date:	5/28/14
Unit Make and Model:	PI49
Unit Number:	
Serial Number:	
Data Recorded By:	
Tested With AHI Unit(s):	Truck(s): 140 Trailer(s): 208
LDEQ Warmup/Cal Req:	On (Day/Time): ~~24hr~~ Cal (Day/Time): 7:00

CYLINDER SERIAL NUMBERS		O_2	THC	CO	CO_2
	Low				
	Mid				
	High				

13:50:09 MSL 5/28

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 (%)	30-70-30	30-70-3	71	—	70-100-70	—						
Time Start (hh:mm:ss)	7:37:09	9:05:09	10:30:09	12:24:09	~~12:47:09~~	15:05:09	16:41:09	18:07:09	19:28:09			
Time Stop (hh:mm:ss)	8:47:09	10:15:09	11:40:09	13:34:09	15:00:09	16:25:09	17:51:09	19:17:09	20:38:09			
Barometric Pressure (in. Hg)	30	30.03	30.02	30.02	30.0	30	29.95	29.94	29.94			
Ambient Temperature (°F)	67	69	79	78	90	80	87	79	76			
Relative Humidity (%)	78	81	61	59	45	46	40	50	55			

CALIBRATION	O_2		CO		THC		CO_2	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.04	0	0.01	0	0.03	0	0.04
Low Gas					3.04	3.00		
Mid Gas	12.2	12.25	9	8.90	5.04	5.09	8.77	8.80
High Gas	21.1	21.11	17.3	17.28	8.48	8.57	19.0	18.66

BIAS	O_2		CO		THC		CO_2	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	0.08	12.23	-0.05	8.80	0.01	3.04	0.04	8.74
Run #1 / Run #2	0.09	12.23	-0.05	8.75	0.02	3.16	0.05	8.73
Run #2 / Run #3	0.07	12.22	-0.06	8.67	-0.01	3.14	0.07	8.74
Run #3 / Run #4	0.11	12.20	-0.16	8.96	0.02	3.10	0.08	8.73
Run #4 / Run #5	0.08	12.19	0.07	9.03	0.01	3.01	0.05	8.74
Run #5 / Run #6	0.09	12.20	0.07	8.94	0.02	3.05	0.06	8.73
Run #6 / Run #7	0.07	12.17	-0.01	8.81	0.03	3.12	0.05	8.71
Run #7 / Run #8	0.09	12.13	0.01	8.76	0.01	3.08	0.06	8.72
Run #8 / Run #9	0.08	12.19	-0.03	8.81	-0.01	3.03	0.07	8.71
Run #9 / Run #10	0.10	12.19	0.06	8.66	0.01	3.02	0.09	8.73
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								
Bias Gas Actual Conc.								

REPORT INFORMATION		
	INSTRUMENT	SERIAL #
O_2		
NOx		
CO		
THC		
CO_2		
SO_2		

AIR HYGIENE

RATA - FIELD DATA SHEET

Company:	Big Bear Oilfield Services Inc
Location:	Alvord City plant
Date:	2/27/14
Unit Make and Model:	PI 48
Unit Number:	#1
Serial Number:	
Data Recorded By:	MSL
Tested With AHI Unit(s):	Truck(s): 170 Trailer(s): 208
LDEQ Warmup/Cal Req:	On (Day/Time): < 24 hr Cal (Day/Time): 7:05

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 (%)	0-30-0%											
Time Start (hh:mm:ss)	9:39:01	11:38:01	13:05:01									
Time Stop (hh:mm:ss)	10:47:01	12:48:01	14:15:01									
Barometric Pressure (in. Hg)	29.98	29.97	29.94									
Ambient Temperature (°F)	70	75	74									
Relative Humidity (%)	76	67	69									

CALIBRATION	O_2		CO		THC		CO_2	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	-0.05	0	-0.01	0	0.05	0	0.05
Low Gas					3.04	3.13		
Mid Gas	12.2	12.14	9	8.84	5.04	5.07	8.77	8.82
High Gas	21.1	21.09	17.3	17.29	8.48	8.53	19.0	19.05

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	0.05	12.13	-0.07	8.93	0.04	3.06	0.06	8.72
Run #1 / Run #2	0.01	12.15	-0.10	8.80	0.03	3.07	0.08	8.77
Run #2 / Run #3	0.01	12.10	-0.07	8.81	-0.03	3.08	0.05	8.73
Run #3 / Run #4	-0.04	12.10	-0.14	9.11	0.02	3.07	0.05	8.74
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..... Elmore City, OK
Sampling Location....
Unit #..... PI 48
Date..... 5/27/14

Console Info...... Samp-Cp-0004
Console.....
Meter Calibratrion Factor .968
Orifice Meter Coefficient 1.796

Run 1 Load Low 0-30-0 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	770.4	712.2	552.7	831.5			
Final Value	$(V_i),(W_i)$	756.6	774.4	560.3	843.5			

Run 2 Load Low 0-30-0 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	763.3	755.8	563.0	786.8			
Final Value	$(V_i),(W_i)$	801.7	767.2	565.2	793.8			

Run 3 Load Low 0-30-0 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g) 5/27/14 TR	(g) 5/27/14 TR	(g)	(g)	(g)
Contents		H_2O	H_2O 5/27/14 TR	H_2O	H_2O TR	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	~~801.7~~ TR 5/27/14	~~767.2~~	565.2	~~778.7~~			
Final Value	$(V_i),(W_i)$	793.1	782.1	561.4	851.5			

Initial 756.6 779.4 560.3 843.5

5/28/14

Run 4 Load mid 30-70-30 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	801.7	767.2	565.2	778.7			
Final Value	$(V_i),(W_i)$	834.2	776.4	568.7	789.6			

Run 5 Load mid 30-70-30 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	793.1	782.1	561.4	829.5			
Final Value	$(V_i),(W_i)$	~~834.2~~ 831.6	792.3	564.6	~~839.5~~ 840.2 TR 5/27/14			

Run 6 Load mid 30-70-30 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	834.2	776.4	568.7	789.6			
Final Value	$(V_i),(W_i)$	876.6	785.3	569.3	797.3			

AIR HYGIENE

MOISTURE (EPA METHOD 4) DATA SHEET

Site Info.
Plant Name..... Elmore City, Ok
Sampling Location....
Unit #..... PI48
Date..... 5/28/14

Console Info.....
Console..... Samp-cp-0009
Meter Calibratrion Factor .968
Orifice Meter Coefficient 1.796

Run 7 Load Mid/High 70-100-70 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	831.6	792.3	564.6	840.2			
Final Value	$(V_i),(W_i)$	872.3	799.8	566.3	850.3			

Run 8 Load Mid/High 70-100-70 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	876.6	785.3	569.3	797.3			
Final Value	$(V_i),(W_i)$	921.0	796.0	571.7	803.4			

Run 9 Load Mid/High 70-100-70 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	872.3	799.8	566.3	870.5			
Final Value	$(V_i),(W_i)$	913.4	809.4	568.2	884.8			

Run 10 Load High 90-100 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	921.0	796.0	571.7	845.7			
Final Value	$(V_i),(W_i)$	951.6	814.7	573.6	857.8			

Run 11 Load High 90-100 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	913.4	809.4	568.2	884.8			
Final Value	$(V_i),(W_i)$		856.5	570.0	895.6			

Run 12 Load High 90-100 Box#

		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)	(g)	(g)	(g)
Contents		H_2O	H_2O	H_2O	H_2O	H_2O	H_2O	H_2O
Initial Value	$(V_f),(W_f)$	744.8	697.7	573.6	857.8			
Final Value	$(V_i),(W_i)$	786.9	706.2	576.4	867.7			

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end of report

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

November 24, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402097 has been amended for the samples submitted to our laboratory on May 28, 2014. The amended report includes all instrument raw data. The added pages have been indicated by the "Added Page" footer located at the bottom right of the page.

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 1:03 pm, Nov 24, 2014

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Air Hygiene, Incorporated
Project: stk-14-elmorecity.ik-comp#1

Service Request No: P1402097

CASE NARRATIVE

The samples were received intact under chain of custody on May 28, 2014 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.

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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	643428
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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: stk-14-elmorecity.ik-comp#1
Service Request: P1402097

Date Received: 5/28/2014
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag 2X
R1-0-30-0%PI 48	P1402097-001	Air	5/27/2014	00:00	X
R2-0-30-0%PI 48	P1402097-003	Air	5/27/2014	00:00	X
R3-0-30-0%PI 48	P1402097-005	Air	5/27/2014	00:00	X

P1402097

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:	stk-14-elmorecity.ik-comp#1	Laboratory Analysis Requested:	Method 3C
Person Taking Samples:	BS/TP		

Sample Number	Location	Date	Volume (L)	Analysis Method			
				O_2	CO_2	N_2	Methane
R1-0-30-0%PI 48	Big Iron Elmore City Plant	27-May	10	X	X	X	X
R1-0-30-0%PI 48 Back Up	Big Iron Elmore City Plant	27-May	5	X	X	X	X
R2-0-30-0%PI 48	Big Iron Elmore City Plant	27-May	10	X	X	X	X
R2-0-30-0%PI 48 Back Up	Big Iron Elmore City Plant	27-May	5	X	X	X	X
R3-0-30-0%PI 48	Big Iron Elmore City Plant	27-May	10	X	X	X	X
R3-0-30-0%PI 48 Back Up	Big Iron Elmore City Plant	27-May	5	X	X	X	X

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/27/14	4:40 pm		5/28/14	0420
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402097

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/28/14 Date opened: 5/28/14 by: MZAMORA

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 if necessary 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
P1402097-001.01	10 L Tedlar Bag					
P1402097-002.01	5.0 L Tedlar Bag					
P1402097-003.01	10 L Tedlar Bag					
P1402097-004.01	5.0 L Tedlar Bag					
P1402097-005.01	10 L Tedlar Bag					
P1402097-006.01	5.0 L Tedlar Bag					

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R1-0-30-0%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402097
ALS Sample ID: P1402097-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/27/14
Date Received: 5/28/14
Date Analyzed: 5/29/14
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**	**15.6**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.75**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R2-0-30-0%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402097
ALS Sample ID: P1402097-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/27/14
Date Received: 5/28/14
Date Analyzed: 5/29/14
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**	**15.7**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.64**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R3-0-30-0%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402097
ALS Sample ID: P1402097-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/27/14
Date Received: 5/28/14
Date Analyzed: 5/29/14
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**	**15.7**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.70**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402097
Client Project ID: **stk-14-elmorecity.ik-comp#1** ALS Sample ID: P140529-MB

Test Code: EPA Method 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 5/29/14
Sample Type: 10 L Tedlar Bag Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291404.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:40 am
Operator : NL
Sample : 2097-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:12 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 :

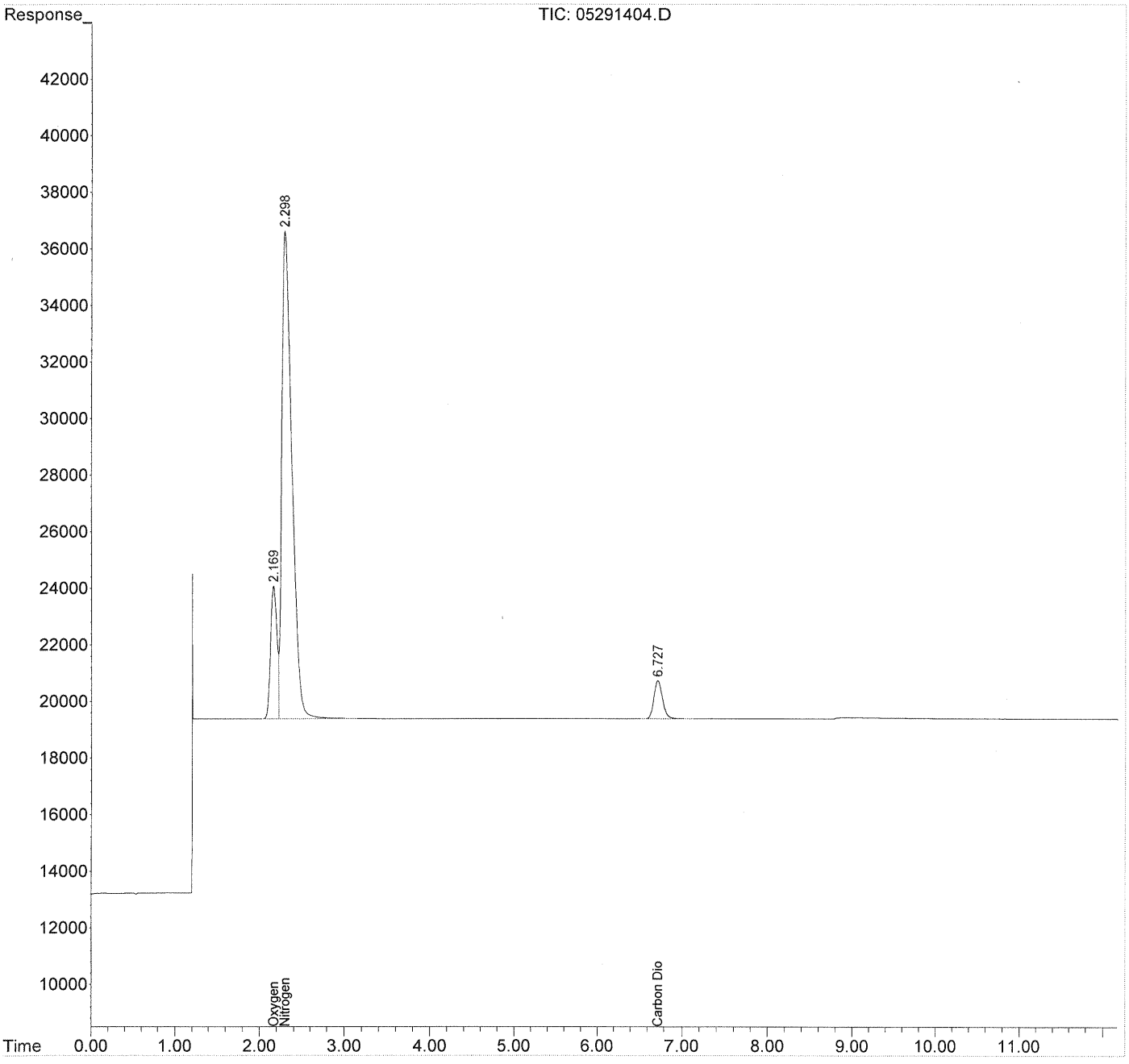
	Compound	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.170	236169	142912.212 ppm
3)	Nitrogen	2.299	1398042	728149.675 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.728	93369	43397.600 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291404.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:40 am
Operator : NL
Sample : 2097-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:12 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291405.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:57 am
Operator : NL
Sample : 2097-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:16 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.164	237635	143799.421	ppm
3)	Nitrogen	2.293	1407002	732816.325	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.724	94254	43808.939	ppm

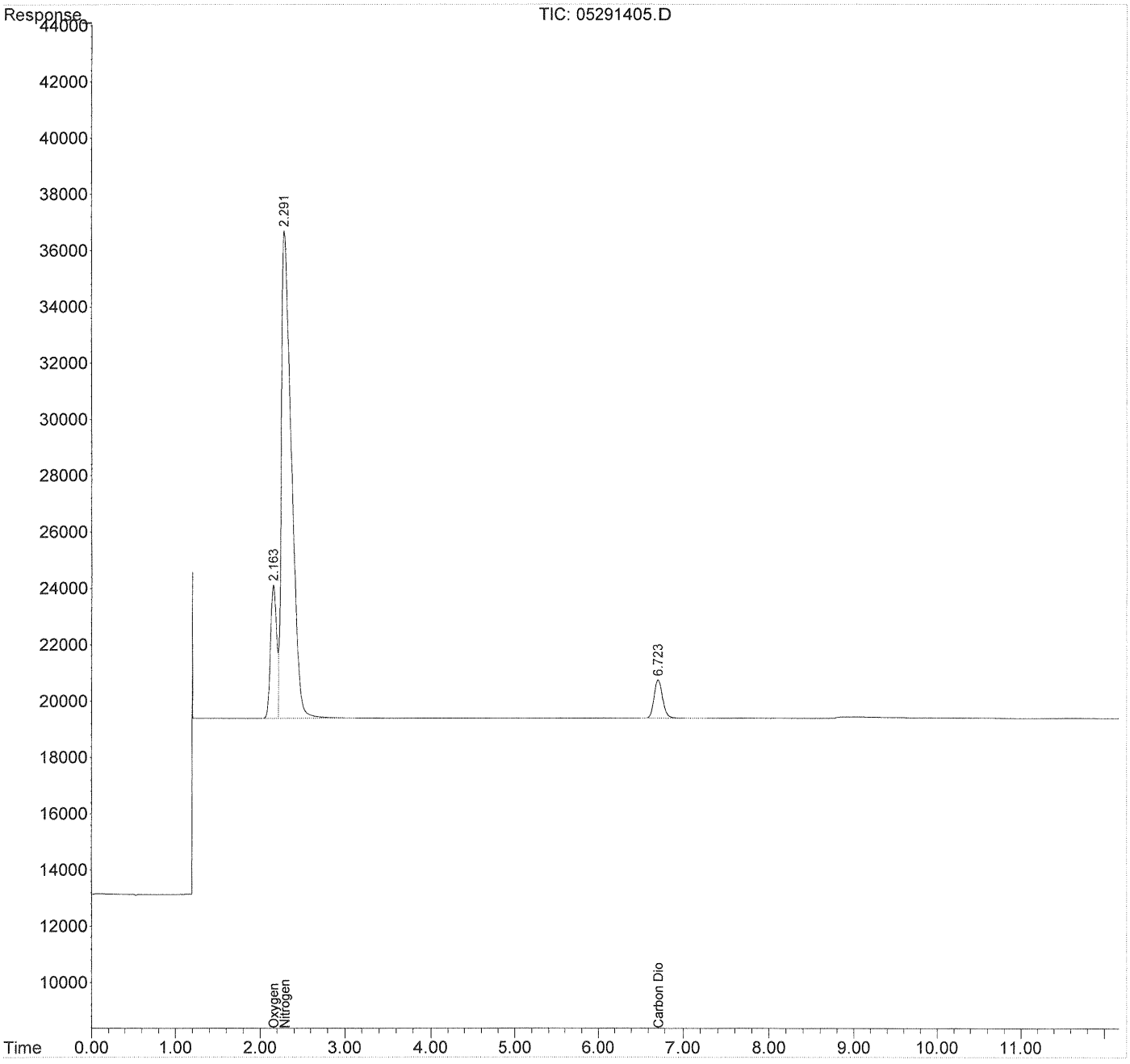
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291405.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:57 am
Operator : NL
Sample : 2097-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:16 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291406.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 9:16 am
Operator : NL
Sample : 2097-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:20 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 :

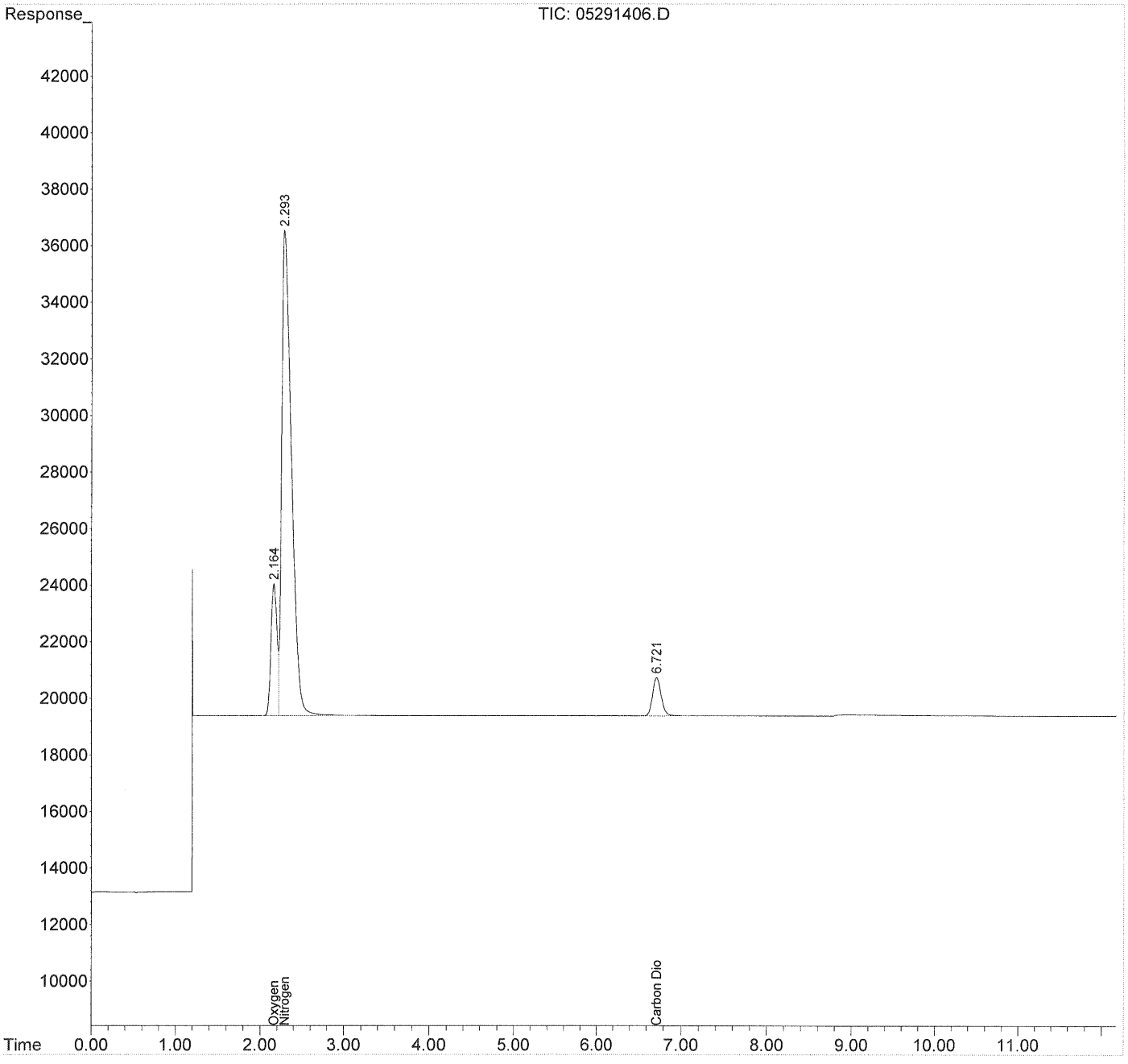
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.165	234720	142035.409	ppm
3)	Nitrogen	2.294	1388613	723238.463	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.723	92546	43015.107	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291406.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 9:16 am
Operator : NL
Sample : 2097-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:20 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291407.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 9:36 am
Operator : NL
Sample : 2097-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:24 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 :

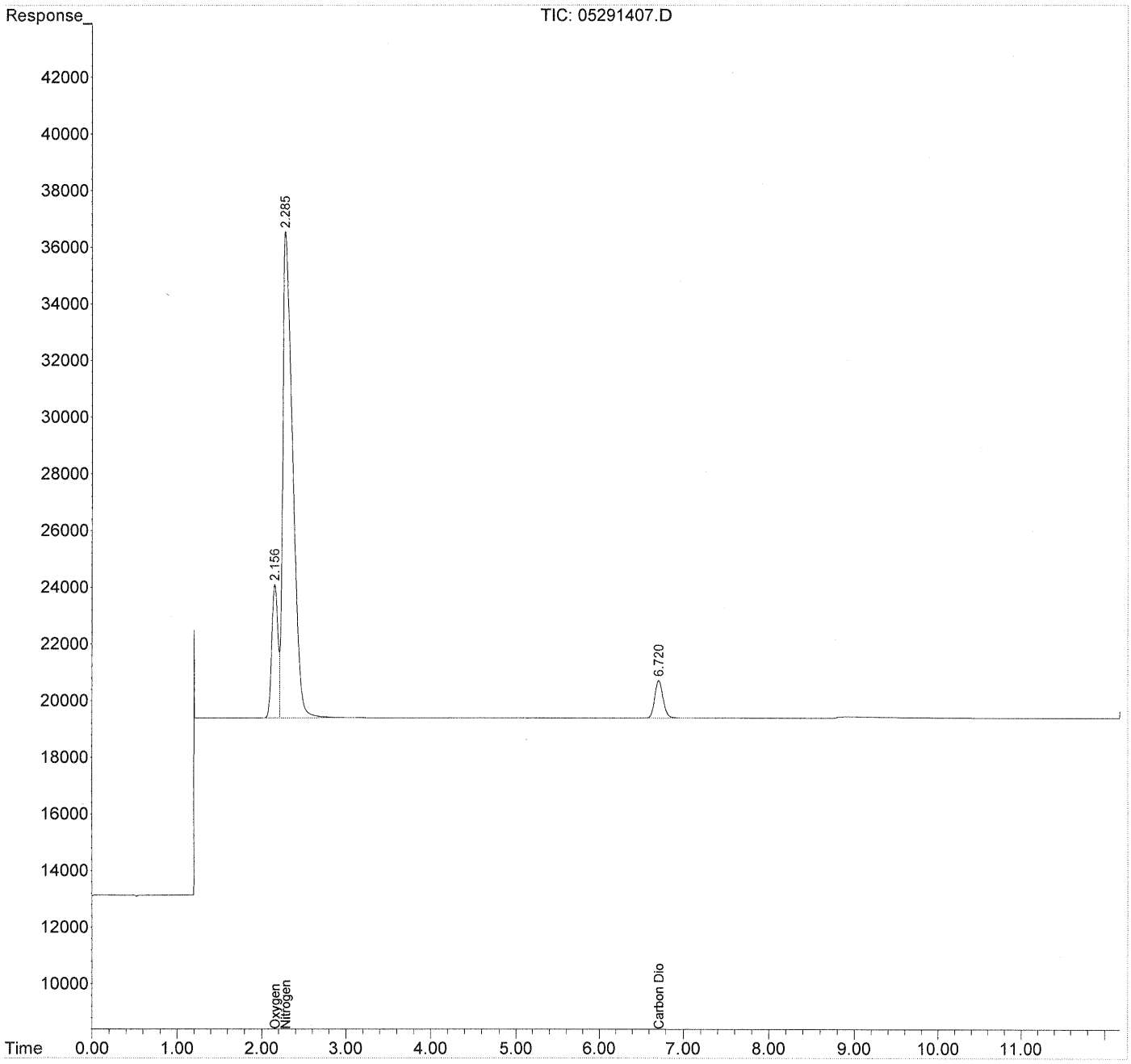
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.157	236758	143268.554	ppm
3)	Nitrogen	2.286	1391172	724571.454	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.721	90867	42234.854	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291407.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 9:36 am
Operator : NL
Sample : 2097-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:24 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291408.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 9:56 am
Operator : NL
Sample : 2097-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:28 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.167	237237	143558.557	ppm
3)	Nitrogen	2.296	1395662	726909.778	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.726	91140	42361.538	ppm

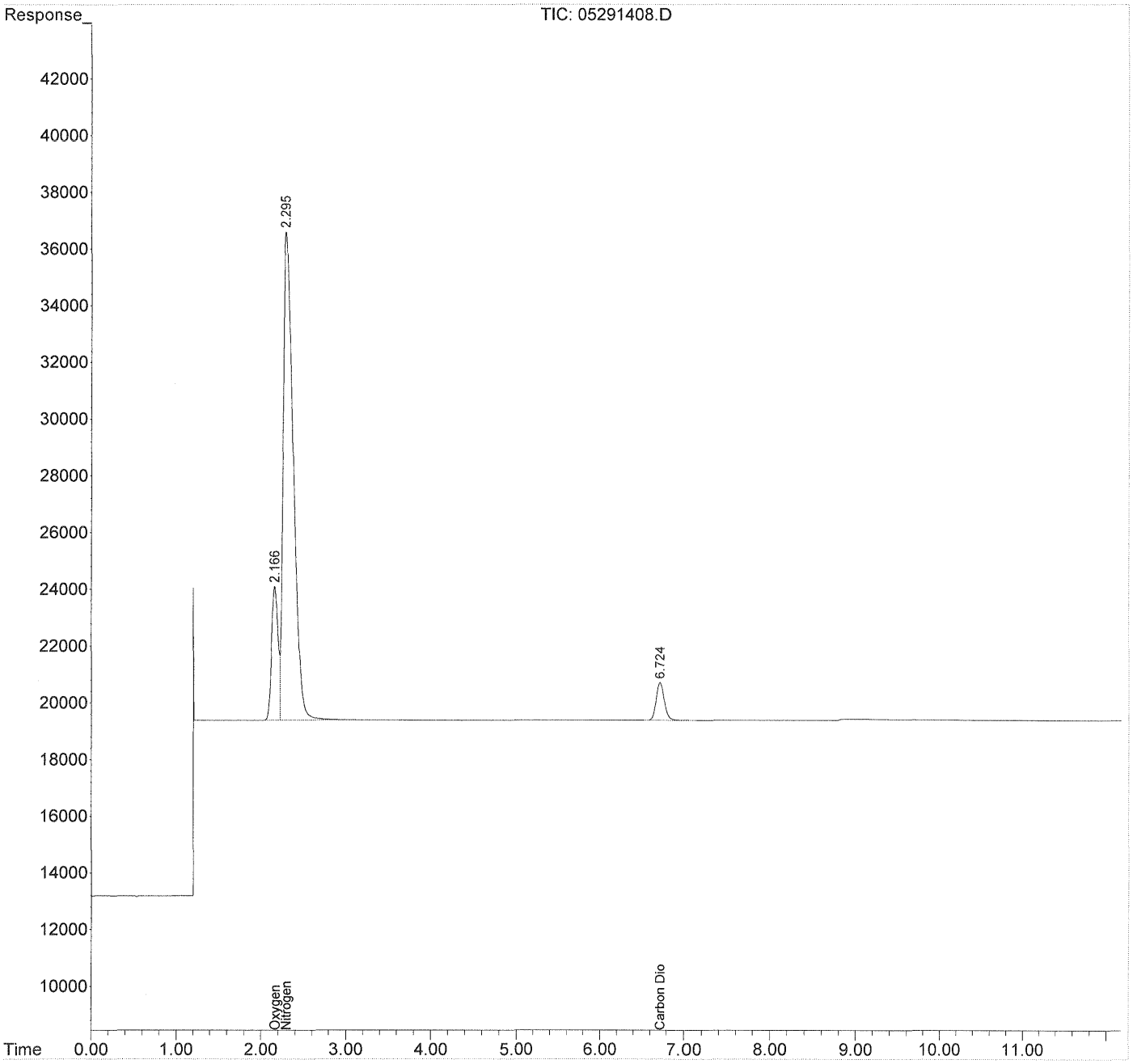
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291408.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 9:56 am
Operator : NL
Sample : 2097-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:28 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291409.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 10:14 am
Operator : NL
Sample : 2097-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:32 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 :

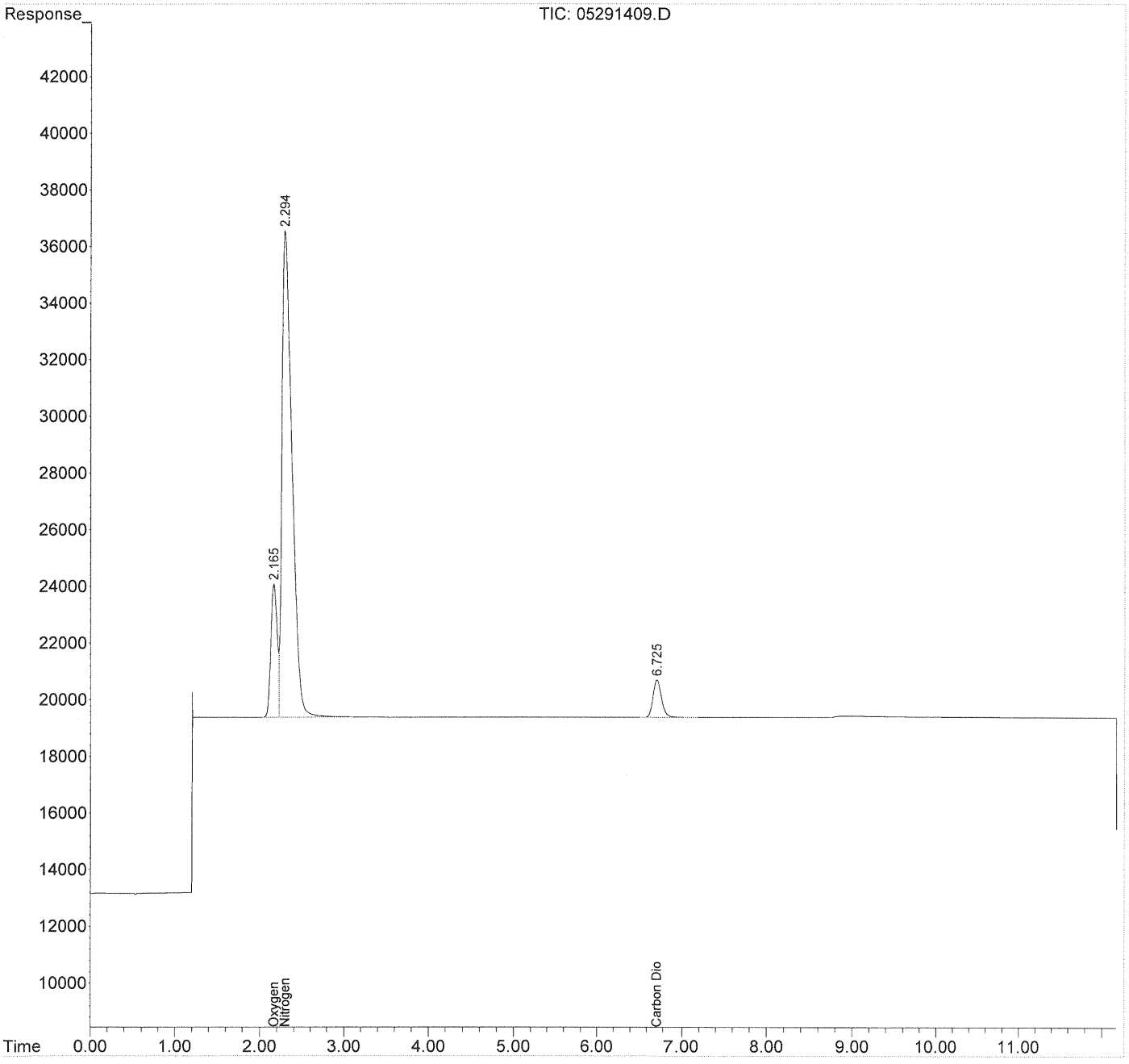
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.167	236782	143283.465	ppm
3)	Nitrogen	2.296	1392266	725141.093	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.726	91085	42335.729	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291409.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 10:14 am
Operator : NL
Sample : 2097-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:32 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291410.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 10:32 am
Operator : NL
Sample : 2097-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:36 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.171	238038	144043.165	ppm
3)	Nitrogen	2.300	1402505	730474.159	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.728	92629	43053.448	ppm

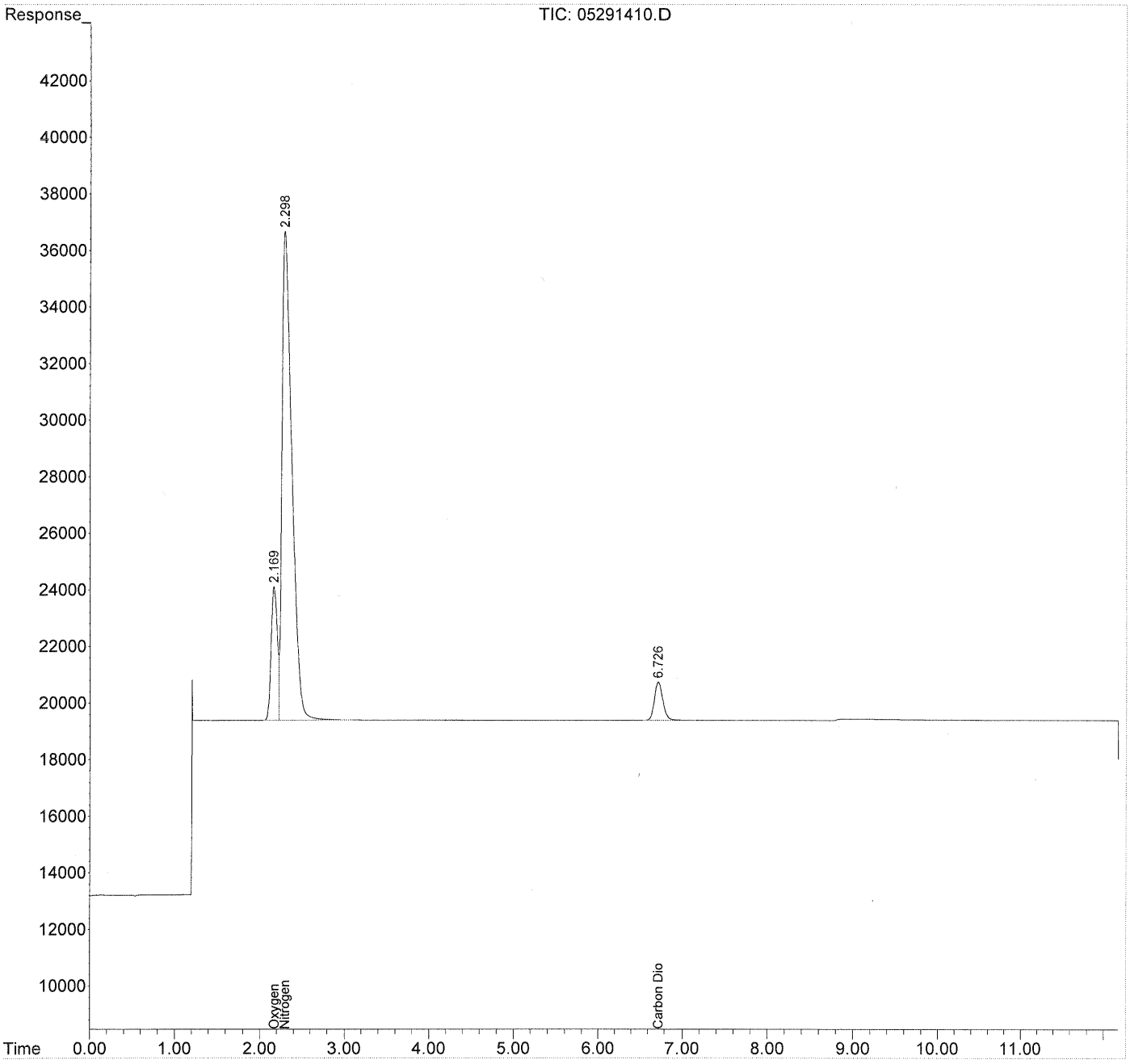
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291410.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 10:32 am
Operator : NL
Sample : 2097-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:36 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291411.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 10:49 am
Operator : NL
Sample : 2097-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:40 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.162	240089	145284.410	ppm
3)	Nitrogen	2.291	1412747	735808.230	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.722	93339	43383.677	ppm

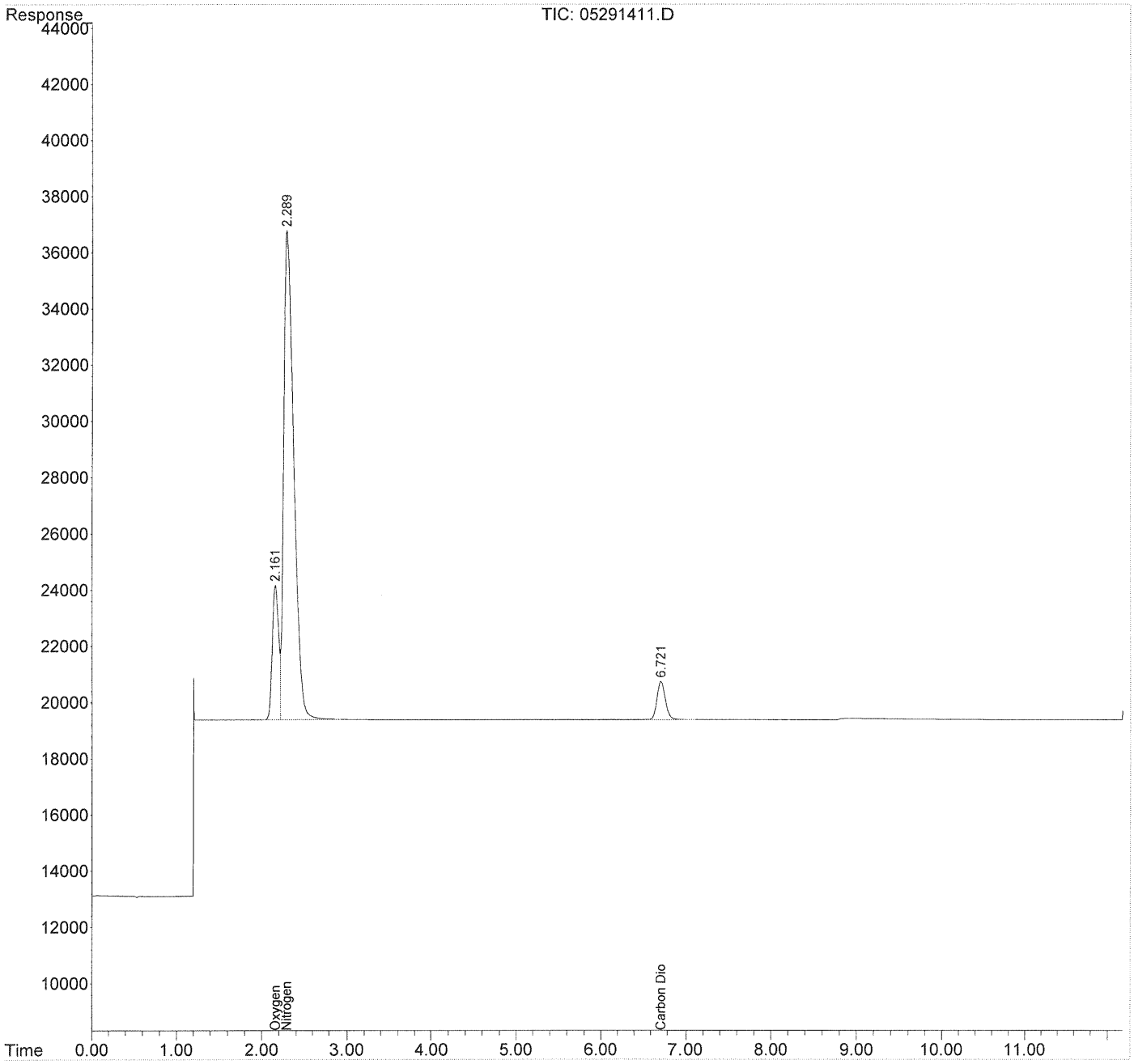
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291411.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 10:49 am
Operator : NL
Sample : 2097-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:40 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291412.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 11:07 am
Operator : NL
Sample : 2097-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:44 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 :

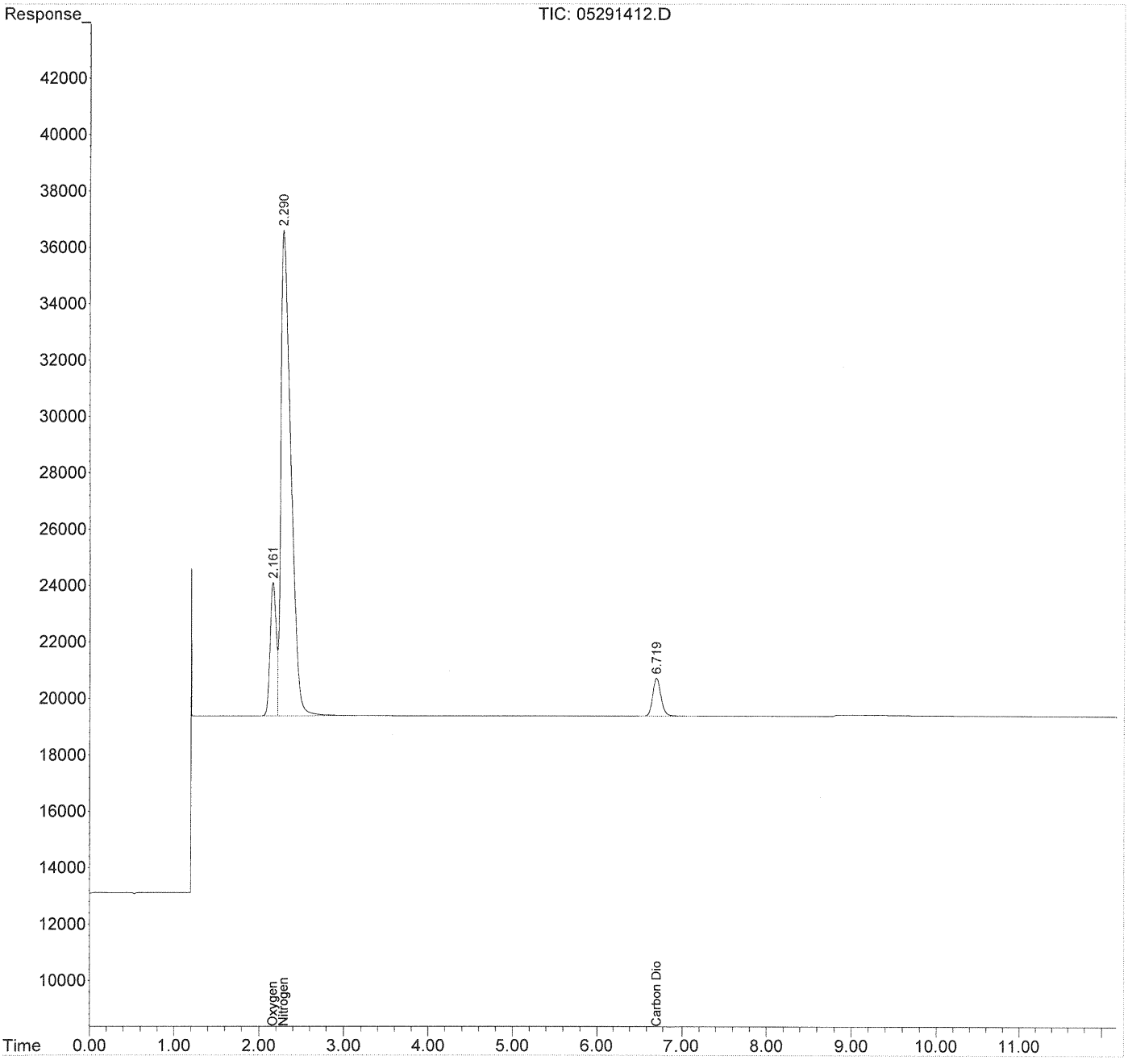
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.163	236855	143327.089	ppm
3)	Nitrogen	2.291	1395200	726669.358	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.720	92470	42979.498	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291412.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 11:07 am
Operator : NL
Sample : 2097-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:44 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291402.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:05 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:04 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 :

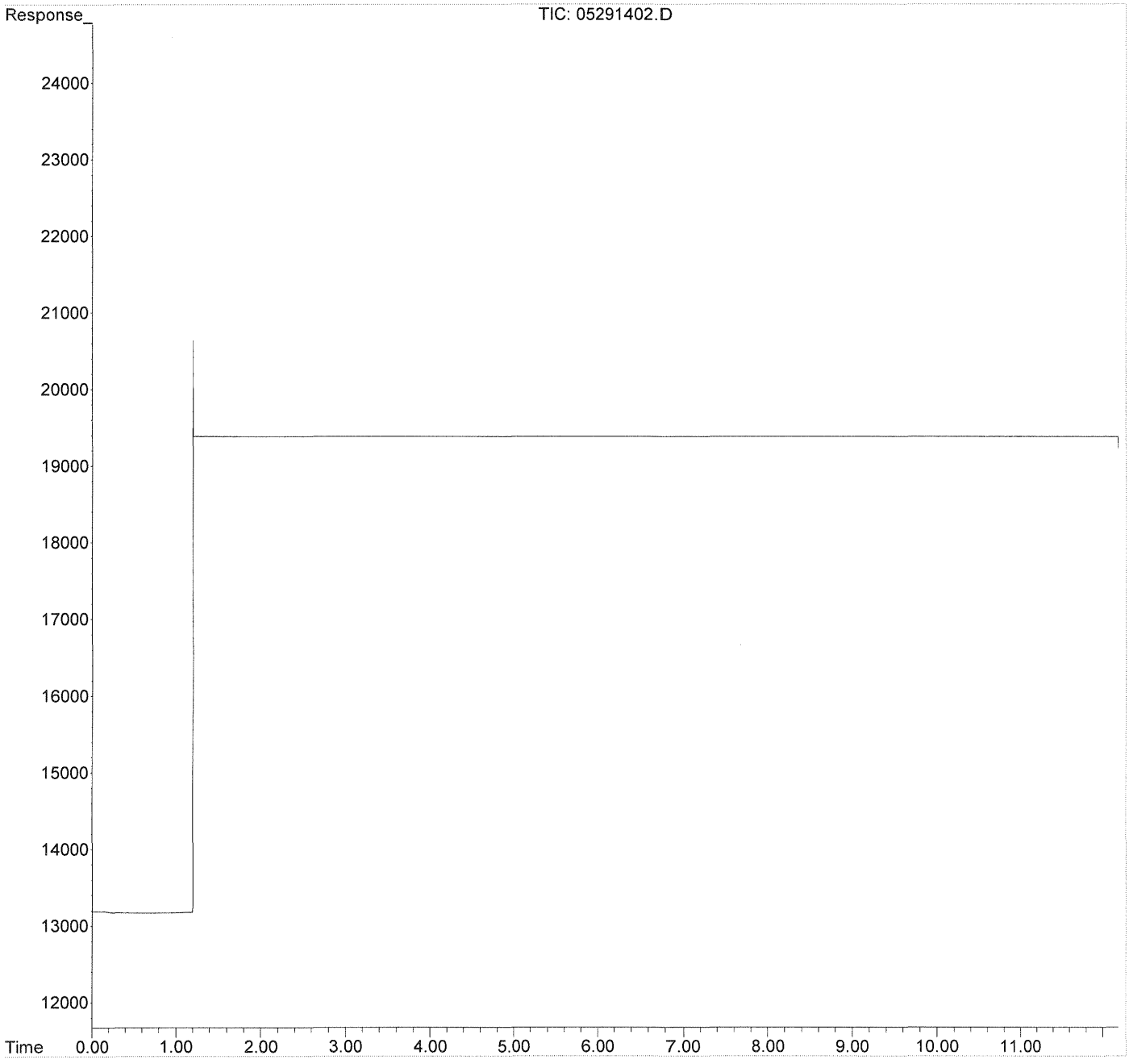
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	0.000	0	N.D.	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291402.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:05 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:04 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 :



NL 5/29/14

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 5/29/2014

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 5/29/2014

PAI Job : P1402097

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen		Nitrogen		Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-04241401	40601	42271		51739		53020	42396	52514	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	1.5%	5.6%		3.5%		6.0%	6.1%	4.9%	
Lab Air		202653		717022				463	
MB									
2097-001		142912	0.0%	728150	0.0%			43398	0.0%
2097-001 - 2		143799	0.6%	732816	0.7%			43809	0.9%
2097-001 - 3		142035	0.6%	723238	0.7%			43015	0.9%
2097-001 - Mean		142915		728068				43407	
2097-003		143269	0.1%	724571	0.1%			42235	0.2%
2097-003 - 2		143559	0.1%	726910	0.2%			42362	0.1%
2097-003 - 3		143283	0.1%	725141	0.1%			42336	0.1%
2097-003 - Mean		143370		725541				42311	
2097-005		144043	0.1%	730474	0.1%			43053	0.2%
2097-005 - 2		145284	0.7%	735808	0.7%			43384	0.6%
2097-005 - 3		143327	0.6%	726669	0.6%			42979	0.4%
2097-005 - Mean		144218		730984				43139	

Added Page

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 5/29/2014

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 5/29/2014

PAI Job : P1402097

Sample amount : 100uL

STD S30-04241401	38364	39844	48446	50067	39950	49646
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	4.1%	0.5%	3.1%	0.1%	0.0%	0.8%

Average Sample Result in ppm with the DILUTION FACTOR

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	Total(%)	D.F.
Lab Air		202653	717022			463	92.0	1.00
MB								1.00
2097-001		142915	728068			43407	91.4	1.00
2097-003		143370	725541			42311	91.1	1.00
2097-005		144218	730984			43139	91.8	1.00

Sample Result (Normalized)

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	Total(%)
MDL ppm *	1000	1000	1000	1000	1000	1000	
Lab Air	ND	220220	779177	ND	ND	503	99.99
QC CRITERIA		20.38-23.38%	76.58-79.58%				
MB	ND	ND	ND	ND	ND	ND	
2097-001	ND	156280	796153	ND	ND	47467	99.99
2097-003	ND	157323	796149	ND	ND	46428	99.99
2097-005	ND	157026	795903	ND	ND	46970	99.99

Added Page

Quantitation Report (Not Reviewed)

NJ 5/29/14

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291401.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 7:48 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:00 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.704	56078	40601.034	ppm
2)	Oxygen	2.216	69855	42271.408	ppm
3)	Nitrogen	2.392	99339	51739.407	ppm
4)	Carbon Monoxide	3.078	98259	53019.794	ppm
5)	Methane	5.070	59183	42396.211	ppm
6)	Carbon Dioxide	6.729	112984	52514.477	ppm

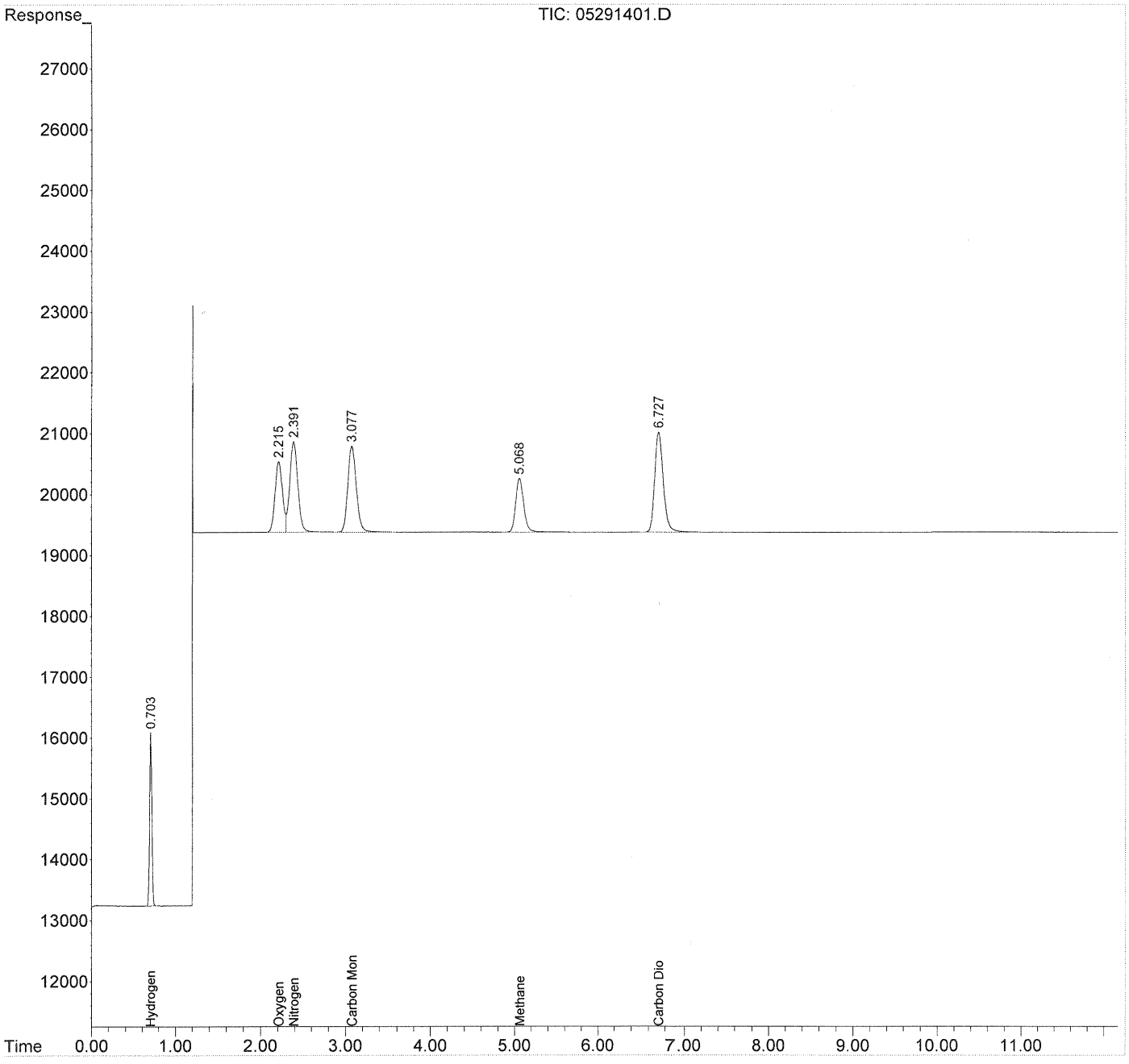
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291401.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 7:48 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:00 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 :



Added Page

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291413.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 11:24 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:48 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 :

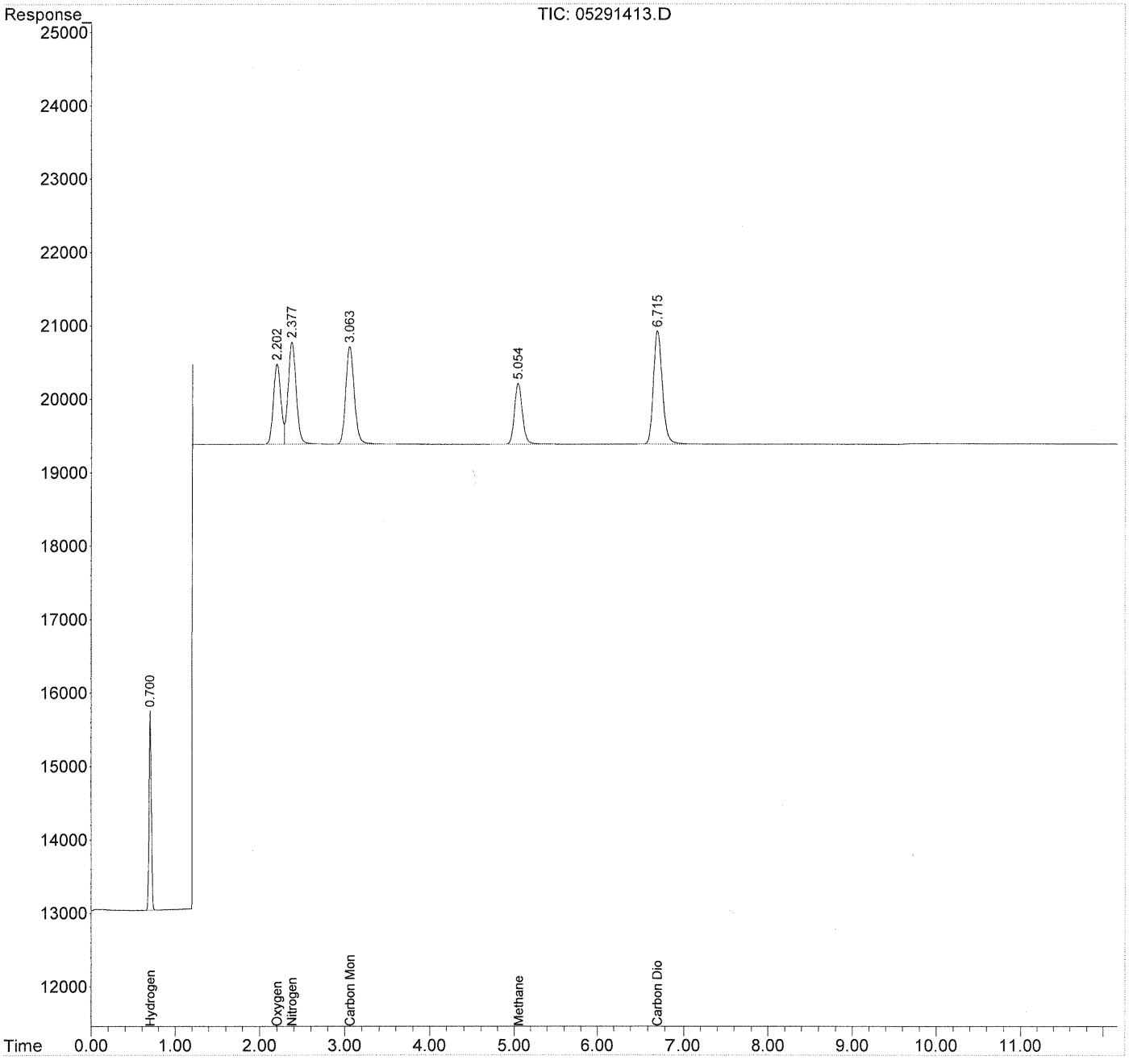
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.701	52988	38363.560	ppm
2)	Oxygen	2.203	65843	39843.628	ppm
3)	Nitrogen	2.379	93016	48446.064	ppm
4)	Carbon Monoxide	3.064	92787	50067.196	ppm
5)	Methane	5.055	55769	39950.383	ppm
6)	Carbon Dioxide	6.716	106812	49645.915	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291413.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 11:24 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 29 11:42:48 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 :



Added Page

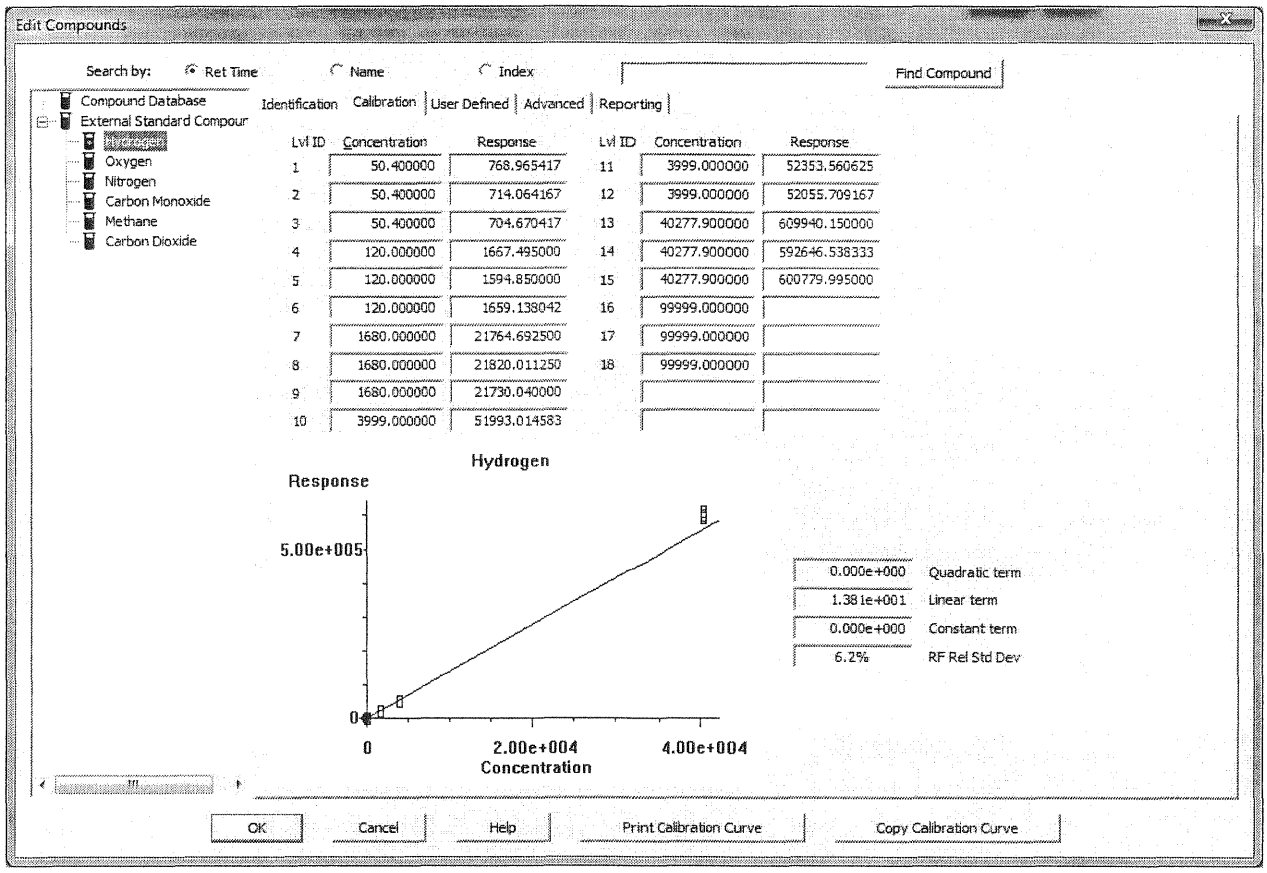
Response Factor Report GC01

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

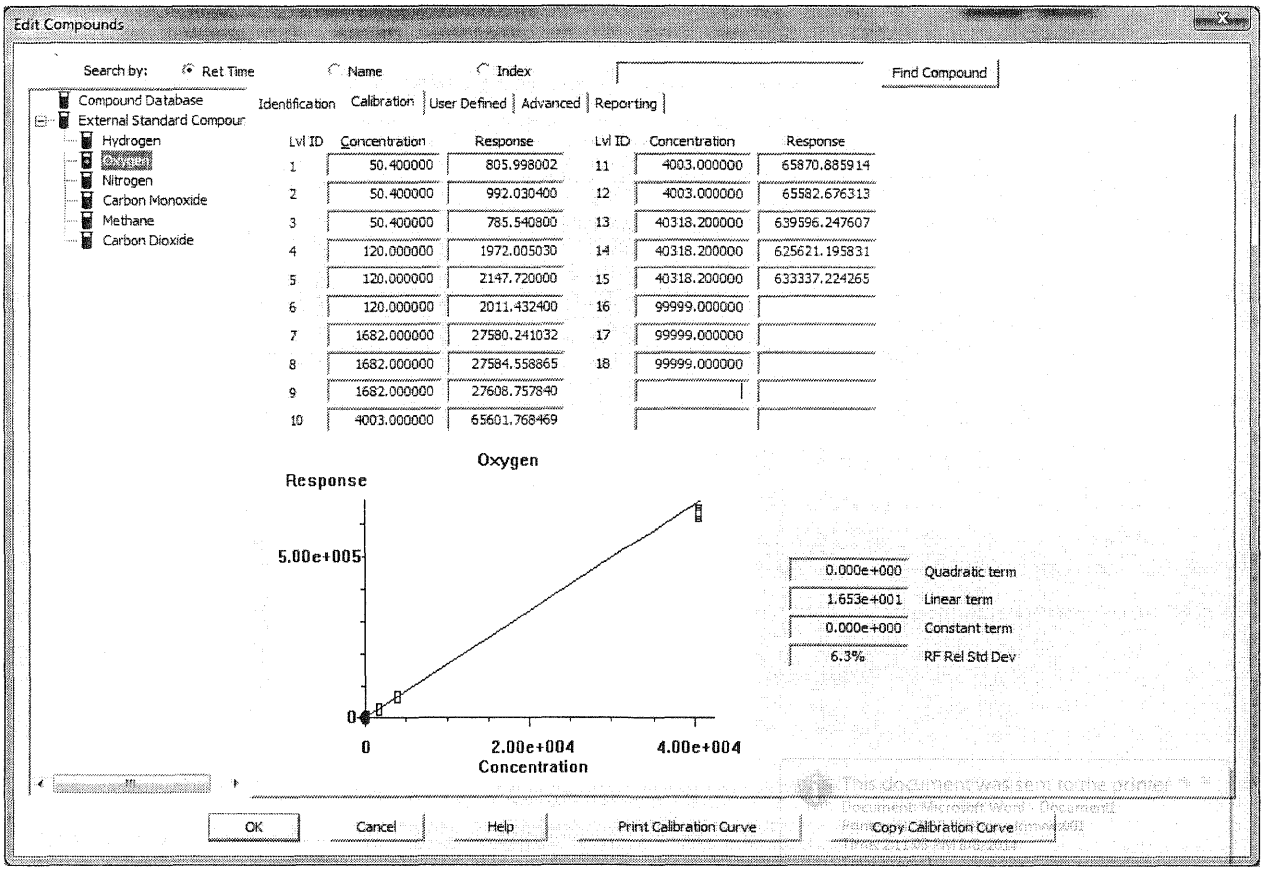
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4 =03101406.D 5 =03101407.D 6 =03101408.D

	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

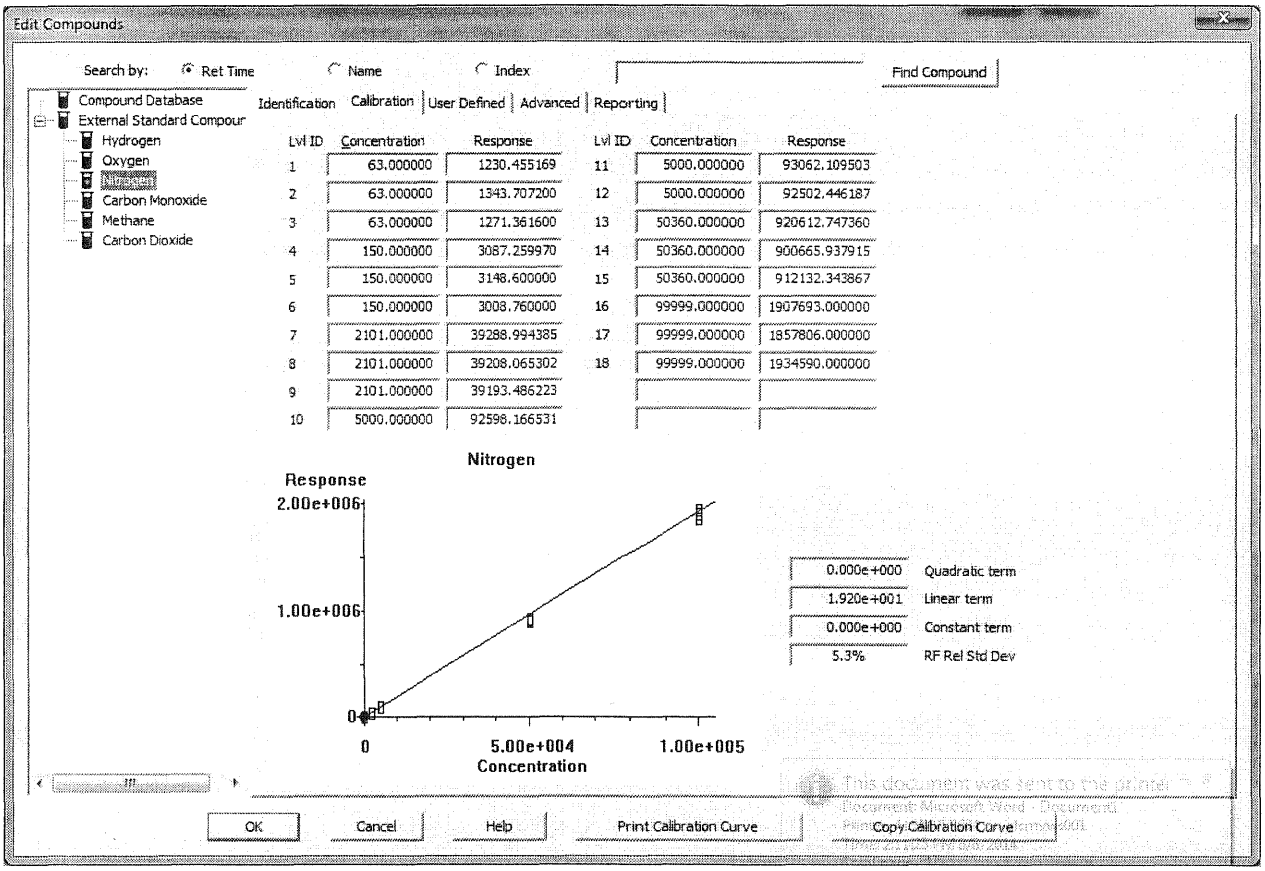
(#) = Out of Range ### Number of calibration levels exceeded format ###


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Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 50.400000 768.965417
2 50.400000 714.064167
3 50.400000 704.670417
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11 3999.000000 52353.560625
12 3999.000000 52055.709167
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14 40277.900000 592646.538333
15 40277.900000 600779.995000
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4.00e+004
Concentration
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0.000e+000 Constant term
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Cancel
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Print Calibration Curve
Copy Calibration Curve

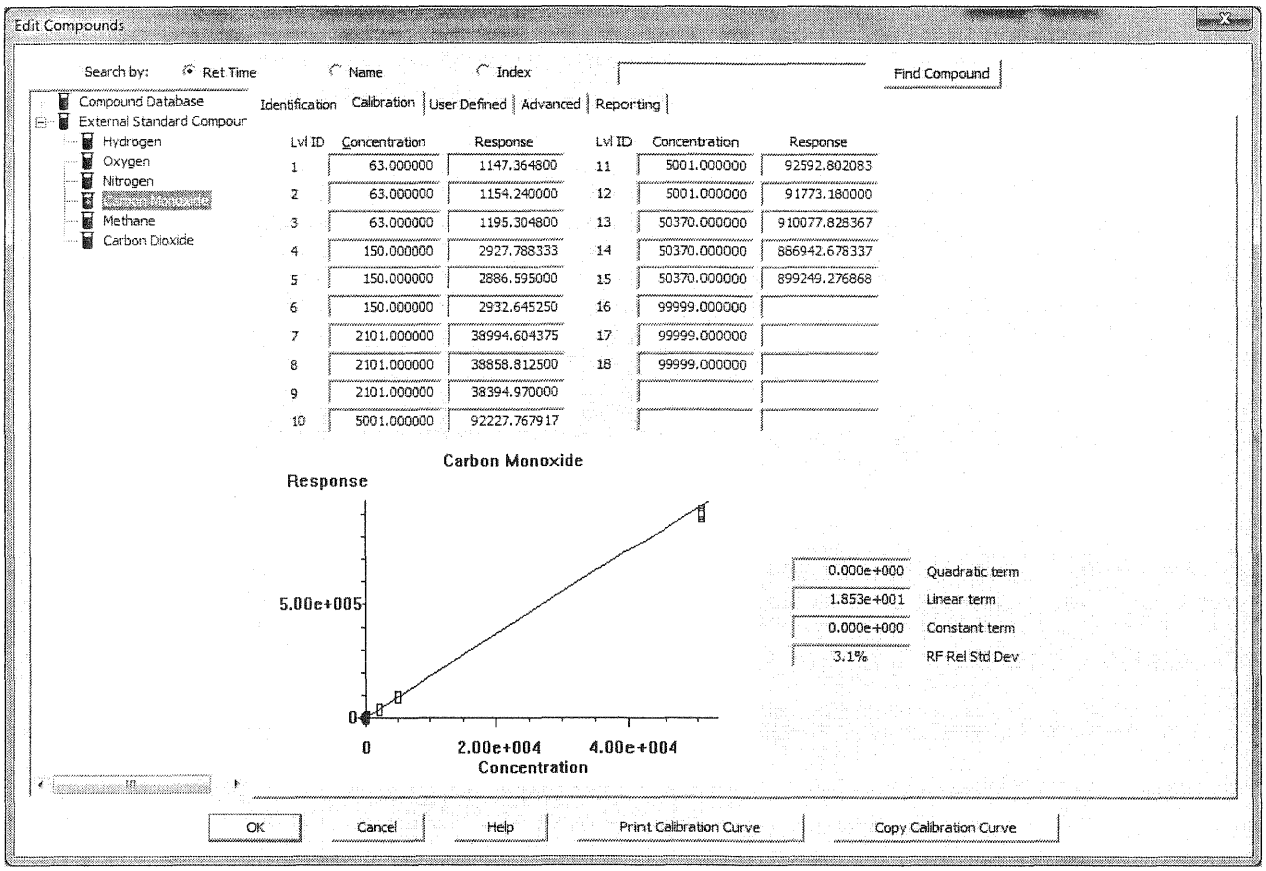
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Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
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3 50.400000 785.540800
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14 40318.200000 625621.195831
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18 99999.000000
Oxygen
Response
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0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
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0.000e+000 Constant term
6.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

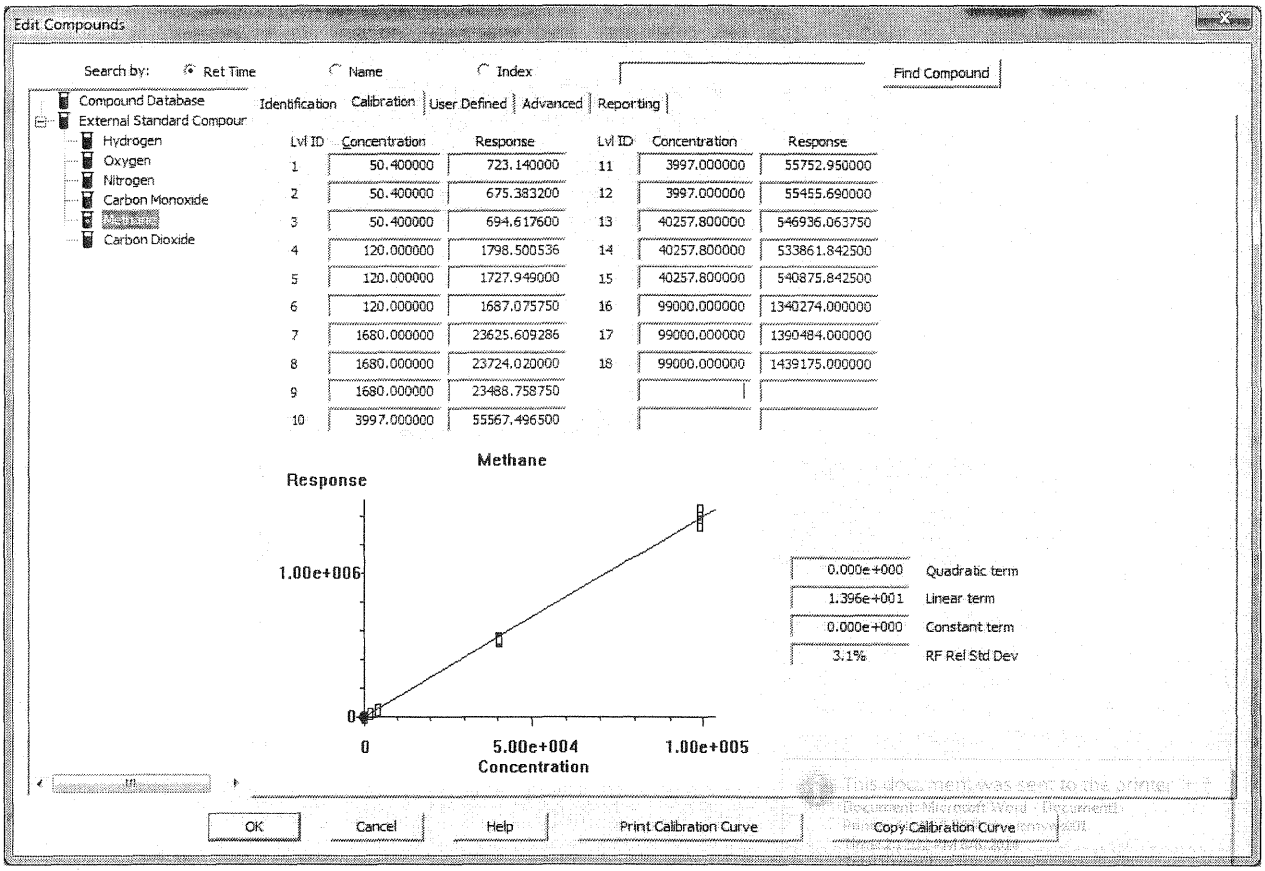
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Search by: Ret Time Name Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification Calibration User Defined Advanced Reporting
Lvl ID Concentration Response
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2 63.000000 1343.707200
3 63.000000 1271.361600
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5 150.000000 3148.600000
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9 2101.000000 39193.486223
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12 5000.000000 92502.446187
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15 50360.000000 912132.343867
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Nitrogen
Response
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0
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1.00e+005
Concentration
0.000e+000 Quadratic term
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5.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

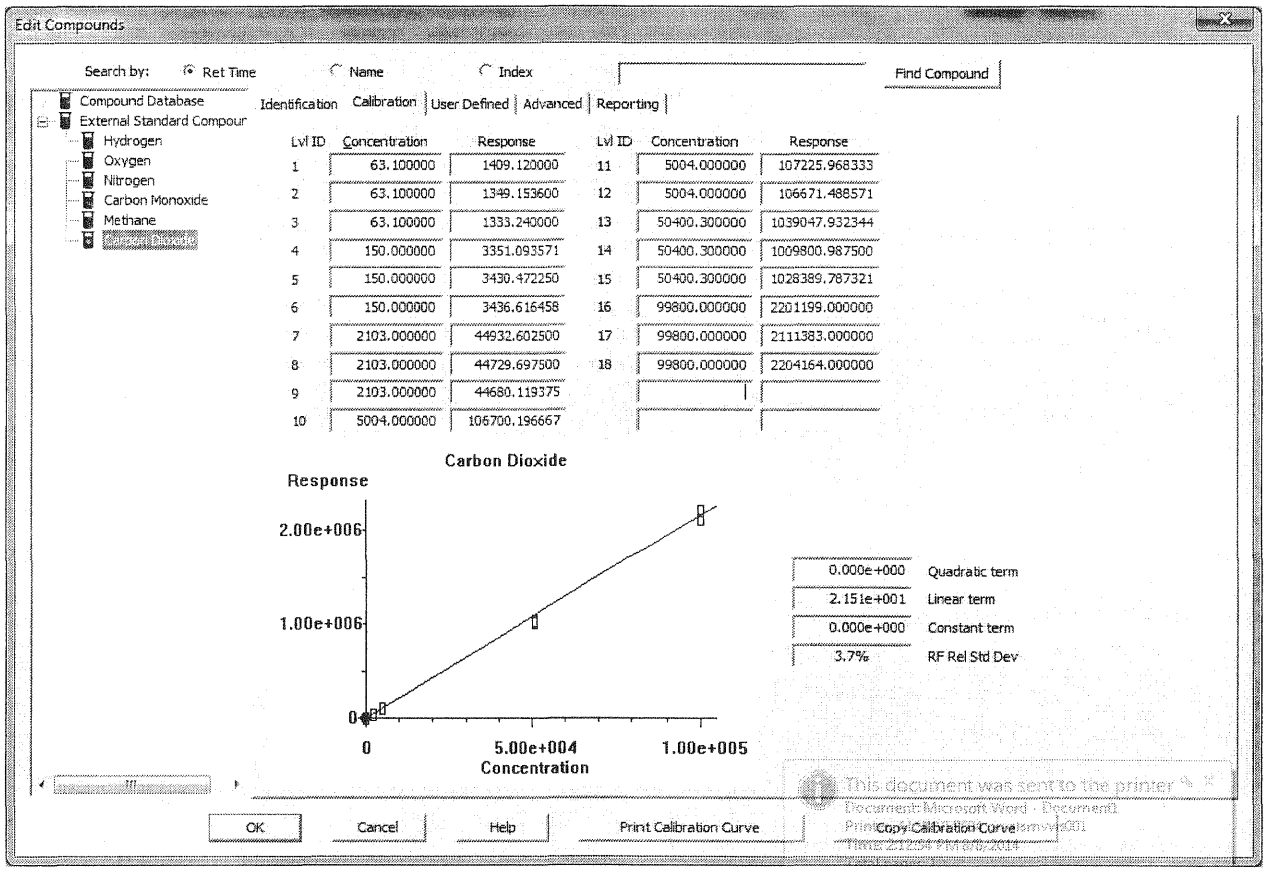
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Search by:
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Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 63.000000 1147.364800
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12 5001.000000 91773.180000
13 50370.000000 910077.828367
14 50370.000000 886942.678337
15 50370.000000 899249.276868
16 99999.000000
17 99999.000000
18 99999.000000
Carbon Monoxide
Response
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0
0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.853e+001 Linear term
0.000e+000 Constant term
3.1% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

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Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
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1 50.400000 723.140000
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1.00e+005
Concentration
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1.396e+001 Linear term
0.000e+000 Constant term
3.1% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

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Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Identification
Calibration
User Defined
Advanced
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Lvl ID
Concentration
Response
1 63.100000 1409.120000
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15 50400.300000 1028389.787321
16 99800.000000 2201199.000000
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Carbon Dioxide
Response
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1.00e+005
Concentration
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Print: Copy Calibration Curve
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Cancel
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Copy Calibration Curve

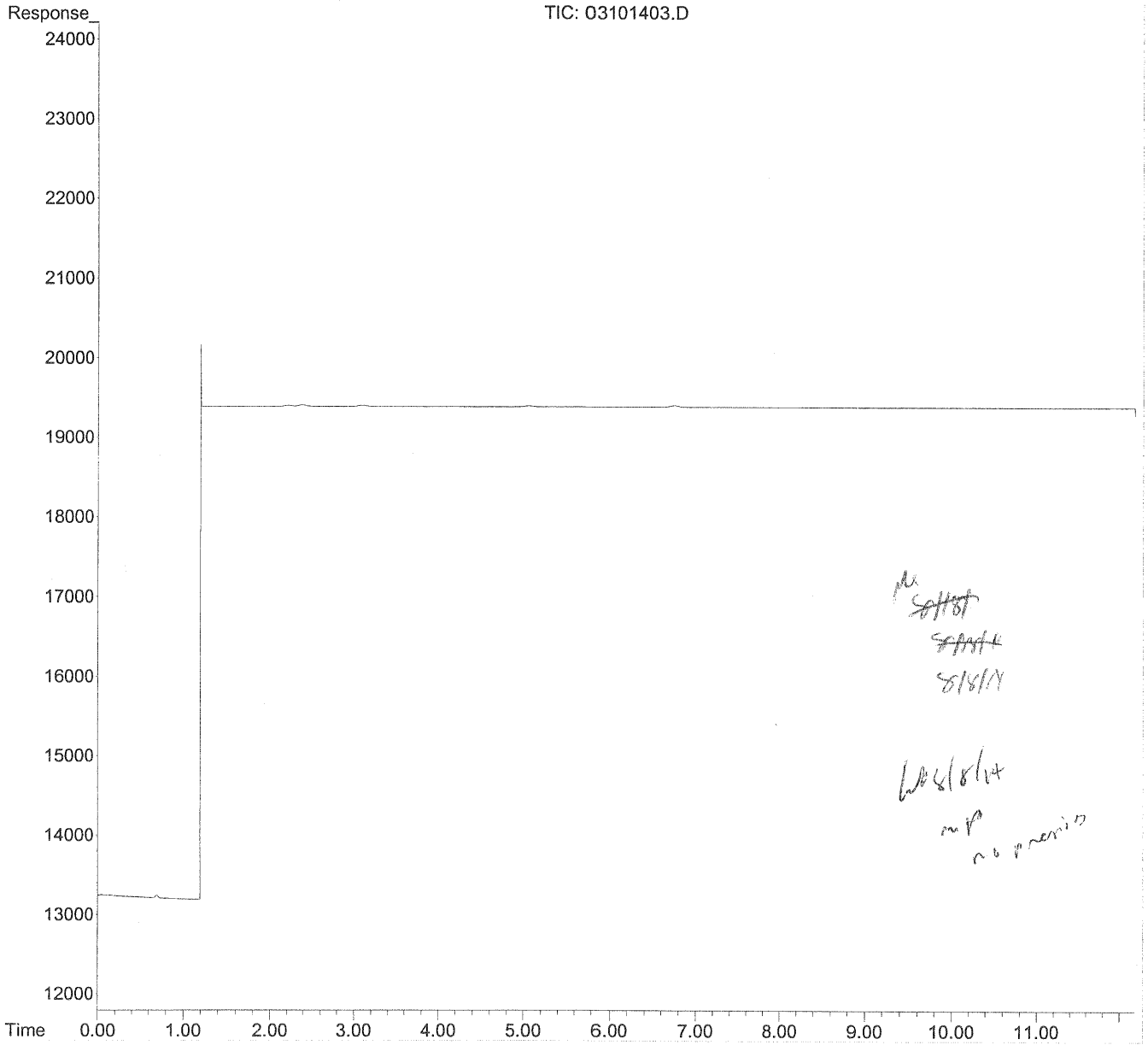
Added Page

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

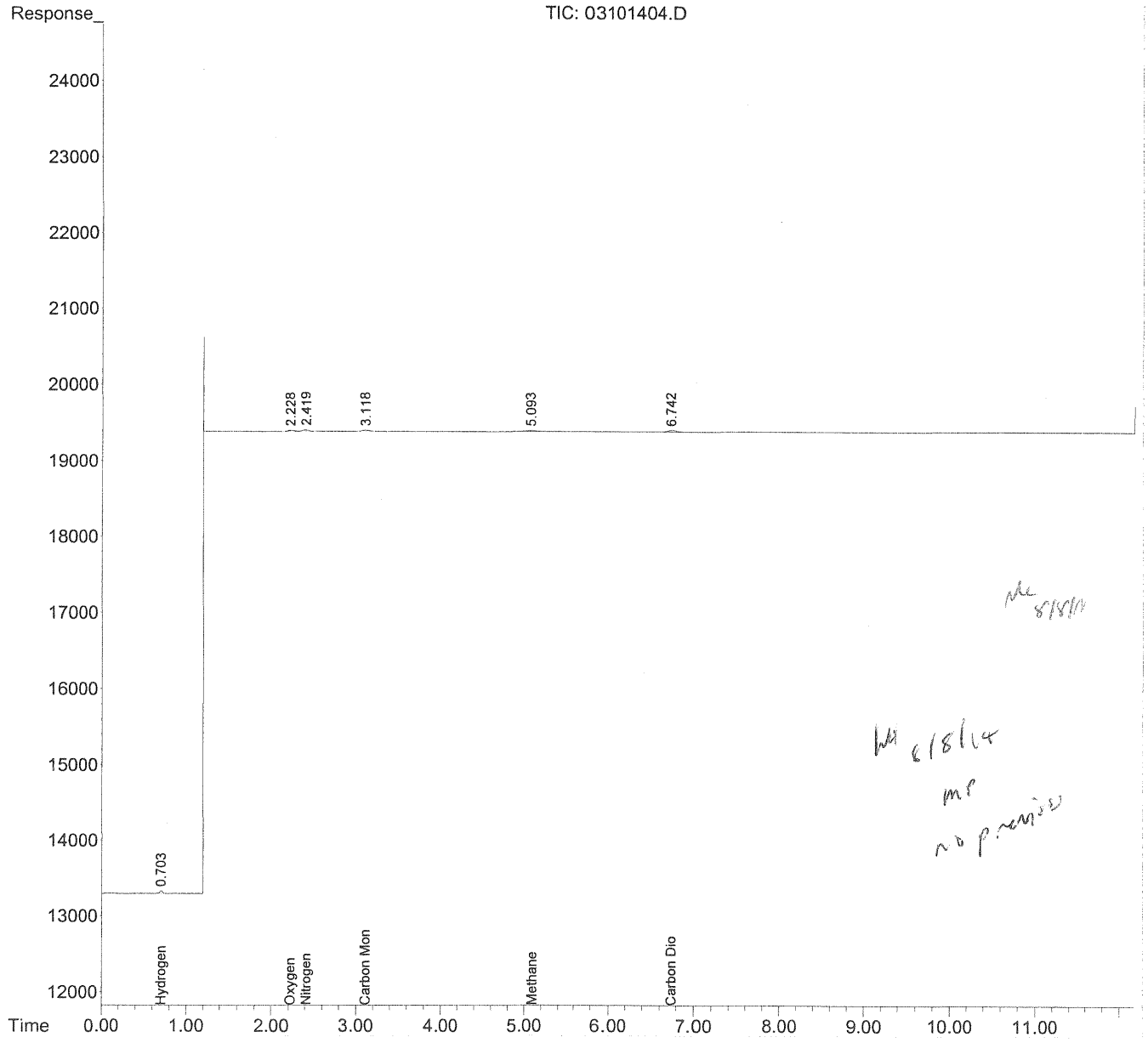
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



mc 8/18/14

WH 6/18/14
mc
no problem

Quantitation Report (QT Reviewed)

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 :

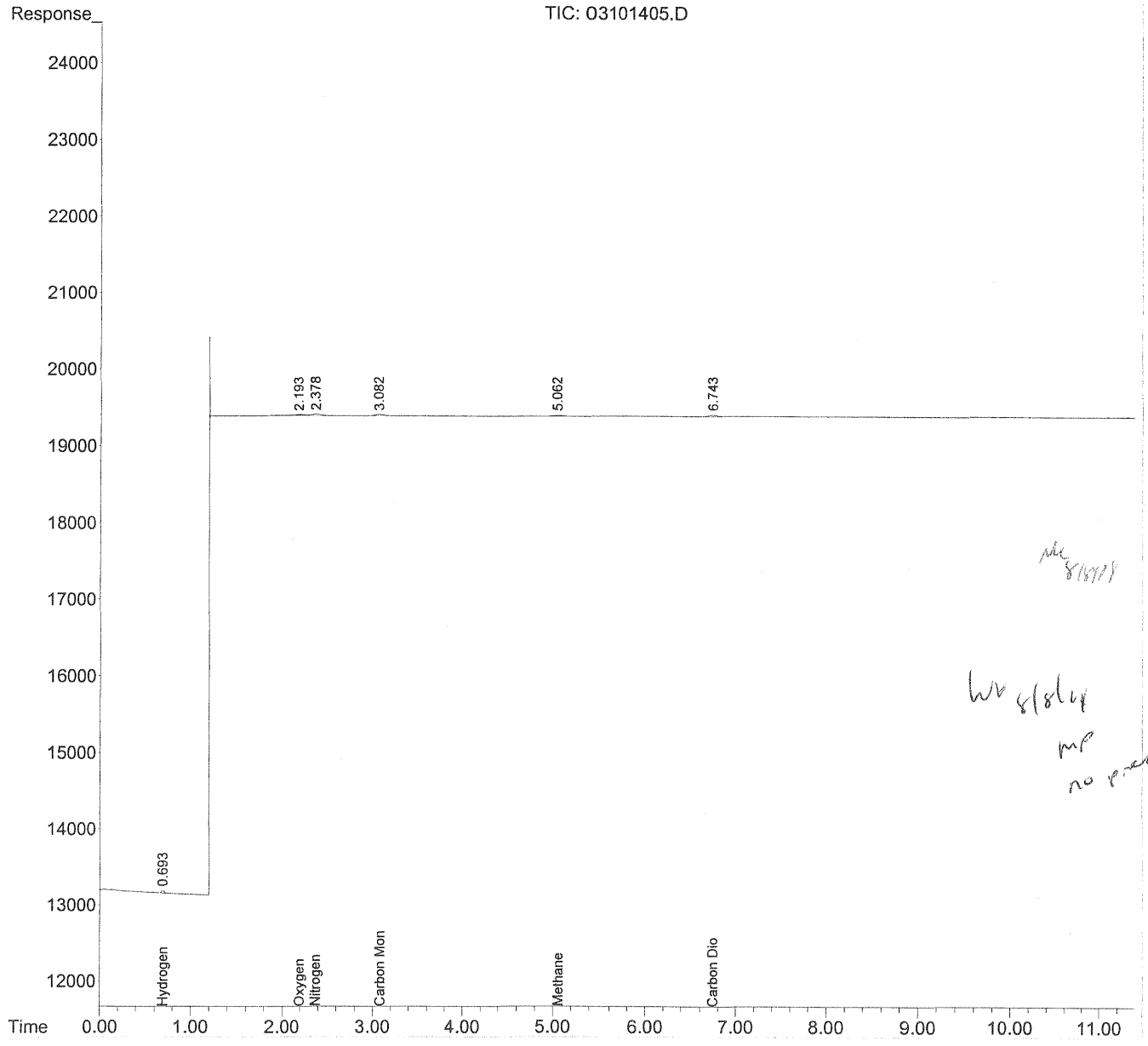
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Hydrogen	0.704	714	468.016	ppm	
2)	Oxygen	2.228	992	620.328	ppm	m
3)	Nitrogen	2.419	1344	687.986	ppm	m
4)	Carbon Monoxide	3.118	1154	633.775	ppm	m
5)	Methane	5.093	675	470.715	ppm	m
6)	Carbon Dioxide	6.742	1349	604.147	ppm	m

(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 :



WH 8/8/14
MP
no previous

Quantitation Report (QT Reviewed)

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

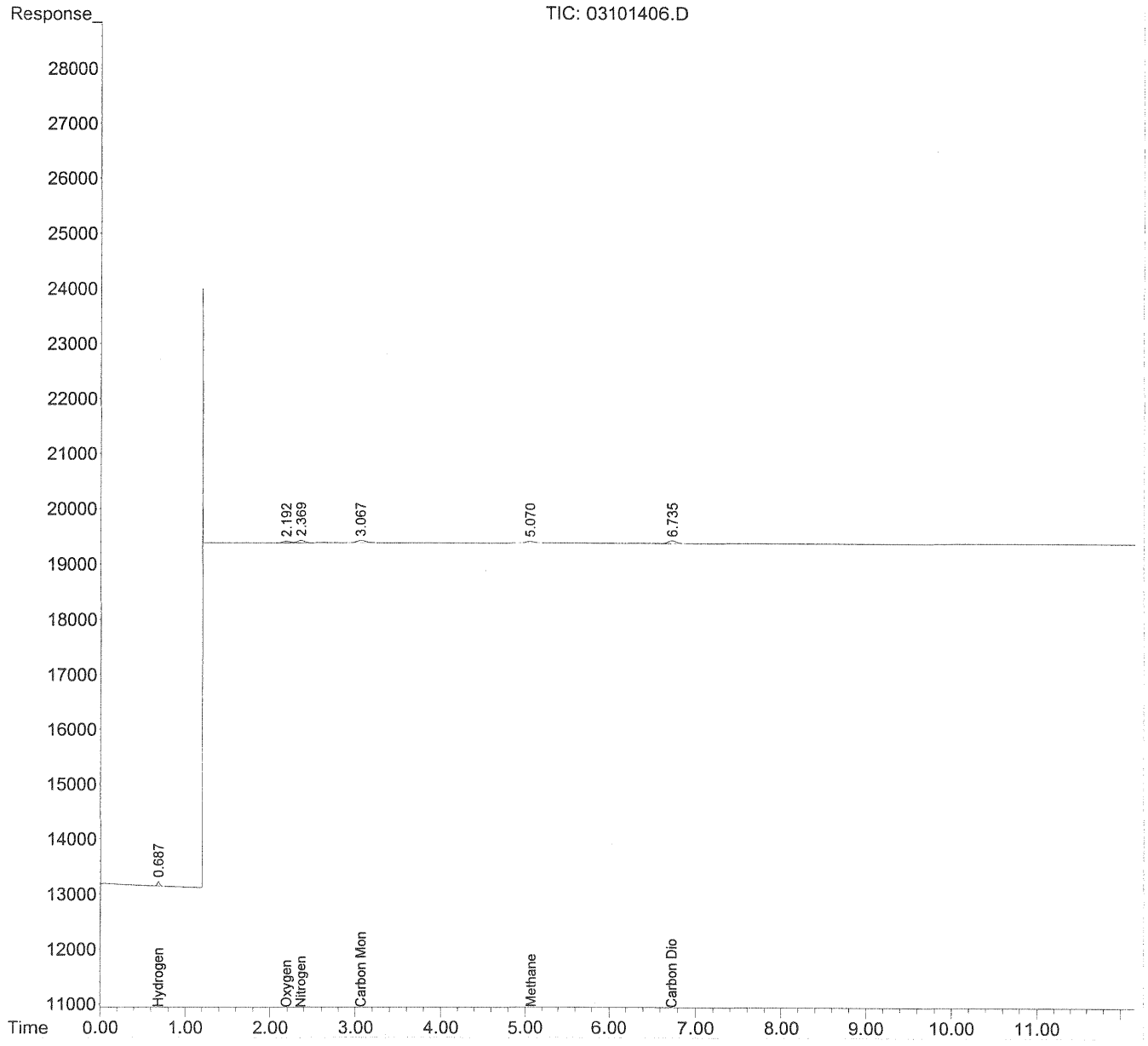
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Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

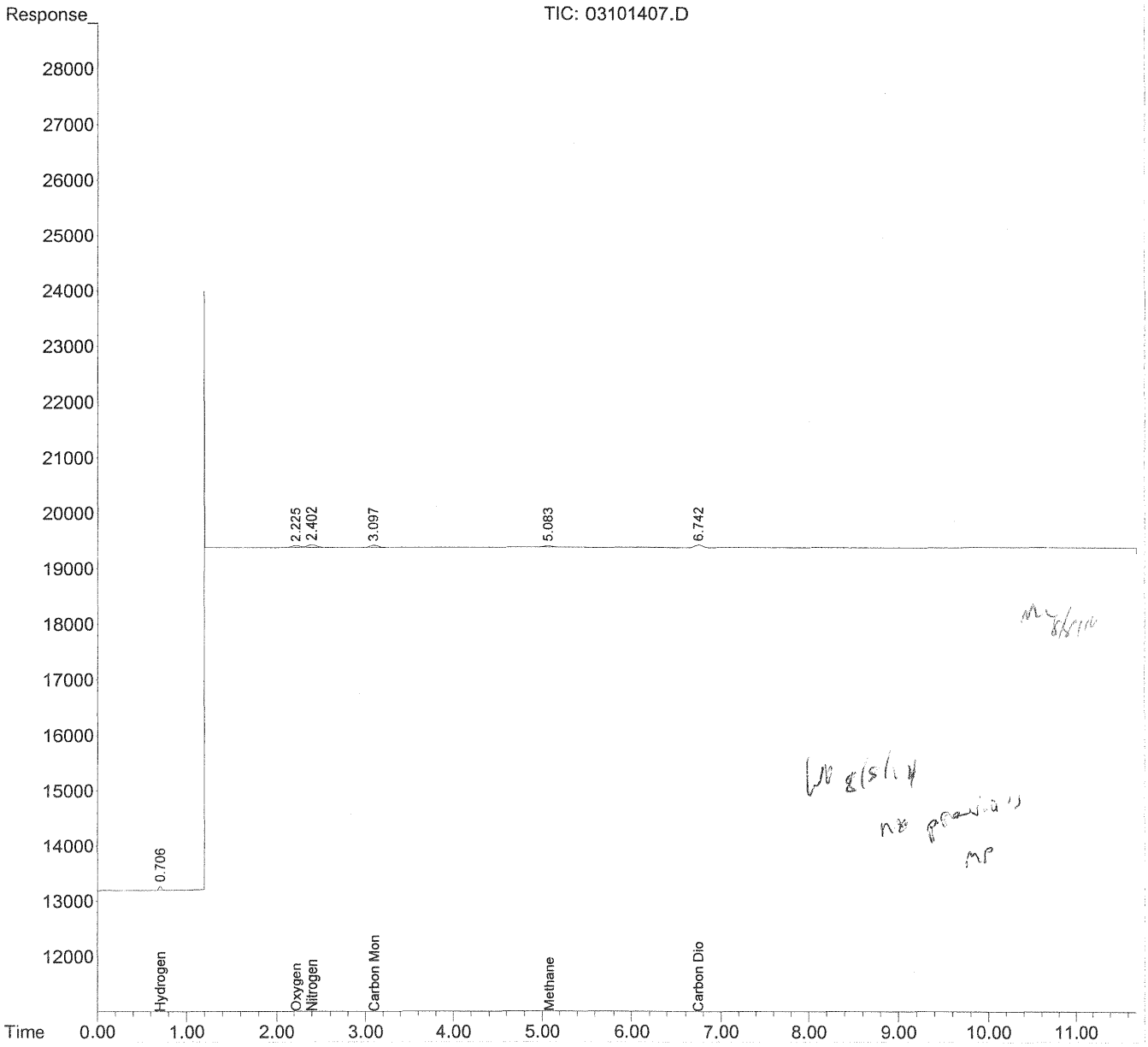
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Added Page

Quantitation Report (QT Reviewed)

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	

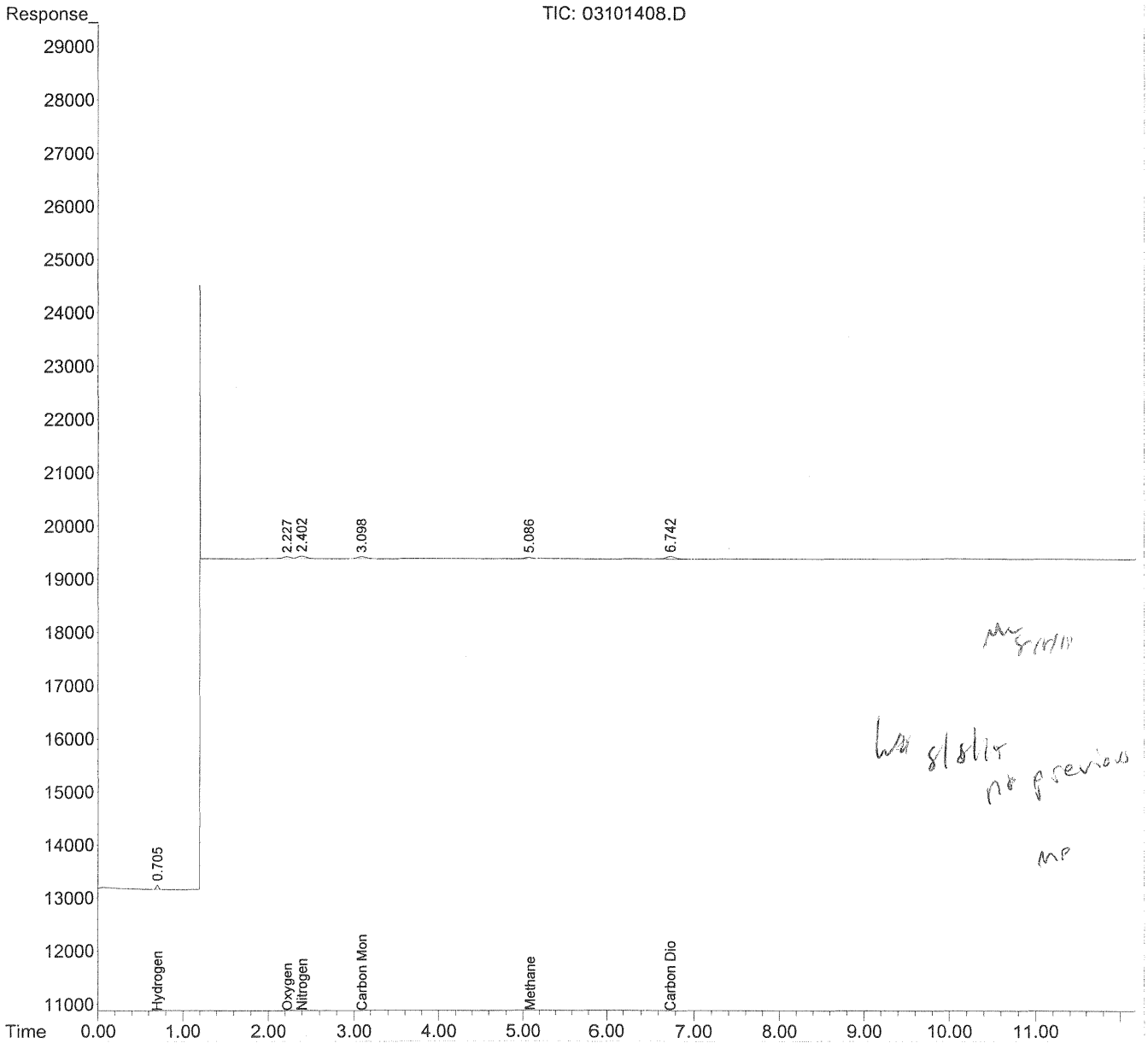
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MW 8/11/14

WH 8/8/14 no previous MP

Added Page

Quantitation Report (QT Reviewed)

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	

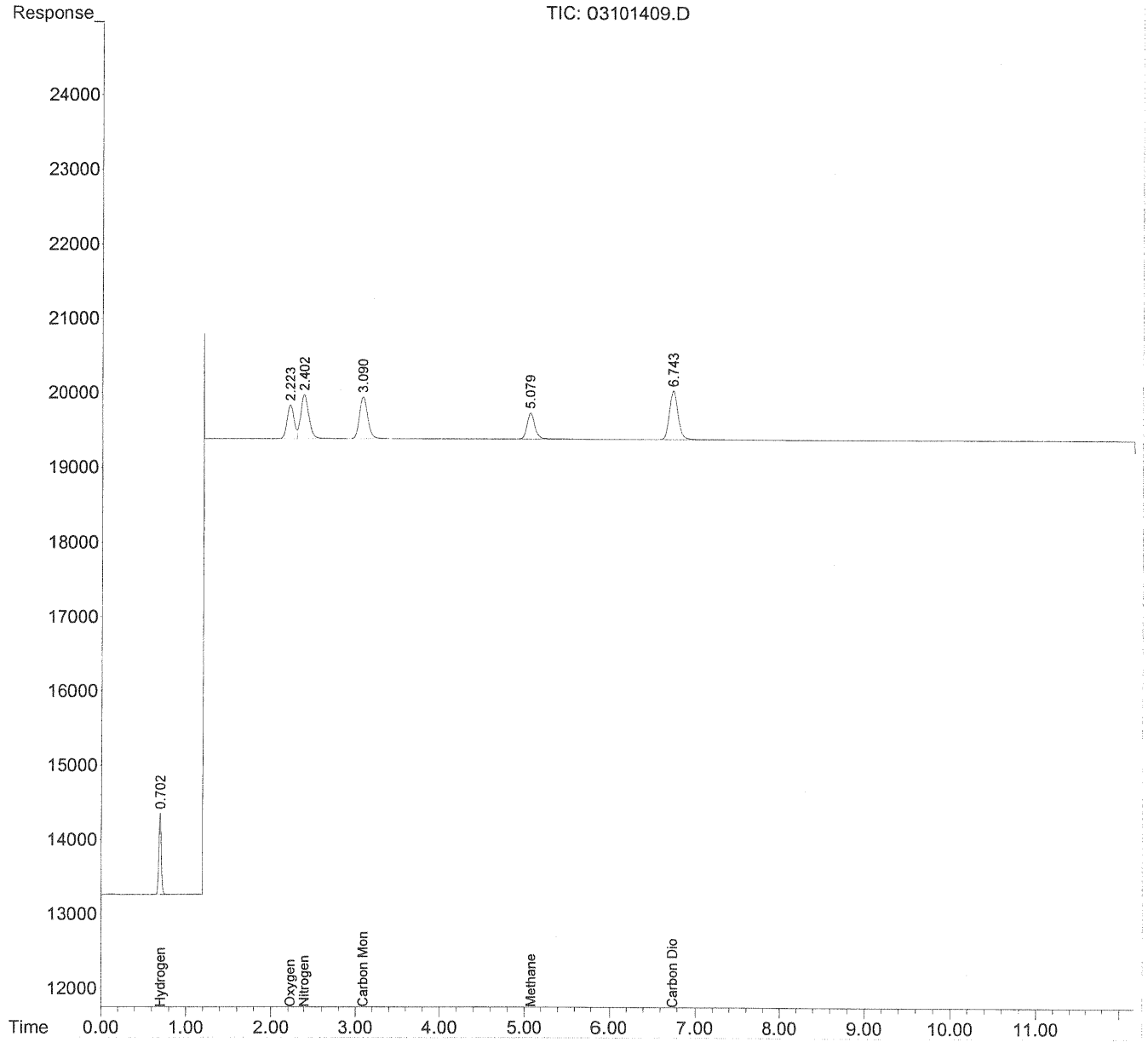
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

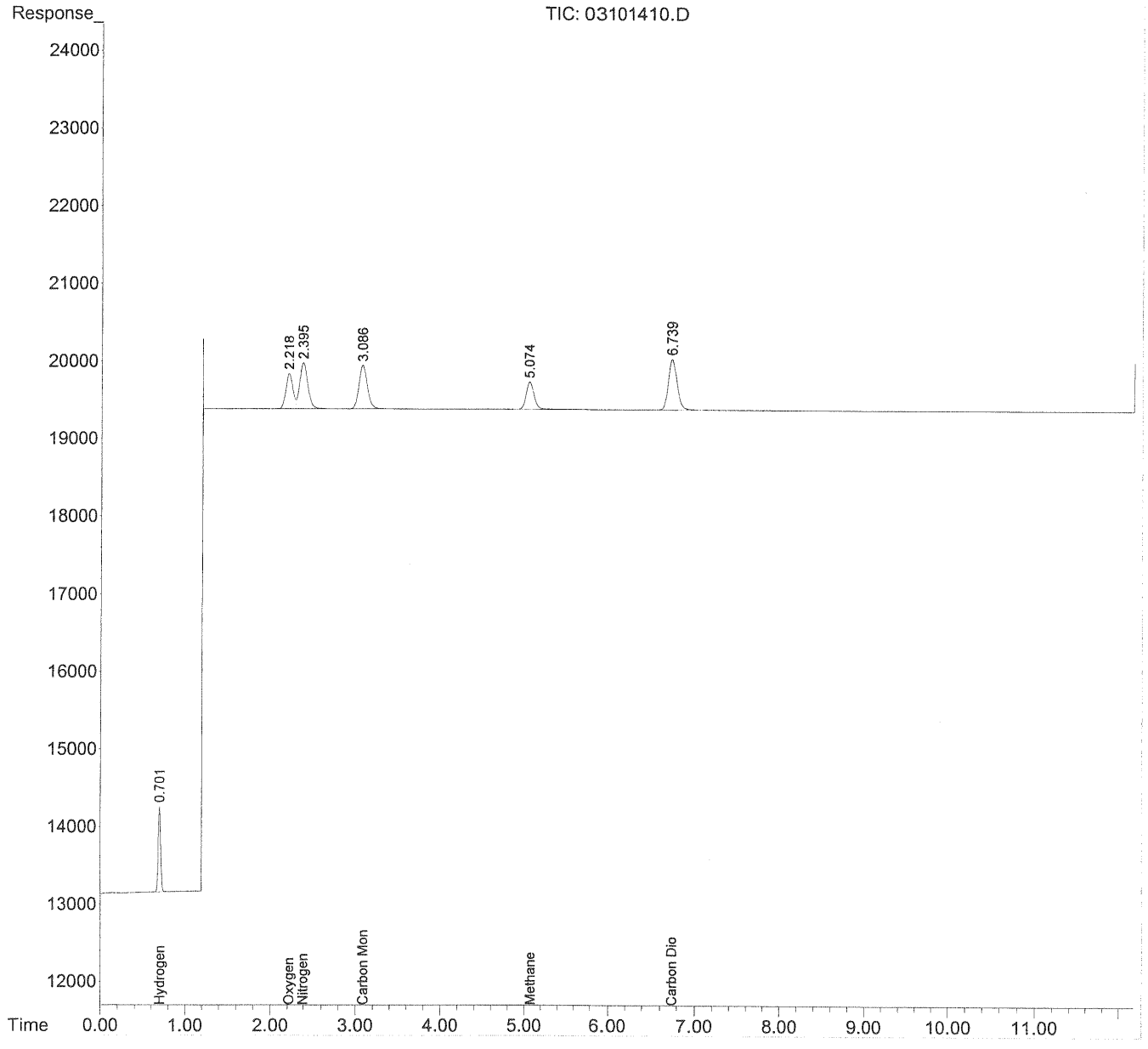
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

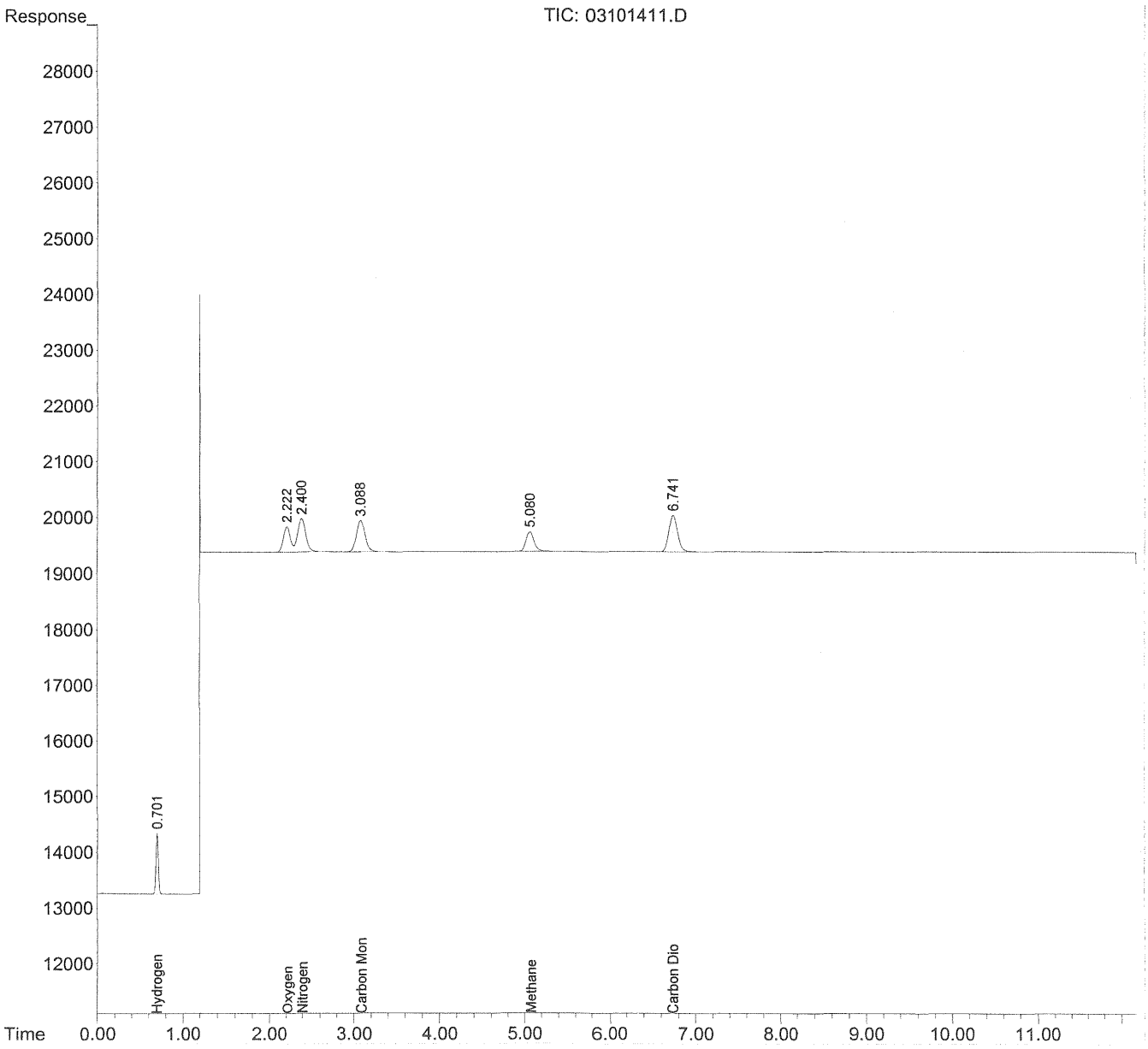
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

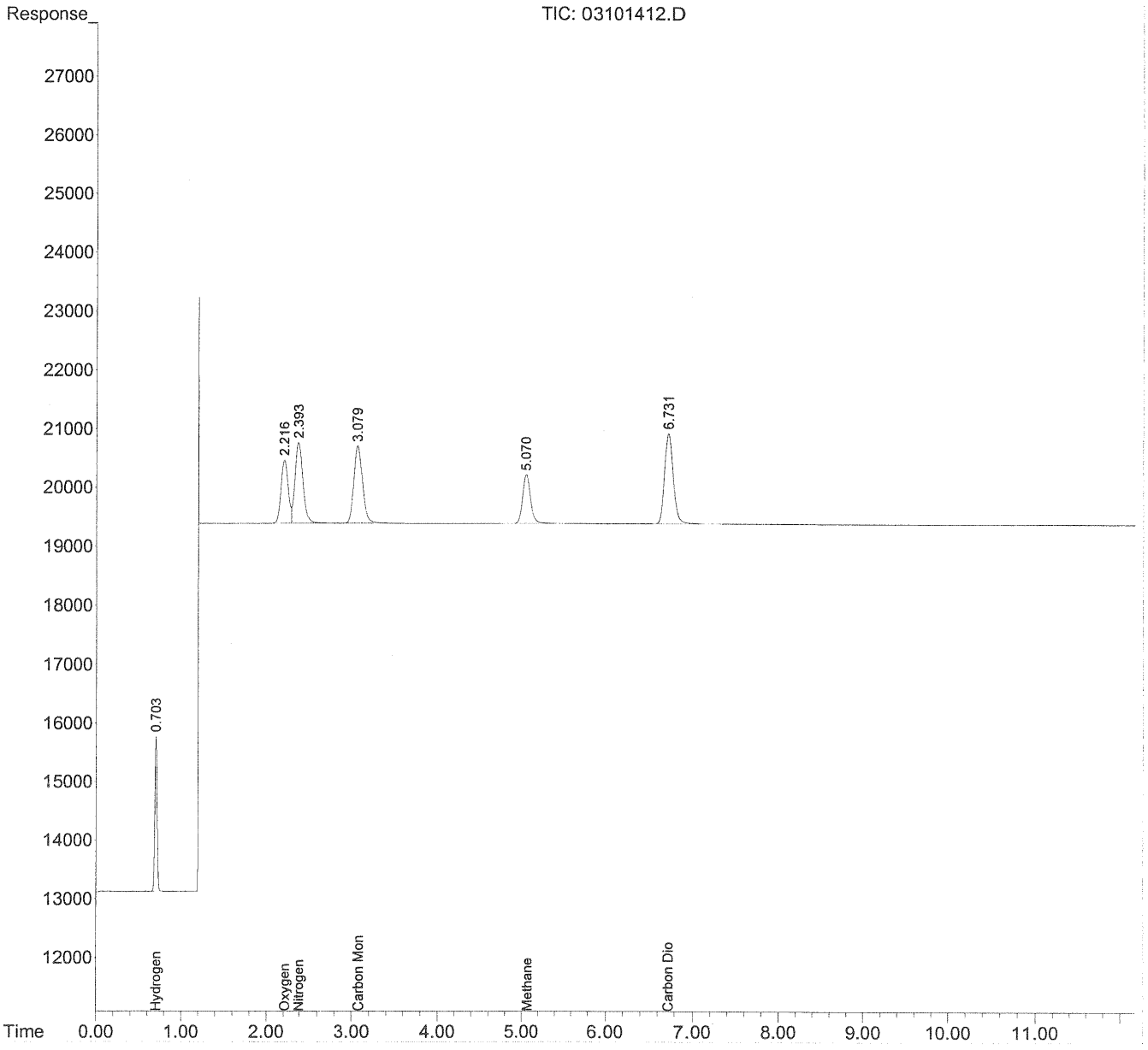
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

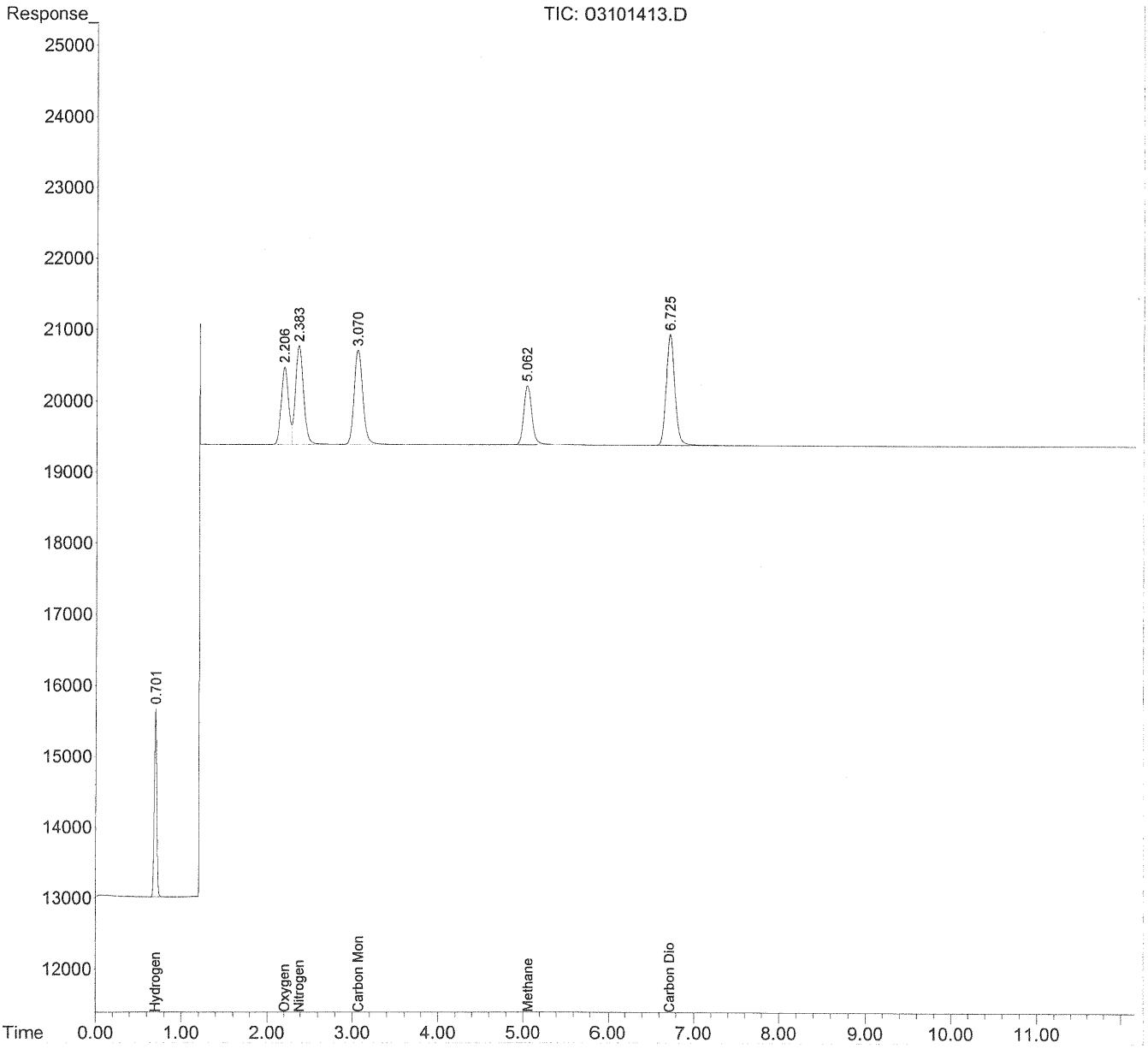
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

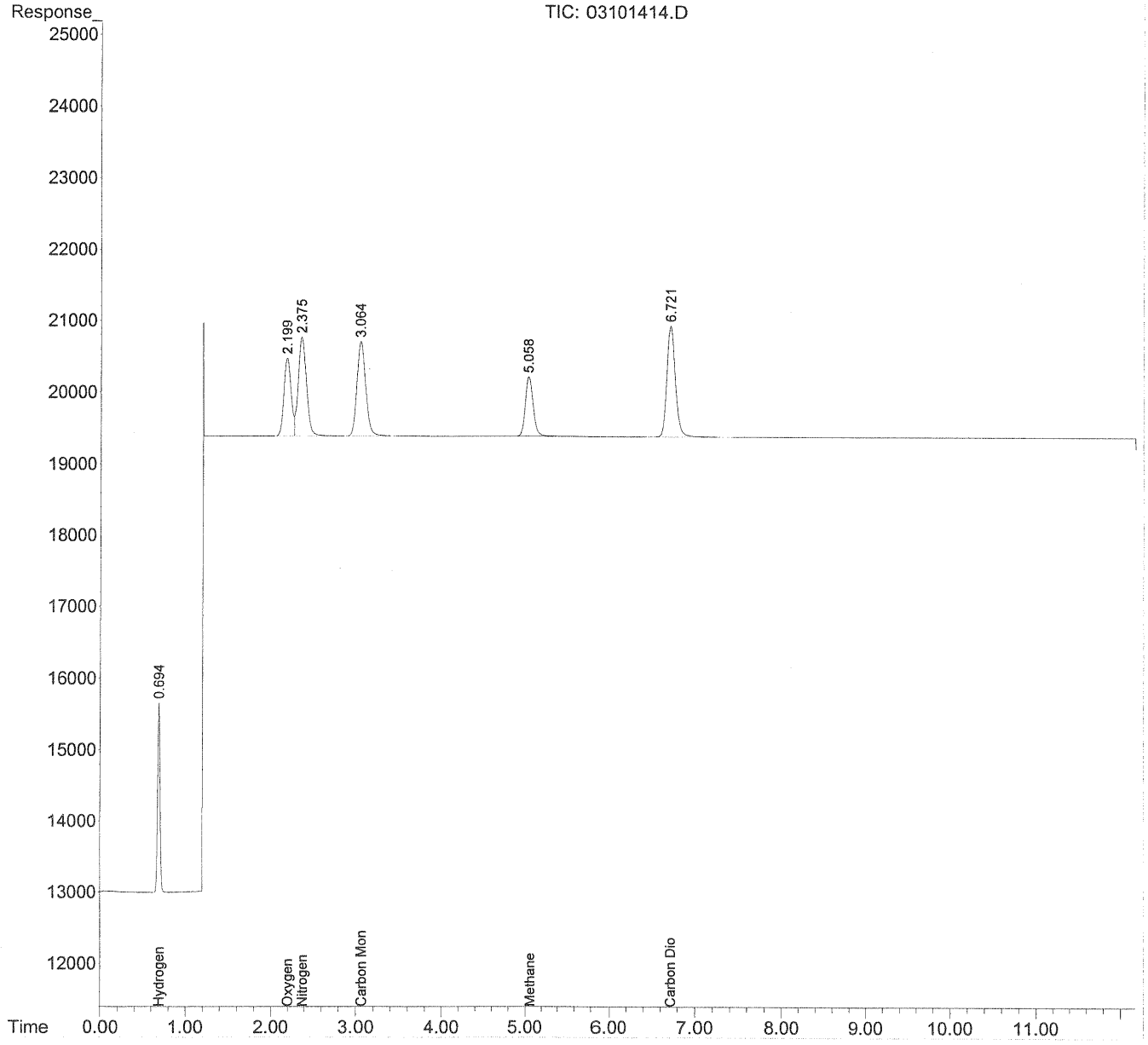
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

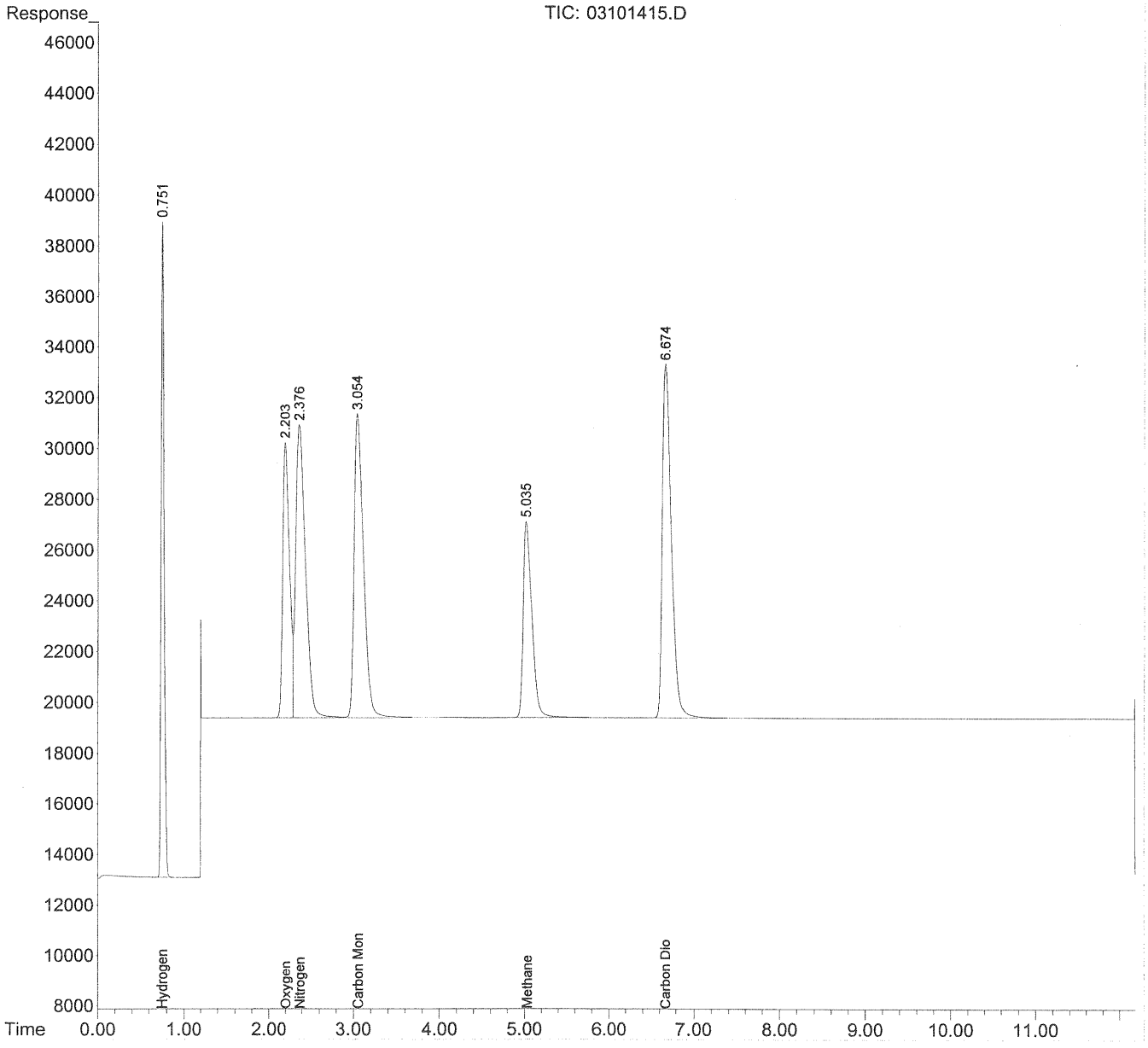
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

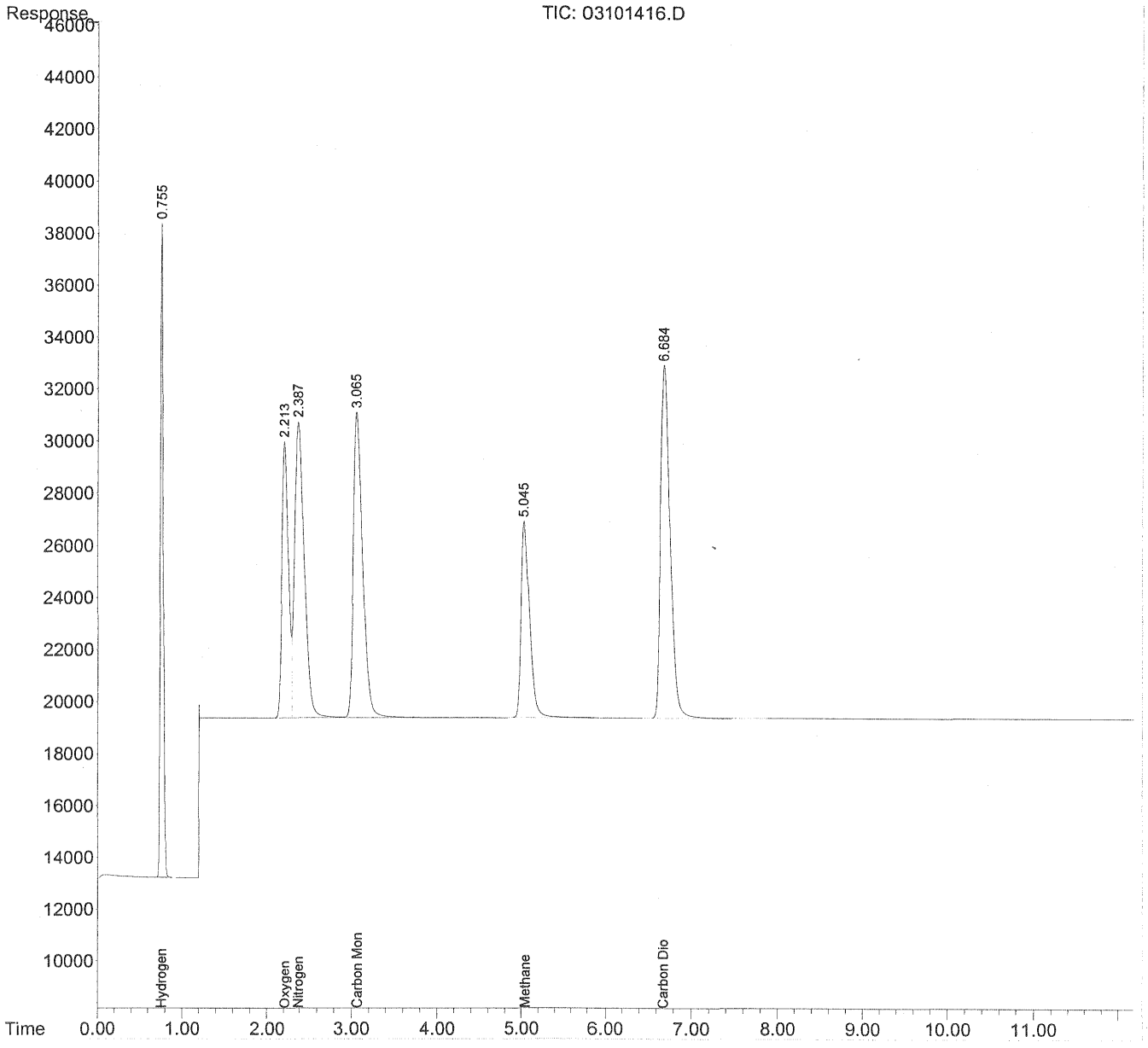
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

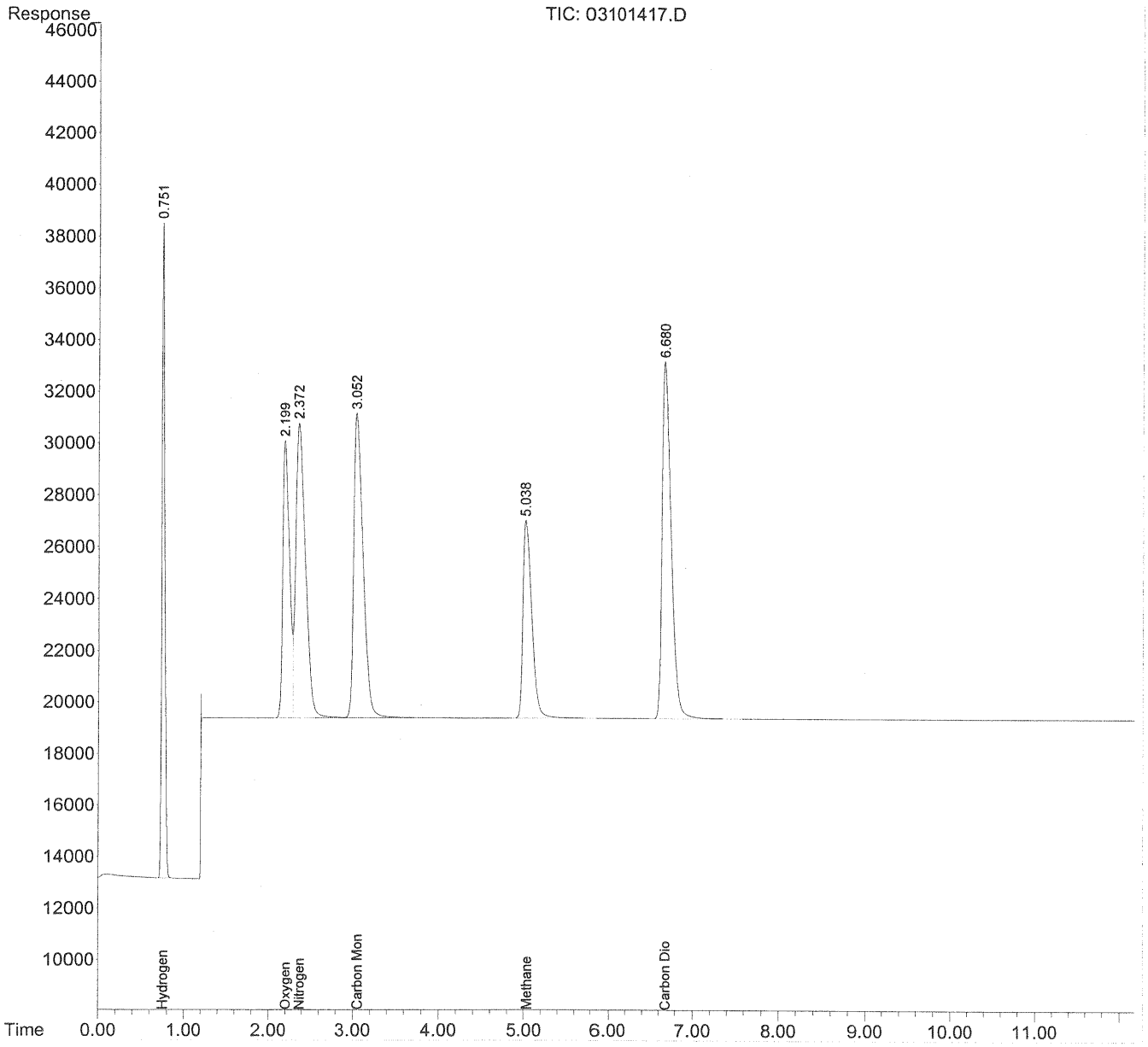
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

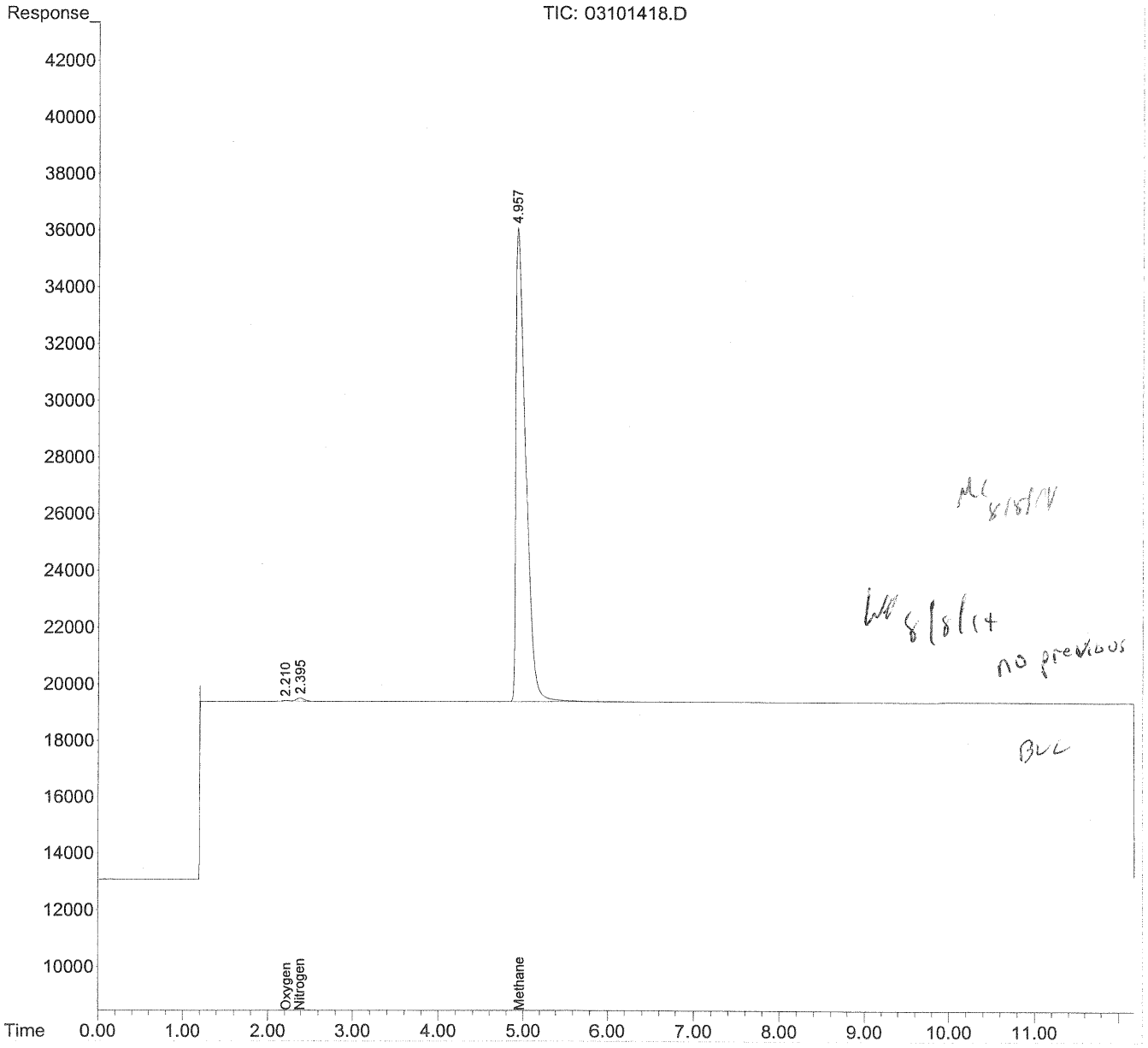
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MC 8/8/14

WH 8/8/14 no previous

BLC

Quantitation Report (QT Reviewed)

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	

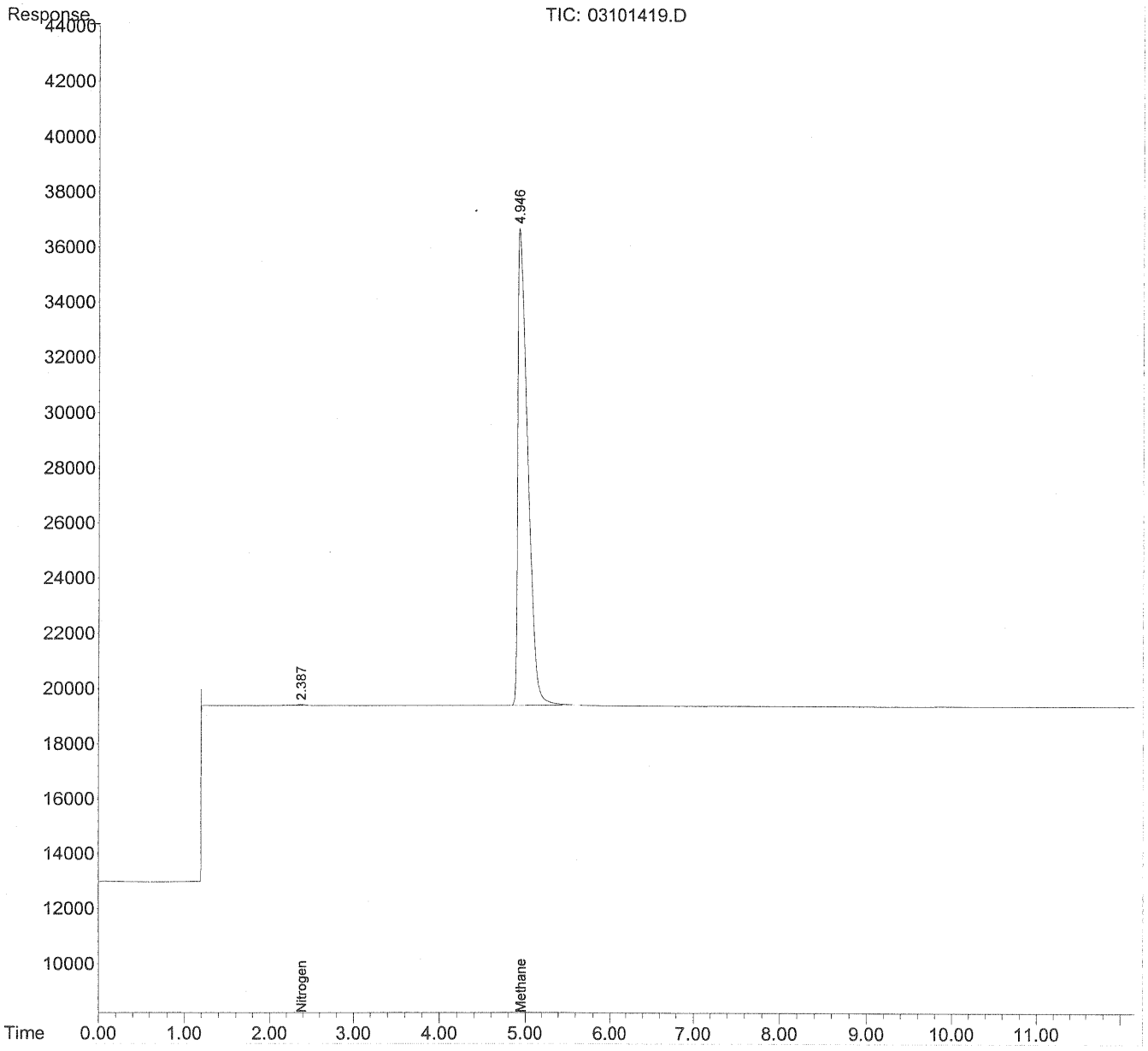
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

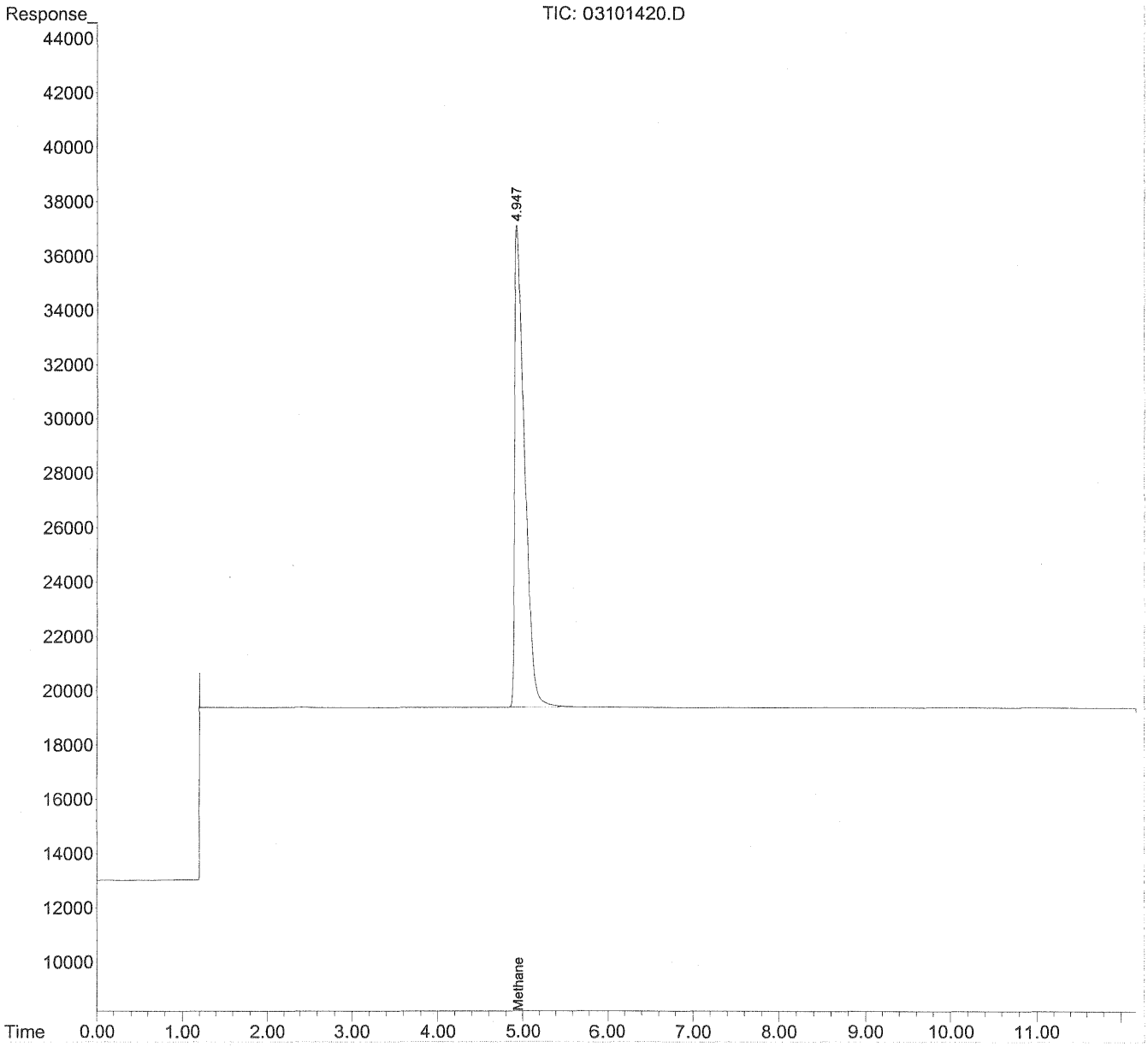
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

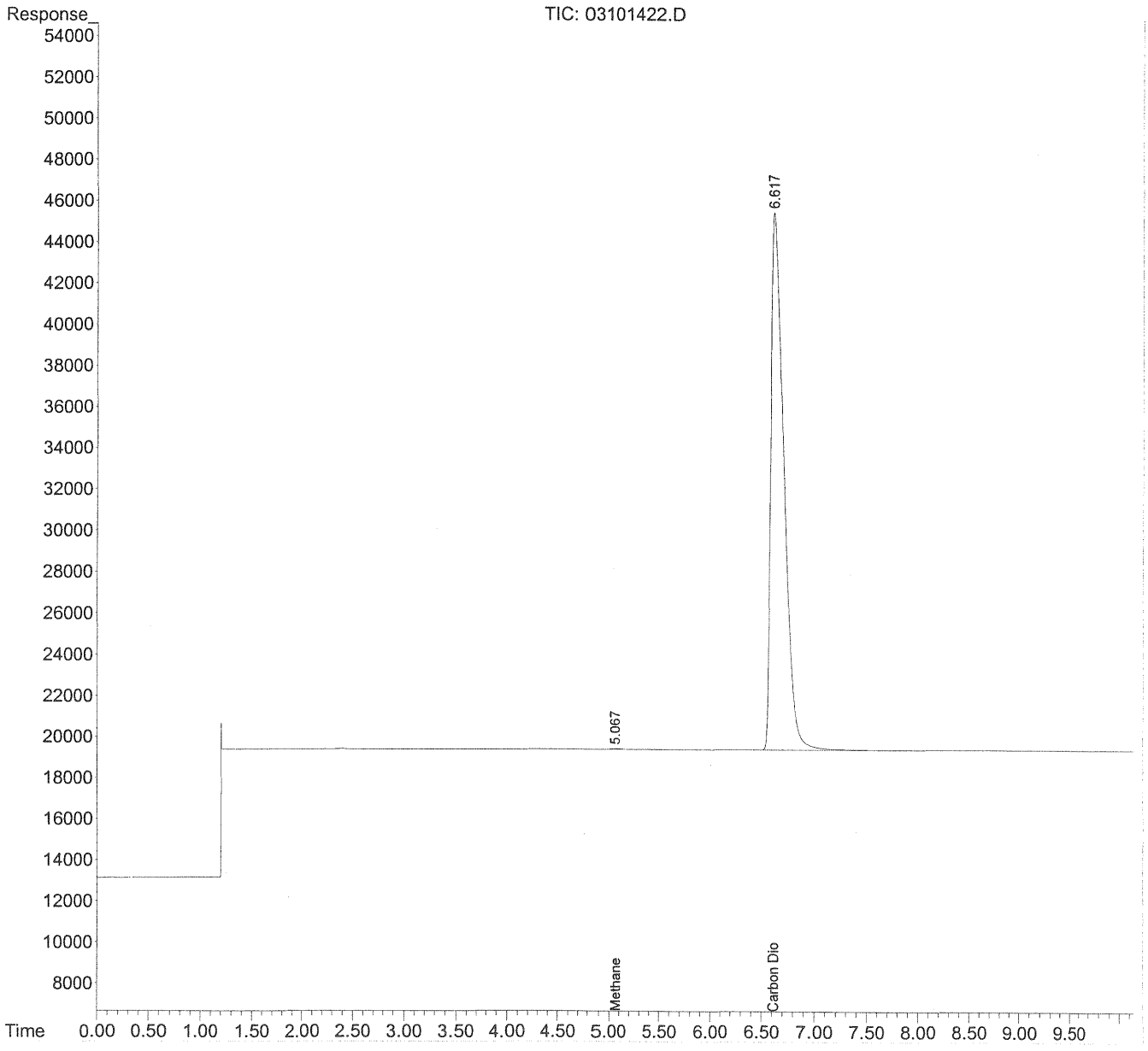
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	0.000	0	N.D.	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	4.949	1439175	1032160.623	ppm
6)	Carbon Dioxide	0.000	0	N.D.	ppm

(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 :



Quantitation Report (QT Reviewed)

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

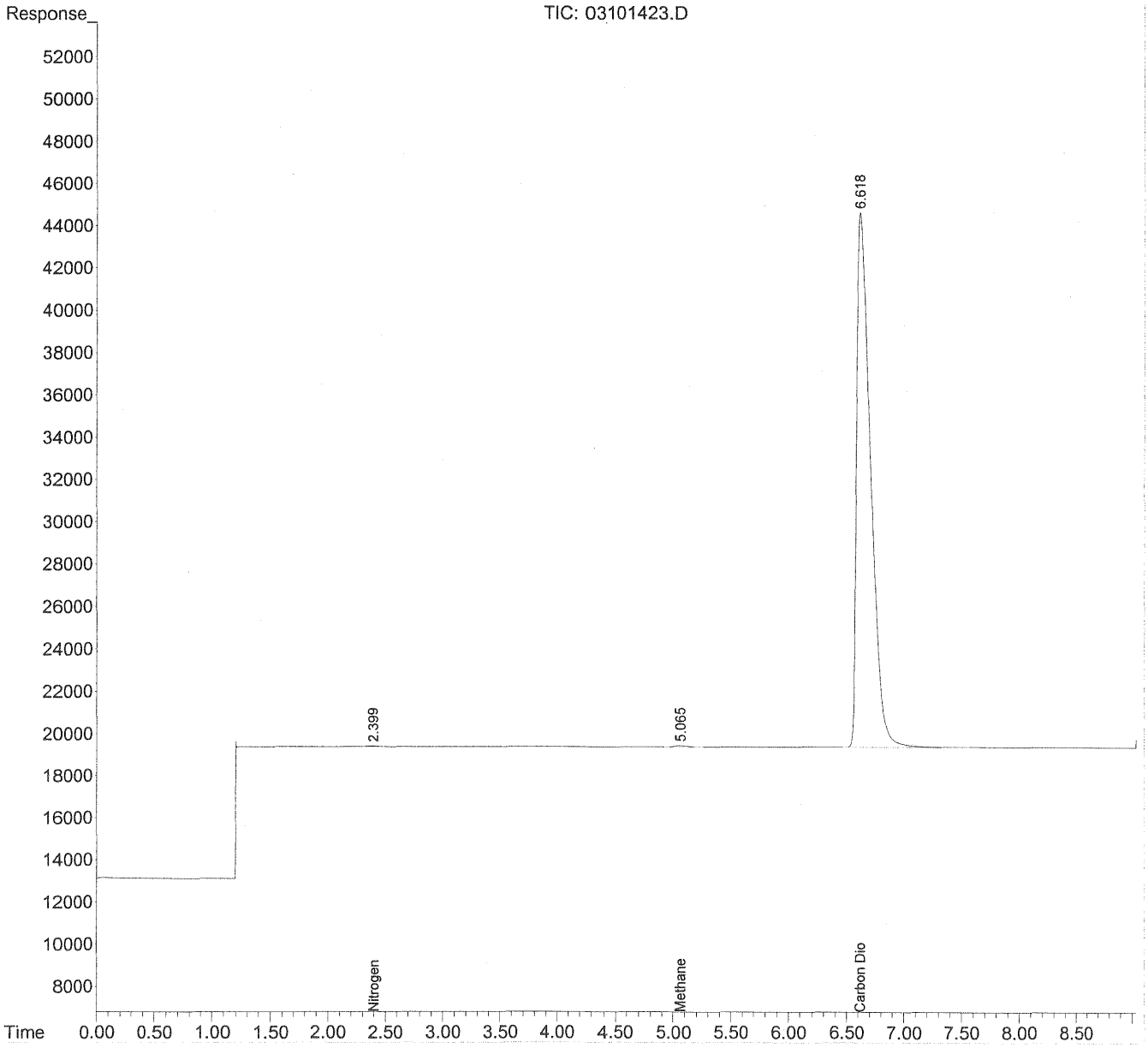
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

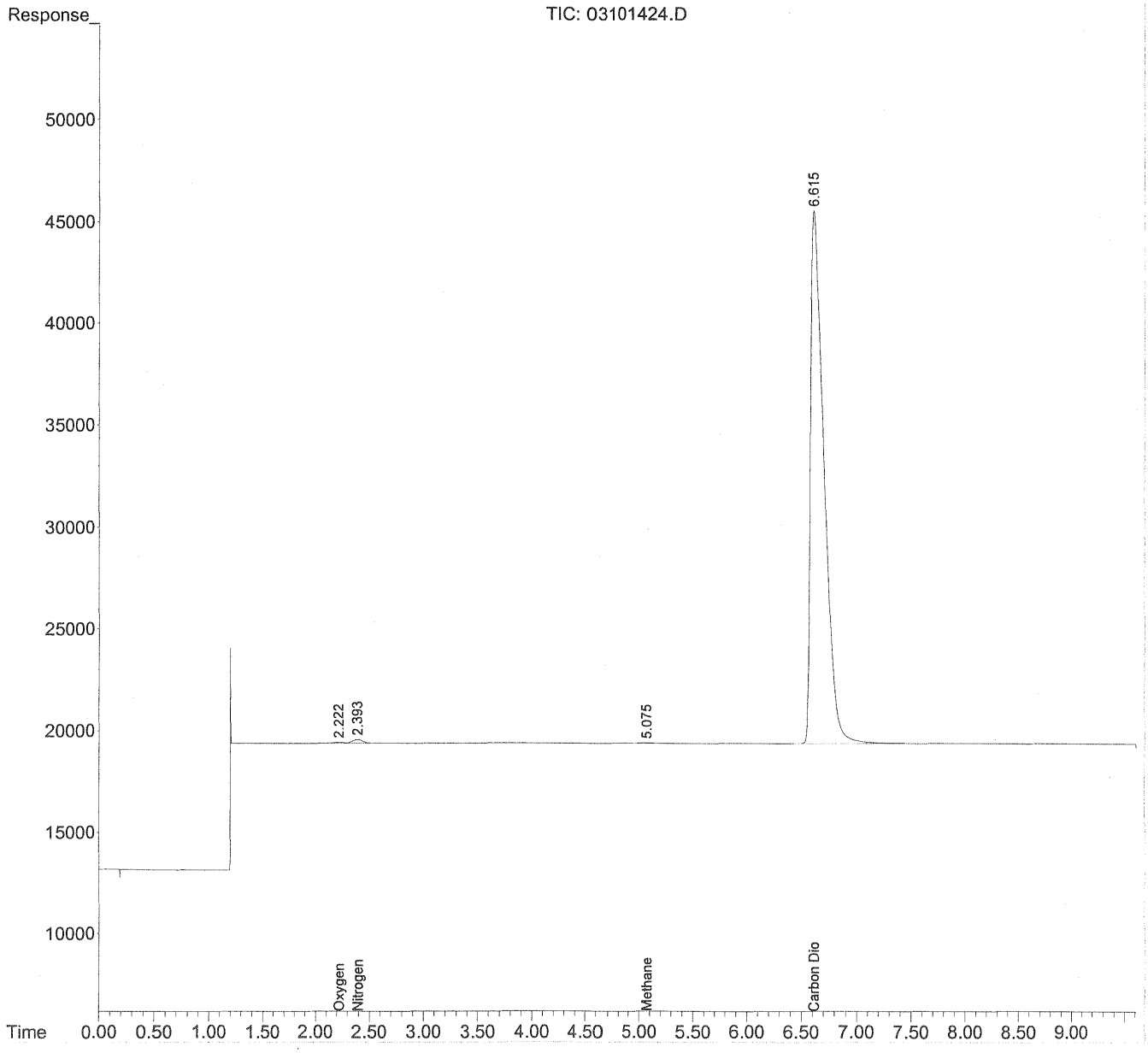
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	2.401	2050	1065.315	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	5.069	4323	3097.155	ppm
6)	Carbon Dioxide	6.619	2111383	983659.786	ppm

(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 :



Quantitation Report (QT Reviewed)

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

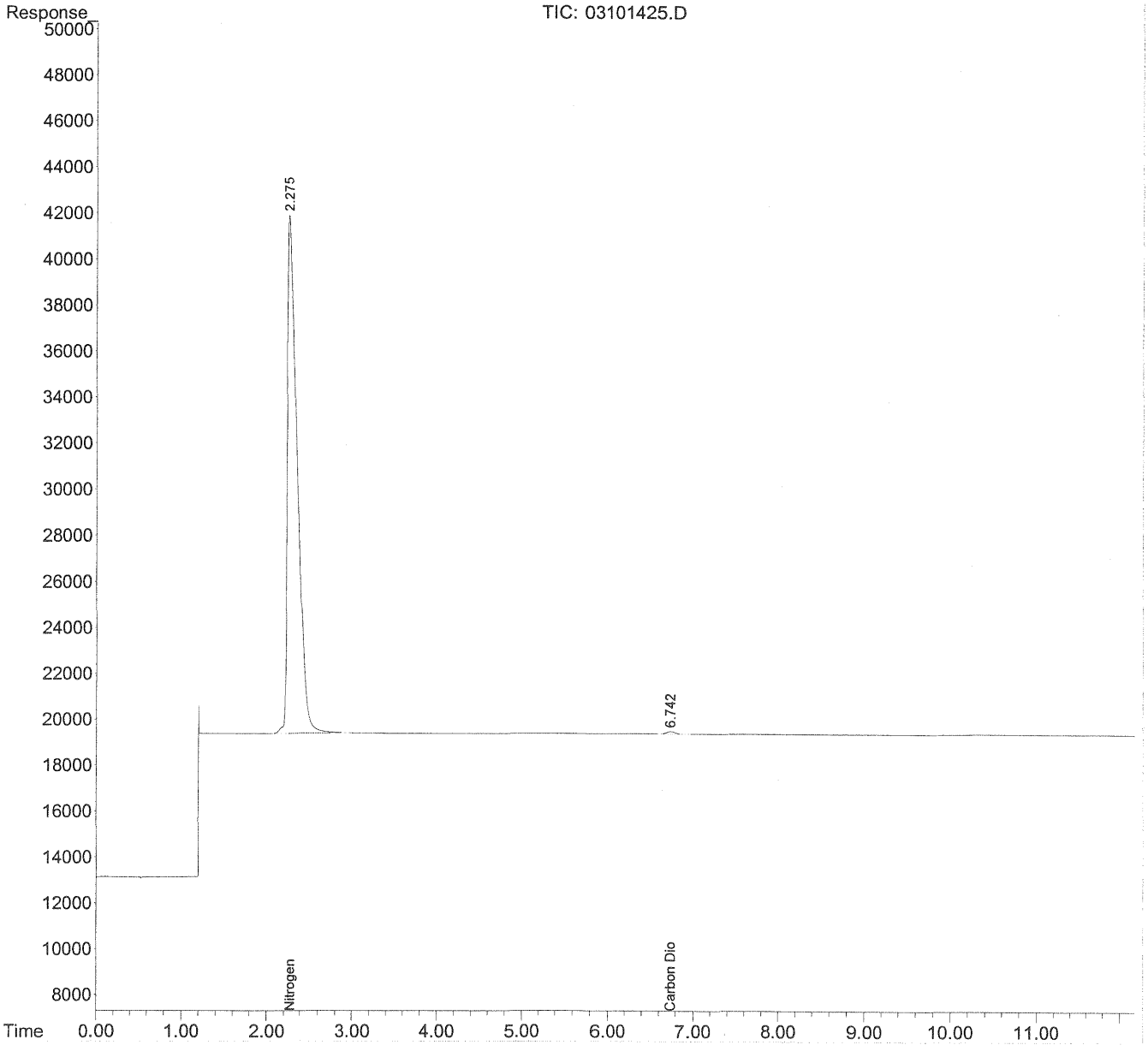
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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	

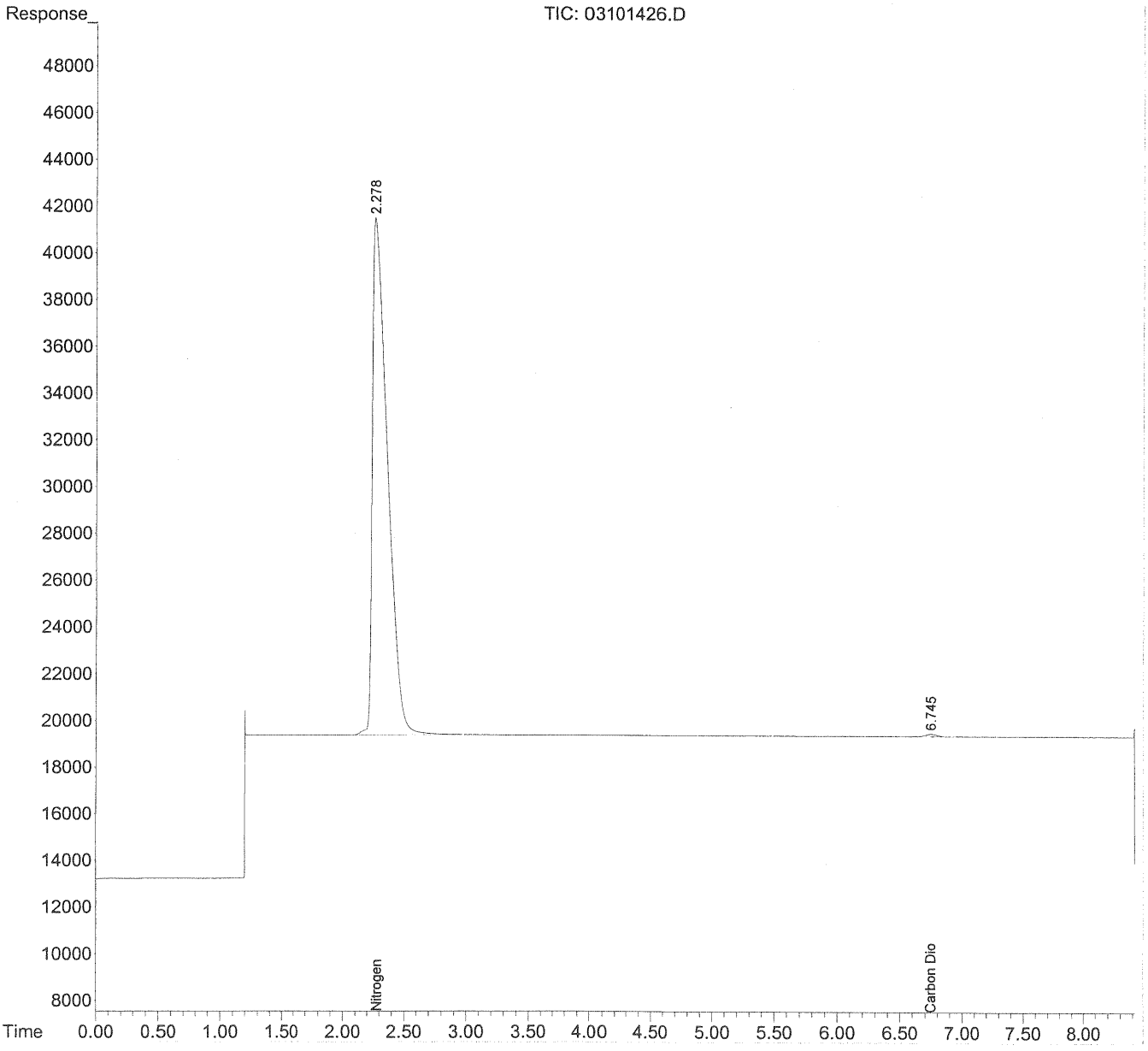
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

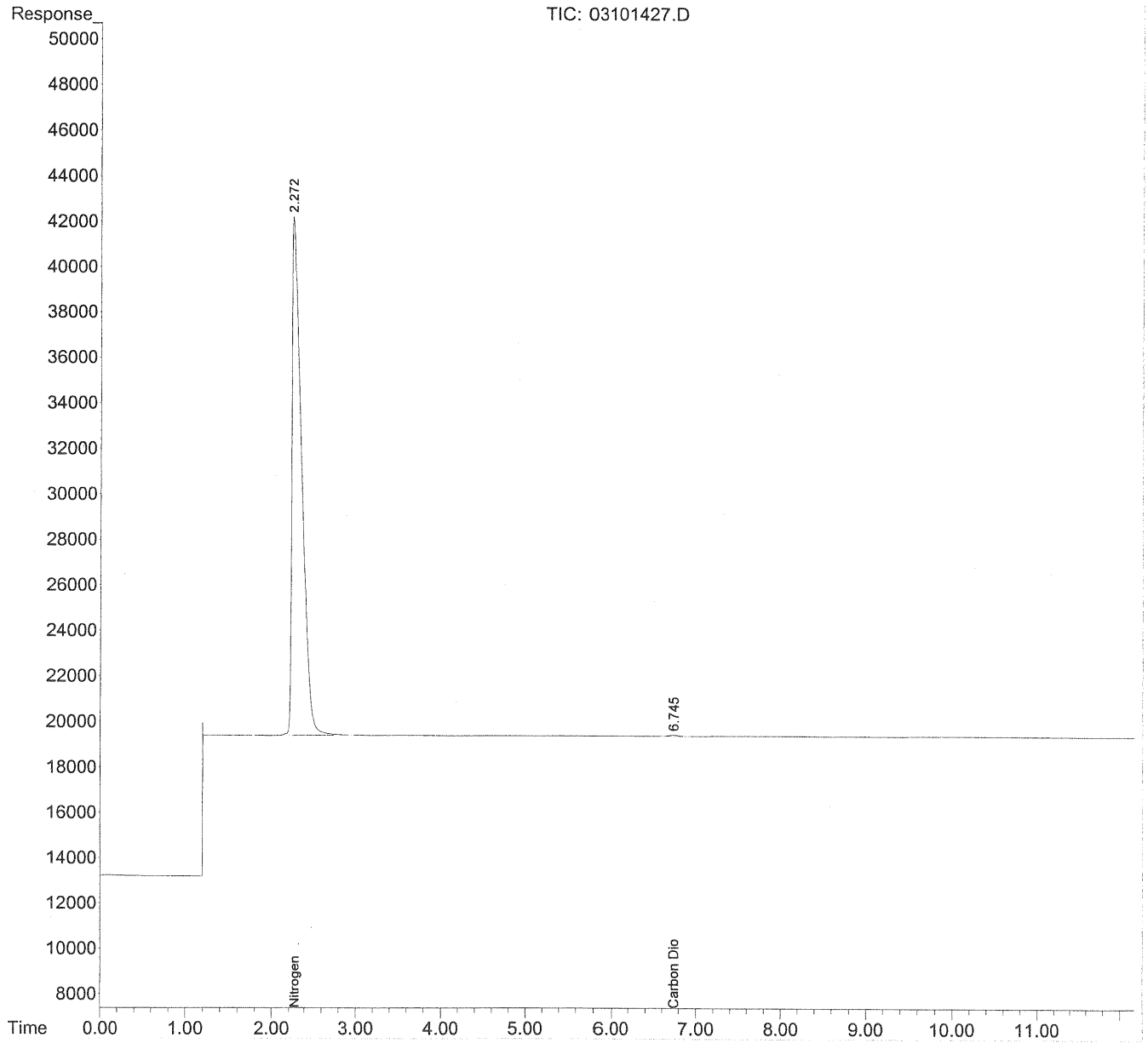
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Hydrogen	0.000	0	N.D.	ppm	
2)	Oxygen	0.000	0	N.D.	ppm	d
3)	Nitrogen	2.280	1857806	965604.527	ppm	
4)	Carbon Monoxide	0.000	0	N.D.	ppm	
5)	Methane	0.000	0	N.D.	ppm	
6)	Carbon Dioxide	6.748	7247	3368.284	ppm	

(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 :



Quantitation Report (QT Reviewed)

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	

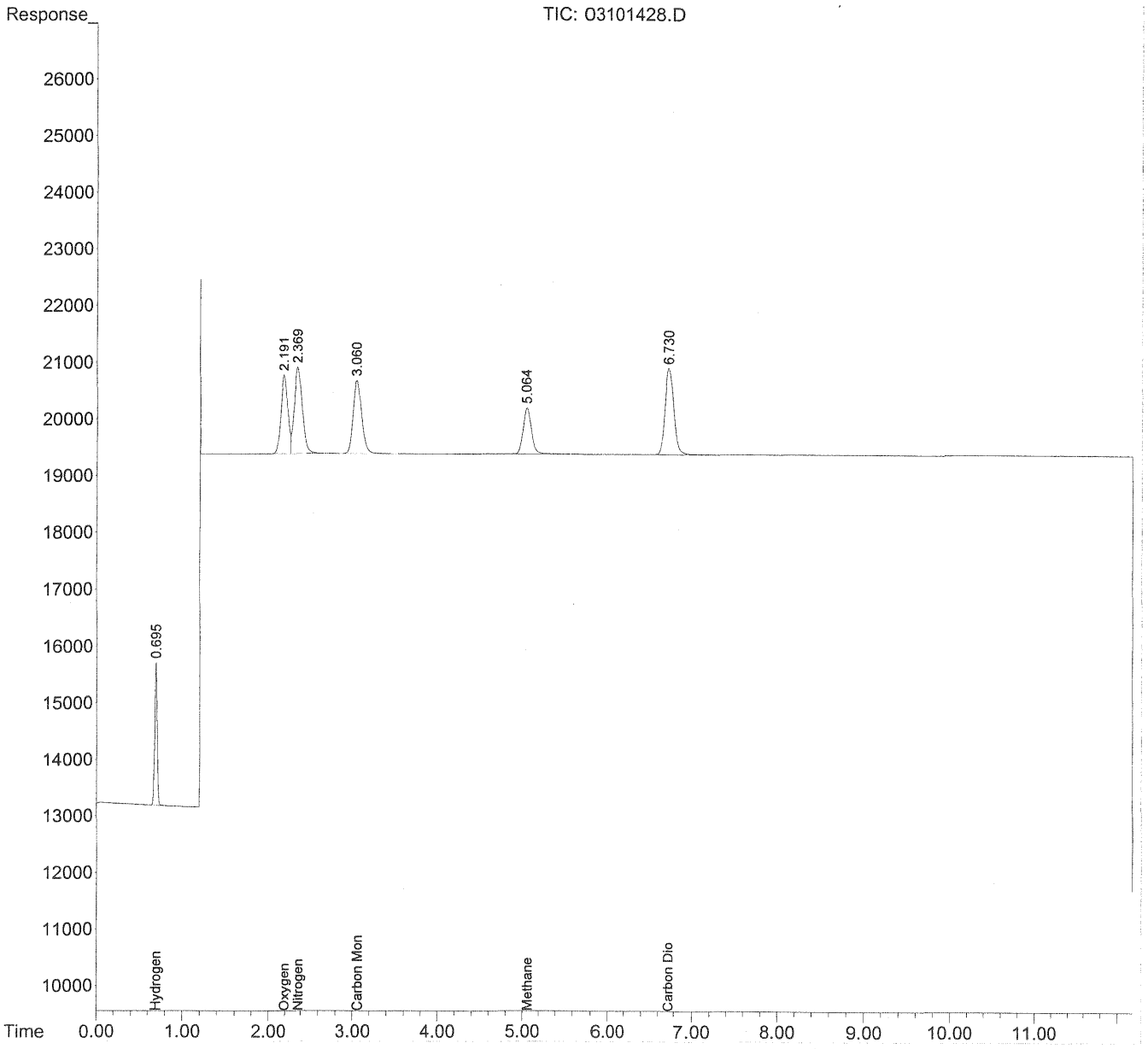
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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.

WH 8/8/14

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\2014_05\29

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	05291401.d	10.	std s30-04241401		29 May 2014 07:48
2	1	05291402.d	10.	mb		29 May 2014 08:05
3	1	05291403.d	10.	lab air		29 May 2014 08:22
4	1	05291404.d	10.	2097-001		29 May 2014 08:40
5	1	05291405.d	10.	2097-001		29 May 2014 08:57
6	1	05291406.d	10.	2097-001		29 May 2014 09:16
7	1	05291407.d	10.	2097-003		29 May 2014 09:36
8	1	05291408.d	10.	2097-003		29 May 2014 09:56
9	1	05291409.d	10.	2097-003		29 May 2014 10:14
10	1	05291410.d	10.	2097-005		29 May 2014 10:32
11	1	05291411.d	10.	2097-005		29 May 2014 10:49
12	1	05291412.d	10.	2097-005		29 May 2014 11:07
13	1	05291413.d	10.	std s30-04241401		29 May 2014 11:24
14	1	05291414.d	10.	lcs s30-02051401		29 May 2014 11:42
15	1	05291415.d	10.	x2117-001		29 May 2014 12:01
16	1	05291416.d	10.	2119-003		29 May 2014 12:19
17	1	05291417.d	10.	2110-001		29 May 2014 12:42
18	1	05291418.d	10.	2117-001		29 May 2014 13:07
19	1	05291419.d	10.	std s30-04241401		29 May 2014 14:02
20	1	05291420.d	10.	2122-001		29 May 2014 14:25
21	1	05291421.d	10.	2122-001		29 May 2014 14:52
22	1	05291422.d	10.	2122-001		29 May 2014 15:17
23	1	05291423.d	10.	2122-003		29 May 2014 15:34
24	1	05291424.d	10.	2122-003		29 May 2014 15:58
25	1	05291425.d	10.	2122-003		29 May 2014 16:17
26	1	05291426.d	10.	2122-005		29 May 2014 16:42
27	1	05291427.d	10.	2122-005		29 May 2014 17:07
28	1	05291428.d	10.	2122-005		29 May 2014 17:29
29	1	05291429.d	10.	2122-007		29 May 2014 17:44
30	1	05291430.d	10.	2122-007		29 May 2014 17:59
31	1	05291431.d	10.	2122-007		29 May 2014 18:15
32	1	05291432.d	10.	xstd		29 May 2014 18:56
33	1	05291433.d	10.	std s30-04241401		29 May 2014 19:12

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

November 24, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402122 has been amended for the samples submitted to our laboratory on May 29, 2014. The amended report includes all instrument raw data. The added pages have been indicated by the "Added Page" footer located at the bottom right of the page.

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 1:24 pm, Nov 24, 2014

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Air Hygiene, Incorporated
Project: stk-14-elmorecity.ik-comp#1

Service Request No: P1402122

CASE NARRATIVE

The samples were received intact under chain of custody on May 29, 2014 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.

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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

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	L11-203
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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	494864
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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
Service Request: P1402122
Project ID: stk-14-elmorecity.ik-comp#1

Date Received: 5/29/2014
Time Received: 09:25

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag 2X
R4-30-70-30%PI 48	P1402122-001	Air	5/28/2014	00:00	X
R5-30-70-30%PI 48	P1402122-003	Air	5/28/2014	00:00	X
R6-30-70-30%PI 48	P1402122-005	Air	5/28/2014	00:00	X
R7-70-100-70%PI 48	P1402122-007	Air	5/28/2014	00:00	X
R8-70-100-70%PI 48	P1402122-009	Air	5/28/2014	00:00	X
R9-70-100-70%PI 48	P1402122-011	Air	5/28/2014	00:00	X

P1402122

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:	stk-14-elmorecity.ik-comp#1	Laboratory Analysis Requested:	Method 3C
Person Taking Samples:	BS/TP		

	Sample Number	Location	Date	Volume (L)	Analysis Method			
					O_2	CO_2	N_2	Methane
1	R4-30-70-30%PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
2	R4-30-70-30%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
3	R5-30-70-30%PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
4	R5-30-70-30%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
5	R6-30-70-30%PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
6	R6-30-70-30%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
7	R7-70-100-700%-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
8	R7-70-100-70%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
9	R8-70-100-700%-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
10	R8-70-100-70%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X
11	R9-70-100-700%-PI 48	Big Iron Elmore City Plant	28-May	10	X	X	X	X
12	R9-70-100-70%PI 48 Back Up	Big Iron Elmore City Plant	28-May	5	X	X	X	X

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/28/14	16:30			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

doc-52714

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402122

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/29/14 Date opened: 5/29/14 by: MZAMORA

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 if necessary 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
P1402122-001.01	10 L Tedlar Bag					
P1402122-002.01	5.0 L Tedlar Bag					
P1402122-003.01	10 L Tedlar Bag					
P1402122-004.01	5.0 L Tedlar Bag					
P1402122-005.01	10 L Tedlar Bag					
P1402122-006.01	5.0 L Tedlar Bag					
P1402122-007.01	10 L Tedlar Bag					
P1402122-008.01	5.0 L Tedlar Bag					

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

Samples -007 thru -012 have an ID of 70-100-700% on the COC, and 70-100-70% on the container label.

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402122

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/29/14 Date opened: 5/29/14 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1402122-009.01	10 L Tedlar Bag					
P1402122-010.01	5.0 L Tedlar Bag					
P1402122-011.01	10 L Tedlar Bag					
P1402122-012.01	5.0 L Tedlar Bag					

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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R4-30-70-30%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**79.5**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.59**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R5-30-70-30%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**15.8**	0.10	
7727-37-9	**Nitrogen**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.63**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R6-30-70-30%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**5.78**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R7-70-100-70%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-007

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/29/14
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**	**5.33**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R8-70-100-70%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-009

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/30/14
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**	**14.9**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.28**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R9-70-100-70%PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402122
ALS Sample ID: P1402122-011

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/28/14
Date Received: 5/29/14
Date Analyzed: 5/30/14
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**	**14.9**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.33**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402122
Client Project ID: **stk-14-elmorecity.ik-comp#1** ALS Sample ID: P140529-MB

Test Code: EPA Method 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 5/29/14
Sample Type: 10 L Tedlar Bag Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291420.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 2:25 pm
Operator : NL
Sample : 2122-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:48 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 :

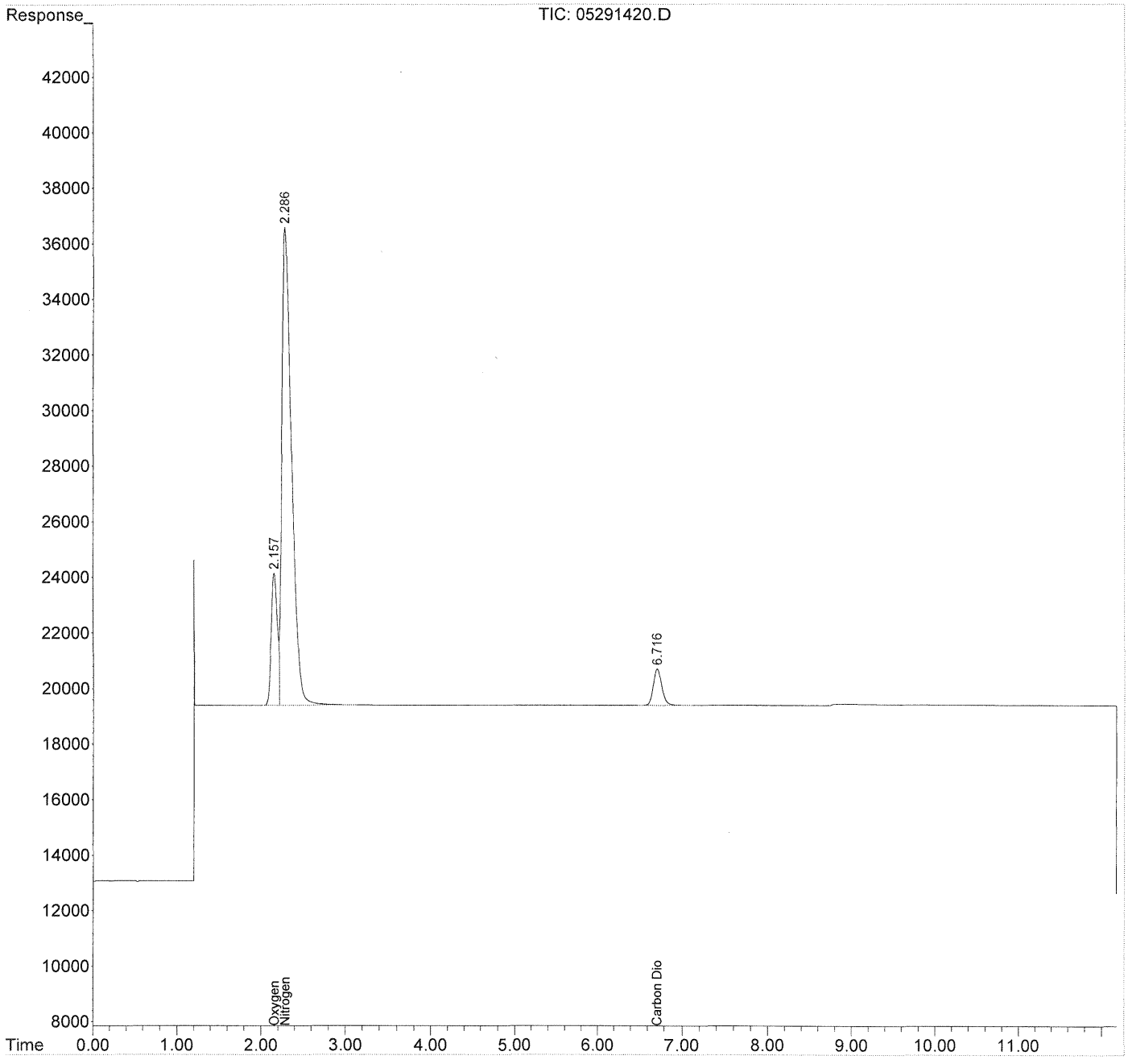
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.158	239043	144651.454	ppm
3)	Nitrogen	2.287	1394545	726328.124	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.717	90024	41842.998	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291420.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 2:25 pm
Operator : NL
Sample : 2122-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:48 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291421.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 2:52 pm
Operator : NL
Sample : 2122-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:52 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.156	237450	143687.306	ppm
3)	Nitrogen	2.285	1381209	719382.295	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.717	89599	41645.222	ppm

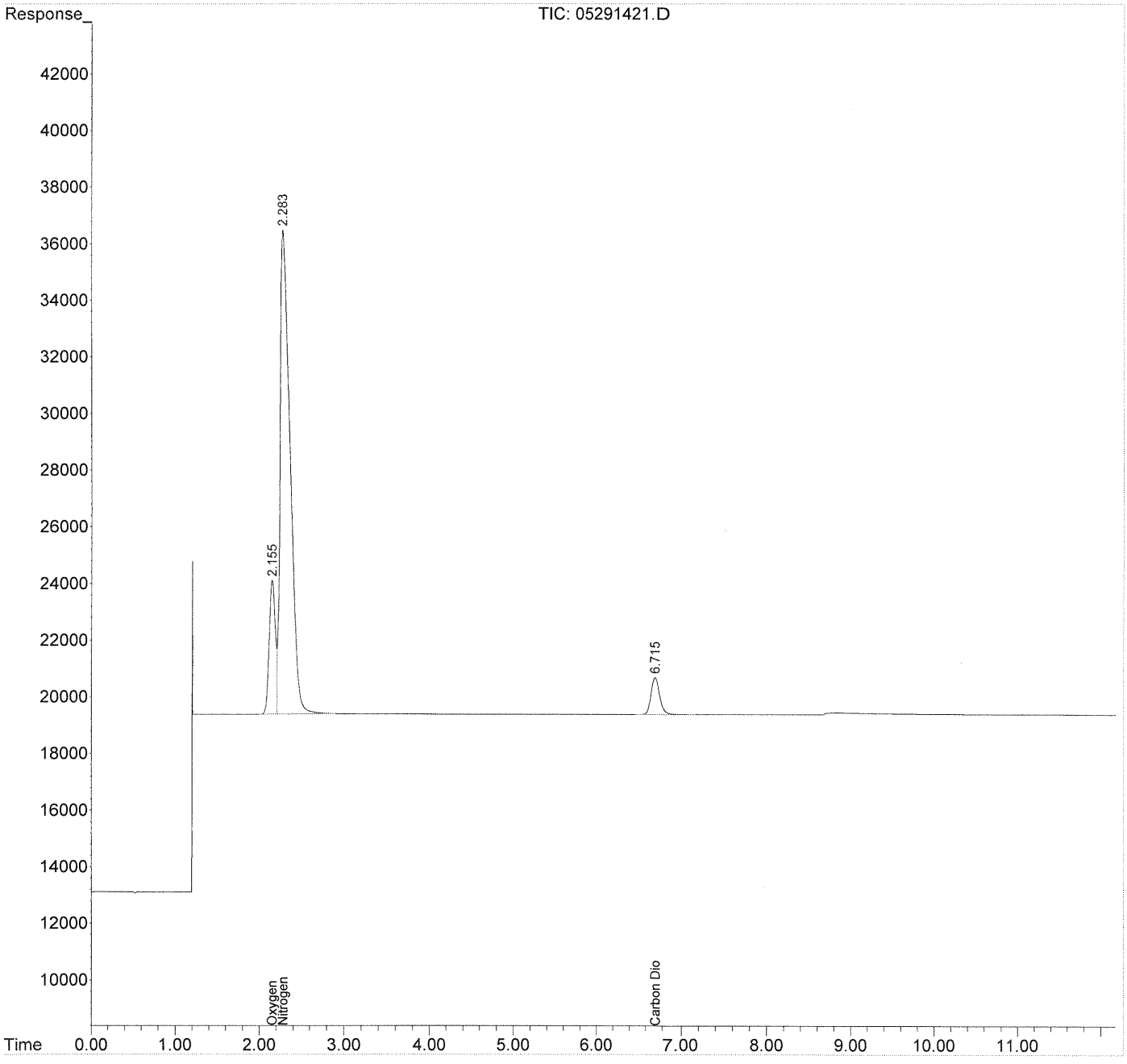
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291421.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 2:52 pm
Operator : NL
Sample : 2122-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:52 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291422.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 3:17 pm
Operator : NL
Sample : 2122-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:56 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	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.148	237584	143768.257 ppm
3)	Nitrogen	2.277	1384814	721259.872 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.716	89463	41582.062 ppm

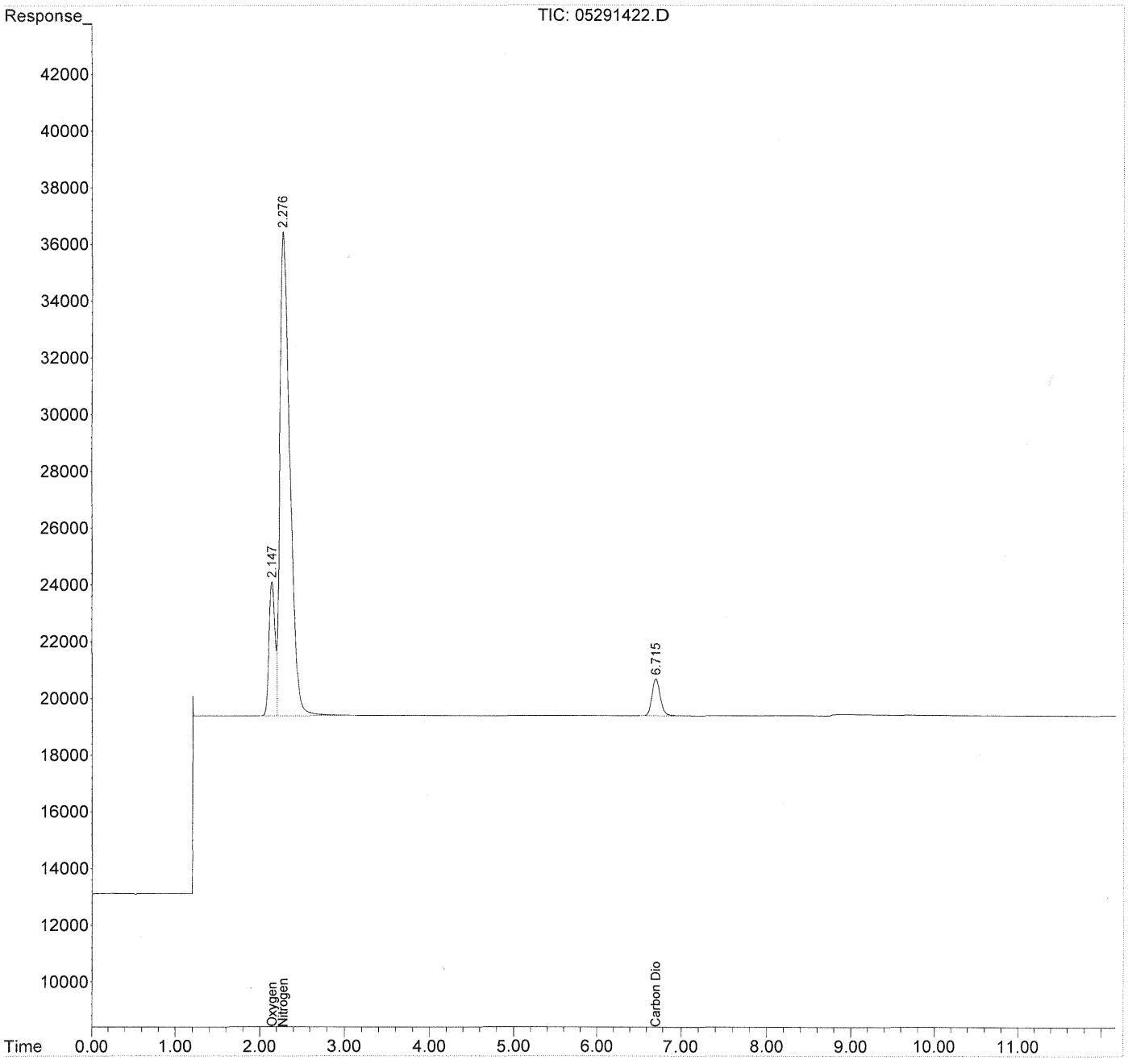
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291422.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 3:17 pm
Operator : NL
Sample : 2122-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:56 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 :



Added Page

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291423.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 3:34 pm
Operator : NL
Sample : 2122-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:00 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.144	237733	143858.799	ppm
3)	Nitrogen	2.273	1391156	724563.270	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.713	90610	42115.230	ppm

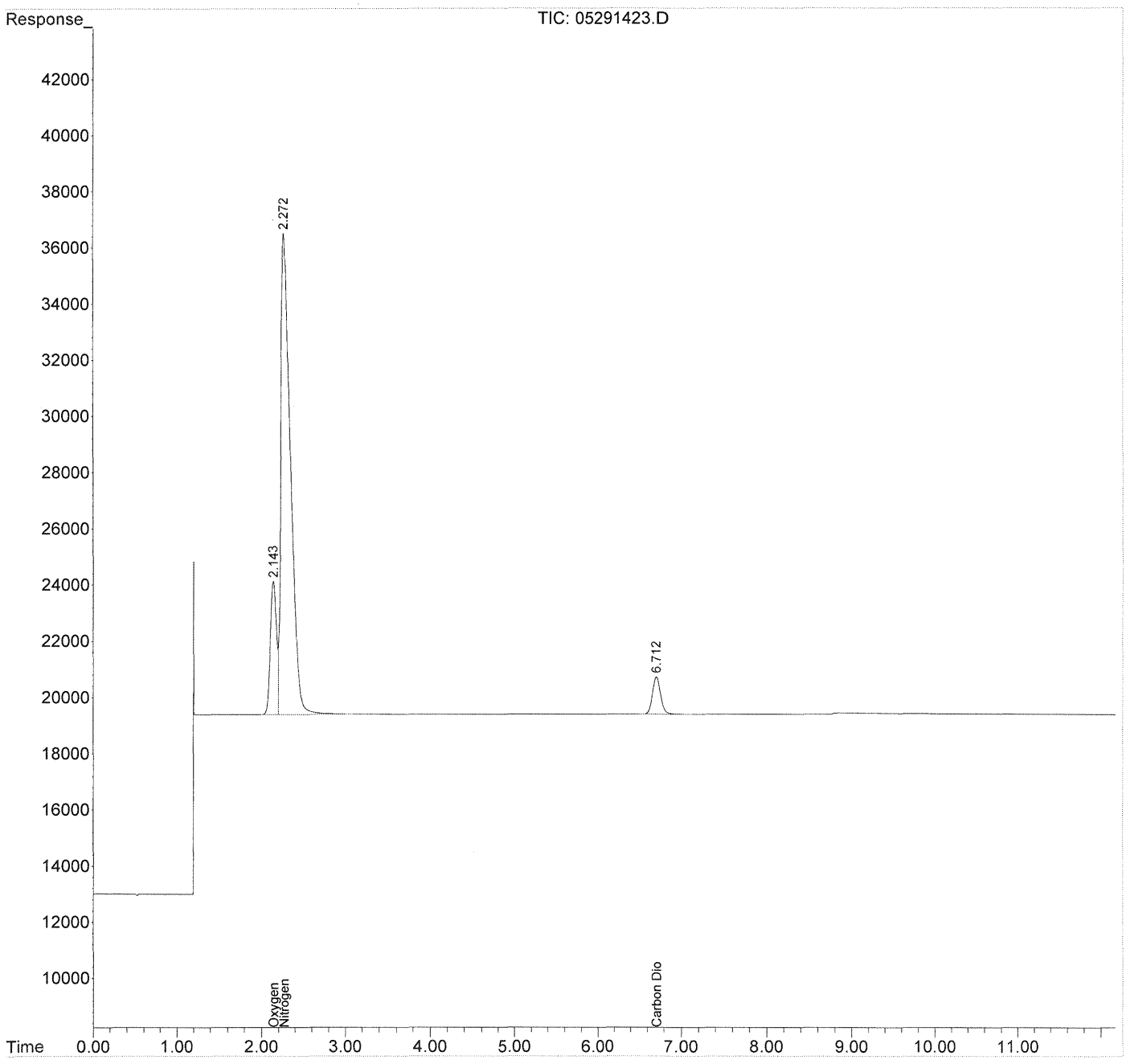
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291423.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 3:34 pm
Operator : NL
Sample : 2122-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:00 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291424.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 3:58 pm
Operator : NL
Sample : 2122-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:04 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	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.159	236685	143224.478 ppm
3)	Nitrogen	2.288	1383838	720751.343 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.717	89907	41788.307 ppm

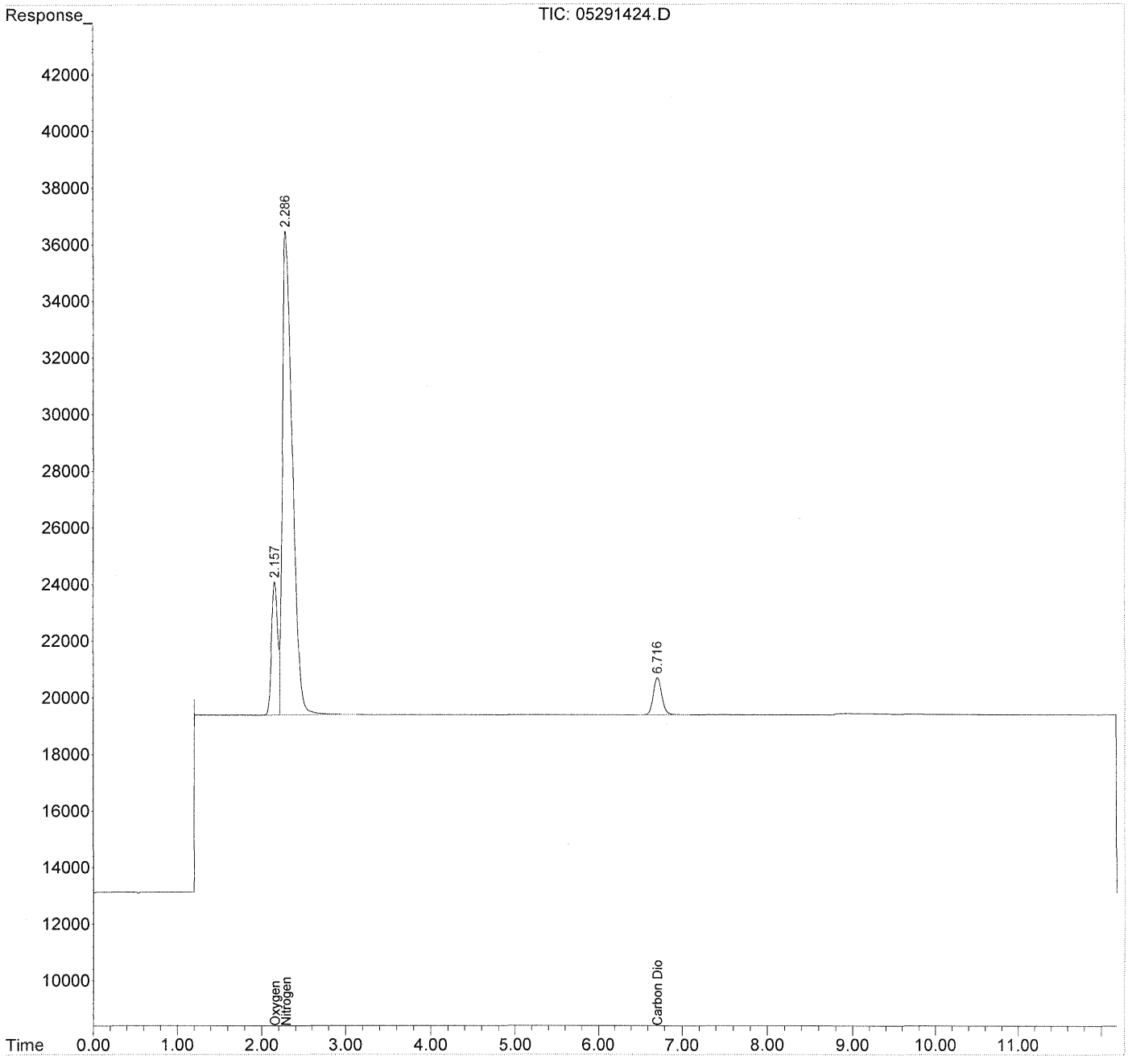
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291424.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 3:58 pm
Operator : NL
Sample : 2122-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:04 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291425.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 4:17 pm
Operator : NL
Sample : 2122-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:08 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.156	235988	142802.860	ppm
3)	Nitrogen	2.286	1379546	718516.372	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.715	90155	41903.823	ppm

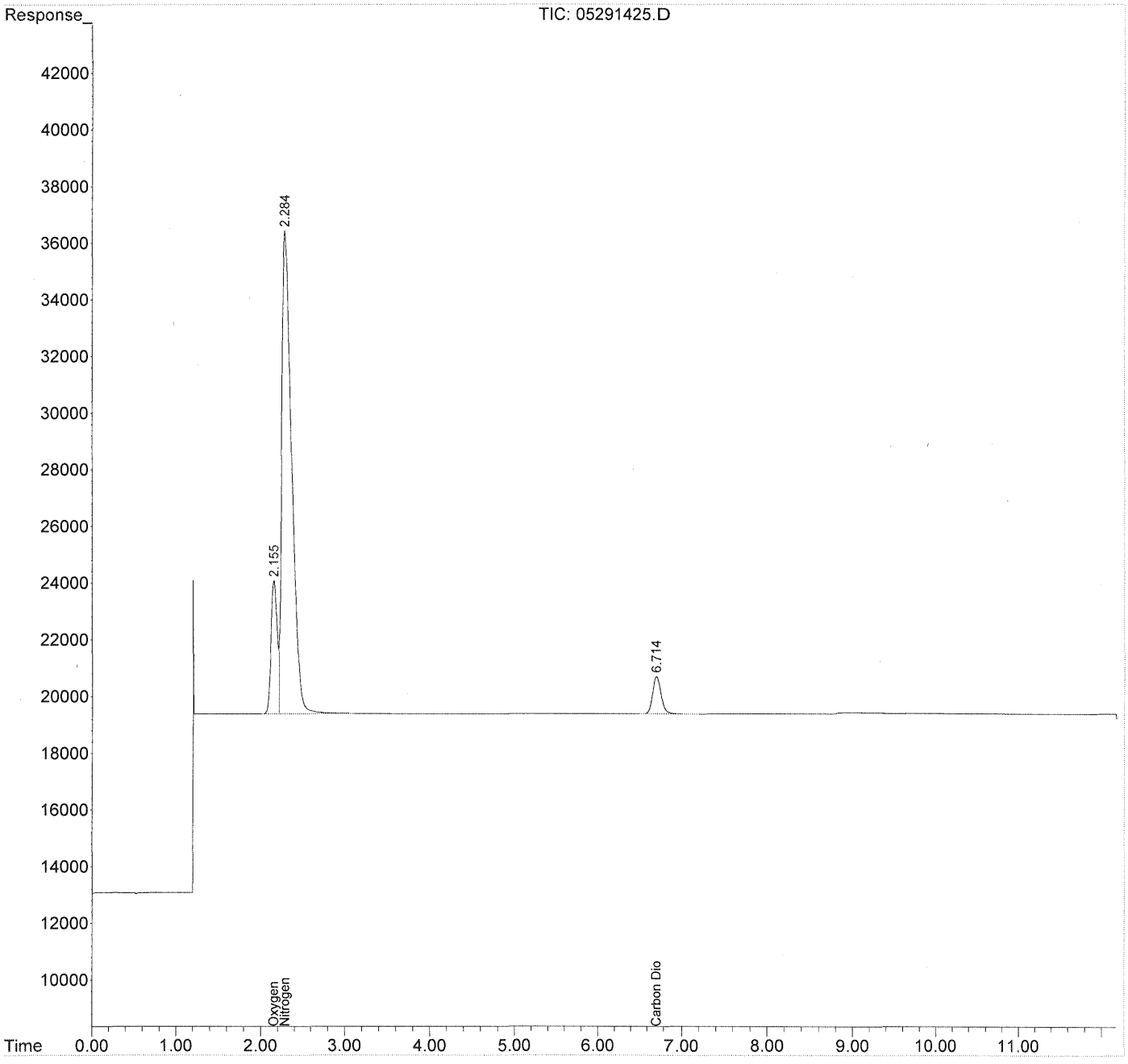
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291425.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 4:17 pm
Operator : NL
Sample : 2122-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:08 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291426.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 4:42 pm
Operator : NL
Sample : 2122-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:12 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	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.161	211958	128261.798 ppm
3)	Nitrogen	2.288	1386519	722148.200 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.716	112515	52296.535 ppm

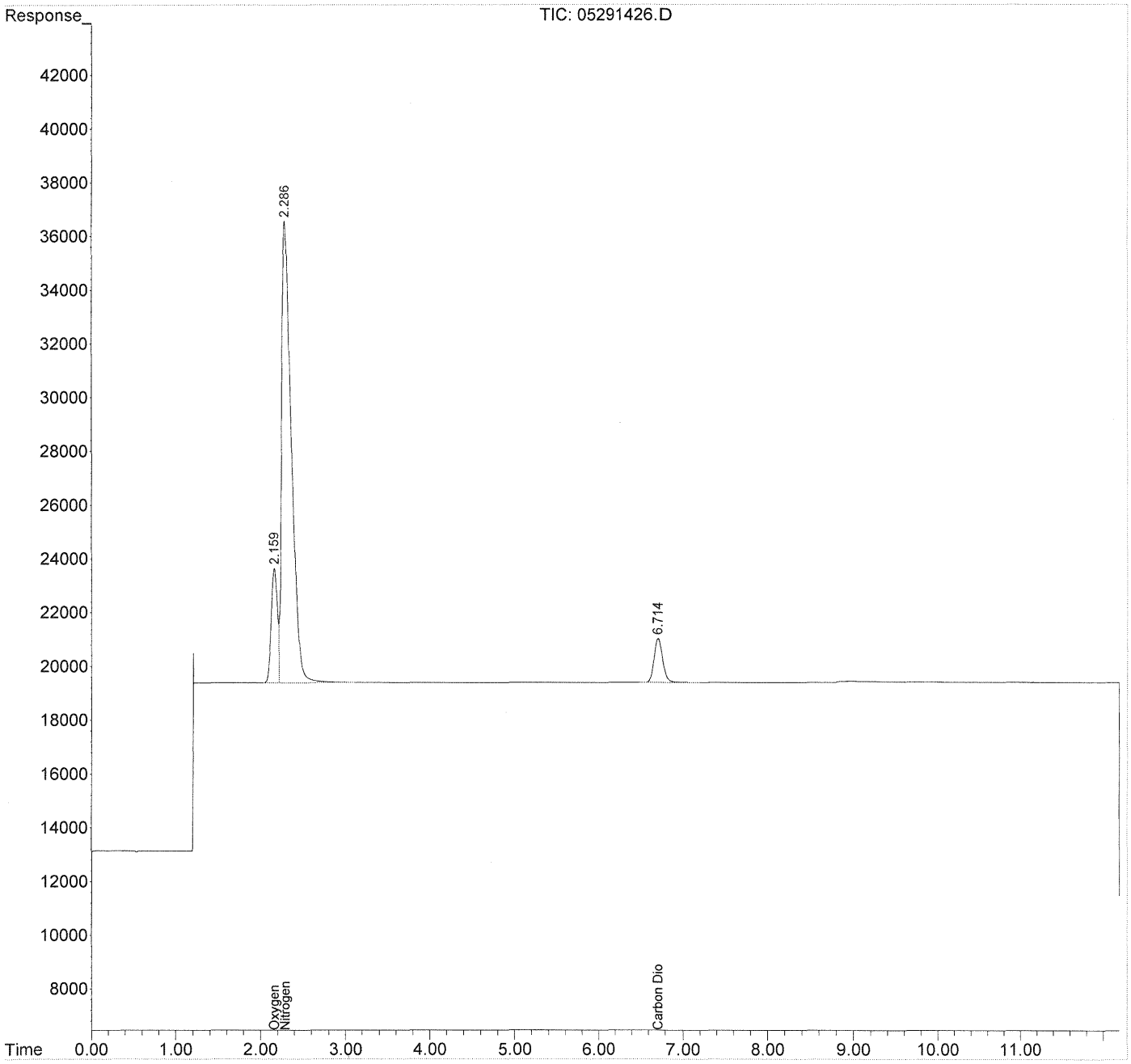
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291426.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 4:42 pm
Operator : NL
Sample : 2122-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:12 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291427.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:07 pm
Operator : NL
Sample : 2122-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:16 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	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.160	211817	128175.960 ppm
3)	Nitrogen	2.287	1385684	721713.179 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.714	112106	52106.558 ppm

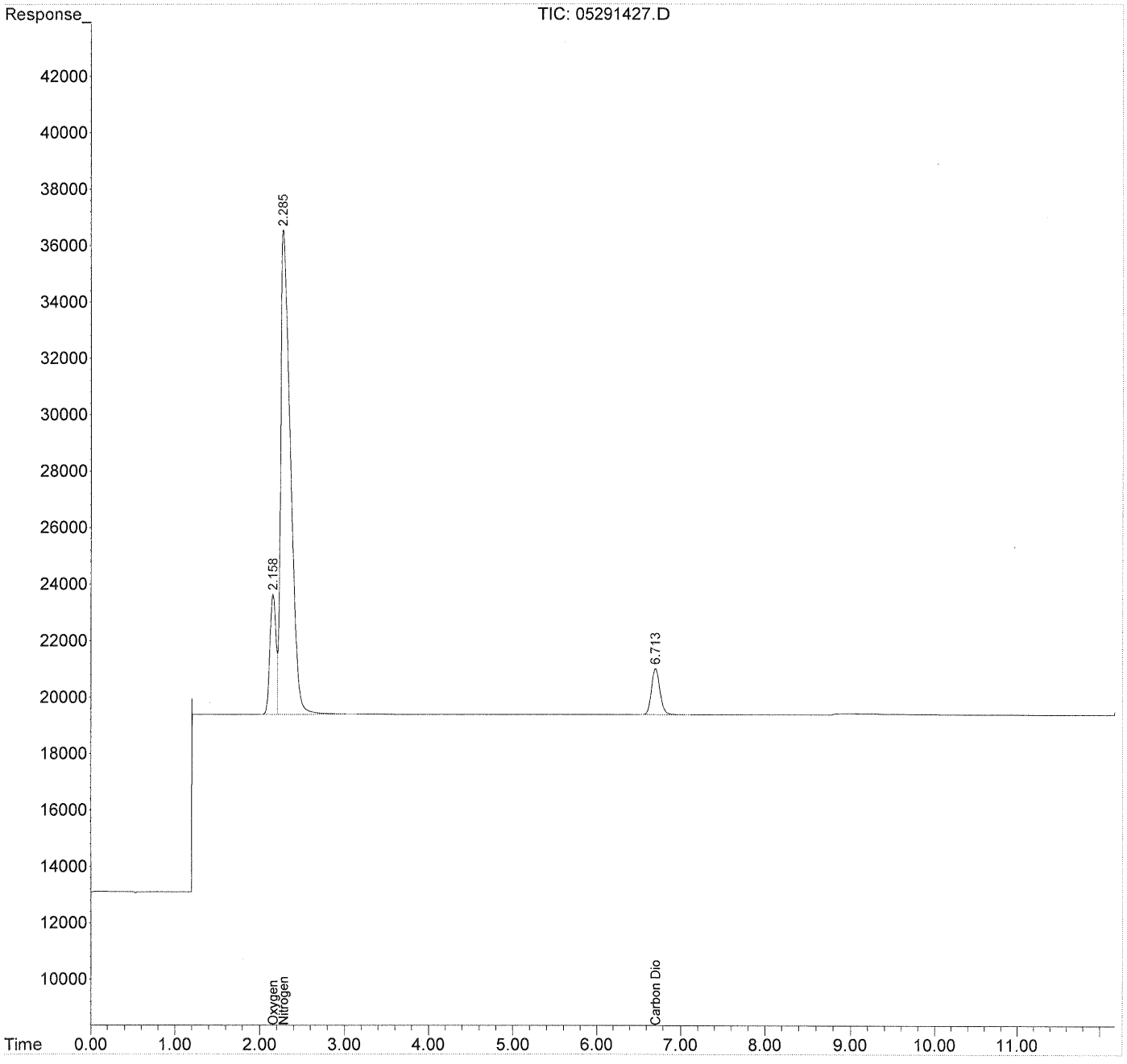
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291427.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:07 pm
Operator : NL
Sample : 2122-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:16 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291428.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:29 pm
Operator : NL
Sample : 2122-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:20 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.156	211226	127818.628	ppm
3)	Nitrogen	2.283	1381043	719296.031	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	111703	51919.200	ppm

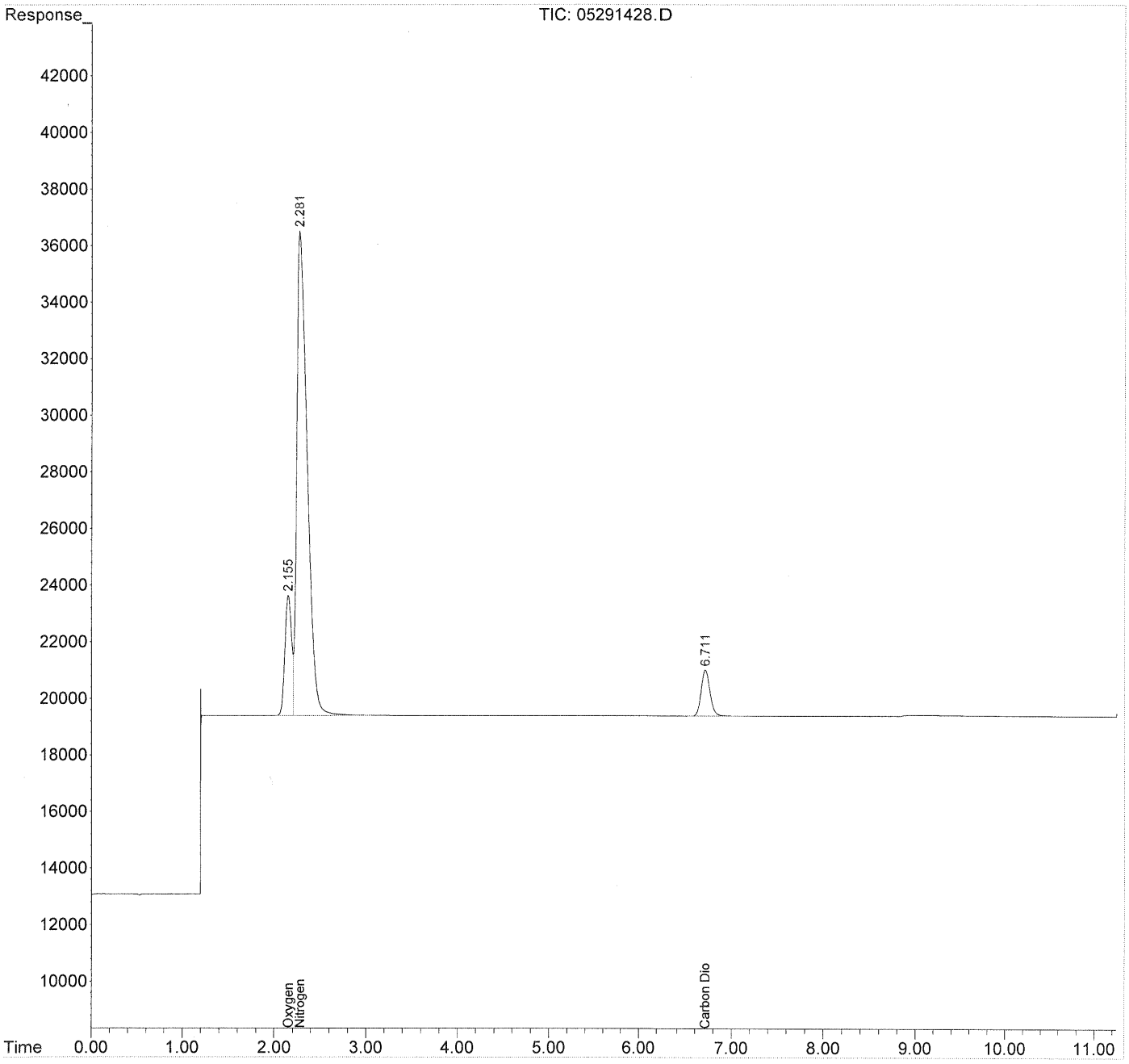
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291428.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:29 pm
Operator : NL
Sample : 2122-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:20 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291429.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:44 pm
Operator : NL
Sample : 2122-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:24 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.154	212539	128613.091	ppm
3)	Nitrogen	2.282	1329035	692208.015	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.710	99316	46161.601	ppm

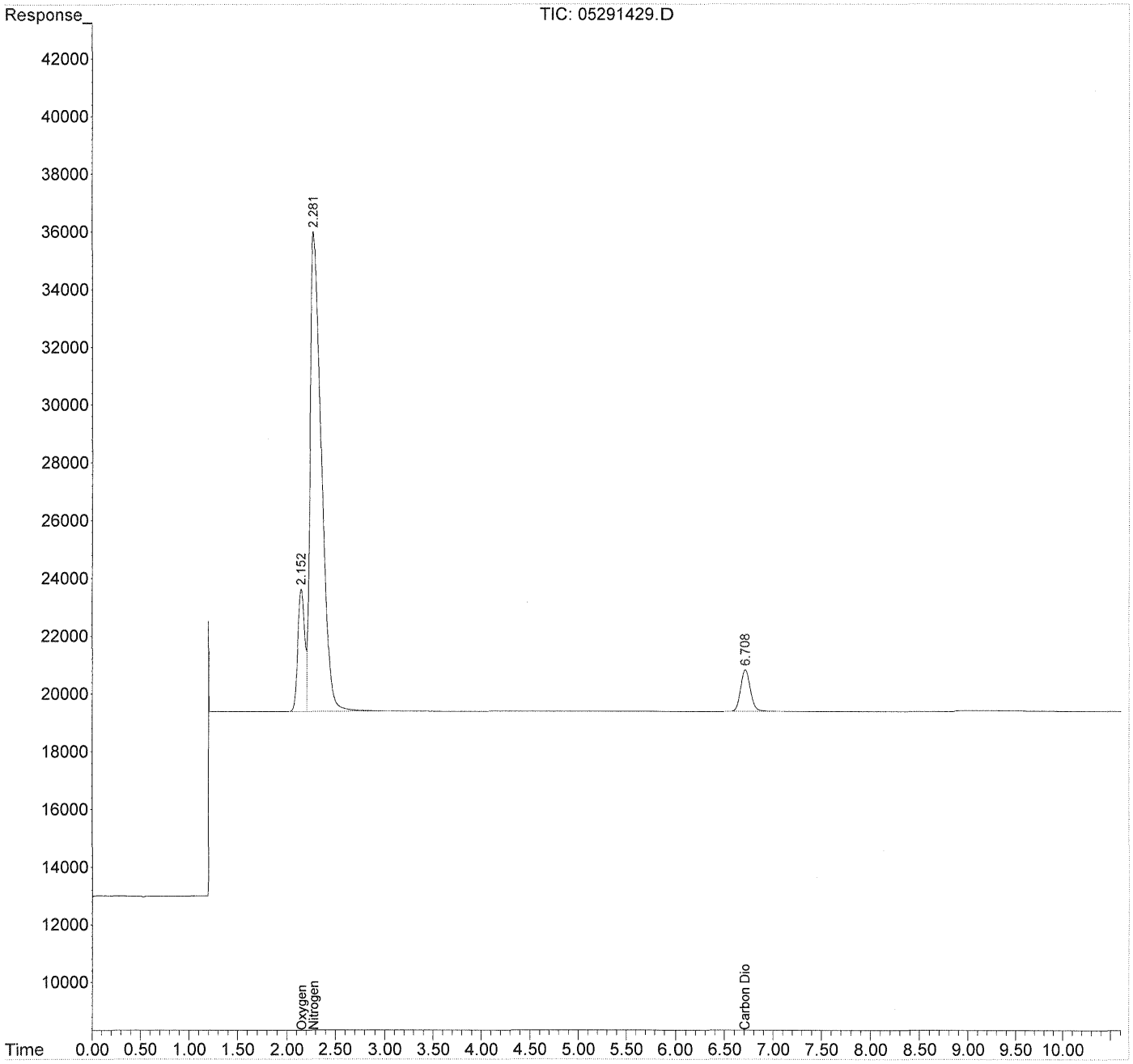
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291429.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:44 pm
Operator : NL
Sample : 2122-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:24 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291430.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:59 pm
Operator : NL
Sample : 2122-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:28 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.147	212473	128573.337	ppm
3)	Nitrogen	2.275	1326344	690806.781	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.709	99517	46255.329	ppm

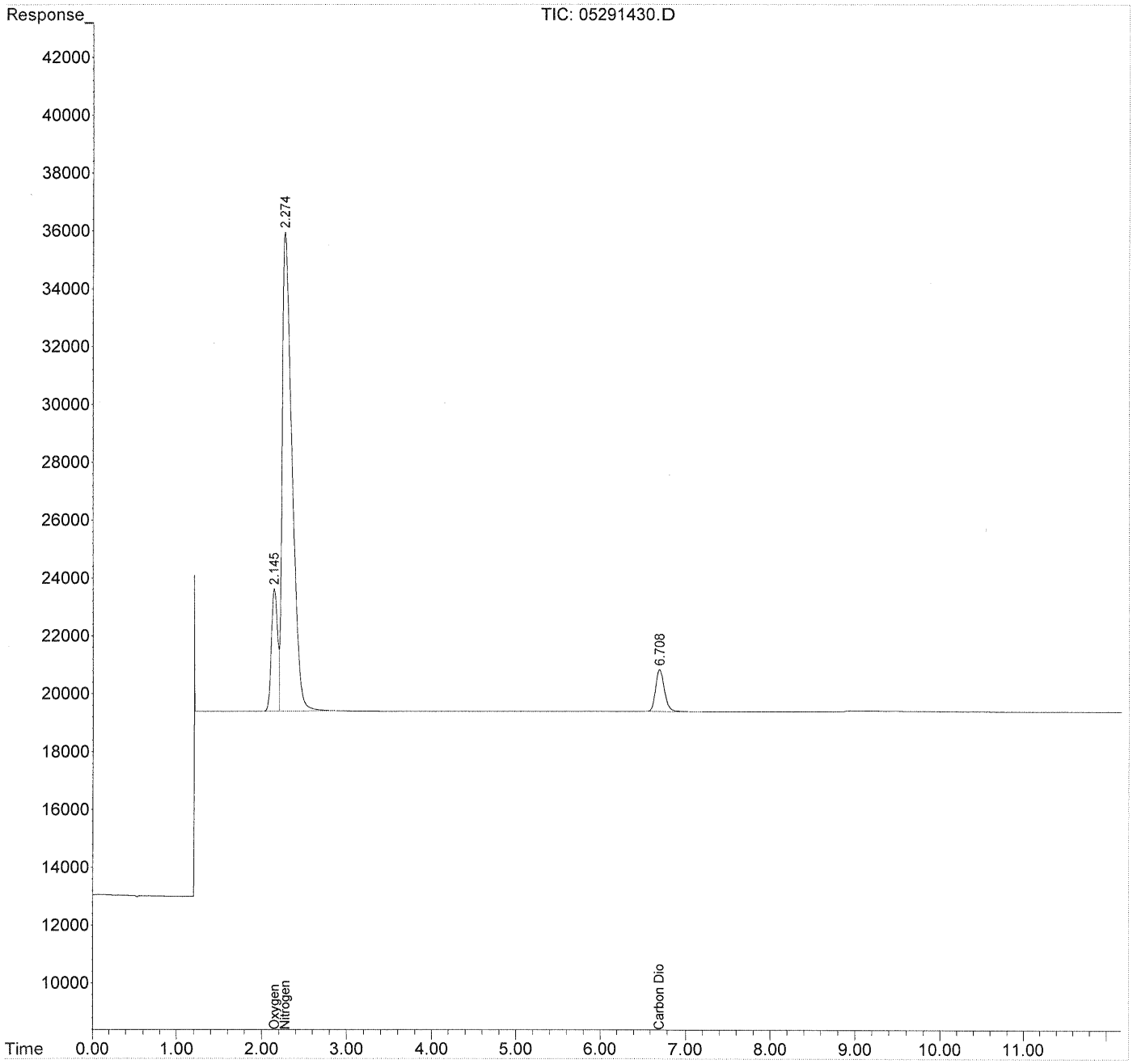
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291430.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 5:59 pm
Operator : NL
Sample : 2122-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:28 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291431.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 6:15 pm
Operator : NL
Sample : 2122-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:32 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	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.151	212723	128724.300 ppm
3)	Nitrogen	2.280	1330391	692914.321 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.709	99581	46284.986 ppm

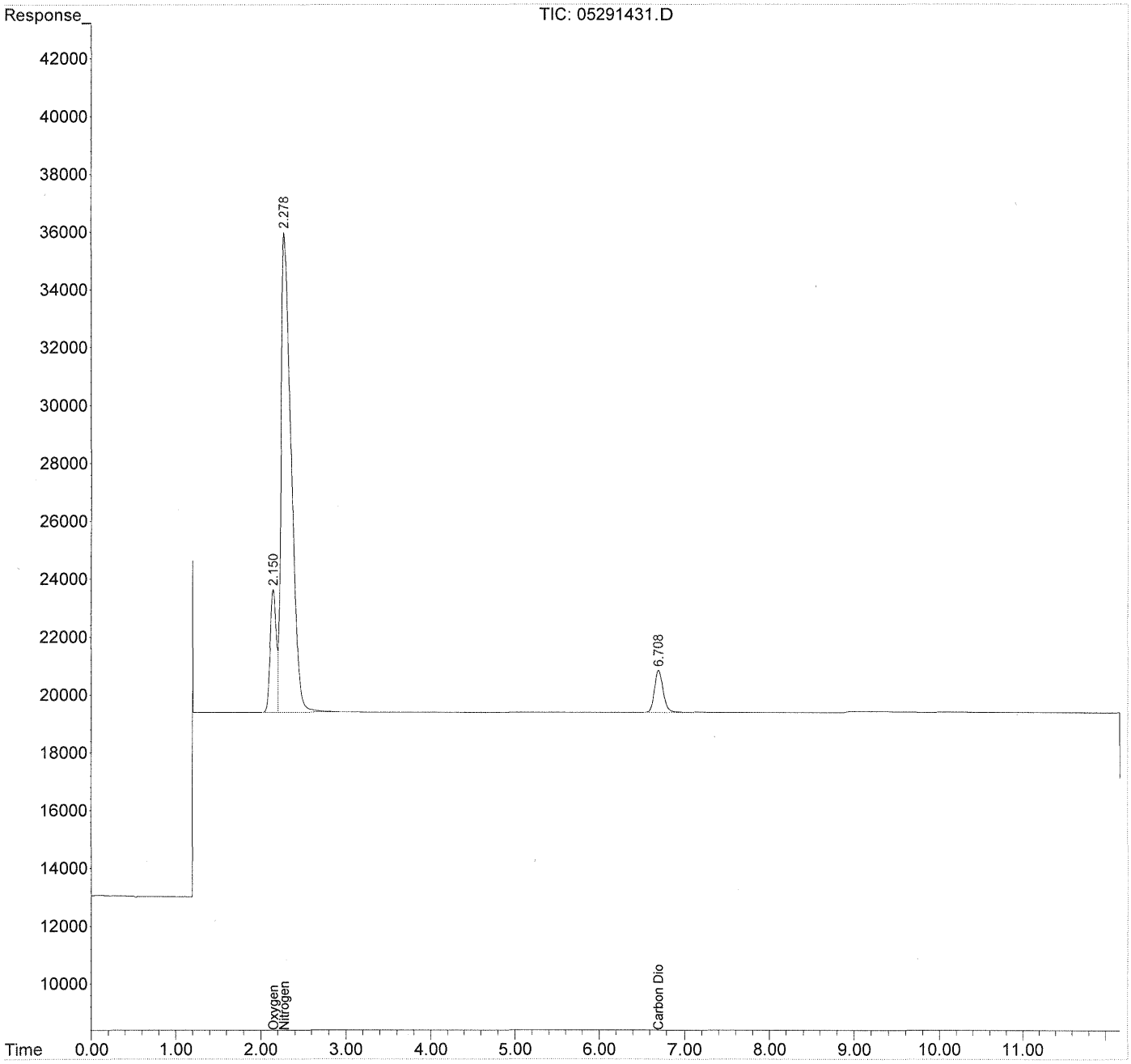
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291431.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 6:15 pm
Operator : NL
Sample : 2122-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:32 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301404.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:49 am
Operator : NL
Sample : 2122-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:30 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.169	217948	131886.086	ppm
3)	Nitrogen	2.298	1357512	707040.233	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.723	100439	46683.570	ppm

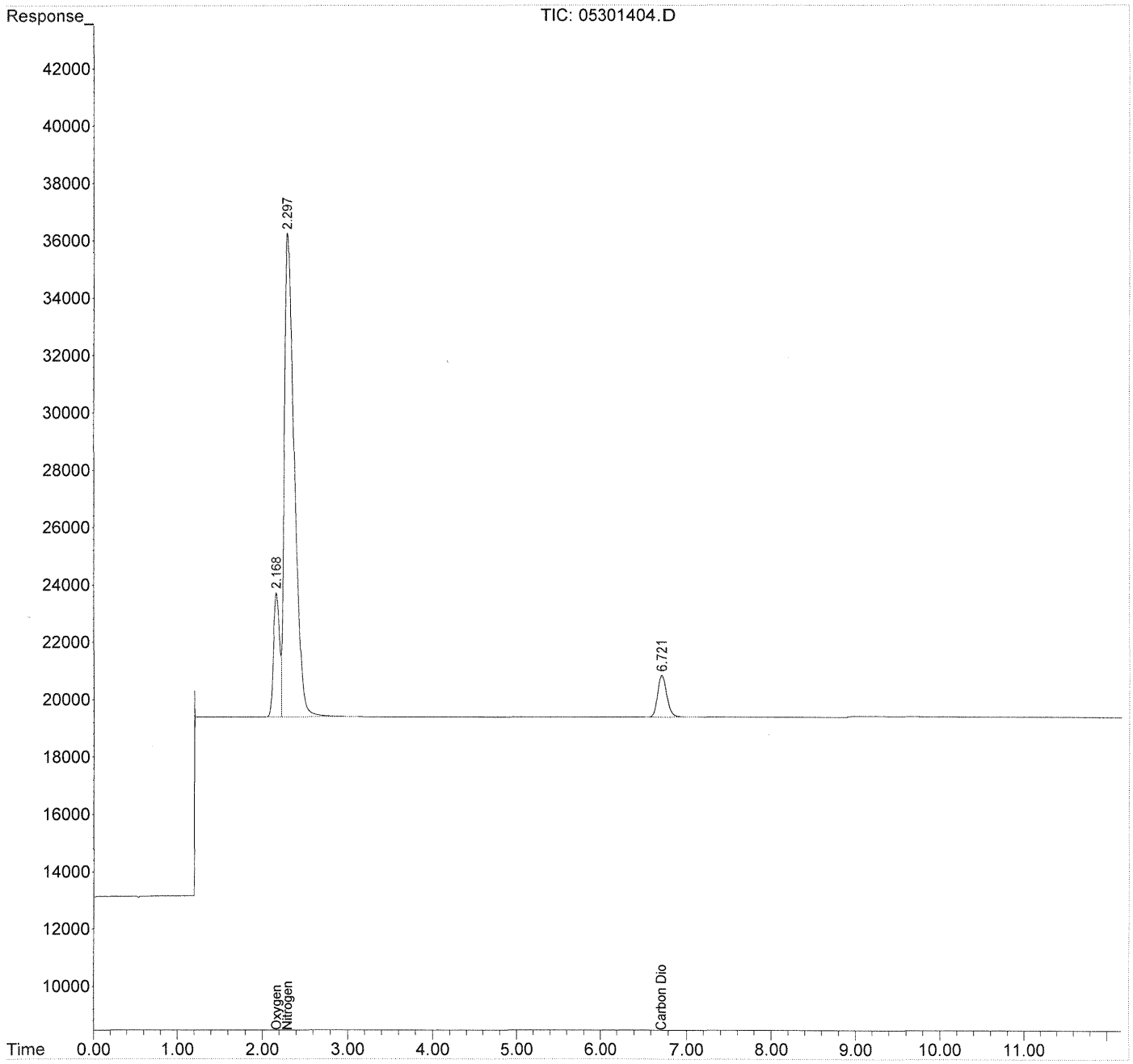
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301404.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:49 am
Operator : NL
Sample : 2122-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:30 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301405.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 9:06 am
Operator : NL
Sample : 2122-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:34 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.161	218214	132046.986	ppm
3)	Nitrogen	2.289	1358361	707482.116	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.722	100900	46897.804	ppm

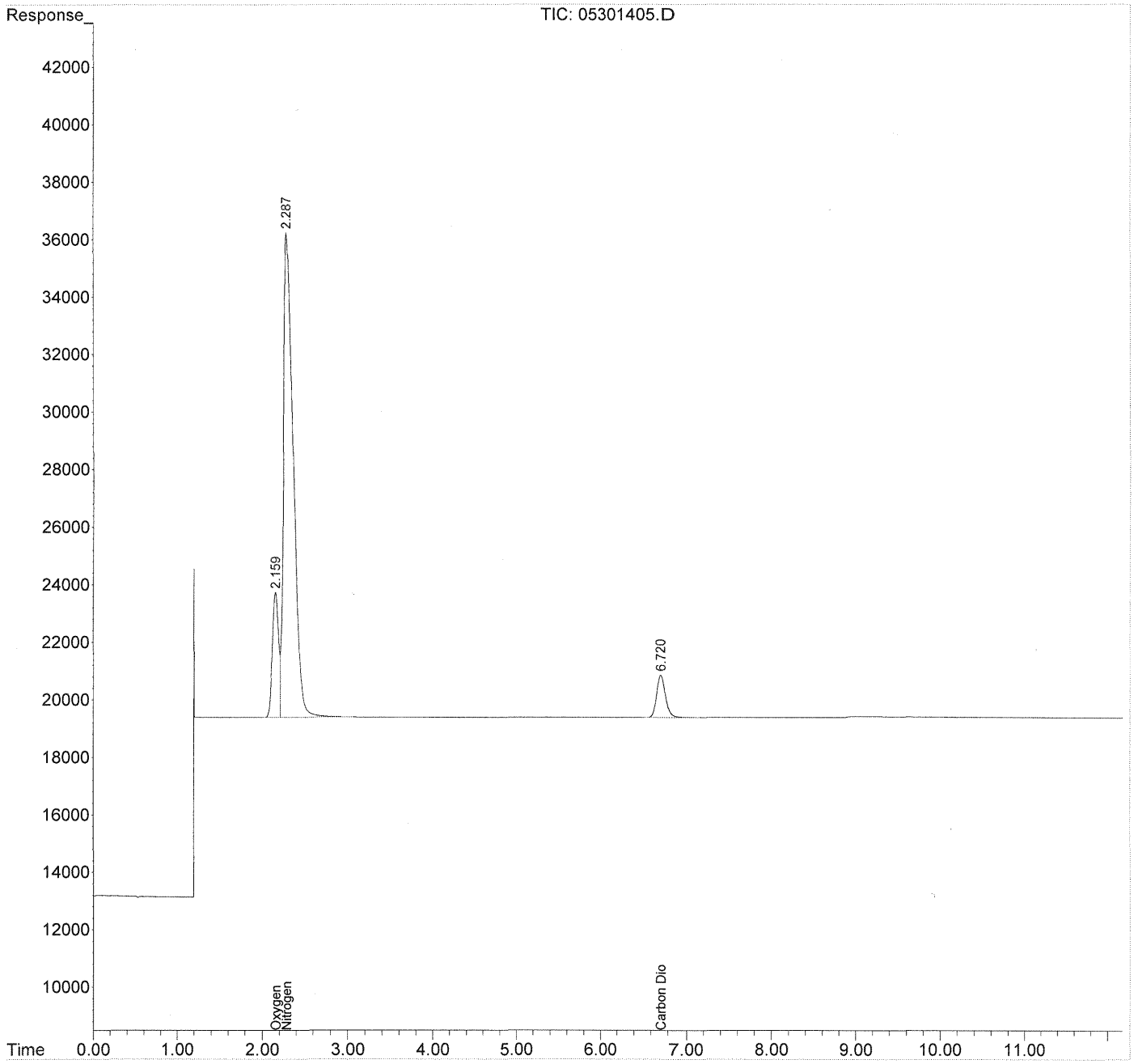
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301405.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 9:06 am
Operator : NL
Sample : 2122-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:34 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301406.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 9:25 am
Operator : NL
Sample : 2122-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:38 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	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.173	215921	130659.531 ppm
3)	Nitrogen	2.302	1341138	698511.882 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.727	99644	46314.191 ppm

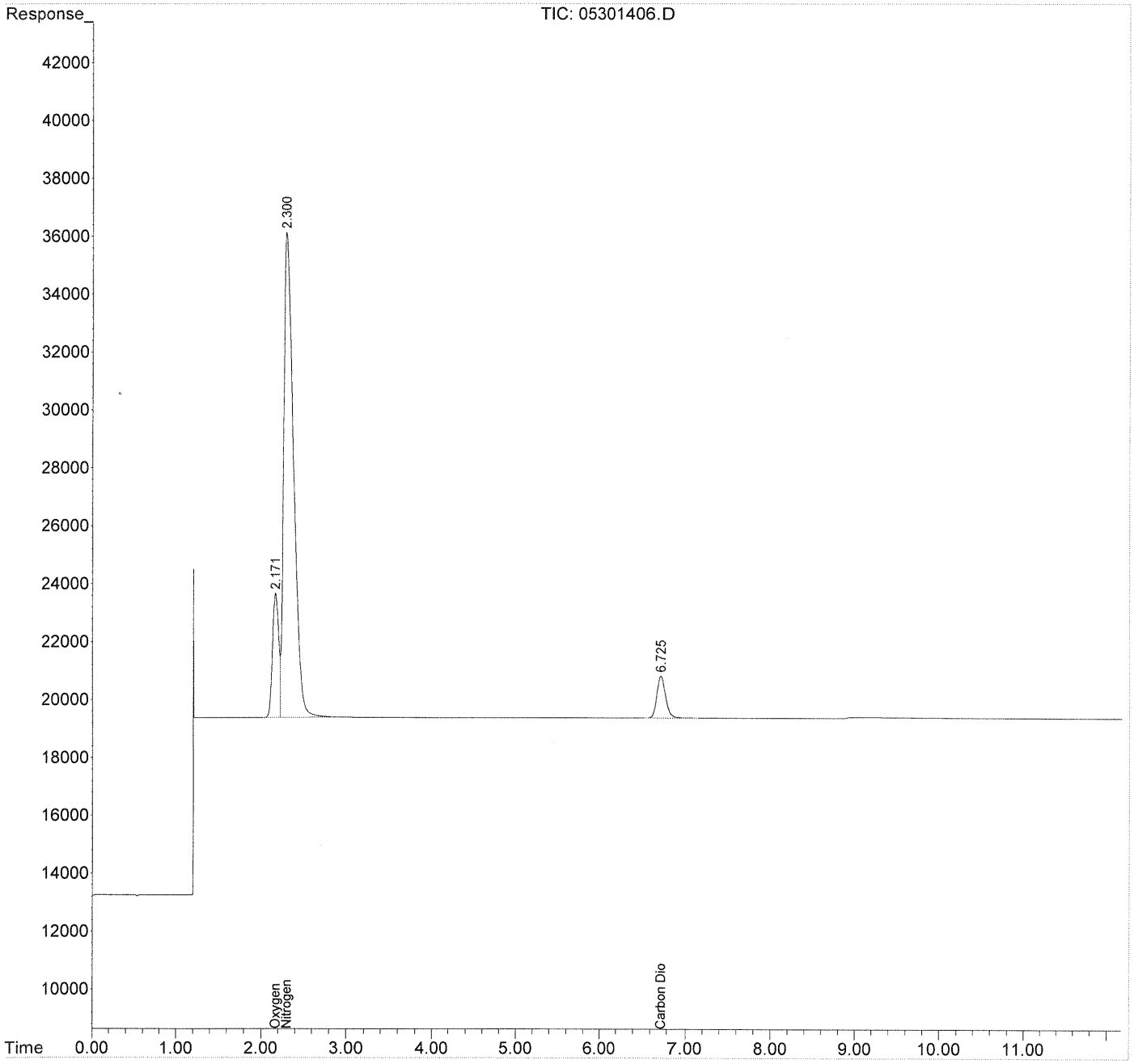
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301406.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 9:25 am
Operator : NL
Sample : 2122-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:38 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301407.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 9:53 am
Operator : NL
Sample : 2122-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:42 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.177	215449	130374.068	ppm
3)	Nitrogen	2.306	1345277	700667.651	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.732	100619	46767.165	ppm

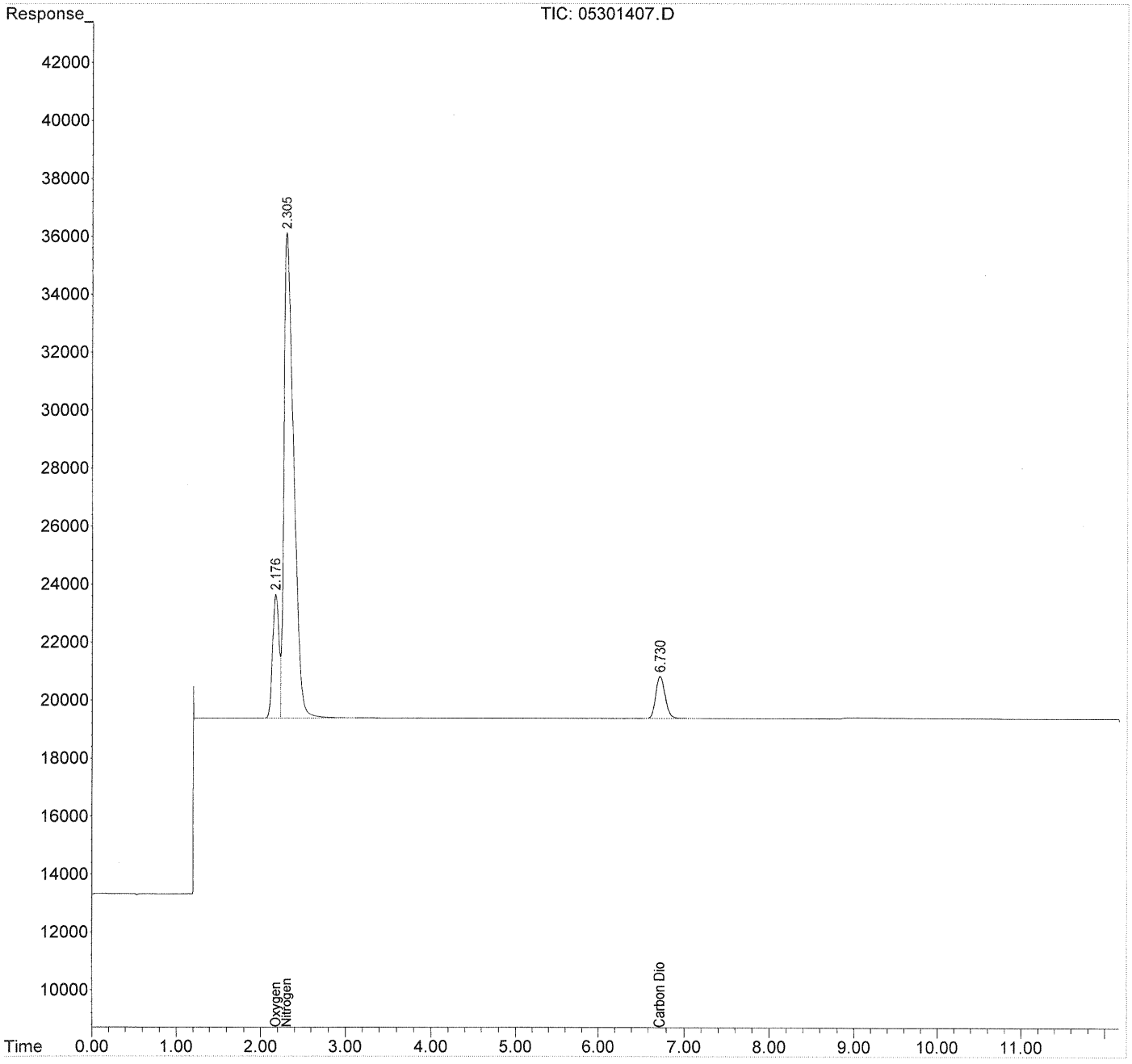
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301407.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 9:53 am
Operator : NL
Sample : 2122-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:42 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301408.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 10:10 am
Operator : NL
Sample : 2122-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:46 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.172	214427	129755.651	ppm
3)	Nitrogen	2.301	1337020	696367.018	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.727	99852	46410.603	ppm

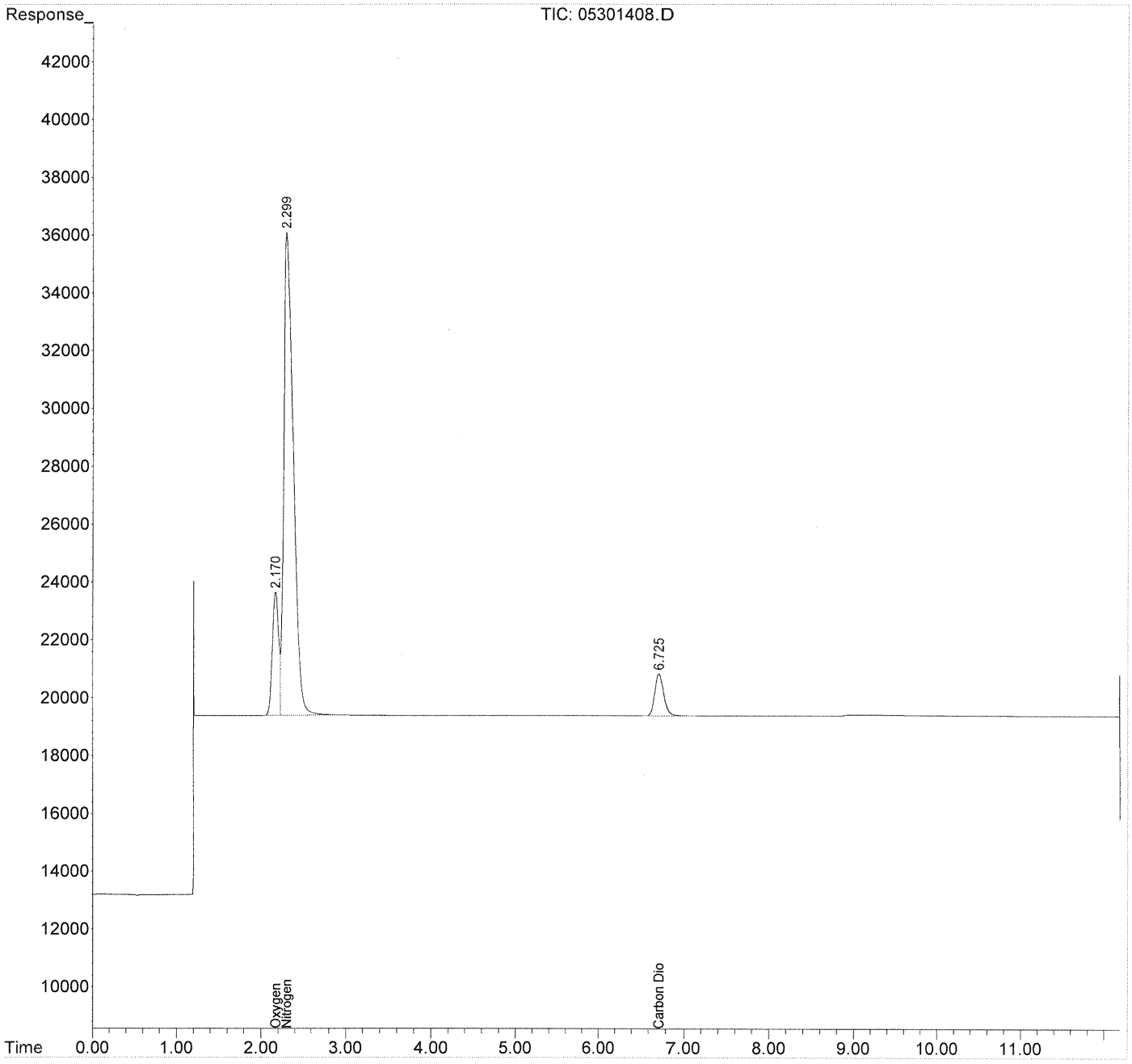
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301408.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 10:10 am
Operator : NL
Sample : 2122-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:46 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301409.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 10:26 am
Operator : NL
Sample : 2122-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:50 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.159	217873	131840.837	ppm
3)	Nitrogen	2.288	1359092	707863.154	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.721	101951	47386.594	ppm

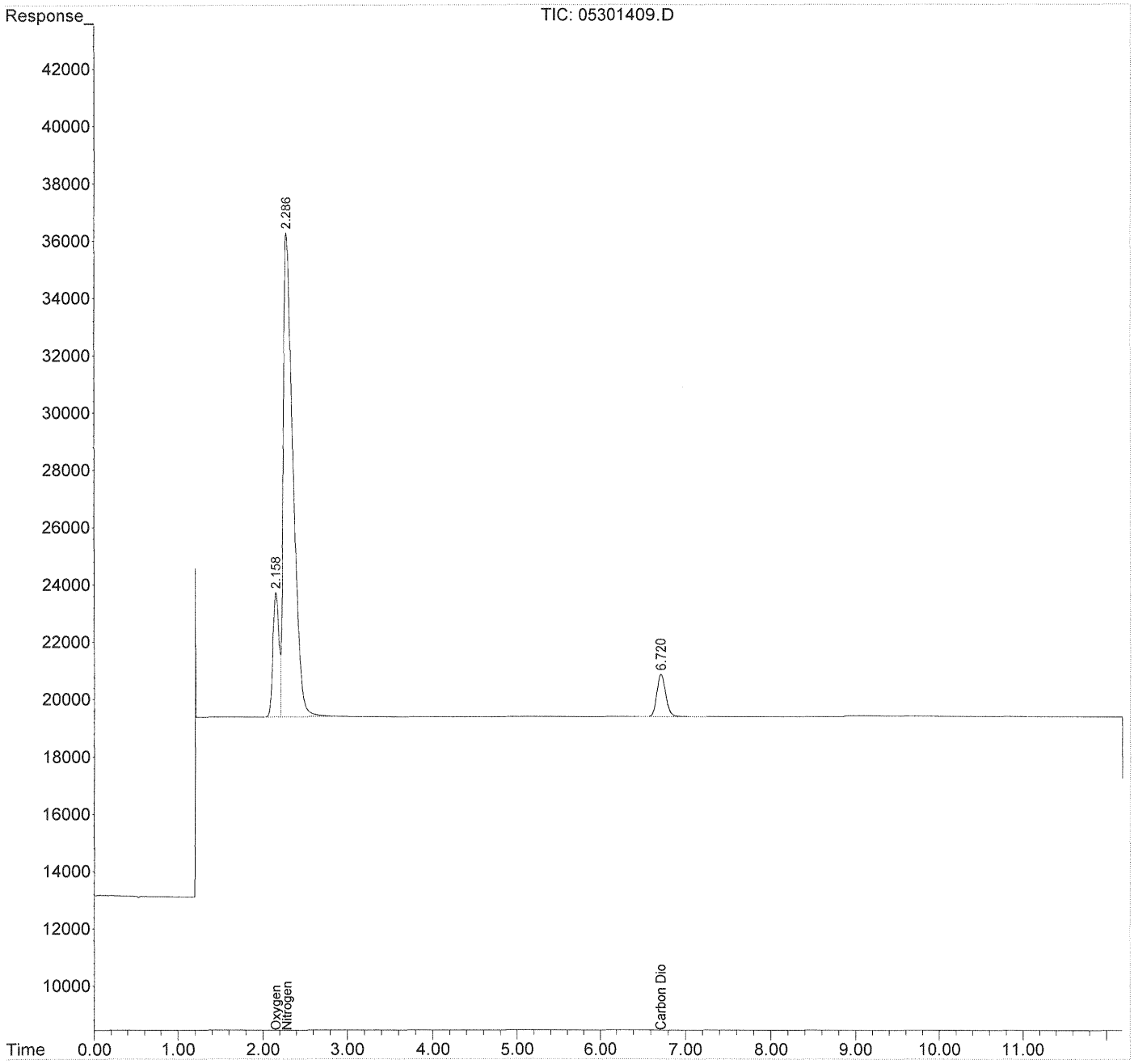
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301409.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 10:26 am
Operator : NL
Sample : 2122-011
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:50 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291402.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:05 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:40 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 :

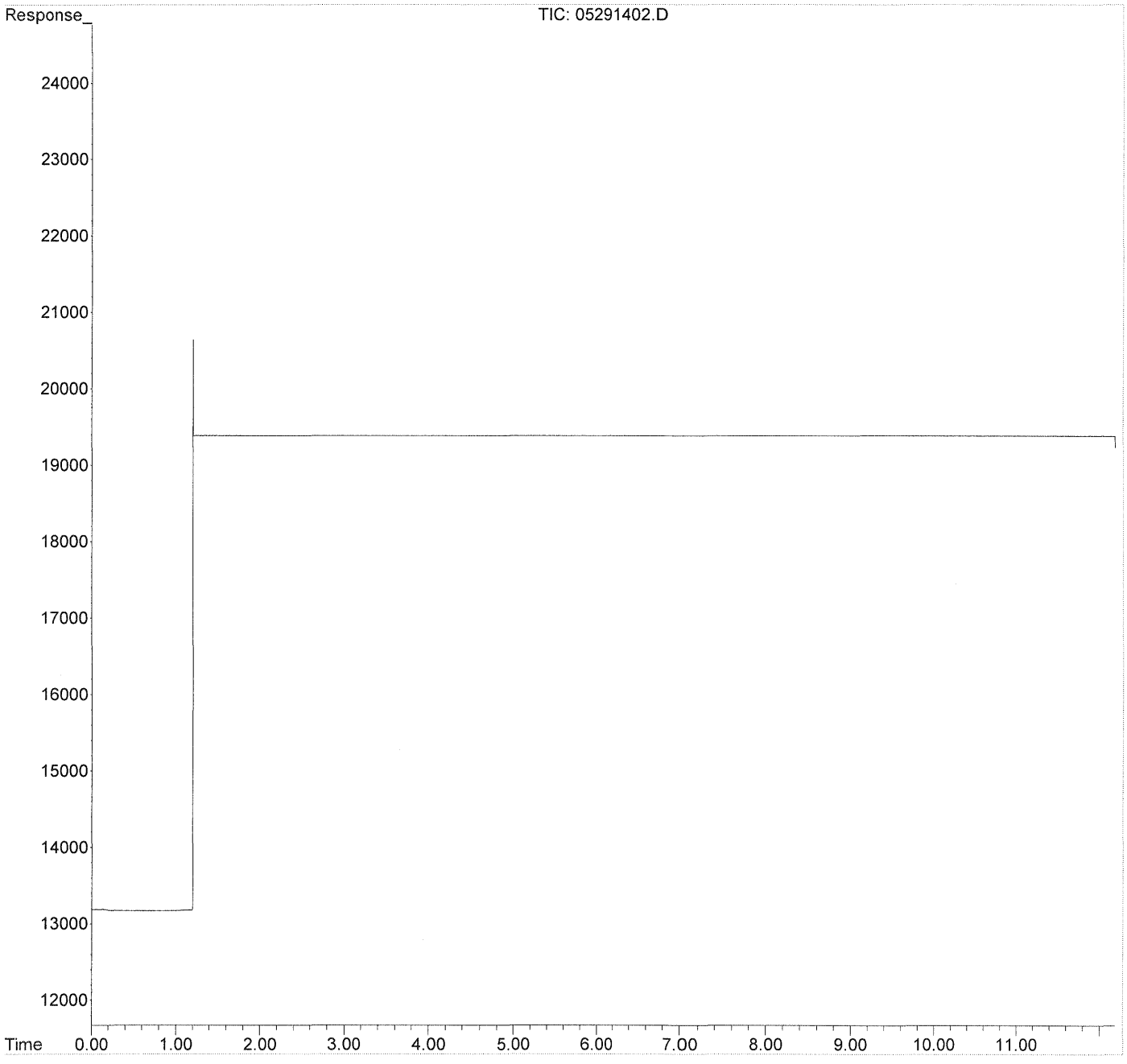
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	0.000	0	N.D.	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291402.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 8:05 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:40 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301402.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:07 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:26 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	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

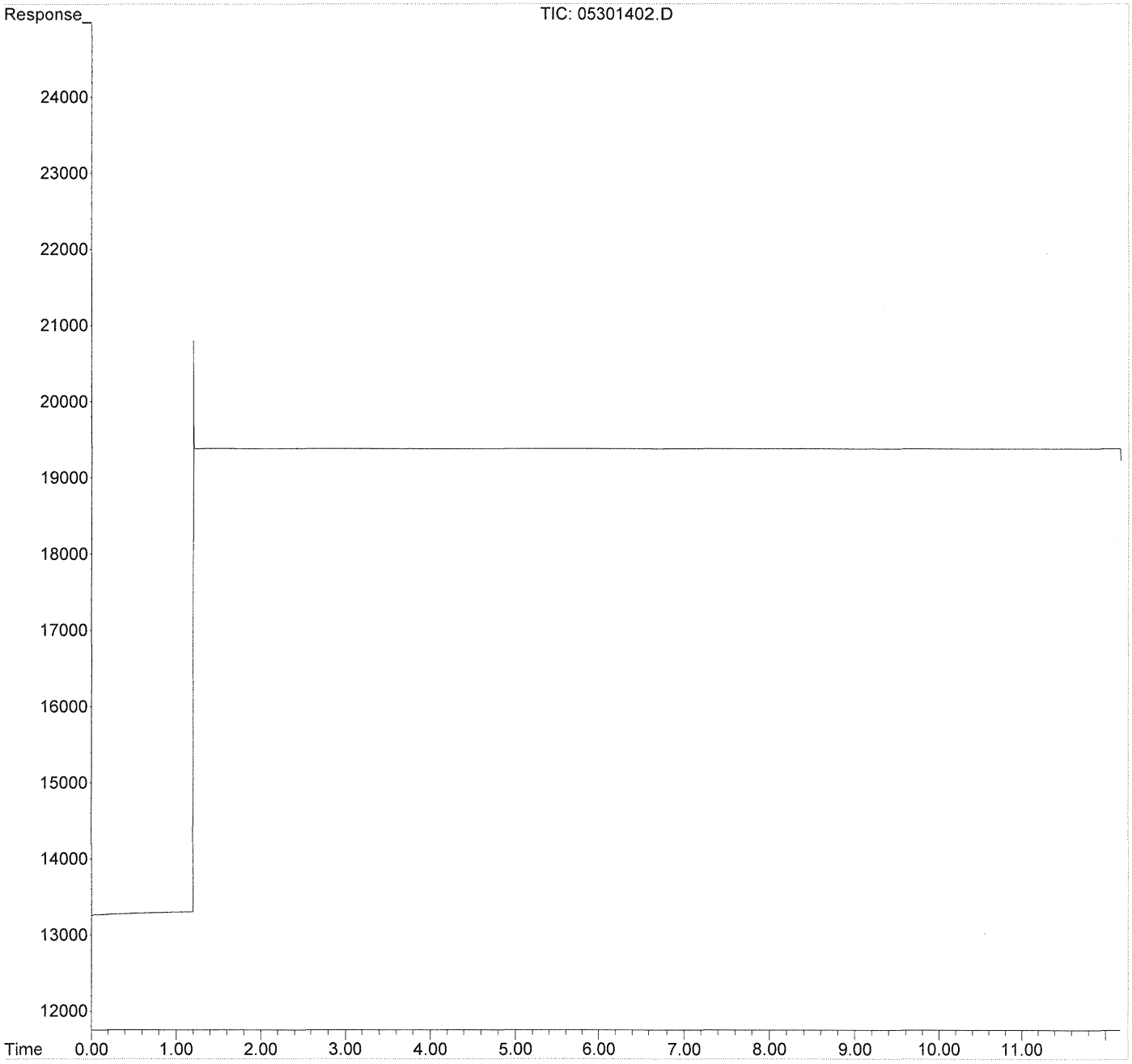
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301402.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:07 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:26 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 :



NLD 6/2/14

REPORT SUMMARYS FIXED GASES BY GC/TCD

CLIENT : Air Hygiene, Incorporated

Analyst : NL

PAI Job : P142147

Printed : 6/2/2014

Instrument : GC #1 / TCD #1

Date analyzed : 5/31/2014

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen		Nitrogen		Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-04241401	38047	40152		49631		49800	39897	49437	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	4.9%	0.3%		0.7%		0.4%	0.2%	1.2%	
Lab Air		202141		713189				441	
MB									
2147-001		142324	0.2%	732748	0.3%			43301	0.3%
2147-001 - 2		142825	0.2%	730847	0.1%			43254	0.2%
2147-001 - 3		142657	0.0%	727726	0.4%			42918	0.6%
2147-001 - Mean		142602		730440				43158	
2147-003		135429	0.1%	730877	0.1%			48561	0.0%
2147-003 - 2		135638	0.1%	732160	0.1%			48559	0.0%
2147-003 - 3		135594	0.0%	730971	0.0%			48549	0.0%
2147-003 - Mean		135554		731336				48556	

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 6/2/2014

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 5/31/2014

PAI Job : P142147

Sample amount : 100uL

2147-005		136290	0.5%	730448	0.6%		48391	0.4%
2147-005 - 2		137464	0.4%	738658	0.5%		48762	0.3%
2147-005 - 3		137042	0.1%	736469	0.2%		48672	0.1%
2147-005 - Mean		136932		735191			48608	
2147-007		136379	0.4%	741400	0.5%		49978	0.6%
2147-007 - 2		135503	0.3%	734785	0.4%		49504	0.4%
2147-007 - 3		135647	0.1%	736575	0.1%		49622	0.2%
2147-007 - Mean		135843		737587			49701	

STD S30-04241401	38119	39451	48292	49640	39464	49135
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	4.7%	1.4%	3.4%	0.7%	1.3%	1.8%

Quantitation Report (Not Reviewed)

NL 6/2/14

Data Path : I:\GC01\DATA\FXG\2014_05\31\
Data File : 05311401.D
Signal(s) : TCD1A.CH
Acq On : 31 May 2014 6:11 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Jun 02 10:27:59 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.700	52551	38047.332	ppm
2)	Oxygen	2.209	66353	40152.187	ppm
3)	Nitrogen	2.384	95292	49631.313	ppm
4)	Carbon Monoxide	3.071	92293	49800.877	ppm
5)	Methane	5.064	55694	39897.040	ppm
6)	Carbon Dioxide	6.724	106365	49437.839	ppm

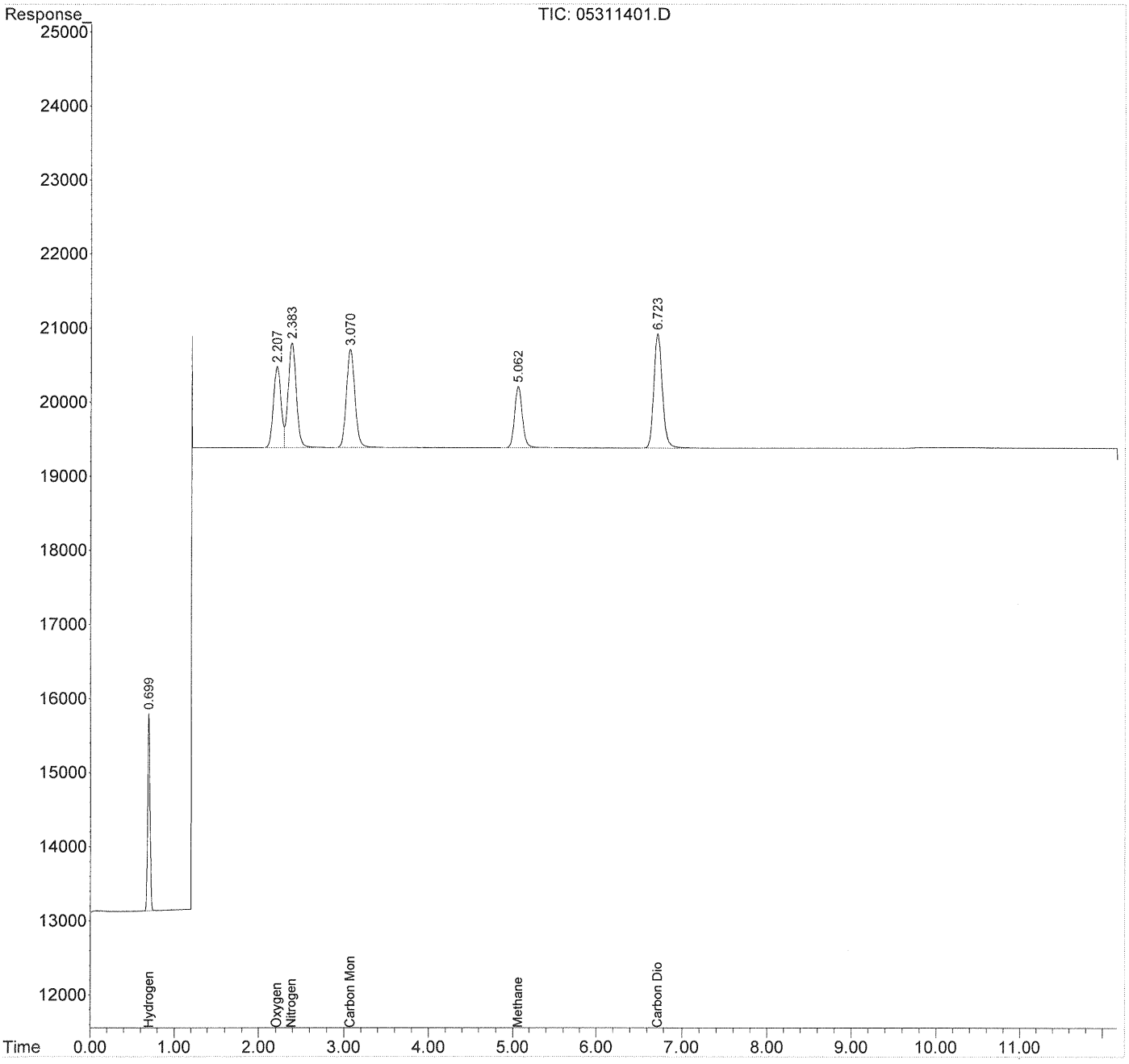
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\31\
Data File : 05311401.D
Signal(s) : TCD1A.CH
Acq On : 31 May 2014 6:11 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Jun 02 10:27:59 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 :



Added Page

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\31\
Data File : 05311420.D
Signal(s) : TCD1A.CH
Acq On : 31 May 2014 11:42 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Jun 02 10:28:59 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.701	52650	38119.122	ppm
2)	Oxygen	2.213	65194	39450.564	ppm
3)	Nitrogen	2.389	92720	48291.782	ppm
4)	Carbon Monoxide	3.075	91995	49640.139	ppm
5)	Methane	5.068	55090	39464.162	ppm
6)	Carbon Dioxide	6.728	105713	49134.840	ppm

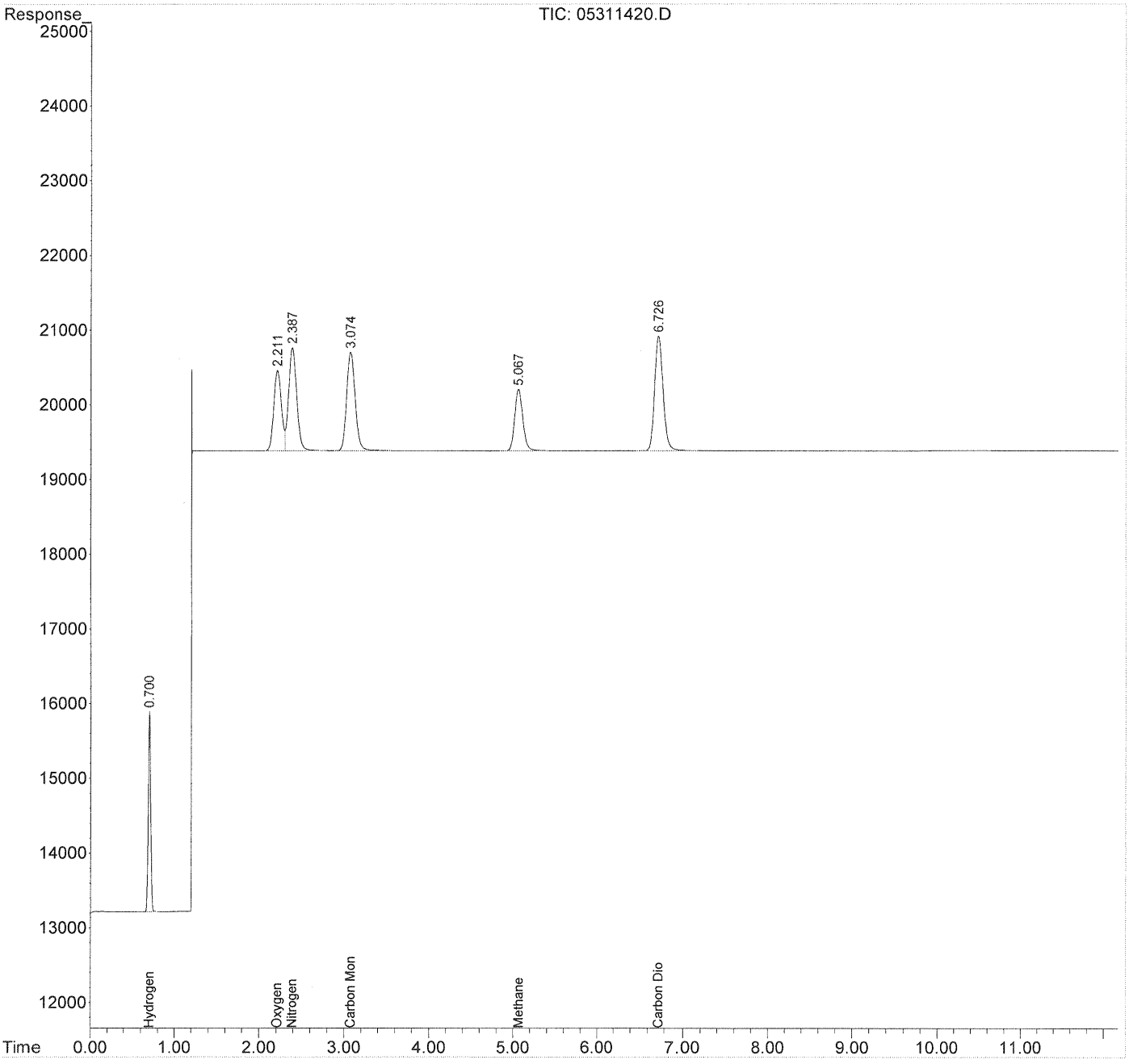
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\31\
Data File : 05311420.D
Signal(s) : TCD1A.CH
Acq On : 31 May 2014 11:42 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Jun 02 10:28:59 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 :



NL 5/30/14

REPORT SUMMARYS FIXED GASES BY GC/TCD

CLIENT : Air Hygiene, Incorporated

Analyst : NL

PAI Job : P142122

Printed : 5/30/2014

Instrument : GC #1 / TCD #1

Date analyzed : 5/29/2014

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen		Nitrogen		Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-04241401	40601	42271		51739		53020	42396	52514	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	1.5%	5.6%		3.5%		6.0%	6.1%	4.9%	
Lab Air		202653		717022				463	
MB									
2122-001		144654	0.4%	726328	0.6%			41843	0.4%
2122-001 - 2		143687	0.2%	719382	0.4%			41645	0.1%
2122-001 - 3		143768	0.2%	721259	0.1%			41582	0.3%
2122-001 - Mean		144036		722323				41690	
2122-003		143859	0.4%	724563	0.5%			42115	0.4%
2122-003 - 2		143224	0.0%	720751	0.1%			41788	0.4%
2122-003 - 3		142803	0.3%	718516	0.4%			41904	0.1%
2122-003 - Mean		143295		721277				41936	

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 5/30/2014

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 5/29/2014

PAI Job : P142122

Sample amount : 100uL

2122-005		128262	0.1%	722148	0.2%		52297	0.4%
2122-005 - 2		128176	0.1%	721713	0.1%		52107	0.0%
2122-005 - 3		127819	0.2%	719296	0.2%		51919	0.4%
2122-005 - Mean		128085		721052			52107	
2122-007		128613	0.0%	692208	0.0%		46162	0.2%
2122-007 - 2		128573	0.0%	690807	0.2%		46255	0.0%
2122-007 - 3		128724	0.1%	692914	0.1%		46285	0.1%
2122-007 - Mean		128637		691976			46234	

STD S30-04241401	35347	37649	46419	46876	37235	46391
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	11.6%	5.9%	7.2%	6.3%	6.8%	7.3%

Quantitation Report (Not Reviewed)

NL 5/30/14

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291401.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 7:48 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:36 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.704	56078	40601.034	ppm
2)	Oxygen	2.216	69855	42271.408	ppm
3)	Nitrogen	2.392	99339	51739.407	ppm
4)	Carbon Monoxide	3.078	98259	53019.794	ppm
5)	Methane	5.070	59183	42396.211	ppm
6)	Carbon Dioxide	6.729	112984	52514.477	ppm

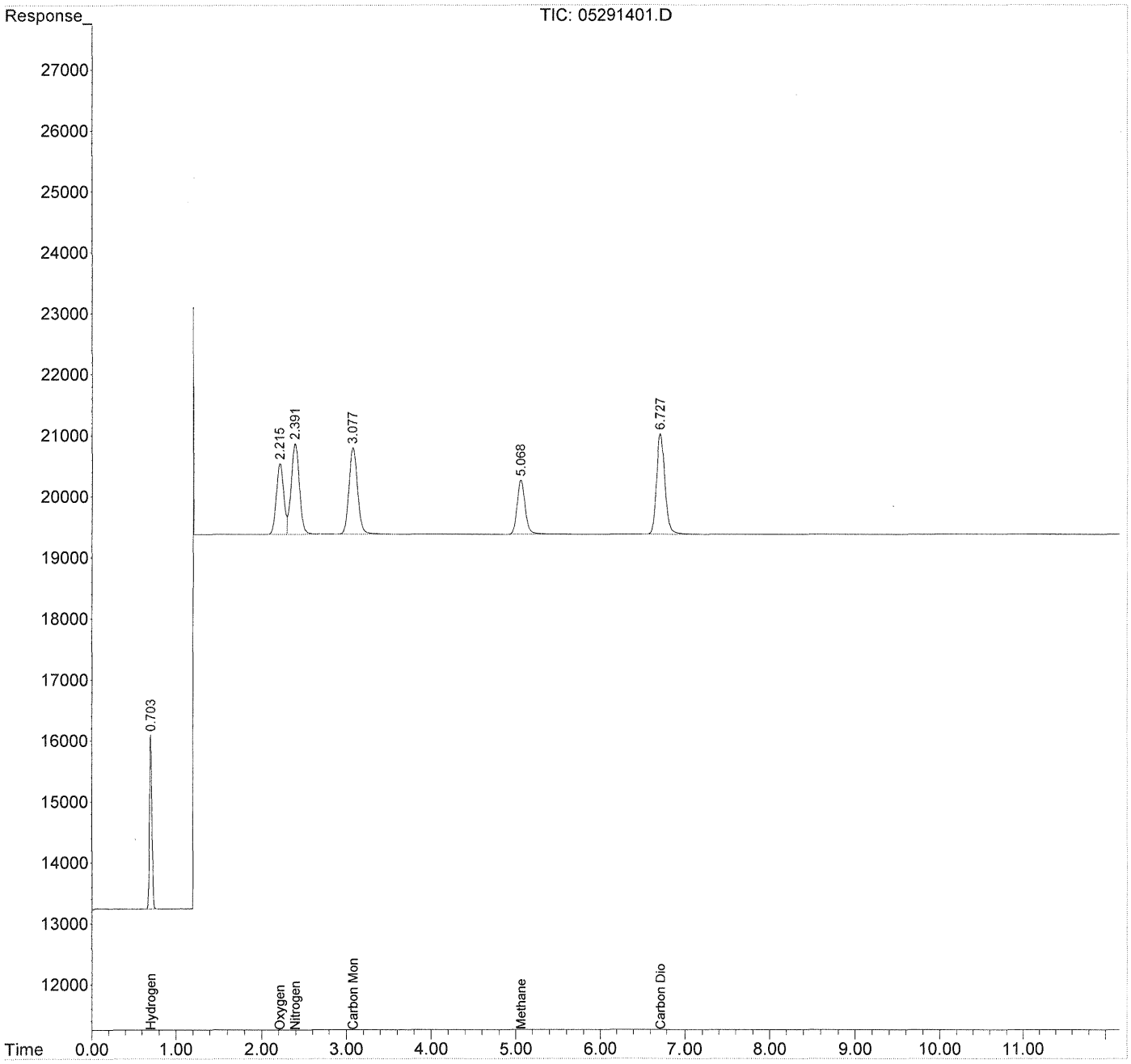
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291401.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 7:48 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:11:36 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291433.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 7:12 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:36 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.699	48821	35346.575	ppm
2)	Oxygen	2.199	62216	37648.795	ppm
3)	Nitrogen	2.374	89123	46418.516	ppm
4)	Carbon Monoxide	3.061	86874	46876.400	ppm
5)	Methane	5.056	51979	37235.399	ppm
6)	Carbon Dioxide	6.718	99810	46391.308	ppm

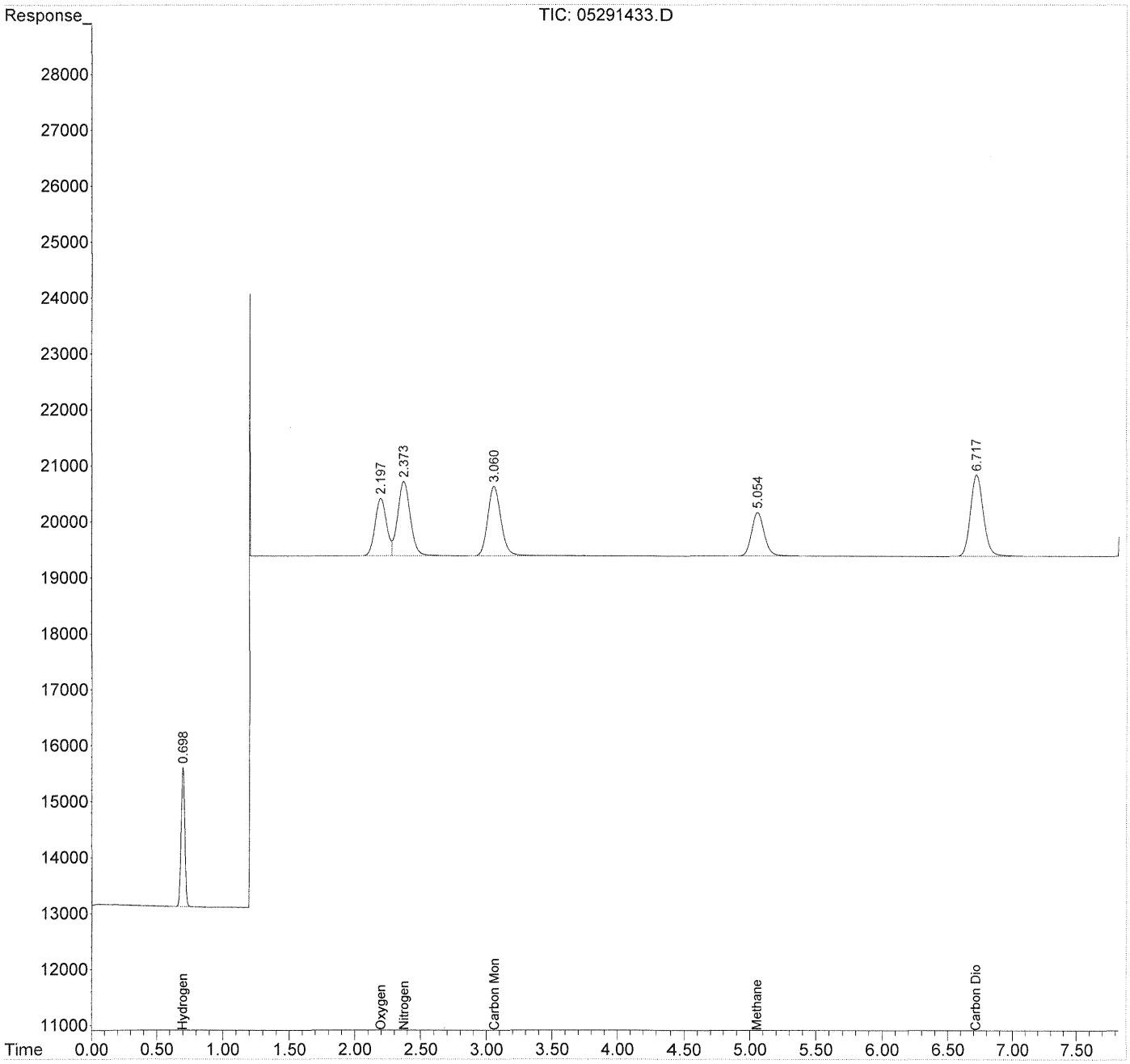
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\29\
Data File : 05291433.D
Signal(s) : TCD1A.CH
Acq On : 29 May 2014 7:12 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 08:12:36 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 :



5/30/14

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 5/30/2014

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 5/30/2014

PAI Job : P1402122

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen		Nitrogen		Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-04241401	34993	36815		45673		45947	36728	45679	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	12.5%	8.0%		8.7%		8.1%	8.1%	8.7%	
Lab Air		201775		718396				349	
MB									
2122-009		131886	0.3%	707040	0.4%			46684	0.1%
2122-009 - 2		132047	0.4%	707482	0.4%			46898	0.6%
2122-009 - 3		130660	0.7%	698512	0.8%			46314	0.7%
2122-009 - Mean		131531		704345				46632	
2122-011		130374	0.2%	700668	0.1%			46767	0.2%
2122-011 - 2		129756	0.7%	696367	0.8%			46410	0.9%
2122-011 - 3		131841	0.9%	707863	0.9%			47387	1.1%
2122-011 - Mean		130657		701633				46855	
STD S30-04241401	40409	41644		50963		52317	41638	52060	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	1.0%	4.0%		1.9%		4.6%	4.2%	4.0%	

Quantitation Report (Not Reviewed)

NL 5/30/14

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301401.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 7:49 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:22 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.706	48332	34993.022	ppm
2)	Oxygen	2.219	60838	36814.922	ppm
3)	Nitrogen	2.395	87692	45673.239	ppm
4)	Carbon Monoxide	3.081	85151	45946.706	ppm
5)	Methane	5.071	51270	36727.545	ppm
6)	Carbon Dioxide	6.732	98277	45678.767	ppm

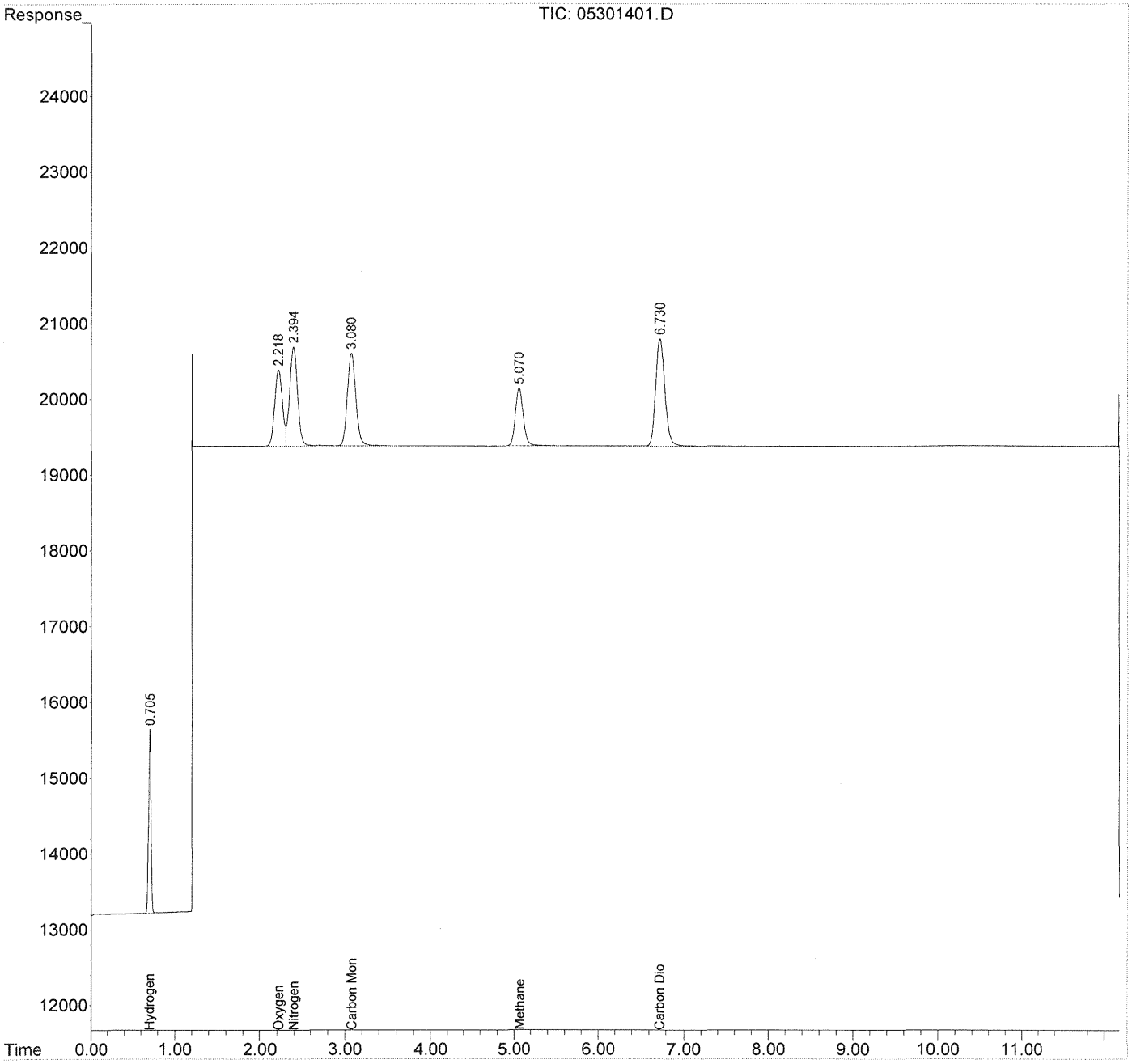
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301401.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 7:49 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 14:03:22 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301423.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:08 pm
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 15:25:08 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.700	55813	40409.343	ppm
2)	Oxygen	2.202	68818	41643.824	ppm
3)	Nitrogen	2.378	97849	50963.027	ppm
4)	Carbon Monoxide	3.063	96956	52317.032	ppm
5)	Methane	5.055	58124	41637.644	ppm
6)	Carbon Dioxide	6.715	112005	52059.597	ppm

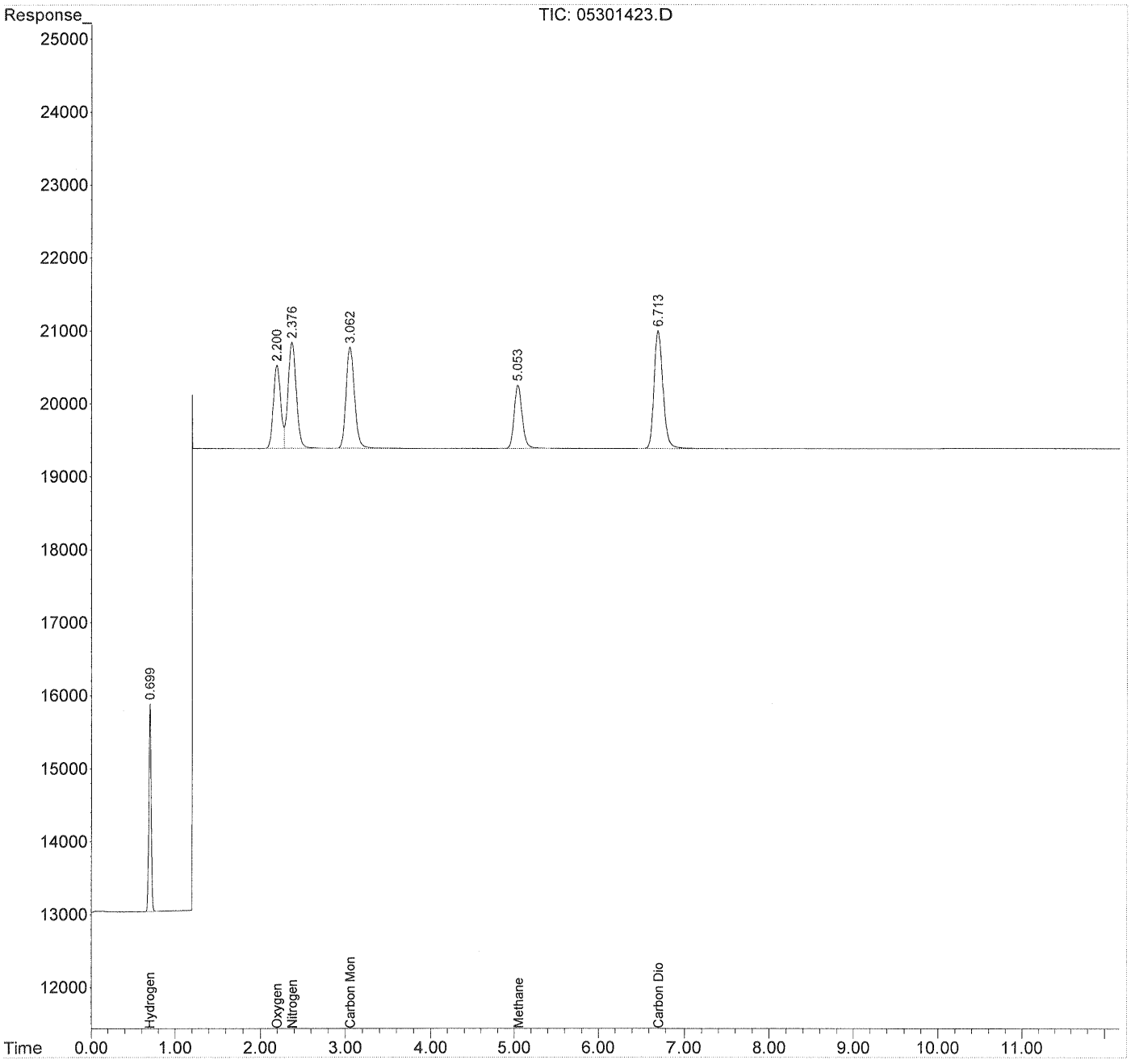
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301423.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:08 pm
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 30 15:25:08 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 :



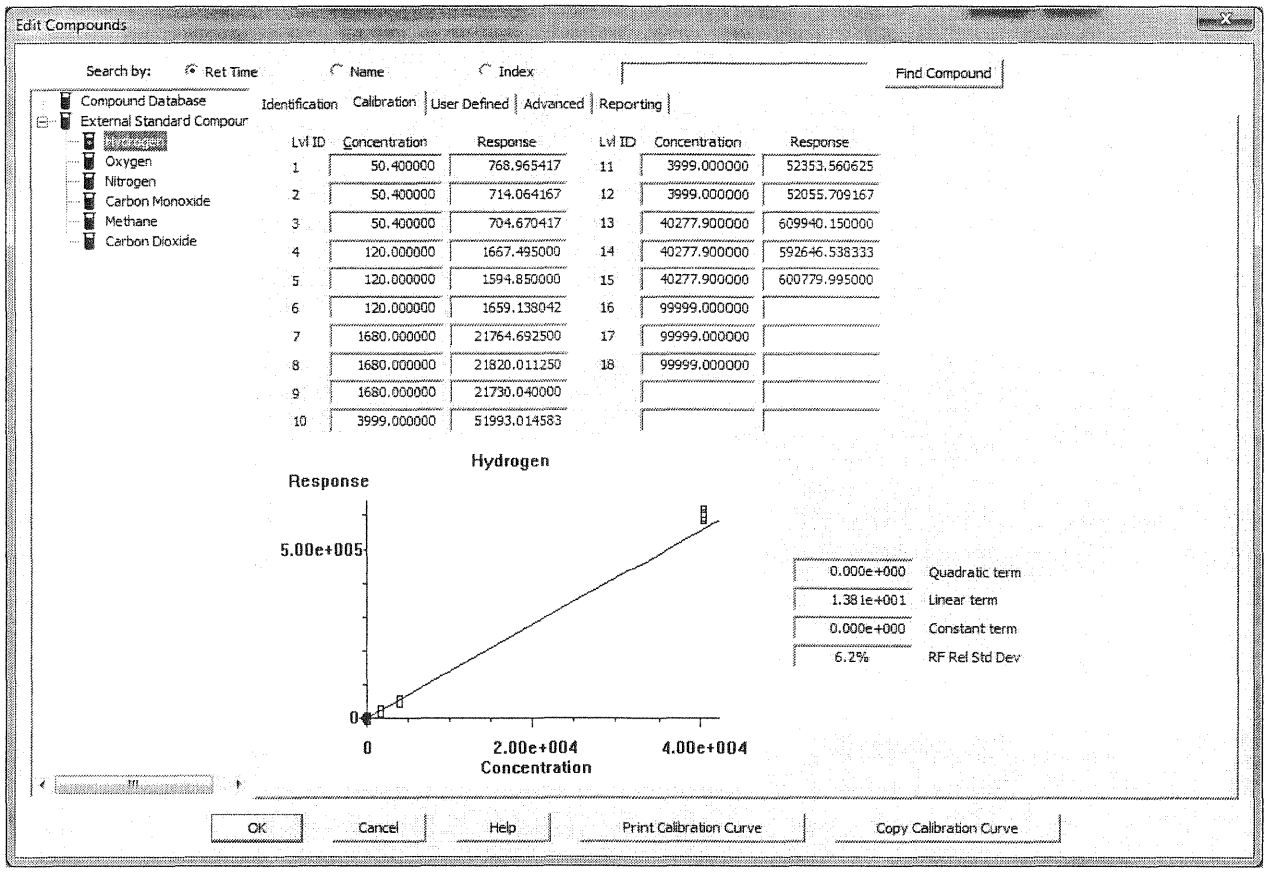
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Method Path : J:\GC01\METHODS\
Method File : TR031014.M
Title : EPA 3C GC/TCD Analysis for Fixed Gases
Last Update : Tue Mar 11 11:04:23 2014
Response Via : Initial Calibration

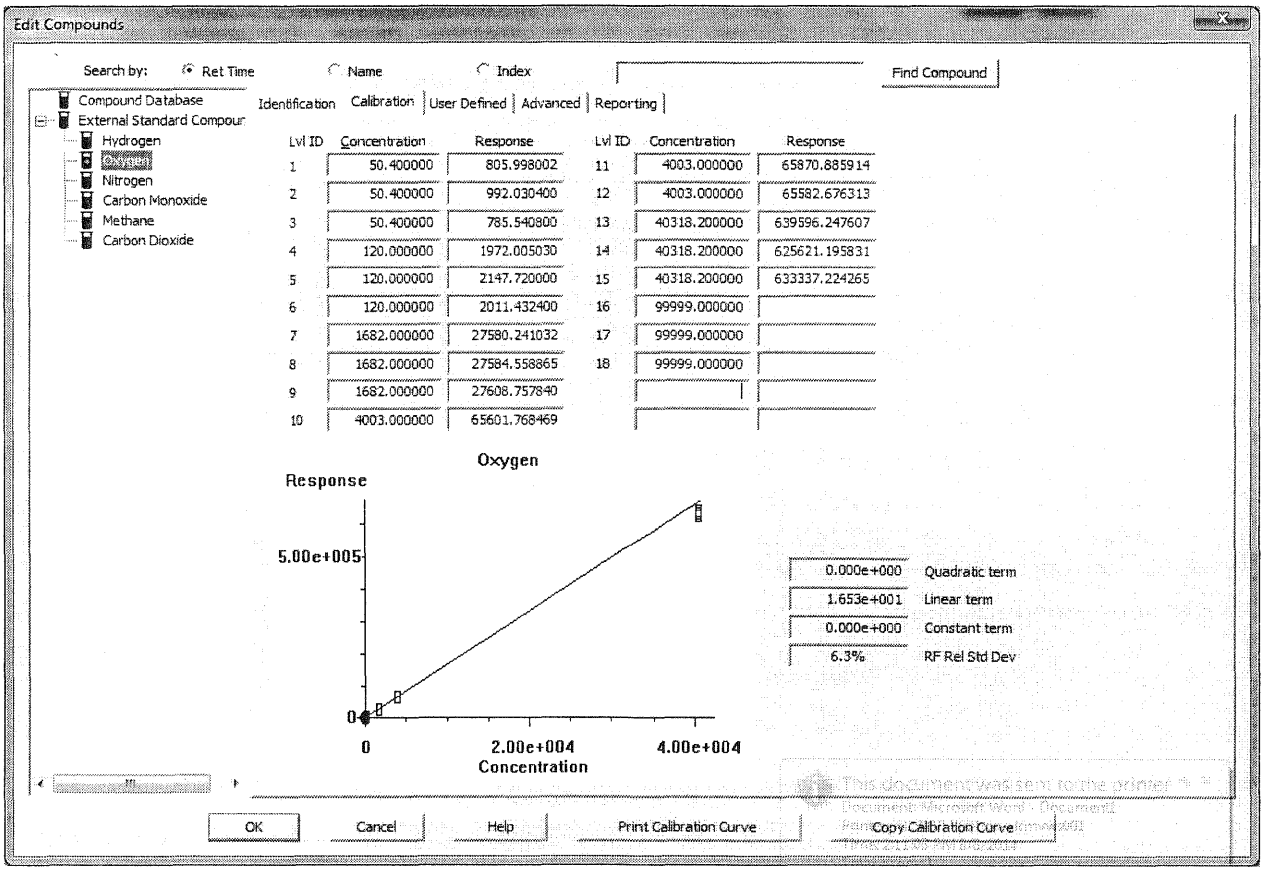
Calibration Files
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4 =03101406.D 5 =03101407.D 6 =03101408.D

	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

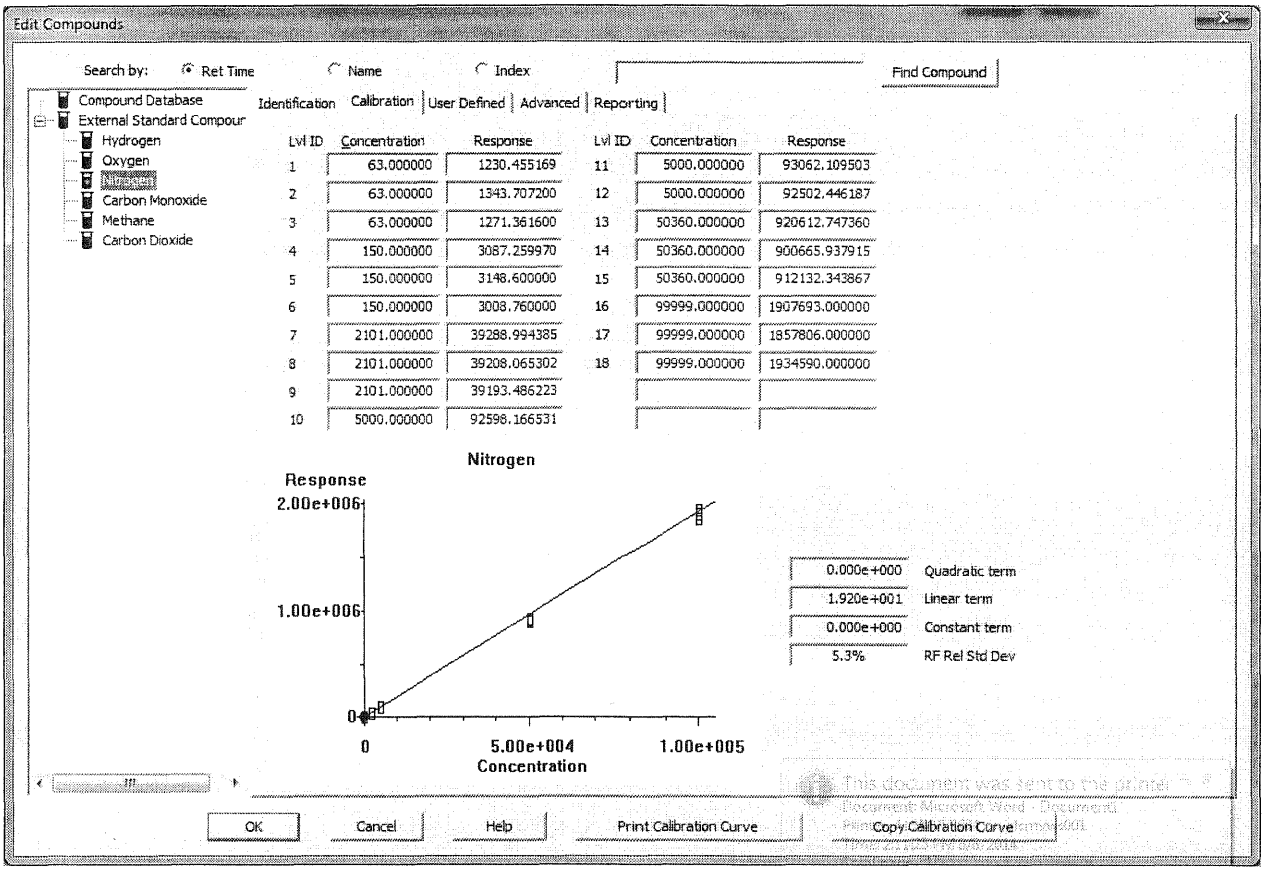
(#) = Out of Range ### Number of calibration levels exceeded format ###


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Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
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3 50.400000 704.670417
4 120.000000 1667.495000
5 120.000000 1594.850000
6 120.000000 1659.138042
7 1680.000000 21764.692500
8 1680.000000 21820.011250
9 1680.000000 21730.040000
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2.00e+004
4.00e+004
Concentration
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OK
Cancel
Help
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Copy Calibration Curve

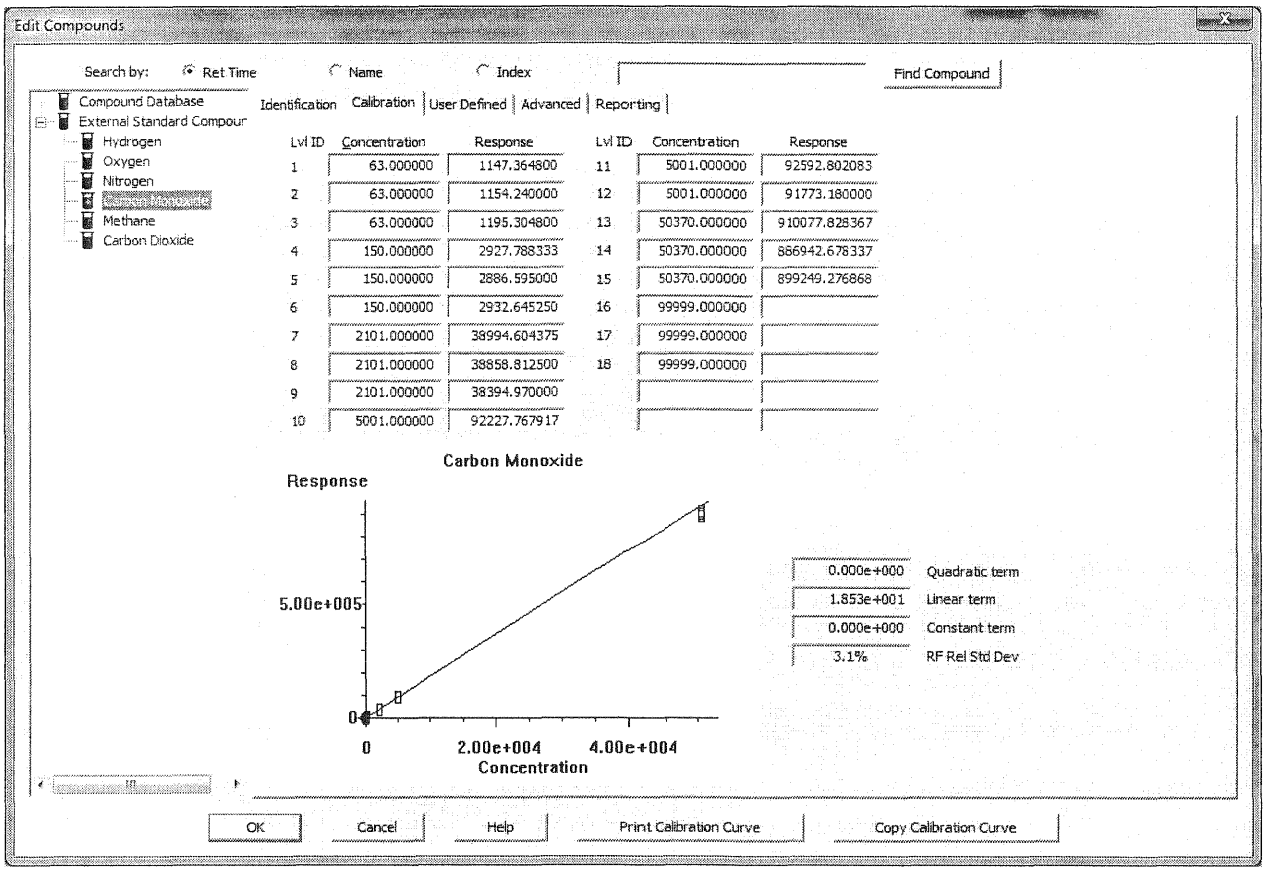
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Name
Index
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Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
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14 40318.200000 625621.195831
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18 99999.000000
Oxygen
Response
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0
0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.653e+001 Linear term
0.000e+000 Constant term
6.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

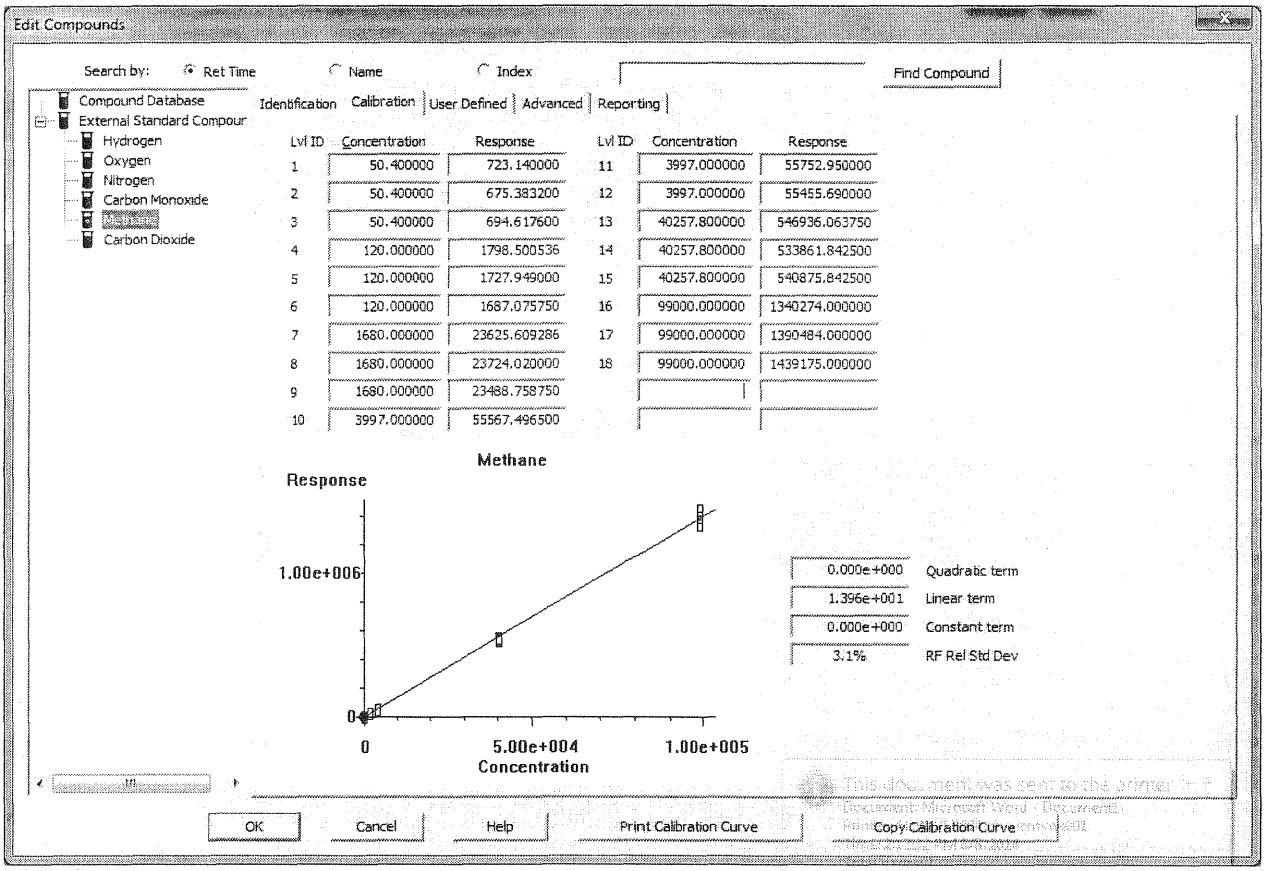
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Search by:
Ret Time
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Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
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2 63.000000 1343.707200
3 63.000000 1271.361600
4 150.000000 3087.259970
5 150.000000 3148.600000
6 150.000000 3008.760000
7 2101.000000 39288.994385
8 2101.000000 39208.065302
9 2101.000000 39193.486223
10 5000.000000 92598.166531
11 5000.000000 93062.109503
12 5000.000000 92502.446187
13 50360.000000 920612.747360
14 50360.000000 900665.937915
15 50360.000000 912132.343867
16 99999.000000 1907693.000000
17 99999.000000 1857806.000000
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Nitrogen
Response
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Concentration
0.000e+000 Quadratic term
1.920e+001 Linear term
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5.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

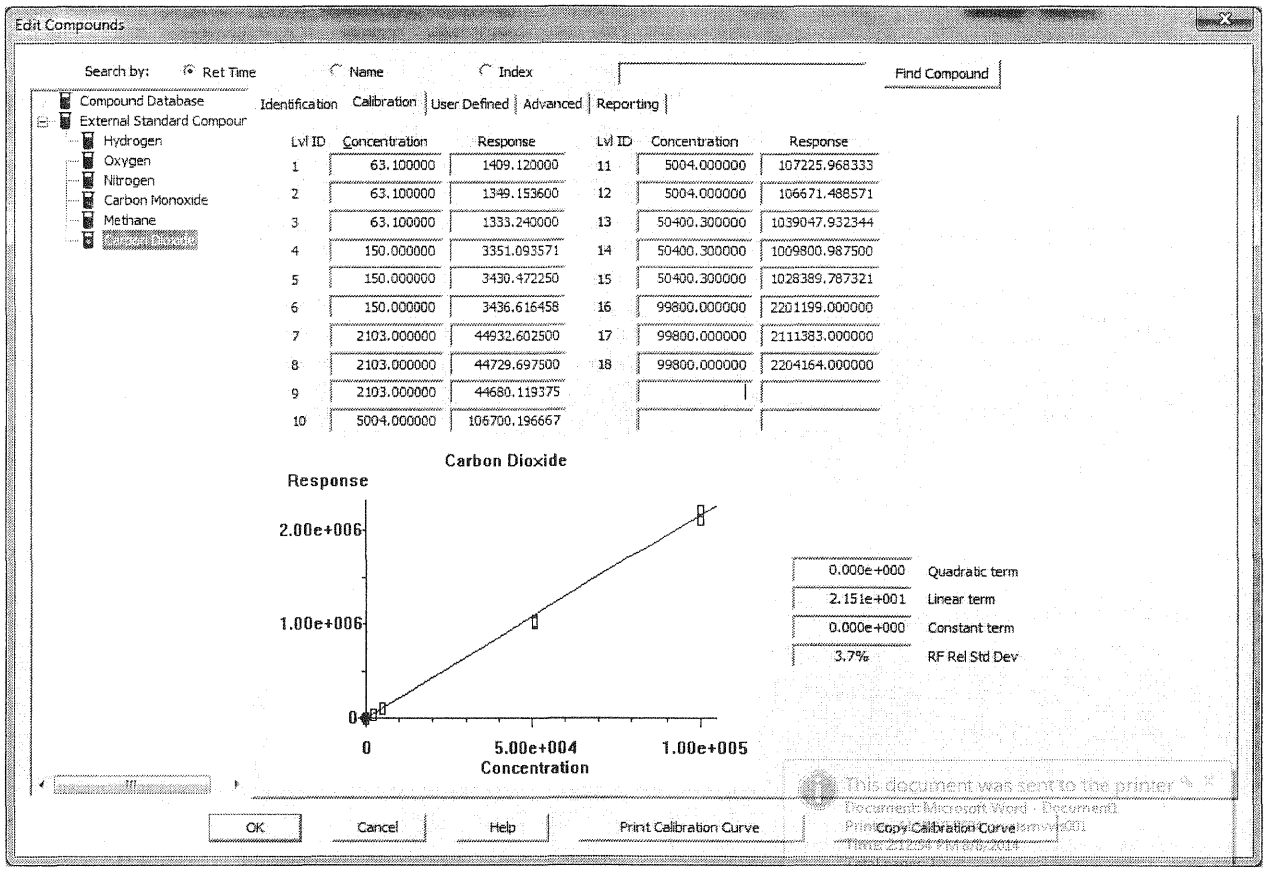
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Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
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2 63.000000 1154.240000
3 63.000000 1195.304800
4 150.000000 2927.788333
5 150.000000 2886.595000
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9 2101.000000 38394.970000
10 5001.000000 92227.767917
11 5001.000000 92592.802083
12 5001.000000 91773.180000
13 50370.000000 910077.828367
14 50370.000000 886942.678337
15 50370.000000 899249.276868
16 99999.000000
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Carbon Monoxide
Response
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0
0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.853e+001 Linear term
0.000e+000 Constant term
3.1% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

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Edit Compounds
Search by:
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Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 50.400000 723.140000
2 50.400000 675.383200
3 50.400000 694.617600
4 120.000000 1798.500536
5 120.000000 1727.949000
6 120.000000 1687.075750
7 1680.000000 23625.609286
8 1680.000000 23724.020000
9 1680.000000 23488.758750
10 3997.000000 55567.496500
11 3997.000000 55752.950000
12 3997.000000 55455.690000
13 40257.800000 546936.063750
14 40257.800000 533861.842500
15 40257.800000 540875.842500
16 99000.000000 1340274.000000
17 99000.000000 1390484.000000
18 99000.000000 1439175.000000
Methane
Response
1.00e+006
0
0
5.00e+004
1.00e+005
Concentration
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
Copy Calibration Curve

Added Page


Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 63.100000 1409.120000
2 63.100000 1349.153600
3 63.100000 1333.240000
4 150.000000 3351.093571
5 150.000000 3430.472250
6 150.000000 3436.616458
7 2103.000000 44932.602500
8 2103.000000 44729.697500
9 2103.000000 44680.119375
10 5004.000000 106700.196667
11 5004.000000 107225.968333
12 5004.000000 106671.488571
13 50400.300000 1039047.932344
14 50400.300000 1009800.987500
15 50400.300000 1028389.787321
16 99800.000000 2201199.000000
17 99800.000000 2111383.000000
18 99800.000000 2204164.000000
Carbon Dioxide
Response
2.00e+006
1.00e+006
0
0
5.00e+004
1.00e+005
Concentration
0.000e+000 Quadratic term
2.151e+001 Linear term
0.000e+000 Constant term
3.7% RF Rel Std Dev
This document was sent to the printer
Document: Microsoft Word - Document1
Print: Copy Calibration Curve
Time: 2:12:54 PM 8/7/2014
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

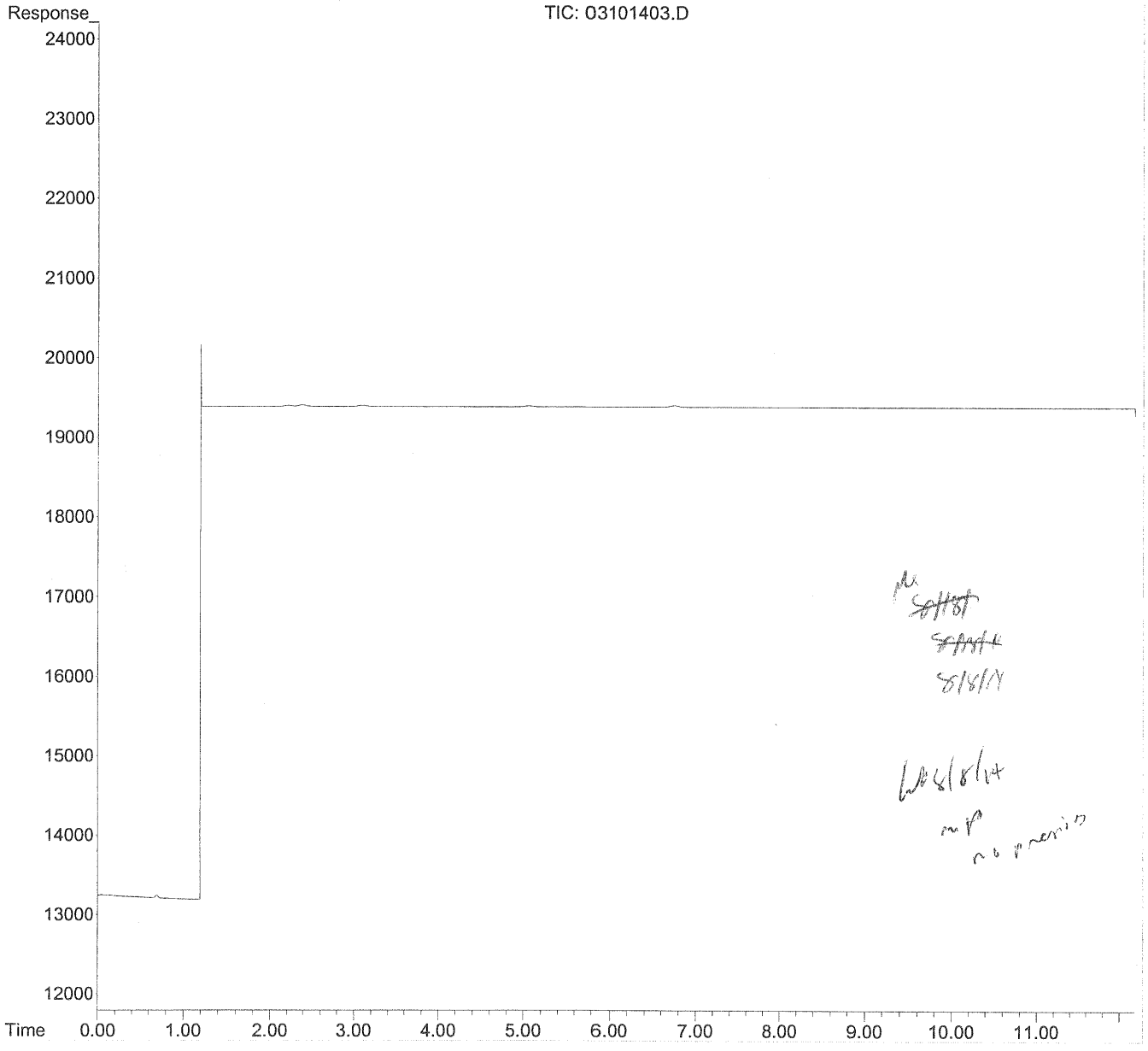
Added Page

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

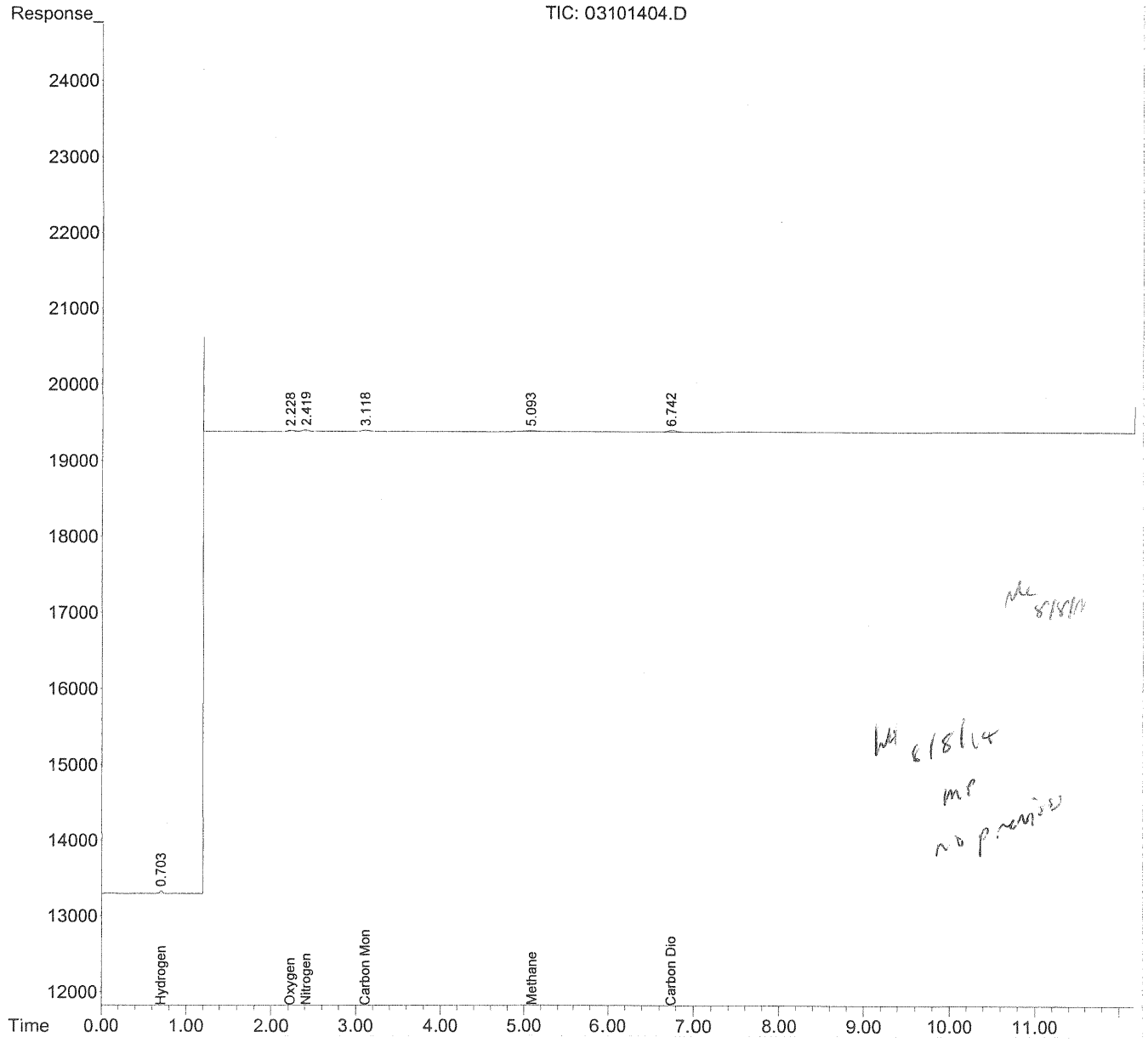
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



mc 8/18/14

WH 8/18/14
mc
no problem

Quantitation Report (QT Reviewed)

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 :

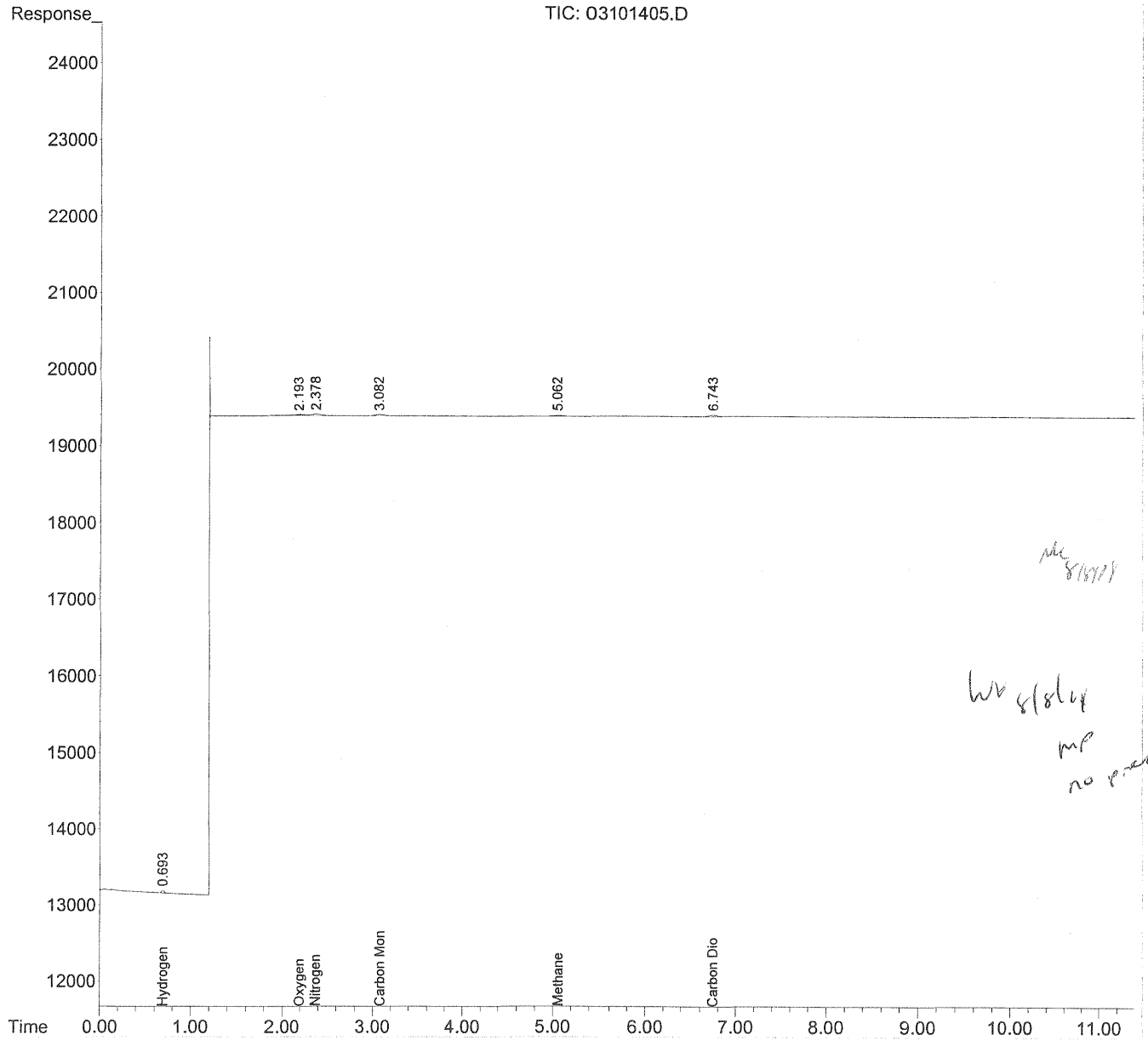
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Hydrogen	0.704	714	468.016	ppm	
2)	Oxygen	2.228	992	620.328	ppm	m
3)	Nitrogen	2.419	1344	687.986	ppm	m
4)	Carbon Monoxide	3.118	1154	633.775	ppm	m
5)	Methane	5.093	675	470.715	ppm	m
6)	Carbon Dioxide	6.742	1349	604.147	ppm	m

(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 :



WH 8/8/14
MP
no previous

Added Page

Quantitation Report (QT Reviewed)

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

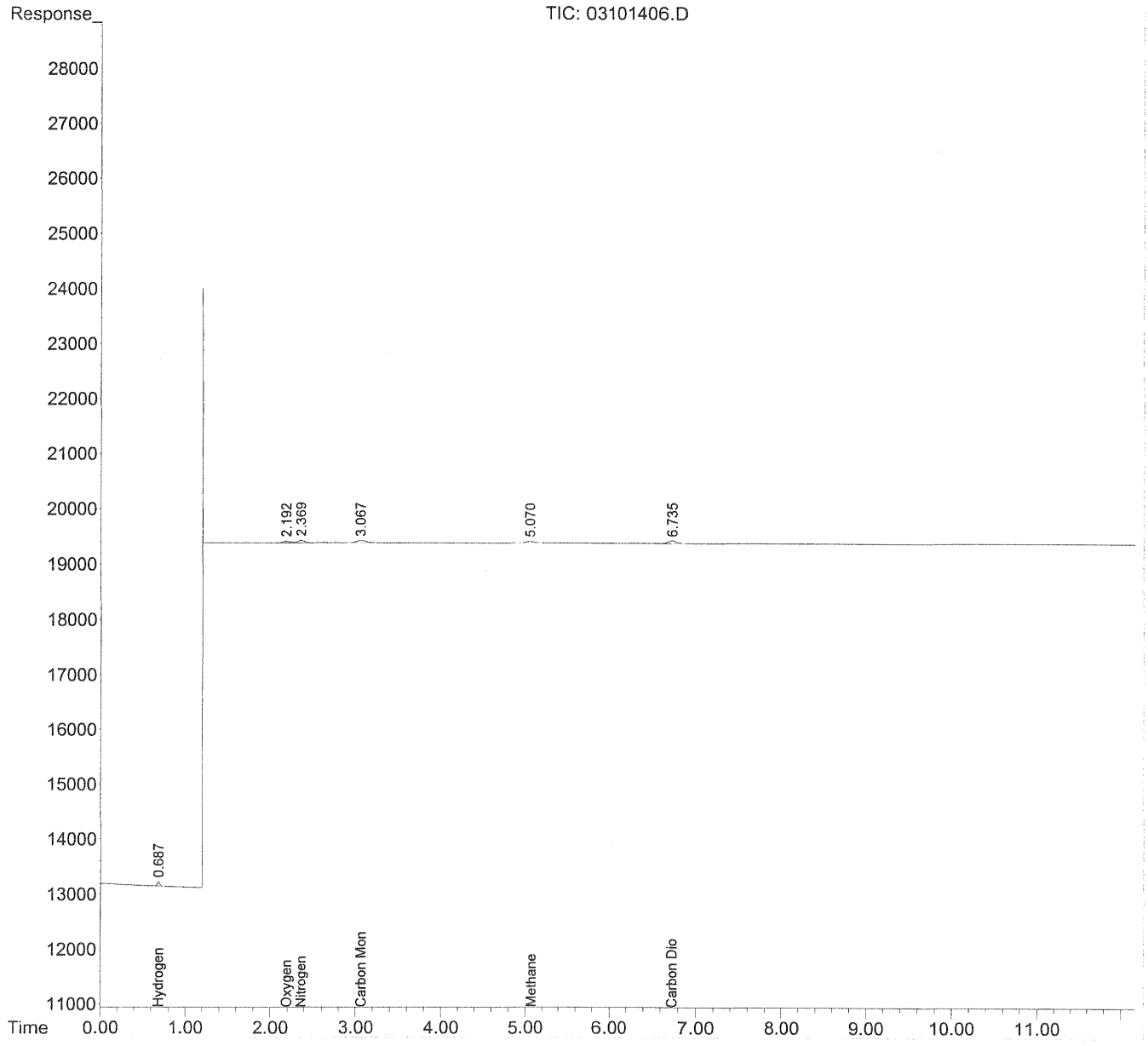
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

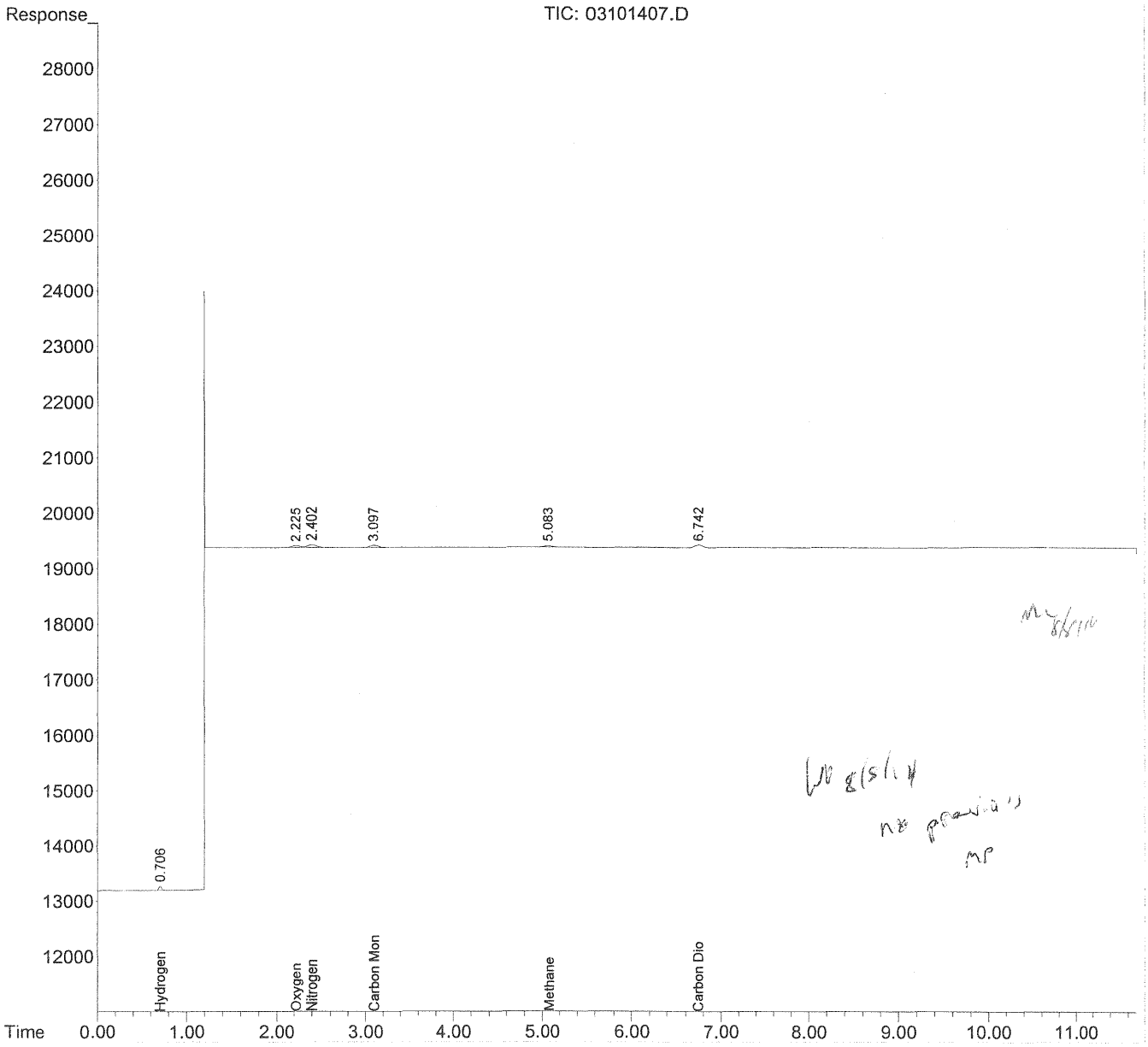
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Added Page

Quantitation Report (QT Reviewed)

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	

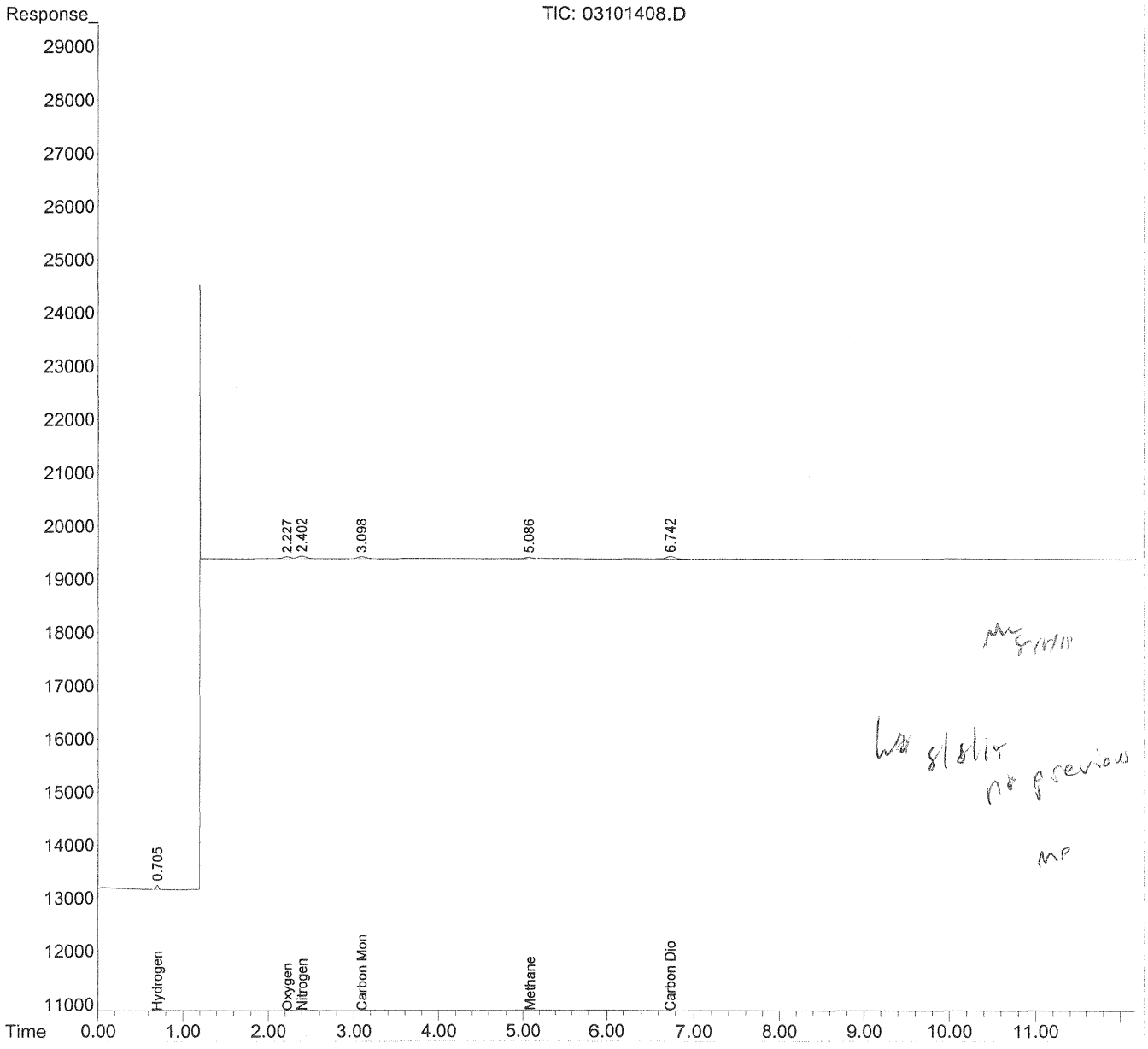
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MW 8/11/14

WH 8/8/14 no previous MP

Added Page

Quantitation Report (QT Reviewed)

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	

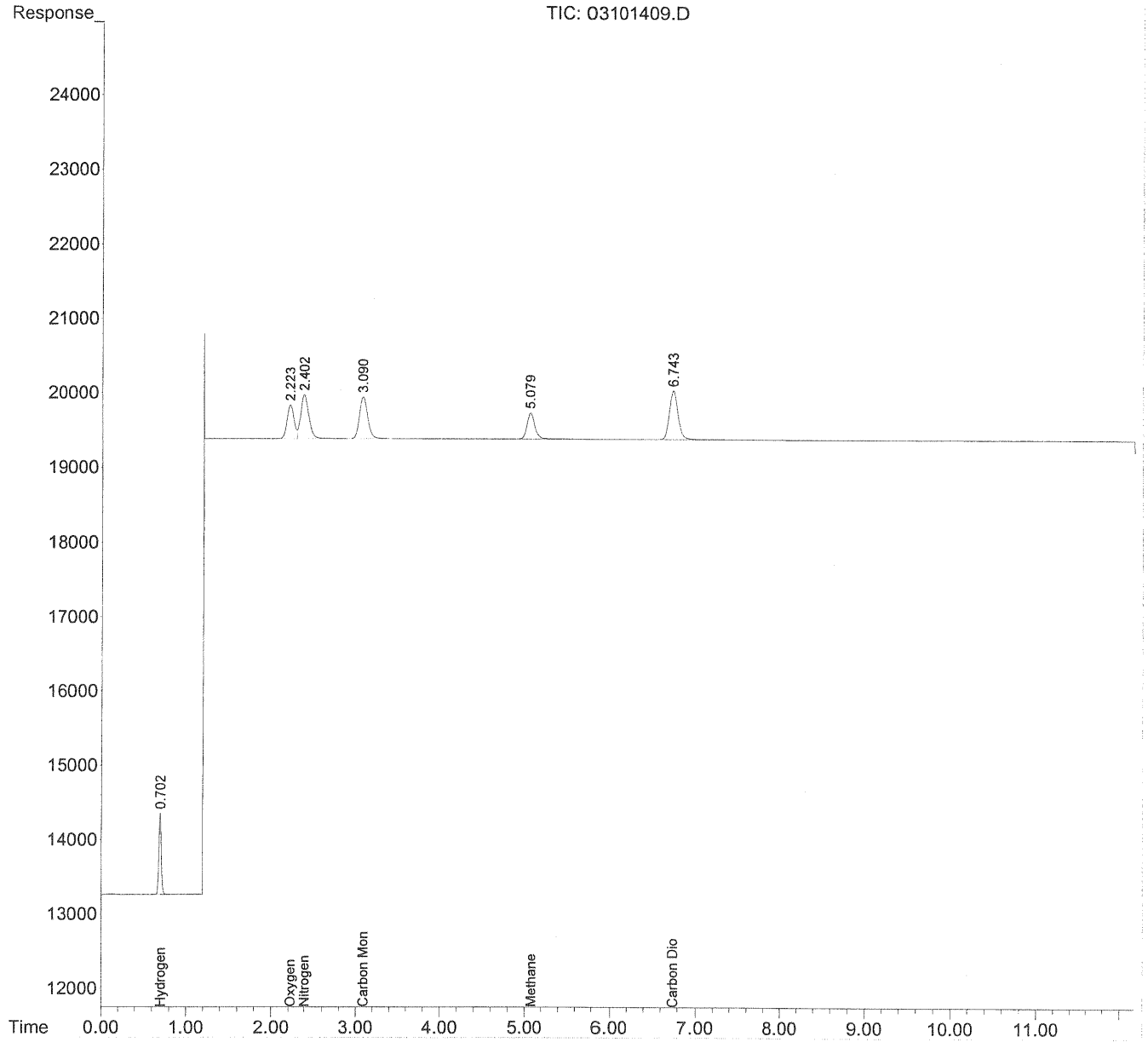
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

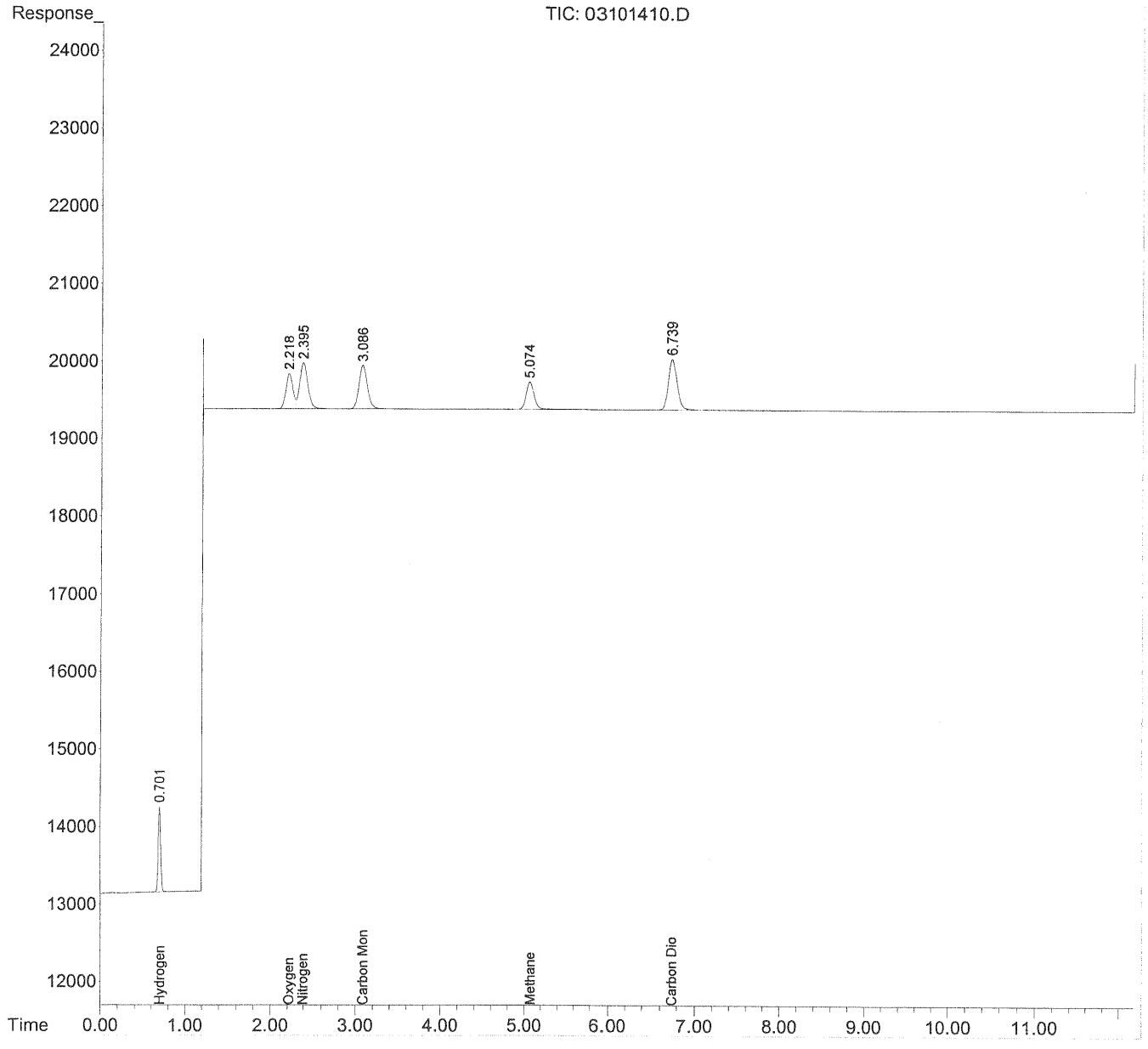
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

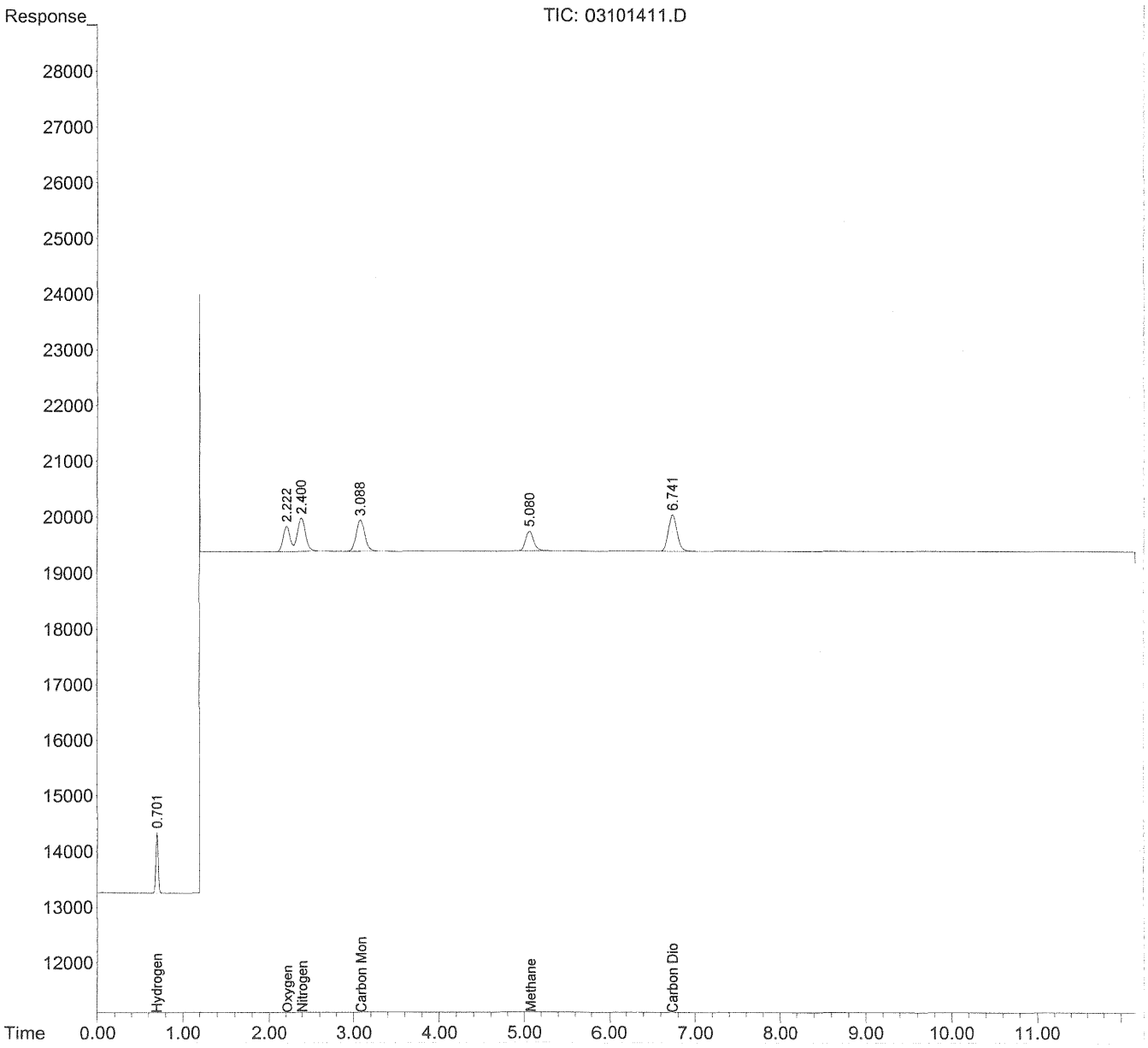
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

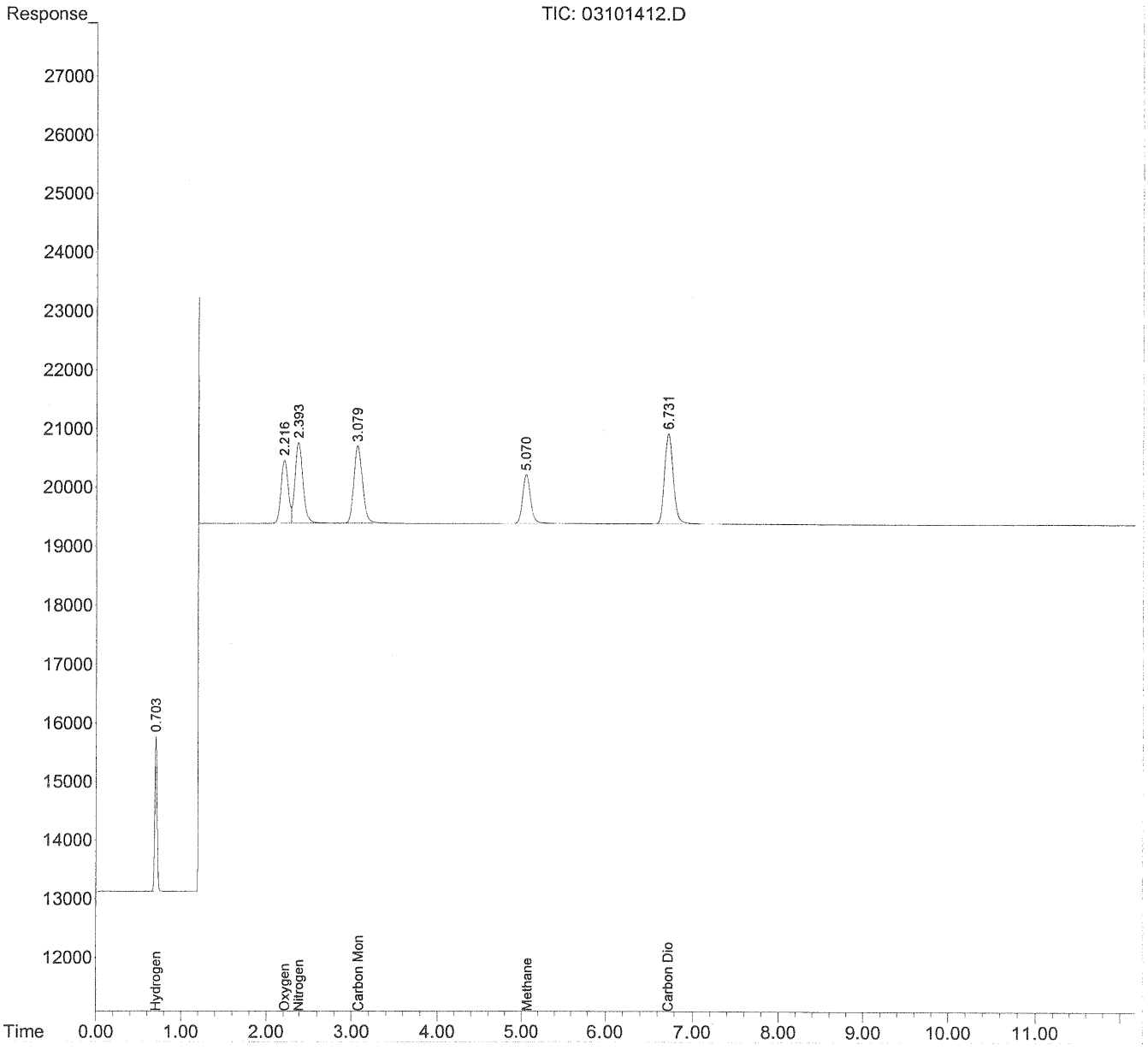
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

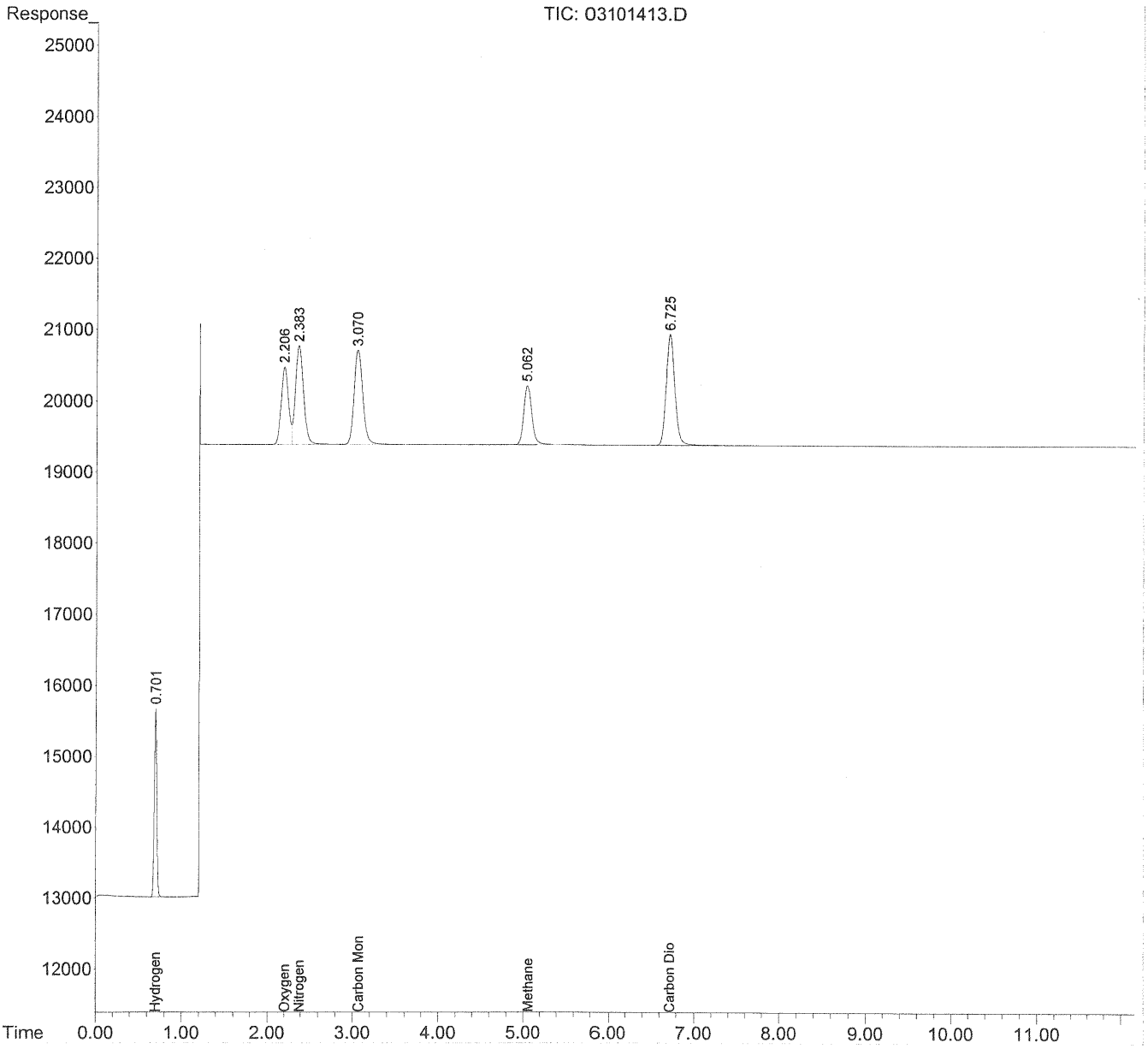
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

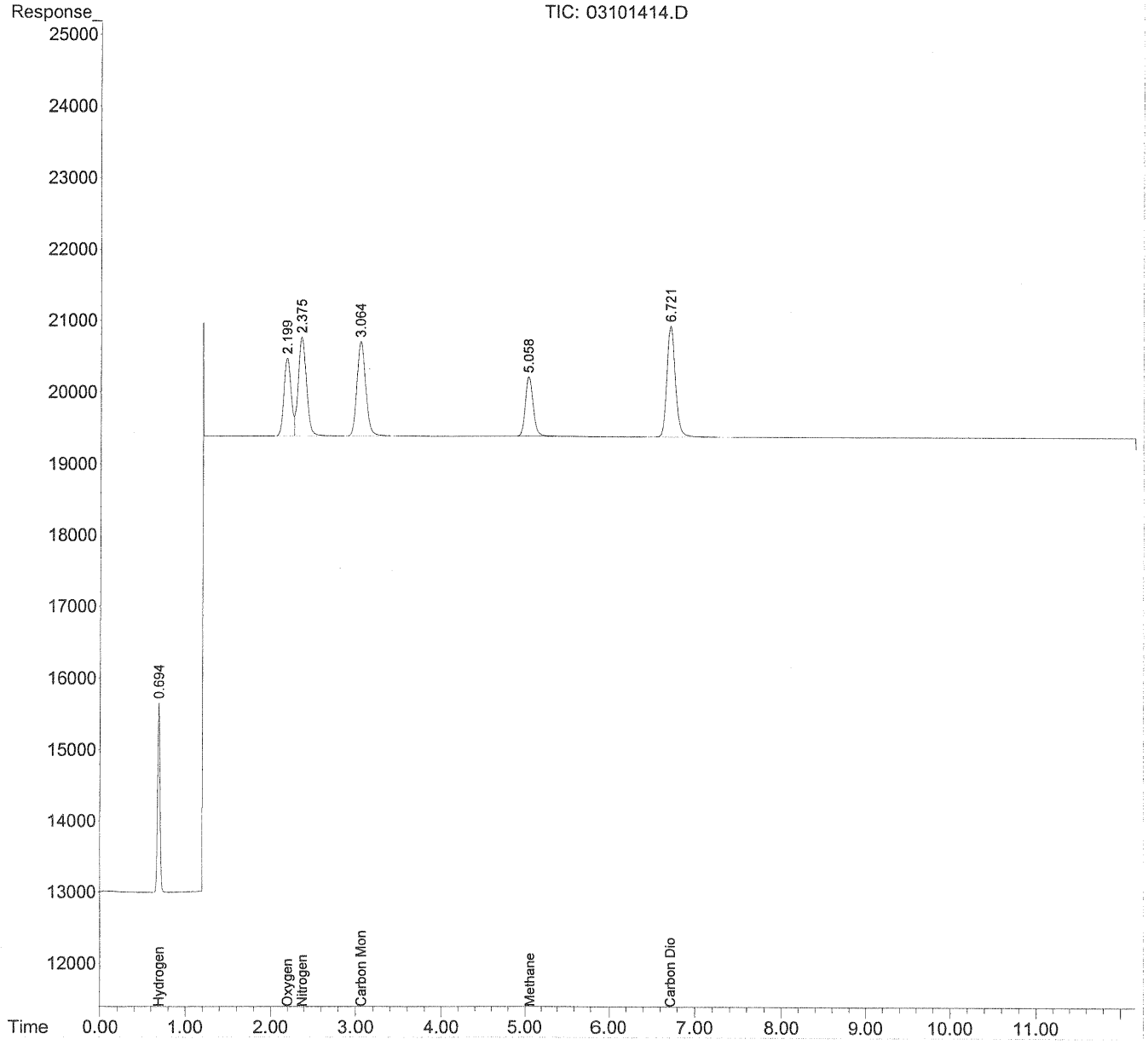
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

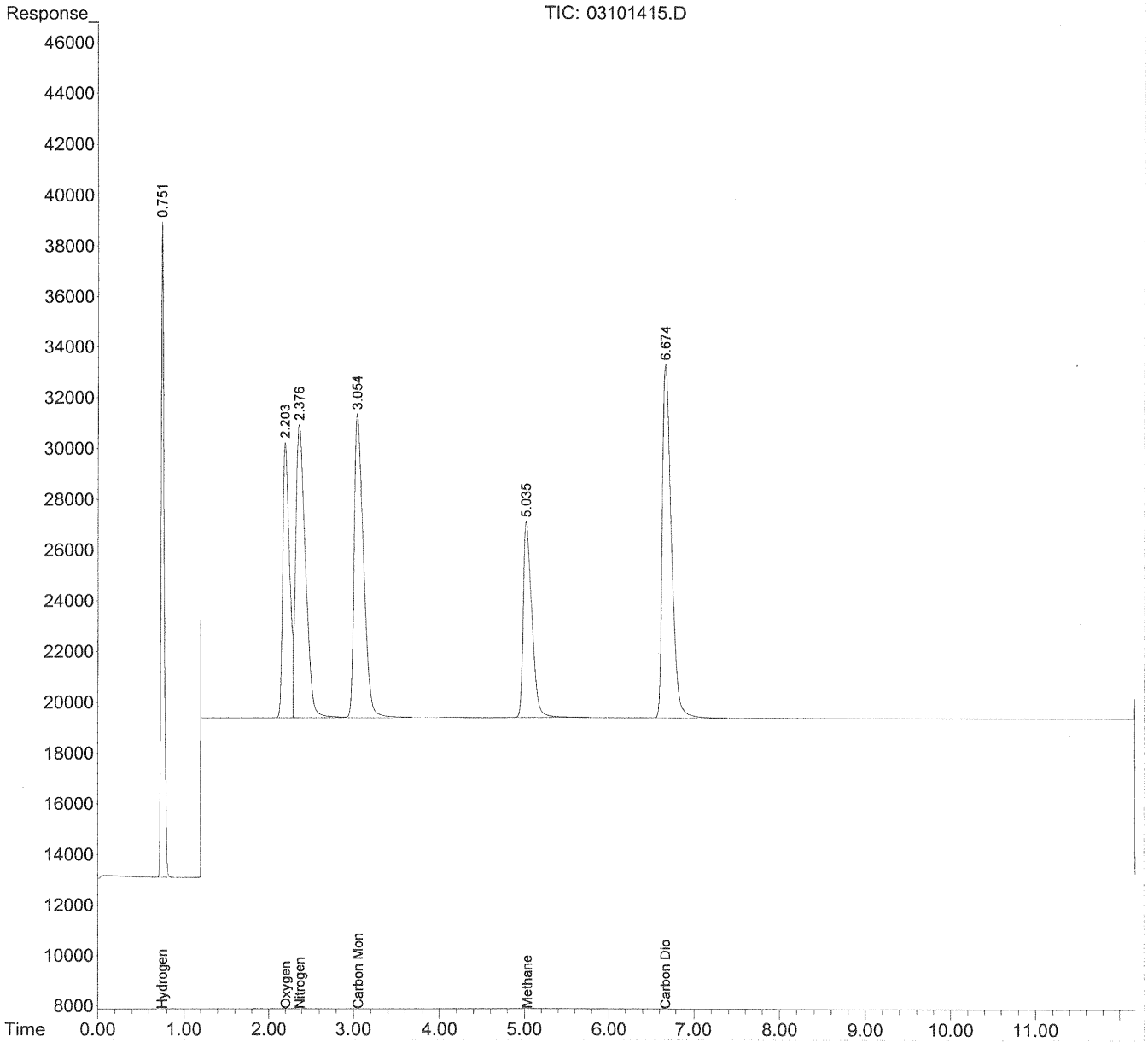
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

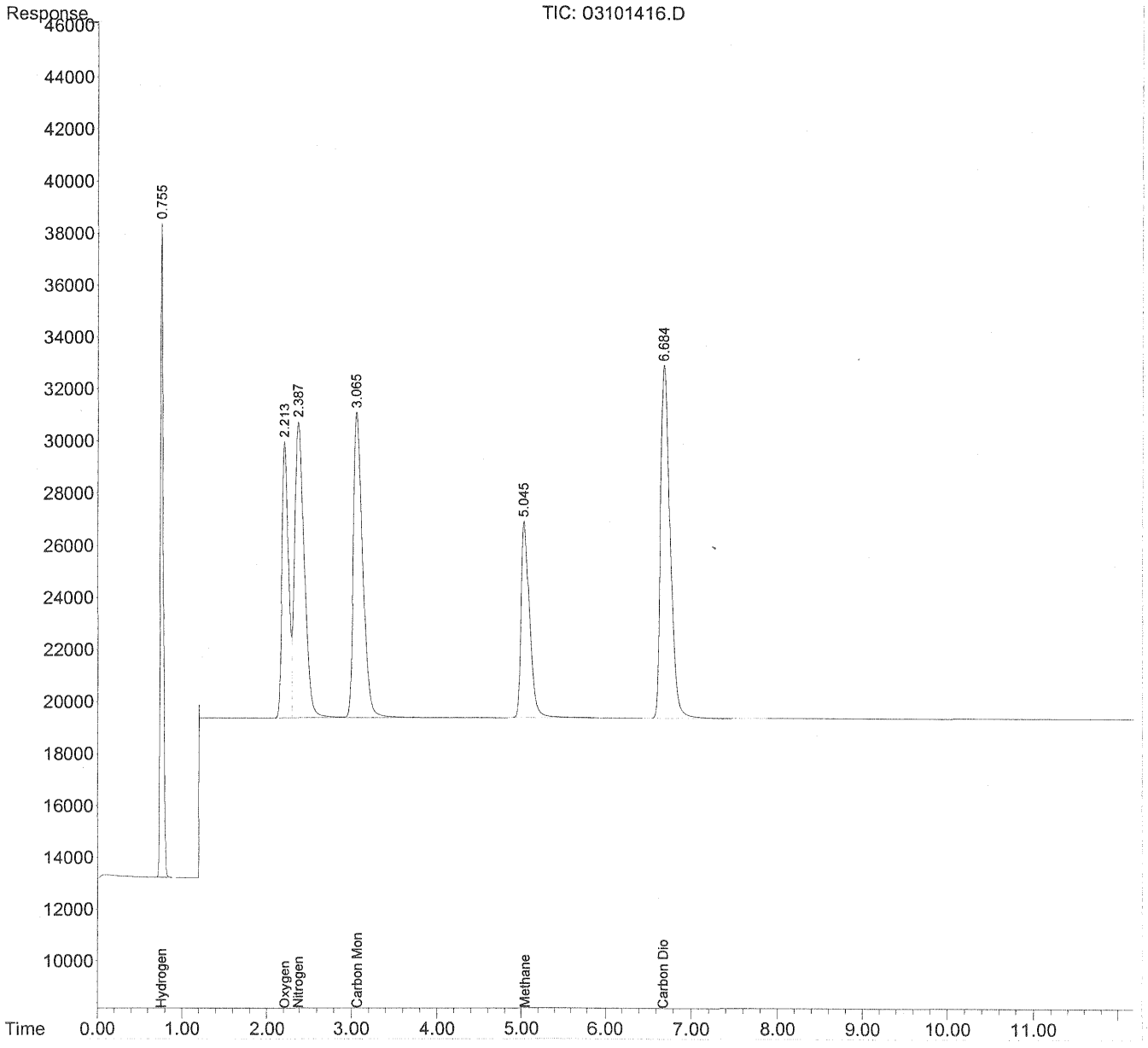
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

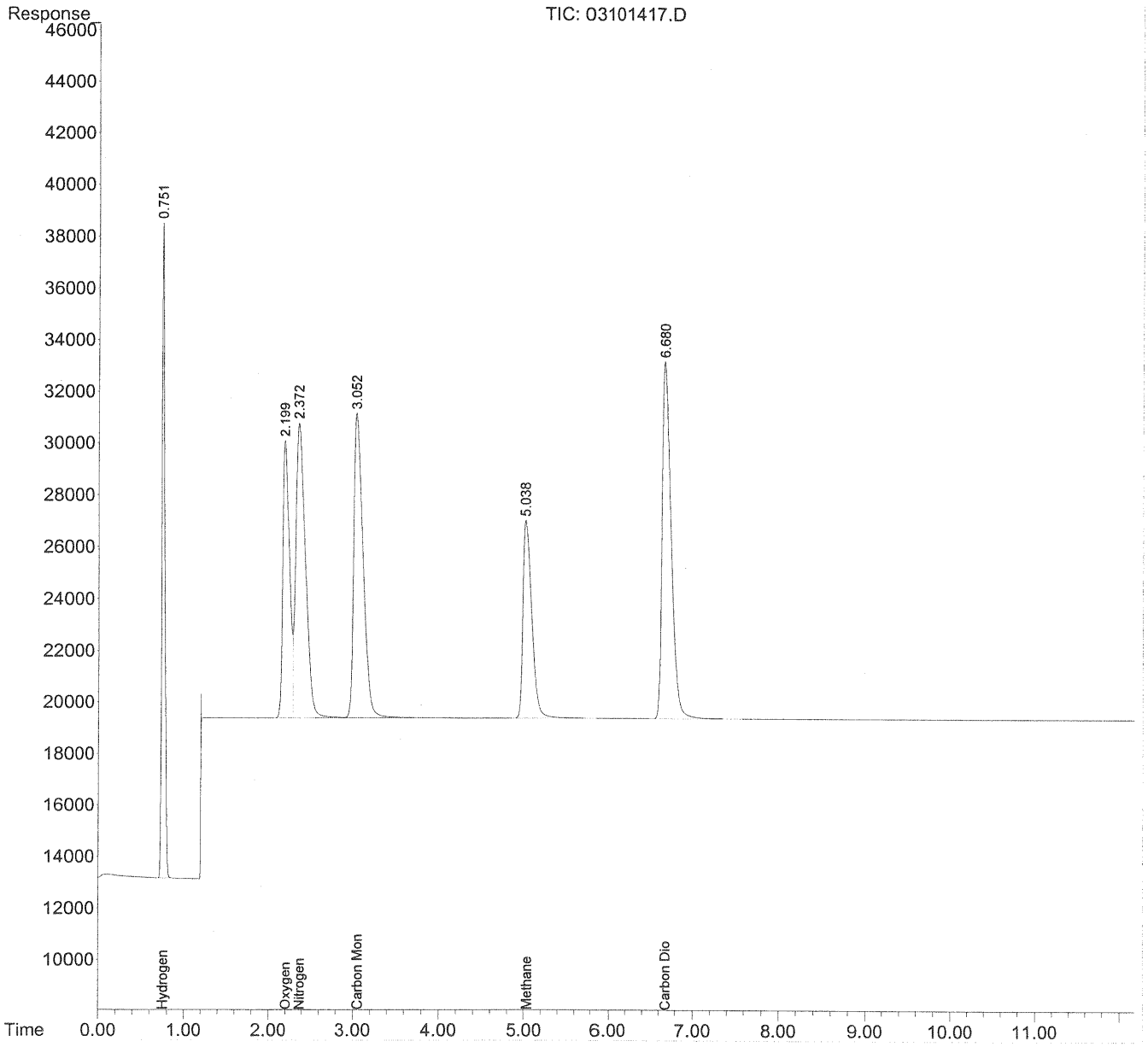
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

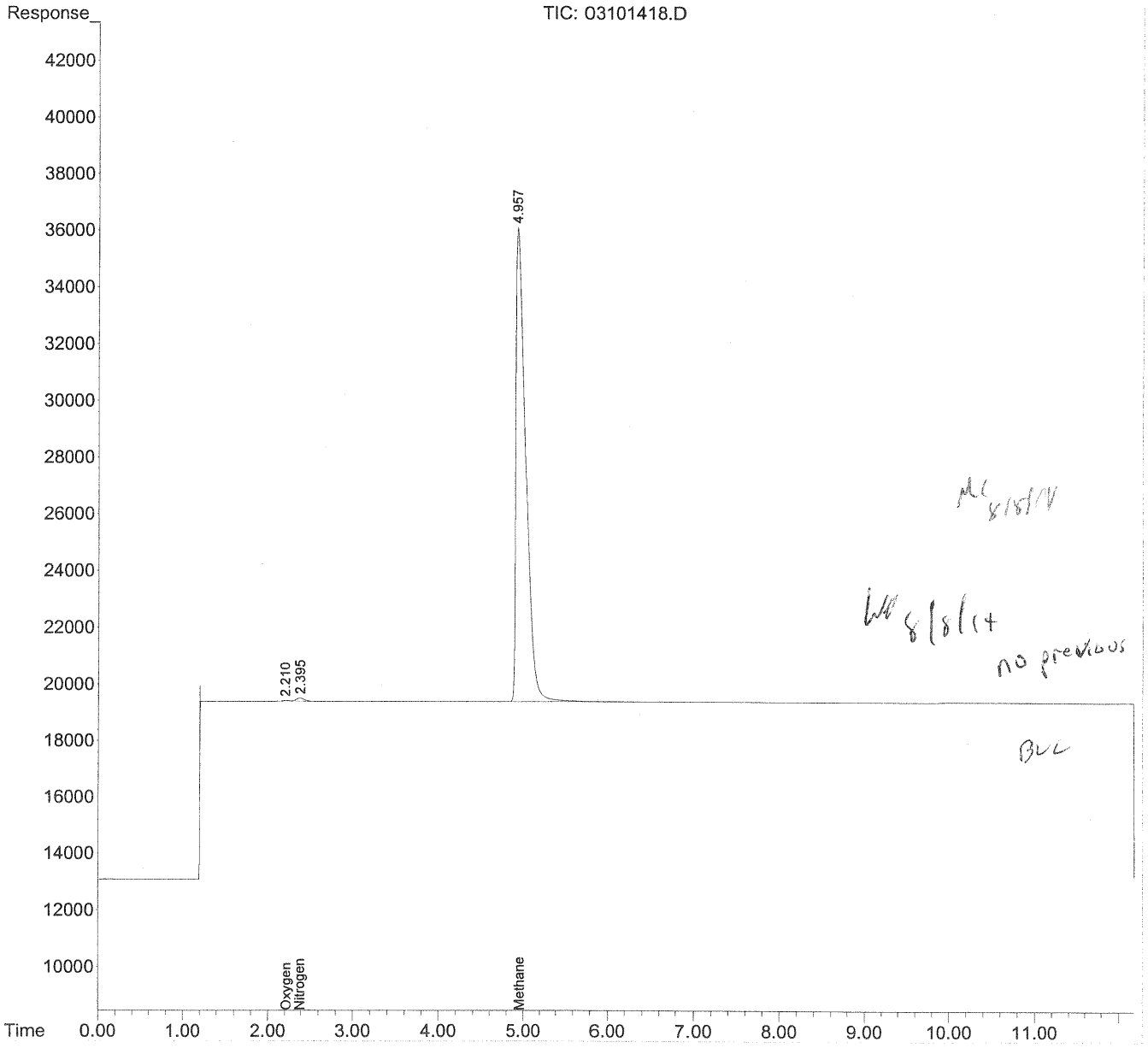
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MC 8/8/14

WH 8/8/14

no previous

BLC

Quantitation Report (QT Reviewed)

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	

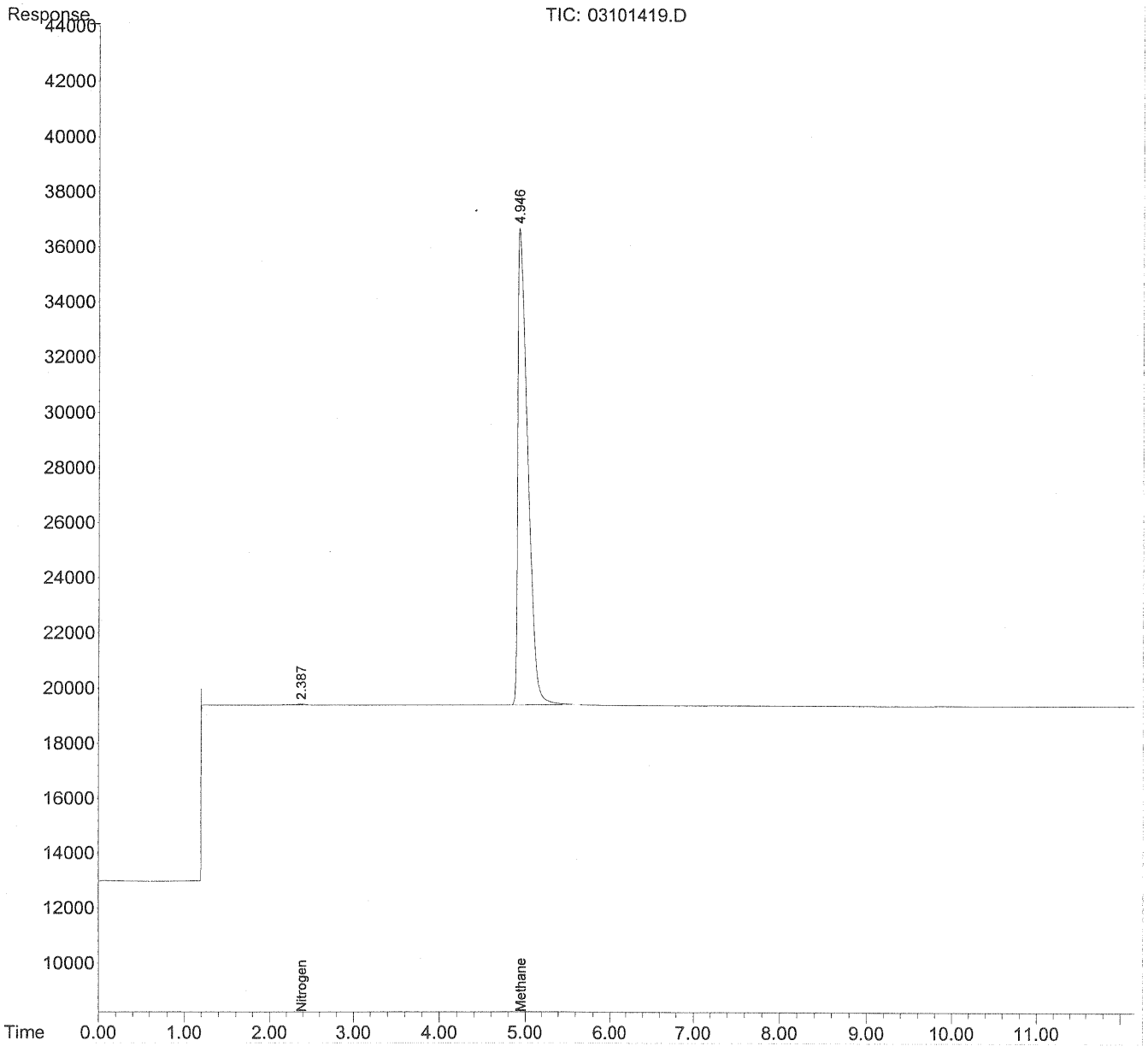
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

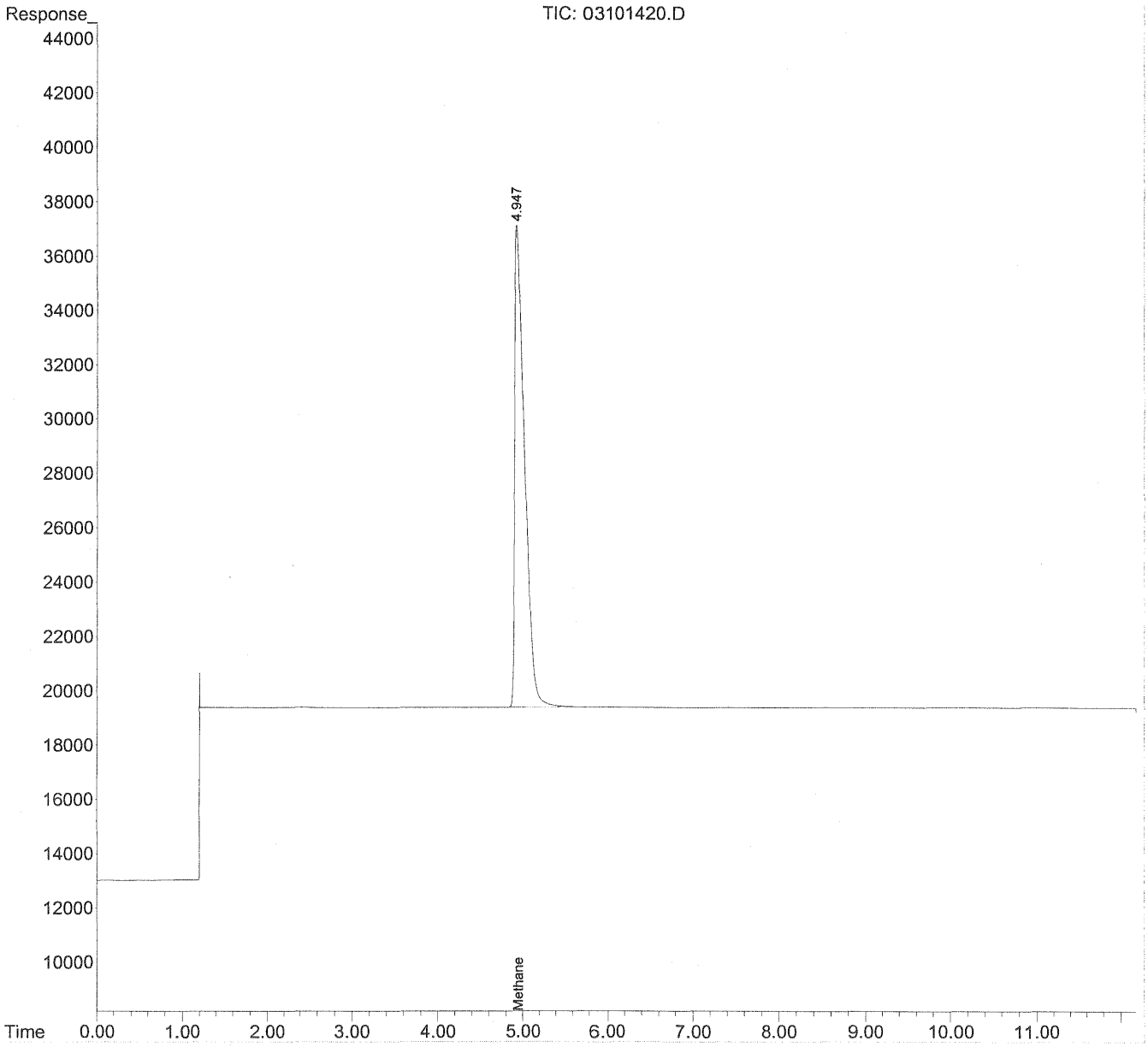
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

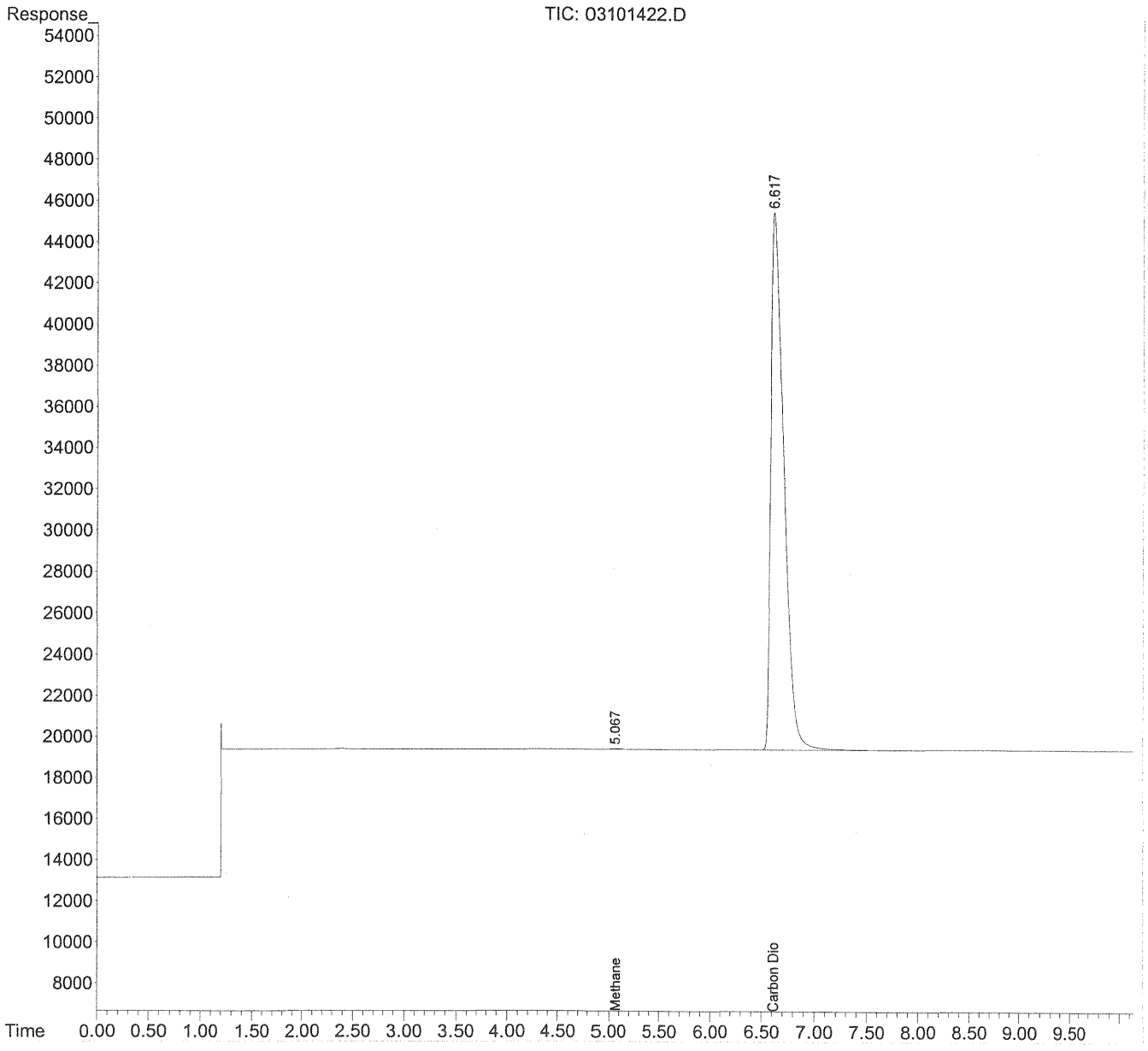
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	0.000	0	N.D.	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	4.949	1439175	1032160.623	ppm
6)	Carbon Dioxide	0.000	0	N.D.	ppm

(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 :



Quantitation Report (QT Reviewed)

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

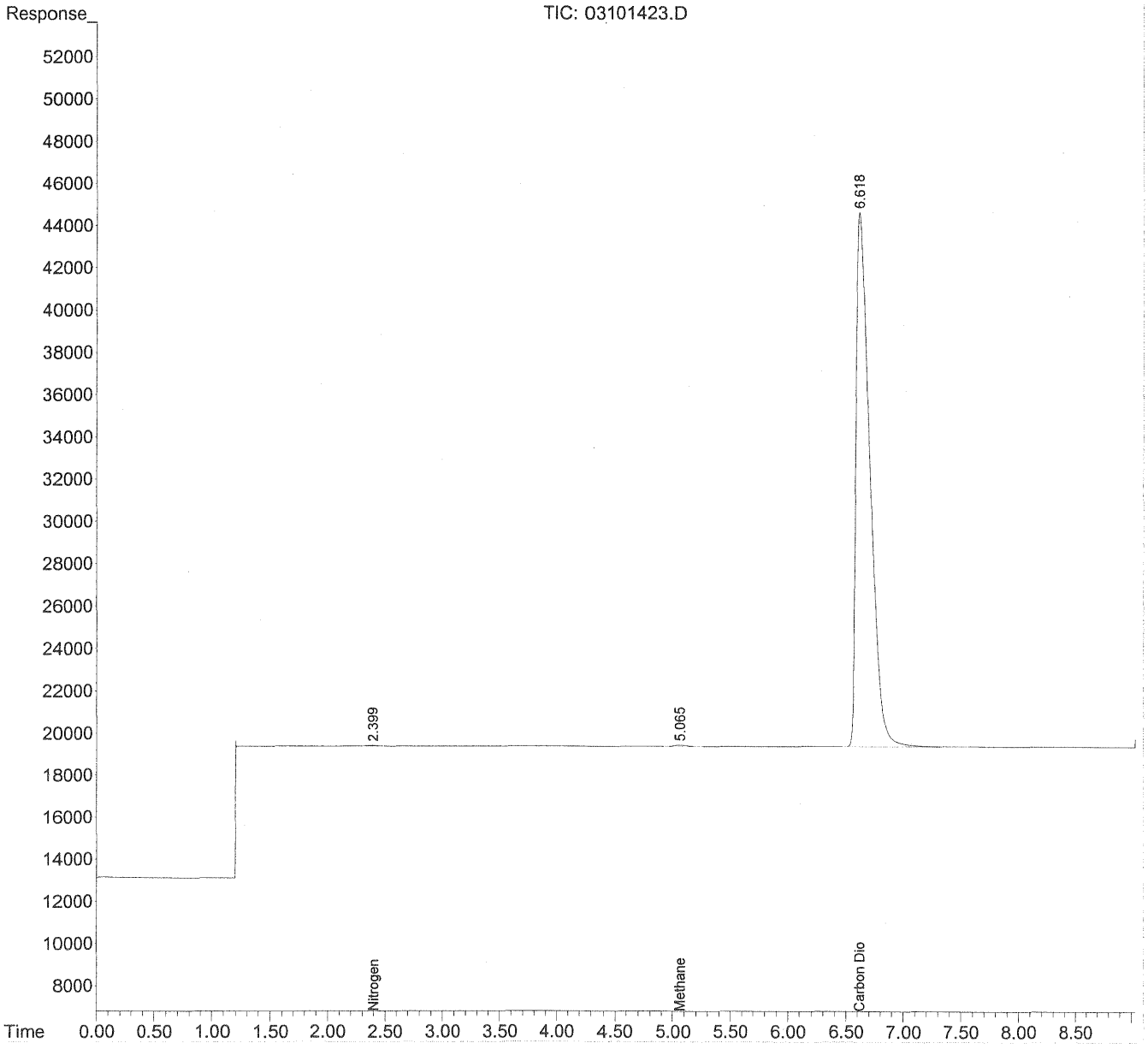
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

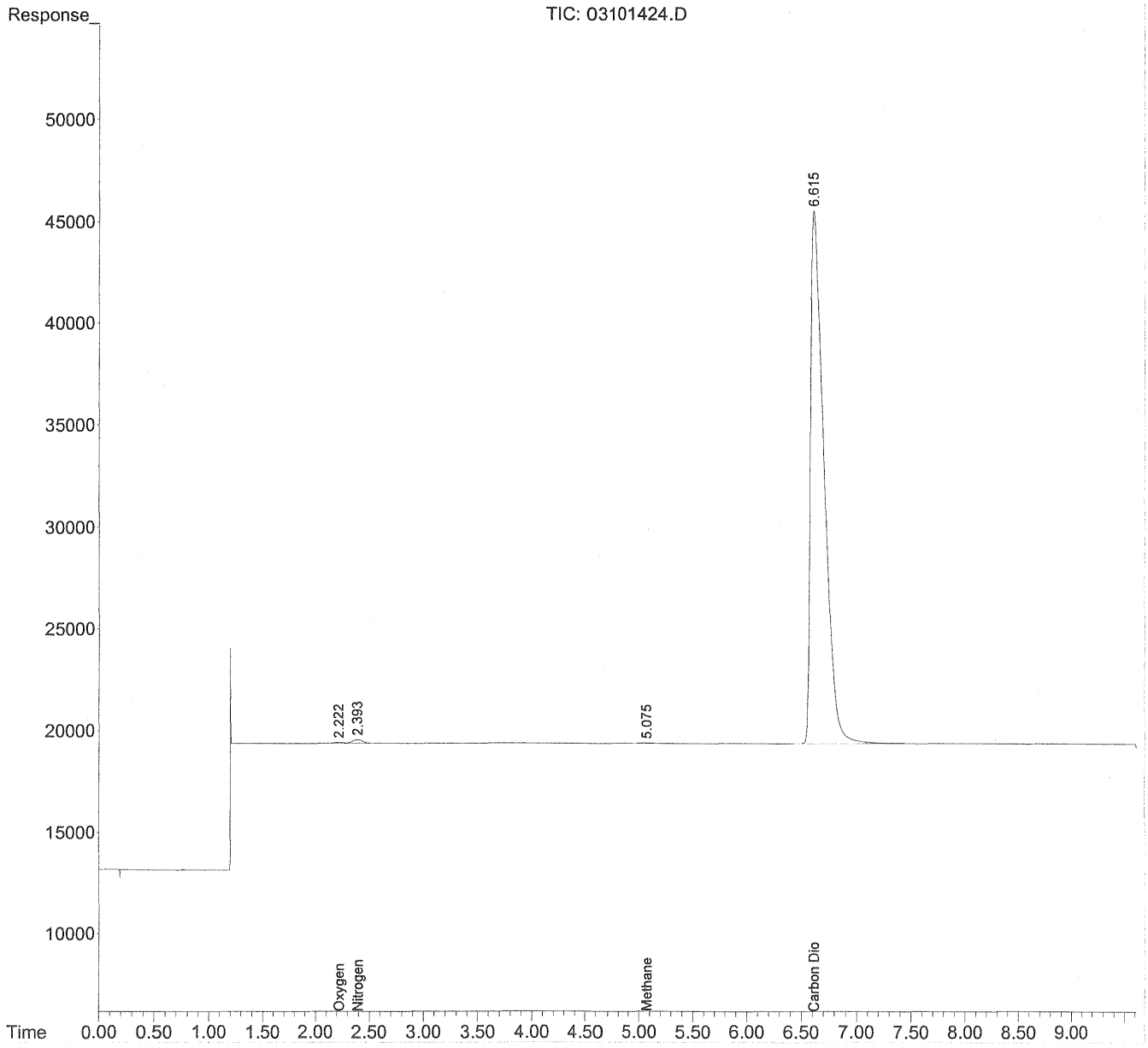
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	2.401	2050	1065.315	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	5.069	4323	3097.155	ppm
6)	Carbon Dioxide	6.619	2111383	983659.786	ppm

(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 :



Quantitation Report (QT Reviewed)

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

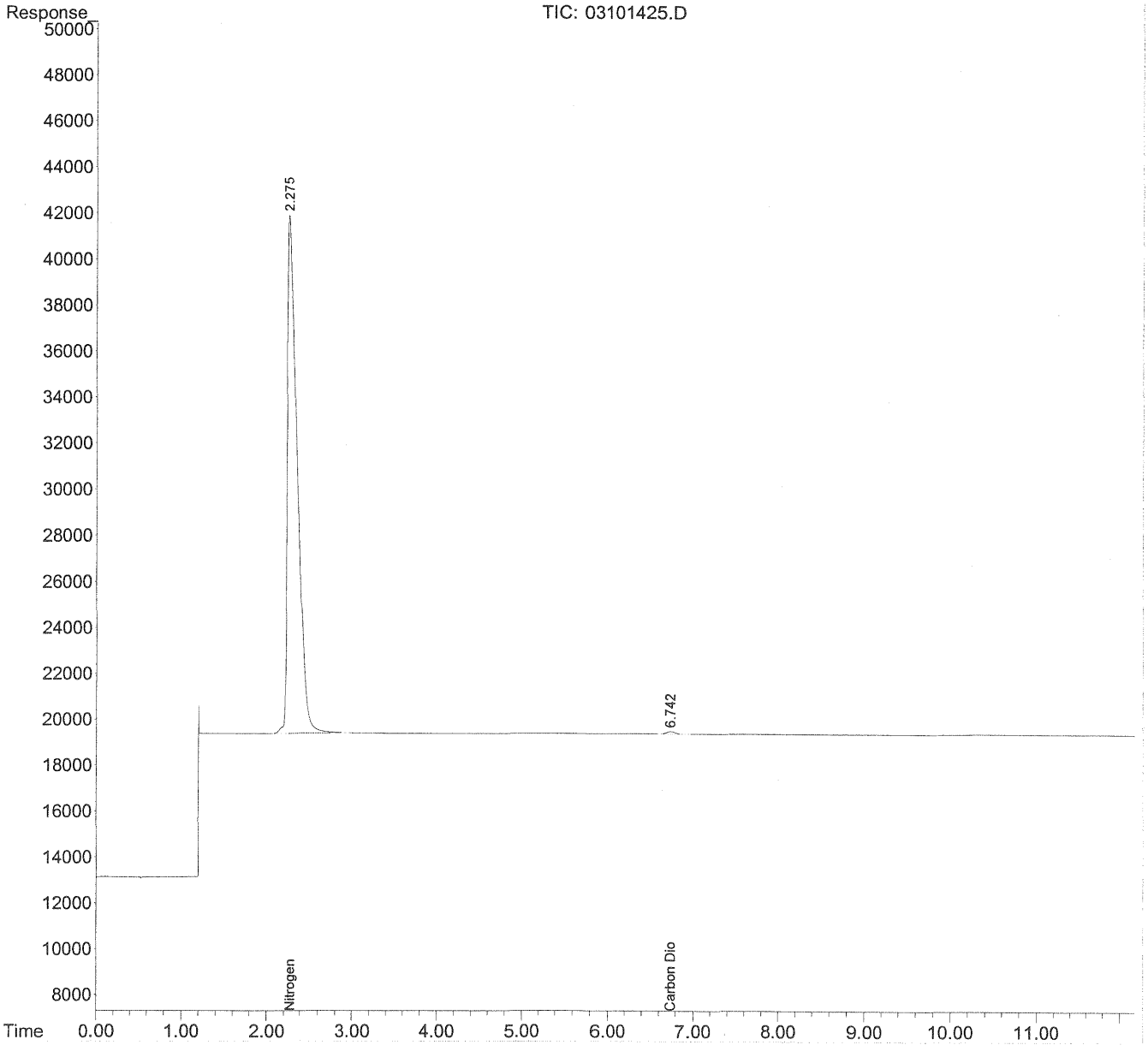
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Added Page

Quantitation Report (QT Reviewed)

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	

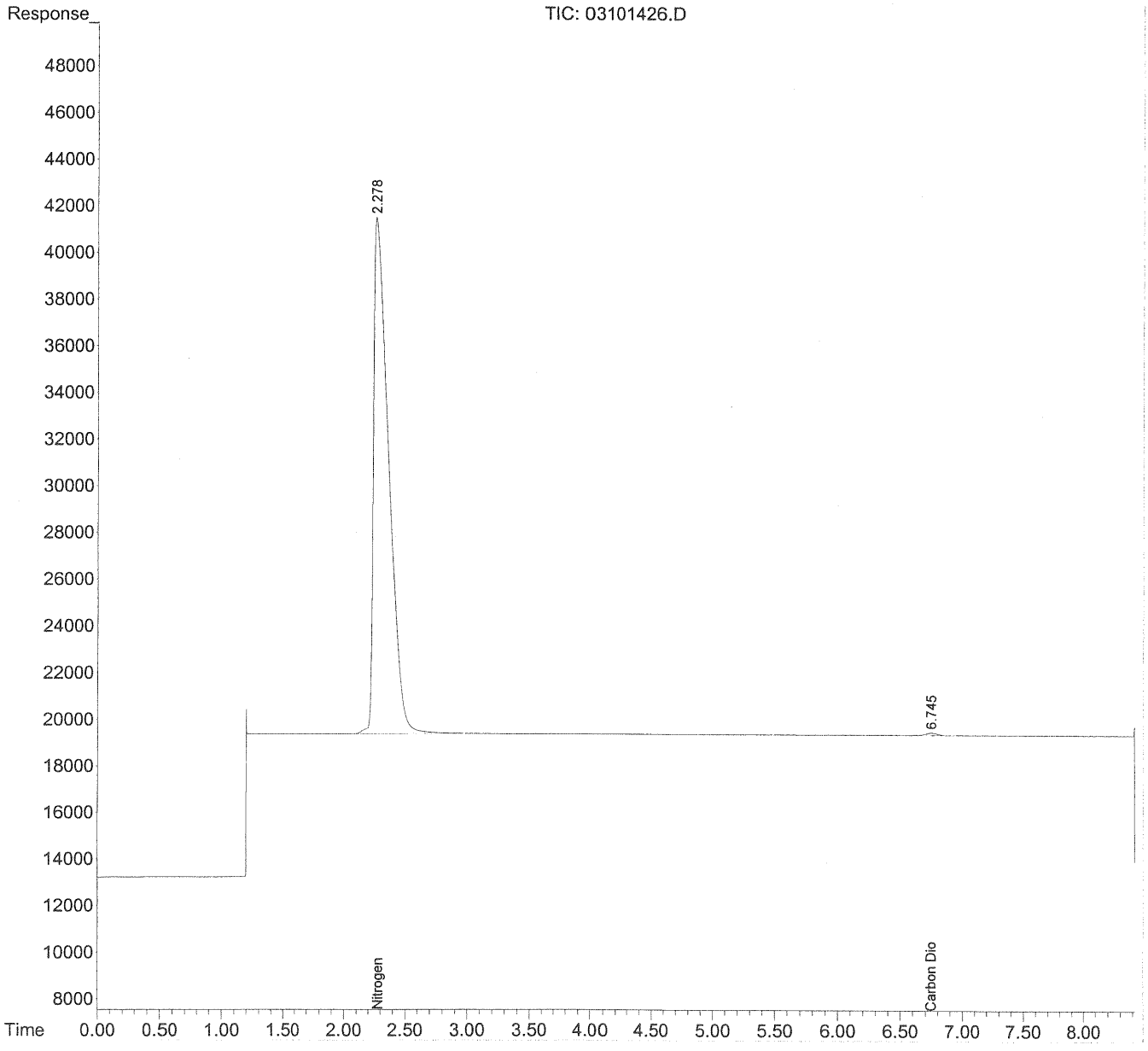
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

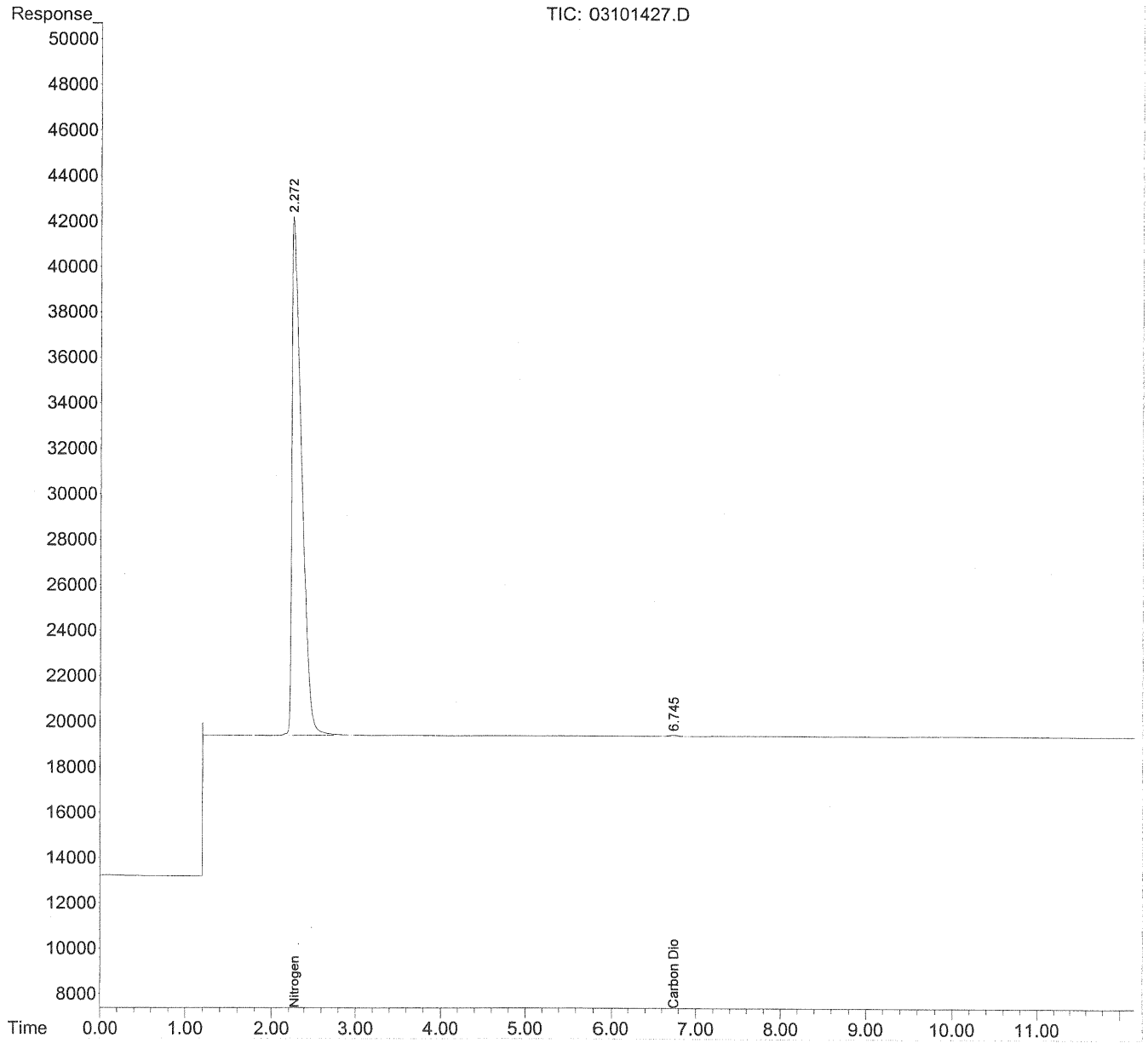
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Hydrogen	0.000	0	N.D.	ppm	
2)	Oxygen	0.000	0	N.D.	ppm	d
3)	Nitrogen	2.280	1857806	965604.527	ppm	
4)	Carbon Monoxide	0.000	0	N.D.	ppm	
5)	Methane	0.000	0	N.D.	ppm	
6)	Carbon Dioxide	6.748	7247	3368.284	ppm	

(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 :



Quantitation Report (QT Reviewed)

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	

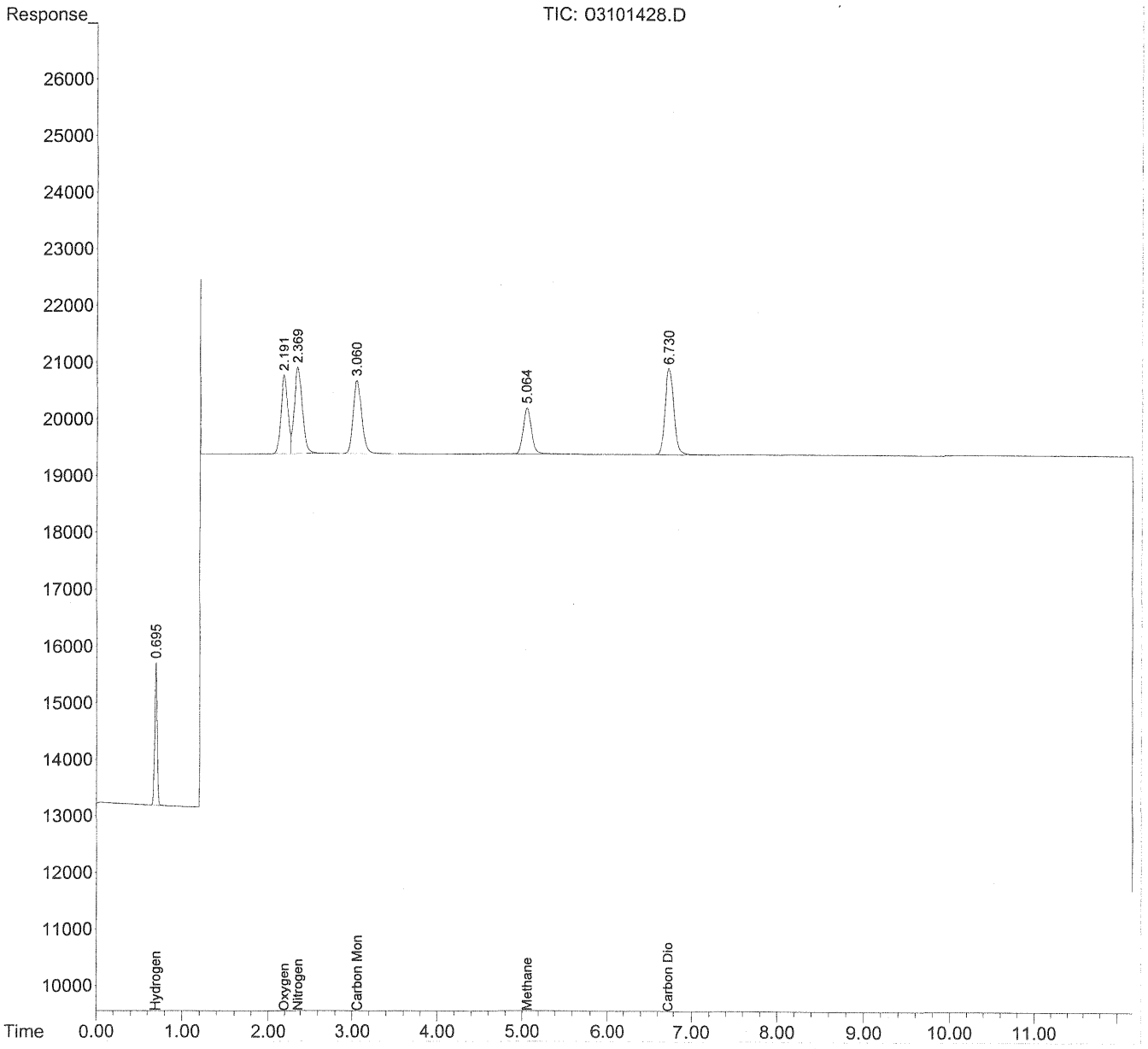
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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.

WH 8/8/14

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\2014_05\29

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	05291401.d	10.	std s30-04241401		29 May 2014 07:48
2	1	05291402.d	10.	mb		29 May 2014 08:05
3	1	05291403.d	10.	lab air		29 May 2014 08:22
4	1	05291404.d	10.	2097-001		29 May 2014 08:40
5	1	05291405.d	10.	2097-001		29 May 2014 08:57
6	1	05291406.d	10.	2097-001		29 May 2014 09:16
7	1	05291407.d	10.	2097-003		29 May 2014 09:36
8	1	05291408.d	10.	2097-003		29 May 2014 09:56
9	1	05291409.d	10.	2097-003		29 May 2014 10:14
10	1	05291410.d	10.	2097-005		29 May 2014 10:32
11	1	05291411.d	10.	2097-005		29 May 2014 10:49
12	1	05291412.d	10.	2097-005		29 May 2014 11:07
13	1	05291413.d	10.	std s30-04241401		29 May 2014 11:24
14	1	05291414.d	10.	lcs s30-02051401		29 May 2014 11:42
15	1	05291415.d	10.	x2117-001		29 May 2014 12:01
16	1	05291416.d	10.	2119-003		29 May 2014 12:19
17	1	05291417.d	10.	2110-001		29 May 2014 12:42
18	1	05291418.d	10.	2117-001		29 May 2014 13:07
19	1	05291419.d	10.	std s30-04241401		29 May 2014 14:02
20	1	05291420.d	10.	2122-001		29 May 2014 14:25
21	1	05291421.d	10.	2122-001		29 May 2014 14:52
22	1	05291422.d	10.	2122-001		29 May 2014 15:17
23	1	05291423.d	10.	2122-003		29 May 2014 15:34
24	1	05291424.d	10.	2122-003		29 May 2014 15:58
25	1	05291425.d	10.	2122-003		29 May 2014 16:17
26	1	05291426.d	10.	2122-005		29 May 2014 16:42
27	1	05291427.d	10.	2122-005		29 May 2014 17:07
28	1	05291428.d	10.	2122-005		29 May 2014 17:29
29	1	05291429.d	10.	2122-007		29 May 2014 17:44
30	1	05291430.d	10.	2122-007		29 May 2014 17:59
31	1	05291431.d	10.	2122-007		29 May 2014 18:15
32	1	05291432.d	10.	xstd		29 May 2014 18:56
33	1	05291433.d	10.	std s30-04241401		29 May 2014 19:12

Injection Log

Directory: I:\GC01\DATA\FXG\2014_05\30

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	05301401.d	10.	std s30-04241401		30 May 2014 07:49
2	1	05301402.d	10.	mb		30 May 2014 08:07
3	1	05301403.d	10.	xlab air		30 May 2014 08:32
4	1	05301404.d	10.	2122-009		30 May 2014 08:49
5	1	05301405.d	10.	2122-009		30 May 2014 09:06
6	1	05301406.d	10.	2122-009		30 May 2014 09:25
7	1	05301407.d	10.	2122-011		30 May 2014 09:53
8	1	05301408.d	10.	2122-011		30 May 2014 10:10
9	1	05301409.d	10.	2122-011		30 May 2014 10:26
10	1	05301410.d	10.	2144-001		30 May 2014 10:45
11	1	05301411.d	10.	2144-002		30 May 2014 11:01
12	1	05301412.d	10.	xlcs		30 May 2014 11:21
13	1	05301413.d	10.	lcs s30-02051401		30 May 2014 11:57
14	1	05301414.d	10.	std s30-04241401		30 May 2014 12:15
15	1	05301415.d	10.	2149-001		30 May 2014 12:33
16	1	05301416.d	10.	2149-001		30 May 2014 12:51
17	1	05301417.d	10.	2149-001		30 May 2014 13:06
18	1	05301418.d	10.	2149-003		30 May 2014 13:24
19	1	05301419.d	10.	2149-003		30 May 2014 13:42
20	1	05301420.d	10.	2149-003		30 May 2014 13:58
21	1	05301421.d	10.	lab air		30 May 2014 14:14
22	1	05301422.d	10.	xstd		30 May 2014 14:51
23	1	05301423.d	10.	std s30-04241401		30 May 2014 15:08
24	1	05301424.d	10.	2149-005		30 May 2014 15:24
25	1	05301425.d	10.	2149-005		30 May 2014 15:41
26	1	05301426.d	10.	2149-005		30 May 2014 15:58
27	1	05301427.d	10.	2149-007		30 May 2014 16:15
28	1	05301428.d	10.	2149-007		30 May 2014 16:32
29	1	05301429.d	10.	2149-007		30 May 2014 16:49
30	1	05301430.d	10.	2149-009		30 May 2014 17:06
31	1	05301431.d	10.	2149-009		30 May 2014 17:22
32	1	05301432.d	10.	2149-009		30 May 2014 17:38
33	1	05301433.d	10.	xstd		30 May 2014 17:56
34	1	05301434.d	10.	std s30-04241401		30 May 2014 18:15

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

November 24, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402149 has been amended for the samples submitted to our laboratory on May 30, 2014. The amended report includes all instrument raw data. The added pages have been indicated by the "Added Page" footer located at the bottom right of the page.

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 9:18 am, Nov 24, 2014

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Air Hygiene, Incorporated
Project: stk-14-elmorecity.ik-comp#1

Service Request No: P1402149

CASE NARRATIVE

The samples were received intact under chain of custody on May 30, 2014 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.

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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	643428
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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
Service Request: P1402149
Project ID: stk-14-elmorecity.ik-comp#1

Date Received: 5/30/2014
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag 2X
R10-90-100-PI 48	P1402149-001	Air	5/29/2014	00:00	X
R11-90-100-PI 48	P1402149-003	Air	5/29/2014	00:00	X
R12-90-100-PI 48	P1402149-005	Air	5/29/2014	00:00	X
R1-0-30-0%-PI 36	P1402149-007	Air	5/29/2014	00:00	X
R2-0-30-0%-PI 36	P1402149-009	Air	5/29/2014	00:00	X

P140 2149

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:	stk-14-elmorecity.ik-comp#1	Laboratory Analysis Requested:	Method 3C
Person Taking Samples:	BS/TP		

	Sample Number	Location	Date	Volume (L)	Analysis Method			
					O_2	CO_2	N_2	Methane
1	R10-90-100-PI 48	Big Iron Elmore City Plant	29-May	10	X	X	X	X
2	R10-90-100-PI 48 Backup	Big Iron Elmore City Plant	29-May	5	X	X	X	X
3	R11-90-100-PI 48	Big Iron Elmore City Plant	29-May	10	X	X	X	X
4	R11-90-100-PI 48 Backup	Big Iron Elmore City Plant	29-May	5	X	X	X	X
5	R12-90-100-PI 48	Big Iron Elmore City Plant	29-May	10	X	X	X	X
6	R12-90-100-PI 48 Backup	Big Iron Elmore City Plant	29-May	5	X	X	X	X
7	R1-0-30-0%-PI 36	Big Iron Elmore City Plant	29-May	10	X	X	X	X
8	R1-0-30-0%-PI 36 Back Up	Big Iron Elmore City Plant	29-May	5	X	X	X	X
9	R2-0-30-0%-PI 36	Big Iron Elmore City Plant	29-May	10	X	X	X	X
10	R2-0-30-0%-PI 36 Back Up	Big Iron Elmore City Plant	29-May	5	X	X	X	X

Relinquished by: (Signature)	5/29/14 Date:	11:45:00 Time:	Received by: (Signature)	Date: 0930 Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: Time:

coc-52714

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ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402149

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/30/14 Date opened: 5/30/14 by: MZAMORA

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 if necessary 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
P1402149-001.01	10 L Tedlar Bag					
P1402149-002.01	5.0 L Tedlar Bag					
P1402149-003.01	10 L Tedlar Bag					
P1402149-004.01	5.0 L Tedlar Bag					
P1402149-005.01	10 L Tedlar Bag					
P1402149-006.01	5.0 L Tedlar Bag					
P1402149-007.01	10 L Tedlar Bag					
P1402149-008.01	5.0 L Tedlar Bag					

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

Chain of Custody is missing time collected

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402149

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/30/14 Date opened: 5/30/14 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1402149-009.01	10 L Tedlar Bag					
P1402149-010.01	5.0 L Tedlar Bag					

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R10-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**15.1**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.12**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R11-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**79.9**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.44**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R12-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**15.1**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.10**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R1-0-30-0%-PI 36**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-007

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.53**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R2-0-30-0%-PI 36**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-009

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**5.18**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402149
Client Project ID: **stk-14-elmorecity.ik-comp#1** ALS Sample ID: P140530-MB

Test Code: EPA Method 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 5/30/14
Sample Type: 10 L Tedlar Bag Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301415.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:33 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:39 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.169	215081	130151.020	ppm
3)	Nitrogen	2.298	1323054	689093.044	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.722	94975	44143.812	ppm

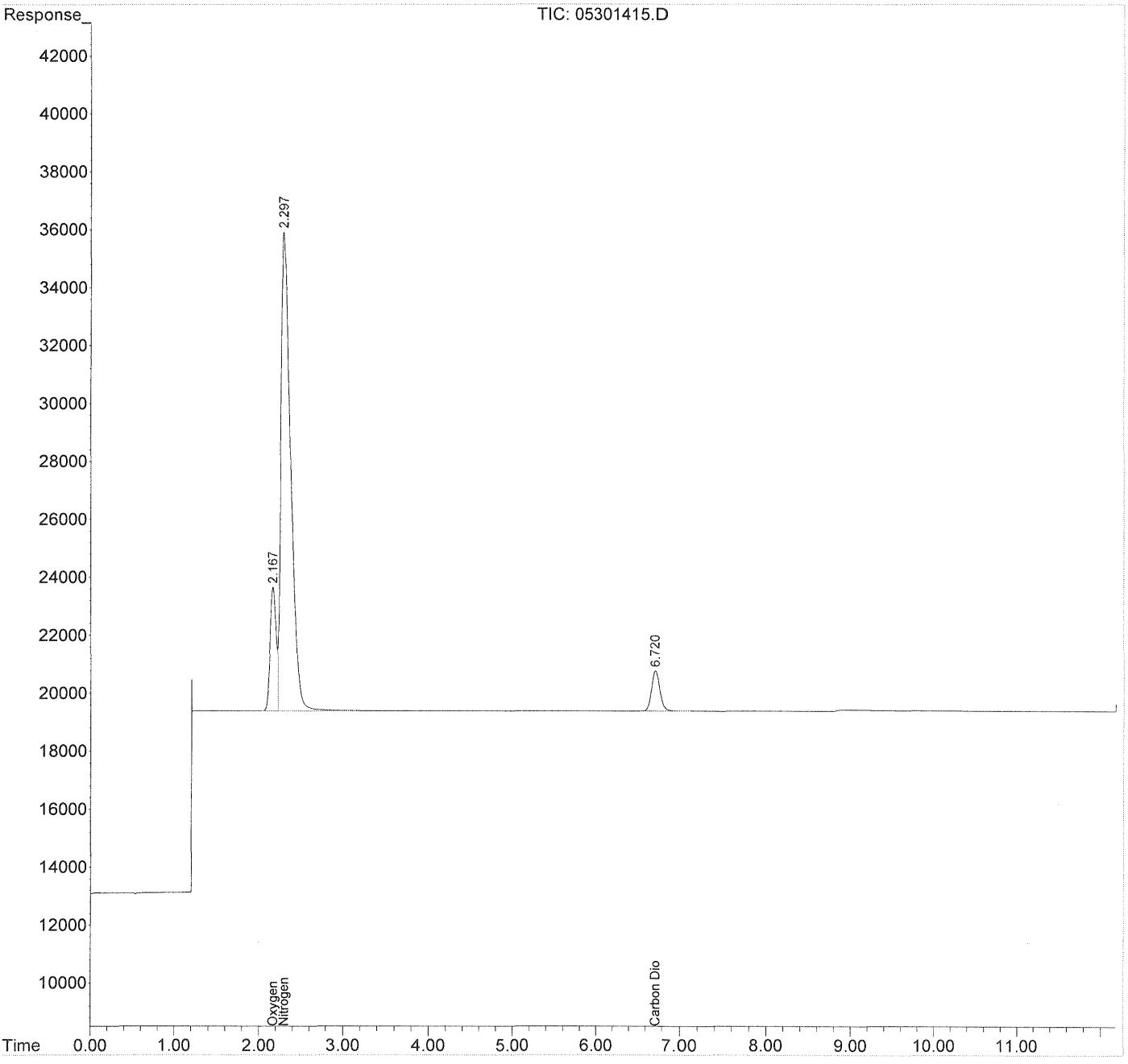
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Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301415.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:33 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:39 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301416.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:51 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:43 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.166	215038	130125.248	ppm
3)	Nitrogen	2.295	1320972	688008.557	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.719	95049	44178.381	ppm

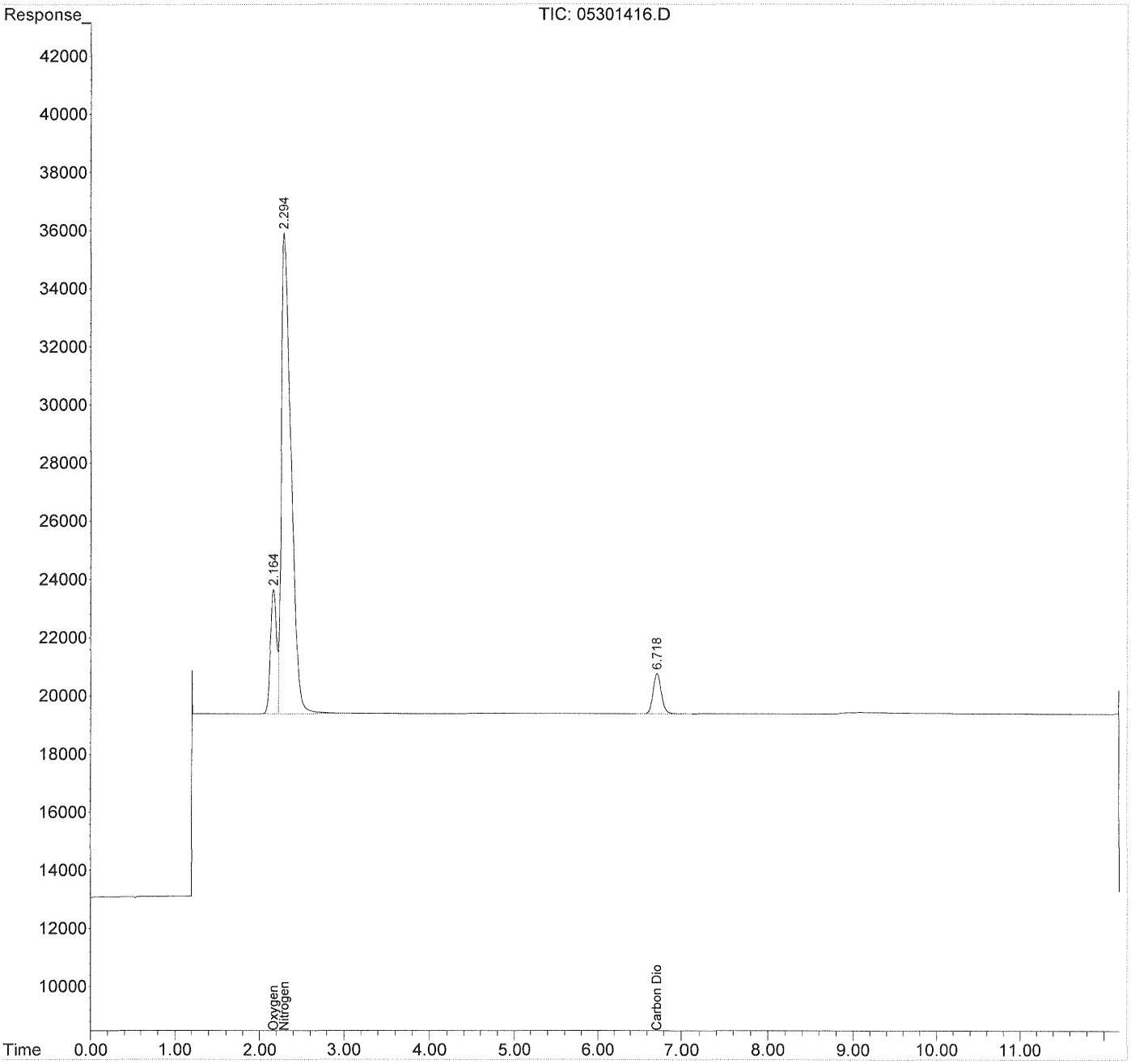
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Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301416.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:51 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:43 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301417.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:06 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:47 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 :

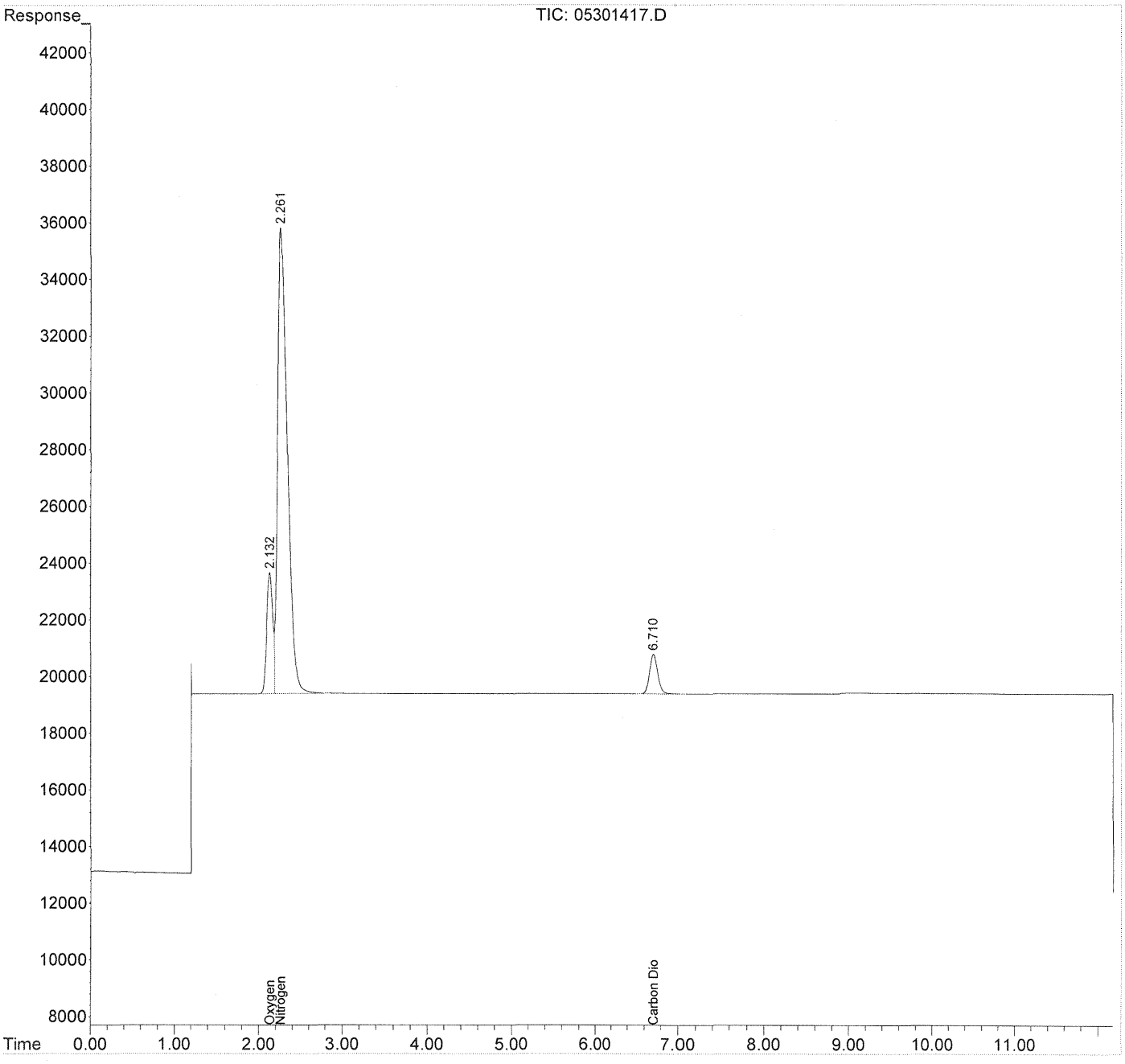
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.133	214894	130038.122	ppm
3)	Nitrogen	2.262	1322012	688550.192	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	95228	44261.440	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301417.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:06 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:47 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 :



Added Page

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301418.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:24 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:51 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.160	208550	126199.297	ppm
3)	Nitrogen	2.289	1322053	688571.968	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.715	100770	46837.373	ppm

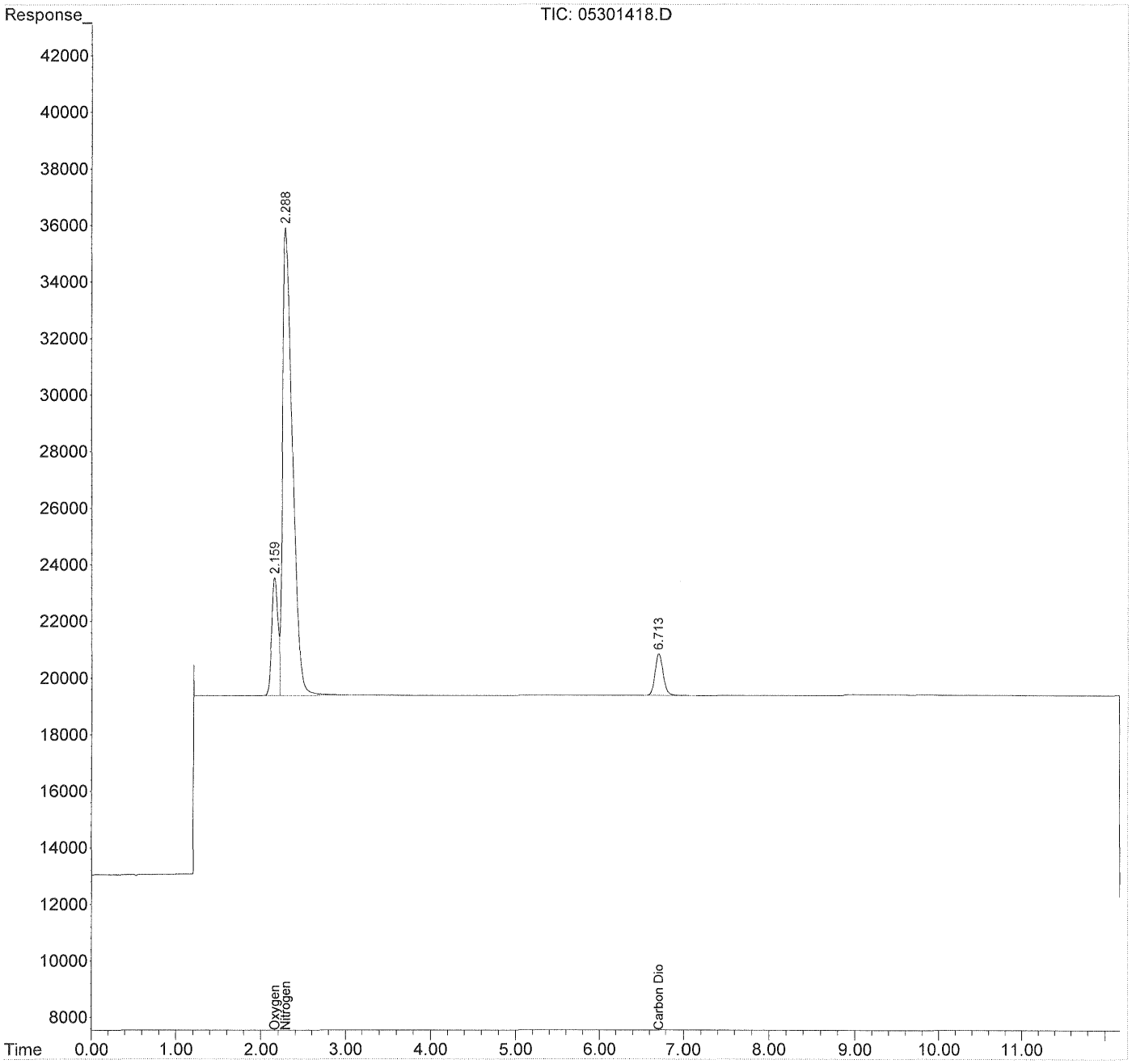
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301418.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:24 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:51 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301419.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:42 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:55 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.164	207593	125620.155	ppm
3)	Nitrogen	2.293	1316661	685763.478	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.716	100155	46551.776	ppm

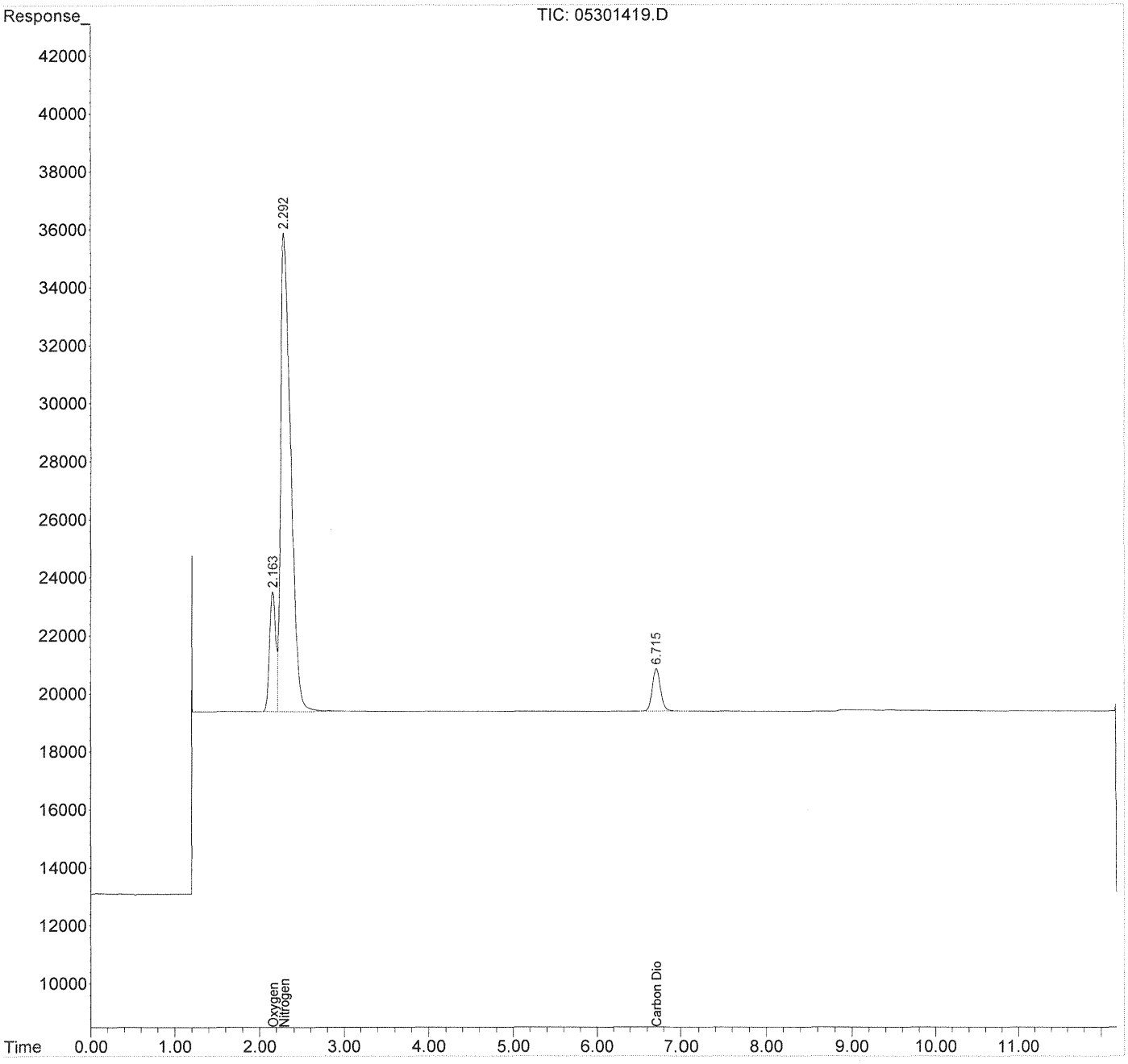
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Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301419.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:42 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:55 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301420.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:58 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:59 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.155	207208	125386.924	ppm
3)	Nitrogen	2.283	1312419	683554.128	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.715	100495	46709.462	ppm

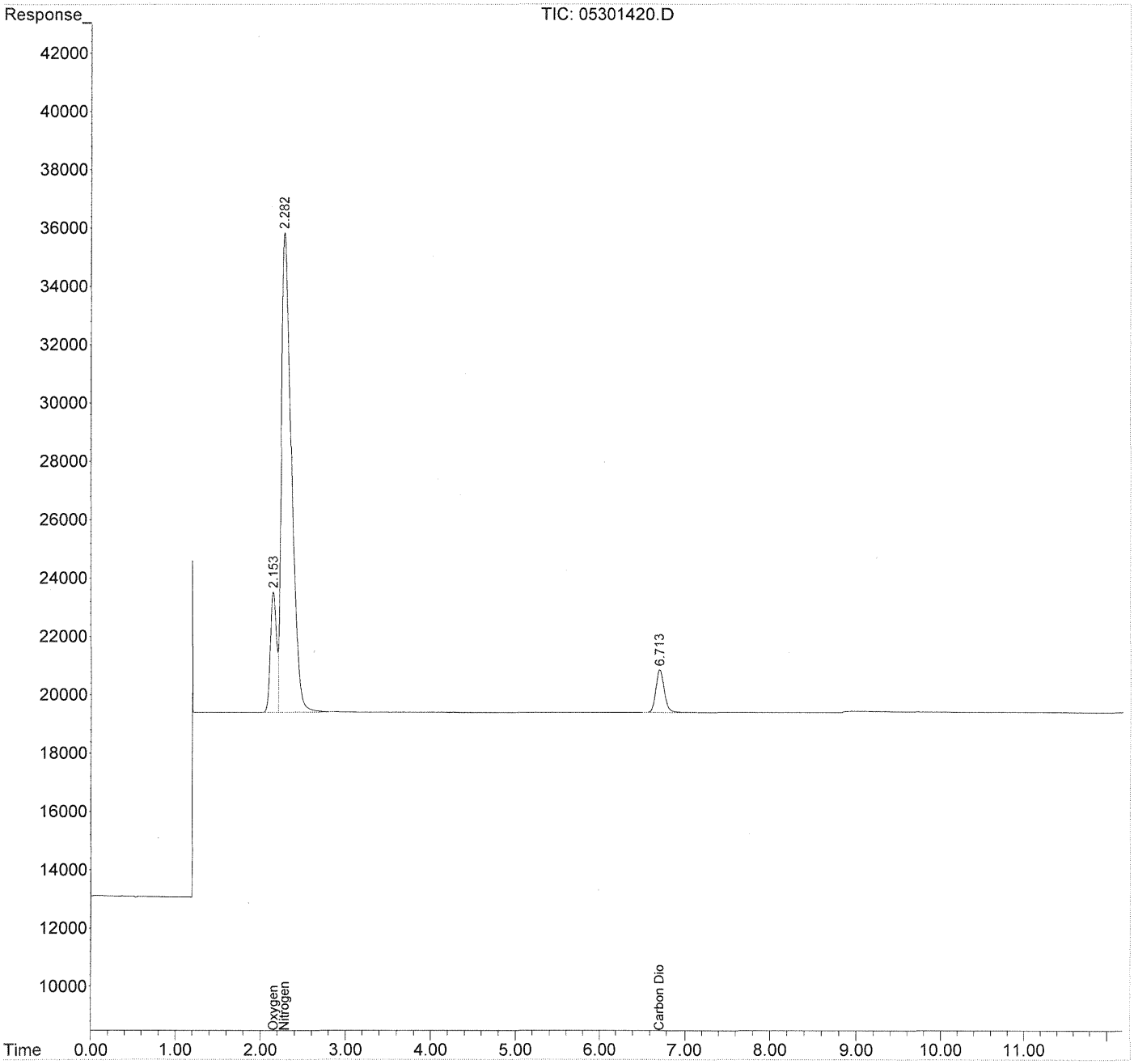
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301420.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:58 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:59 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301424.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:24 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:07 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 :

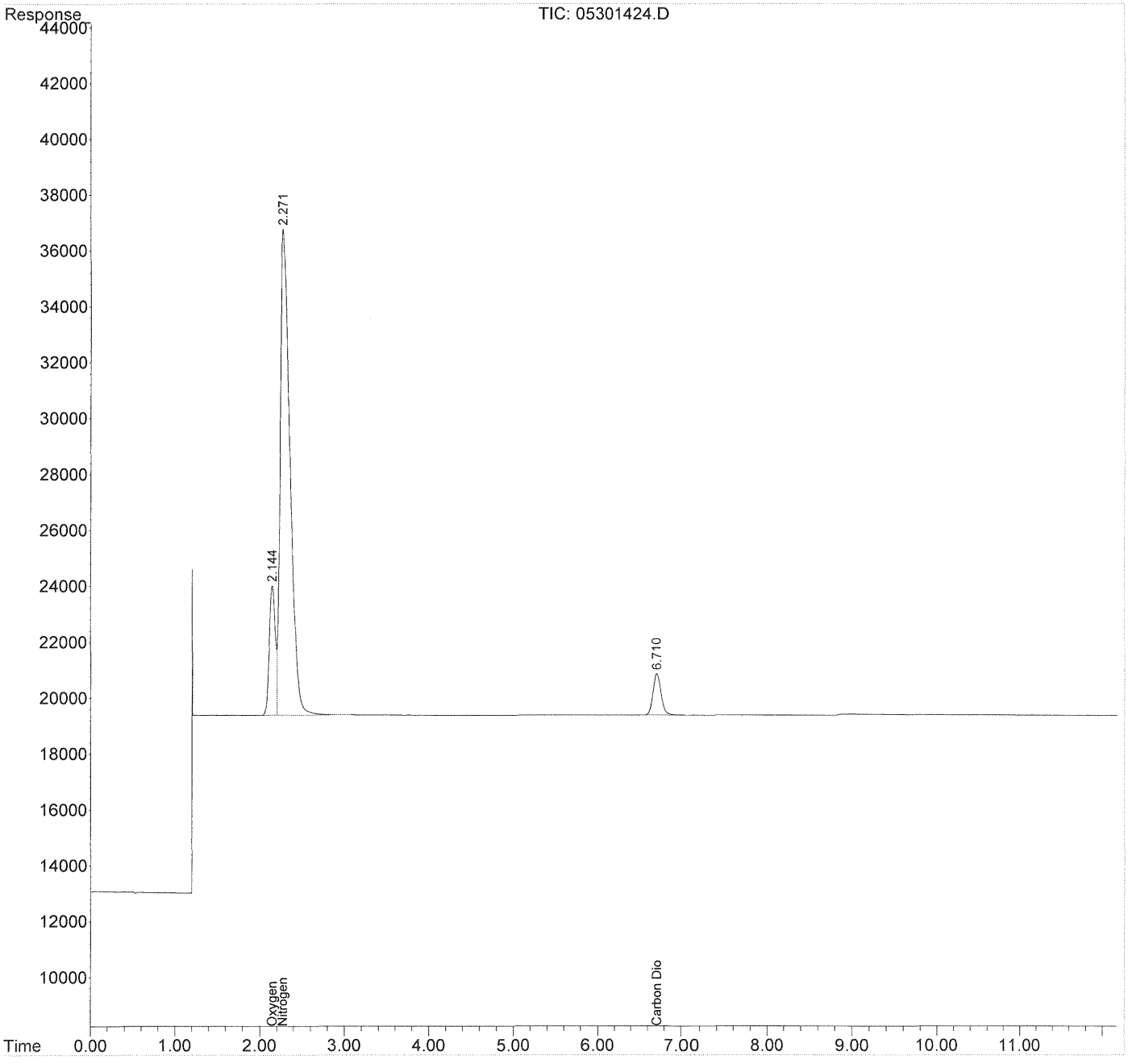
	Compound	R.T.	Response	Conc	Units
Target	Compounds				
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.146	230583	139531.930	ppm
3)	Nitrogen	2.273	1419730	739445.478	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	101699	47269.220	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301424.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:24 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:07 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 :



Added Page

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301425.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:41 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:11 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.152	229488	138869.687	ppm
3)	Nitrogen	2.279	1412029	735434.373	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	101097	46989.590	ppm

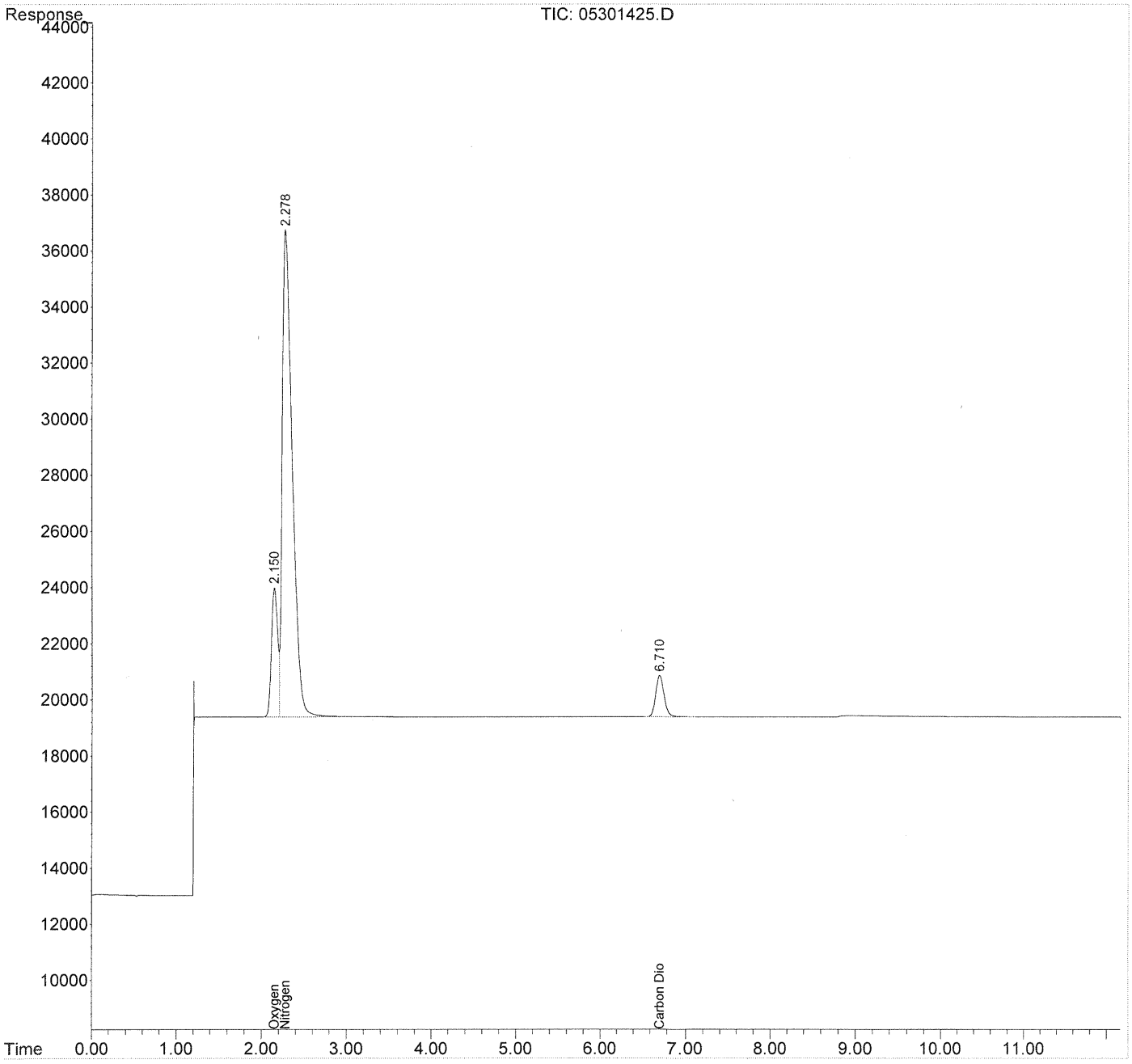
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301425.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:41 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:11 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301426.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:58 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:15 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.157	226382	136990.055	ppm
3)	Nitrogen	2.285	1390609	724278.083	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.714	99612	46299.443	ppm

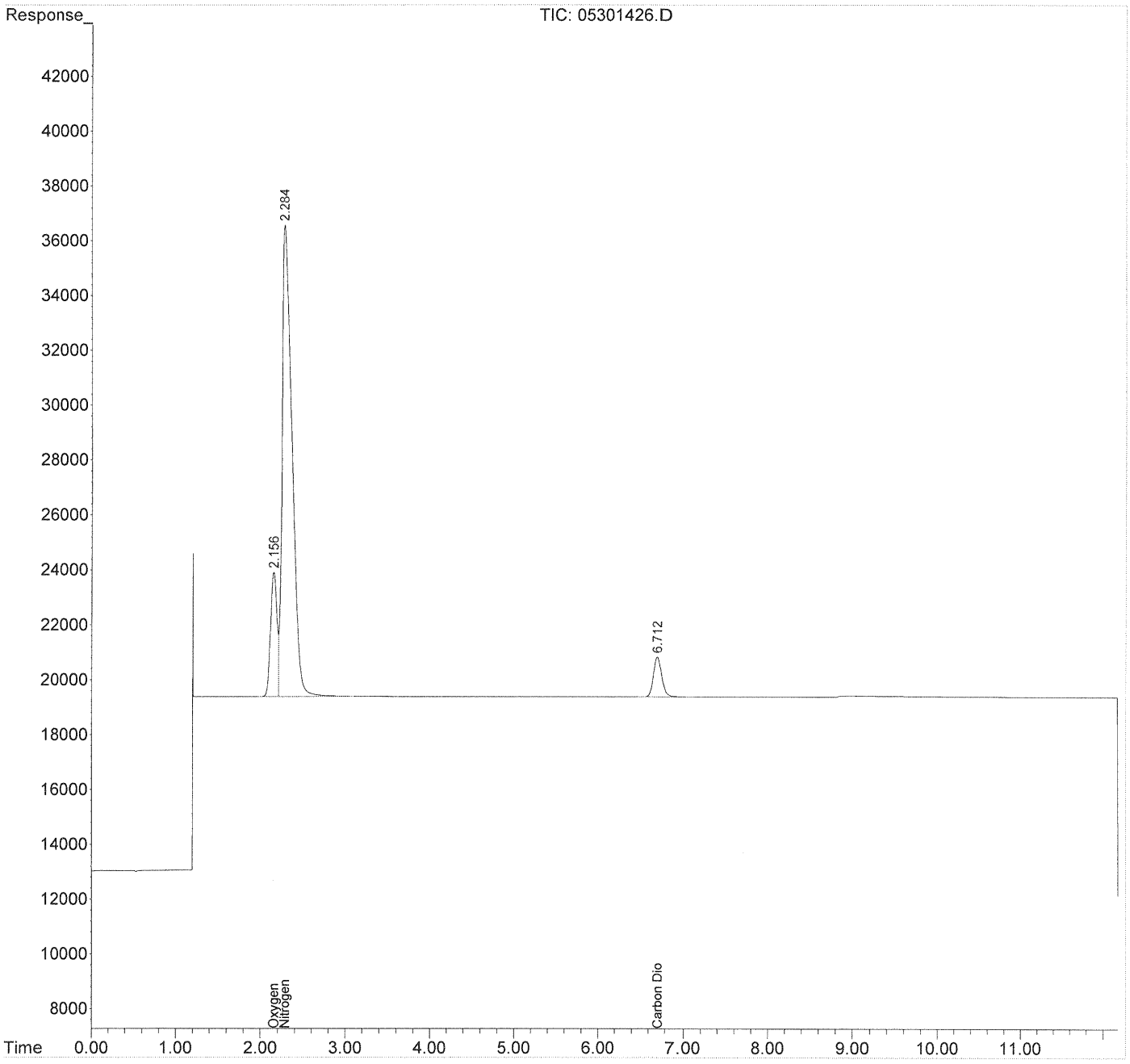
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301426.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:58 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:15 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301402.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:07 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:35 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	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

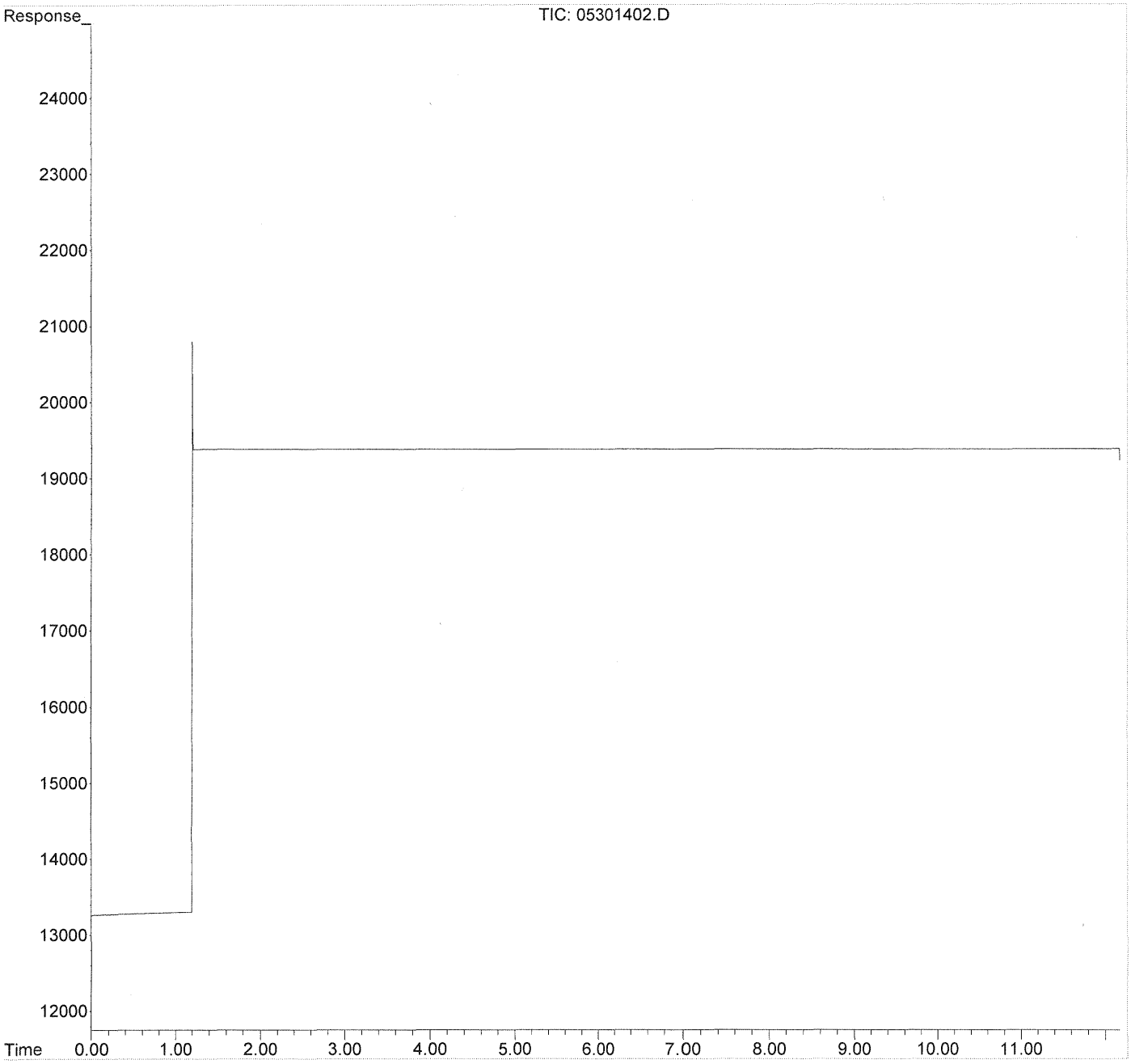
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301402.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:07 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:35 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 :



Added Page

NL 5/31/14

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

CLIENT : Air Hygiene, Incorporated

Analyst : NL

PAI Job : P1402149

Printed : 5/31/2014

Instrument : GC #1 / TCD #1

Date analyzed : 5/30/2014

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen		Nitrogen		Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-01231404	34993	36815		45673		45947	36728	45679	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	12.5%	8.0%		8.7%		8.1%	8.1%	8.7%	
Lab Air		201775		718396				349	
MB									
2149-001		130151	0.0%	689093	0.1%			44144	0.1%
2149-001 - 2		130125	0.0%	688009	0.1%			44178	0.0%
2149-001 - 3		130038	0.1%	688550	0.0%			44261	0.2%
2149-001 - Mean		130105		688551				44194	
2149-003		126199	0.4%	688572	0.4%			46837	0.3%
2149-003 - 2		125620	0.1%	685763	0.0%			46552	0.3%
2149-003 - 3		125387	0.3%	683554	0.4%			46709	0.0%
2149-003 - Mean		125735		685963				46699	

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 5/31/2014

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 5/30/2014

PAI Job : P1402149

Sample amount : 100uL

2149-005			139532	0.8%	739445	0.9%				47269	0.9%	
2149-005 - 2			138870	0.3%	735434	0.3%				46990	0.3%	
2149-005 - 3			136990	1.1%	724278	1.2%				46299	1.2%	
2149-005 - Mean			138464		733052					46853		
2149-007			147079	0.6%	736225	0.7%				42103	1.0%	
2149-007 - 2			145185	0.7%	725889	0.8%				41225	1.1%	
2149-007 - 3			146379	0.1%	732269	0.1%				41682	0.0%	
2149-007 - Mean			146214		731461					41670		
2149-009			138668	0.3%	735166	0.2%				47957	0.8%	
2149-009 - 2			138054	0.1%	734232	0.1%				47573	0.1%	
2149-009 - 3			138045	0.1%	731763	0.3%				47369	0.6%	
2149-009 - Mean			138256		733720					47633		
STD S30-01231404	38383		40051		48922		50122		40105	49808		
ACTUAL	39990		40030		50000		50010		39970	50040		
% Difference	4.0%		0.1%		2.2%		0.2%		0.3%	0.5%		

Quantitation Report (Not Reviewed)

NL 5/31/14

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301401.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 7:49 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:31 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.706	48332	34993.022	ppm
2)	Oxygen	2.219	60838	36814.922	ppm
3)	Nitrogen	2.395	87692	45673.239	ppm
4)	Carbon Monoxide	3.081	85151	45946.706	ppm
5)	Methane	5.071	51270	36727.545	ppm
6)	Carbon Dioxide	6.732	98277	45678.767	ppm

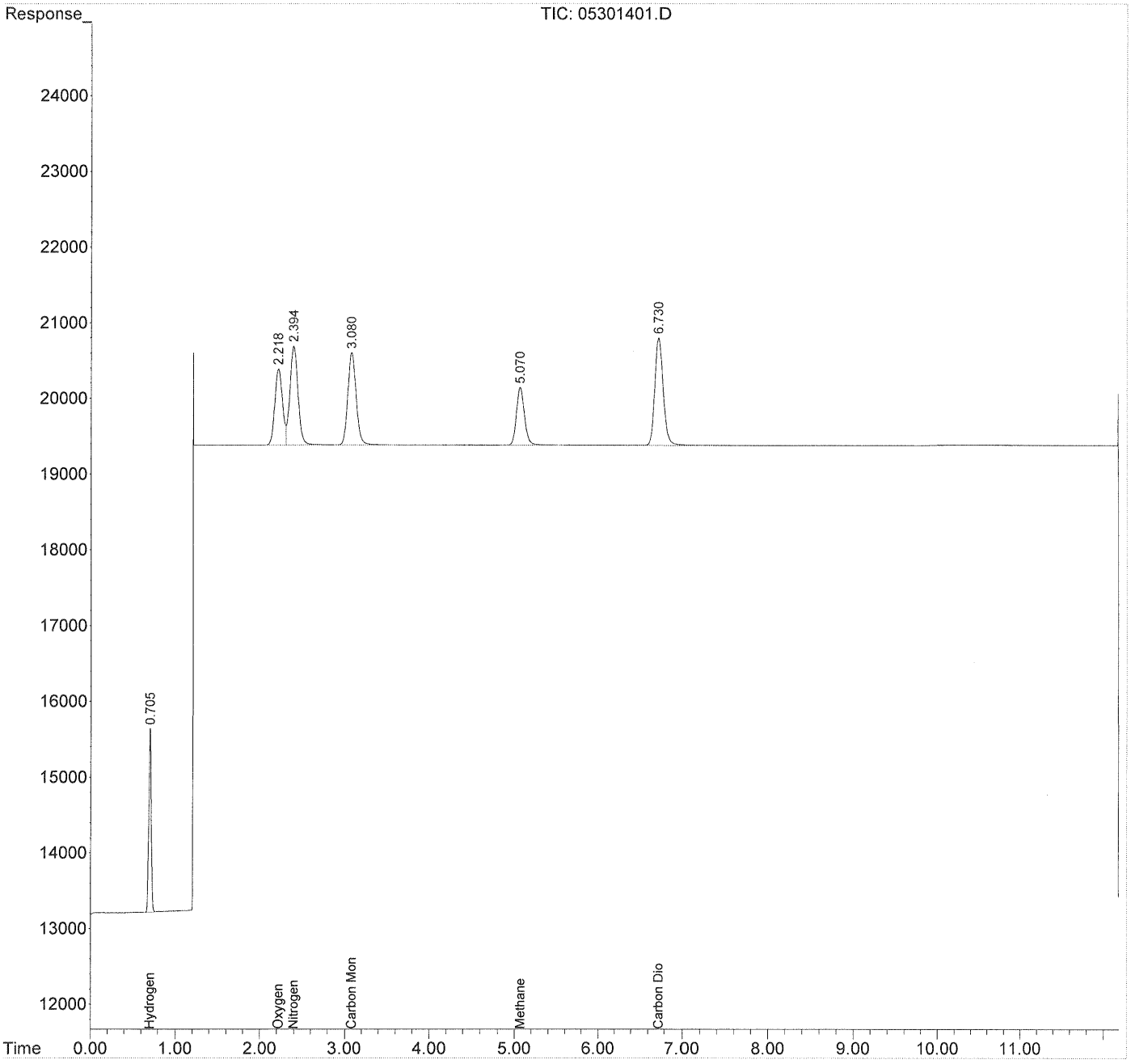
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301401.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 7:49 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:31 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301434.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 6:15 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:43 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.700	53015	38383.410	ppm
2)	Oxygen	2.201	66187	40051.481	ppm
3)	Nitrogen	2.377	93930	48922.083	ppm
4)	Carbon Monoxide	3.062	92888	50122.033	ppm
5)	Methane	5.053	55985	40105.336	ppm
6)	Carbon Dioxide	6.714	107162	49808.468	ppm

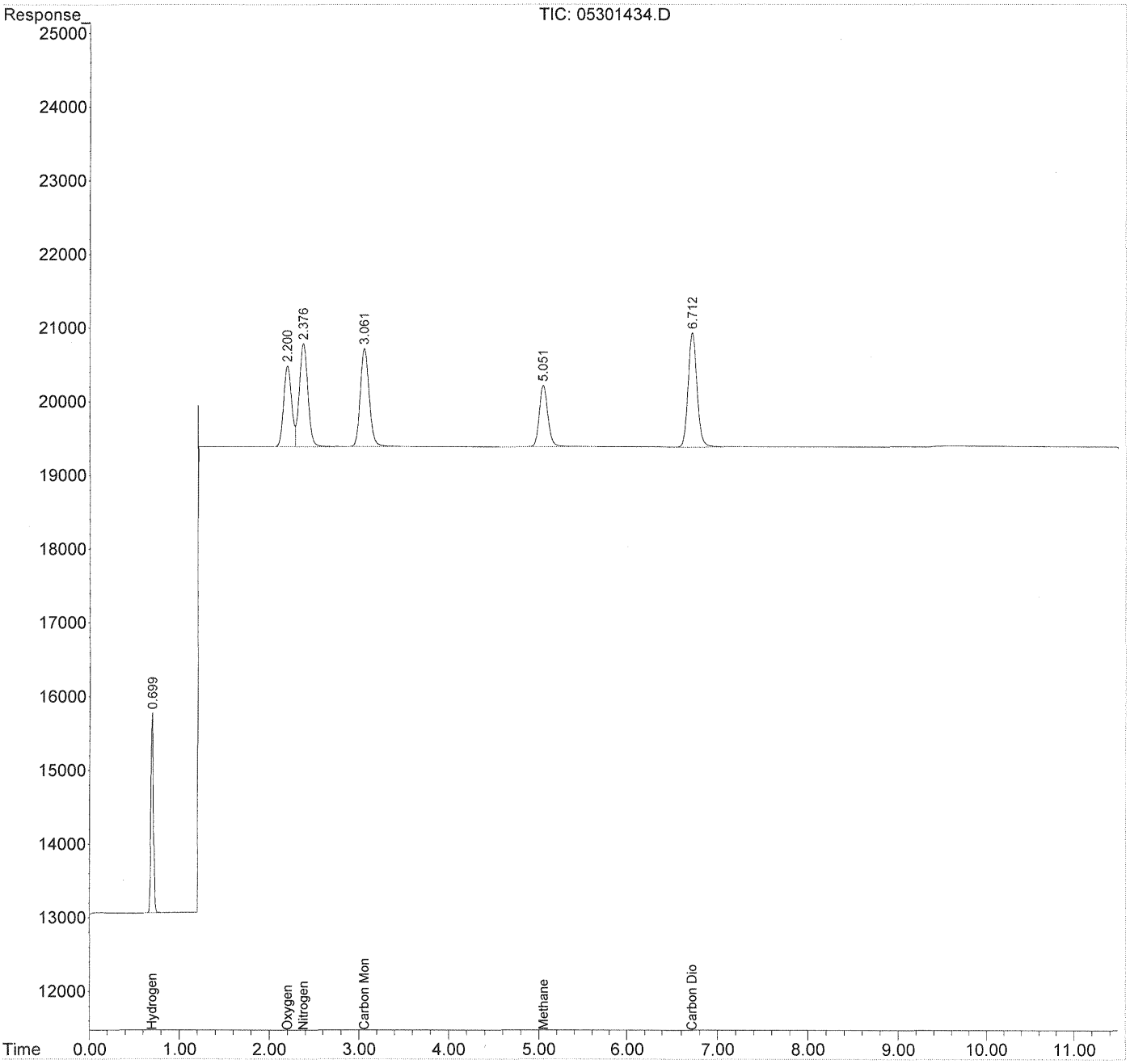
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301434.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 6:15 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:43 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 :



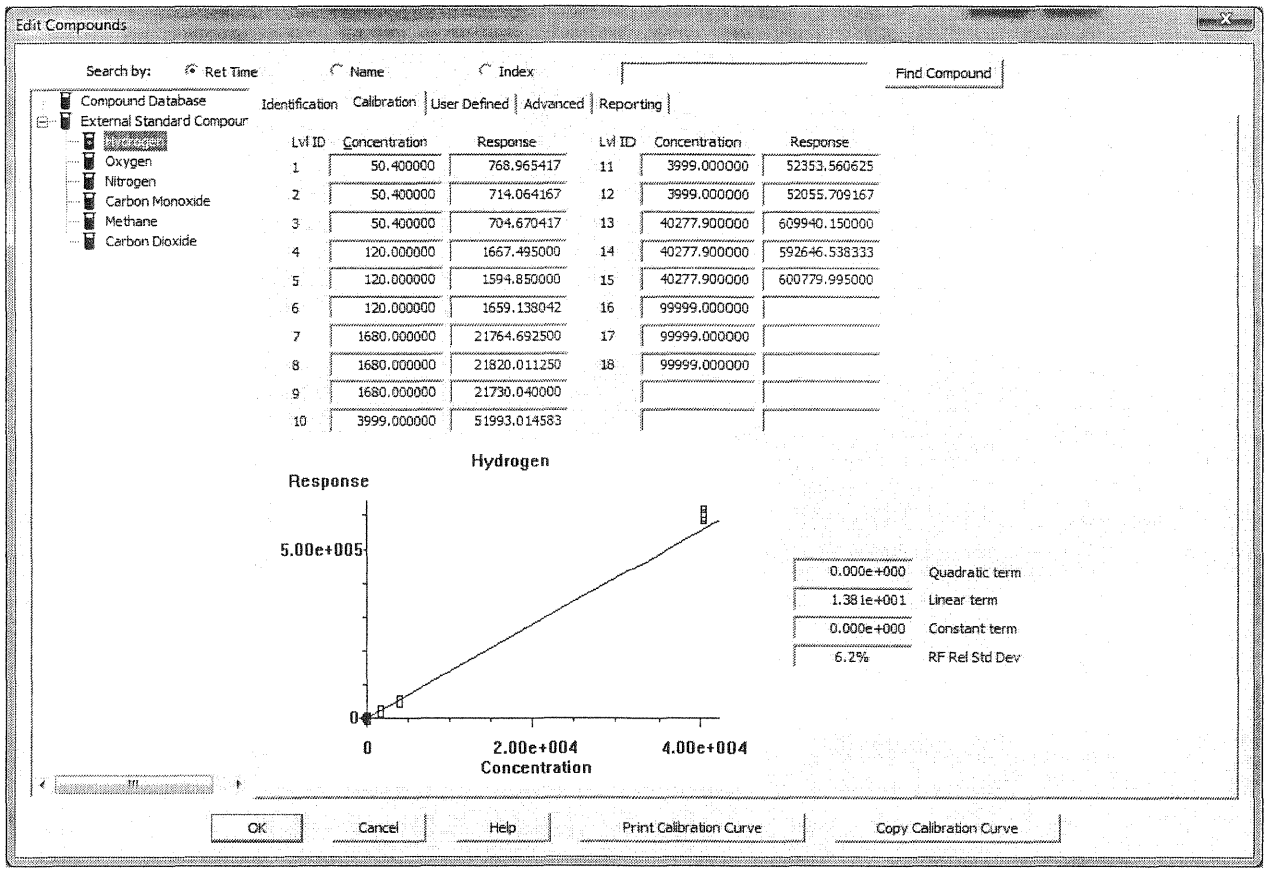
Response Factor Report GC01

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

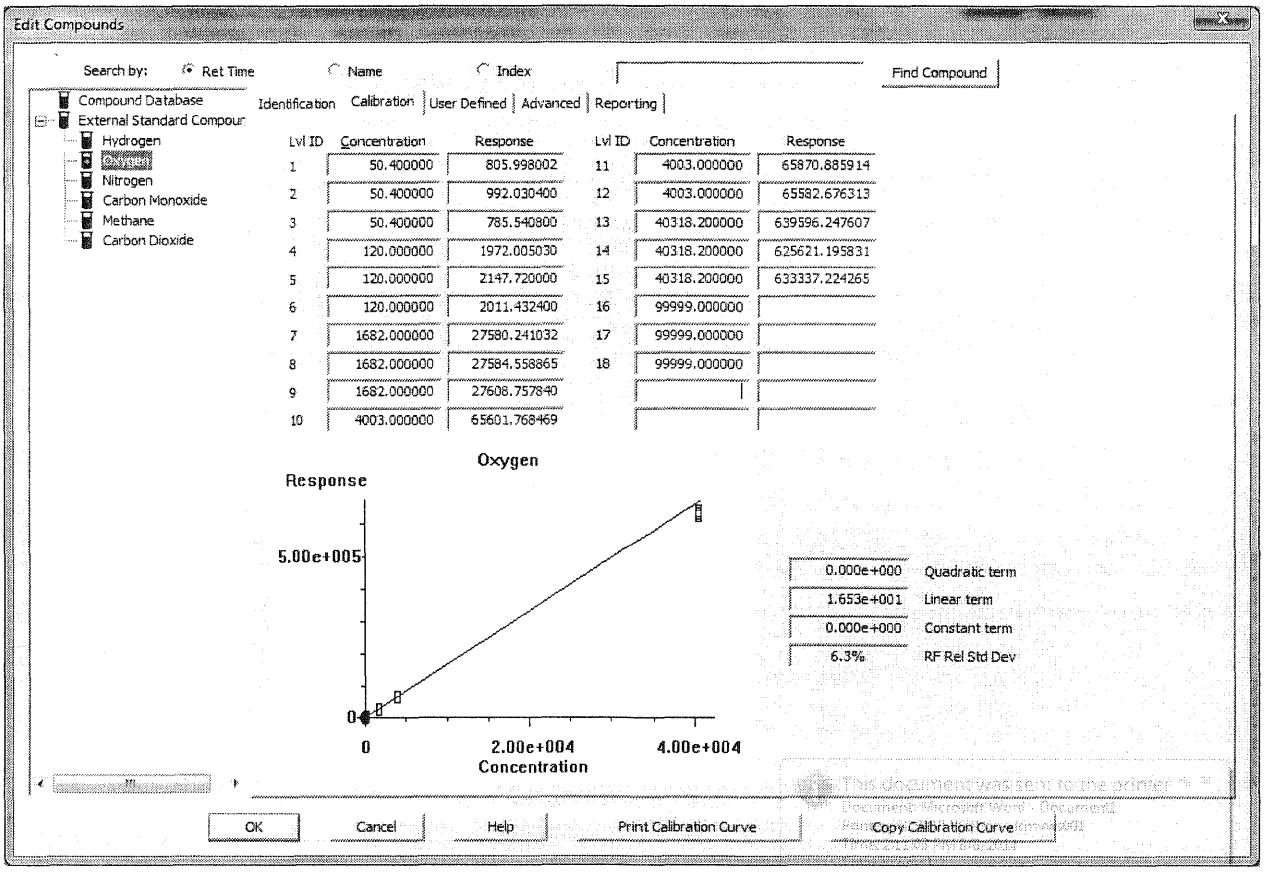
Calibration Files
1 =03101403.D 2 =03101404.D 3 =03101405.D
4 =03101406.D 5 =03101407.D 6 =03101408.D

	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

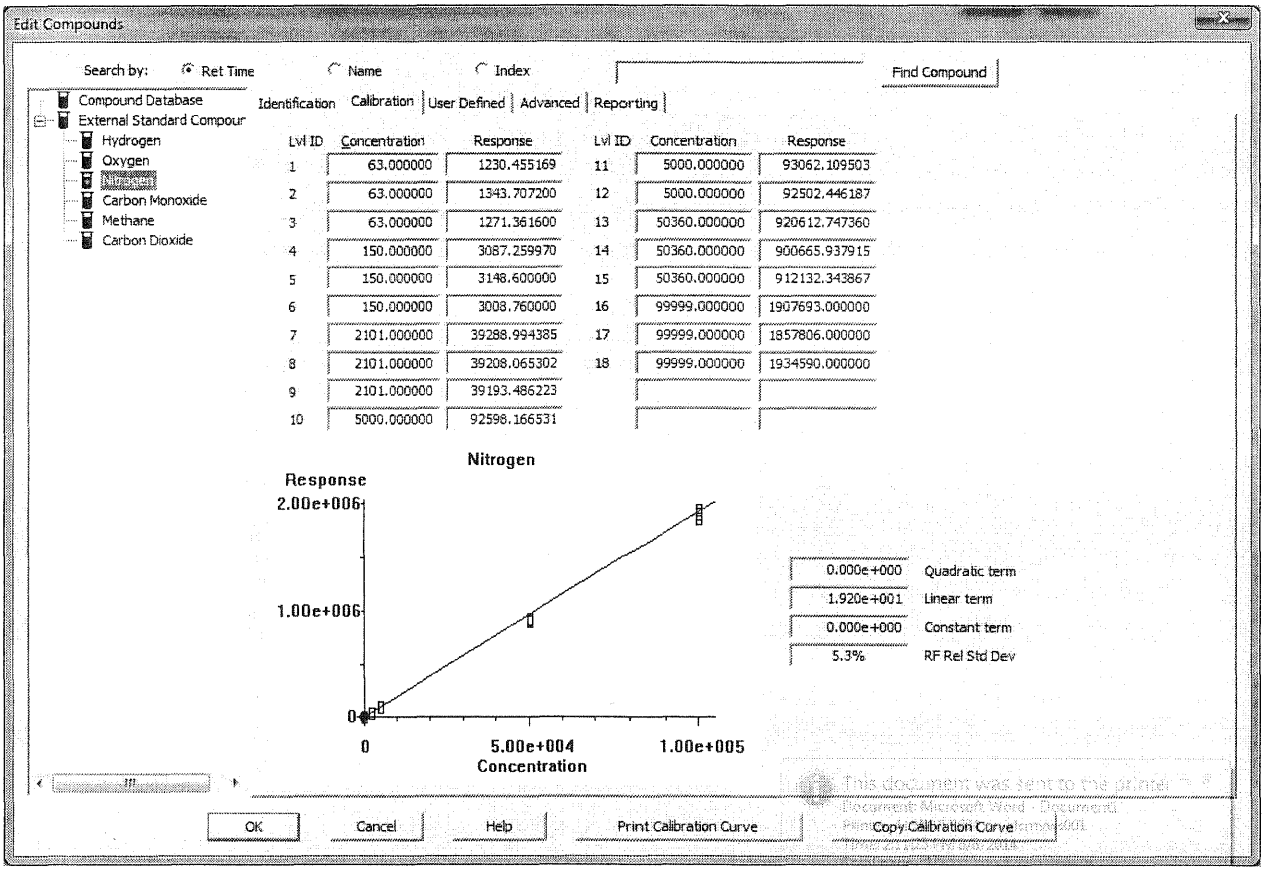
(#) = Out of Range ### Number of calibration levels exceeded format ###


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Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
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3 50.400000 704.670417
4 120.000000 1667.495000
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7 1680.000000 21764.692500
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18 99999.000000
Hydrogen
Response
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0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.381e+001 Linear term
0.000e+000 Constant term
6.2% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

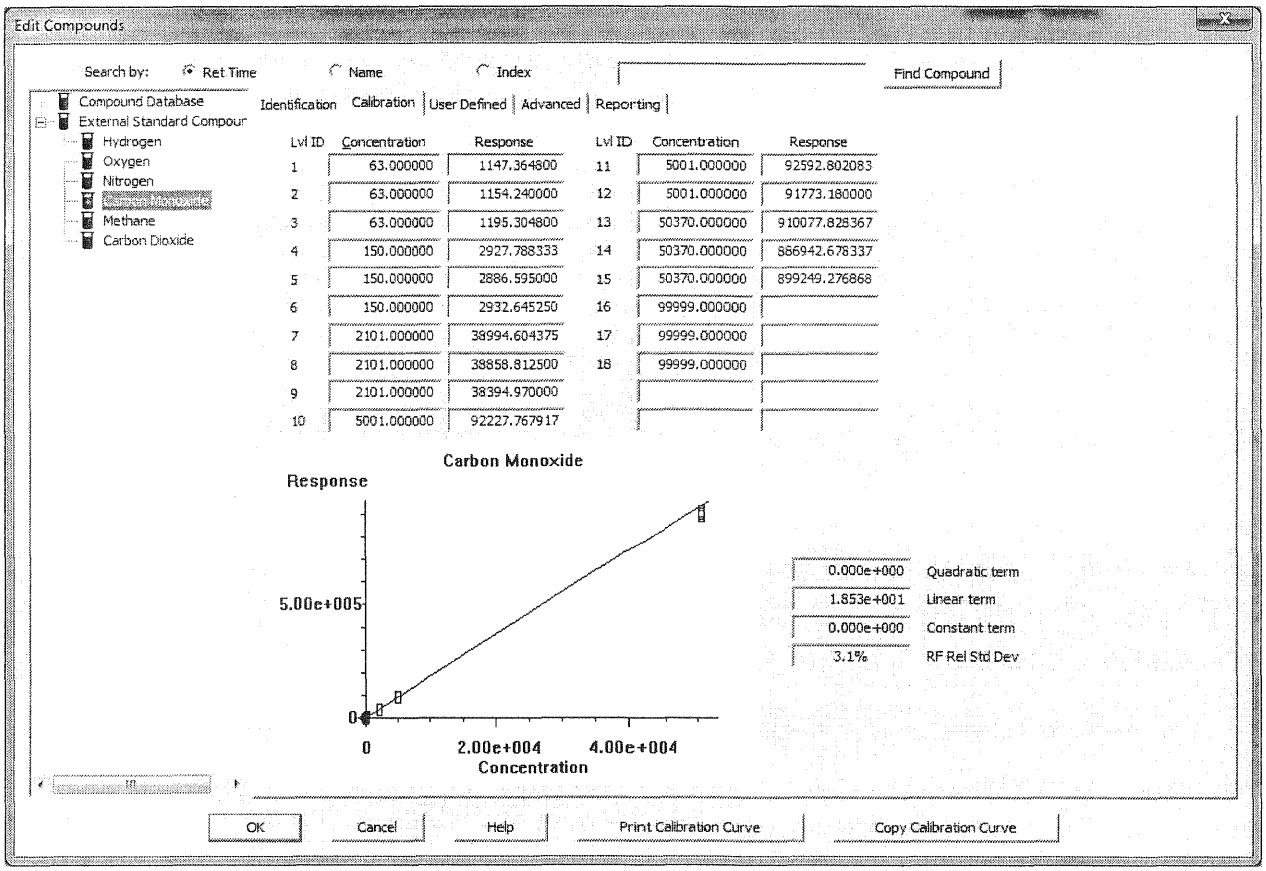
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Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
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2 50.400000 992.030400
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4 120.000000 1972.005030
5 120.000000 2147.720000
6 120.000000 2011.432400
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9 1682.000000 27608.757840
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11 4003.000000 65870.885914
12 4003.000000 65582.676313
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15 40318.200000 633337.224265
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17 99999.000000
18 99999.000000
Oxygen
Response
5.00e+005
0
0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.653e+001 Linear term
0.000e+000 Constant term
6.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

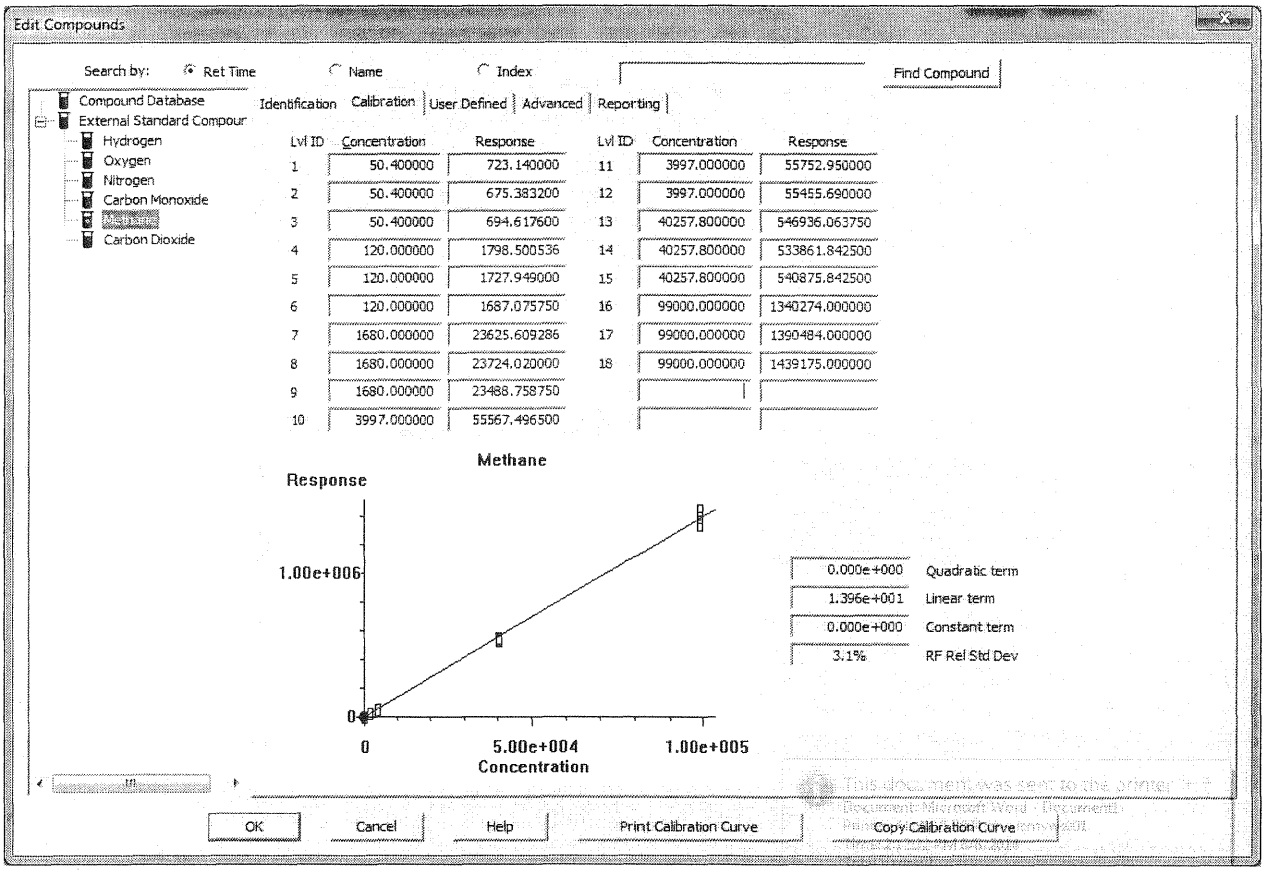
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Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 63.000000 1230.455169
2 63.000000 1343.707200
3 63.000000 1271.361600
4 150.000000 3087.259970
5 150.000000 3148.600000
6 150.000000 3008.760000
7 2101.000000 39288.994385
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9 2101.000000 39193.486223
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12 5000.000000 92502.446187
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15 50360.000000 912132.343867
16 99999.000000 1907693.000000
17 99999.000000 1857806.000000
18 99999.000000 1934590.000000
Nitrogen
Response
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1.00e+006
0
0
5.00e+004
1.00e+005
Concentration
0.000e+000 Quadratic term
1.920e+001 Linear term
0.000e+000 Constant term
5.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

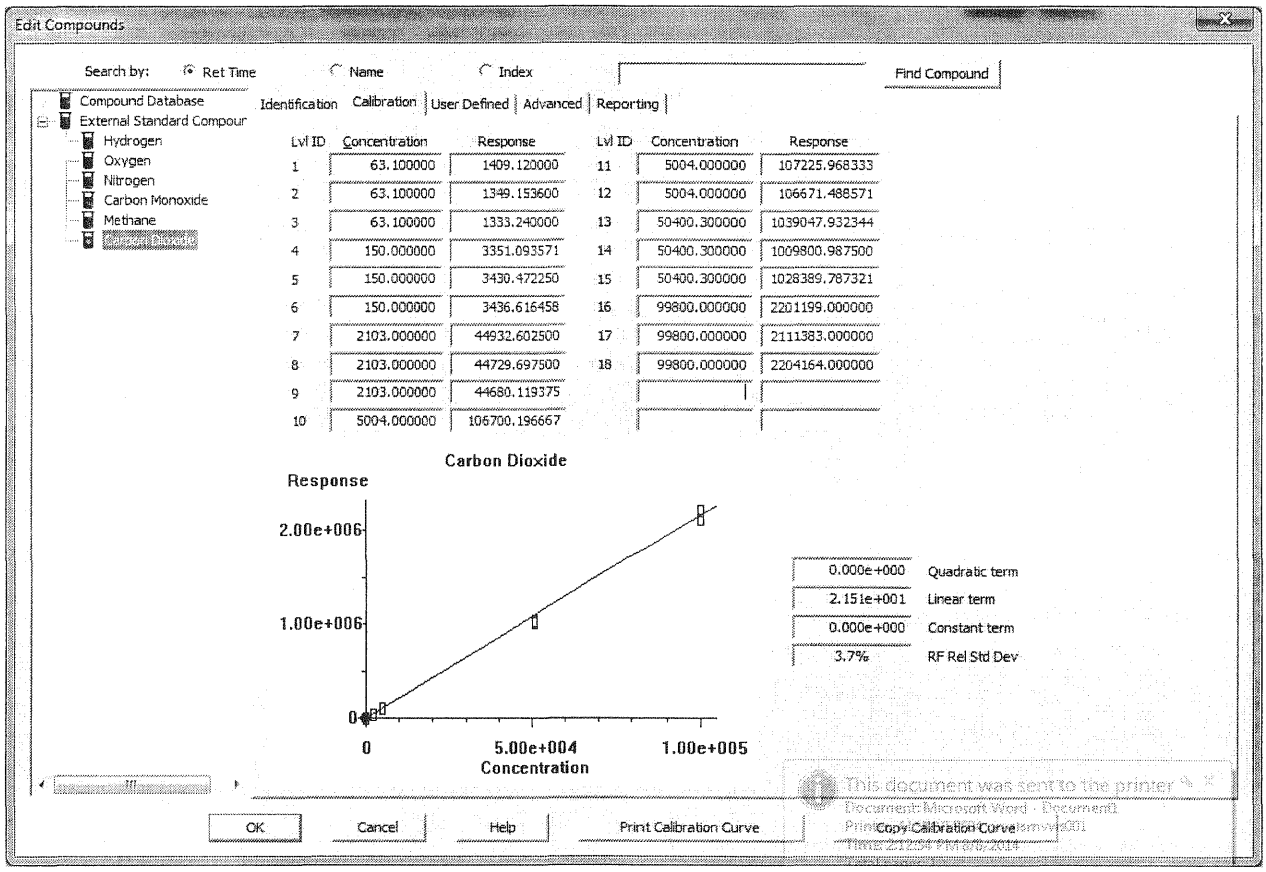
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Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 63.000000 1147.364800
2 63.000000 1154.240000
3 63.000000 1195.304800
4 150.000000 2927.788333
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6 150.000000 2932.645250
7 2101.000000 38994.604375
8 2101.000000 38858.812500
9 2101.000000 38394.970000
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11 5001.000000 92592.802083
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Carbon Monoxide
Response
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2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.853e+001 Linear term
0.000e+000 Constant term
3.1% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

Added Page


Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 50.400000 723.140000
2 50.400000 675.383200
3 50.400000 694.617600
4 120.000000 1798.500536
5 120.000000 1727.949000
6 120.000000 1687.075750
7 1680.000000 23625.609286
8 1680.000000 23724.020000
9 1680.000000 23488.758750
10 3997.000000 55567.496500
11 3997.000000 55752.950000
12 3997.000000 55455.690000
13 40257.800000 546936.063750
14 40257.800000 533861.842500
15 40257.800000 540875.842500
16 99000.000000 1340274.000000
17 99000.000000 1390484.000000
18 99000.000000 1439175.000000
Methane
Response
1.00e+006
0
0
5.00e+004
1.00e+005
Concentration
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
Copy Calibration Curve

Added Page


Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 63.100000 1409.120000
2 63.100000 1349.153600
3 63.100000 1333.240000
4 150.000000 3351.093571
5 150.000000 3430.472250
6 150.000000 3436.616458
7 2103.000000 44932.602500
8 2103.000000 44729.697500
9 2103.000000 44680.119375
10 5004.000000 106700.196667
11 5004.000000 107225.968333
12 5004.000000 106671.488571
13 50400.300000 1039047.932344
14 50400.300000 1009800.987500
15 50400.300000 1028389.787321
16 99800.000000 2201199.000000
17 99800.000000 2111383.000000
18 99800.000000 2204164.000000
Carbon Dioxide
Response
2.00e+006
1.00e+006
0
0
5.00e+004
1.00e+005
Concentration
0.000e+000 Quadratic term
2.151e+001 Linear term
0.000e+000 Constant term
3.7% RF Rel Std Dev
This document was sent to the printer
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Print: Copy Calibration Curve
Time: 2:12:54 PM 8/7/2014
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

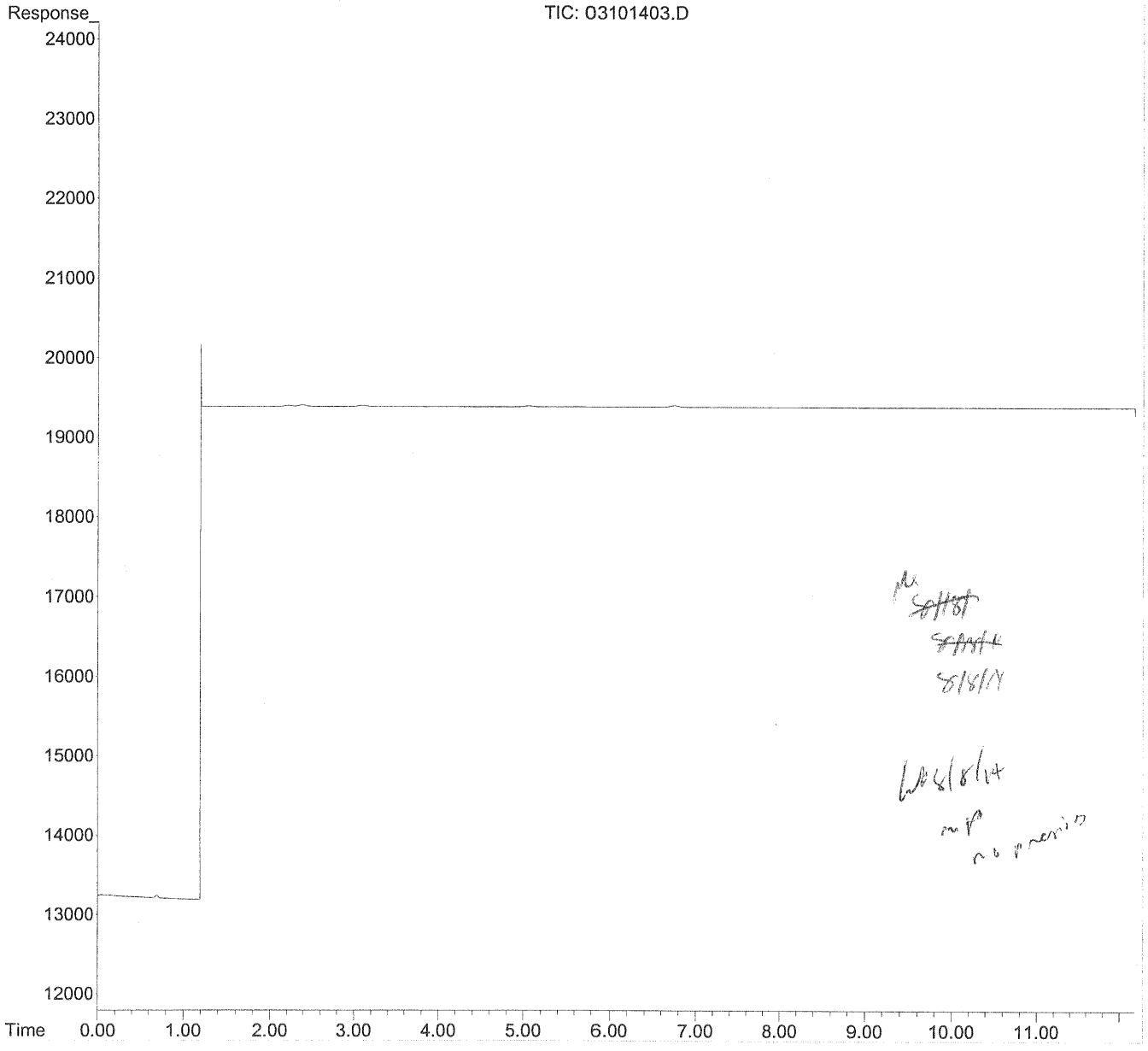
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Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

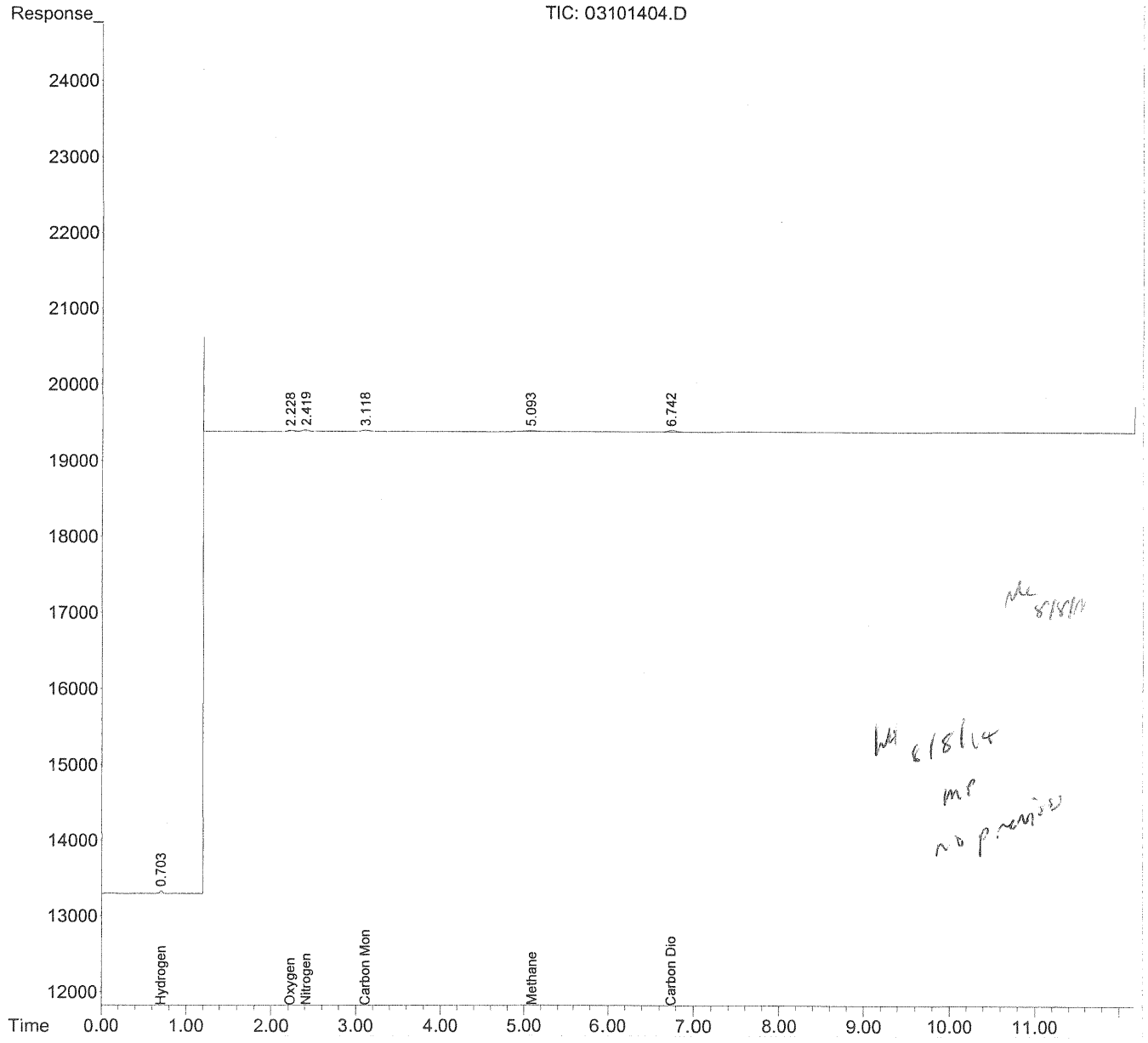
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MC 8/18/14

WH 8/18/14
mc
no problem

Quantitation Report (QT Reviewed)

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

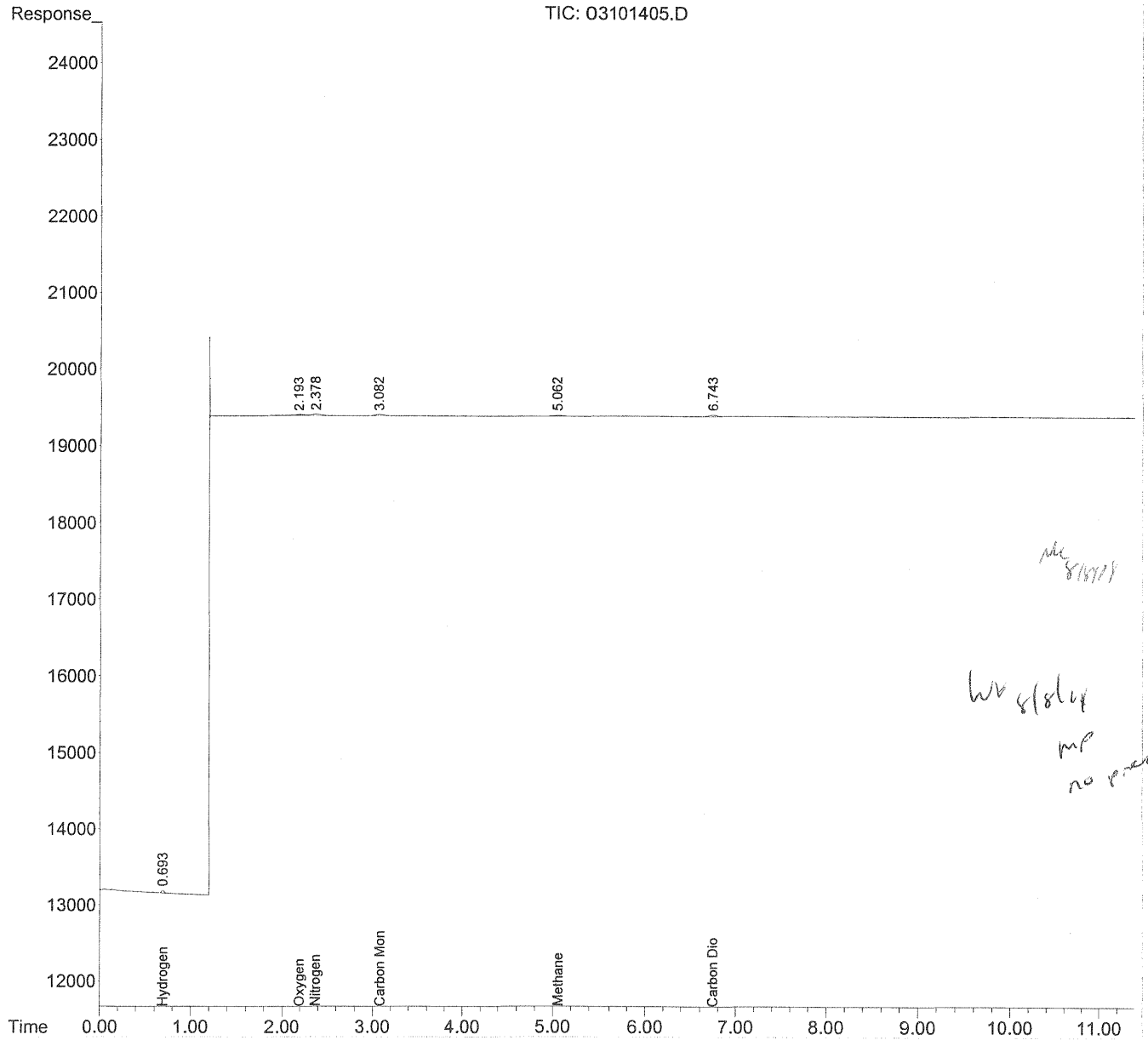
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



WH 8/8/14
MP
no previous

Quantitation Report (QT Reviewed)

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

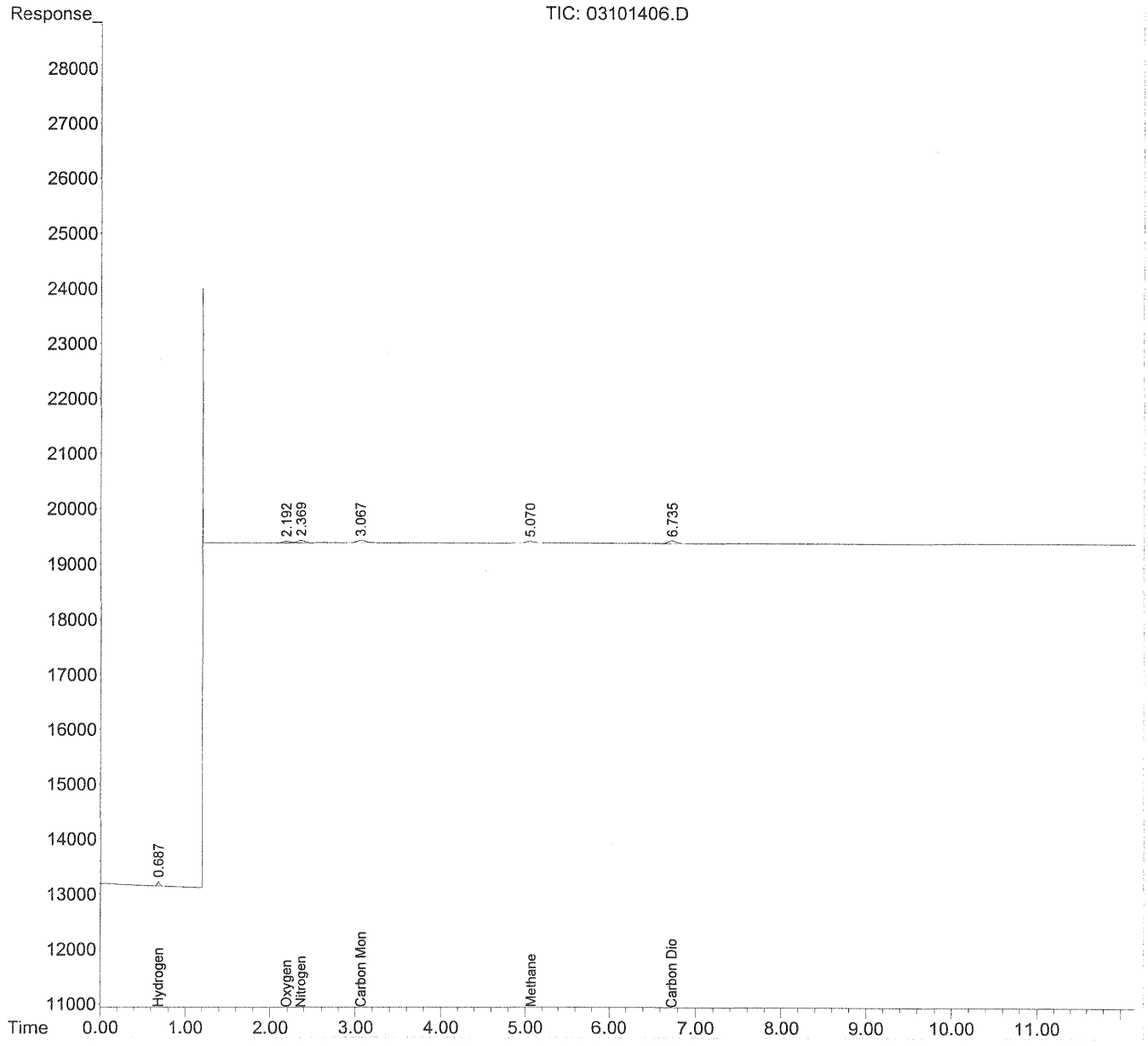
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

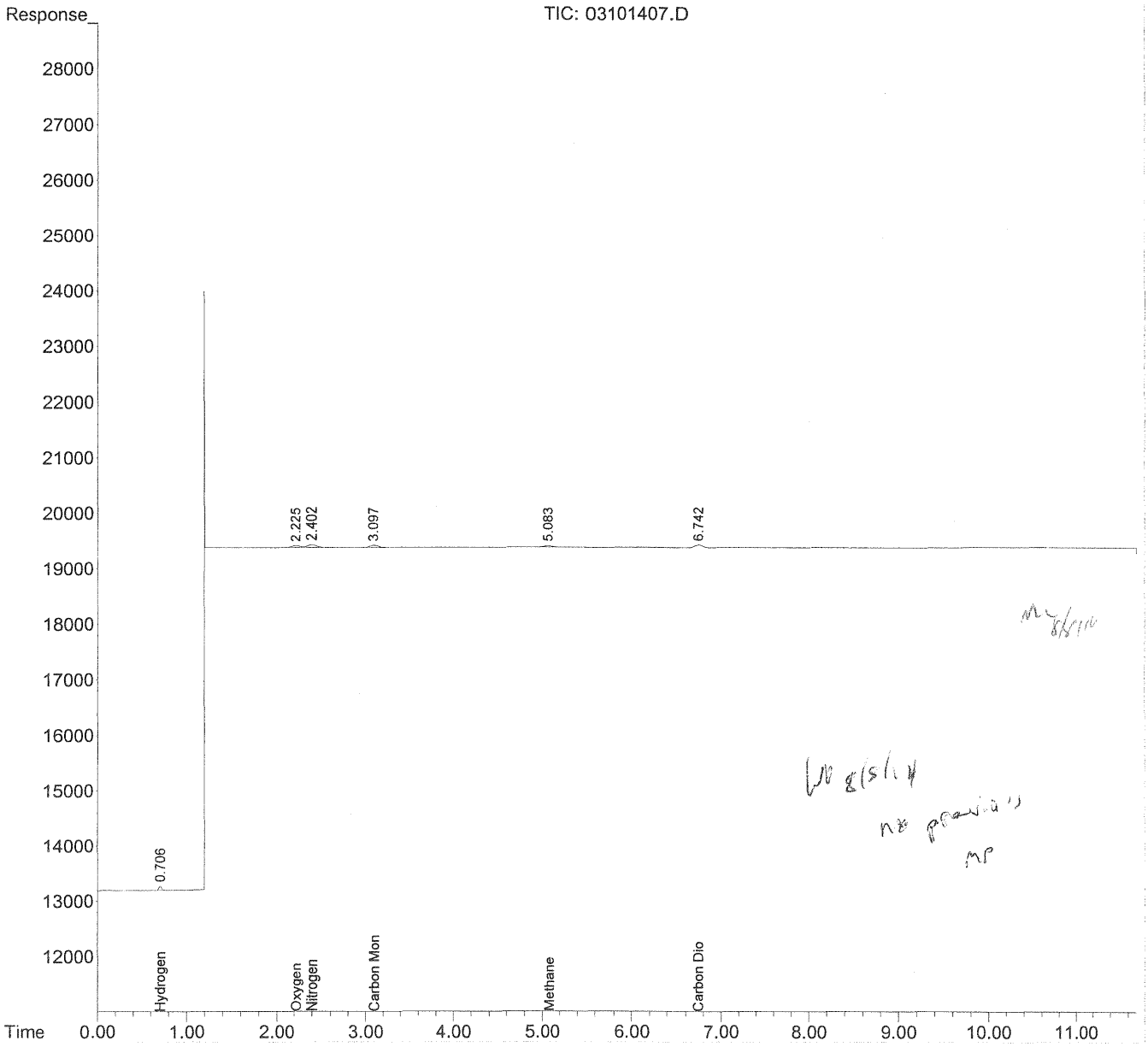
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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	

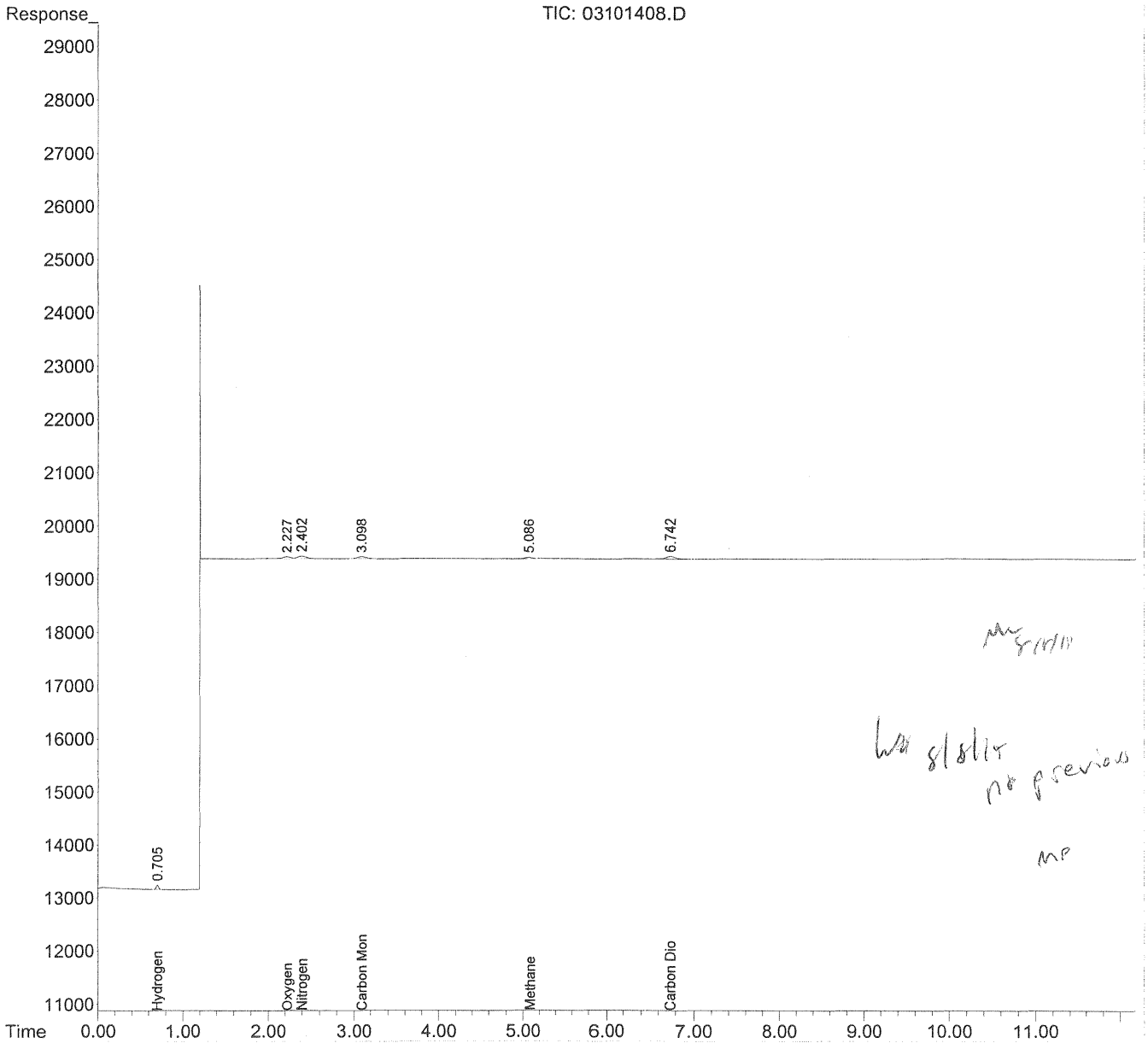
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MP 8/11/14

WH 8/8/14 no previous MP

Added Page

Quantitation Report (QT Reviewed)

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	

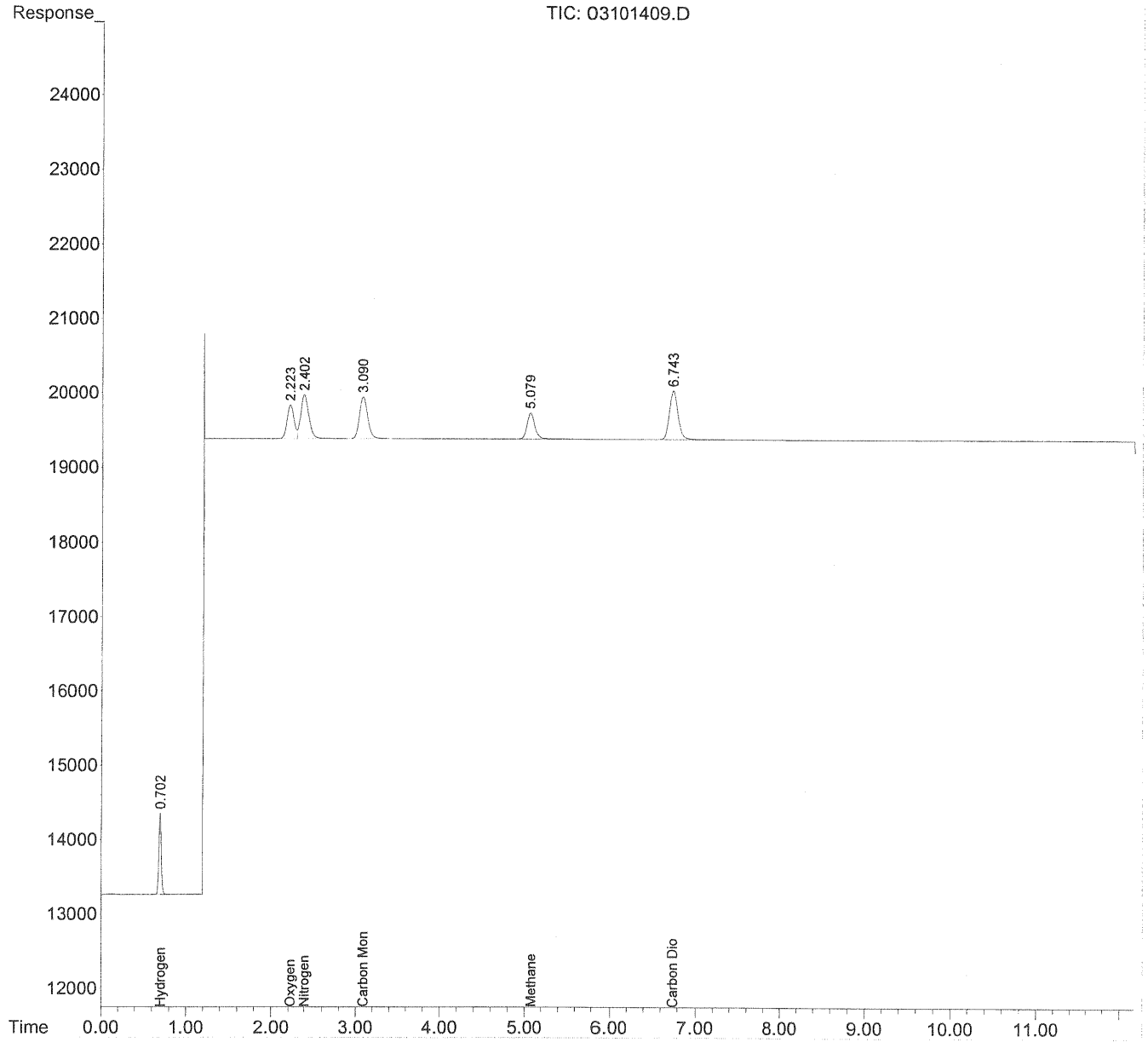
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

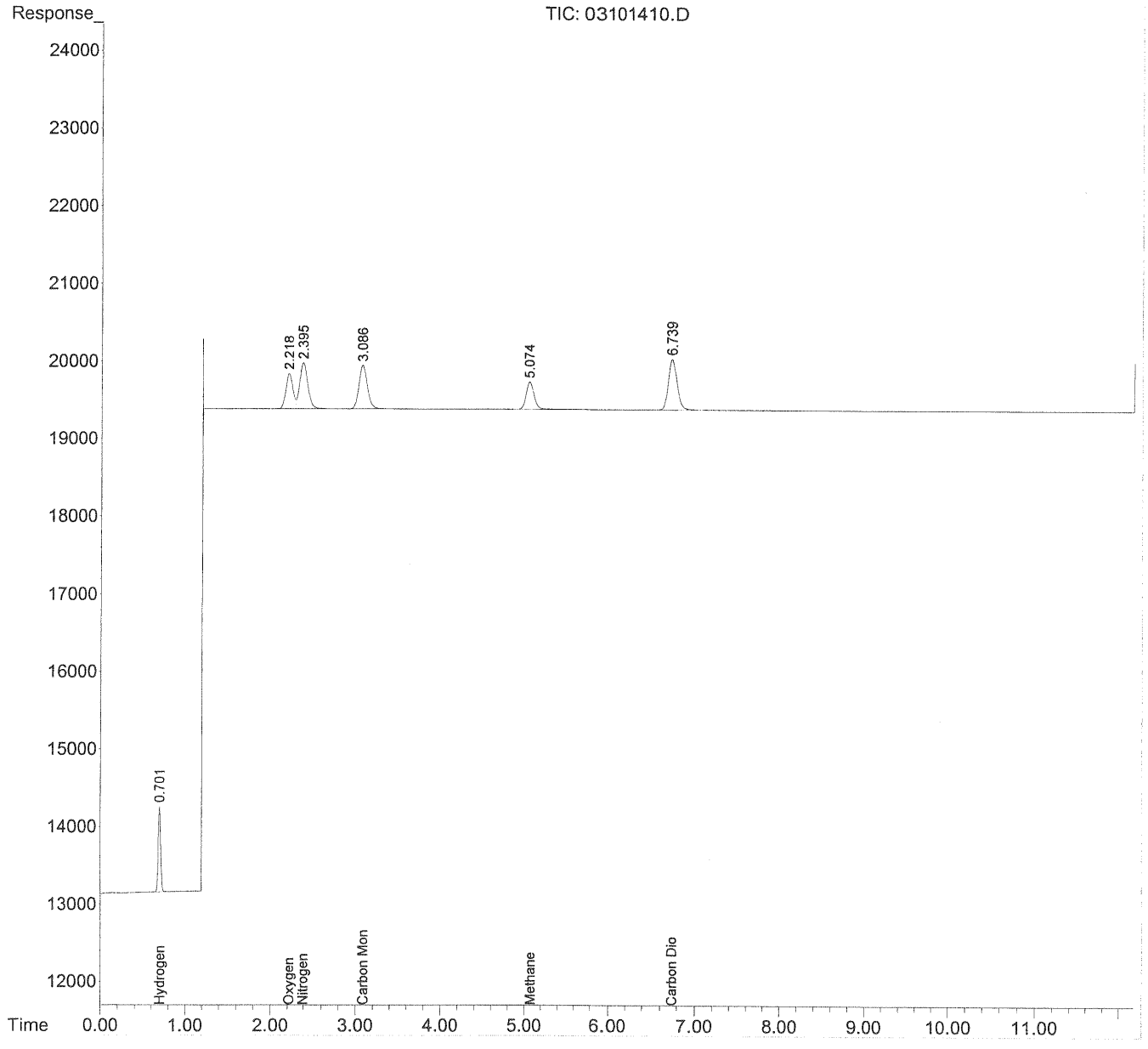
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

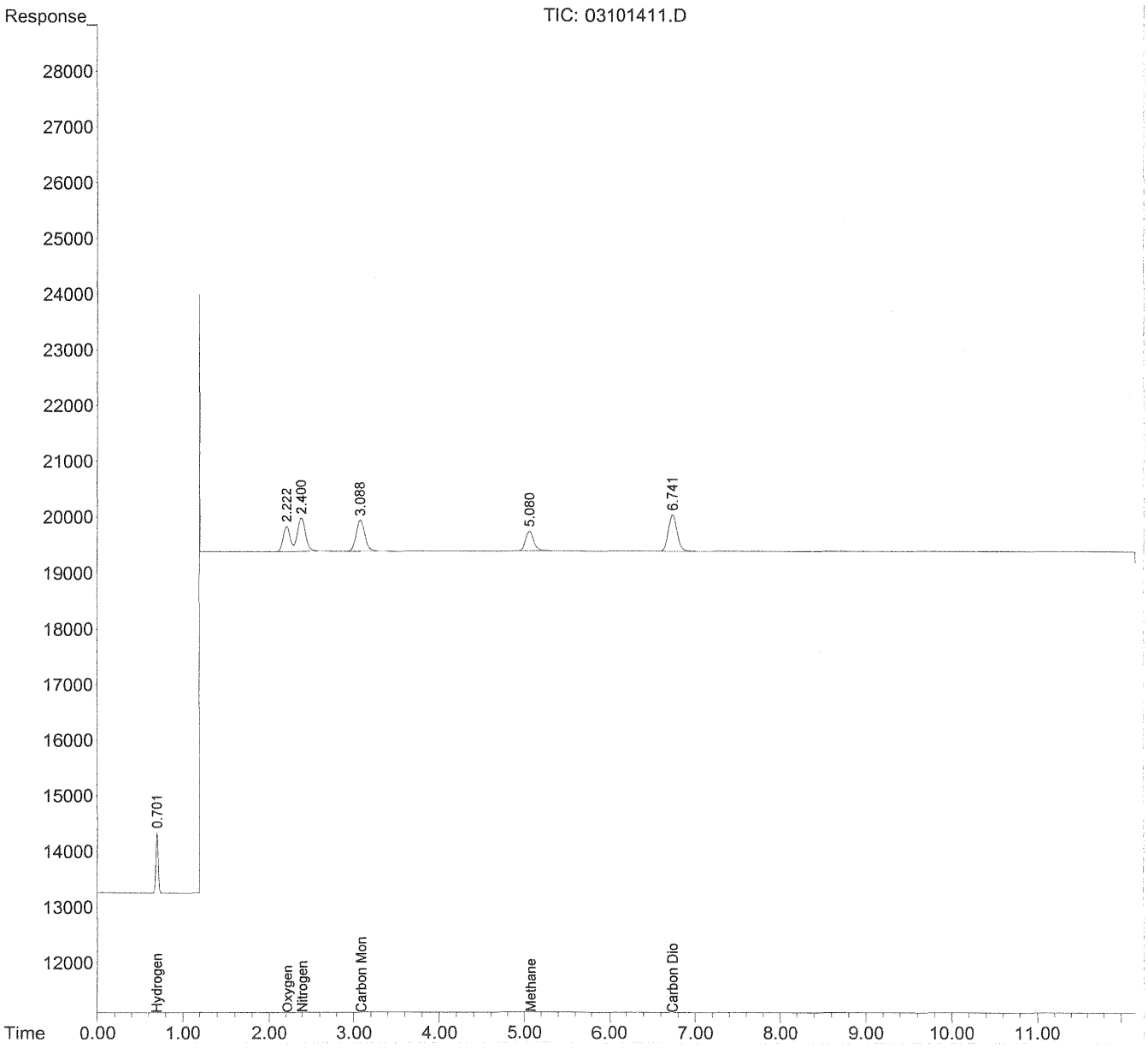
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

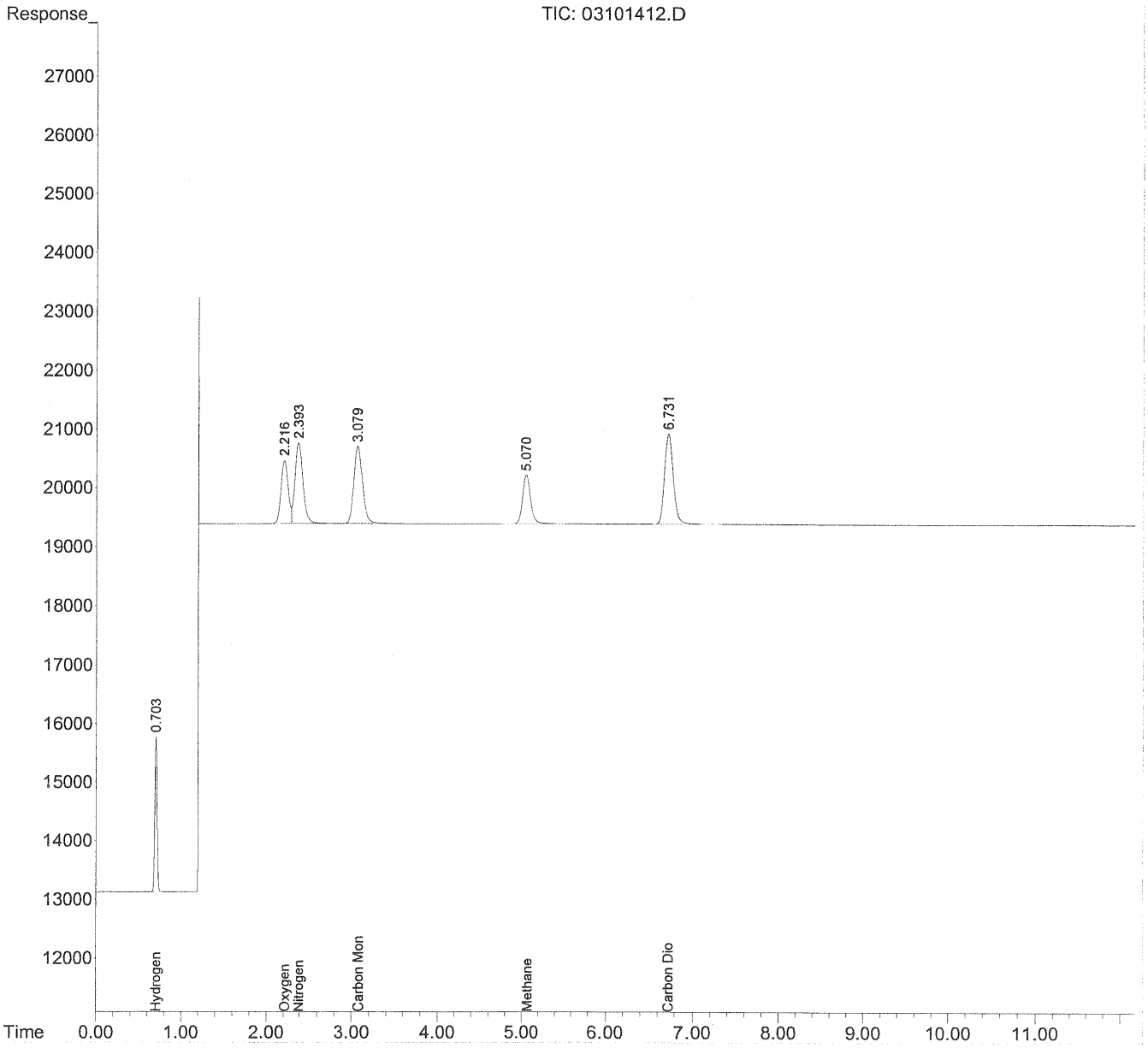
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

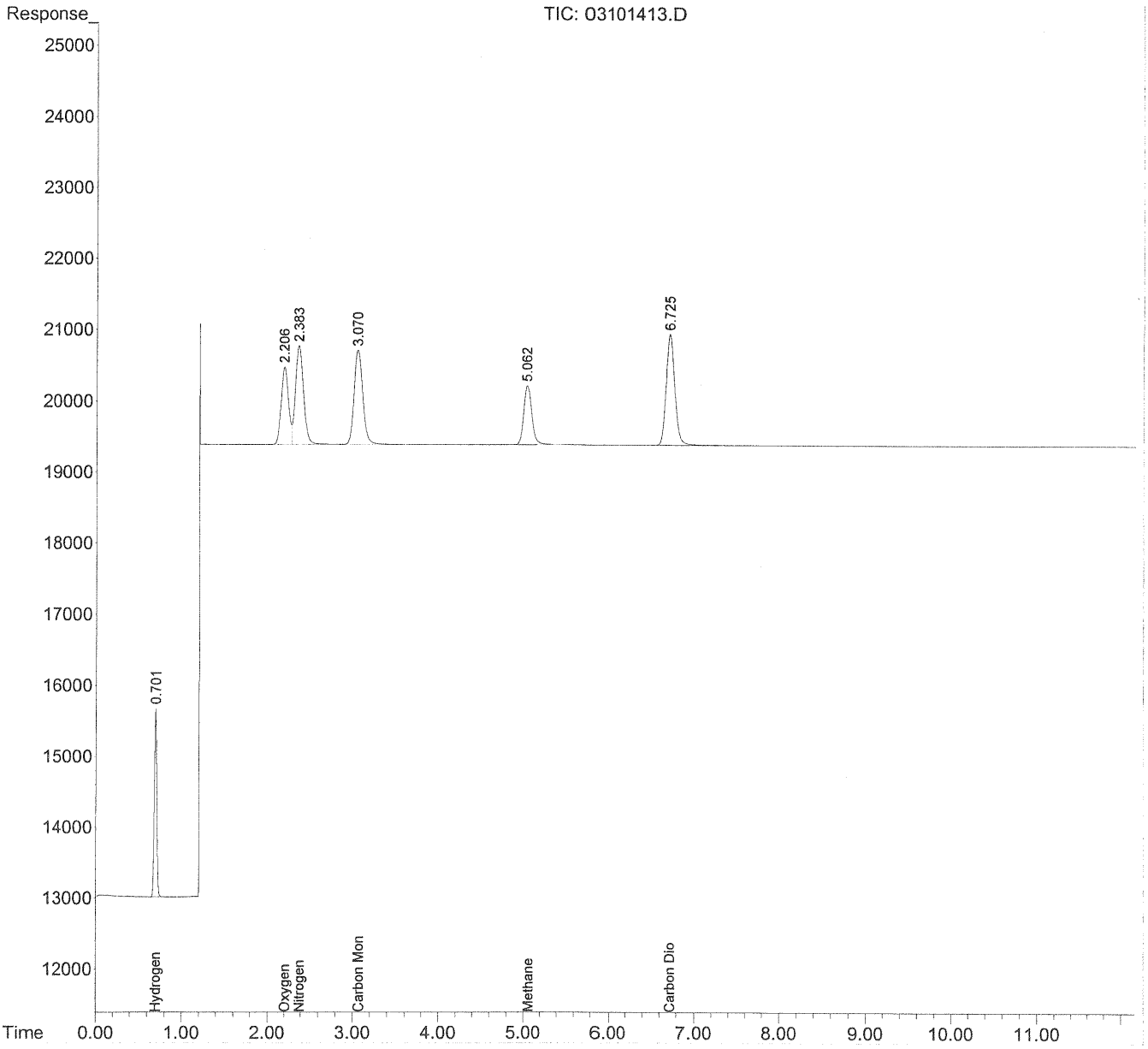
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

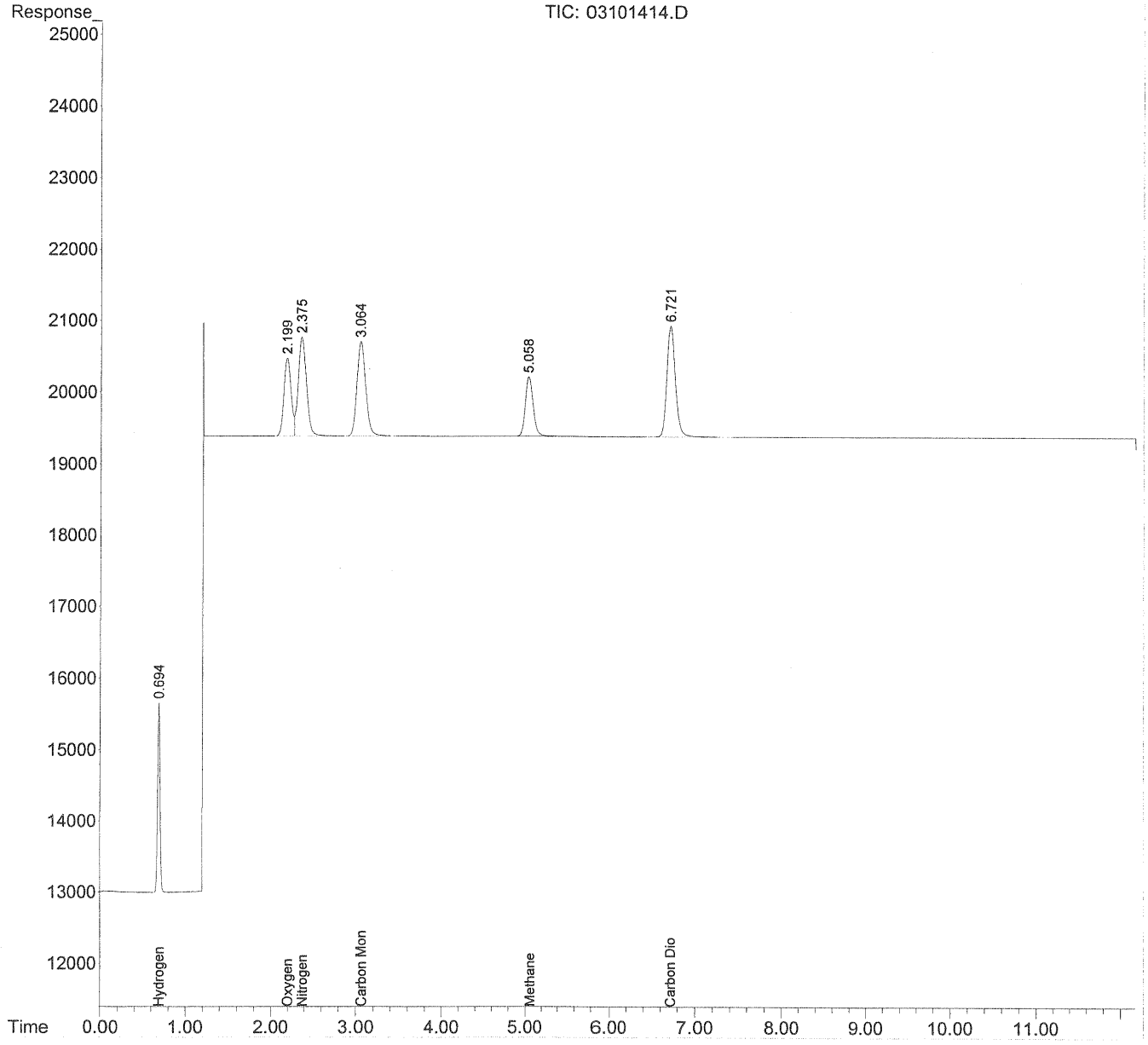
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

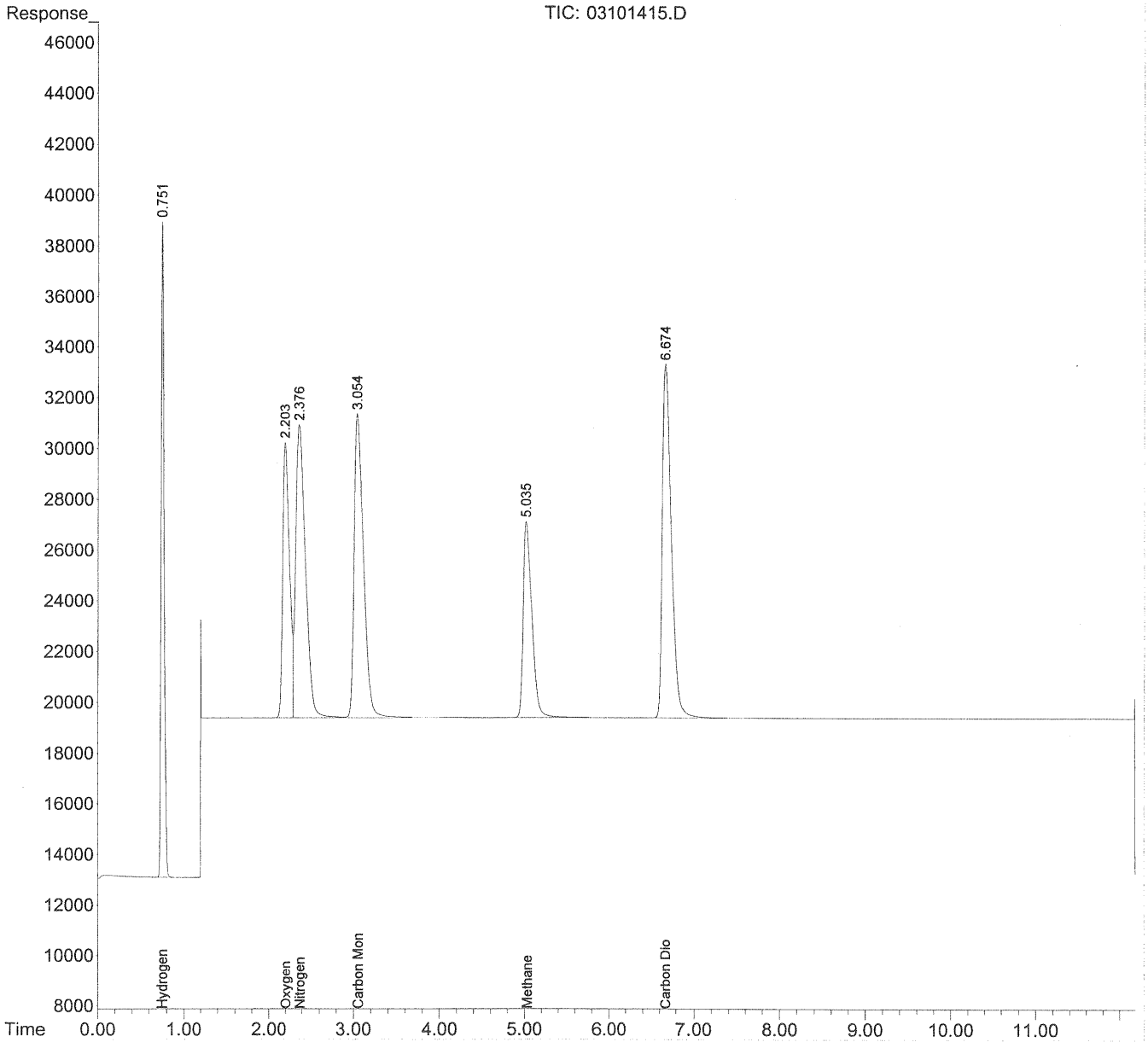
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

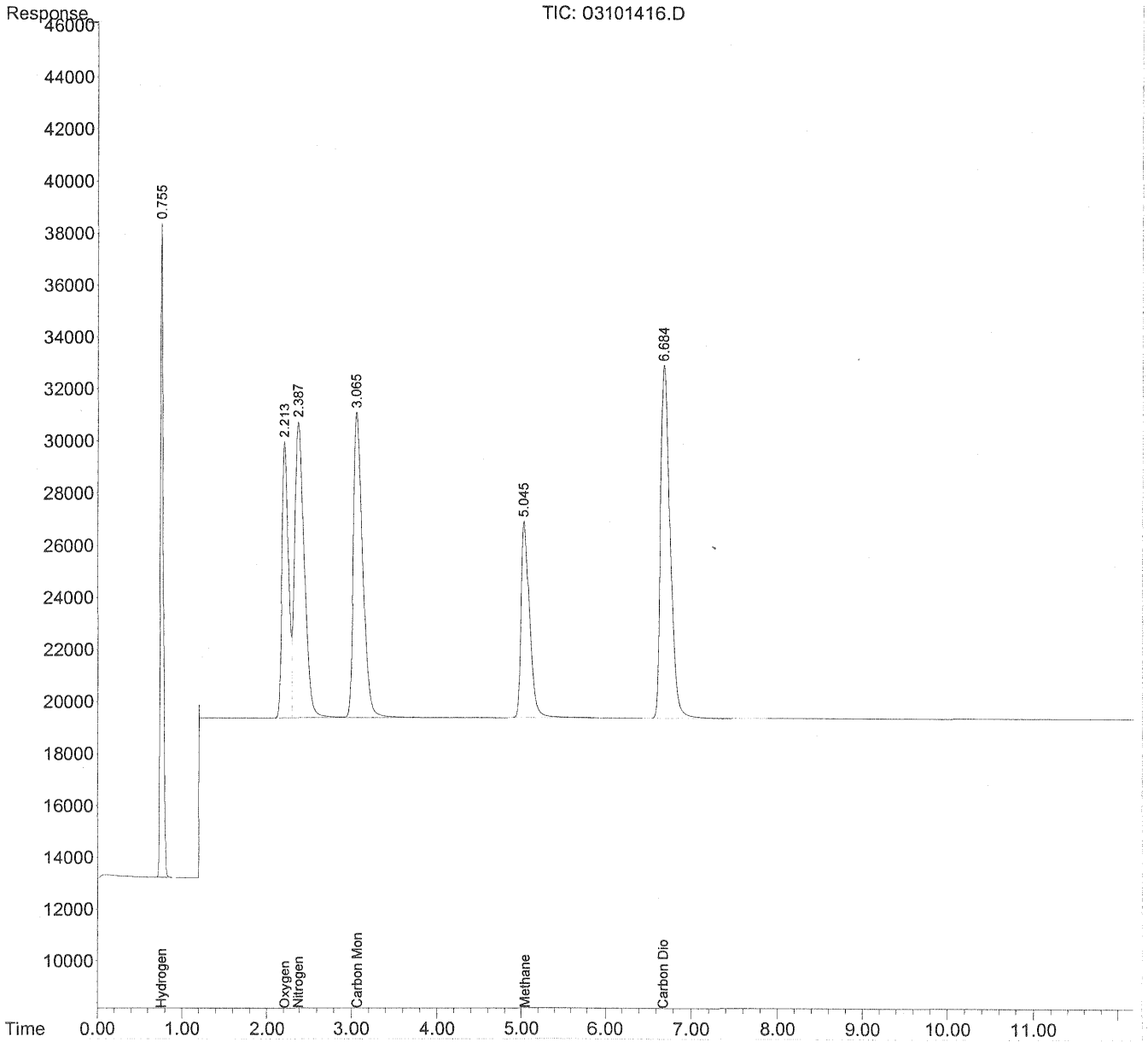
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

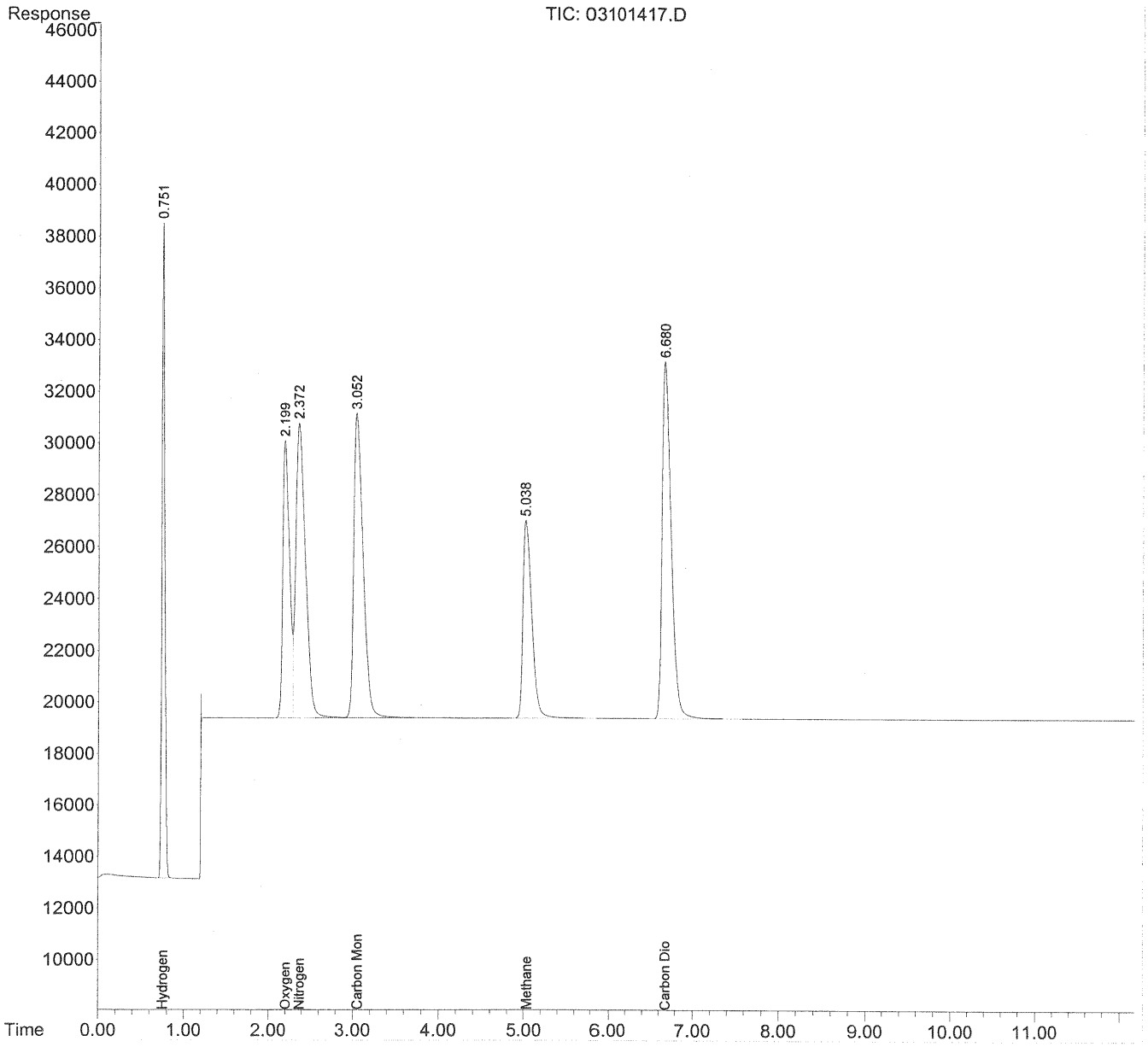
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

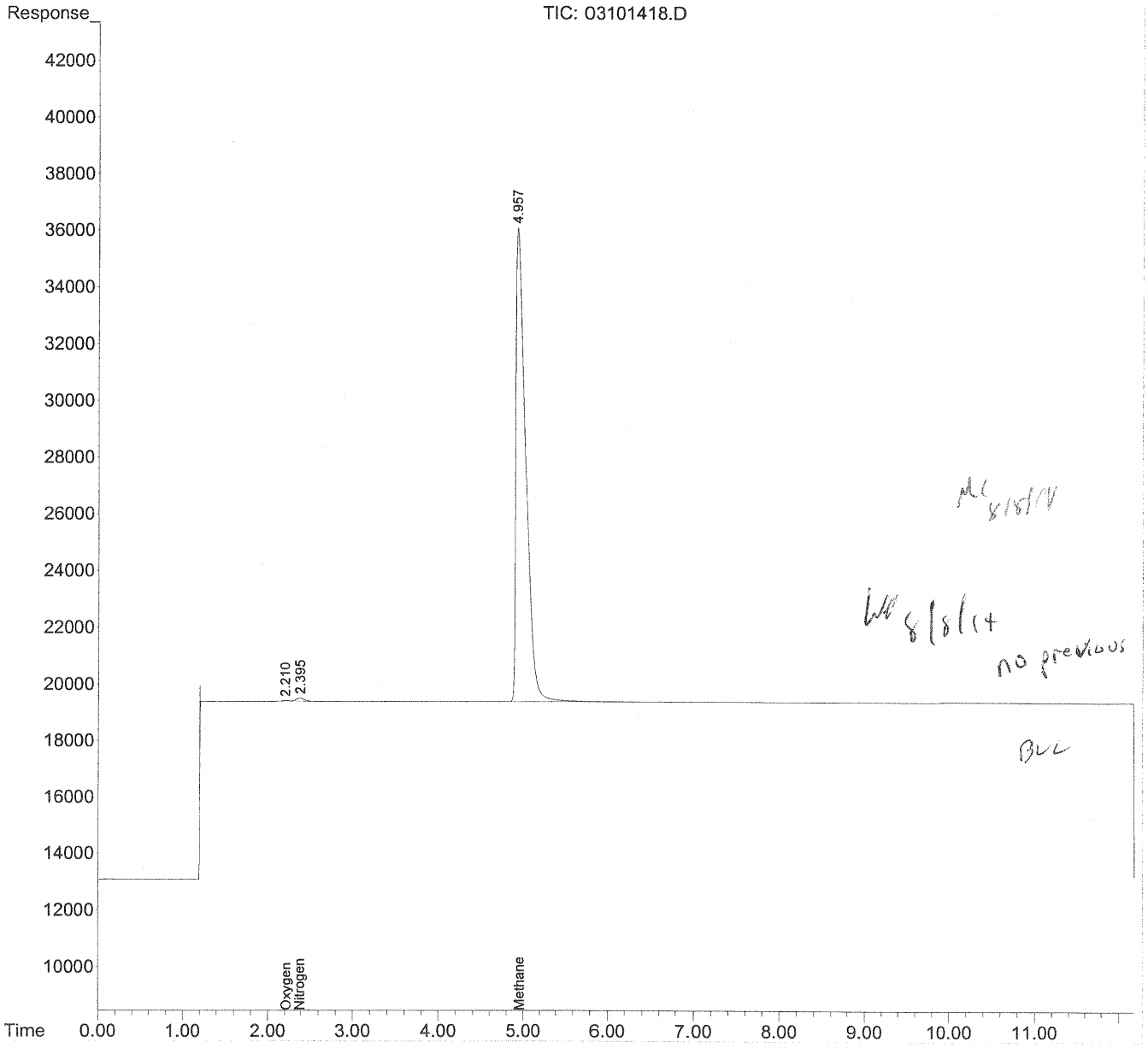
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MC 8/8/14

WH 8/8/14

no previous

BLC

Quantitation Report (QT Reviewed)

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	

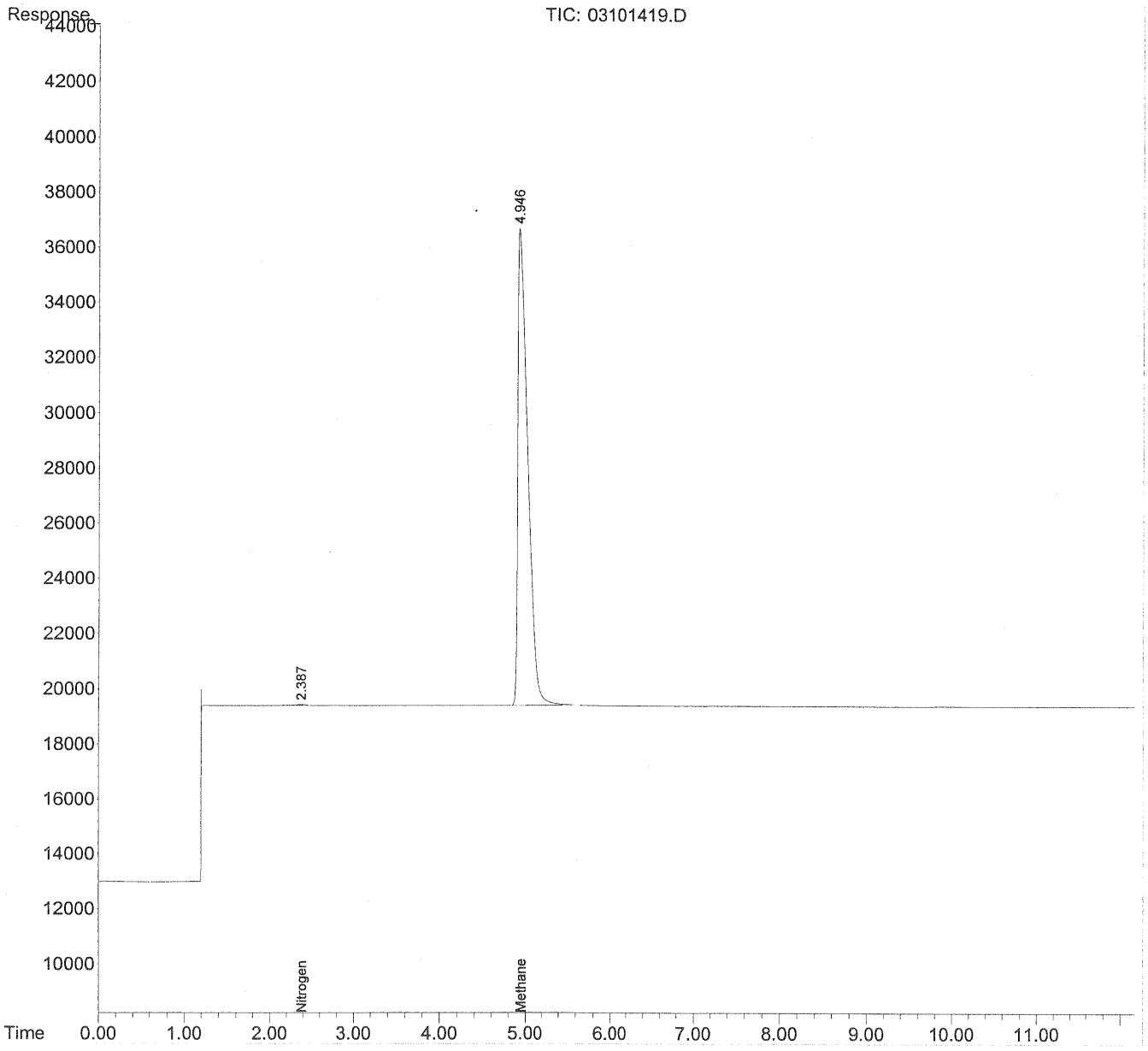
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

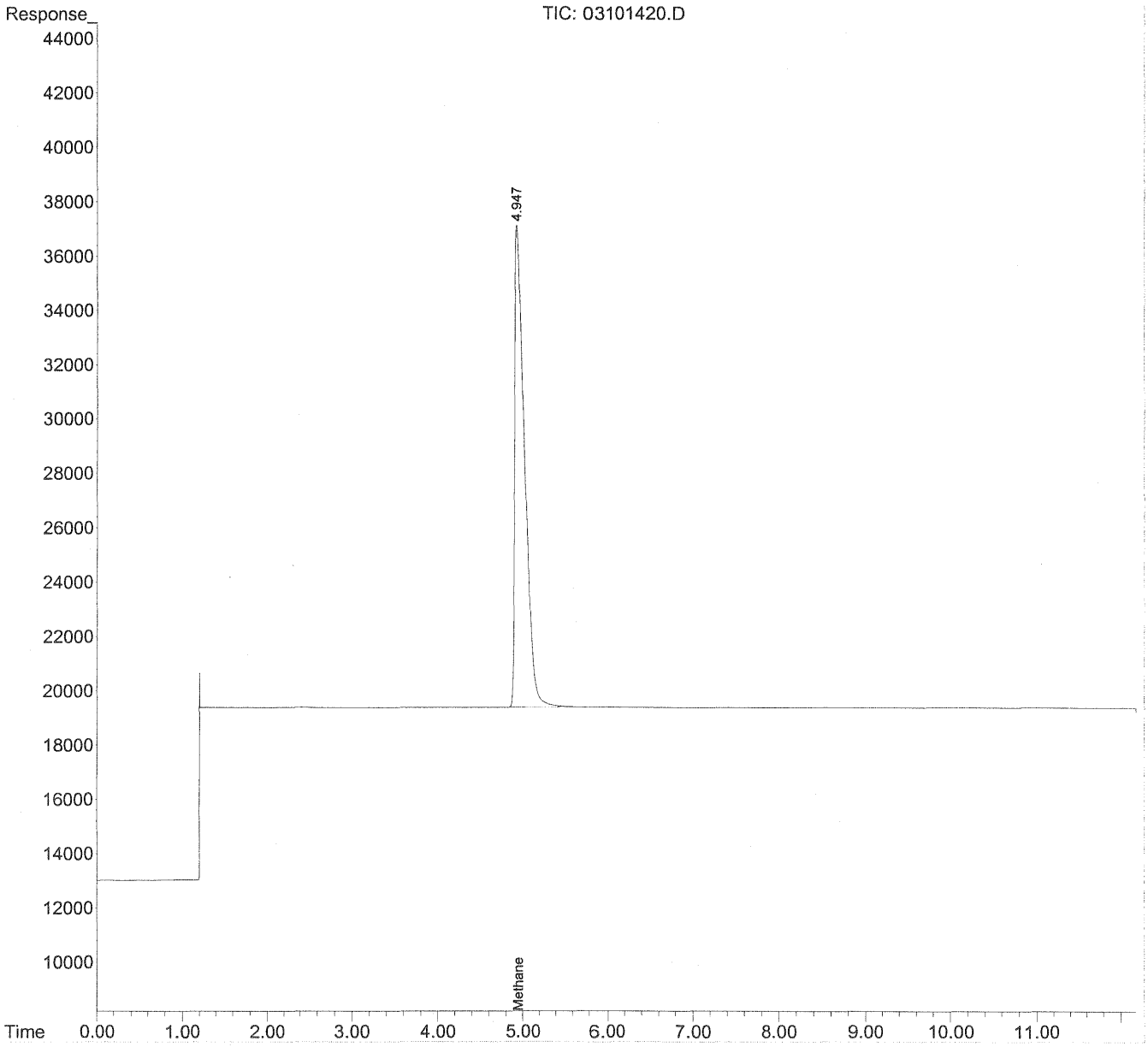
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

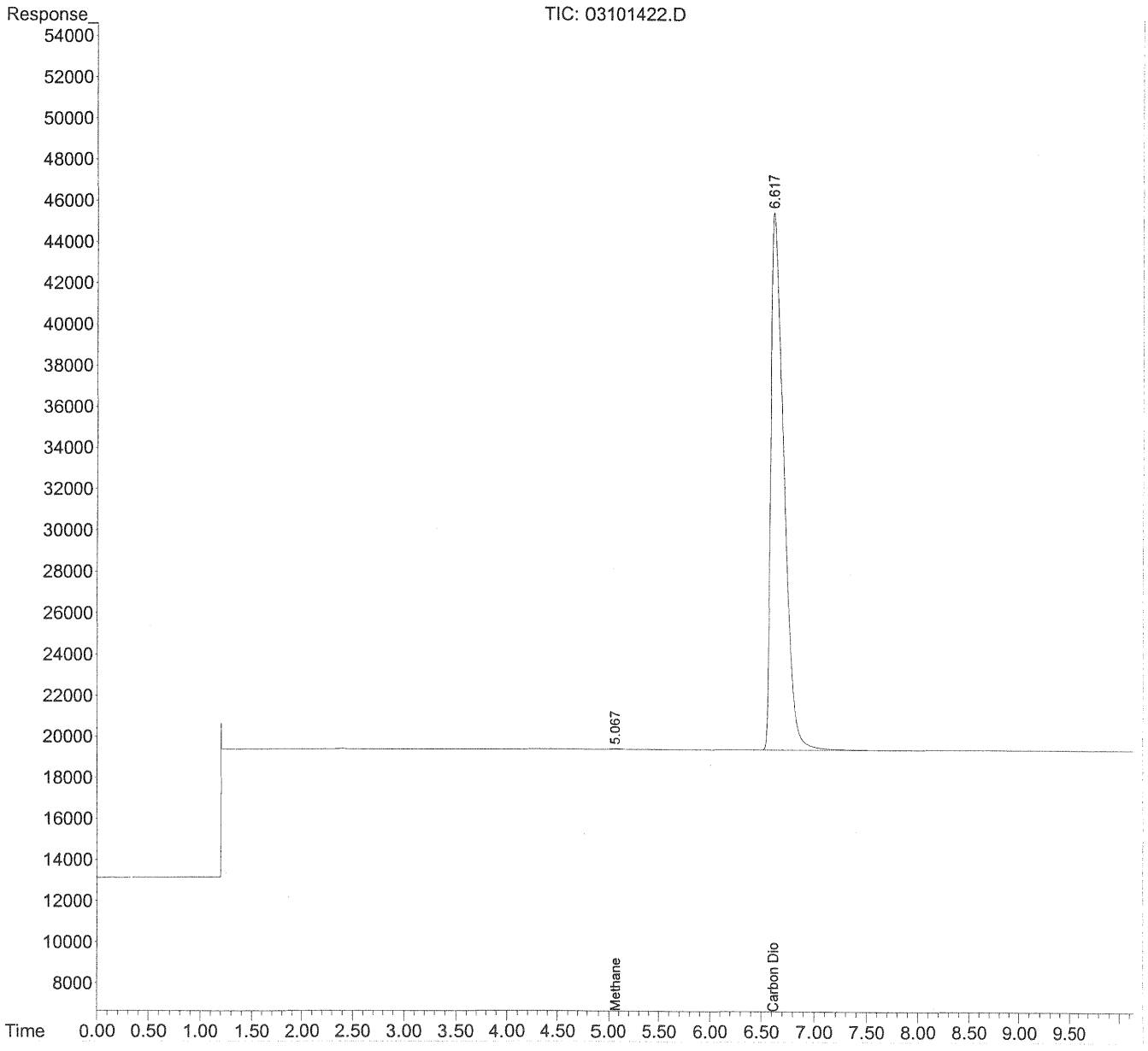
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	0.000	0	N.D.	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	4.949	1439175	1032160.623	ppm
6)	Carbon Dioxide	0.000	0	N.D.	ppm

(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 :



Quantitation Report (QT Reviewed)

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

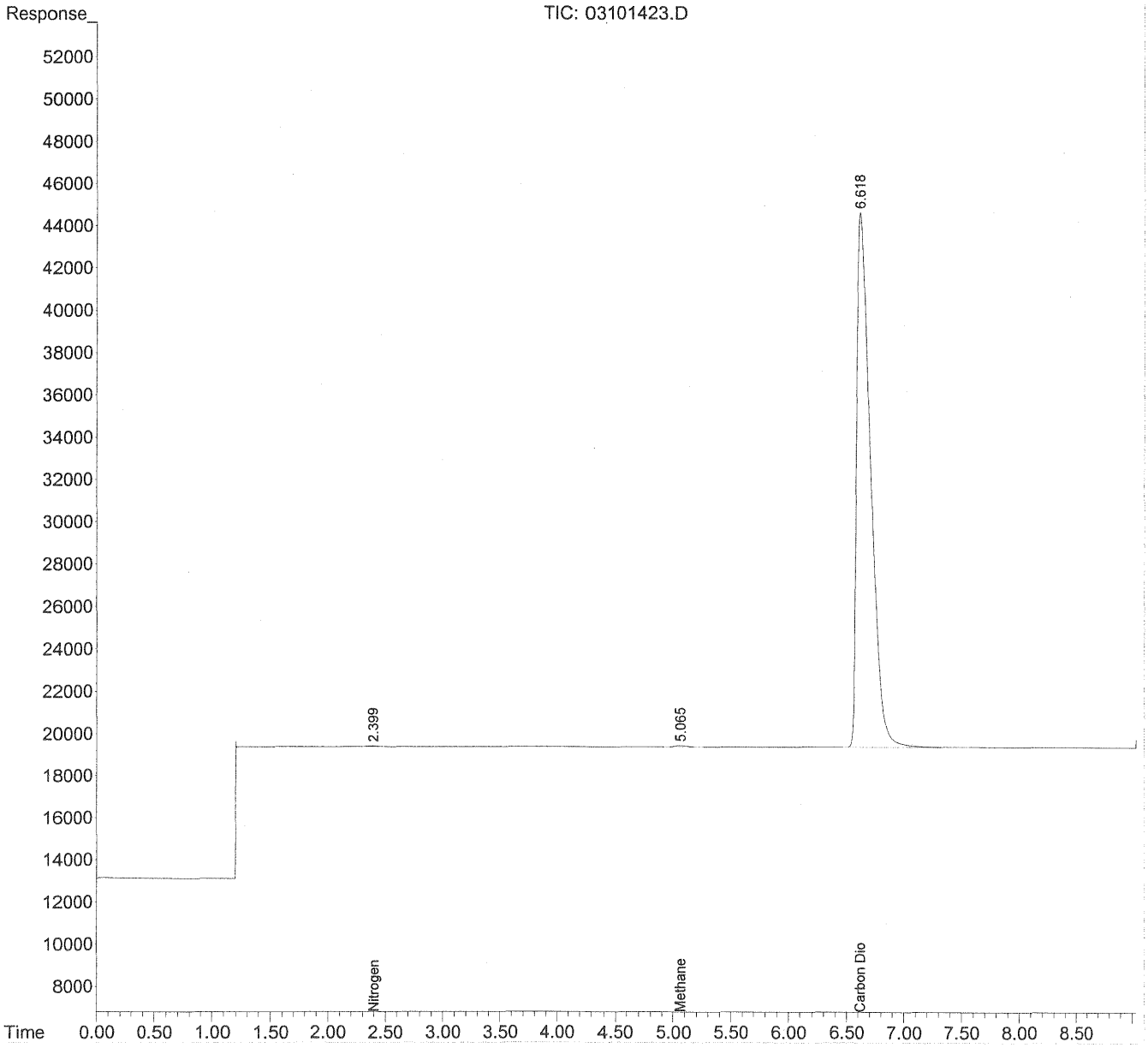
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

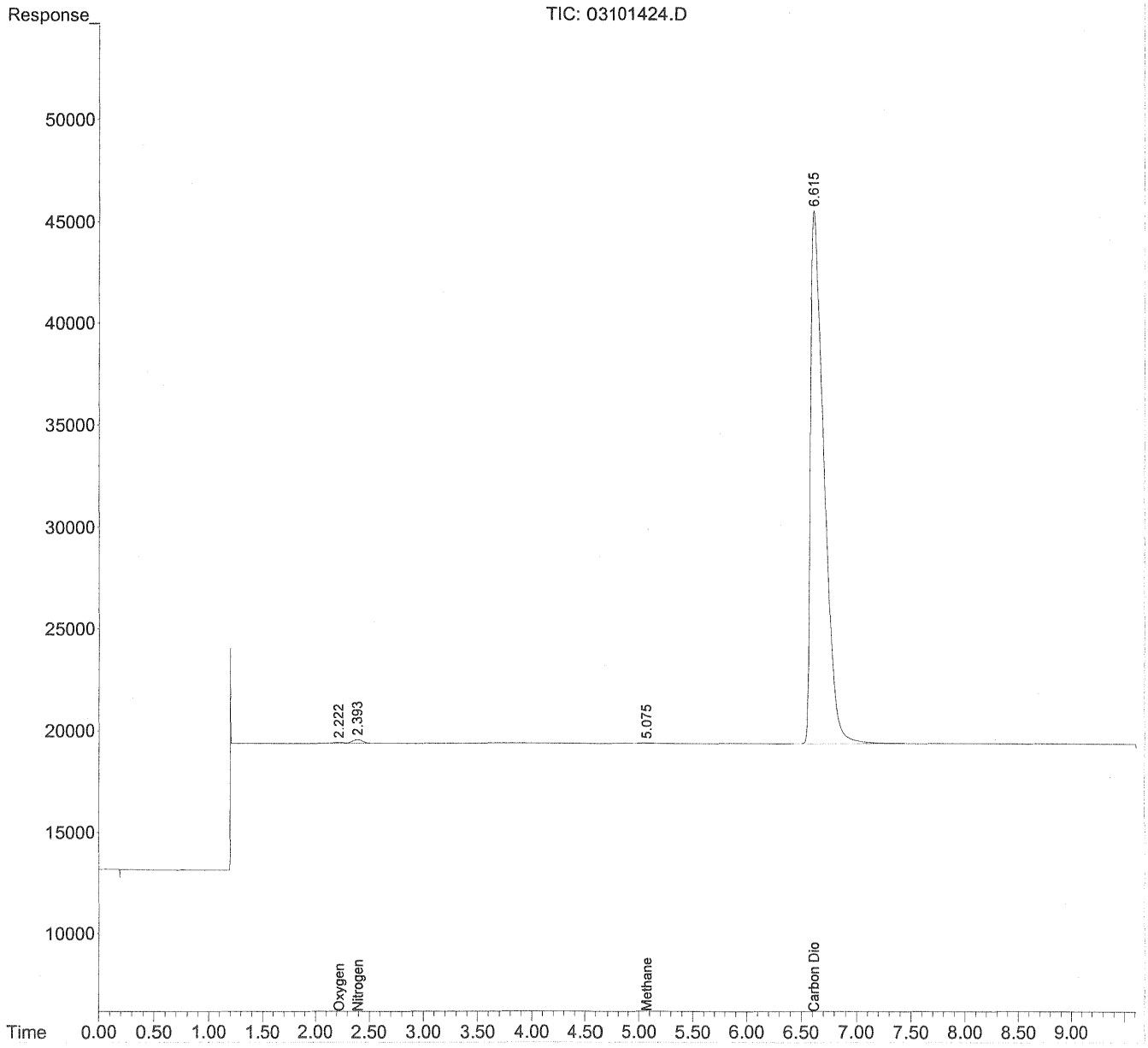
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

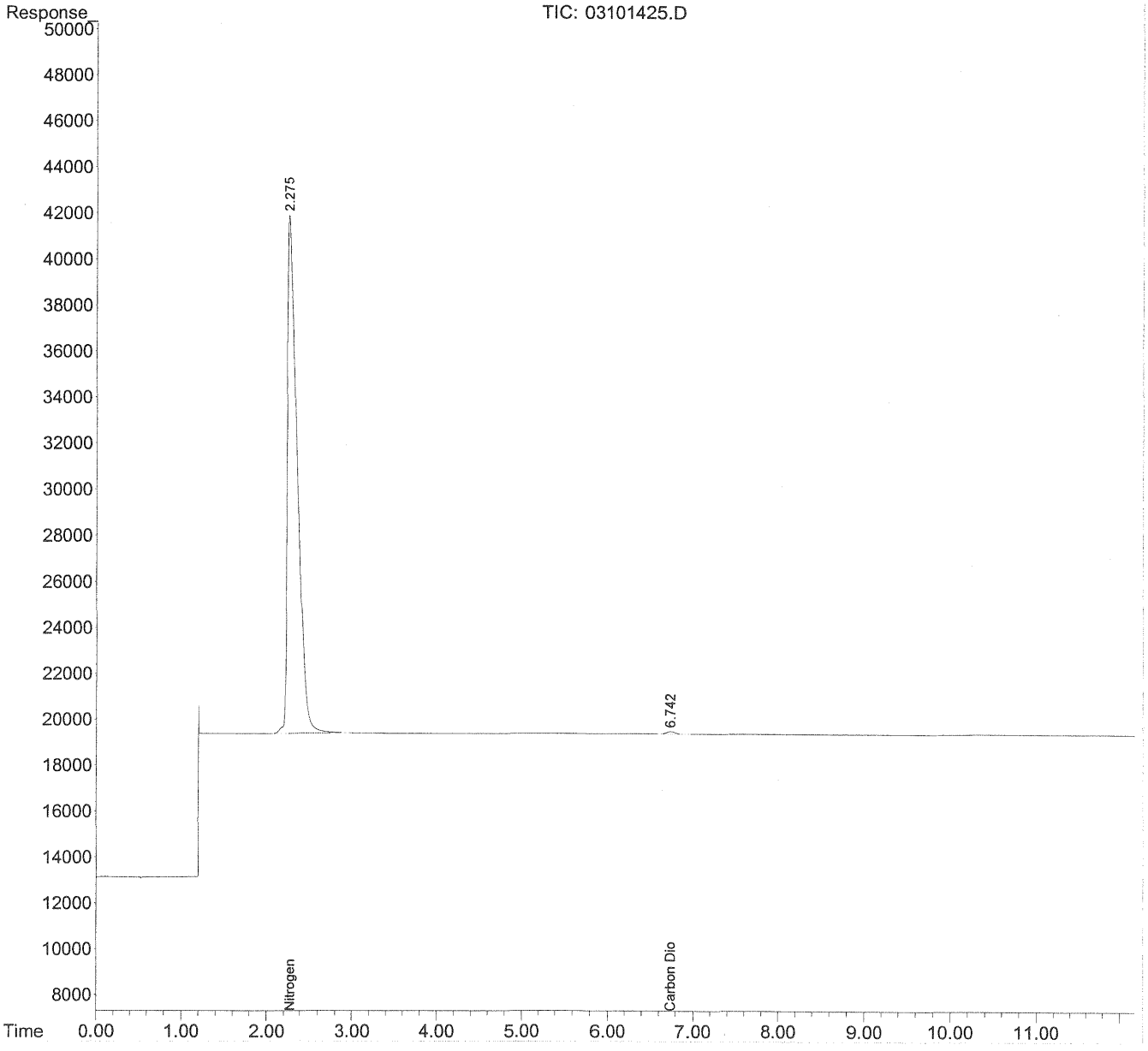
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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	

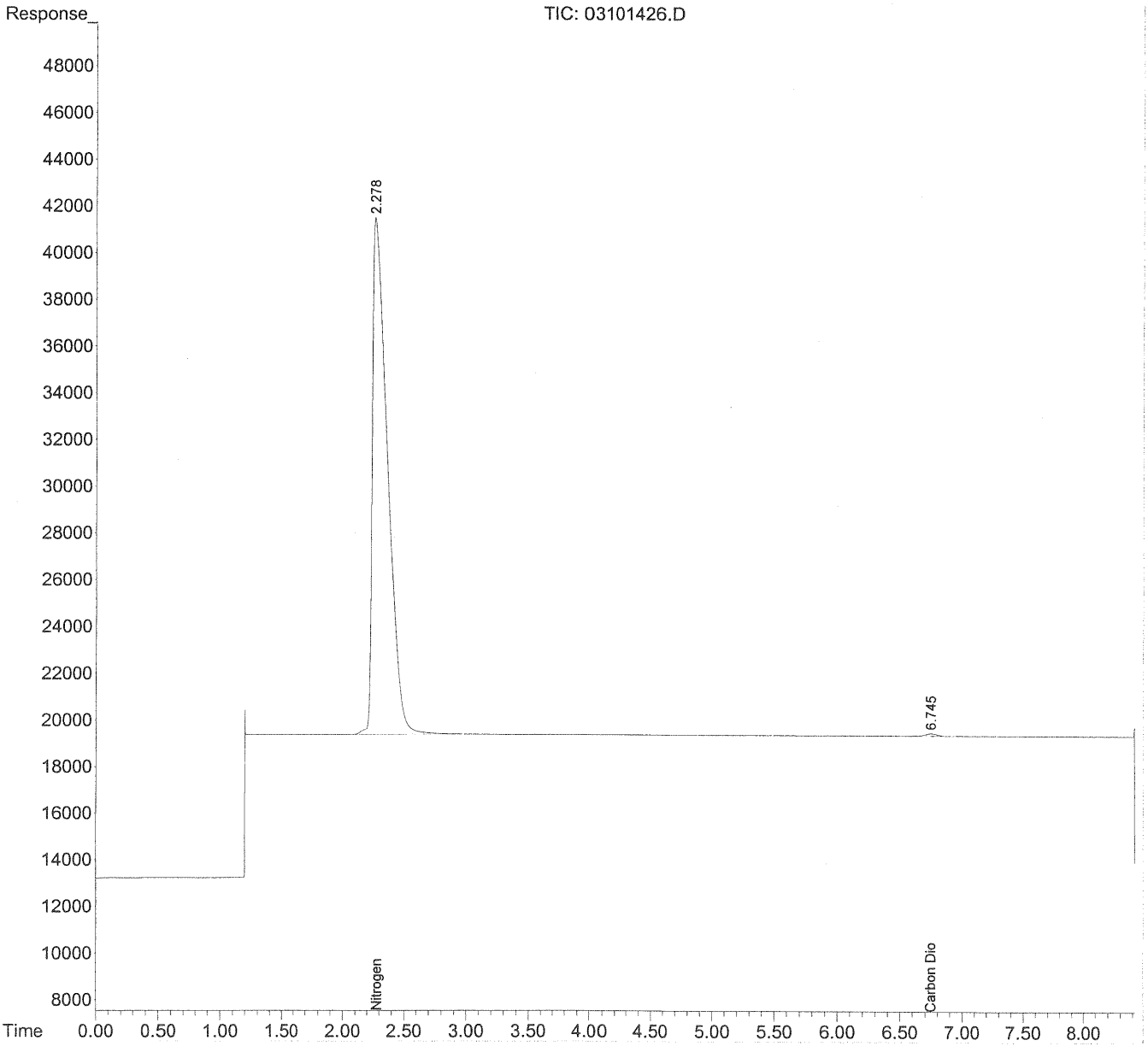
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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	

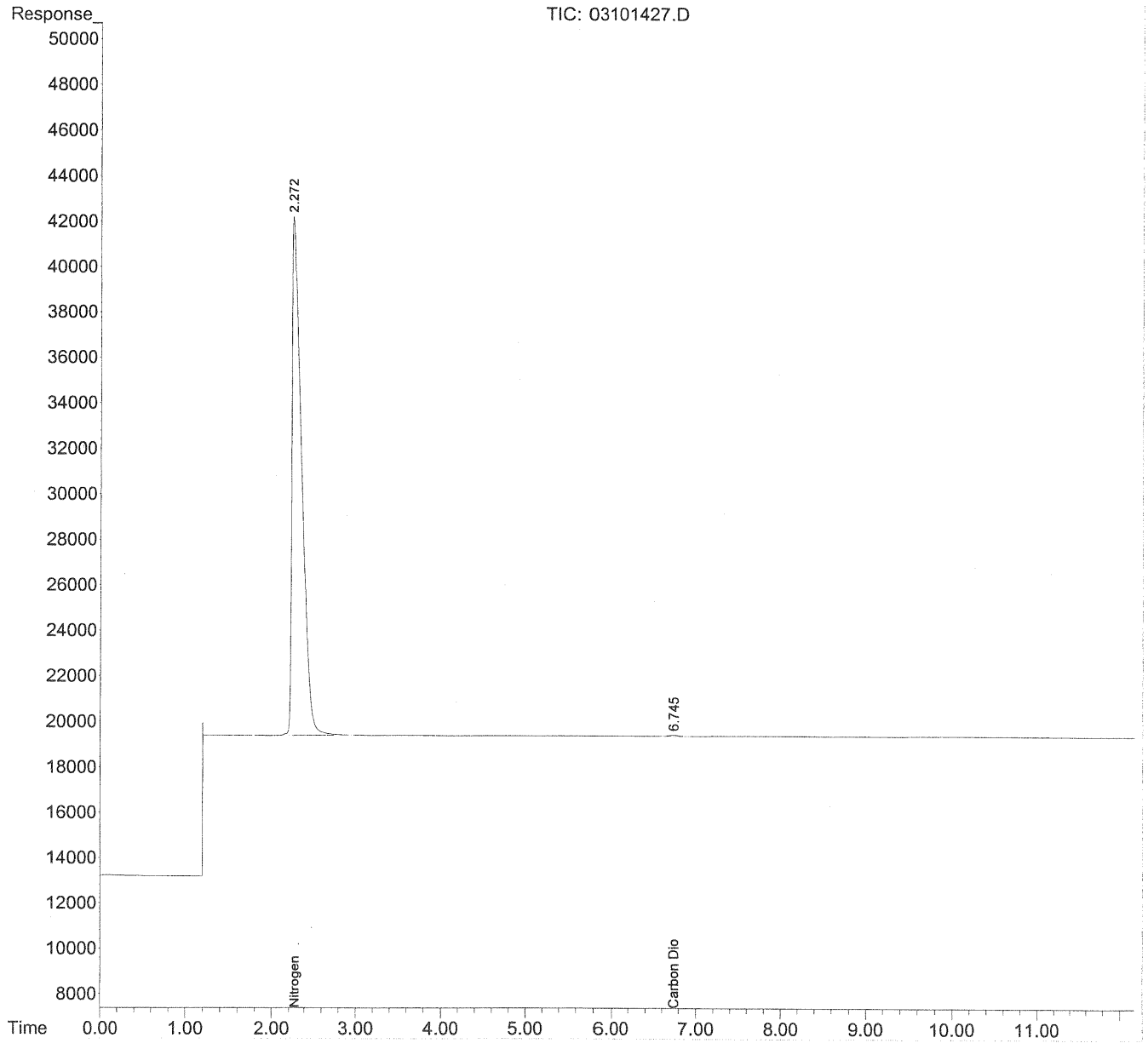
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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	

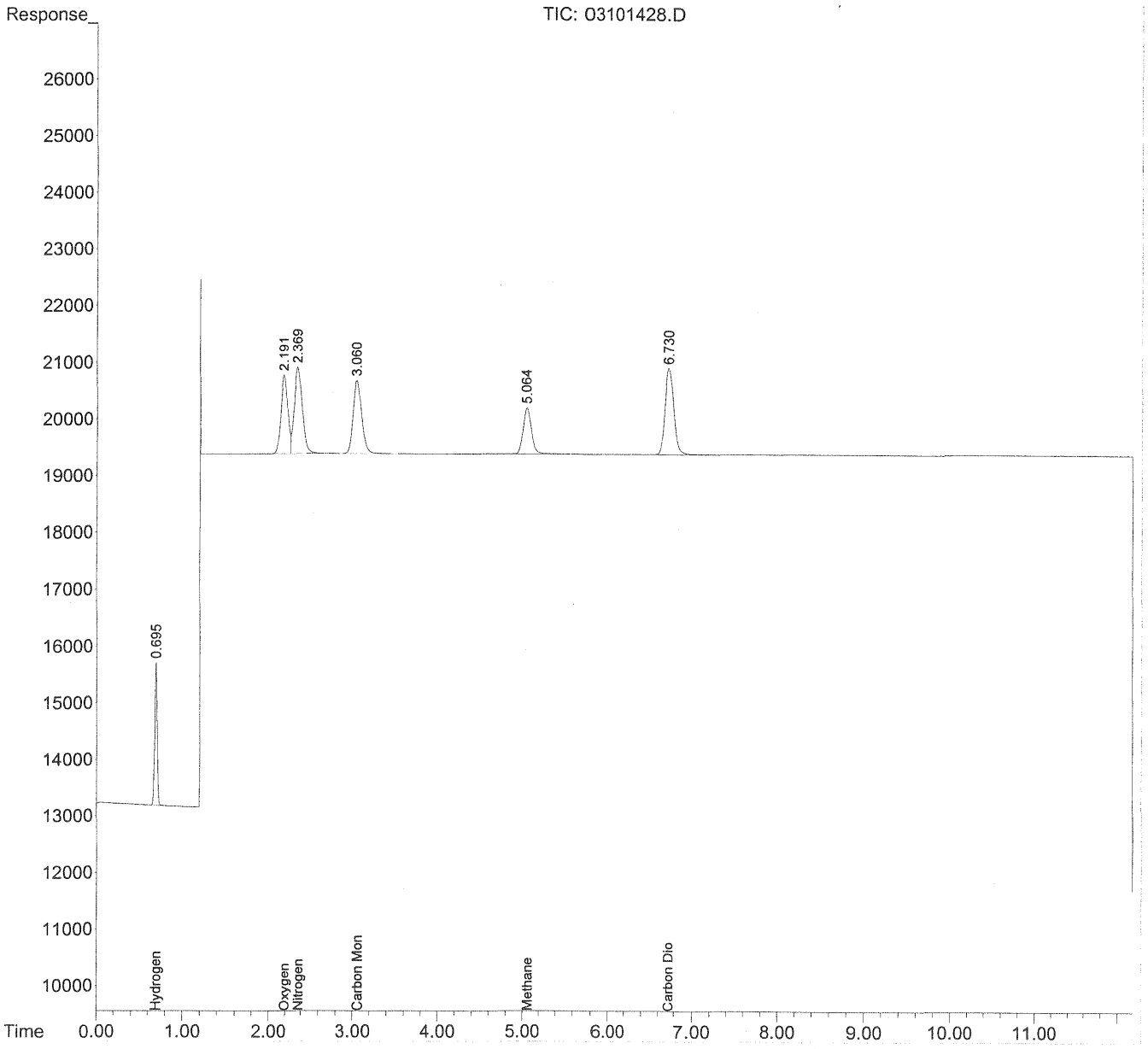
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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.

WH 8/8/14

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\2014_05\30

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	05301401.d	10.	std s30-04241401		30 May 2014 07:49
2	1	05301402.d	10.	mb		30 May 2014 08:07
3	1	05301403.d	10.	xlab air		30 May 2014 08:32
4	1	05301404.d	10.	2122-009		30 May 2014 08:49
5	1	05301405.d	10.	2122-009		30 May 2014 09:06
6	1	05301406.d	10.	2122-009		30 May 2014 09:25
7	1	05301407.d	10.	2122-011		30 May 2014 09:53
8	1	05301408.d	10.	2122-011		30 May 2014 10:10
9	1	05301409.d	10.	2122-011		30 May 2014 10:26
10	1	05301410.d	10.	2144-001		30 May 2014 10:45
11	1	05301411.d	10.	2144-002		30 May 2014 11:01
12	1	05301412.d	10.	xlcs		30 May 2014 11:21
13	1	05301413.d	10.	lcs s30-02051401		30 May 2014 11:57
14	1	05301414.d	10.	std s30-04241401		30 May 2014 12:15
15	1	05301415.d	10.	2149-001		30 May 2014 12:33
16	1	05301416.d	10.	2149-001		30 May 2014 12:51
17	1	05301417.d	10.	2149-001		30 May 2014 13:06
18	1	05301418.d	10.	2149-003		30 May 2014 13:24
19	1	05301419.d	10.	2149-003		30 May 2014 13:42
20	1	05301420.d	10.	2149-003		30 May 2014 13:58
21	1	05301421.d	10.	lab air		30 May 2014 14:14
22	1	05301422.d	10.	xstd		30 May 2014 14:51
23	1	05301423.d	10.	std s30-04241401		30 May 2014 15:08
24	1	05301424.d	10.	2149-005		30 May 2014 15:24
25	1	05301425.d	10.	2149-005		30 May 2014 15:41
26	1	05301426.d	10.	2149-005		30 May 2014 15:58
27	1	05301427.d	10.	2149-007		30 May 2014 16:15
28	1	05301428.d	10.	2149-007		30 May 2014 16:32
29	1	05301429.d	10.	2149-007		30 May 2014 16:49
30	1	05301430.d	10.	2149-009		30 May 2014 17:06
31	1	05301431.d	10.	2149-009		30 May 2014 17:22
32	1	05301432.d	10.	2149-009		30 May 2014 17:38
33	1	05301433.d	10.	xstd		30 May 2014 17:56
34	1	05301434.d	10.	std s30-04241401		30 May 2014 18:15

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

January 8, 2015

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402149 has been amended for the samples submitted to our laboratory on May 30, 2014. The revised report corrects the standard concentration number on the summary report. The revised pages have been indicated by the "Revised Page" footer located at the bottom right of the page.

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 5:17 pm, Jan 08, 2015

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Air Hygiene, Incorporated
Project: stk-14-elmorecity.ik-comp#1

Service Request No: P1402149

CASE NARRATIVE

The samples were received intact under chain of custody on May 30, 2014 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.

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.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

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	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	643428
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	CA200007
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	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272013-3
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
Service Request: P1402149
Project ID: stk-14-elmorecity.ik-comp#1

Date Received: 5/30/2014
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	3C Modified - Fxd Gases Bag 2X
R10-90-100-PI 48	P1402149-001	Air	5/29/2014	00:00	X
R11-90-100-PI 48	P1402149-003	Air	5/29/2014	00:00	X
R12-90-100-PI 48	P1402149-005	Air	5/29/2014	00:00	X
R1-0-30-0%-PI 36	P1402149-007	Air	5/29/2014	00:00	X
R2-0-30-0%-PI 36	P1402149-009	Air	5/29/2014	00:00	X

P140 2149

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:	stk-14-elmorecity.ik-comp#1	Laboratory Analysis Requested:	Method 3C
Person Taking Samples:	BS/TP		

	Sample Number	Location	Date	Volume (L)	Analysis Method			
					O_2	CO_2	N_2	Methane
1	R10-90-100-PI 48	Big Iron Elmore City Plant	29-May	10	X	X	X	X
2	R10-90-100-PI 48 Backup	Big Iron Elmore City Plant	29-May	5	X	X	X	X
3	R11-90-100-PI 48	Big Iron Elmore City Plant	29-May	10	X	X	X	X
4	R11-90-100-PI 48 Backup	Big Iron Elmore City Plant	29-May	5	X	X	X	X
5	R12-90-100-PI 48	Big Iron Elmore City Plant	29-May	10	X	X	X	X
6	R12-90-100-PI 48 Backup	Big Iron Elmore City Plant	29-May	5	X	X	X	X
7	R1-0-30-0%-PI 36	Big Iron Elmore City Plant	29-May	10	X	X	X	X
8	R1-0-30-0%-PI 36 Back Up	Big Iron Elmore City Plant	29-May	5	X	X	X	X
9	R2-0-30-0%-PI 36	Big Iron Elmore City Plant	29-May	10	X	X	X	X
10	R2-0-30-0%-PI 36 Back Up	Big Iron Elmore City Plant	29-May	5	X	X	X	X

Relinquished by: (Signature)	5/29/14 Date:	11:45:00 Time:	Received by: (Signature)	5/30/14 Date: 0930 Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: Time:

coc-52714

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402149

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/30/14 Date opened: 5/30/14 by: MZAMORA

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 if necessary 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
P1402149-001.01	10 L Tedlar Bag					
P1402149-002.01	5.0 L Tedlar Bag					
P1402149-003.01	10 L Tedlar Bag					
P1402149-004.01	5.0 L Tedlar Bag					
P1402149-005.01	10 L Tedlar Bag					
P1402149-006.01	5.0 L Tedlar Bag					
P1402149-007.01	10 L Tedlar Bag					
P1402149-008.01	5.0 L Tedlar Bag					

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

Chain of Custody is missing time collected

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: Air Hygiene, Incorporated Work order: P1402149

Project: stk-14-elmorecity.ik-comp#1

Sample(s) received on: 5/30/14 Date opened: 5/30/14 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1402149-009.01	10 L Tedlar Bag					
P1402149-010.01	5.0 L Tedlar Bag					

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R10-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**15.1**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.12**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R11-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**79.9**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.44**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R12-90-100-PI 48**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**15.1**	0.10	
7727-37-9	**Nitrogen**	**79.8**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**5.10**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R1-0-30-0%-PI 36**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-007

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**79.6**	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	**Carbon Dioxide**	**4.53**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **R2-0-30-0%-PI 36**
Client Project ID: **stk-14-elmorecity.ik-comp#1**

ALS Project ID: P1402149
ALS Sample ID: P1402149-009

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 5/29/14
Date Received: 5/30/14
Date Analyzed: 5/30/14
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**	**5.18**	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

Client: **Air Hygiene, Incorporated**
Client Sample ID: **Method Blank** ALS Project ID: P1402149
Client Project ID: **stk-14-elmorecity.ik-comp#1** ALS Sample ID: P140530-MB

Test Code: EPA Method 3C Modified Date Collected: NA
Instrument ID: HP5890 II/GC1/TCD Date Received: NA
Analyst: Nalini Lall Date Analyzed: 5/30/14
Sample Type: 10 L Tedlar Bag Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

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.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301415.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:33 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:39 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 :

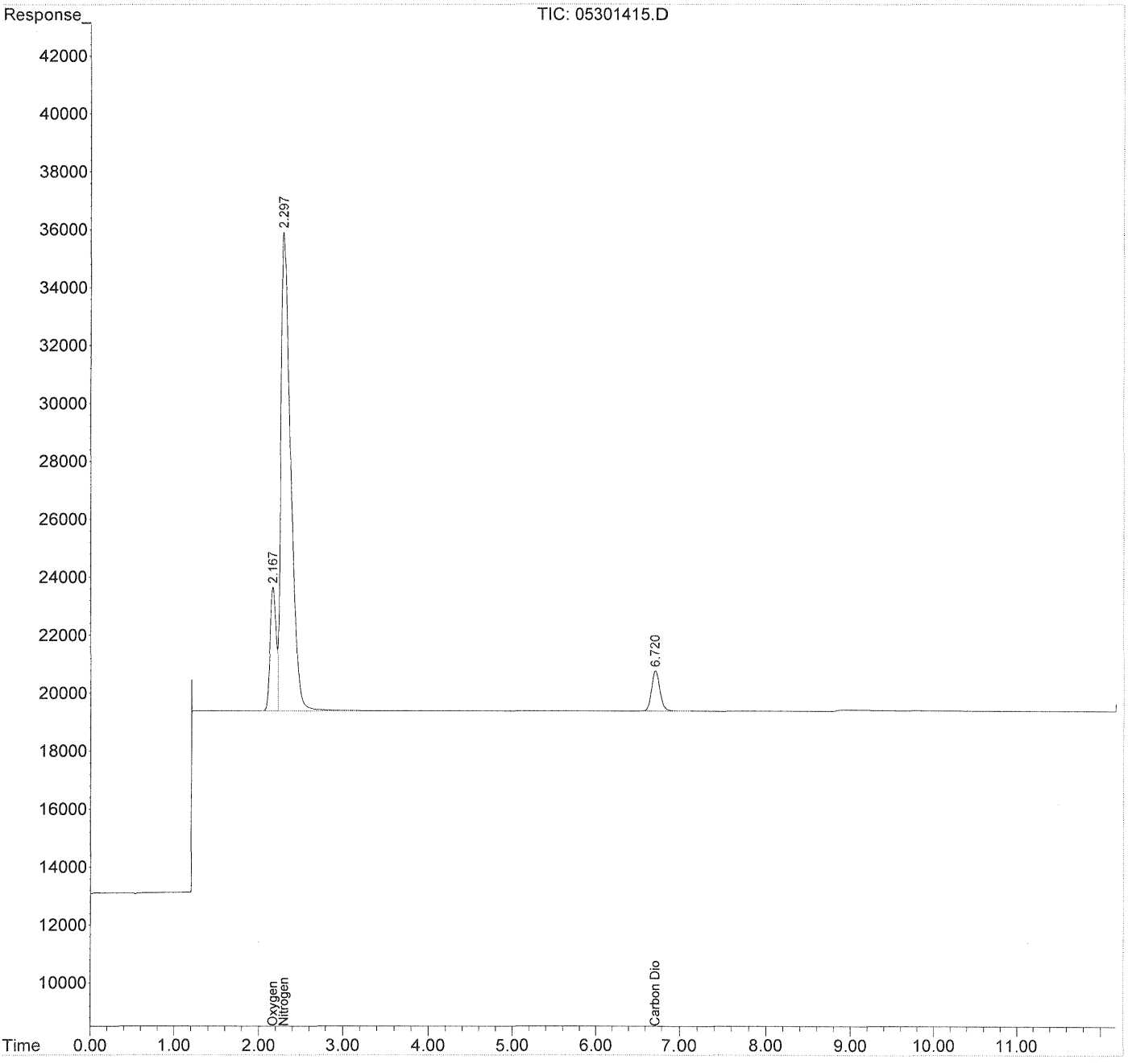
	Compound	R.T.	Response	Conc Units
Target Compounds				
1)	Hydrogen	0.000	0	N.D. ppm
2)	Oxygen	2.169	215081	130151.020 ppm
3)	Nitrogen	2.298	1323054	689093.044 ppm
4)	Carbon Monoxide	0.000	0	N.D. ppm
5)	Methane	0.000	0	N.D. ppm
6)	Carbon Dioxide	6.722	94975	44143.812 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301415.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:33 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:39 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301416.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:51 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:43 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 :

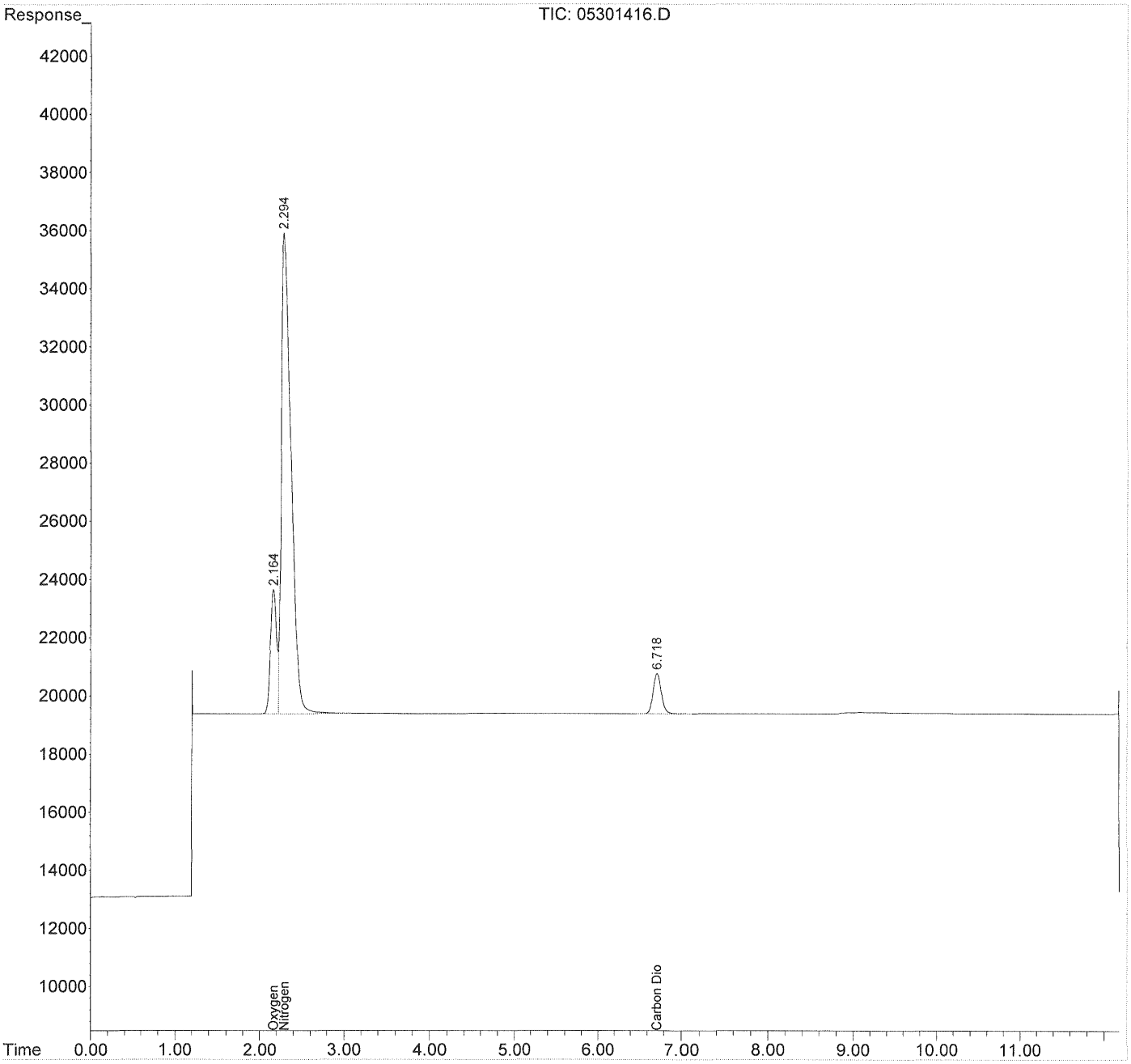
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.166	215038	130125.248	ppm
3)	Nitrogen	2.295	1320972	688008.557	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.719	95049	44178.381	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301416.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 12:51 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:43 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301417.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:06 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:47 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 :

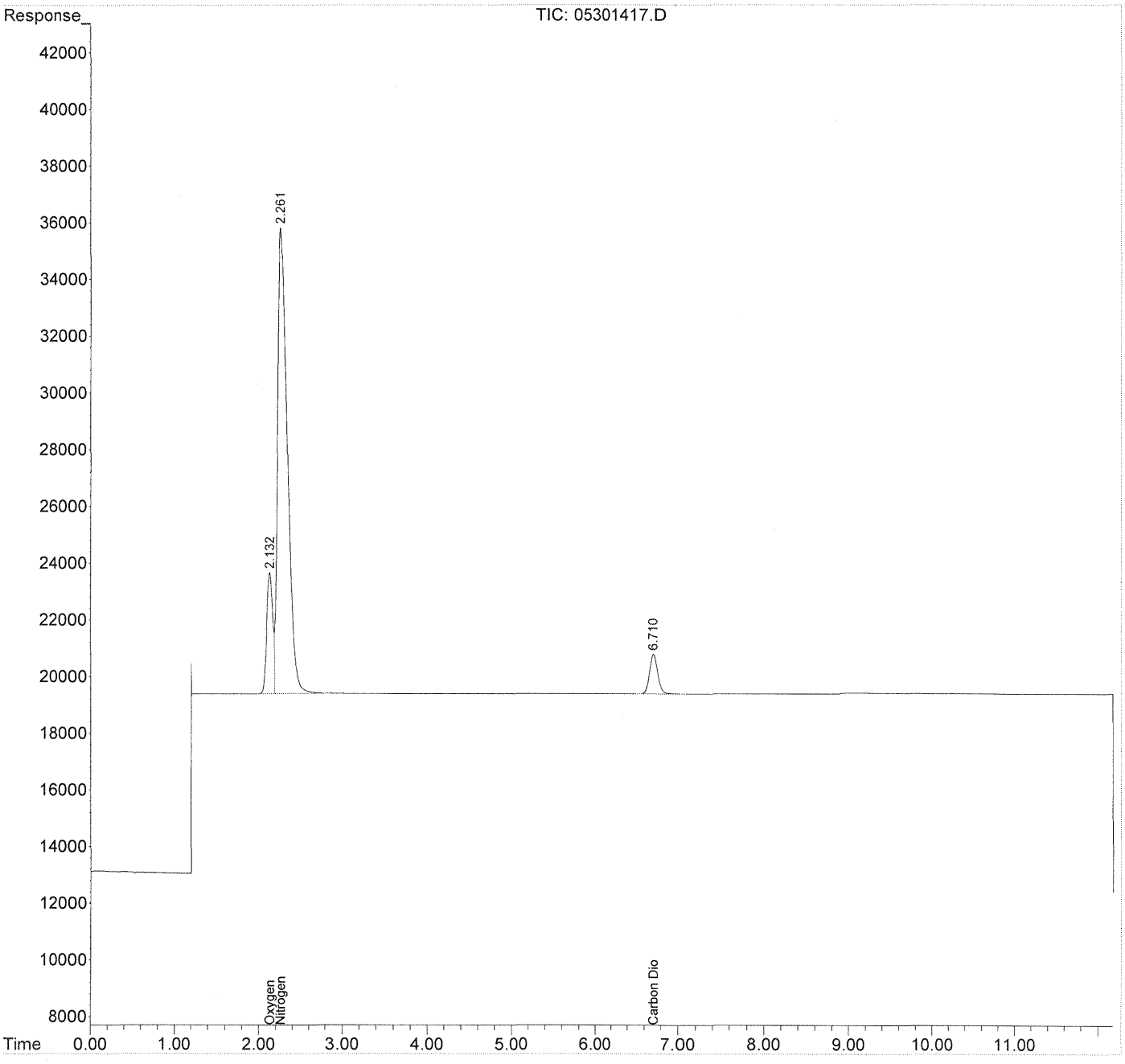
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.133	214894	130038.122	ppm
3)	Nitrogen	2.262	1322012	688550.192	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	95228	44261.440	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301417.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:06 pm
Operator : NL
Sample : 2149-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:47 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301418.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:24 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:51 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 :

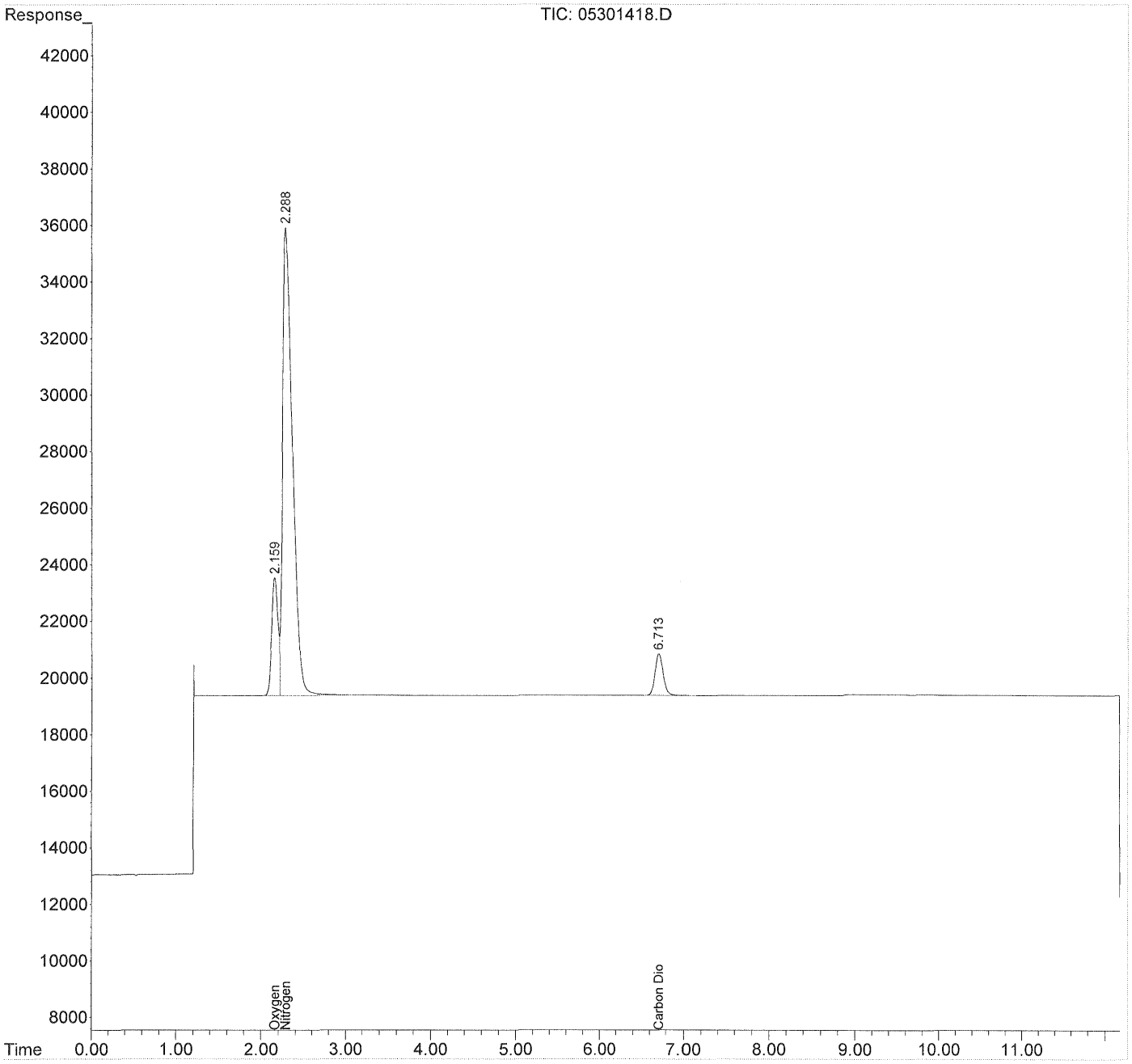
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.160	208550	126199.297	ppm
3)	Nitrogen	2.289	1322053	688571.968	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.715	100770	46837.373	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301418.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:24 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:51 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301419.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:42 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:55 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.164	207593	125620.155	ppm
3)	Nitrogen	2.293	1316661	685763.478	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.716	100155	46551.776	ppm

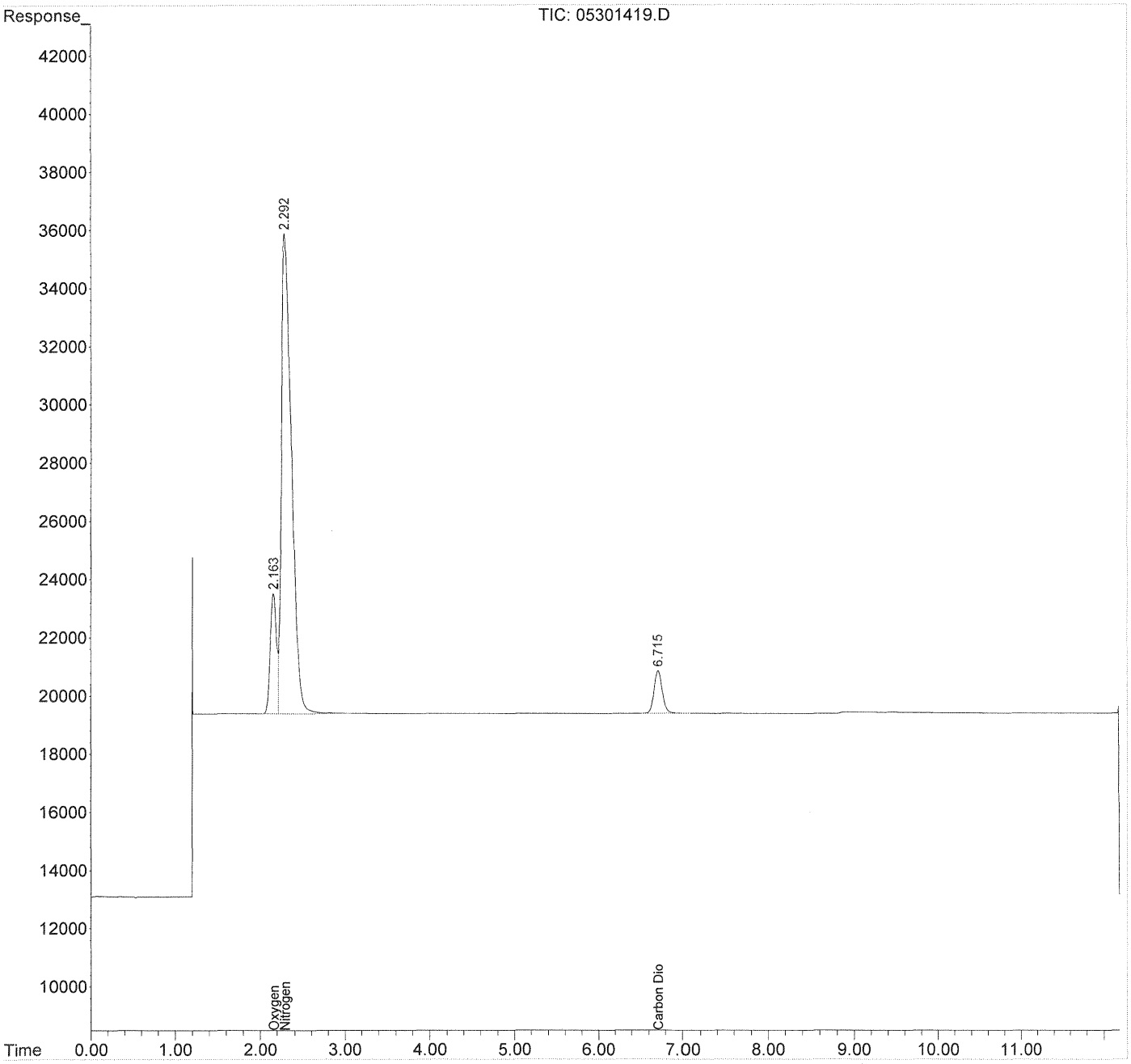
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301419.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:42 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:55 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301420.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:58 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:59 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 :

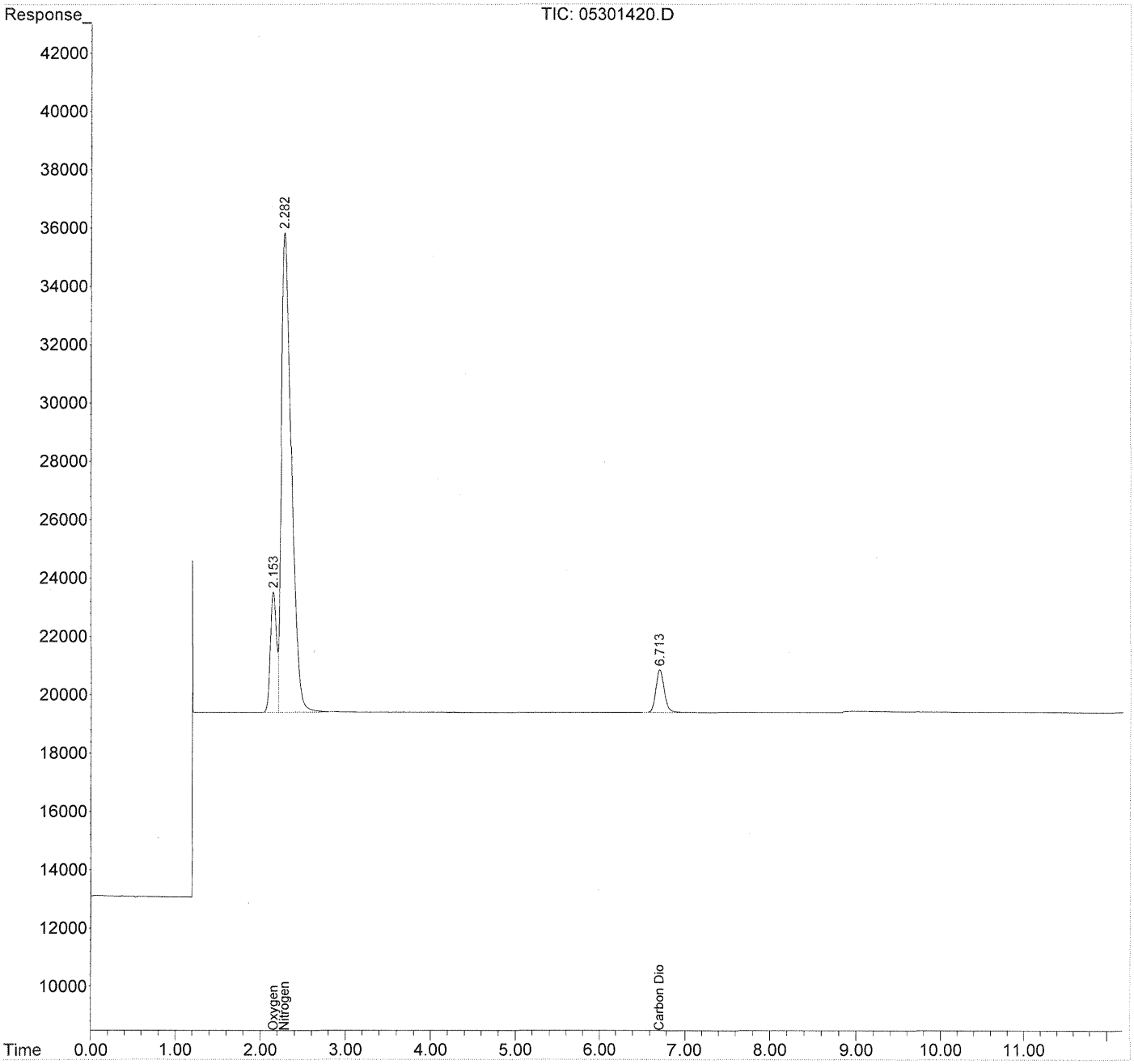
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.155	207208	125386.924	ppm
3)	Nitrogen	2.283	1312419	683554.128	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.715	100495	46709.462	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301420.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 1:58 pm
Operator : NL
Sample : 2149-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:59 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301424.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:24 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:07 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 :

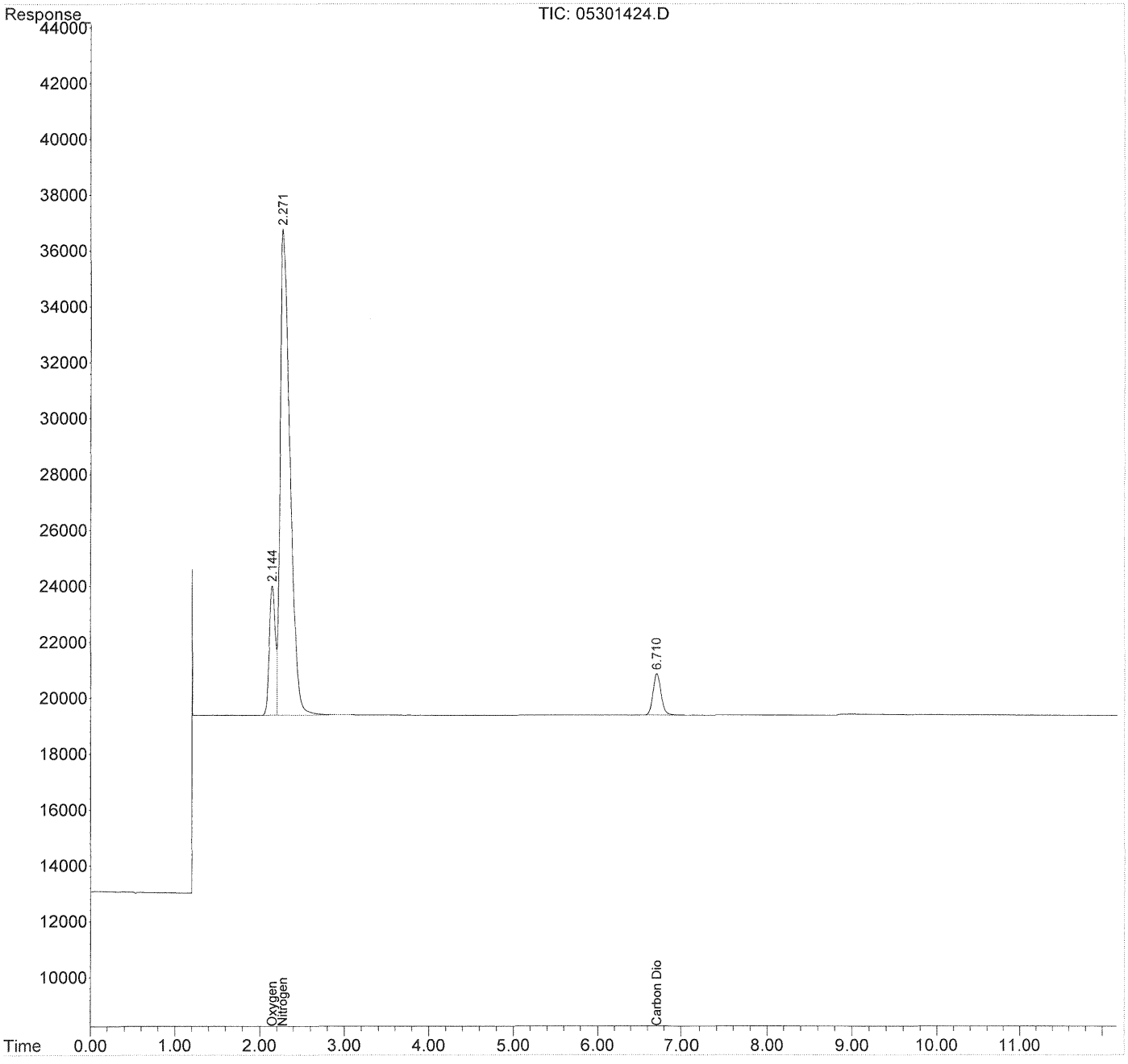
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.146	230583	139531.930	ppm
3)	Nitrogen	2.273	1419730	739445.478	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	101699	47269.220	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301424.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:24 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:07 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301425.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:41 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:11 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 :

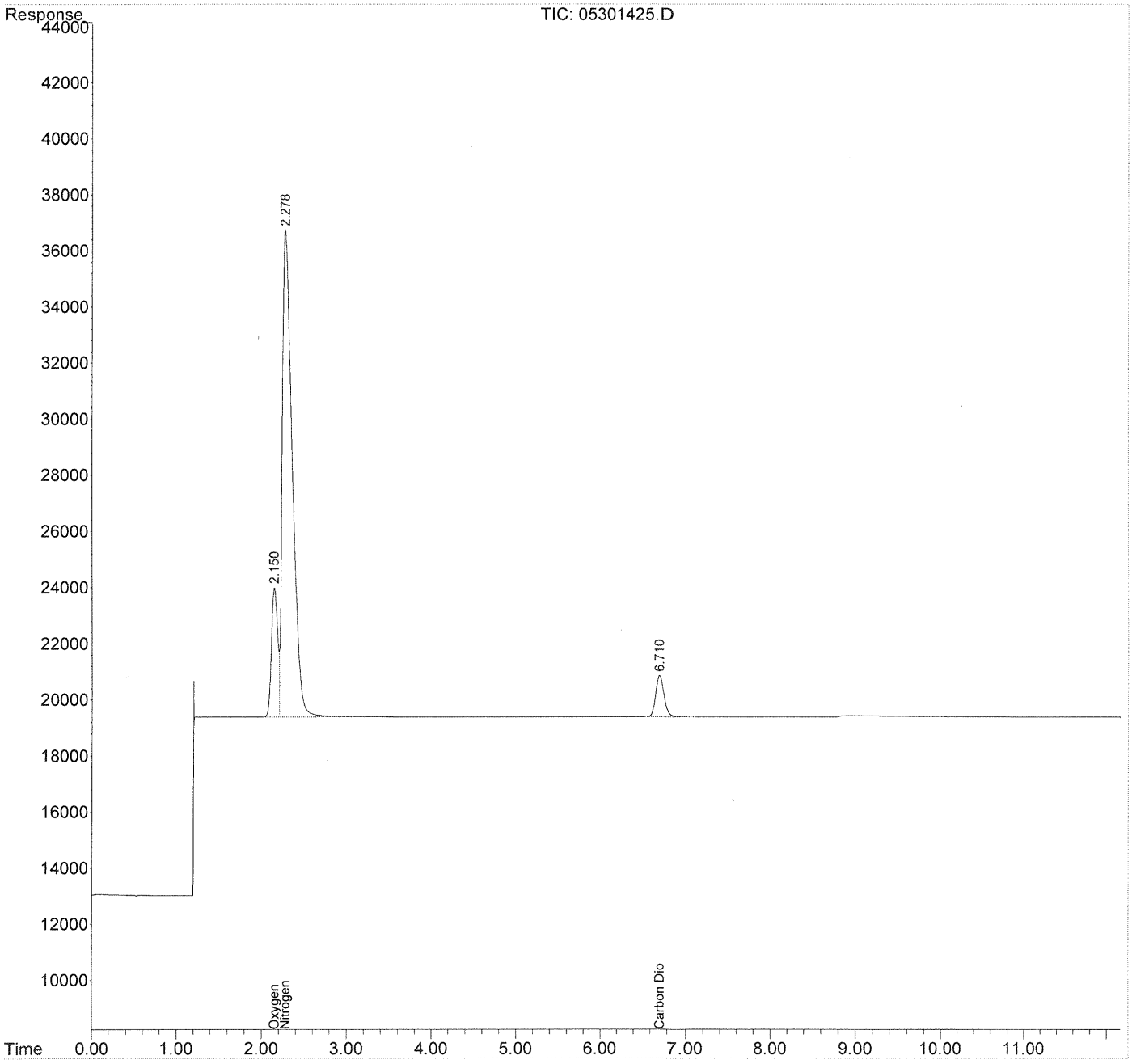
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.152	229488	138869.687	ppm
3)	Nitrogen	2.279	1412029	735434.373	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	101097	46989.590	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301425.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:41 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:11 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301426.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:58 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:15 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.157	226382	136990.055	ppm
3)	Nitrogen	2.285	1390609	724278.083	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.714	99612	46299.443	ppm

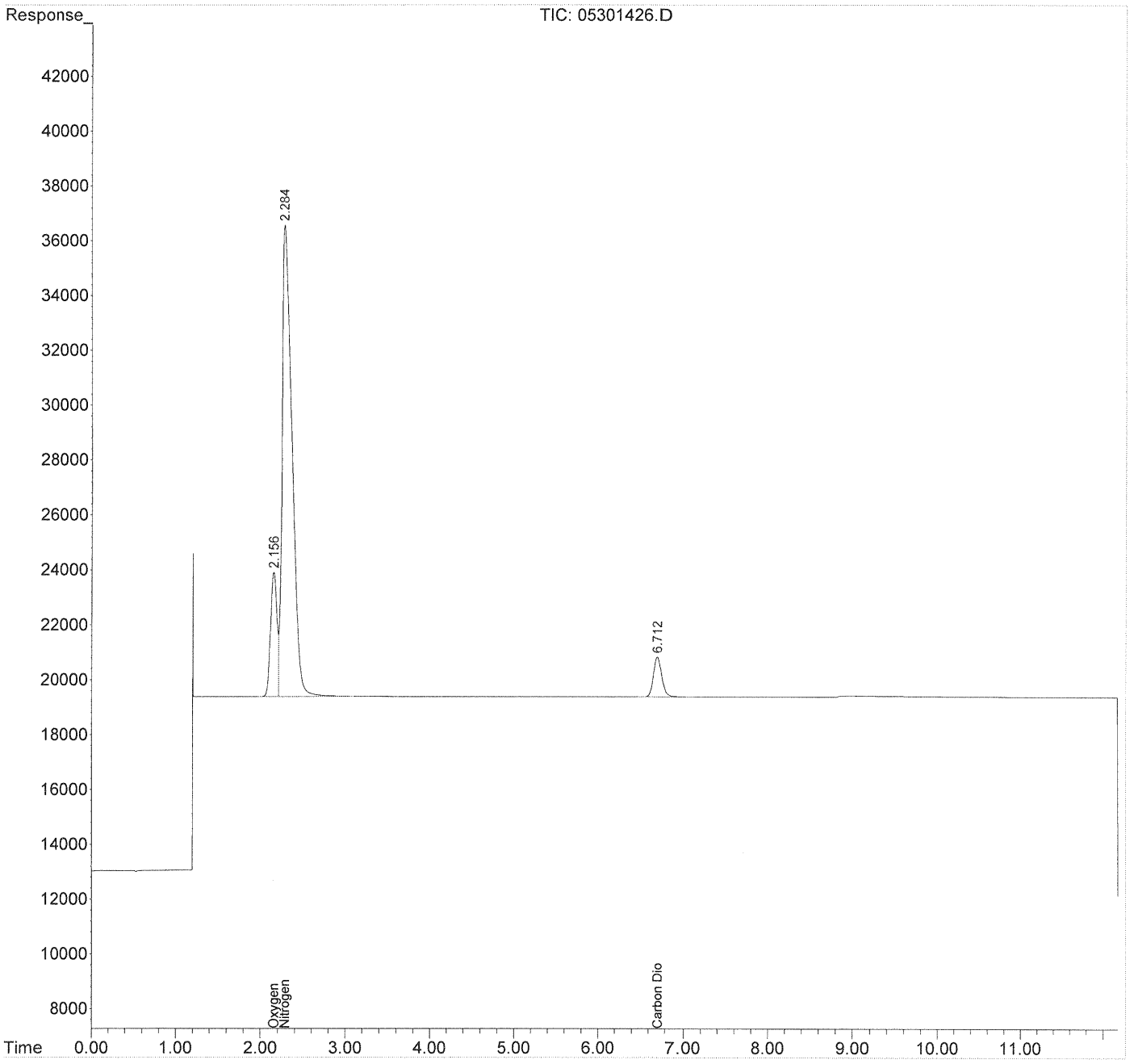
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301426.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 3:58 pm
Operator : NL
Sample : 2149-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:15 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301427.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 4:15 pm
Operator : NL
Sample : 2149-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:19 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 :

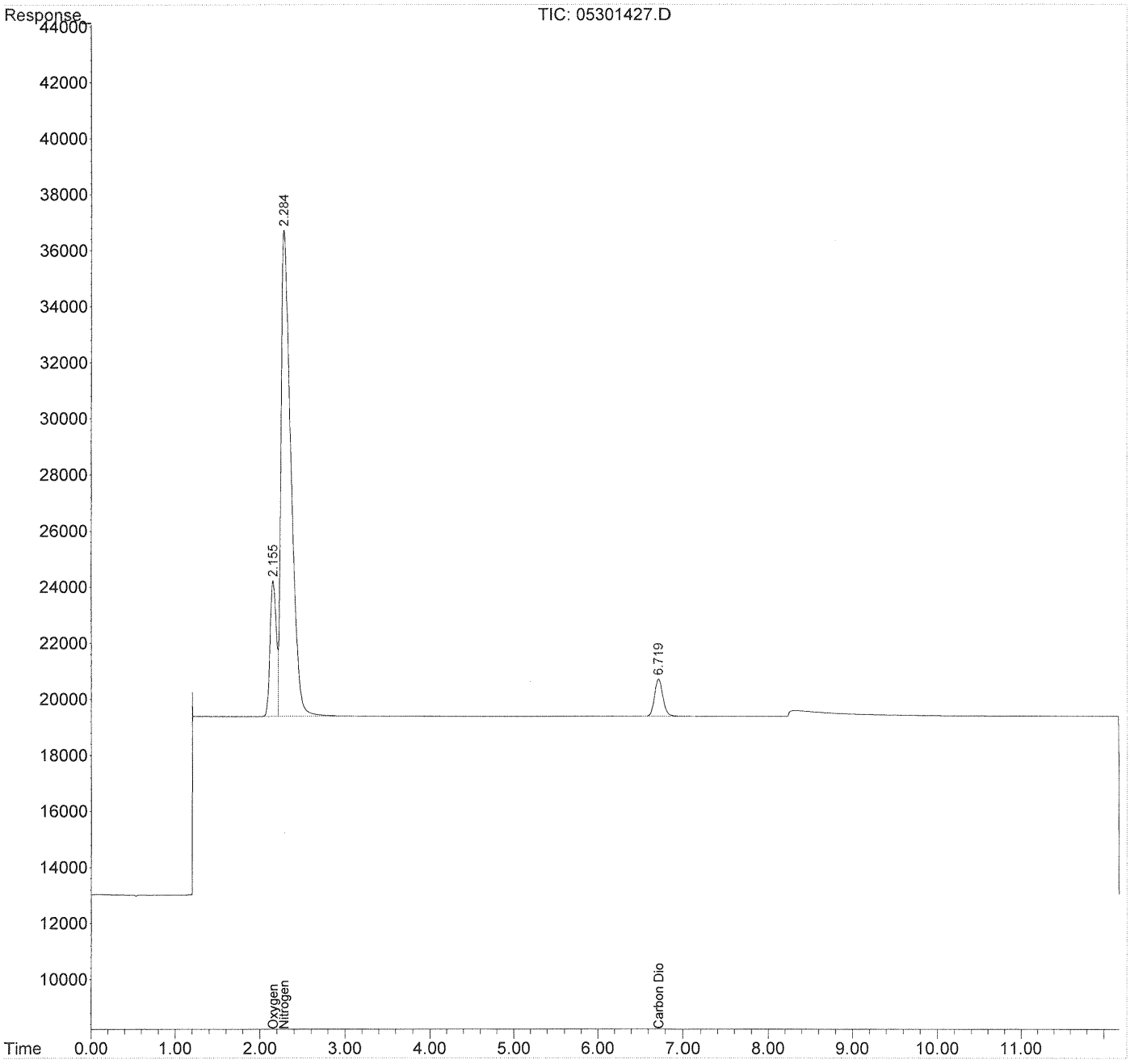
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.156	243055	147079.422	ppm
3)	Nitrogen	2.285	1413548	736225.404	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.720	90583	42102.575	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301427.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 4:15 pm
Operator : NL
Sample : 2149-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:19 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301428.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 4:32 pm
Operator : NL
Sample : 2149-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:23 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 :

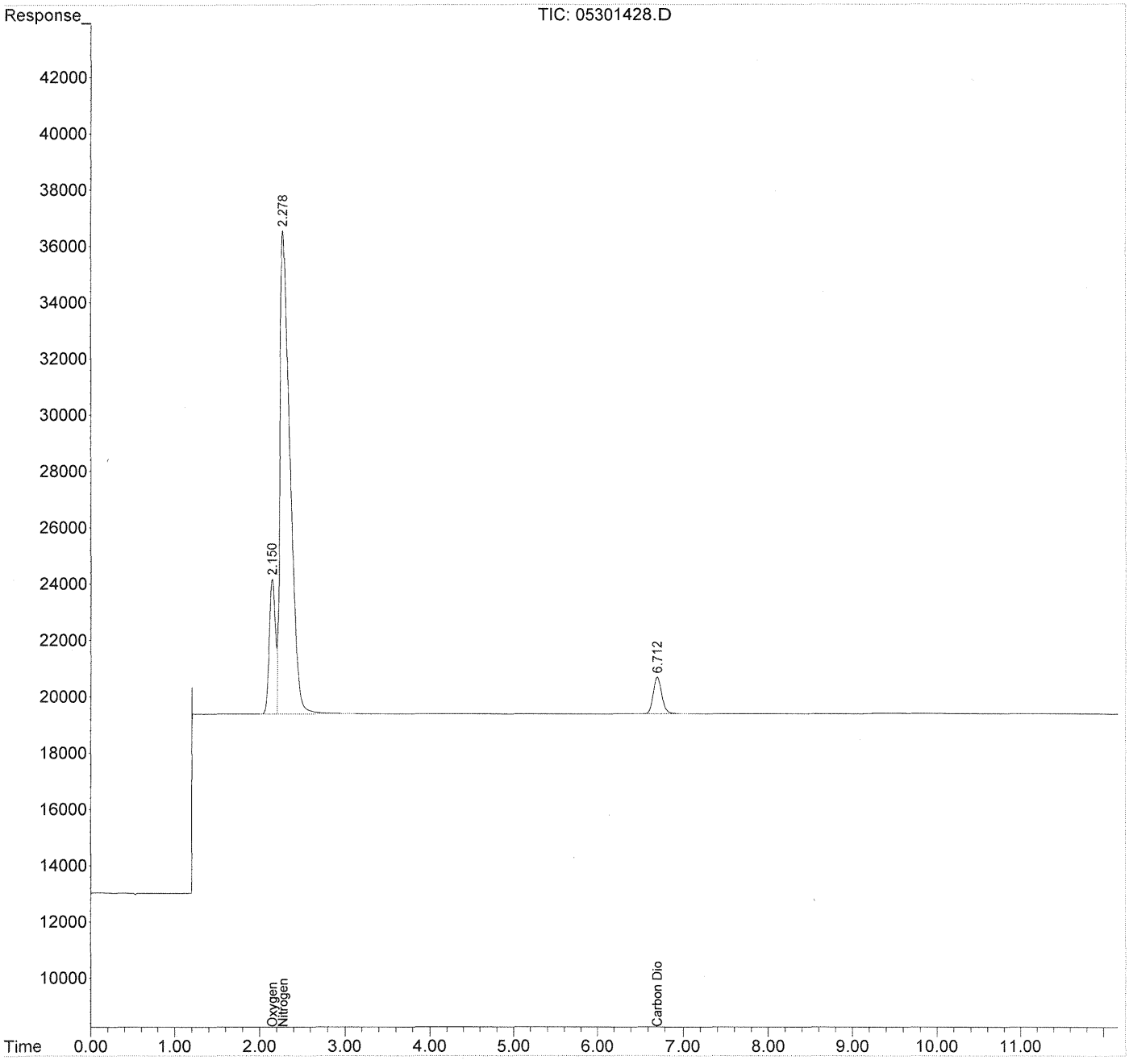
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.151	239925	145184.841	ppm
3)	Nitrogen	2.280	1393702	725889.113	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.713	88695	41224.941	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301428.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 4:32 pm
Operator : NL
Sample : 2149-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:23 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301429.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 4:49 pm
Operator : NL
Sample : 2149-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:27 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 :

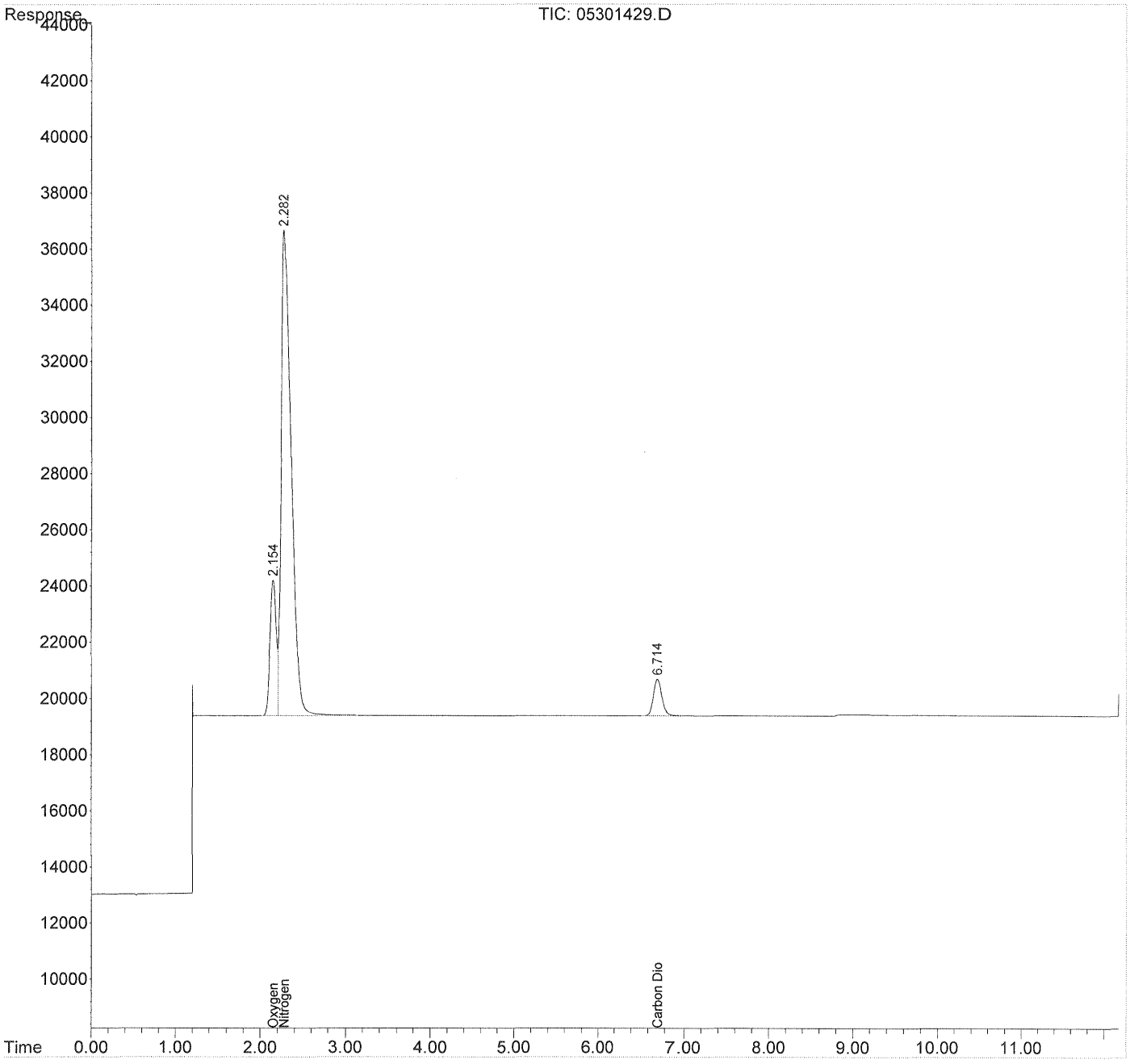
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.155	241898	146379.262	ppm
3)	Nitrogen	2.284	1405951	732268.679	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.715	89678	41681.983	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301429.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 4:49 pm
Operator : NL
Sample : 2149-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:27 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301430.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 5:06 pm
Operator : NL
Sample : 2149-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:31 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.154	229156	138668.301	ppm
3)	Nitrogen	2.281	1411513	735165.778	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.713	103179	47957.330	ppm

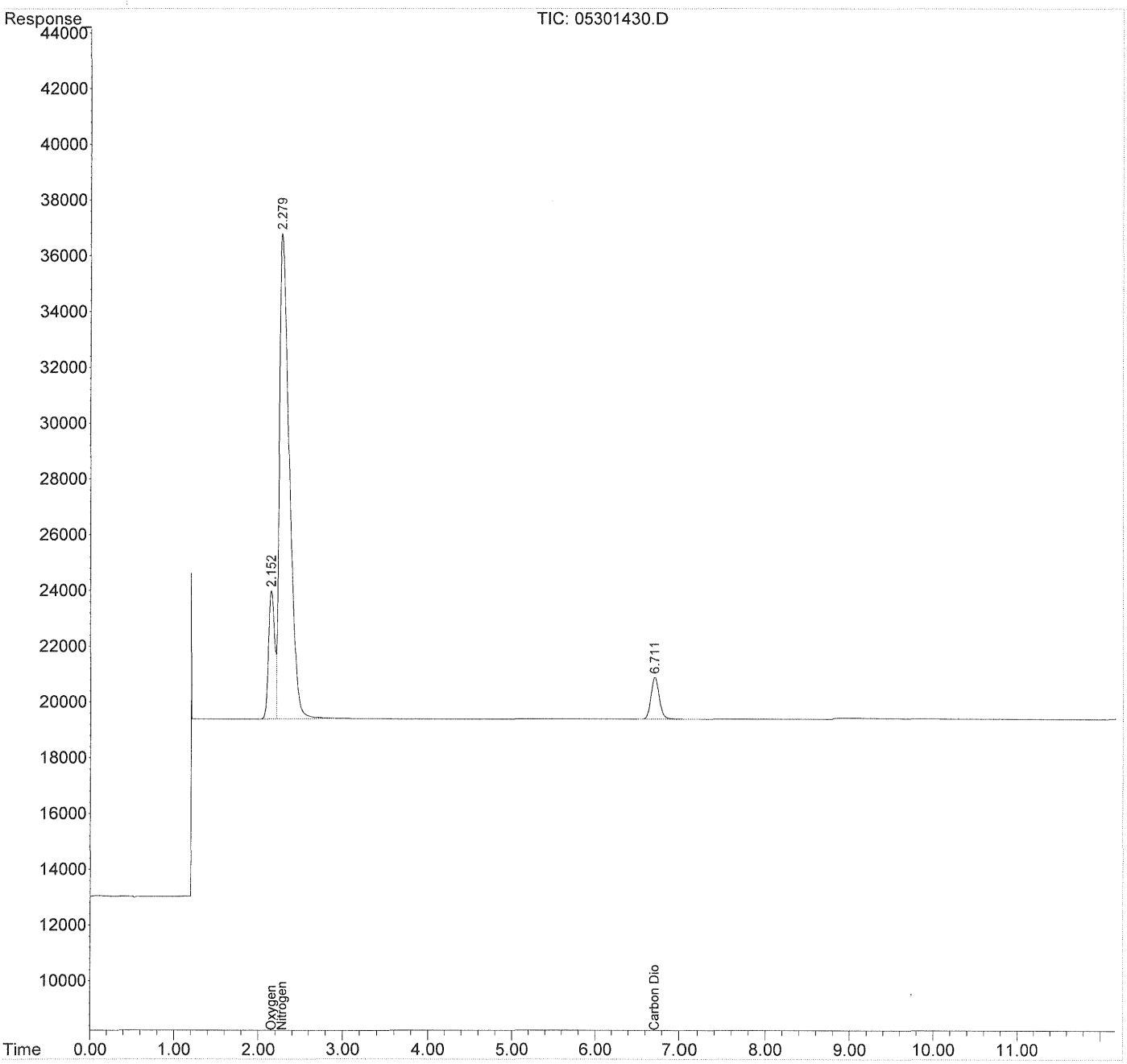
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301430.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 5:06 pm
Operator : NL
Sample : 2149-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:31 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301431.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 5:22 pm
Operator : NL
Sample : 2149-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:35 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	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.143	228142	138054.717	ppm
3)	Nitrogen	2.270	1409720	734231.695	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.713	102353	47573.462	ppm

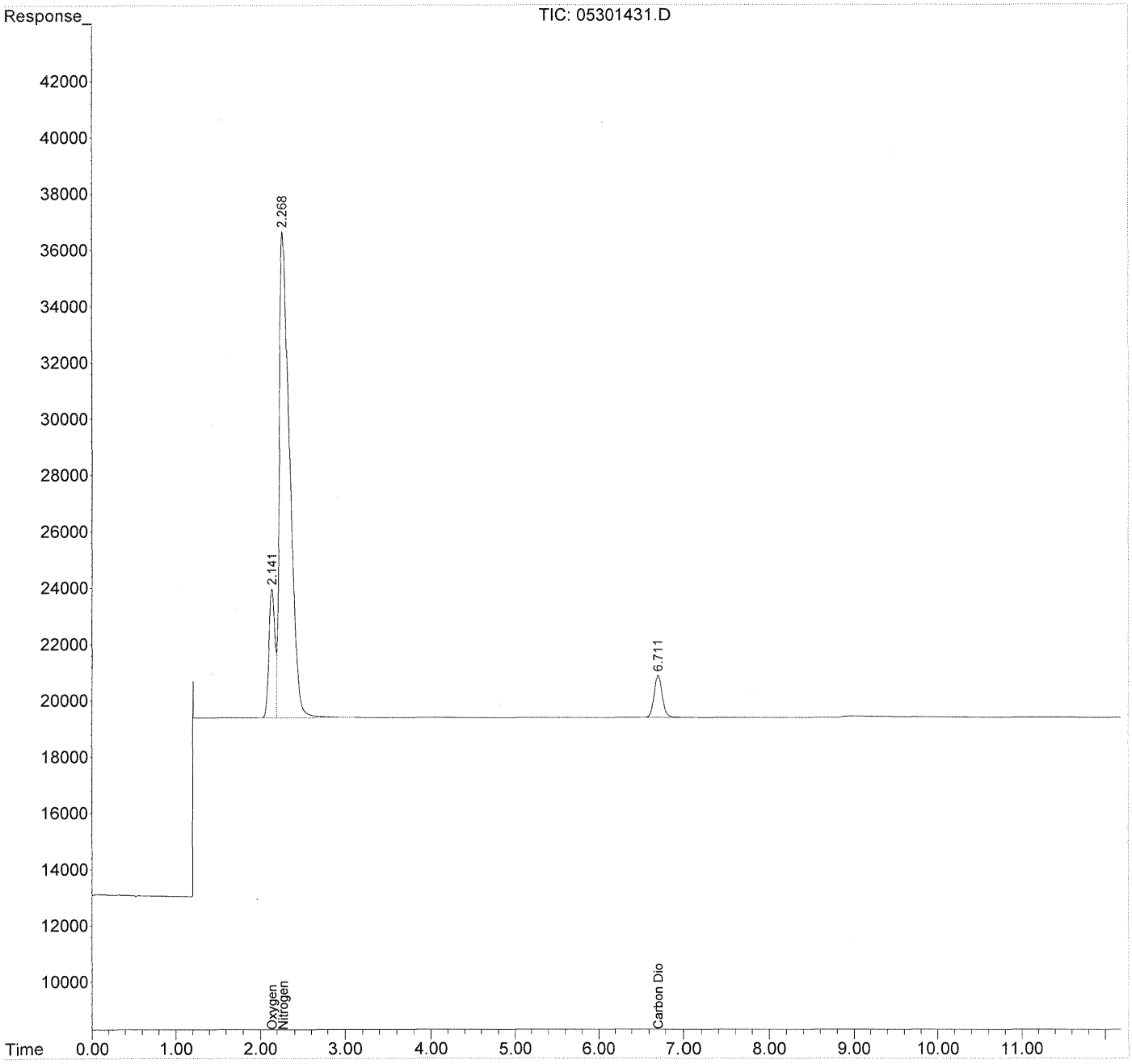
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301431.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 5:22 pm
Operator : NL
Sample : 2149-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:35 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301432.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 5:38 pm
Operator : NL
Sample : 2149-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:39 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 :

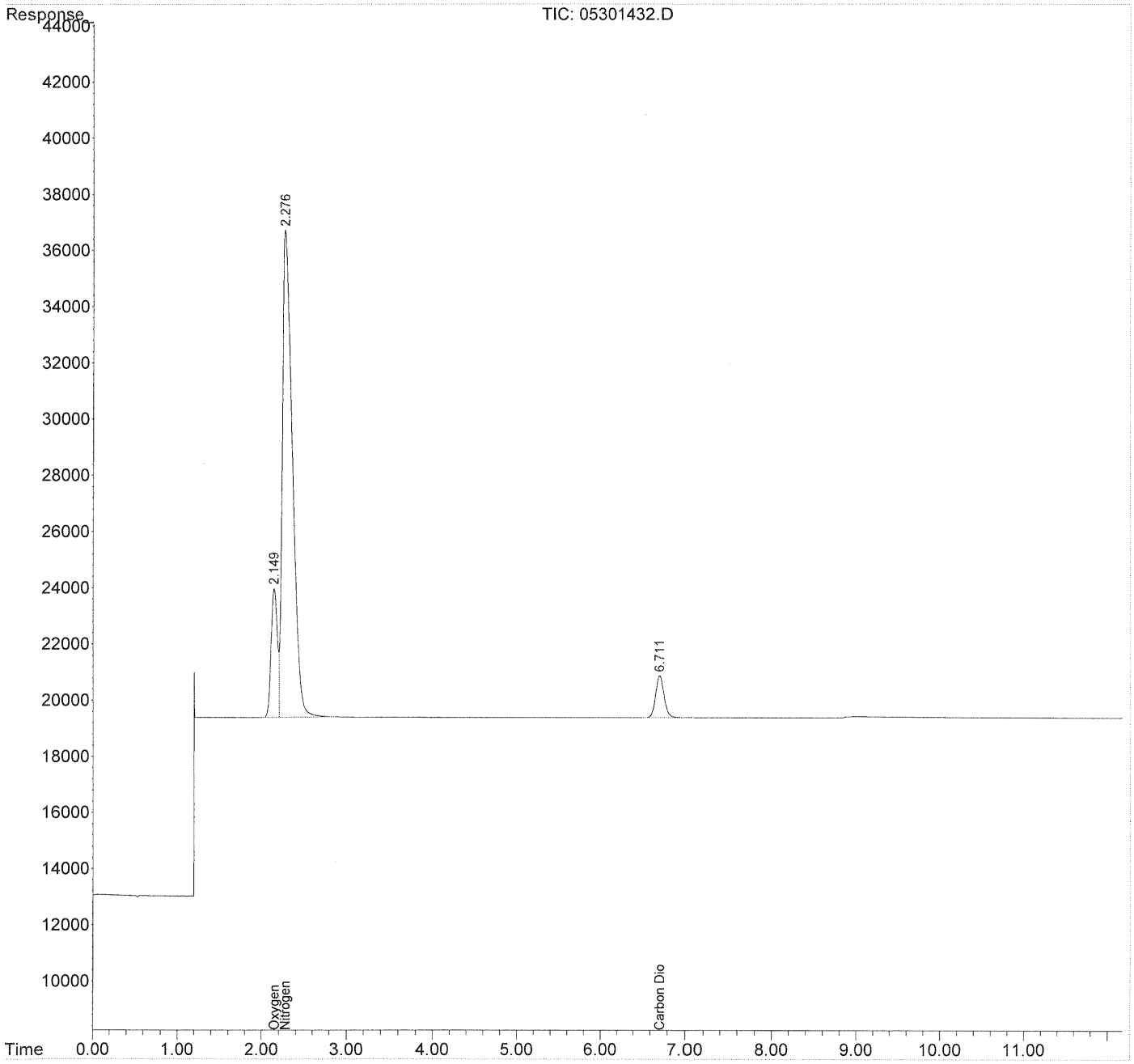
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	2.151	228126	138045.428	ppm
3)	Nitrogen	2.278	1404980	731762.876	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.712	101914	47369.400	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301432.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 5:38 pm
Operator : NL
Sample : 2149-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:39 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301402.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:07 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:35 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 :

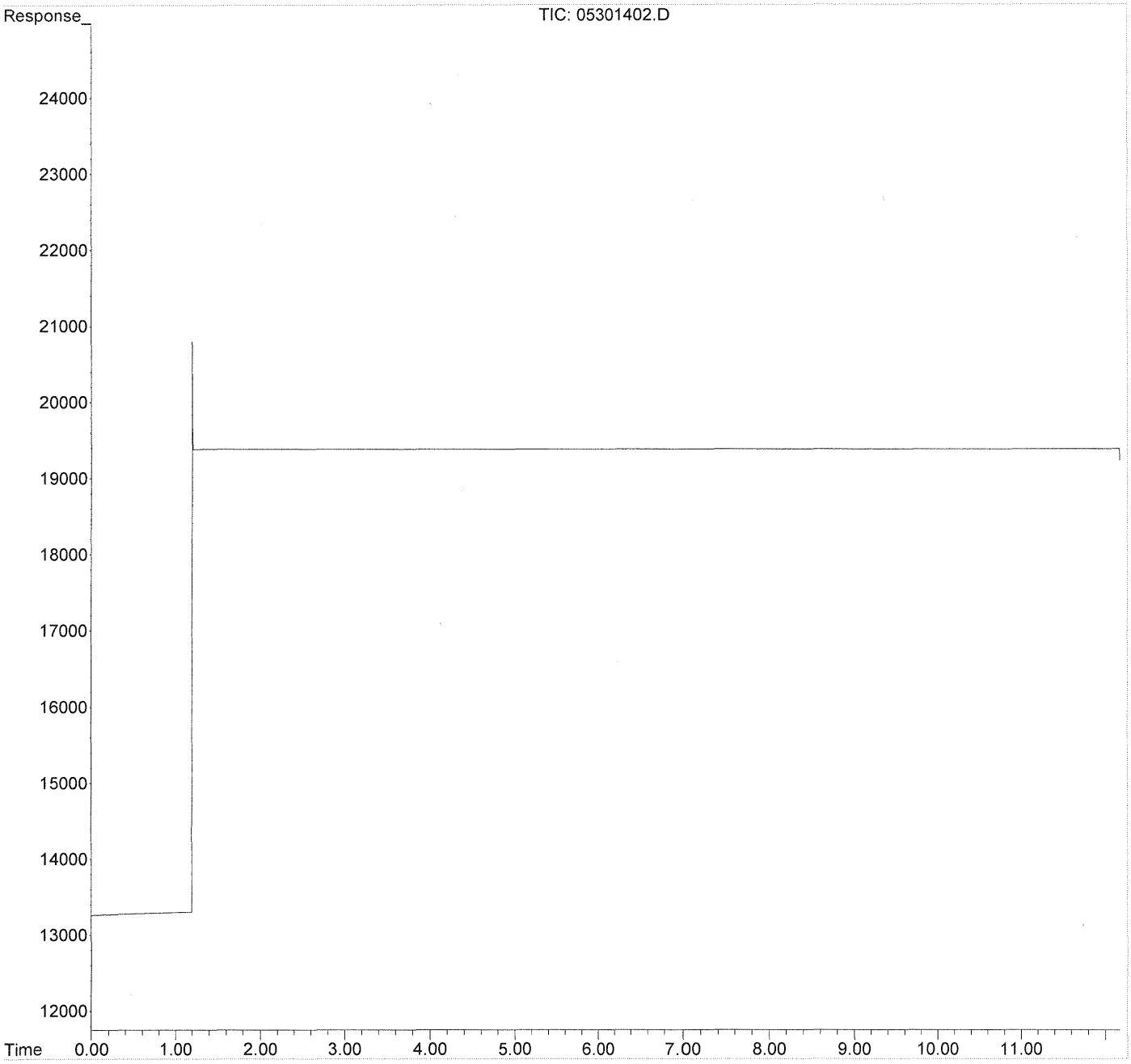
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	0.000	0	N.D.	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	0.000	0	N.D.	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301402.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 8:07 am
Operator : NL
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:35 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 :



ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

CLIENT : Air Hygiene, Incorporated

Analyst : NL

PAI Job : P1402149

Printed : 1/8/2015

Instrument : GC #1 / TCD #1

Date analyzed : 5/30/2014

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen		Nitrogen		Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-04241401	34993	36815		45673		45947	36728	45679	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	12.5%	8.0%		8.7%		8.1%	8.1%	8.7%	
Lab Air		201775		718396				349	
MB									
2149-001		130151	0.0%	689093	0.1%			44144	0.1%
2149-001 - 2		130125	0.0%	688009	0.1%			44178	0.0%
2149-001 - 3		130038	0.1%	688550	0.0%			44261	0.2%
2149-001 - Mean		130105		688551				44194	
2149-003		126199	0.4%	688572	0.4%			46837	0.3%
2149-003 - 2		125620	0.1%	685763	0.0%			46552	0.3%
2149-003 - 3		125387	0.3%	683554	0.4%			46709	0.0%
2149-003 - Mean		125735		685963				46699	

Revised Page

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 1/8/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 5/30/2014

PAI Job : P1402149

Sample amount : 100uL

2149-005			139532	0.8%	739445	0.9%	47269	0.9%
2149-005 - 2			138870	0.3%	735434	0.3%	46990	0.3%
2149-005 - 3			136990	1.1%	724278	1.2%	46299	1.2%
2149-005 - Mean			138464		733052		46853	
2149-007			147079	0.6%	736225	0.7%	42103	1.0%
2149-007 - 2			145185	0.7%	725889	0.8%	41225	1.1%
2149-007 - 3			146379	0.1%	732269	0.1%	41682	0.0%
2149-007 - Mean			146214		731461		41670	
2149-009			138668	0.3%	735166	0.2%	47957	0.8%
2149-009 - 2			138054	0.1%	734232	0.1%	47573	0.1%
2149-009 - 3			138045	0.1%	731763	0.3%	47369	0.6%
2149-009 - Mean			138256		733720		47633	
STD S30-04241401	38383	40051		48922		50122	40105	49808
ACTUAL	39990	40030		50000		50010	39970	50040
% Difference	4.0%	0.1%		2.2%		0.2%	0.3%	0.5%

Revised Page

Quantitation Report (Not Reviewed)

NL 5/31/14

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301401.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 7:49 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:31 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 :

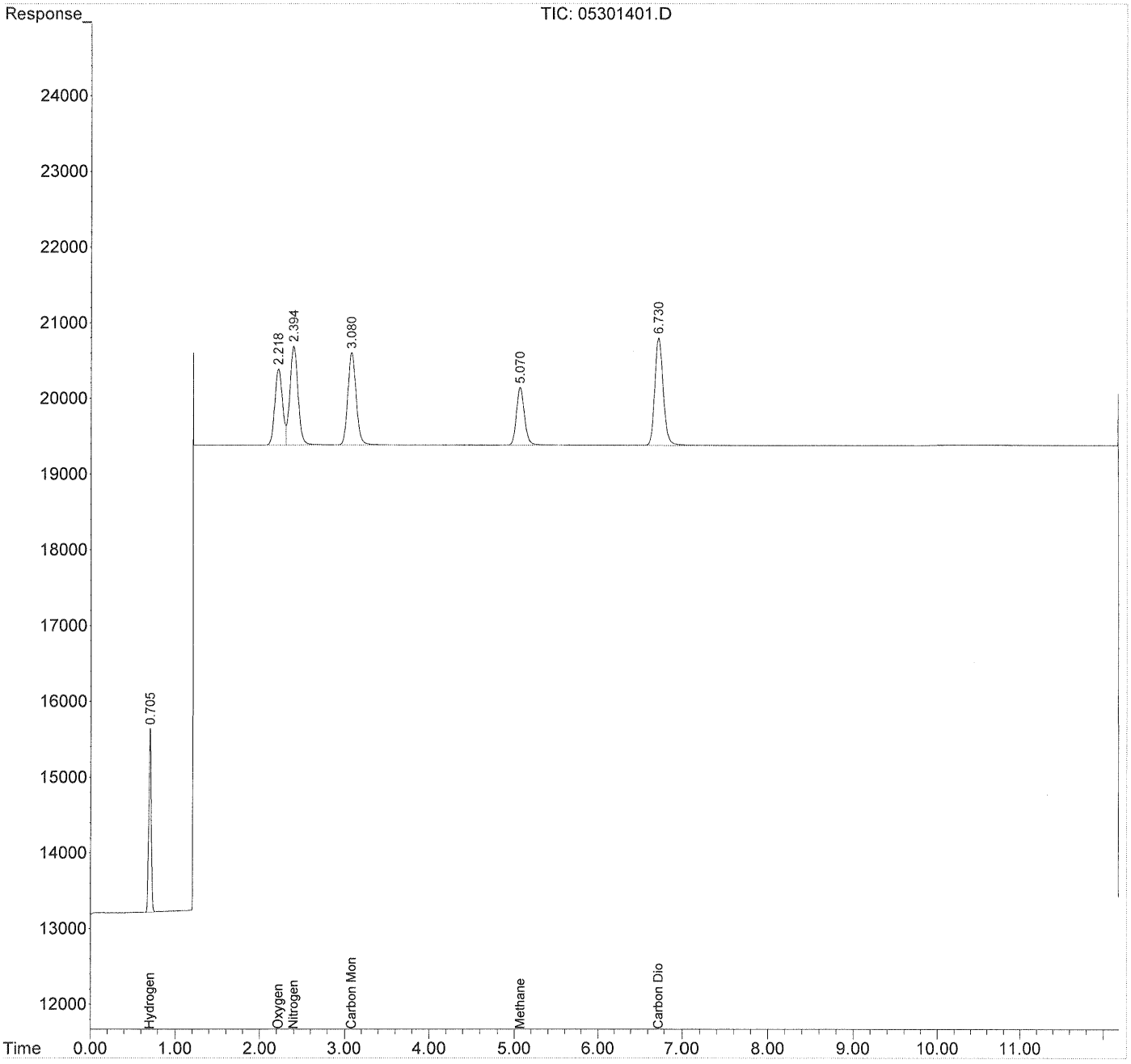
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.706	48332	34993.022	ppm
2)	Oxygen	2.219	60838	36814.922	ppm
3)	Nitrogen	2.395	87692	45673.239	ppm
4)	Carbon Monoxide	3.081	85151	45946.706	ppm
5)	Methane	5.071	51270	36727.545	ppm
6)	Carbon Dioxide	6.732	98277	45678.767	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301401.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 7:49 am
Operator : NL
Sample : std s30-04241401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:16:31 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 :



Quantitation Report (Not Reviewed)

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301434.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 6:15 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:43 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 :

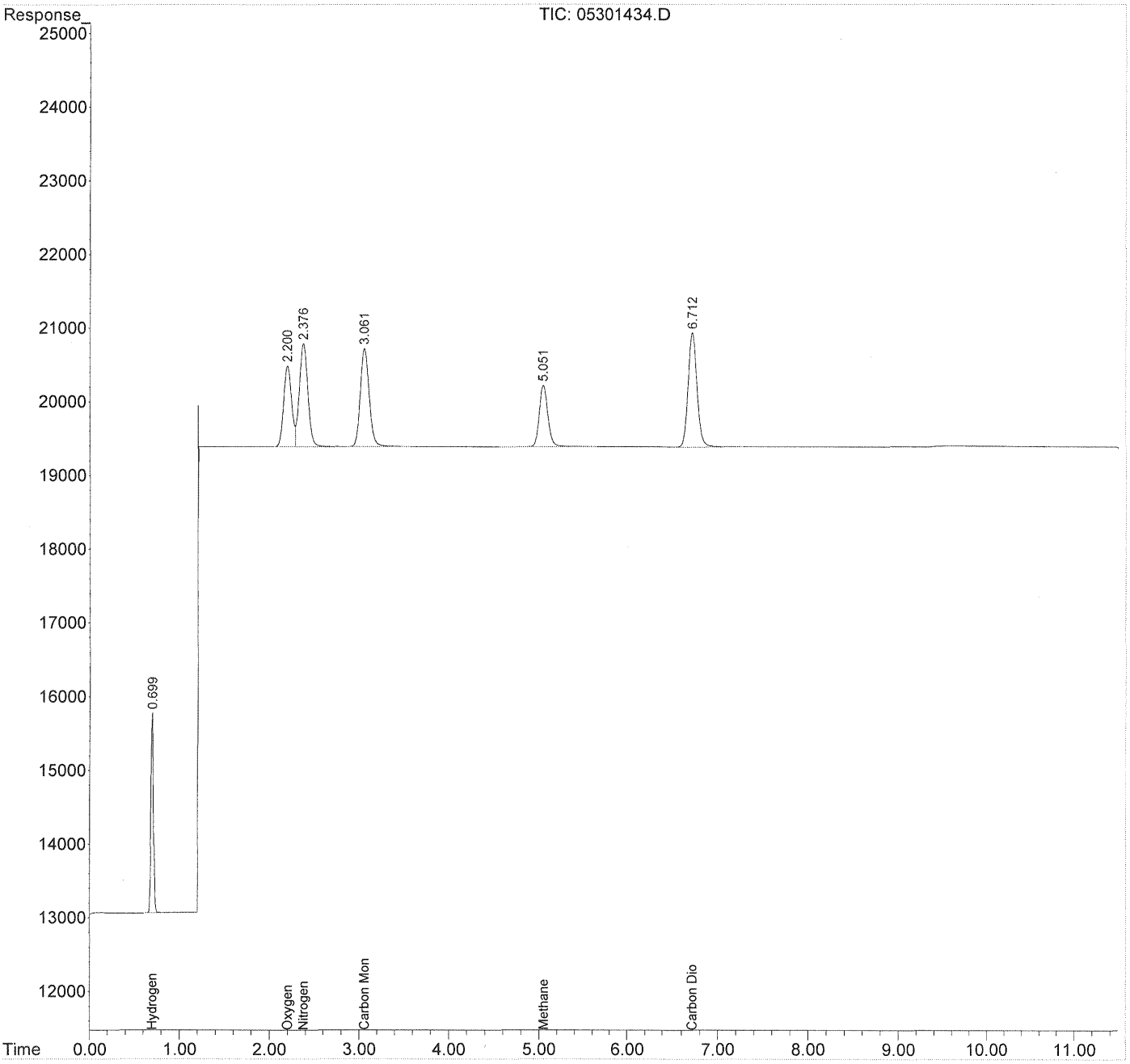
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.700	53015	38383.410	ppm
2)	Oxygen	2.201	66187	40051.481	ppm
3)	Nitrogen	2.377	93930	48922.083	ppm
4)	Carbon Monoxide	3.062	92888	50122.033	ppm
5)	Methane	5.053	55985	40105.336	ppm
6)	Carbon Dioxide	6.714	107162	49808.468	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data Path : I:\GC01\DATA\FXG\2014_05\30\
Data File : 05301434.D
Signal(s) : TCD1A.CH
Acq On : 30 May 2014 6:15 pm
Operator : NL
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: May 31 07:17:43 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 :



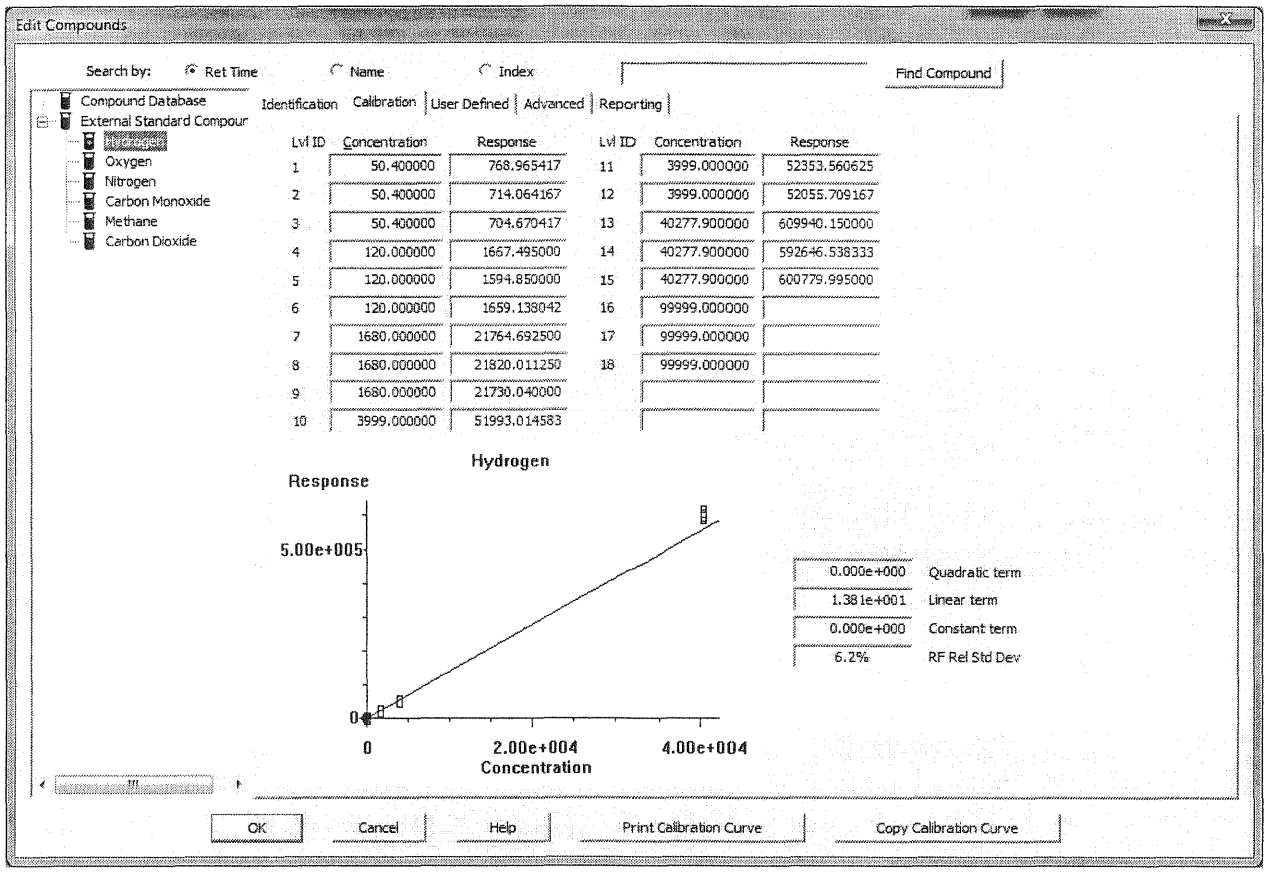
Response Factor Report GC01

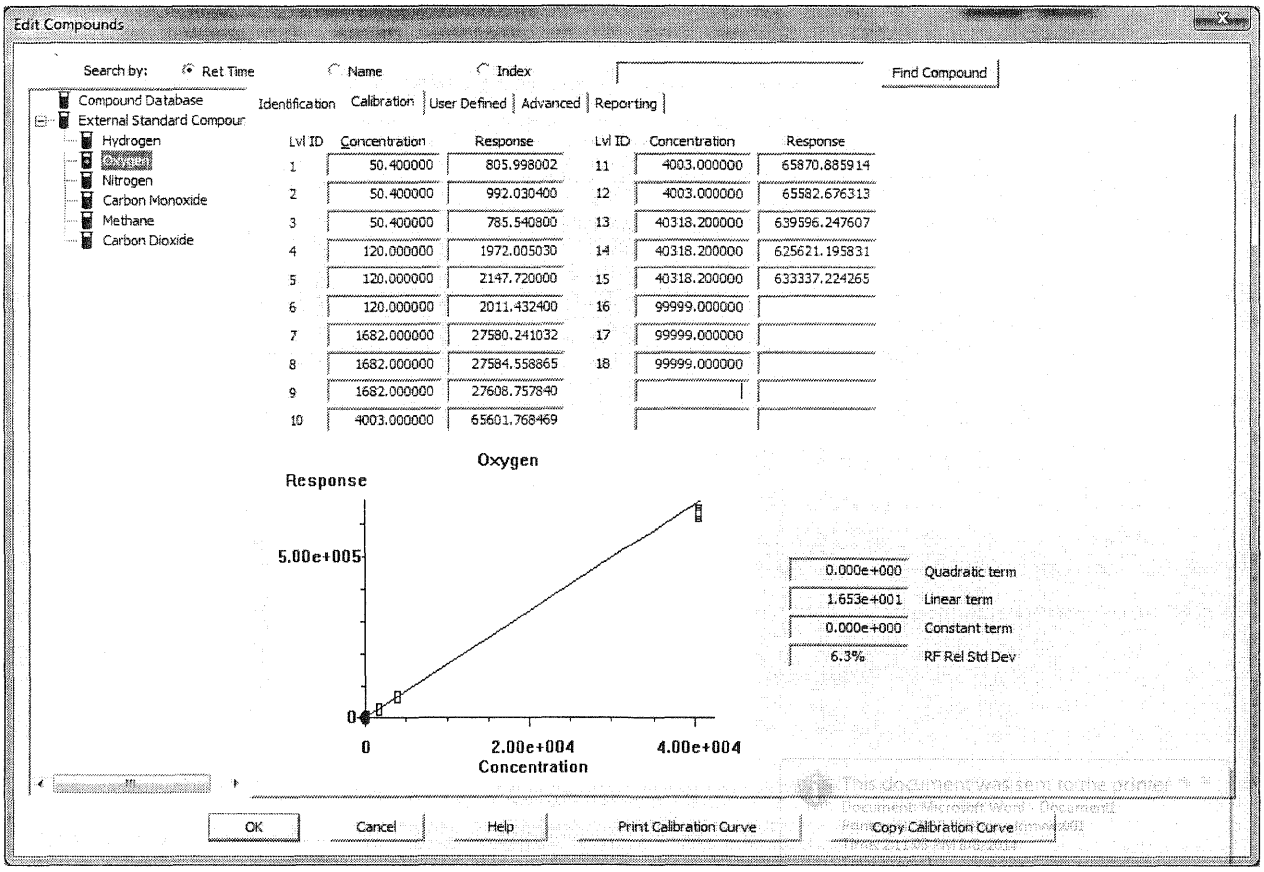
Method Path : J:\GC01\METHODS\
Method File : TR031014.M
Title : EPA 3C GC/TCD Analysis for Fixed Gases
Last Update : Tue Mar 11 11:04:23 2014
Response Via : Initial Calibration

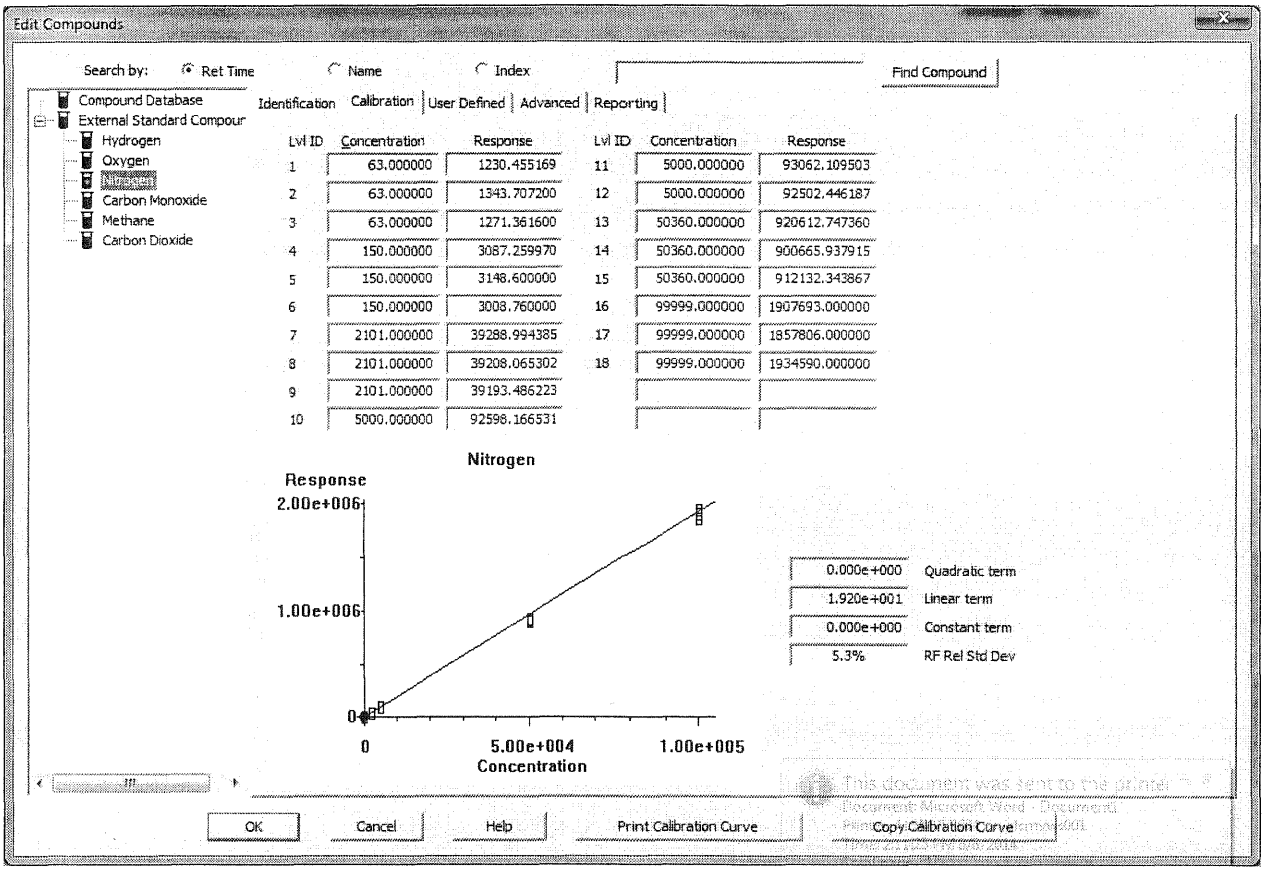
Calibration Files
1 =03101403.D 2 =03101404.D 3 =03101405.D
4 =03101406.D 5 =03101407.D 6 =03101408.D

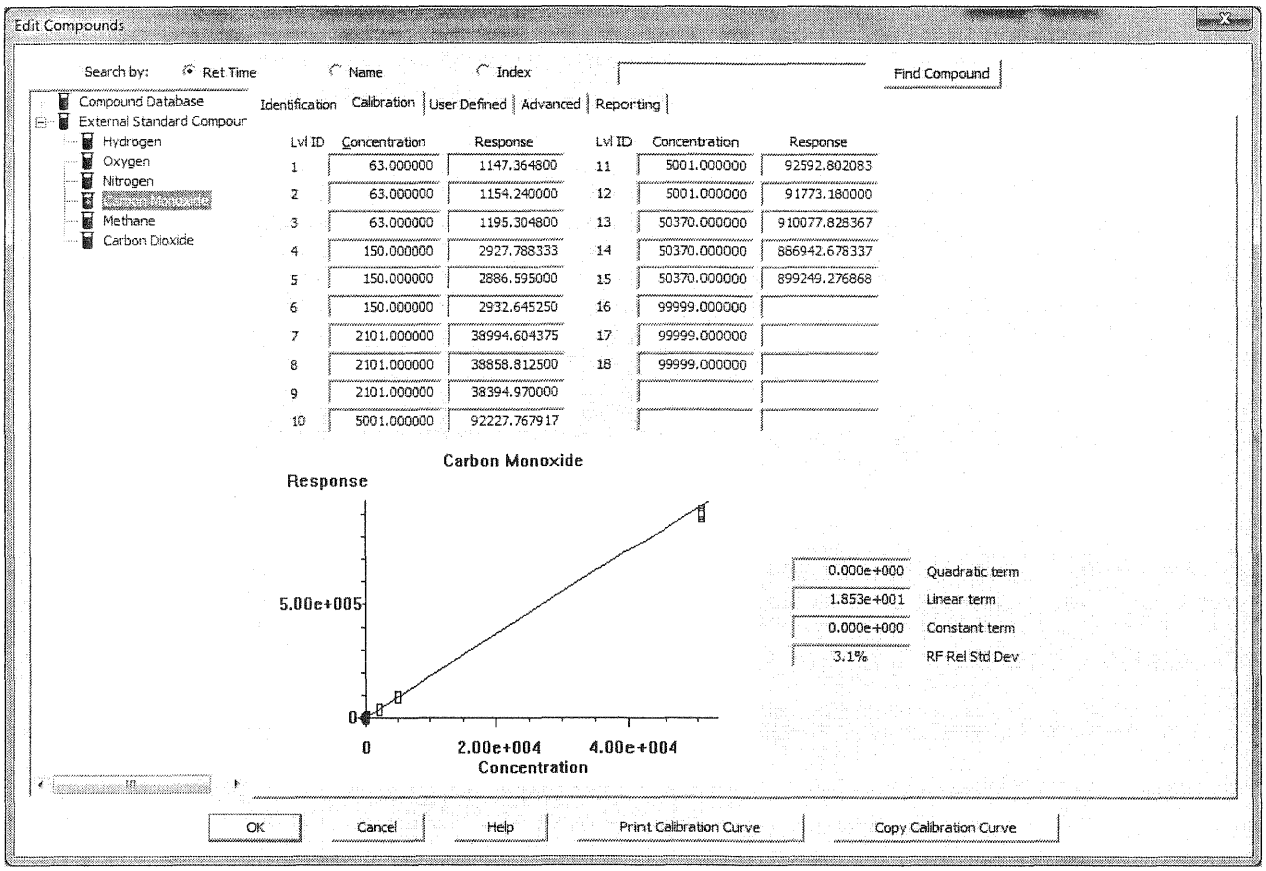
	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Hydrogen	1.526	1.417	1.398	1.390	1.329	1.383	1.381	E1	6.22
2)	Oxygen	1.599	1.968	1.559	1.643	1.790	1.676	1.653	E1	6.33
3)	Nitrogen	1.953	2.133	2.018	2.058	2.099	2.006	1.920	E1	5.33
4)	Carbon Monoxide	1.821	1.832	1.897	1.952	1.924	1.955	1.853	E1	3.06
5)	Methane	1.435	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

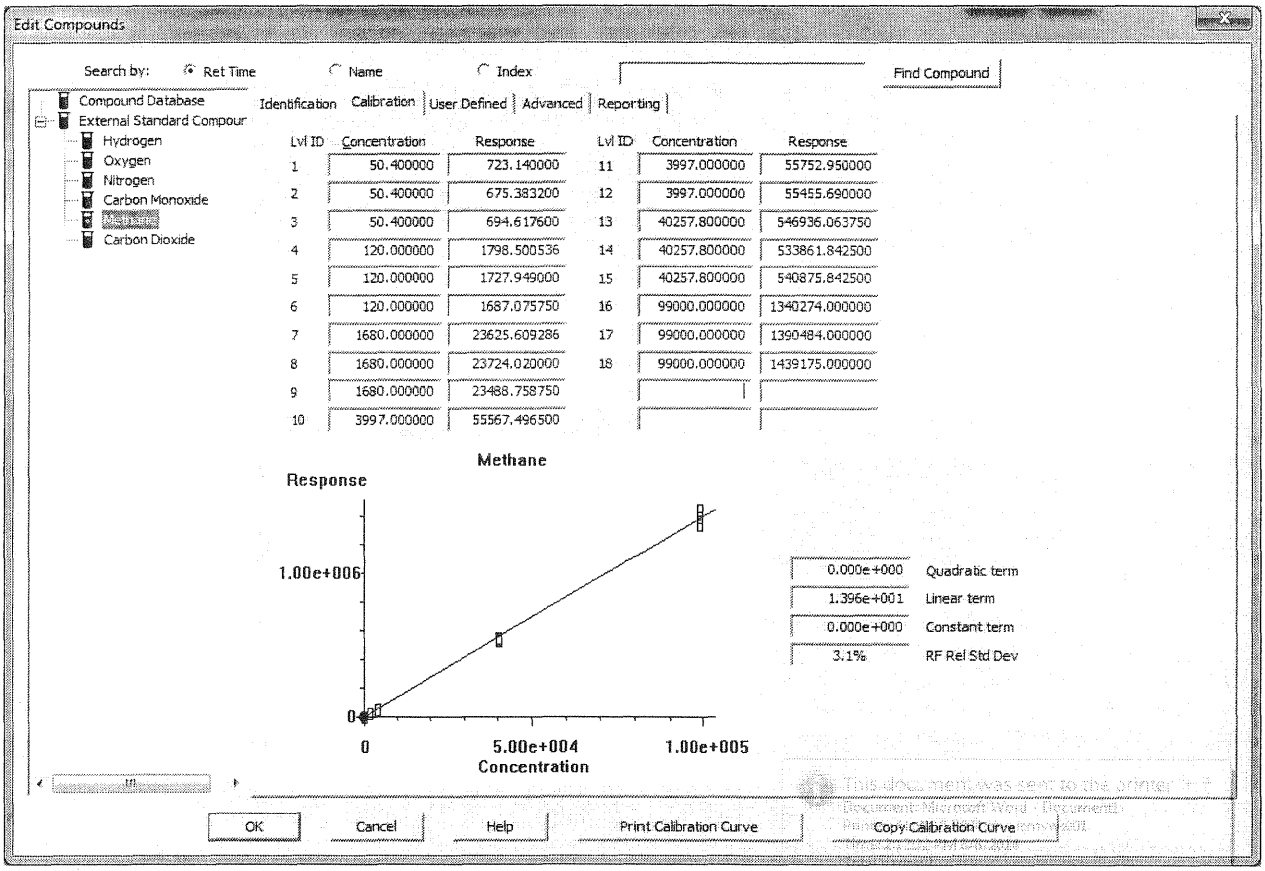
(#) = Out of Range ### Number of calibration levels exceeded format ###

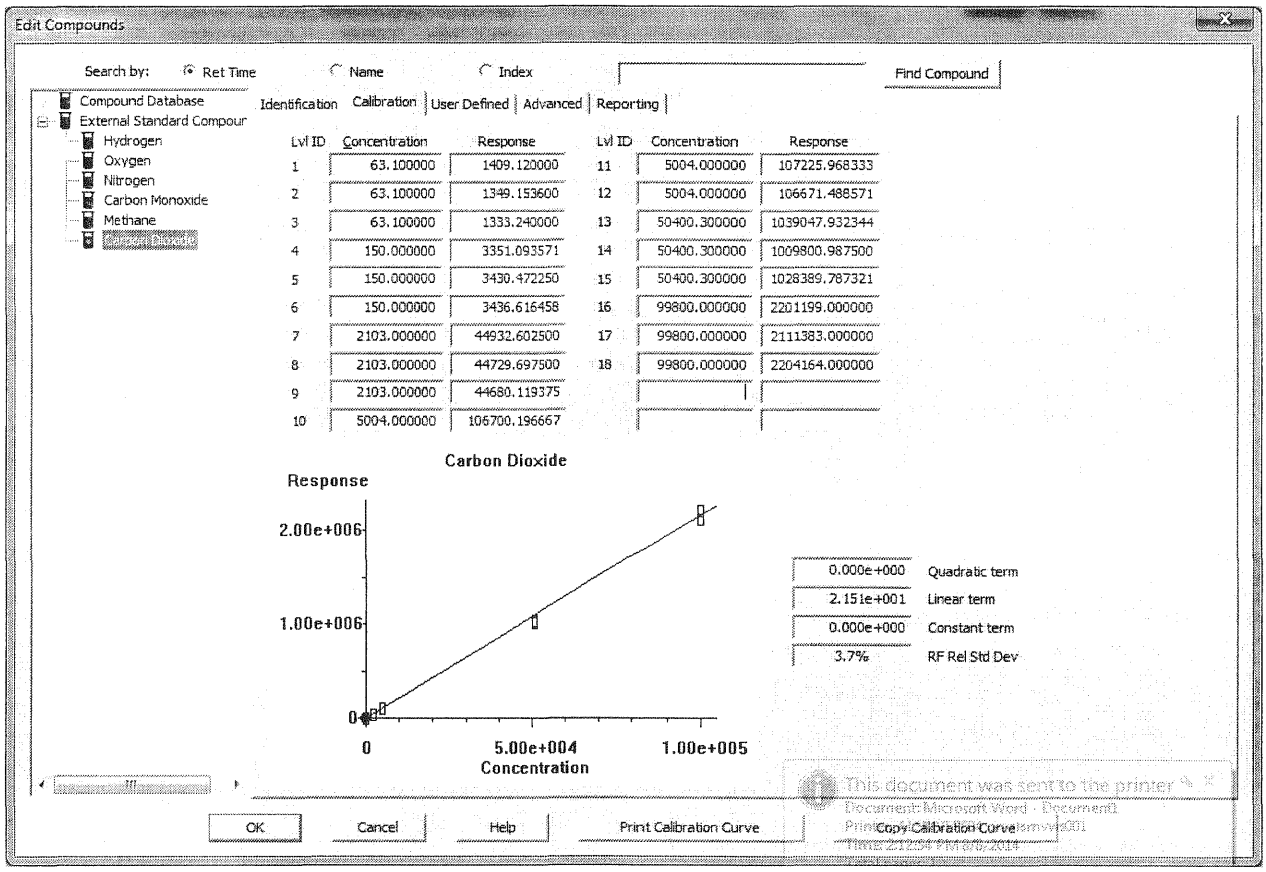

Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 50.400000 768.965417
2 50.400000 714.064167
3 50.400000 704.670417
4 120.000000 1667.495000
5 120.000000 1594.850000
6 120.000000 1659.138042
7 1680.000000 21764.692500
8 1680.000000 21820.011250
9 1680.000000 21730.040000
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11 3999.000000 52353.560625
12 3999.000000 52055.709167
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14 40277.900000 592646.538333
15 40277.900000 600779.995000
16 99999.000000
17 99999.000000
18 99999.000000
Hydrogen
Response
5.00e+005
0
0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.381e+001 Linear term
0.000e+000 Constant term
6.2% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve


Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 50.400000 805.998002
2 50.400000 992.030400
3 50.400000 785.540800
4 120.000000 1972.005030
5 120.000000 2147.720000
6 120.000000 2011.432400
7 1682.000000 27580.241032
8 1682.000000 27584.558865
9 1682.000000 27608.757840
10 4003.000000 65601.768469
11 4003.000000 65870.885914
12 4003.000000 65582.676313
13 40318.200000 639596.247607
14 40318.200000 625621.195831
15 40318.200000 633337.224265
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17 99999.000000
18 99999.000000
Oxygen
Response
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0
0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.653e+001 Linear term
0.000e+000 Constant term
6.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve


Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 63.000000 1230.455169
2 63.000000 1343.707200
3 63.000000 1271.361600
4 150.000000 3087.259970
5 150.000000 3148.600000
6 150.000000 3008.760000
7 2101.000000 39288.994385
8 2101.000000 39208.065302
9 2101.000000 39193.486223
10 5000.000000 92598.166531
11 5000.000000 93062.109503
12 5000.000000 92502.446187
13 50360.000000 920612.747360
14 50360.000000 900665.937915
15 50360.000000 912132.343867
16 99999.000000 1907693.000000
17 99999.000000 1857806.000000
18 99999.000000 1934590.000000
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0
5.00e+004
1.00e+005
Concentration
0.000e+000 Quadratic term
1.920e+001 Linear term
0.000e+000 Constant term
5.3% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve


Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
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5 150.000000 2886.595000
6 150.000000 2932.645250
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8 2101.000000 38858.812500
9 2101.000000 38394.970000
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11 5001.000000 92592.802083
12 5001.000000 91773.180000
13 50370.000000 910077.828367
14 50370.000000 886942.678337
15 50370.000000 899249.276868
16 99999.000000
17 99999.000000
18 99999.000000
Carbon Monoxide
Response
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0
2.00e+004
4.00e+004
Concentration
0.000e+000 Quadratic term
1.853e+001 Linear term
0.000e+000 Constant term
3.1% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve


Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Carbon Dioxide
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 50.400000 723.140000
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8 1680.000000 23724.020000
9 1680.000000 23488.758750
10 3997.000000 55567.496500
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12 3997.000000 55455.690000
13 40257.800000 546936.063750
14 40257.800000 533861.842500
15 40257.800000 540875.842500
16 99000.000000 1340274.000000
17 99000.000000 1390484.000000
18 99000.000000 1439175.000000
Methane
Response
1.00e+006
0
0
5.00e+004
1.00e+005
Concentration
0.000e+000 Quadratic term
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3.1% RF Rel Std Dev
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

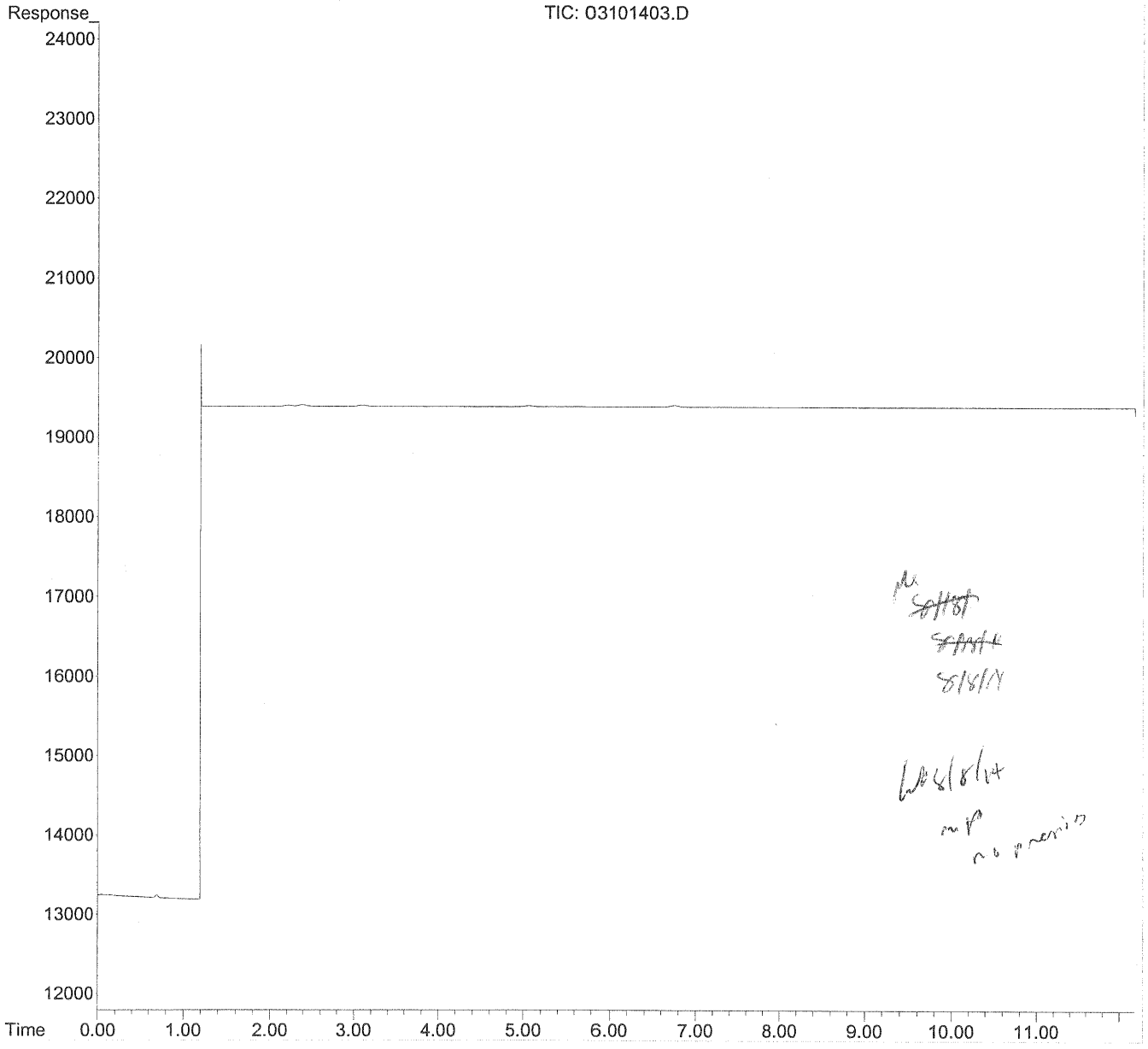

Edit Compounds
Search by:
Ret Time
Name
Index
Find Compound
Compound Database
External Standard Compour
Hydrogen
Oxygen
Nitrogen
Carbon Monoxide
Methane
Identification
Calibration
User Defined
Advanced
Reporting
Lvl ID
Concentration
Response
1 63.100000 1409.120000
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5 150.000000 3430.472250
6 150.000000 3436.616458
7 2103.000000 44932.602500
8 2103.000000 44729.697500
9 2103.000000 44680.119375
10 5004.000000 106700.196667
11 5004.000000 107225.968333
12 5004.000000 106671.488571
13 50400.300000 1039047.932344
14 50400.300000 1009800.987500
15 50400.300000 1028389.787321
16 99800.000000 2201199.000000
17 99800.000000 2111383.000000
18 99800.000000 2204164.000000
Carbon Dioxide
Response
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1.00e+006
0
0
5.00e+004
1.00e+005
Concentration
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2.151e+001 Linear term
0.000e+000 Constant term
3.7% RF Rel Std Dev
This document was sent to the printer
Document: Microsoft Word - Document1
Print: Copy Calibration Curve
Time: 2:12:54 PM 8/7/2014
OK
Cancel
Help
Print Calibration Curve
Copy Calibration Curve

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

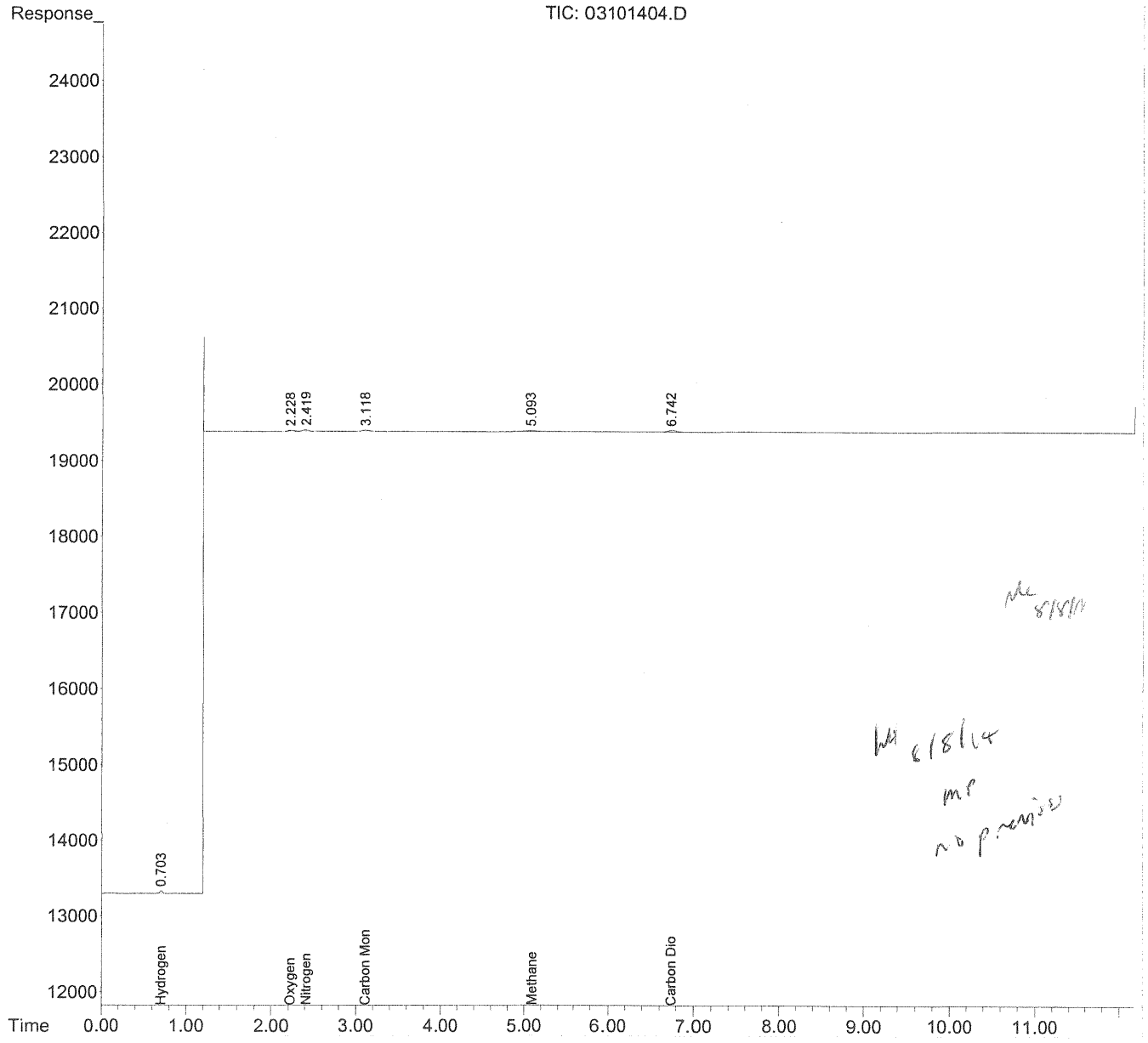
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Hydrogen	0.700	769	NoCal	ppm	
2)	Oxygen	2.227	806	NoCal	ppm	m
3)	Nitrogen	2.393	1230	NoCal	ppm	m
4)	Carbon Monoxide	3.092	1147	NoCal	ppm	m
5)	Methane	5.085	723	NoCal	ppm	m
6)	Carbon Dioxide	6.748	1409	NoCal	ppm	m

(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 :



Quantitation Report (QT Reviewed)

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 :

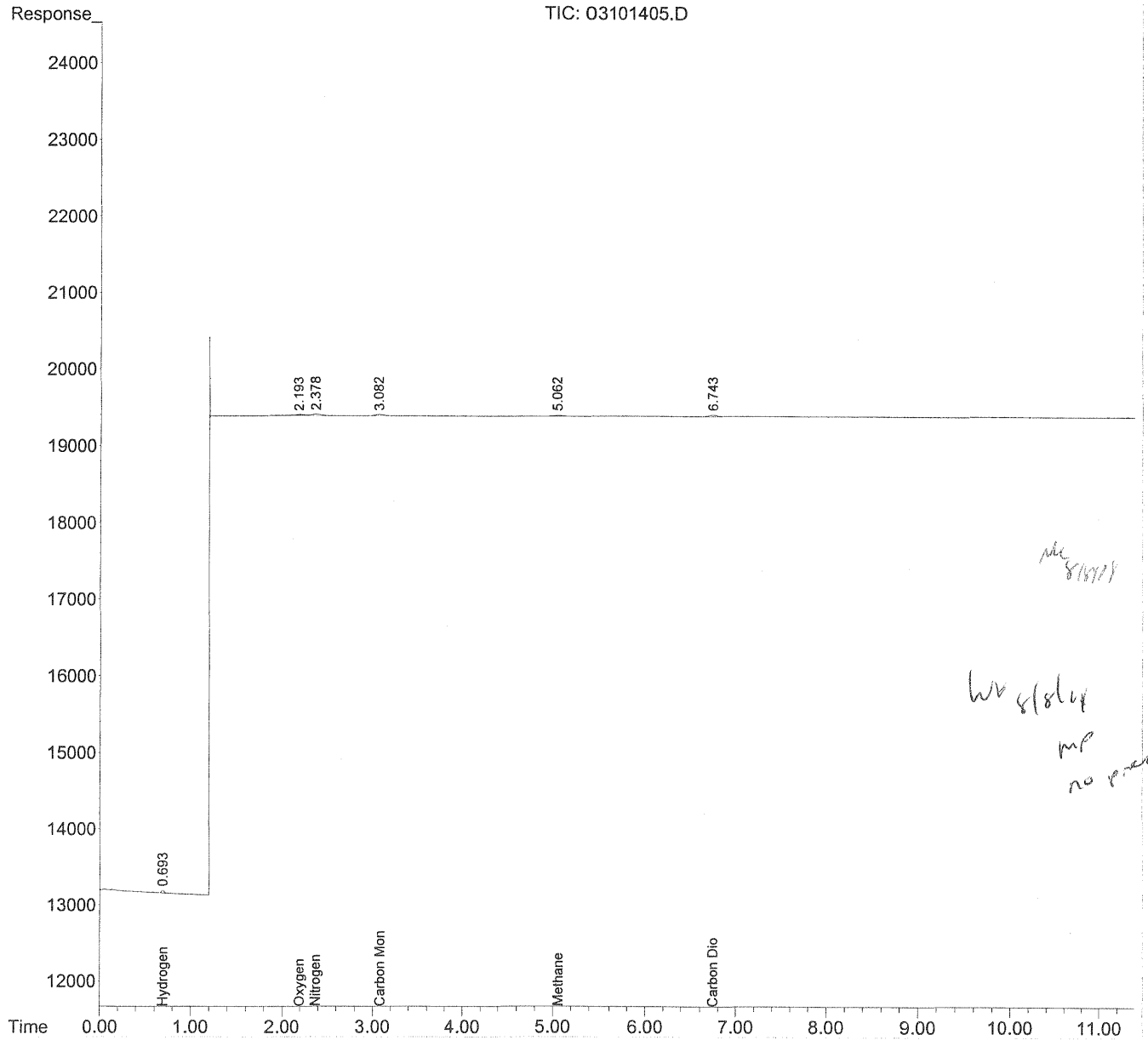
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Hydrogen	0.704	714	468.016	ppm	
2)	Oxygen	2.228	992	620.328	ppm	m
3)	Nitrogen	2.419	1344	687.986	ppm	m
4)	Carbon Monoxide	3.118	1154	633.775	ppm	m
5)	Methane	5.093	675	470.715	ppm	m
6)	Carbon Dioxide	6.742	1349	604.147	ppm	m

(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 :



WH 8/8/14
MP
no previous

Quantitation Report (QT Reviewed)

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

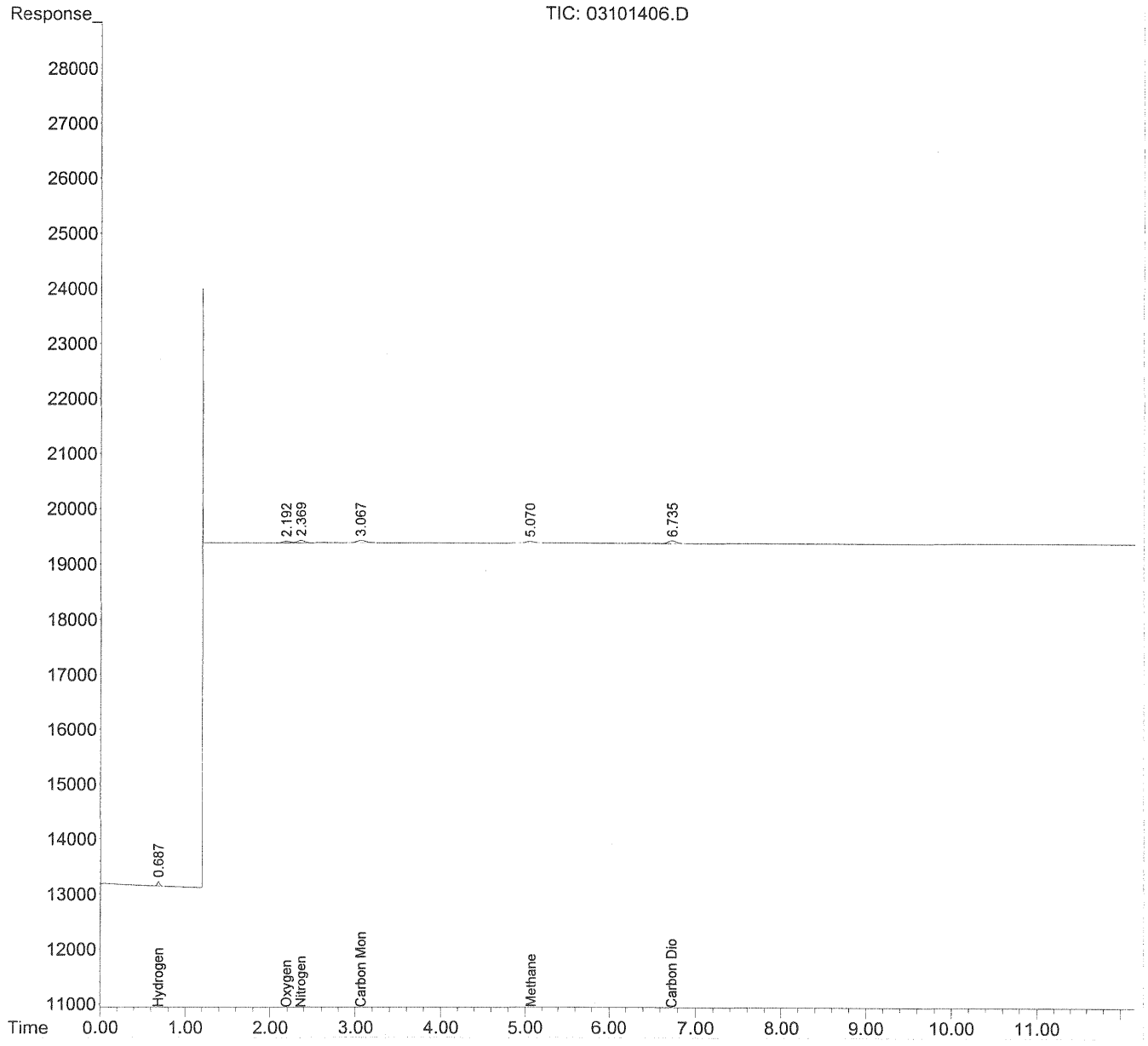
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

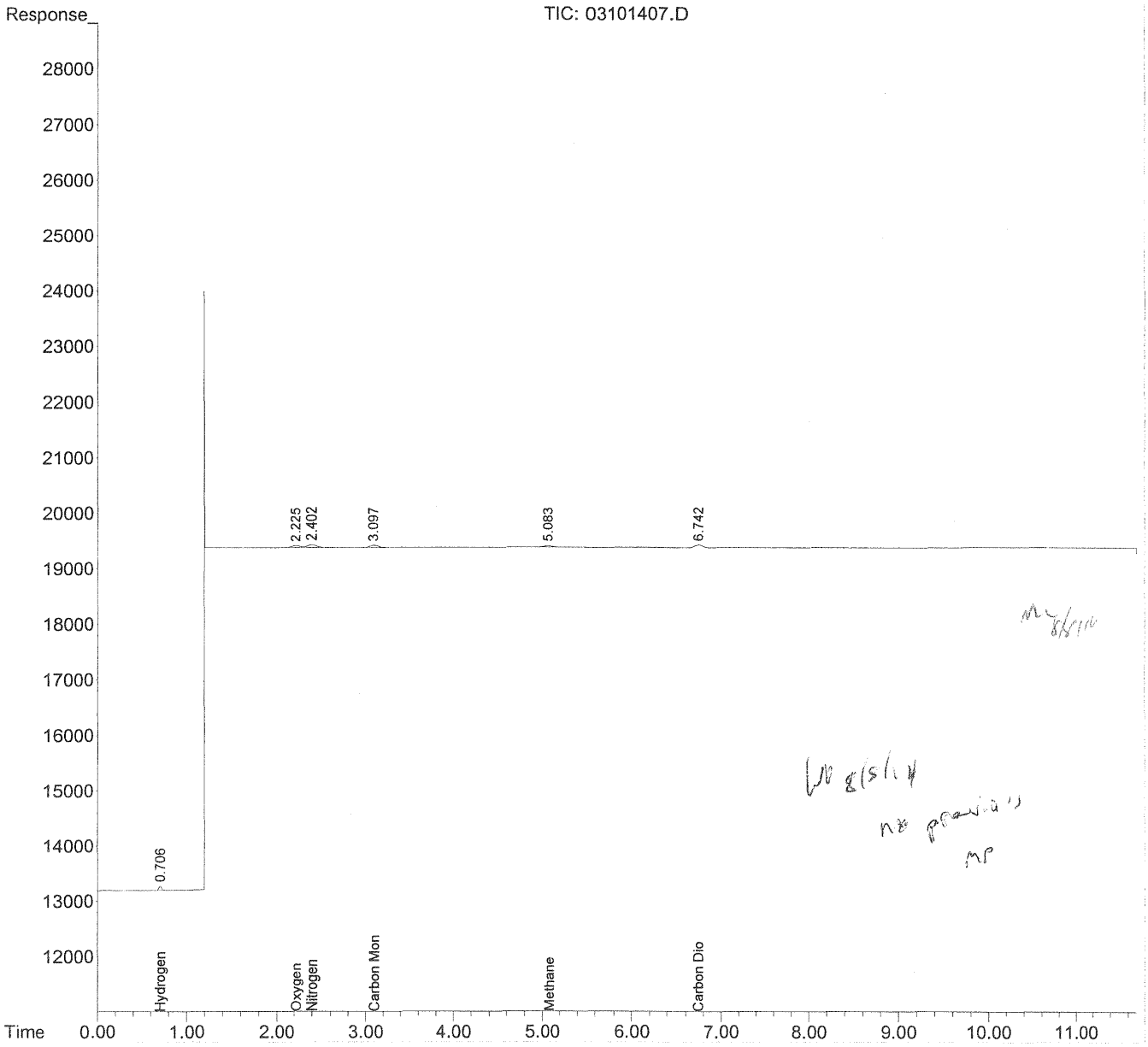
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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	

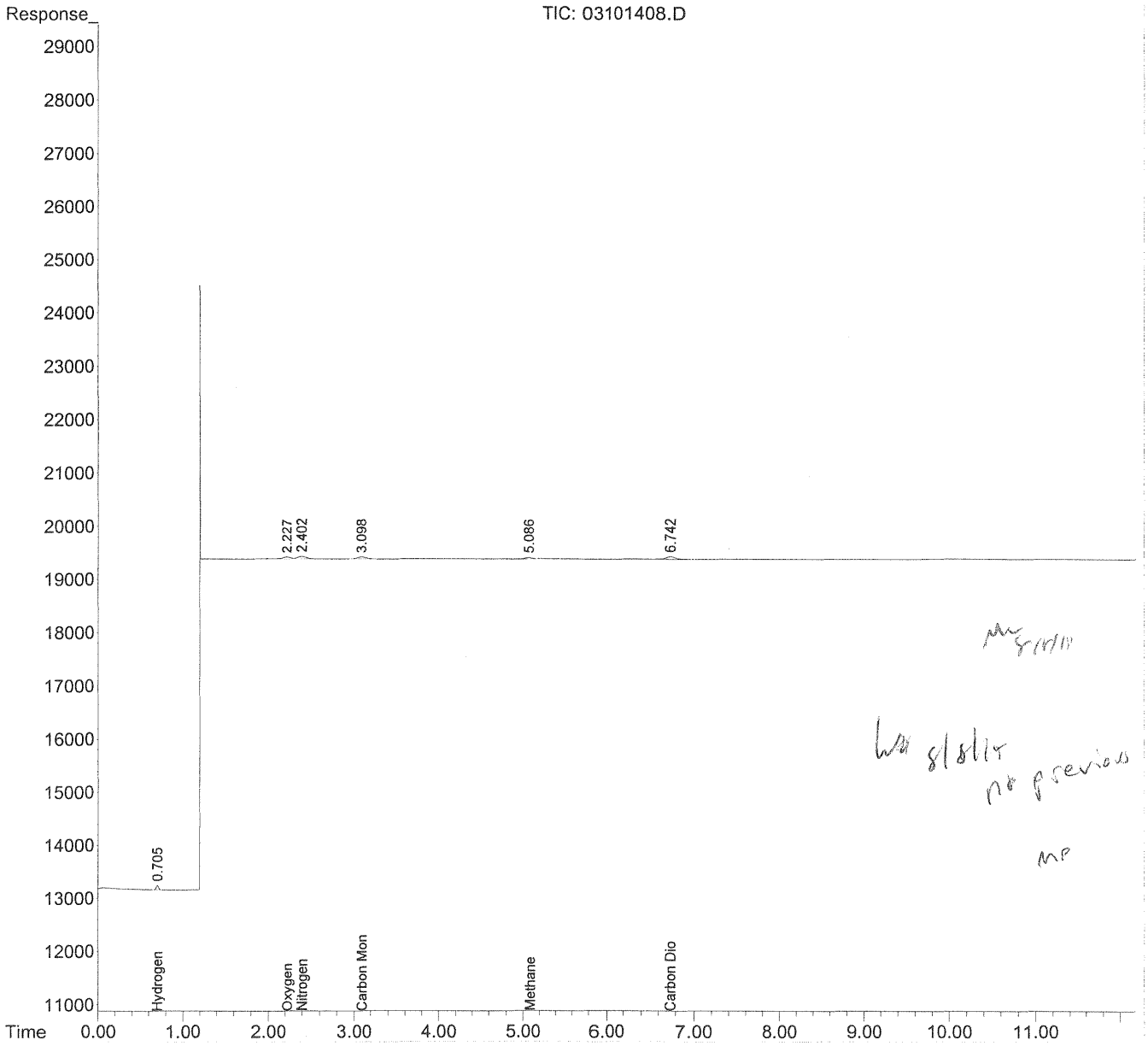
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MW 8/11/14

WH 8/8/14 no previous MP

Quantitation Report (QT Reviewed)

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	

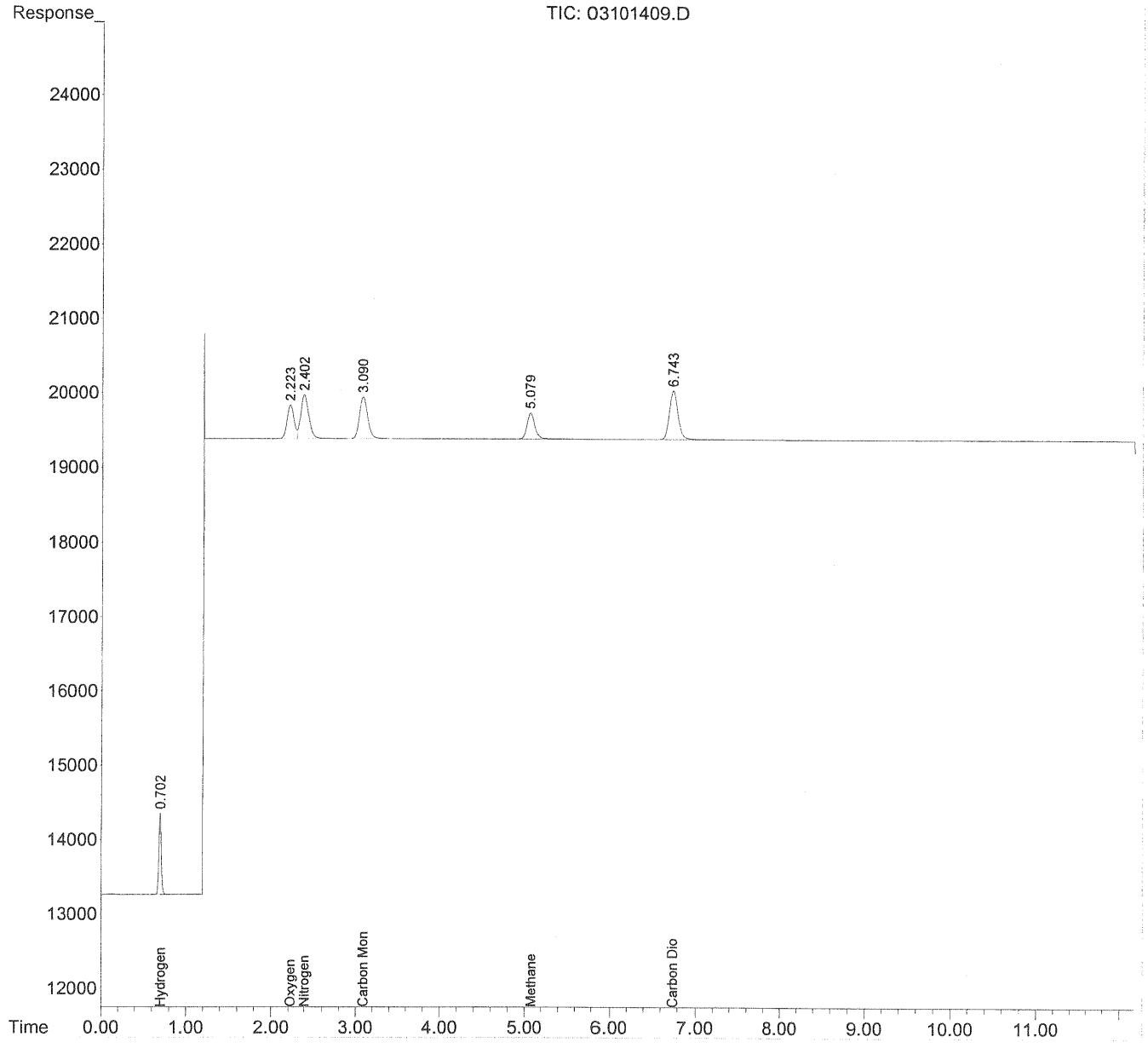
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

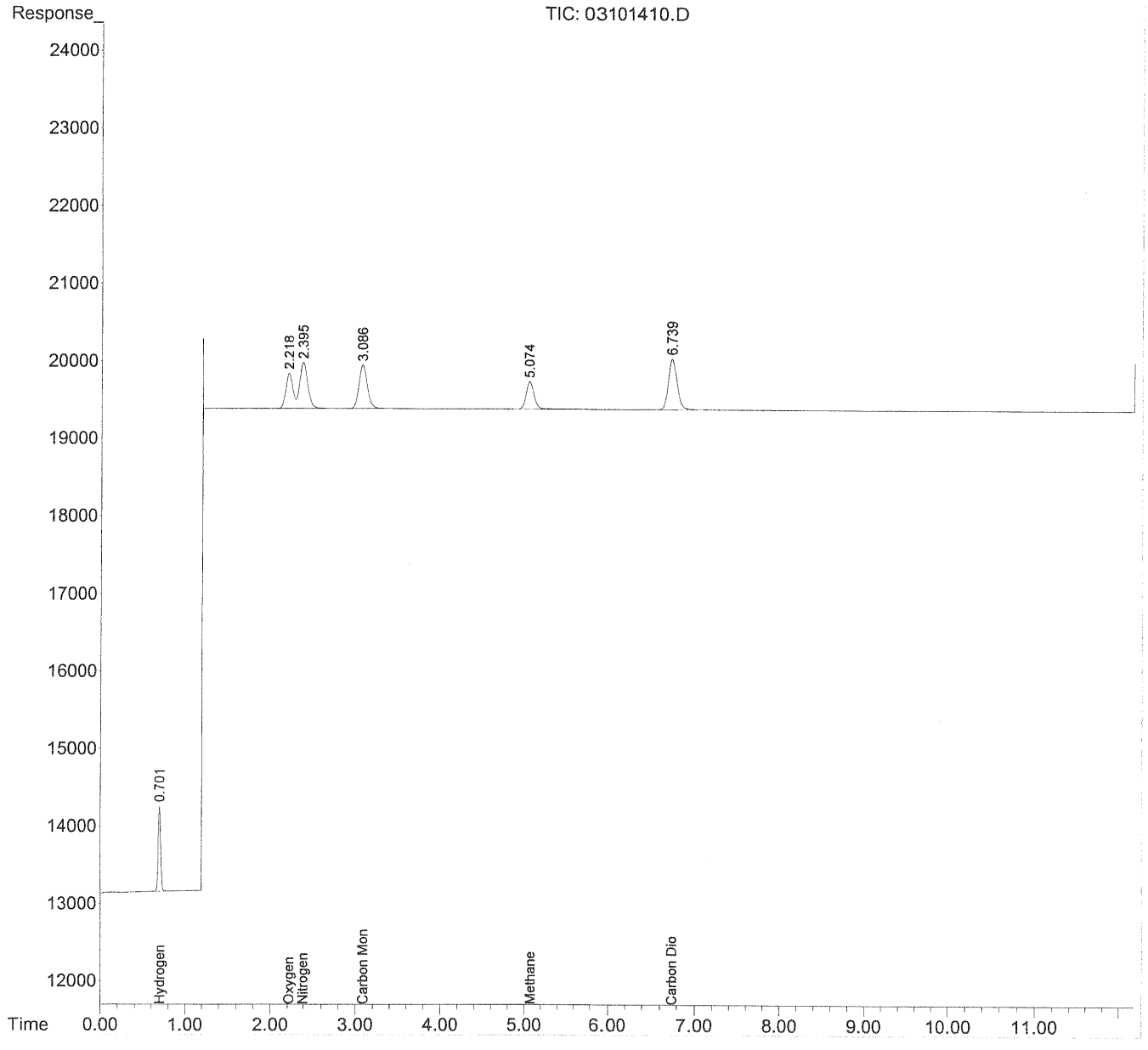
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

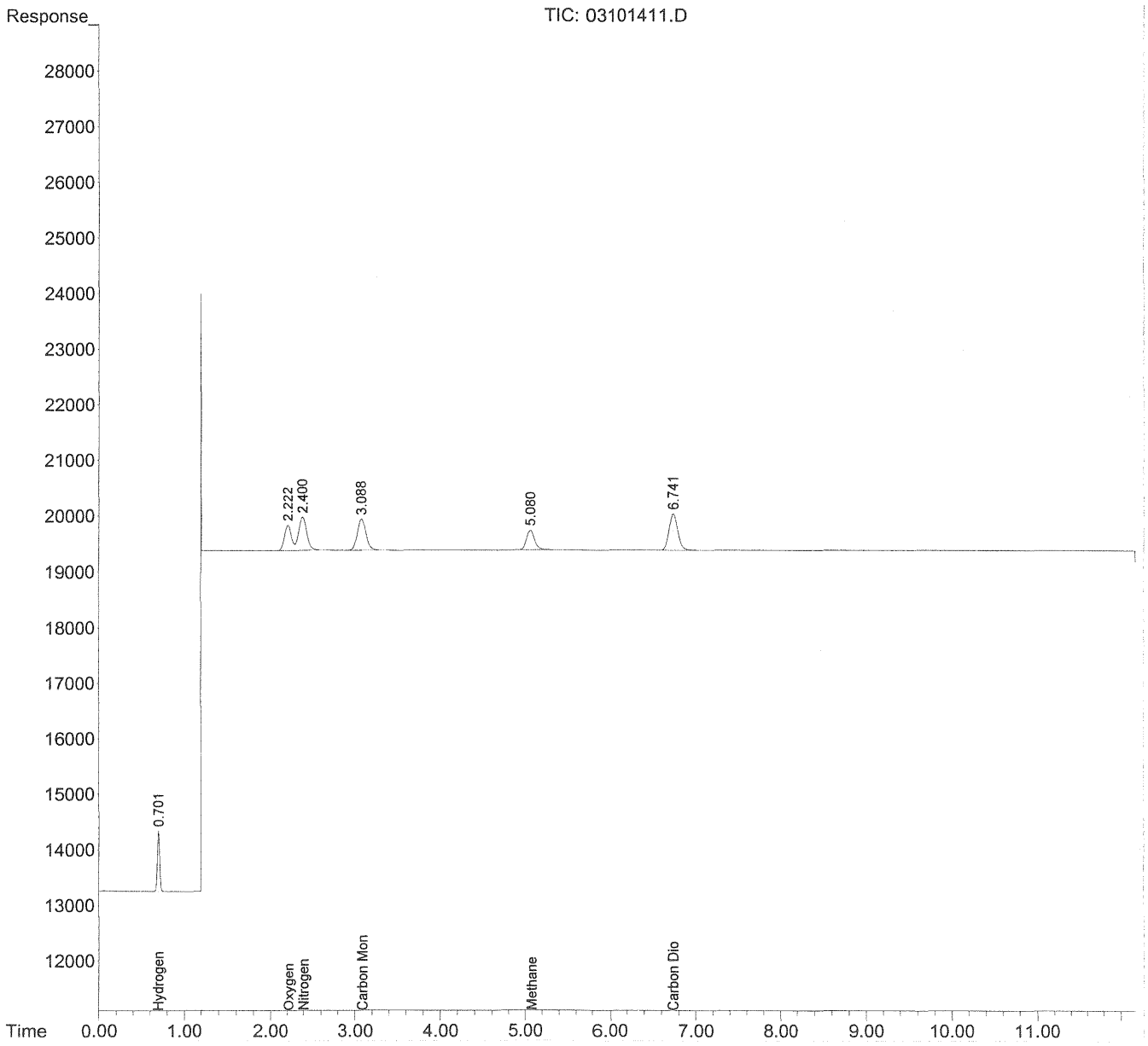
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

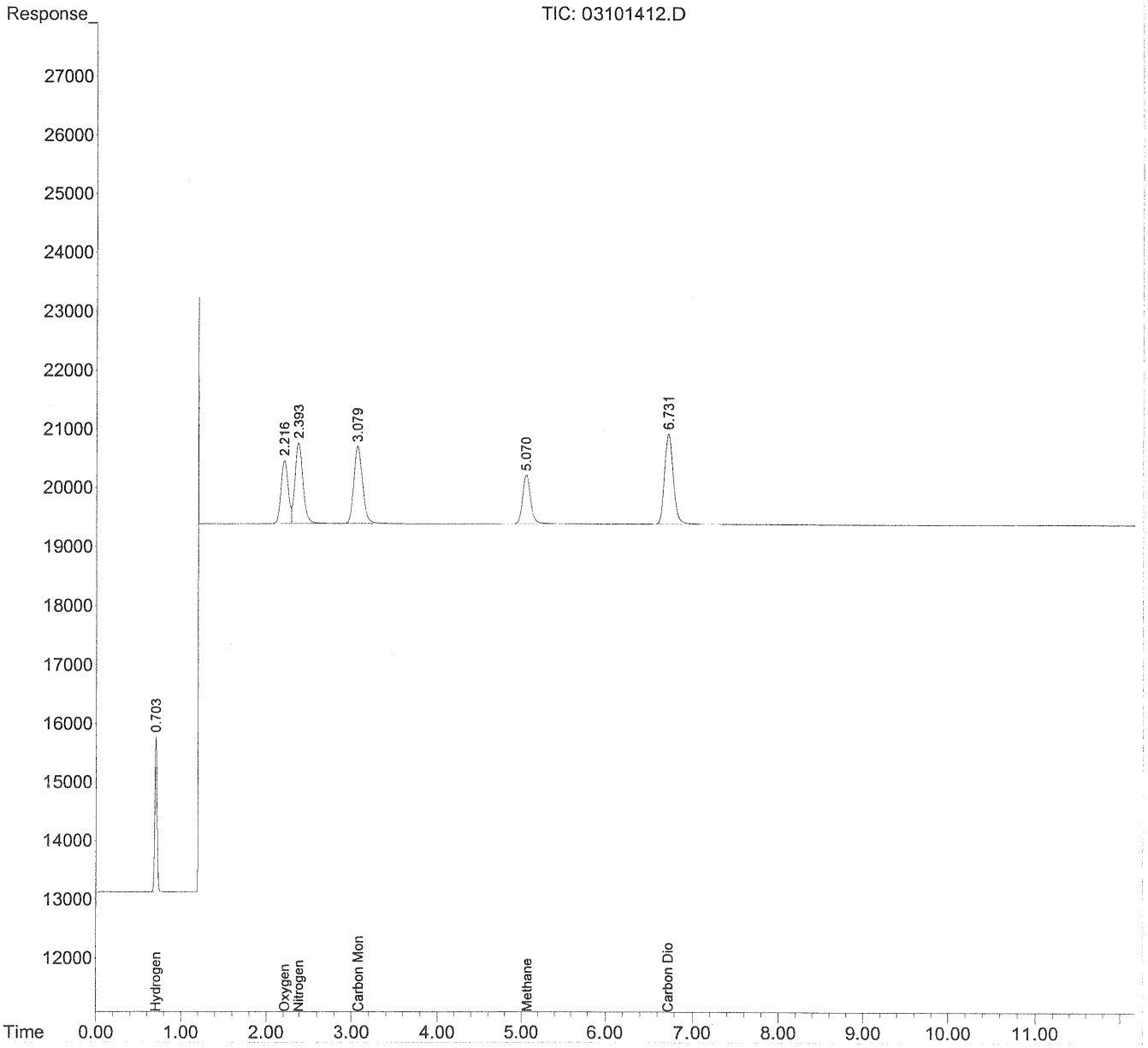
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

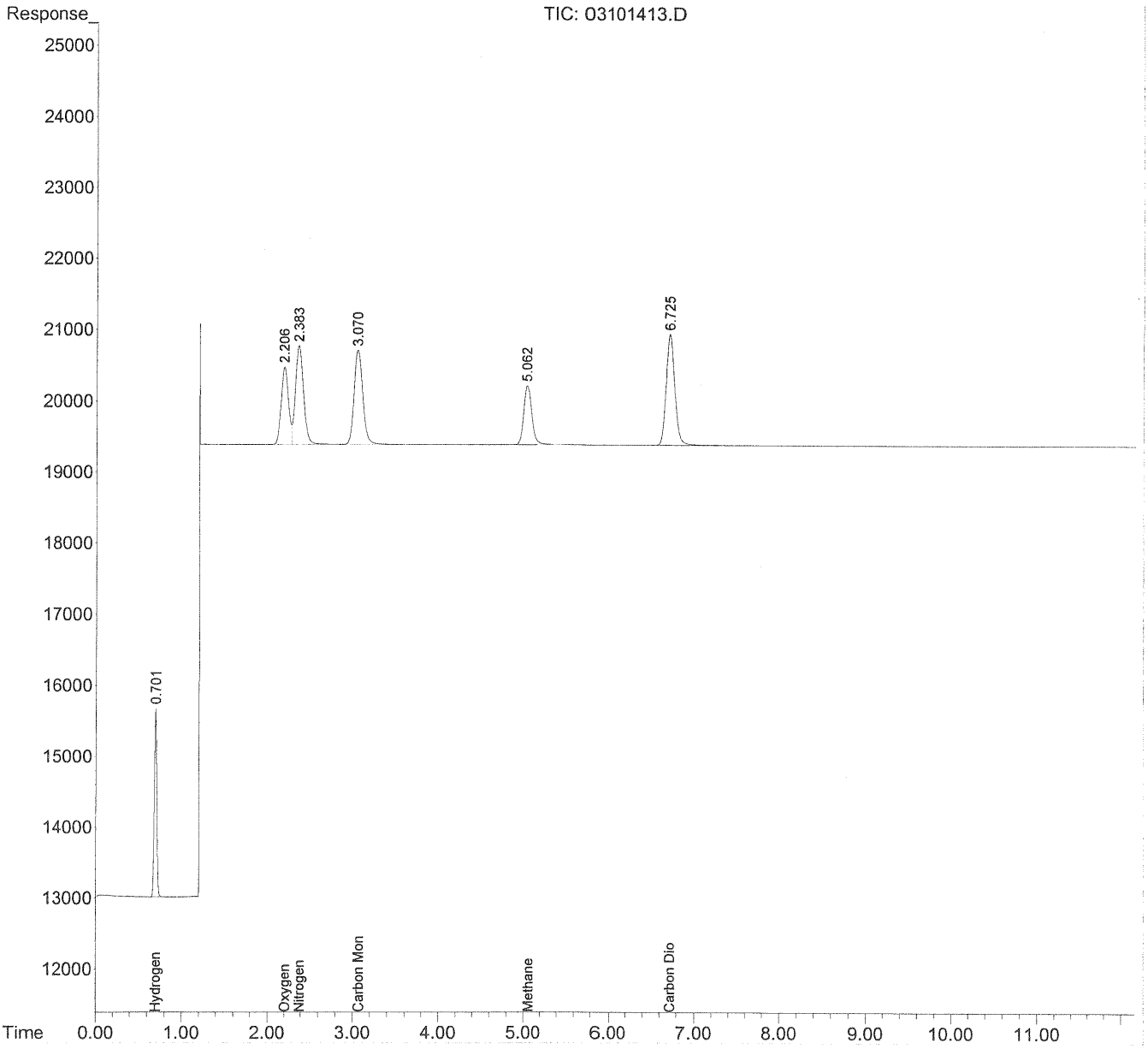
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

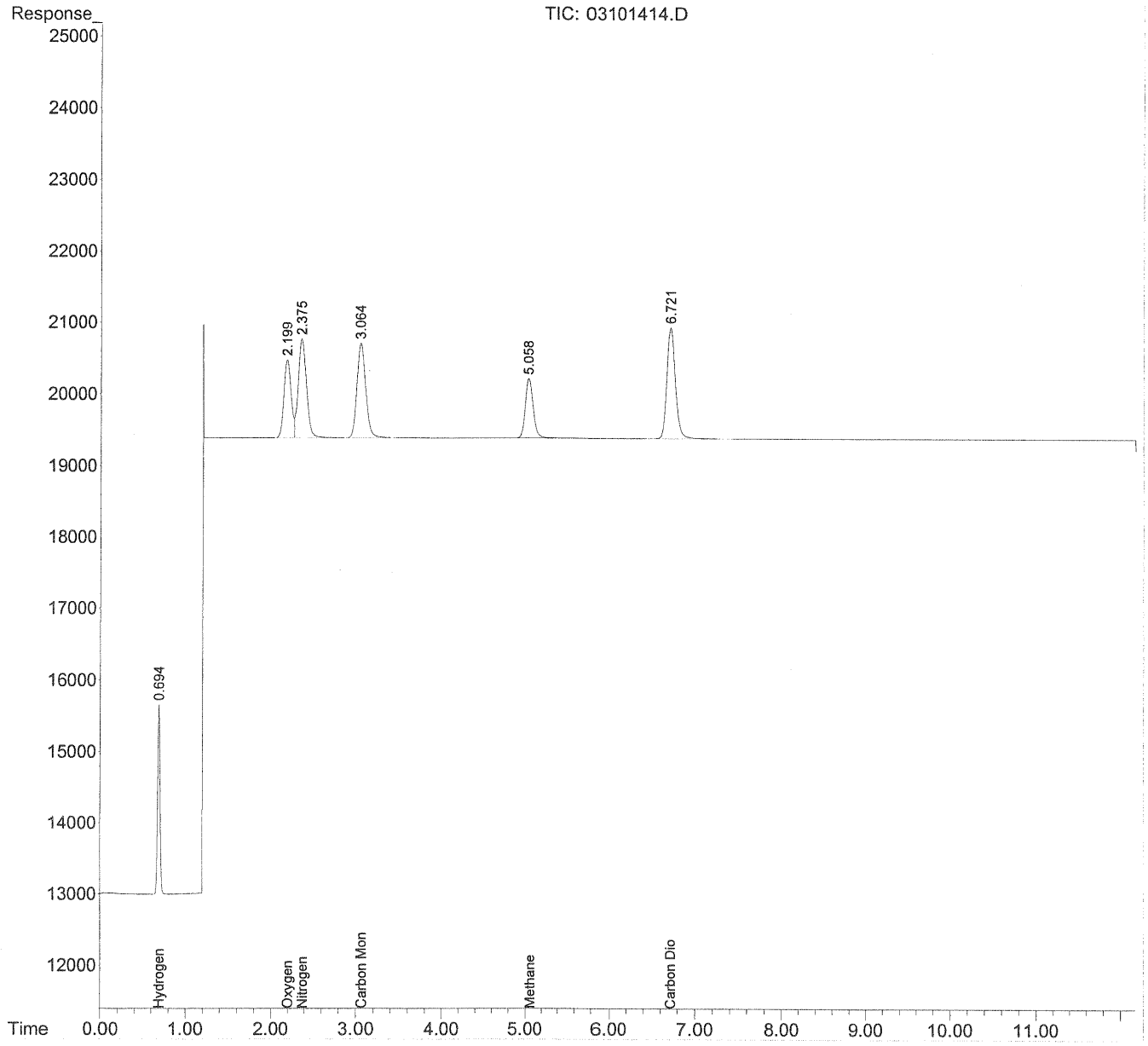
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

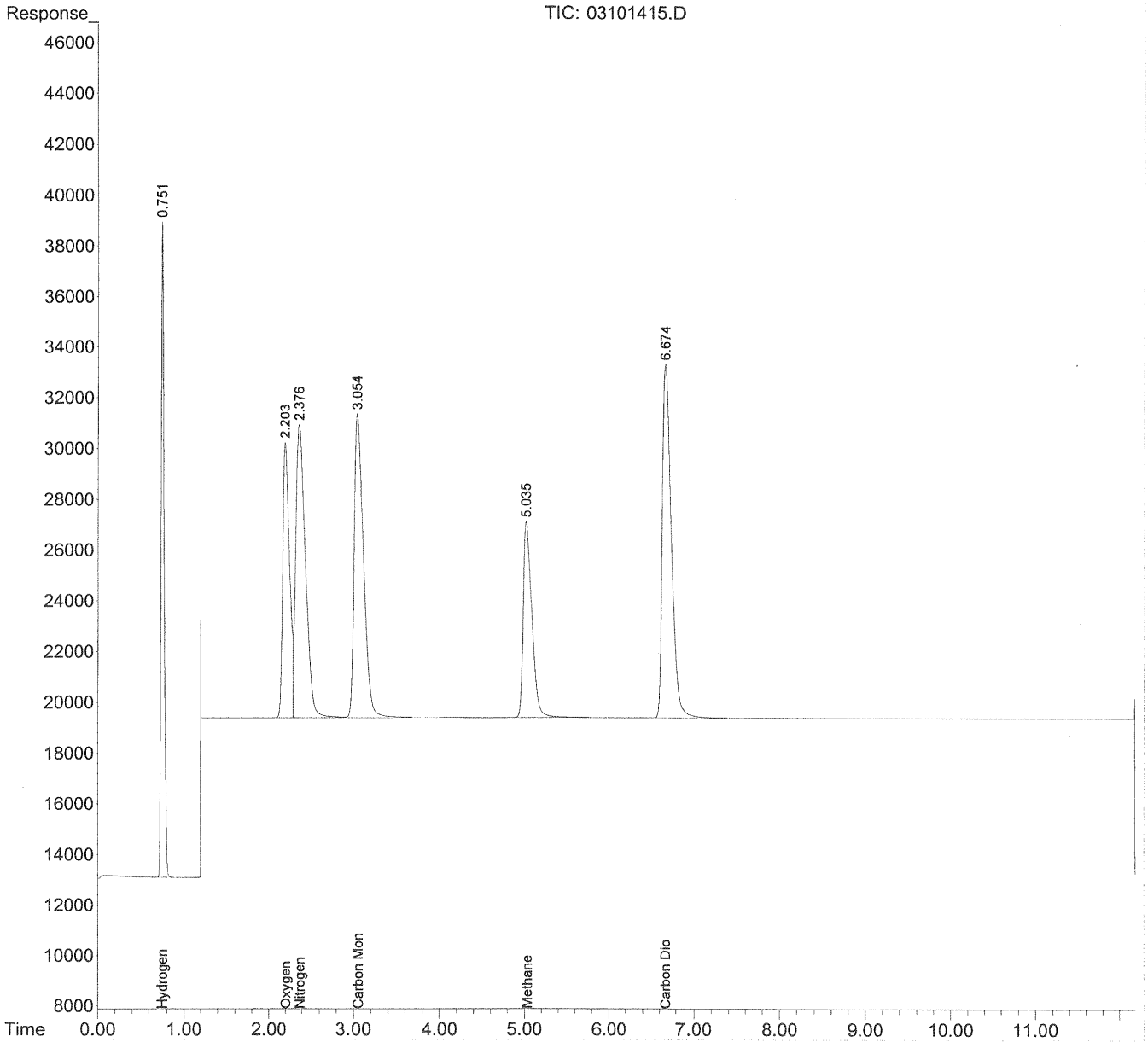
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

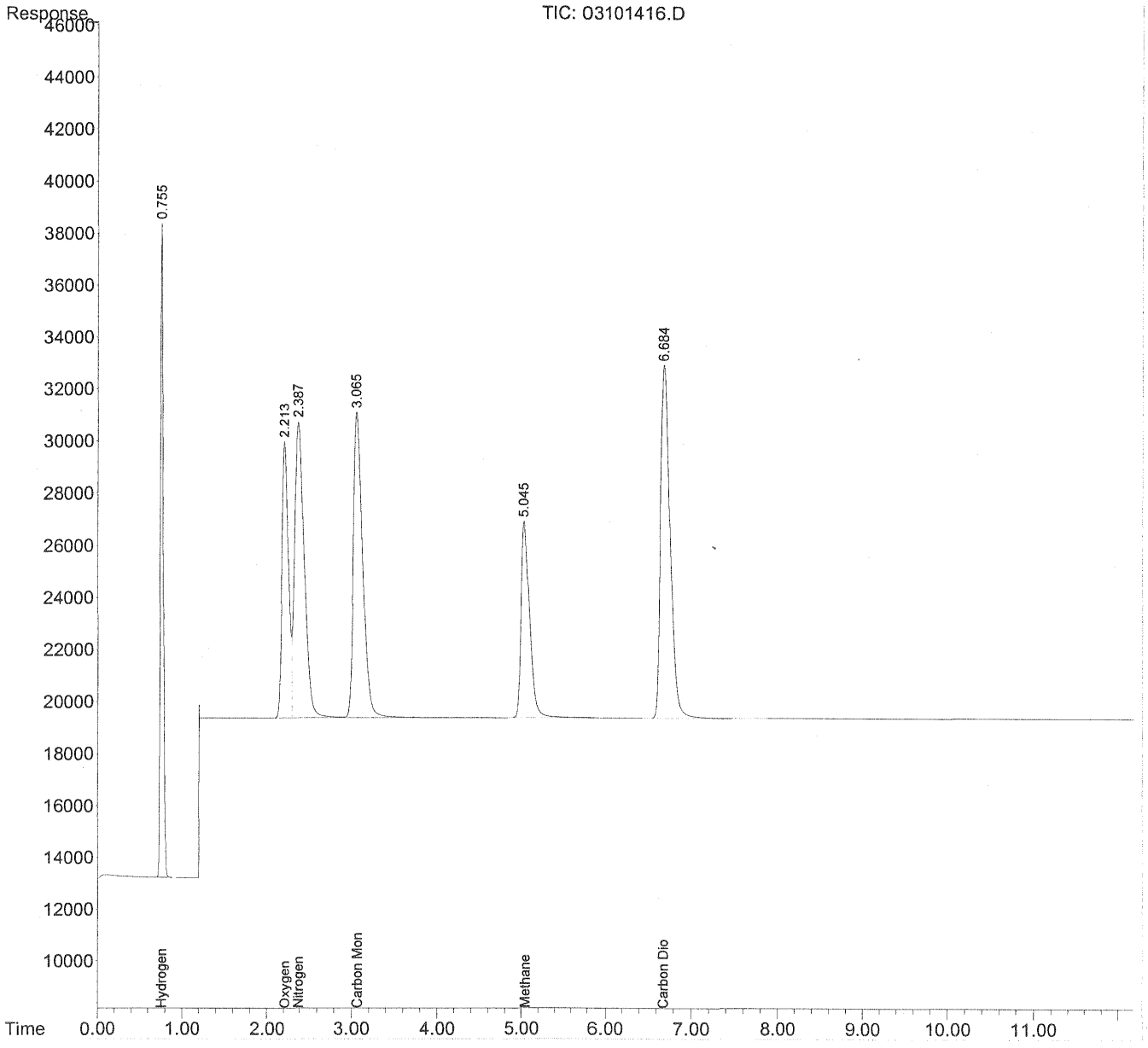
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

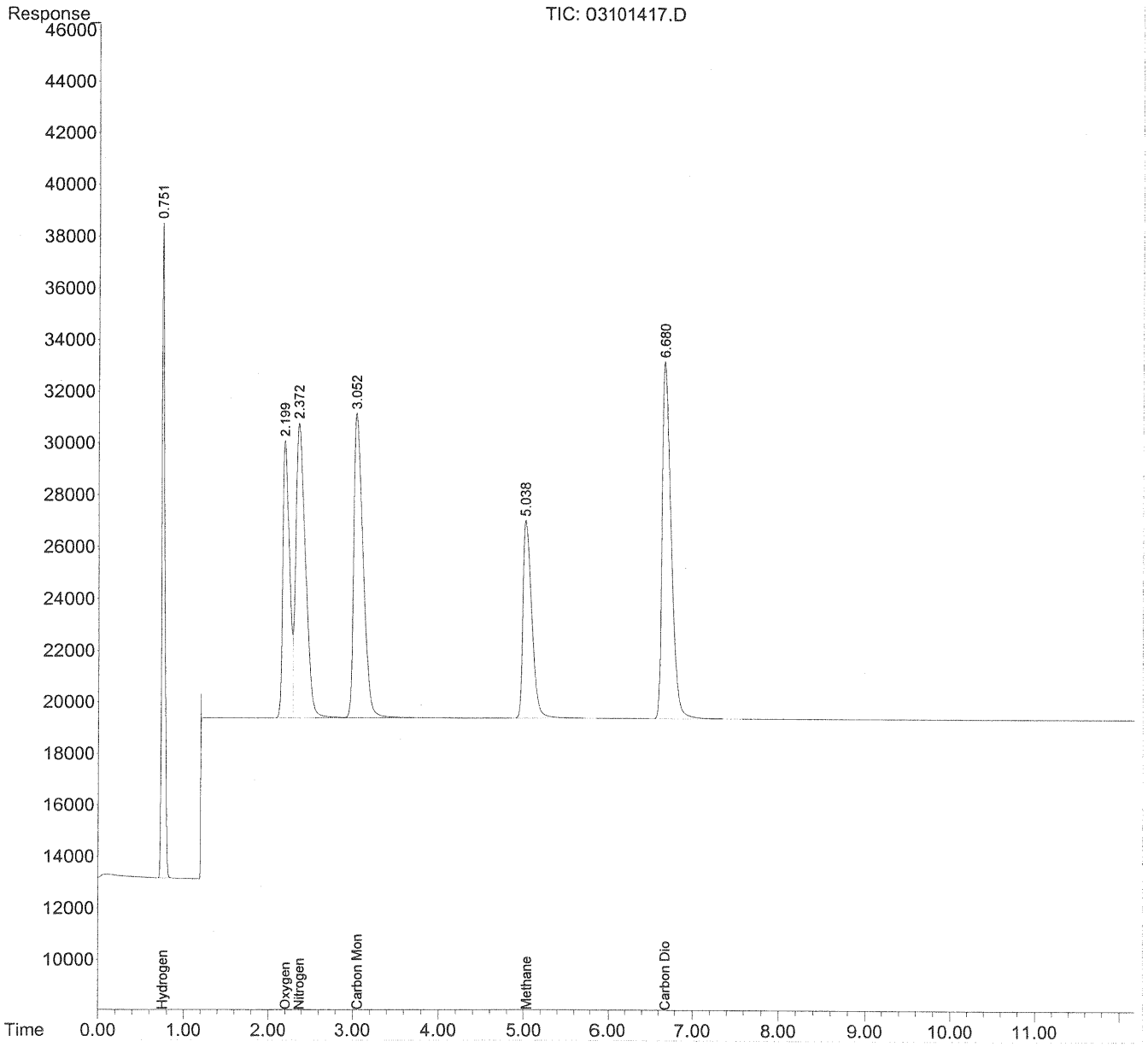
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

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 :



Quantitation Report (Not Reviewed)

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

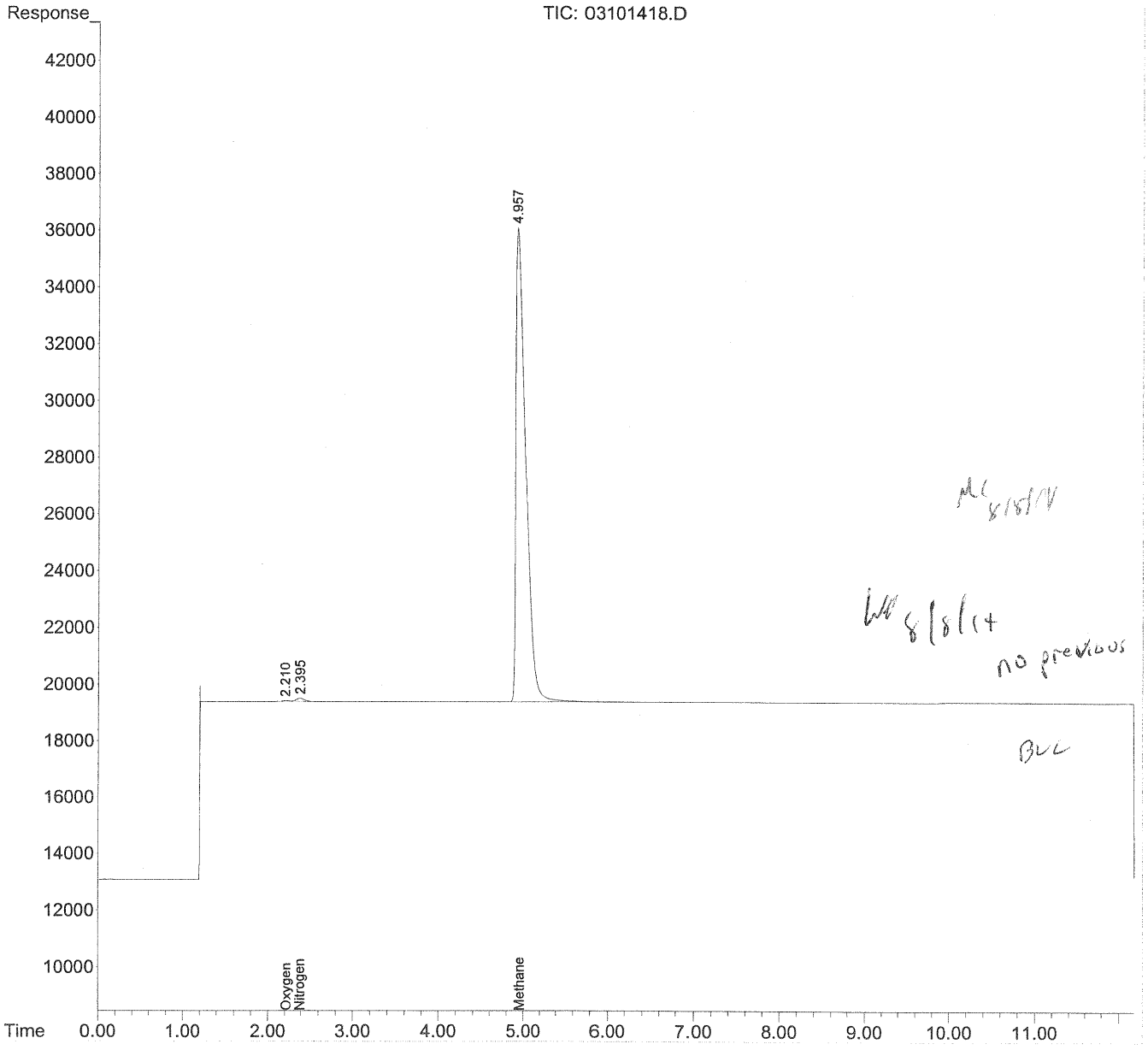
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



MC 8/8/14

WH 8/8/14

no previous

BLC

Quantitation Report (QT Reviewed)

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	

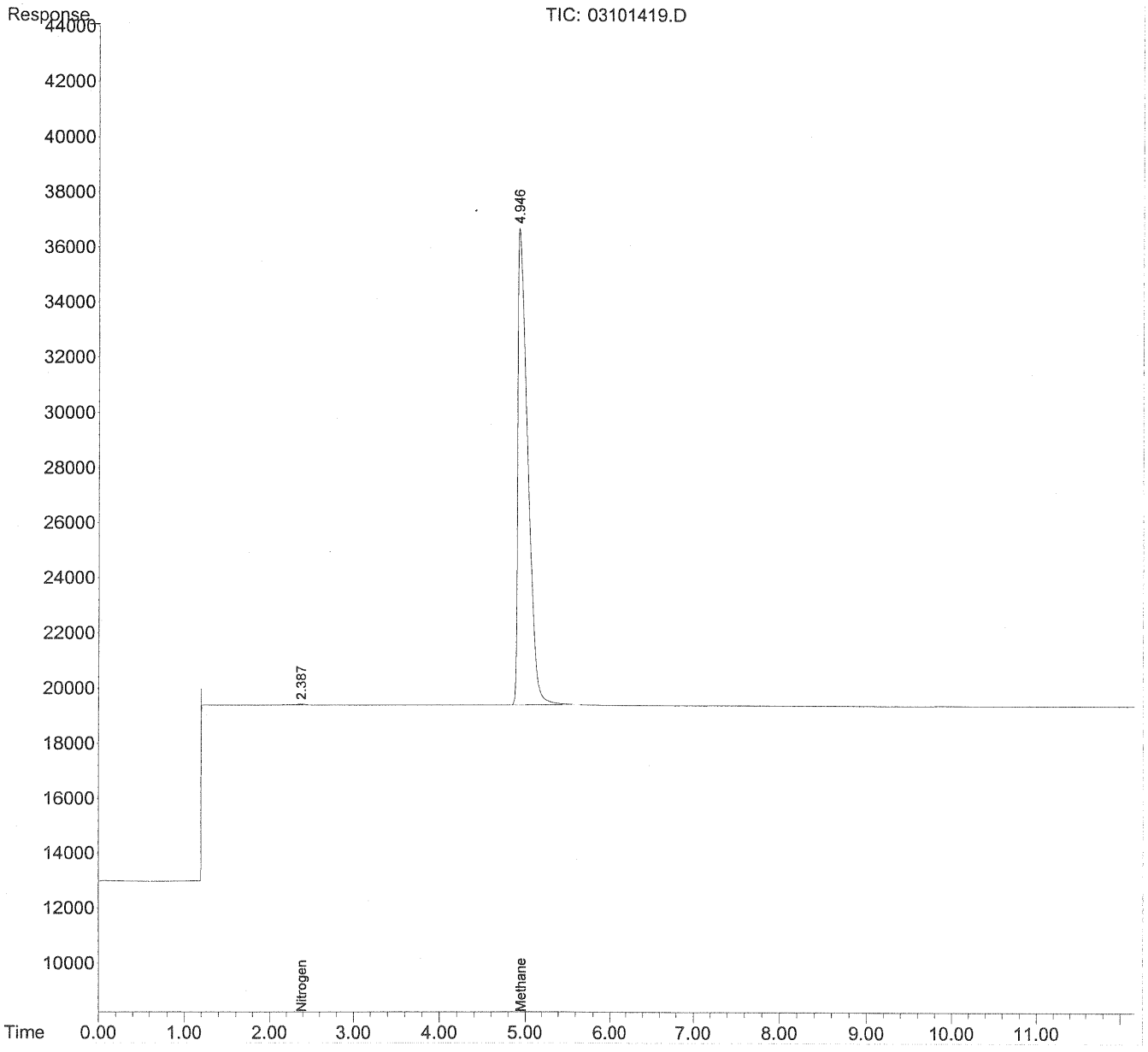
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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

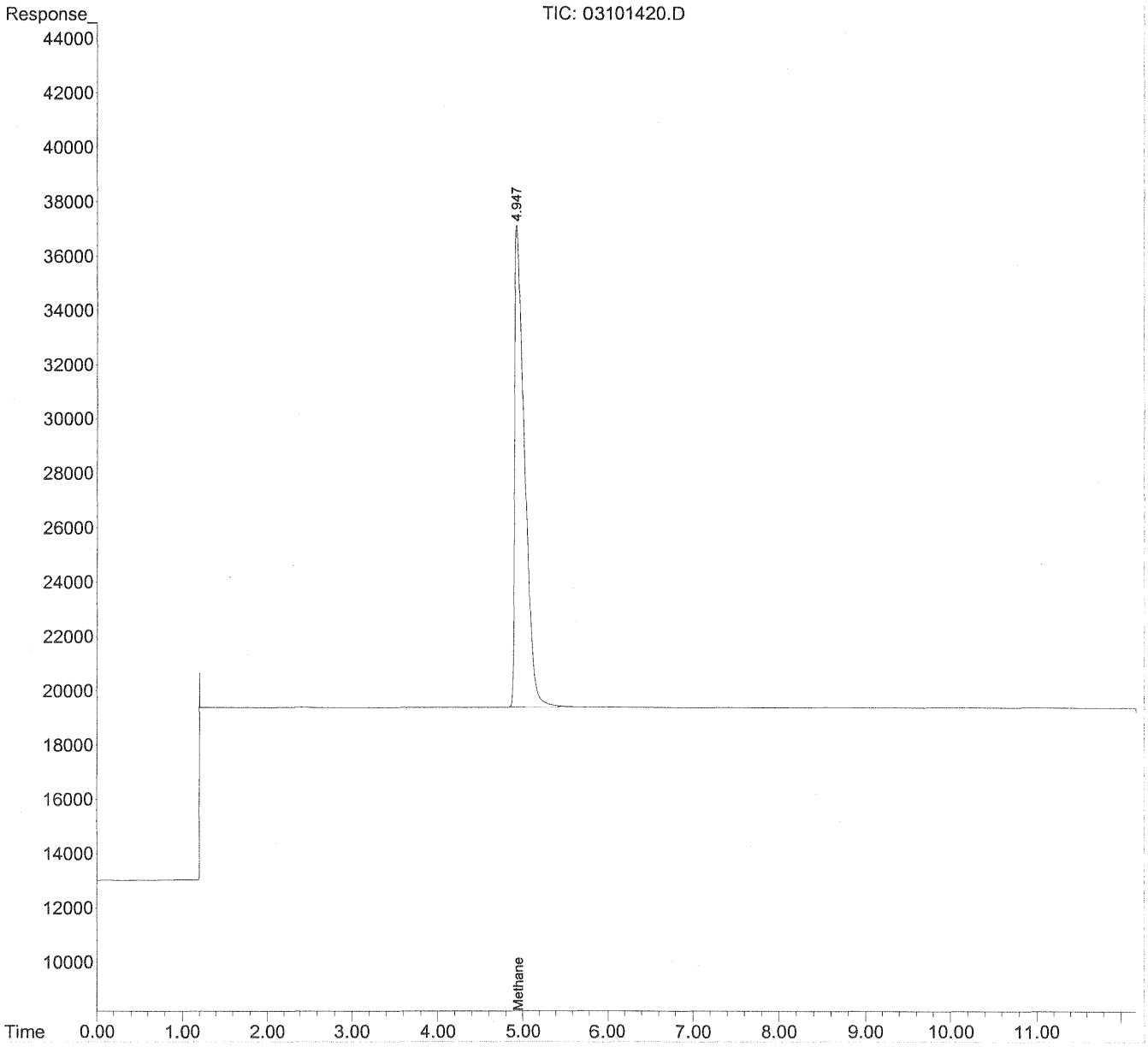
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

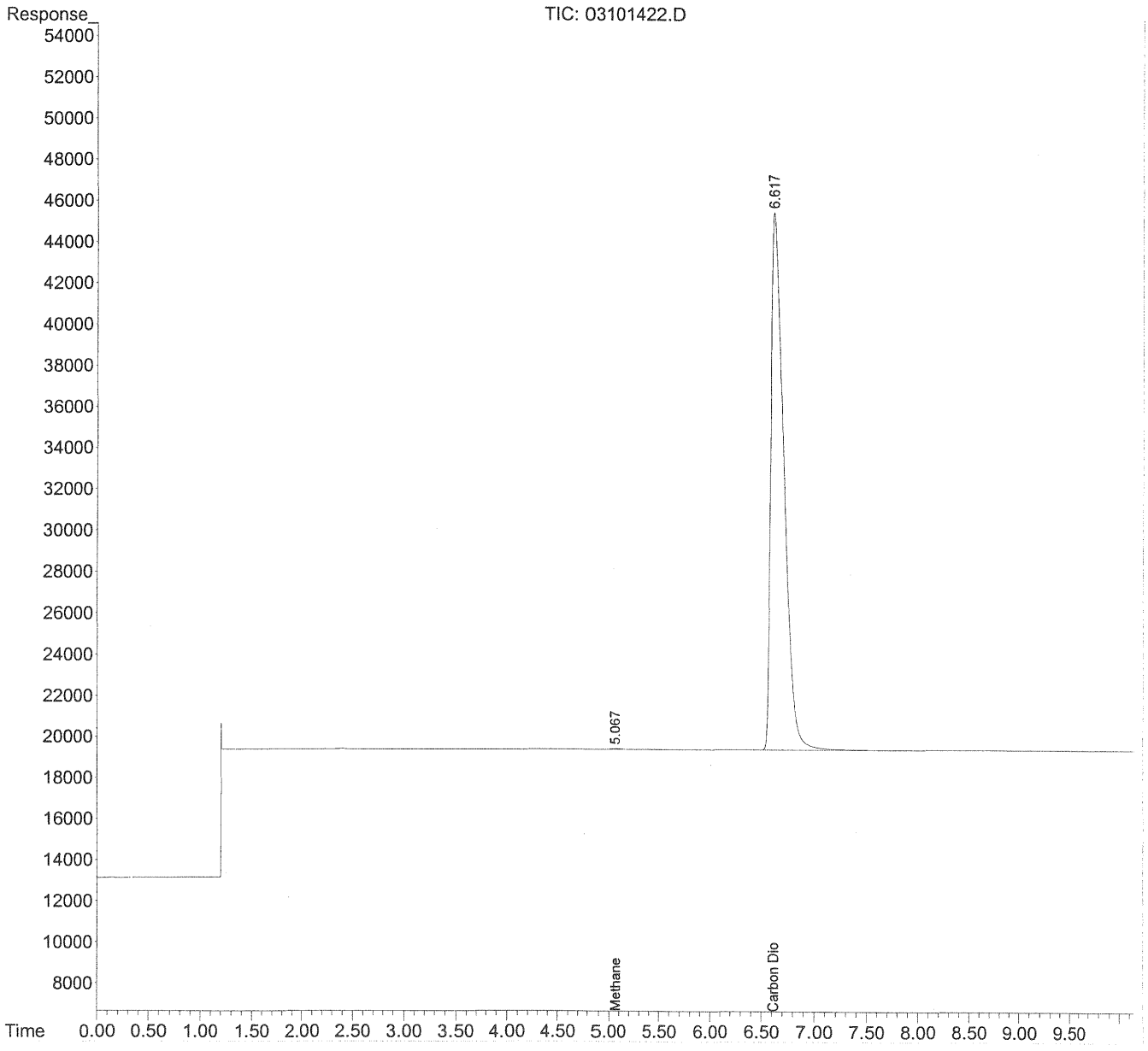
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	0.000	0	N.D.	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	4.949	1439175	1032160.623	ppm
6)	Carbon Dioxide	0.000	0	N.D.	ppm

(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 :



Quantitation Report (QT Reviewed)

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

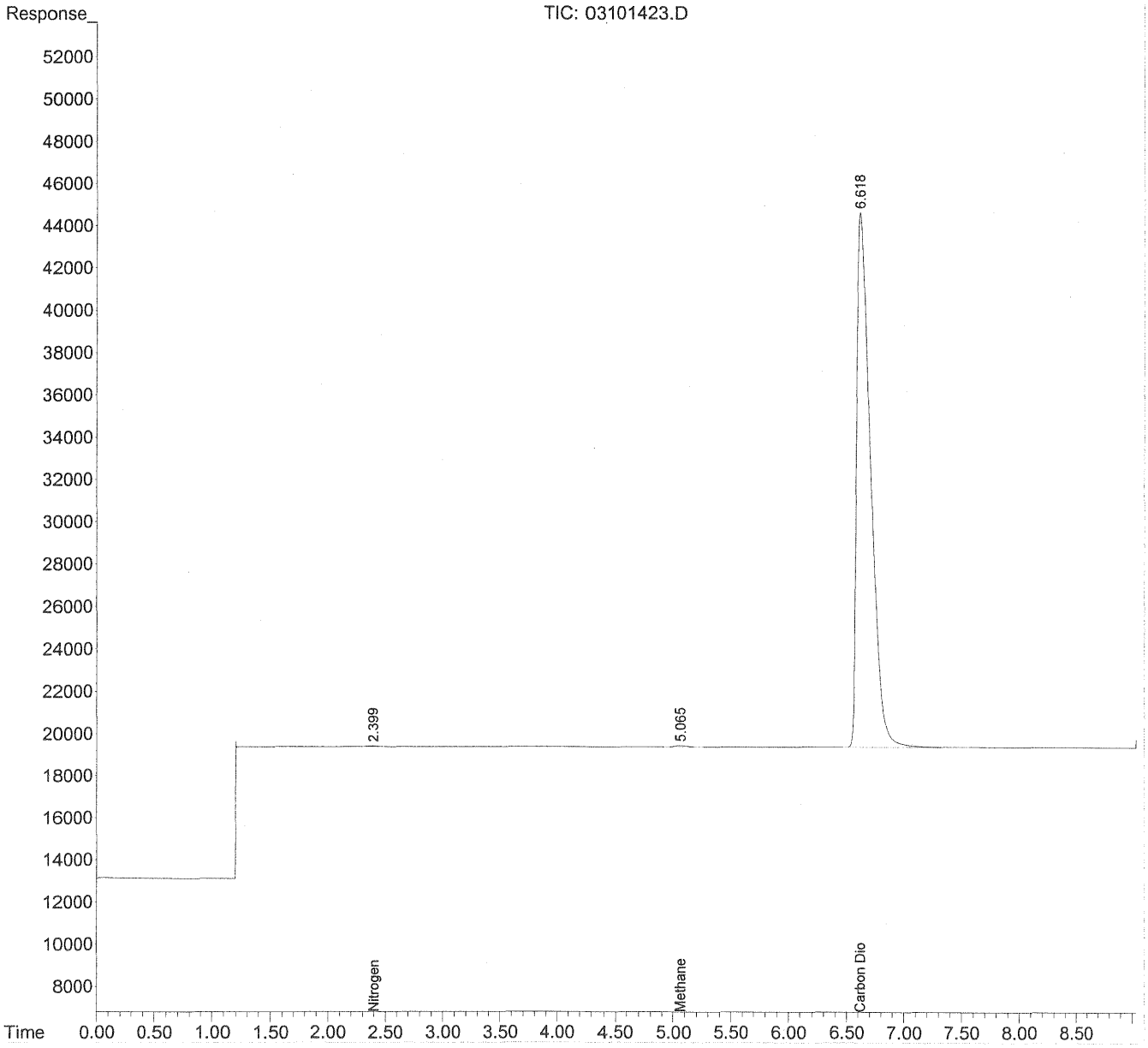
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

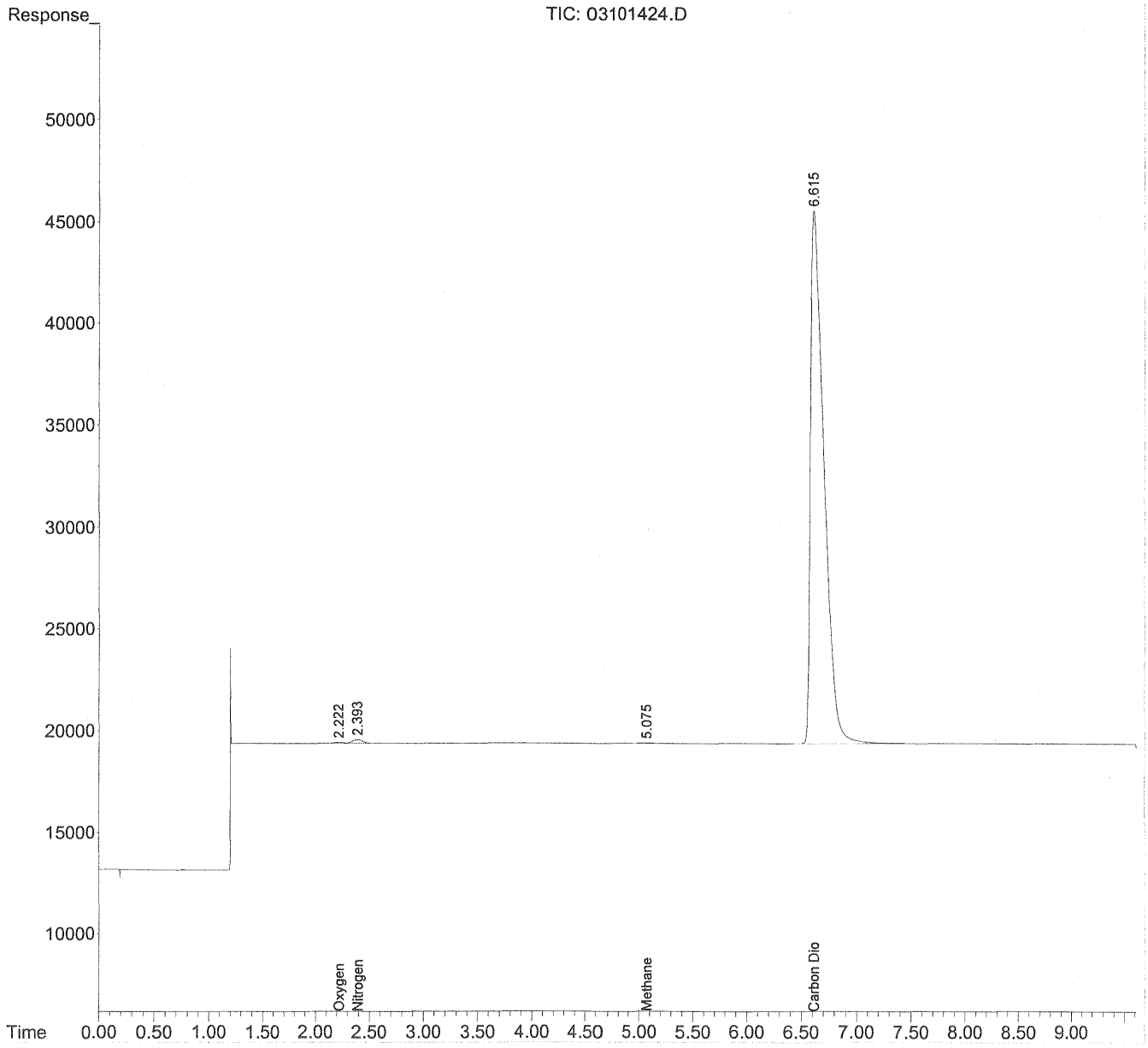
	Compound	R.T.	Response	Conc	Units
Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm
3)	Nitrogen	2.401	2050	1065.315	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	5.069	4323	3097.155	ppm
6)	Carbon Dioxide	6.619	2111383	983659.786	ppm

(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 :



Quantitation Report (QT Reviewed)

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

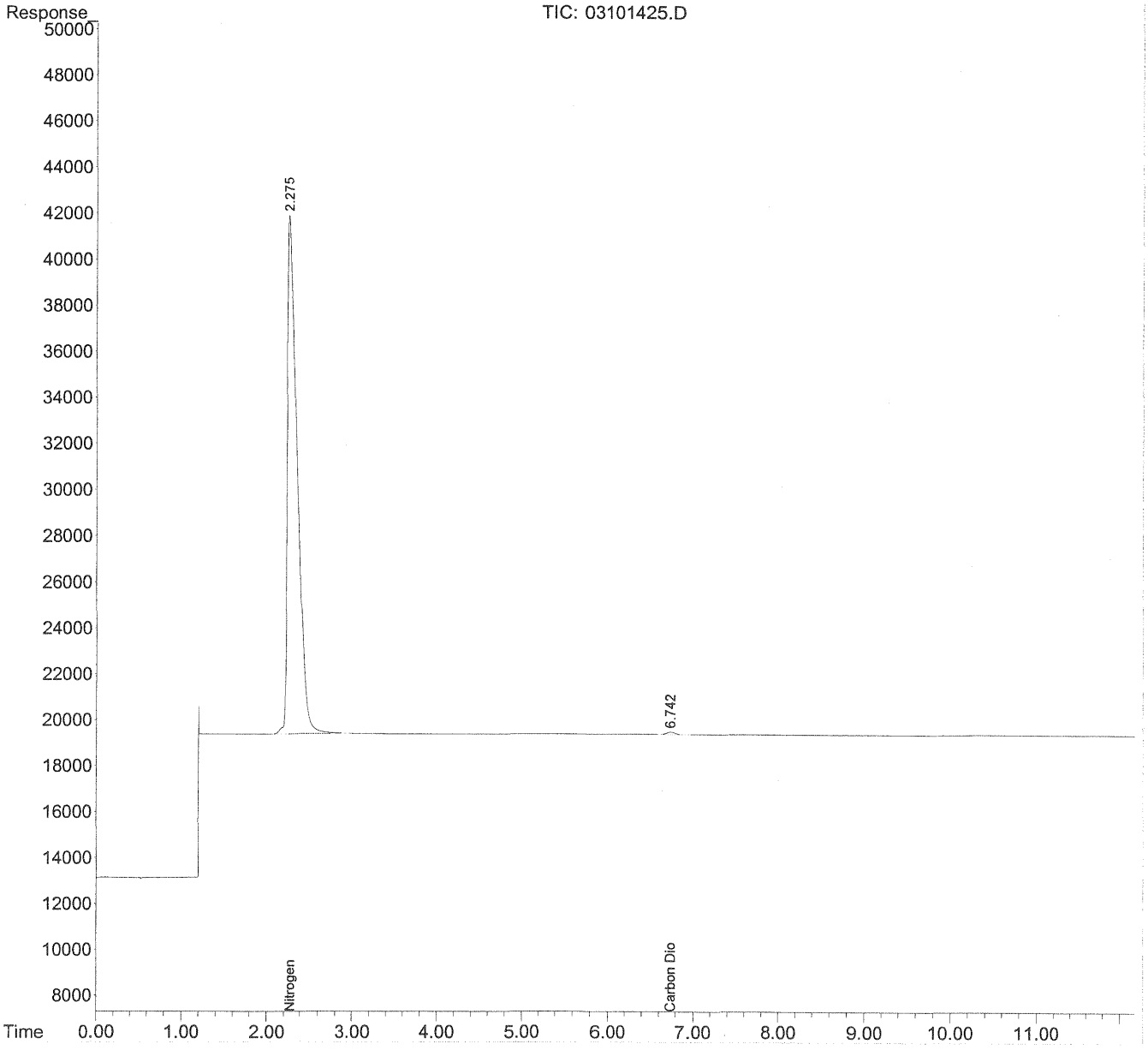
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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	

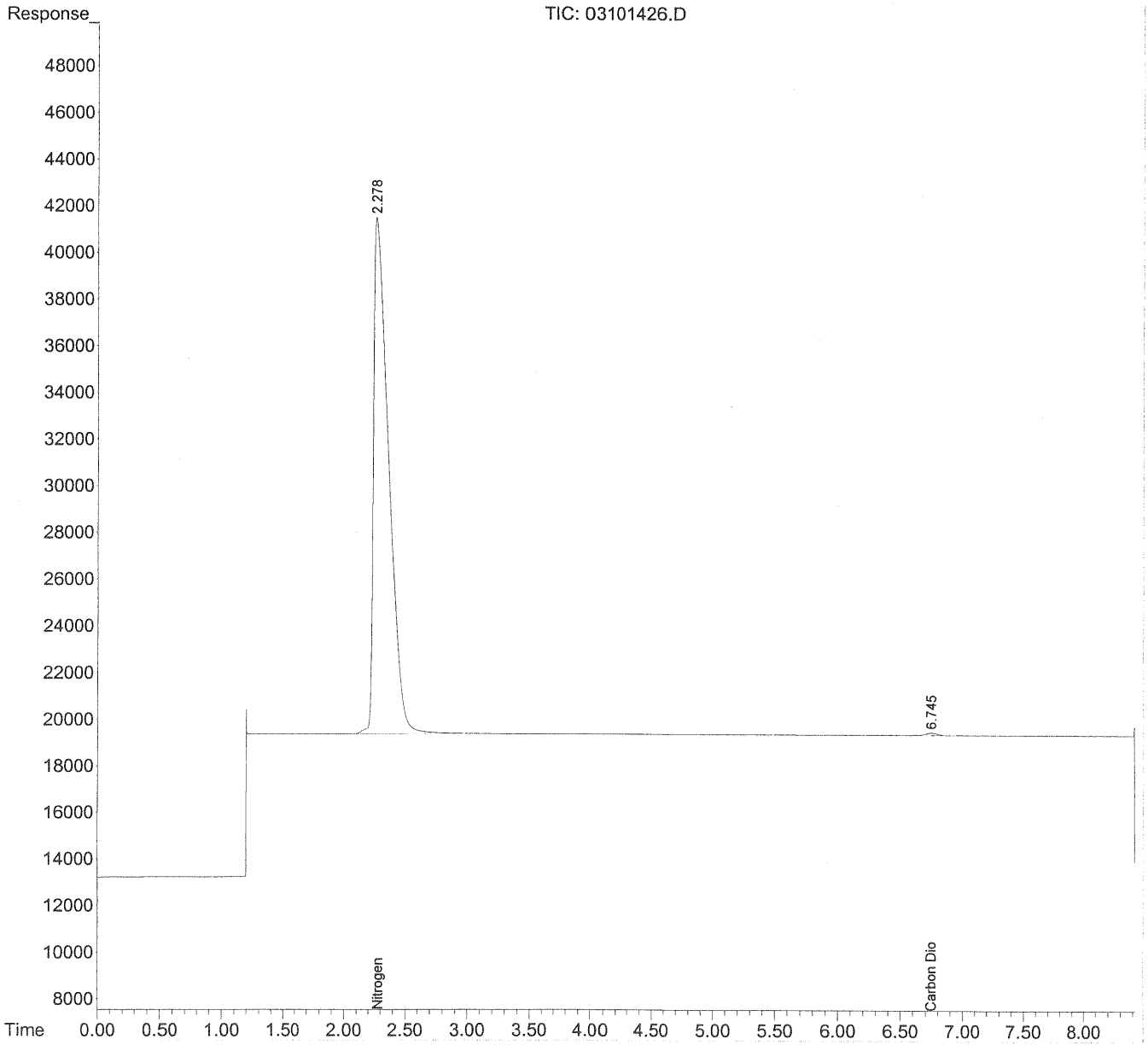
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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 :

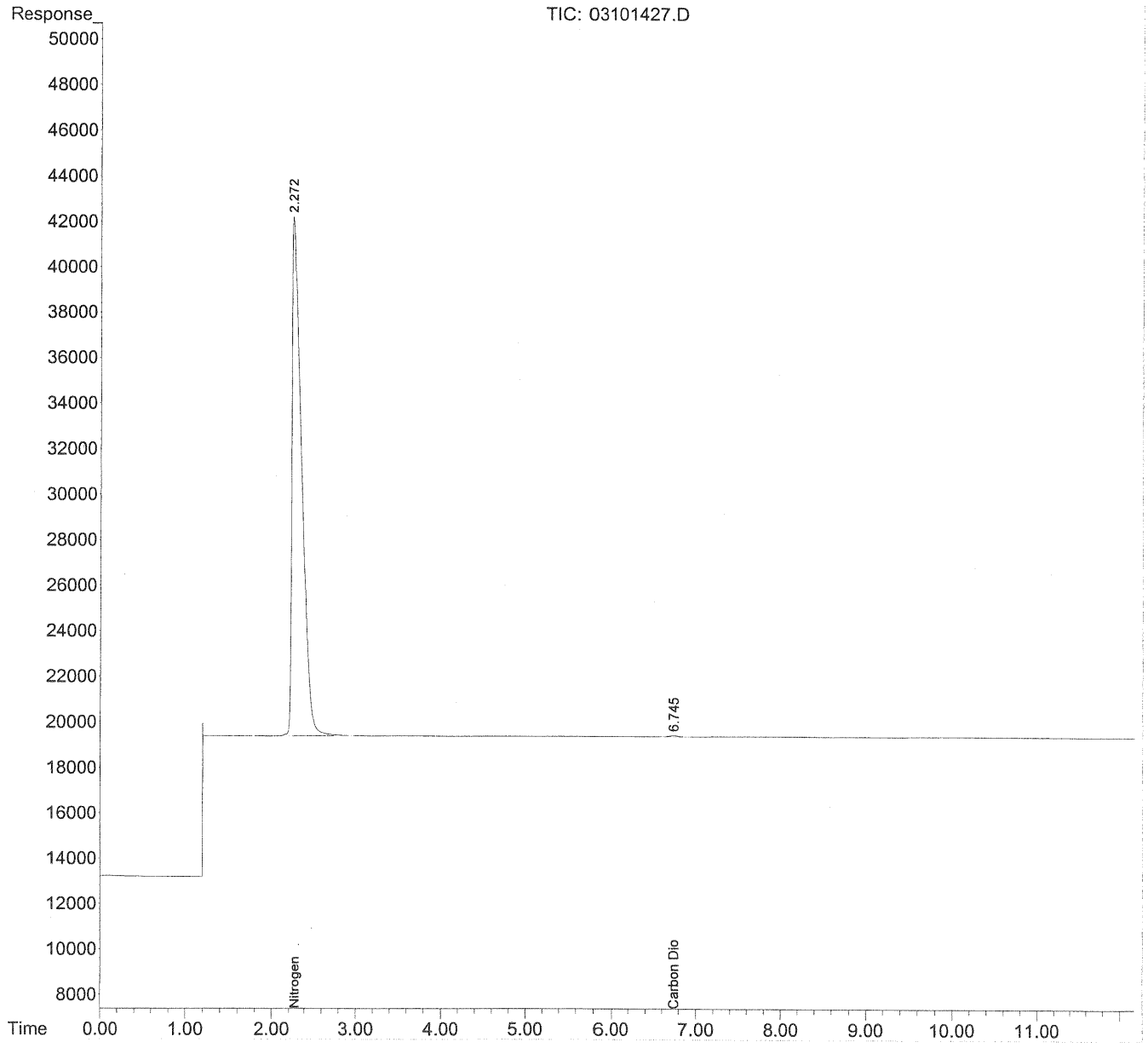
	Compound	R.T.	Response	Conc	Units	
Target Compounds						
1)	Hydrogen	0.000	0	N.D.	ppm	
2)	Oxygen	0.000	0	N.D.	ppm	d
3)	Nitrogen	2.280	1857806	965604.527	ppm	
4)	Carbon Monoxide	0.000	0	N.D.	ppm	
5)	Methane	0.000	0	N.D.	ppm	
6)	Carbon Dioxide	6.748	7247	3368.284	ppm	

(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 :



Quantitation Report (QT Reviewed)

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	

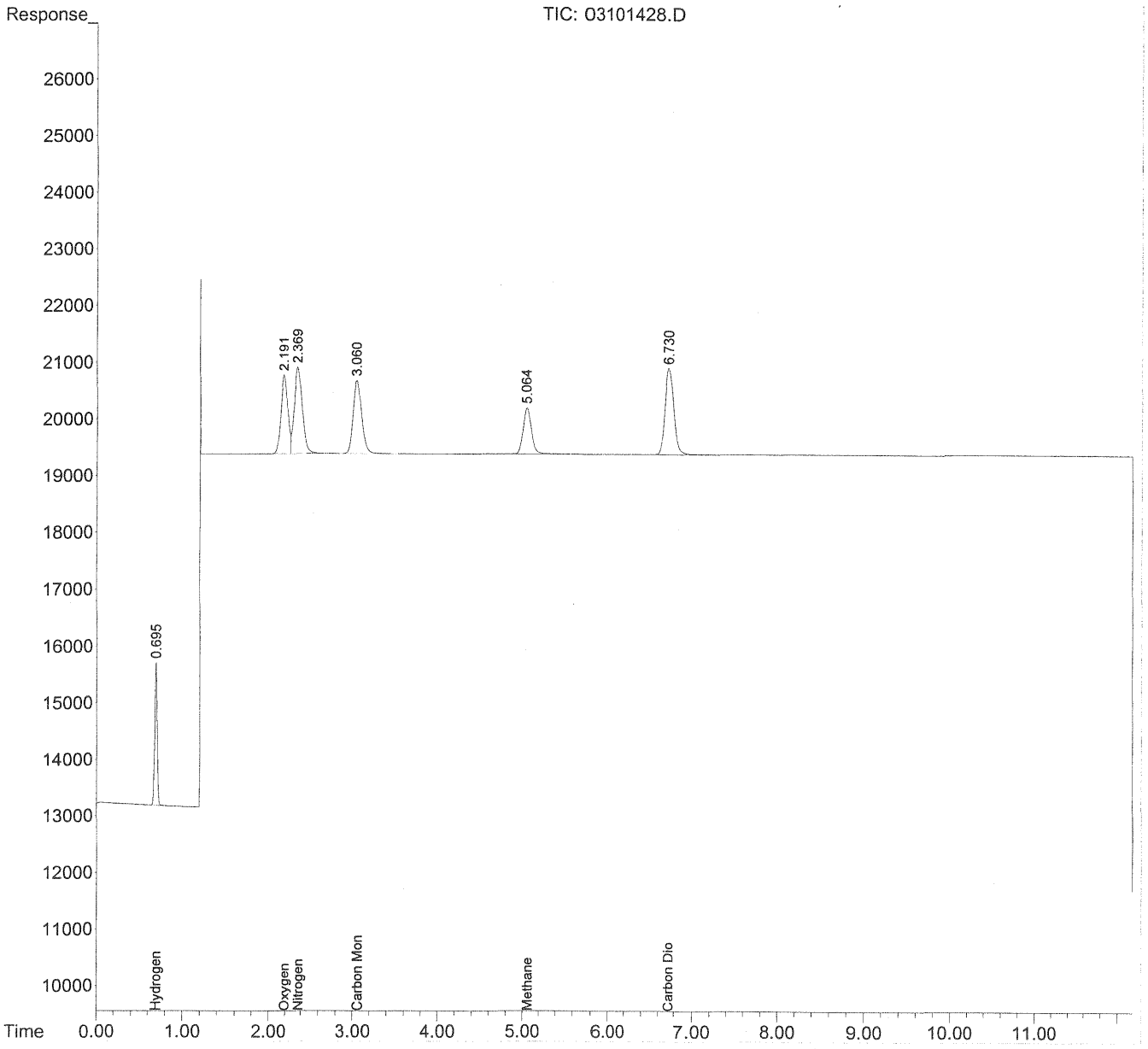
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

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 :



Quantitation Report (QT Reviewed)

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.

WH 8/8/14

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\2014_05\30

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	05301401.d	10.	std s30-04241401		30 May 2014 07:49
2	1	05301402.d	10.	mb		30 May 2014 08:07
3	1	05301403.d	10.	xlab air		30 May 2014 08:32
4	1	05301404.d	10.	2122-009		30 May 2014 08:49
5	1	05301405.d	10.	2122-009		30 May 2014 09:06
6	1	05301406.d	10.	2122-009		30 May 2014 09:25
7	1	05301407.d	10.	2122-011		30 May 2014 09:53
8	1	05301408.d	10.	2122-011		30 May 2014 10:10
9	1	05301409.d	10.	2122-011		30 May 2014 10:26
10	1	05301410.d	10.	2144-001		30 May 2014 10:45
11	1	05301411.d	10.	2144-002		30 May 2014 11:01
12	1	05301412.d	10.	xlcs		30 May 2014 11:21
13	1	05301413.d	10.	lcs s30-02051401		30 May 2014 11:57
14	1	05301414.d	10.	std s30-04241401		30 May 2014 12:15
15	1	05301415.d	10.	2149-001		30 May 2014 12:33
16	1	05301416.d	10.	2149-001		30 May 2014 12:51
17	1	05301417.d	10.	2149-001		30 May 2014 13:06
18	1	05301418.d	10.	2149-003		30 May 2014 13:24
19	1	05301419.d	10.	2149-003		30 May 2014 13:42
20	1	05301420.d	10.	2149-003		30 May 2014 13:58
21	1	05301421.d	10.	lab air		30 May 2014 14:14
22	1	05301422.d	10.	xstd		30 May 2014 14:51
23	1	05301423.d	10.	std s30-04241401		30 May 2014 15:08
24	1	05301424.d	10.	2149-005		30 May 2014 15:24
25	1	05301425.d	10.	2149-005		30 May 2014 15:41
26	1	05301426.d	10.	2149-005		30 May 2014 15:58
27	1	05301427.d	10.	2149-007		30 May 2014 16:15
28	1	05301428.d	10.	2149-007		30 May 2014 16:32
29	1	05301429.d	10.	2149-007		30 May 2014 16:49
30	1	05301430.d	10.	2149-009		30 May 2014 17:06
31	1	05301431.d	10.	2149-009		30 May 2014 17:22
32	1	05301432.d	10.	2149-009		30 May 2014 17:38
33	1	05301433.d	10.	xstd		30 May 2014 17:56
34	1	05301434.d	10.	std s30-04241401		30 May 2014 18:15

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 2 5 2015

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

MEMORANDUM

To: Edward Messina, Director
Monitoring, Assistance, and Media Programs Division

Through: Julius Banks, Chief
Air Branch

From: Marcia B. Mia
Air Branch

Subject: Performance Testing for Enclosed Combustion Control Devices – Manufacturer's Performance Test under New Source Performance Standards for Crude Oil and Natural Gas Production, Transmission and Distribution (NSPS OOOO) and National Emissions Standards for Hazardous Air Pollutant (NESHAP) for Oil and Natural Gas Production (MACT HH) and NESHAP for Natural Gas Transmission and Storage (MACT HHH)

Recommendation for Posting – Big Iron Oilfield Services "BNECU-PI-48" Enclosed Combustor

I have completed the review of the manufacturer performance test submitted by Big Iron Oilfield Services on July 28, 2014, for the "BNECU PI-48" and recommend it for posting to the EPA Oil and Gas page at: http://www.epa.gov/airquality/oilandgas/.

According to NSPS OOOO, owners or operators of centrifugal compressors are exempt from the requirement to conduct performance tests and design evaluations (§60.5413(a)(7)) if they use a control device whose model can be demonstrated to meet the performance requirements for centrifugal compressors at §60.5412(a), through a performance test conducted by the manufacturer. According to §60.5413(a)(7), the performance requirements for centrifugal compressors are demonstrated using the provisions specified in §60.5413(d).

In addition, under NSPS OOOO, owners or operators of storage vessels may meet the emissions reduction standard in §60.5395(d) by installing a control device model that is tested under §60.5413(d) and meets the criteria of §60.5413(d)(11) and §60.5413(e).

MACT HH and MACT HHH also provide for the use of manufacturer tested control devices. Section 63.772(e) (MACT HH) states that "[a]s an alternative to conducting a performance test under this section for combustion control devices, a control device that can be demonstrated to meet the performance requirements of §63.771(d)(1), (e)(3)(ii) or (f)(1) through a performance test conducted by the manufacturer, as specified in paragraph (h) of this section, can be used." MACT HHH has conforming cites at §63.1282(d) (alternative to conducting a performance test), §63.1281(d)(1), (e)(3)(ii), or (f)(1) (performance requirements), and §63.1282(g) (demonstration specifications).

Using the demonstration specifications at §60.5413(d), §63.772(h) and §63.1282(g), the attached checklist was created. The performance test, referenced above, was evaluated against this checklist. The results of this review and the supporting documents which form the basis of this recommendation are attached.

The review was coordinated with the Office of Air Quality Planning and Standards. I recommend that you concur, by signing below. If you have any questions, please contact me at mia.marcia@epa.gov or 202-564-7042.

Edward J. Messina 3/25/15

Concur/Signature

NonConcur/Signature

Attachments (11)

Cc (without attachments):
Amy Branning, OGC
Steffan Johnson, OAQPS
Bruce Moore, OAQPS
Chris Franz, OAQPS
Alison Davis, OAQPS

Index of Attachments

Tab 1: External Document: "Stack Emissions Study 40 CFR Part 60 Subpart OOOO for the Enclosed Combustor Unit, BNECU-PI 48 (File Name: stk-14-elmorecity.ok-comp#1-PI48-Report-V2.1.pdf)

Tab 2: EPA Word Document: "NSPS Subpart OOOO/NESHAP HH/HHH Enclosed Combustor Manufacturer Performance Test Administrative Checklist
Enclosed Combustor Make/Model: BNECU PI-48 Combustor" File Name: Administrative Checklist BNECU48.docx)

Tab 3: External Documents:

1. Big Iron Oilfield Cover Letter, Undated (File Name: Big Iron Oilfield Cover Letter-PI 48.pdf)
2. Laboratory Report – Amended, dated 11/24/2014[1] (File Name: BNECU-PI36-Data Validation.pdf)
3. Affidavit Me 22 Time Stamp, dated 11/26/2014 (File Name: Affidavit-Picture time stamp-BNECU-STK.pdf)
4. Date/Time Stamp Corrected Photos (12) (File: pi48-m22pic-timestampscorrection.pdf)
5. Gatekeeper Ignition System (File Name: UPDATED GATEKEEPER CUT SHEET.pdf)
6. Affidavits, dated 01/12/2015 (File Name: STK-BNECU PI-48 & PI-36 Discrepancy Affidavit.pdf)
7. Corrected Time Stamp Me 22 (File Name: Pages from pi48-m22-time stamp correction.pdf)
8. Data Validation Revised Laboratory Report, dated 01/08/2015 (File Name: Data Validation-RevisedPackage-PI402149AR.pdf)

Tab 4: Email: Derek Moore to Marcia Mia, dated 01/14/2015, with attachments (File Name: RE FW Final Report of stk-14-elmorecity#1.msg)

[1] Amends Stack Test to include all instrument raw data and is 314 pages total. Raw data sheets not printed but included in electronic record.

Tab 2

NSPS Subpart OOOO/NESHAP HH/HHH Enclosed Combustor Manufacturer Performance Test Administrative Checklist

Enclosed Combustor Make/Model: Big Iron Oilfield BNECU PI-48 Combustor

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
1. 4 conditions tested - Three 1 hr. (or longer) test runs at each setting.	§60.5413(d)(2); §63.772(h)(2); §63.1282(g)(2)	Y	
a. Propene (propylene) gas must be used as testing fuel.	§60.5413(d)(2); §63.772(h)(2); §63.1282(g)(2)	Y	
b. All fuel analyses must be performed by an independent third-party laboratory (not affiliated with the control device manufacturer or fuel supplier).	§60.5413(d)(2); §63.772(h)(2); §63.1282(g)(2)	Y	
c. 90-100% max	§60.5413(d)(2)(i); §63.772(h)(2)(i); §63.1282(g)(2)(i)	Y	
d. 70-100-70 ramp up/down	§60.5413(d)(2)(ii); §63.772(h)(2)(ii); §63.1282(g)(2)(ii)	Y	
e. 30-70-30 ramp up/down	§60.5413(d)(2)(iii); §63.772(h)(2)(iii); §63.1282(g)(2)(iii)	Y	
f. 0-30-0 ramp up /down	§60.5413(d)(2)(iv); §63.772(h)(2)(iv); §63.1282(g)(2)(iv)	Y	
2. Multiple enclosures must be tested simultaneously and with all burners operational. Results must be reported for each enclosure individually and for the average of the emissions from all interconnected combustion enclosures/chambers.	§60.5413(d)(3); §63.772(h)(3); §63.1282(g)(3)	N/A	Unit has one burner.
3. Inlet fuel metering:	§60.5413(d)(4); §63.772(h)(4); §63.1282(g)(4)	Y	
a. Inlet gas flow metering system located according to Me 2A – must position the fitting for filling fuel sample containers a minimum of 8 diameters upstream of any inlet gas flow monitoring meter.	§60.5413(d)(4)(i); §63.772(h)(4)(i); §63.1282(g)(4)(i)	Y	

Administrative Checklist BNECU_48.docx

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
b. Calibrated meter	Referenced from Me 2A, Section 10.0	Y	
c. Record the start and stop reading for each 60-minute THC test.	§60.5413(d)(4)(ii); §63.772(h)(4)(ii); §63.1282(g)(4)(ii)	Y	
d. Temp/pressure compensated or recorded every 5 minutes	§60.5413(d)(4)(ii); §63.772(h)(4)(ii); §63.1282(g)(4)(ii)	Y	
4. Inlet fuel sampling and analysis:	§60.5413(d)(5); §63.772(h)(4)(iii); §63.1282(g)(4)(iii)	Y	
a. 4 samples, 1 for each condition	§60.5413(d)(5)(i)(B); §63.772(h)(4)(iii)(A)(2); §63.1282(g)(4)(iii)(A)(2)	Y	
b. Sampled for 3 hours	§60.5413(d)(5)(i); §63.772(h)(4)(iii)(A); §63.1282(g)(4)(iii)(A)	Y	
c. Sampled in accordance with (d)(5)(i)(A)-(C) (e.g., label each canister and record information on chain of custody).	§60.5413(d)(5)(i)(A)-(C); §63.772(h)(4)(iii)(A)(1-3); §63.1282(g)(4)(iii)(A)(1-3)		
d. Labs for hydrocarbons	§60.5413(d)(5)(ii)(A); §63.772(h)(4)(iii)(B)(1); §63.1282(g)(4)(iii)(B)(1)	Y	
e. Labs for fixed gases	§60.5413(d)(5)(ii)(B); §63.772(h)(4)(iii)(B)(2); §63.1282(g)(4)(iii)(B)(2)	Y	
f. Labs for Higher Heat Value (Btu)	§60.5413(d)(5)(ii)(C); §63.772(h)(4)(iii)(B)(3); §63.1282(g)(4)(iii)(B)(3)	Y	
5. Outlet testing:	§60.5413(d)(6)-(10); §63.772(h)(5)-(6); §63.1282(g)(5)-(6)	Y	
a. Location: 4 diameters downstream	§60.5413(d)(6)(i)(A); §63.772(h)(5)(i)(A); §63.1282(g)(5)(i)(A)	Y	

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
b. One diameter upstream	§60.5413(d)(6)(i)(A); §63.772(h)(5)(i)(A); §63.1282(g)(5)(i)(A)	Y	
c. Two sample ports	§60.5413(d)(6)(i)(A); §63.772(h)(5)(i)(A); §63.1282(g)(5)(i)(A)	Y	
d. Method 1 for flow traverse point location	§60.5413(d)(6)(i)(B); §63.772(h)(5)(i)(B); §63.1282(g)(5)(i)(B)	Y	
e. Method 2 for duct velocity	§60.5413(d)(6)(i)(B); §63.772(h)(5)(i)(B); §63.1282(g)(5)(i)(B)	Y	
f. Method 4 - Traverse both ports	§60.5413(d)(7)(ii); §63.772(h)(5)(ii)(B); §63.1282(g)(5)(ii)(B)	Y	
g. Method 3C - Integrated bag O2, CO2, N2, and CH4	§60.5413(d)(7)(i); §63.772(h)(5)(ii)(A); §63.1282(g)(5)(ii)(A)	Y	
h. Collect integrated Me 3C sample throughout entire test.	§60.5413(d)(7)(i)(A); §63.772(h)(5)(ii)(A)(1); §63.1282(g)(5)(ii)(A)(1)	Y	
i. Clearly label each bag and record information on a chain of custody form.	§60.5413(d)(7)(i)(B)	Y	
j. The GC-TCD calibration procedure in Me 3C must be modified using EPA Alt-045.	§60.5413(d)(7)(i)(D); §63.772(h)(5)(ii)(A)(4); §63.1282(g)(5)(ii)(A)(4)	Y	Lab Validation report submitted in addendum 12/05/2015 (File Name: BNECU_PI48 Data Validation.pdf). The standards in the calibration summary of the Lab Validation report do not match the standard indicated in the injection log. Revised

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
			data validation package submitted on 01/14/15 (File Name: Data Validation-RevisedPackage-P1402149.pdf)
k. Method 10 for CO and Method 25A for THC- 3 point traverse, simultaneous; 60 minute duration	§60.5413(d)(8), §60.5413(d)(9)(i-ii); §63.772(h)(5)(iii), §63.772(h)(6)(i)-(ii); §63.1282(g)(5)(iii), §63.1282(g)(6)(i)-(ii)	Y	
l. Protocol 1 calibration gas	§60.5413(d)(9)(iv); §63.772(h)(6)(iv); §63.1282(g)(6)(iv)	Y	
m. Method 22 VE - 12 color photos, one from each test run.	§60.5413(d)(10); §63.772(h)(5)(iv); §63.1282(g)(5)(iv)	Y	Affidavit and revised photos with time stamps provided in 12/05/14 submittal (File Name: Affidavit-Picture time stamp-BNECU-STK.pdf and pi48-m22-time stamp correction.pdf) Photo Times for Run #7 and #10 in revised photos above do not align with the Table A-1 for when the runs were conducted. Run times reconciled in 01/14/15 submittal (File name: STK-BNECU PI-48 & PI-36 Discrepancy Affidavit.pdf and pages from pi48-m22-timestamp correction.pdf)
n. Excess combustion air determined	§60.5413(d)(7)(iii); §63.772(h)(5)(v); §63.1282(g)(5)(iv)	Y	

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
o. CO corrected to 3% CO2	§60.5413(d)(11)(i)(C); §63.772(h)(7)(i)(C); §63.1282(g)(7)(i)(C)	Y	
p. THC, as propane, corrected to 3% CO2	§60.5413(d)(9)(v-vi); §63.772(h)(6)(v)-(vi); §63.1282(g)(6)(v)-(vi)	Y	
q. Subtraction of methane or ethane from THC data is not allowed	§60.5413(d)(9)(vii); §63.772(h)(6)(vii); §63.1282(g)(6)(vii)	Y	
6. Performance Test Criteria			
a. Method 22 – No VE	§60.5413(d)(11)(i)(A); §63.772(h)(7)(i)(A); §63.1282(g)(7)(i)(A)	Y	
b. Average Method 25A ≤ 10 ppmv at 3% CO2	§60.5413(d)(11)(i)(B); §63.772(h)(7)(i)(B); §63.1282(g)(7)(i)(B)	Y	
c. Average Method 10 for CO ≤ 10 ppmv at 3% CO2	§60.5413(d)(11)(i)(C); §63.772(h)(7)(i)(C); §63.1282(g)(7)(i)(C)	Y	
d. Excess combustion air ≥150%	§60.5413(d)(11)(i)(D); §63.772(h)(7)(i)(D); §63.1282(g)(7)(i)(D)	Y	
e. Destruction efficiency 95% for regulated VOC	§60.5413(d)(11)(iii); §63.772(h)(7)(iii); §63.1282(g)(7)(iii)	Y	
7. To be included in test report:	§60.5413(d)(12); §63.772(h)(8); §63.1282(g)(8)	Y	
a. Name (or other identifier) of the model tested.	Implied in §60.5413(d)(12); §63.772(h)(8); §63.1282(g)(8)?	Y	
b. Schematic of control device including dimensions.	§60.5413(d)(12)(i); §63.772(h)(8)(i); §63.1282(g)(8)(i)	Y	
c. Maximum net heating value of the device.	§60.5413(d)(12)(ii); §63.772(h)(8)(ii); §63.1282(g)(8)(ii)	Y	

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
d. Fuel gas flow range, including max. allowable inlet gas flow.	§60.5413(d)(3), §60.5413(d)(11)(ii), §60.5413(d)(12)(iii) and (vi)(operating strip charts)); §63.772(h)(3), §63.772(h)(7)(ii), §63.772(h)(8)(iii) and (vi); §63.1282(g)(3), §63.1282(g)(7)(ii), §63.1282(g)(8)(iii) and (vi)	Y	
e. Air/steam injection/assist ranges, if used. (Optional)	§60.5413(d)(12)(iv); §63.772(h)(8)(iv); §63.1282(g)(8)(iv)	N/A	
f. Fuel gas delivery pressure and temperature.	§60.5413(d)(3), §60.5413(d)(12)(v)(A), §60.5413(d)(12)(vi)(strip charts); §63.772(h)(3), §63.772(h)(8)(v)(A), §63.772(h)(8)(vi); §63.1282(g)(3), §63.1282(g)(8)(v)(A), §63.1282(g)(8)(vi)	Y	
g. Fuel gas moisture range. (Optional)	§60.5413(d)(12)(v)(B); §63.772(h)(8)(v)(B); §63.1282(g)(8)(v)(B)	Y	Not provided, but optional
h. Purge gas usage. (Optional)	§60.5413(d)(12)(v)(C); §63.772(h)(8)(v)(C); §63.1282(g)(8)(v)(C)	Y	Not provided, but optional
i. Condensate separation range. (Optional)	§60.5413(d)(12)(v)(D); §63.772(h)(8)(v)(D); §63.1282(g)(8)(v)(D)	Y	Not provided, but optional
j. Combustion zone temperature range.	§60.5413(d)(3), §60.5413(d)(12)(v)(E), §60.5413(d)(12)(vi)(strip charts); §63.772(h)(3), §63.772(h)(8)(v)(E), §63.772(h)(8)(vi); §63.1282(g)(3), §63.1282(g)(8)(v)(E), §63.1282(g)(8)(vi)	Y	
k. Excess combustion air range.	§60.5413(d)(12)(v)(F); §63.772(h)(8)(v)(F); §63.1282(g)(8)(v)(F)	Y	

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
l. Flame arrestor(s). (Optional)	§60.5413(d)(12)(v)(G); §63.772(h)(8)(v)(G); §63.1282(g)(8)(v)(G)	Y	Not provided, but optional
m. Burner manifold pressure. (Optional)	§60.5413(d)(12)(v)(H); §63.772(h)(8)(v)(H); §63.1282(g)(8)(v)(H)	Y	
n. Pilot flame indicator presence.	§60.5413(d)(12)(v)(I); §63.772(h)(8)(v)(I); §63.1282(g)(8)(v)(I)	Y	Description of pilot monitoring system included in 12/05/14 addendum (File Name: Updated Gatekeeper Cut Sheet.pdf)
o. Pilot flame design fuel and calculated/measured pilot fuel usage during test. (Required - but okay if none burned during test)	§60.5413(d)(12)(v)(J); §63.772(h)(8)(v)(J); §63.1282(g)(8)(v)(J)	Y	
p. Burner tip velocity range. (Optional)	§60.5413(d)(12)(v)(K); §63.772(h)(8)(v)(K); §63.1282(g)(8)(v)(K)	Y	Not provided, but optional
q. Momentum flux ratio. (Optional)	§60.5413(d)(12)(v)(L); §63.772(h)(8)(v)(L); §63.1282(g)(8)(v)(L)	Y	Not provided, but optional
r. Exit temperature range. (From Method 1-4 data)	§60.5413(d)(12)(v)(M); §63.772(h)(8)(v)(M); §63.1282(g)(8)(v)(M)	Y	
s. Exit flow rate	§60.5413(d)(12)(v)(N); §63.772(h)(8)(v)(N); §63.1282(g)(8)(v)(N)	Y	
t. Wind velocity and direction.	§60.5413(d)(12)(v)(O); §63.772(h)(8)(v)(O); §63.1282(g)(8)(v)(O)	Y	
u. Calibration and QA data (Required)	§60.5413(d)(12)(vi); §63.772(h)(8)(vi); §63.1282(g)(8)(vi)	Y	See 5.j. above
v. Strip charts. Gas cylinder certifications. (Required)	§60.5413(d)(3)(operating parameters, THC and CO), §60.5413(d)(12)(vi); §63.772(h)(3),	Y	

Manufacturer Testing/Reporting Element	Rule Cite	Meets criterion	Comments
	§63.772(h)(8)(vi); §63.1282(g)(3), §63.1282(g)(8)(vi)		
w. Field test data sheets.	Referenced from EPA Quality assurance guidance[1]	Y	
x. Lab report w/lab data and QA.	§60.5413(d)(5)(ii), §60.5413(d)(12)(vi); §63.772(h)(4)(iii)(B), §63.772(h)(8)(vi); §63.1282(g)(4)(iii)(B), §63.1282(g)(8)(vi)	Y	See 5.j. above

[1] U.S. EPA, *Quality Assurance Handbook for Air Pollution Measurement Systems* (EPA/600/R-94/038c, September 1994). Accessed from http://www.epa.gov/ttnemc01/qahandbook3/qaiii%201994/qa%20vol%20iii%20-%20sept%201994%20pt1.pdf on 3/7/2014.

Tab 3

BNECU-P148-DataValidation.pdf

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

November 24, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402149 has been amended for the samples submitted to our laboratory on May 30, 2014. The amended report includes all instrument raw data. The added pages have been indicated by the "Added Page" footer located at the bottom right of the page.

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

Kelly Horiuchi
By Kelly Horiuchi at 9:18 am, Nov 24, 2014

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

November 24, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402122 has been amended for the samples submitted to our laboratory on May 29, 2014. The amended report includes all instrument raw data. The added pages have been indicated by the "Added Page" footer located at the bottom right of the page.

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

Kelly Horiuchi
By Kelly Horiuchi at 1:24 pm, Nov 24, 2014

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

November 24, 2014

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

RE: stk-14-almorectly ik comp#1

Dear Mr.:

Your report number R1402122 has been amended for the samples submitted to our laboratory on May 29, 2014. The amended report includes all instrument raw data. The added pages have been indicated by the "Added Page" footer located at the bottom right of the page.

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

Kelly Hanson
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

November 24, 2014

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402149 has been amended for the samples submitted to our laboratory on May 30, 2014. The amended report includes all instrument raw data. The added pages have been indicated by the "Added Page" footer located at the bottom right of the page.

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

Kelly Horiuchi
By Kelly Horiuchi at 9:18 am, Nov 24, 2014

Kelly Horiuchi
Laboratory Director

Affidavit-Picture time stamp - BNECU-STK.pdf

November 26, 2014

To whom it may concern,

I Ashwin Ravi was the person who had conducted the M22 visual emission testing. I have recorded the time when I took the picture in the data sheet.

For BNECU-PI36
Run1: 5/29/14 09:18; Run2: 5/29/14 10:45; Run3: 5/29/14 12:10; Run4: 5/29/14 13:46; Run5: 5/29/14 15:11; Run6: 5/29/14 16:35; Run7: 5/29/14 18:08; Run8: 5/30/14 08:49; Run9: 5/30/14 10:14; Run10: 5/30/14 11:45; Run11: 5/30/14 13:10; Run12: 5/30/14 14:35

For BNECU-PI48
Run1: 5/27/14 10:02; Run2: 5/27/14 12:03; Run3: 5/27/14 13:30; Run4: 5/28/14 08:02; Run5: 5/28/14 09:30; Run6: 5/28/14 10:55; Run7: 5/28/14 11:49; Run8 5/28/14 14:15; Run9: 5/28/14 15:40; Run10: 5/28/14 16:26; Run11: 5/28/14 18:40; Run12: 5/28/14 20:05

Ashwin Ravi, QSTI
Project Manager
Air Hygiene Inc.
aravi@airhygiene.com
Cell: (918) 829-9838
Office: (918) 307-8865

pi48-m22-timestamp correction.pdf

Run 1



5/27/14 10:02

Run 2



5/27/14 12:03

Run 3



5/27/14 13:30

Run 4



5/28/14 08:02

Run5



5/28/14 09:30

Run 6



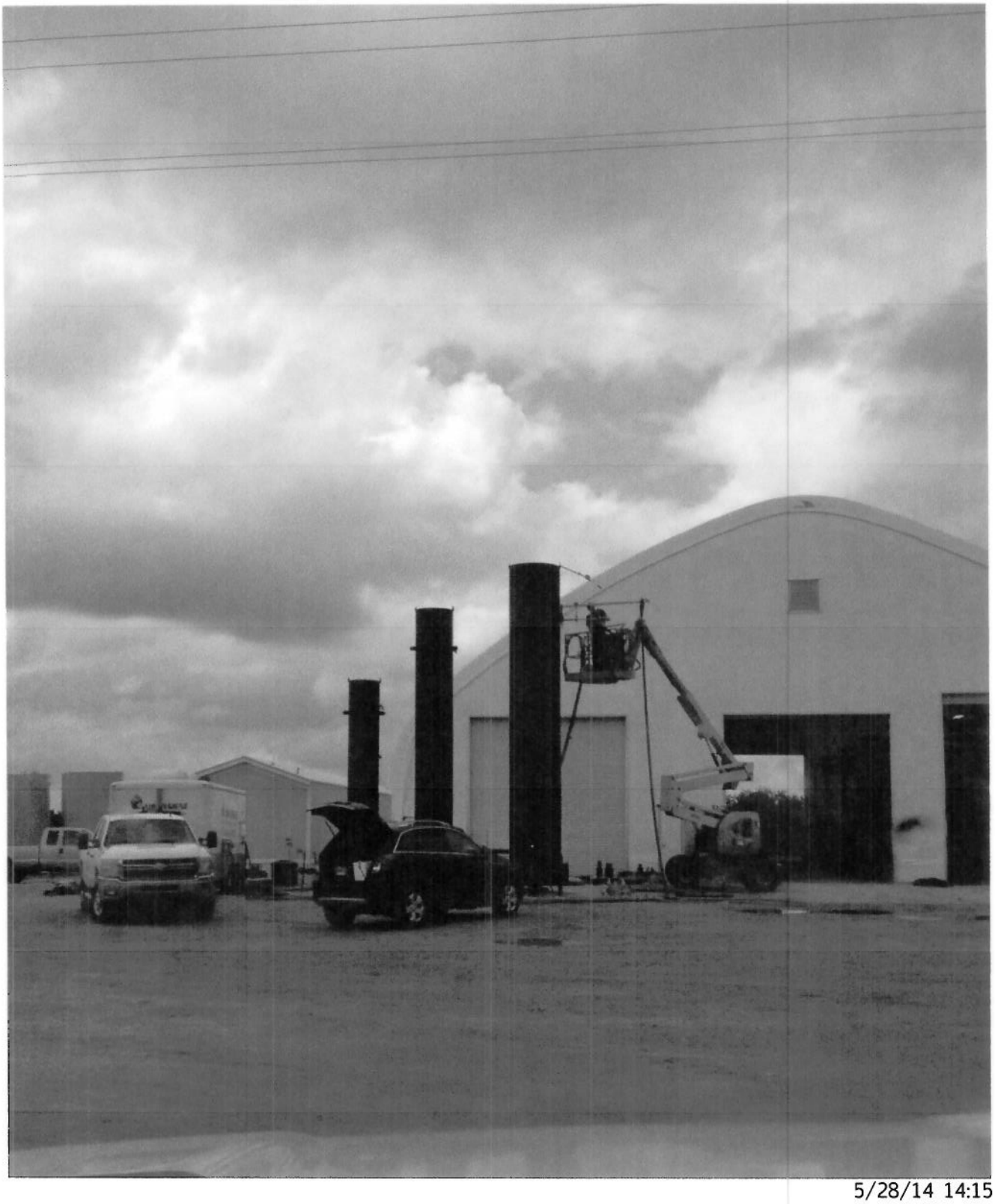
5/28/14 10:55

Run 7



5/28/14 11:49

Run 8



5/28/14 14:15

Run 9



5/28/14 15:40

Run 10



5/28/14 16:26

Run 11



5/28/14 18:40

Run 12



5/28/14 20:05

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD | Printed : 1/8/2015

CLIENT : Air Hygiene, Incorporated | Instrument : GC #1 / TCD #1

Analyst : NL | Date analyzed : 5/30/2014

PAI Job : P1402149 | Sample amount : 100uL

2149-005		139532	0.8%	739445	0.9%		47269	0.9%
2149-005 - 2		138870	0.3%	735434	0.3%		46990	0.3%
2149-005 - 3		136990	1.1%	724278	1.2%		46299	1.2%
2149-005 - Mean		138464		733052			46853	
2149-007		147079	0.6%	736225	0.7%		42103	1.0%
2149-007 - 2		145185	0.7%	725889	0.8%		41225	1.1%
2149-007 - 3		146379	0.1%	732269	0.1%		41682	0.0%
2149-007 - Mean		146214		731461			41670	
2149-009		138668	0.3%	735166	0.2%		47957	0.8%
2149-009 - 2		138054	0.1%	734232	0.1%		47573	0.1%
2149-009 - 3		138045	0.1%	731763	0.3%		47369	0.6%
2149-009 - Mean		138256		733720			47633	
STD S30-04241401	38383	40051		48922		50122	40105	49808
ACTUAL	39990	40030		50000		50010	39970	50040
% Difference	4.0%	0.1%		2.2%		0.2%	0.3%	0.5%

47 of 110

Revised Page

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

CLIENT : Air Hygiene, Incorporated

Analyst : NL

PAI Job : P1402149

Printed : 1/8/2015

Instrument : GC #1 / TCD #1

Date analyzed : 5/30/2014

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen		Nitrogen		Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-04241401	34993	36815		45673		45947	36728	45679	
ACTUAL	39990	40030		50000		50010	39970	50040	
% Difference	12.5%	8.0%		8.7%		8.1%	8.1%	8.7%	
Lab Air		201775		718396				349	
MB									
2149-001		130151	0.0%	689093	0.1%			44144	0.1%
2149-001 - 2		130125	0.0%	688009	0.1%			44178	0.0%
2149-001 - 3		130038	0.1%	688550	0.0%			44261	0.2%
2149-001 - Mean		130105		688551				44194	
2149-003		126199	0.4%	688572	0.4%			46837	0.3%
2149-003 - 2		125620	0.1%	685763	0.0%			46552	0.3%
2149-003 - 3		125387	0.3%	683554	0.4%			46709	0.0%
2149-003 - Mean		125735		685963				46699	

Revised Page

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

January 8, 2015

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

RE: Stk-14-elmorecity-k-comp#1

Dear Min:

Your report number P1402149 has been amended for the samples submitted to our laboratory on May 30, 2014. The revised report corrects the standard concentration number on the summary report. The revised pages have been indicated by the "Revised Page" footer located at the bottom right of the page.

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

Kelly Monuchi
Laboratory Director

DataValidation-RevisedPackage-P1402149AR.pdf

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

January 8, 2015

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402149 has been amended for the samples submitted to our laboratory on May 30, 2014. The revised report corrects the standard concentration number on the summary report. The revised pages have been indicated by the "Revised Page" footer located at the bottom right of the page.

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

Kelly Horiuchi
By Kelly Horiuchi at 5:17 pm, Jan 08, 2015

Kelly Horiuchi
Laboratory Director

Run 10



5/28/14 17:06

Pagesfrom p148-m22-timestamp correction.pdf

Run 7



5/28/14 12:49

Injection Log

Directory: I:\GC01\DATA\FXG\2014_05\30

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	05301401.d	10.	std s30-04241401		30 May 2014 07:49
2	1	05301402.d	10.	mb		30 May 2014 08:07
3	1	05301403.d	10.	xlab air		30 May 2014 08:32
4	1	05301404.d	10.	2122-009		30 May 2014 08:49
5	1	05301405.d	10.	2122-009		30 May 2014 09:06
6	1	05301406.d	10.	2122-009		30 May 2014 09:25
7	1	05301407.d	10.	2122-011		30 May 2014 09:53
8	1	05301408.d	10.	2122-011		30 May 2014 10:10
9	1	05301409.d	10.	2122-011		30 May 2014 10:26
10	1	05301410.d	10.	2144-001		30 May 2014 10:45
11	1	05301411.d	10.	2144-002		30 May 2014 11:01
12	1	05301412.d	10.	xlcs		30 May 2014 11:21
13	1	05301413.d	10.	lcs s30-02051401		30 May 2014 11:57
14	1	05301414.d	10.	std s30-04241401		30 May 2014 12:15
15	1	05301415.d	10.	2149-001		30 May 2014 12:33
16	1	05301416.d	10.	2149-001		30 May 2014 12:51
17	1	05301417.d	10.	2149-001		30 May 2014 13:06
18	1	05301418.d	10.	2149-003		30 May 2014 13:24
19	1	05301419.d	10.	2149-003		30 May 2014 13:42
20	1	05301420.d	10.	2149-003		30 May 2014 13:58
21	1	05301421.d	10.	lab air		30 May 2014 14:14
22	1	05301422.d	10.	xstd		30 May 2014 14:51
23	1	05301423.d	10.	std s30-04241401		30 May 2014 15:08
24	1	05301424.d	10.	2149-005		30 May 2014 15:24
25	1	05301425.d	10.	2149-005		30 May 2014 15:41
26	1	05301426.d	10.	2149-005		30 May 2014 15:58
27	1	05301427.d	10.	2149-007		30 May 2014 16:15
28	1	05301428.d	10.	2149-007		30 May 2014 16:32
29	1	05301429.d	10.	2149-007		30 May 2014 16:49
30	1	05301430.d	10.	2149-009		30 May 2014 17:06
31	1	05301431.d	10.	2149-009		30 May 2014 17:22
32	1	05301432.d	10.	2149-009		30 May 2014 17:38
33	1	05301433.d	10.	xstd		30 May 2014 17:56
34	1	05301434.d	10.	std s30-04241401		30 May 2014 18:15

20 Nov 2014 13:35

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

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

CLIENT : Air Hygiene, Incorporated

Analyst : NL

PAI Job : P1402149

Printed : 1/8/2015

Instrument : GC #1 / TCD #1

Date analyzed : 5/30/2014

Sample amount : 100uL

2149-005	139582	0.8%	739445	0.9%			47269	0.9%
2149-005 - 2	138870	0.3%	735784	0.3%			46990	0.3%
2149-005 - 3	136990	1.1%	724298	1.2%			46239	1.2%
2149-005 - Mean	138464		733032				46833	
2149-007	147029	0.6%	778225	0.7%			42403	1.0%
2149-007 - 2	145185	0.7%	770589	0.8%			41725	1.1%
2149-007 - 3	146879	0.1%	780269	0.1%			41982	0.0%
2149-007 - Mean	146364		776361				41670	
2149-009	138604	0.3%	738166	0.2%			46957	0.8%
2149-009 - 2	138036	0.1%	736350	0.1%			47571	0.1%
2149-009 - 3	138045	0.1%	736263	0.3%			47369	0.6%
2149-009 - Mean	138228		736926				47633	
STD S30-04241401	138384		738510		739224		50102	49105	49808
ACTUAL	39990		40030		50000		50010	39970	50040
% Difference	4.0%		0.1%		2.2%		0.2%	0.3%	0.5%

47 of 110

Revised Page

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

January 8, 2015

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

RE: stk-14-elmorecity.ik-comp#1

Dear Min:

Your report number P1402149 has been amended for the samples submitted to our laboratory on May 30, 2014. The revised report corrects the standard concentration number on the summary report. The revised pages have been indicated by the "Revised Page" footer located at the bottom right of the page.

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

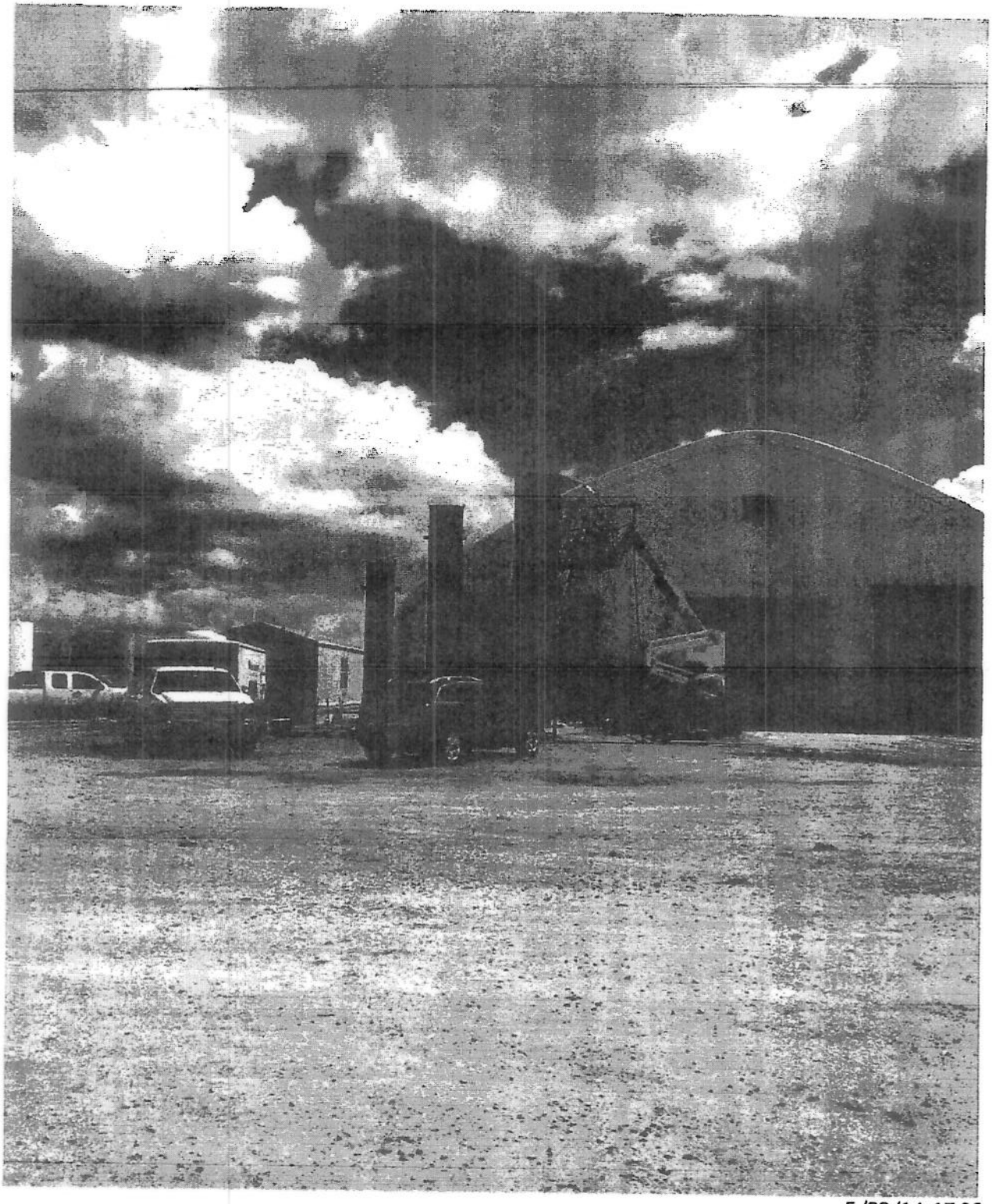
Respectfully submitted,

ALS | Environmental

Kelly Horiuchi
Laboratory Director

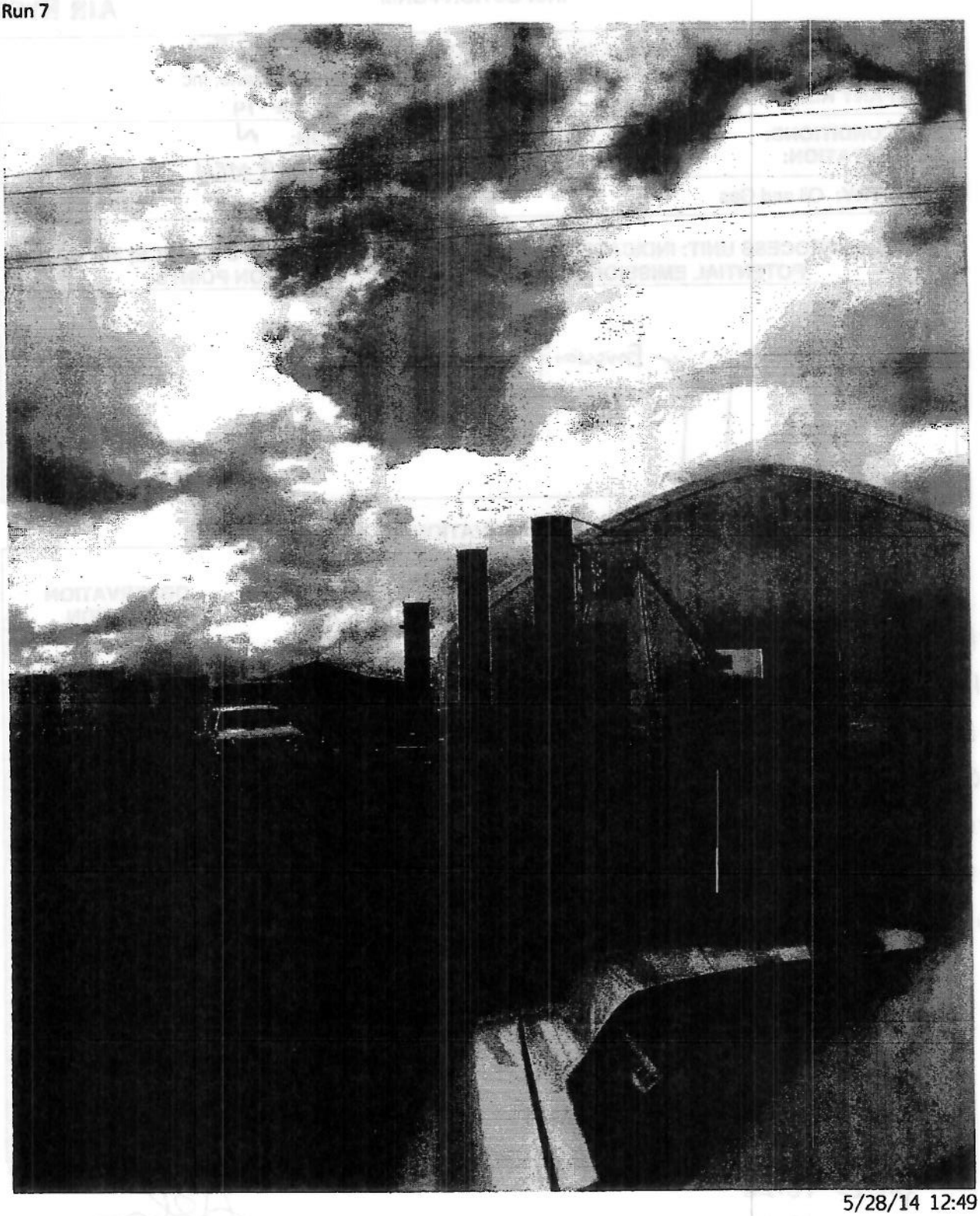
PI-36 and PI-48 Lab Data Validation Discrepancy

Run 10



5/28/14 17:06

Run 7



5/28/14 12:49

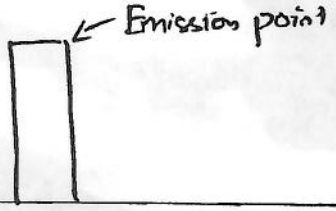
R10

AIR HYGIENE

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin Ram **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4 MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
16:01	20:00	00:00	north of plant
16:21	5:00 (break)	00:00	
16:26	20:00	00:00	
16:46	5:00 (break)	00:00	
16:51	20:00	00:00	
17:11			

16:41
17:01
17:06
17:26
17:31
17:51
AR 5/28/15

pic @ 16:26
17:06
AR 5/28/15

SIGNATURE

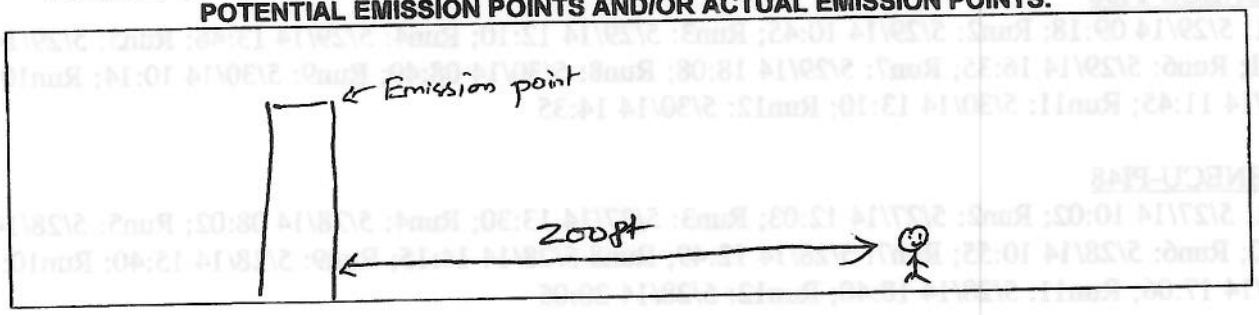
R7

AIR HYGIENE

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

COMPANY: Big Iron Oilfield Services, Inc **LOCATION:** Elmore City Product Facility **COMPANY REP:** Shawn Shattuck	**OBSERVER:** Ashwin **AFFILIATION:** Air Hygiene, Inc **DATE:** 5-28-14
SKY CONDITIONS: Cloudy **PRECIPITATION:** none	**WIND DIRECTION:** N **WIND SPEED:** 4MPH
INDUSTRY: Oil and Gas	**PROCESS UNIT:** PI 48

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



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURACTION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
11:24	20:00	00:00	north of flare
11:44	5:00 (break)	00:00	
11:49	20:00	00:00	
12:09	5:00 (break)	00:00	
12:14	20:00	00:00	
12:34			

12:24
12:44
12:49
13:09
13:14
13:34
AR 1/12/15

pic @ 11:49
12:49 AR 1/12/15

SIGNATURE

January 12, 2014

To whom it may concern,

I Ashwin Ravi was the person who had conducted the M22 visual emission testing. I have recorded the time when I took the picture in the data sheet.

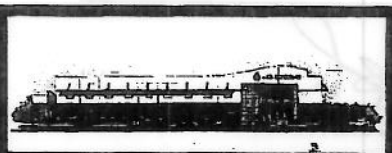
For BNECU-PI36

Run1: 5/29/14 09:18; Run2: 5/29/14 10:45; Run3: 5/29/14 12:10; Run4: 5/29/14 13:46; Run5: 5/29/14 15:11; Run6: 5/29/14 16:35; Run7: 5/29/14 18:08; Run8: 5/30/14 08:49; Run9: 5/30/14 10:14; Run10: 5/30/14 11:45; Run11: 5/30/14 13:10; Run12: 5/30/14 14:35

For BNECU-PI48

Run1: 5/27/14 10:02; Run2: 5/27/14 12:03; Run3: 5/27/14 13:30; Run4: 5/28/14 08:02; Run5: 5/28/14 09:30; Run6: 5/28/14 10:55; Run7: 5/28/14 12:49; Run8 5/28/14 14:15; Run9: 5/28/14 15:40; Run10: 5/28/14 17:06; Run11: 5/28/14 18:40; Run12: 5/28/14 20:05

Ashwin Ravi, QSTI
Project Manager
Air Hygiene Inc.
aravi@airhygiene.com
Cell: (918) 829-9838
Office: (918) 307-8865



January 12th, 2015

To whom it may concern,

BNECU-PI48

I have closely reviewed the VE data on report PI48 and discussed the issue with Mr. Min Sum Lee. I have discovered the discrepancy was caused by miscommunication. I affirm that the data is accurate, valid, and fit for the purpose of this report.

The Run7 VE test was indeed started from 12:24-13:34, but I recorded the time as 11:24-12:34. During testing I was in 2-way radio contact with Mr. Lee and started all runs at his verbal direction. I kept my time with a hand held stopwatch and noted the start time of each run from Mr. Lee's verbal instruction. Clearly I have miscommunicated with Mr. Sum Lee when verbalized the start time; however, I did begin the VE readings simultaneously with the other test runs. It is impossible for me start Run 7 at 11:24, because I was performing the testing on Run6 from 10:30-11:45. I have a habit of taking the picture of right after the first break; therefore, the picture was taken at 12:49 instead of 11:49.

Similarly, I made the same error on VE Run 10. Run 10 was actually performed from 16:41-17:41, but I have recorded the start time from 16:01-17:11. It is impossible for me start Run 9 at 16:01, because I was performing the VE testing on Run 9 from 15:15-16:25. I have a habit of taking the picture of right after the first break; therefore, the picture was taken at 17:06 instead of 16:26.

Mr. Lee is from Malaysia and speaks English as his second language with a thick accent. While I thought I understood the times he verbalized, it is apparent that I did not; however, I affirm that VE Runs 7 and 10 were performed simultaneously with the other pollutants during those runs.

Please contact me anytime to discuss in additional detail,

Ashwin Ravi, QSTI Project Manager

Min Sum Lee, QSTI, Project Manager

STK-BNSCU PI-48 + PI-36 Discrepancy Affidavit.pdf

PI-48 Photo Times Discrepancy

ADDED BENEFITS:

The GATEKEEPER not only ignites and controls proper flow to the ECU, but also has built in radio capabilities and or digital output for alarm, data logging, and high temp shutdown capabilities via thermocouple.

Cordova also recommends its GATEKEEPER Process Valve (GPV-250) which was specifically designed for low pressure applications with minimal pressure drop across the valve. The valve (pictured below) is 3" FNPT ported and is field configurable for straight through or angle installation and includes internal pressure sensing ports for easy configuration with the GATEKEEPER.



Cordova GPV-250



3.5 Inch LCD Display

SPECIFICATIONS:

Enclosure	12"W x 14"T x 6"D Nema 4
Battery	20 ah SLA (Included)
Solar	30 Watt (Included)
Alarm Output	1 Digital Output (Included)
Alarm Radio Output	Upgradeable to Cordova RAD-I/O Wire Replacement
High Temperature Shutdown (must include valve)	Thermocouple (Not Included)
Pilot Fail Shutdown (must include valve)	Closes GPV-250 Valve Upon Pilot Gas Failure
Data Logging	Hardware Accepts Up To 32G SD Card
Ignition Sequence	30 Seconds
Interface	3.5" TFT LCD Display

CORDOVA FLOW CONTROLS, LLC

1935 65TH Avenue, Suite B

Greeley, CO 80634

Toll Free: 1-855-900-CORDOVA

www.CordovaFlow.com

Rev. 6/14/14

Updated Gatekeeper Cut Sheet.pdf

CORDOVA FLOW CONTROLS
INNOVATION MEETS APPLICATION

GATEKEEPER IGNITION SYSTEM



DESCRIPTION:

The Cordova GATEKEEPER Ignition System is the perfect solution for maintaining a complete destruction of the VOC's in your Enclosed Combustion Unit (ECU). The system was specifically engineered to help Big Iron meet Quad O requirements involving enclosed combustors. Most ECUs or ECDs only have a simple ignition system which simply re-lights the pilot and possibly alarms out upon ignition failure. These systems offer no control on what process pressures enter the combustion device, and most combustors available on the market today will not destruct VOCs efficiently at lower pressures (usually below 3 or 4 ounces). Here is where the GATEKEEPER can help!!

The GATEKEEPER is not only an ignition system, but it constantly monitors process pressures entering the ECU and only allows tank vapors to enter the combustor when proper pressures are met and maintained ensuring a complete burn of the vapors. When there is low or inconsistent process pressure from the tanks, the GATEKEEPER will signal a valve on the inlet of the combustor to close until proper pressure is sensed upstream. When proper process pressure is sensed and maintained upstream from the process valve, The GATEKEEPER will open the valve and allow tank vapors to enter the ECU.

Tab 4

RE FW finalReport of stk-14-elmorecity#1.msg

Mia, Marcia

From: dmoore@cordovaflow.com
Sent: Wednesday, January 14, 2015 6:01 PM
To: Mia, Marcia
Subject: RE: FW: Final Report of stk-14-elmorecity.ok-comp#1
Attachments: Data Validation-Revised Package-P1402149AR.zzz

Hello, again Marcia.

Let's try this again. I have attached the Revised Data Validation Package from Air Hygiene. Please review and advise.

Thank you,

Derek Moore

Derek Moore
970.573.1053
5502 W. 2nd St.
Greeley, CO 80634

-------- Original Message --------
Subject: RE: FW: Final Report of stk-14-elmorecity.ok-comp#1
From: "Mia, Marcia" <Mia.Marcia@epa.gov>
Date: Tue, January 06, 2015 8:45 am
To: 'Derek Moore' <dmoore@cordovaflow.com>
Cc: "Johnson, Steffan" <johnson.steffan@epa.gov>, 'Jason Huckaby' <Jason.Huckaby@erg.com>

Derek,

Please find below, a couple of questions on your latest supplemental submittal for the Big Iron Oilfield units.

PI-48
Photo Times for Run #7 and #10 - The photo times in the updated photos and affidavit do not align with the Table A-1 times for when these runs were conducted. For example, Run #10 photo time was 16:26, but the run was 16:41 - 17:41, so the photo was apparently taken prior to the run. Run #7 is similar. Please explain the discrepancy.

PI-36 and PI-48
Lab validation reports – The standards in calibration summary do not match the standard indicated in the injection log. Specifically, the standard code in the calibration summaries on pages 127 in PI-36 and 261 in PI-48 are STD S30-01231404. The corresponding injection logs on pages 187 (PI-36) and 324 (PI-48) are STD S30-04241401. (Note that these sections of the reports are the same in both the PI-36 and PI-48 because the chain of custody included some samples from each unit.) Please explain the discrepancy.

Thank you, in advance, for your responses to these questions.

Marcia Mia
AB/MAMPD/OC

202-564-7042

From: Derek Moore [mailto:dmoore@cordovaflow.com]
Sent: Tuesday, December 16, 2014 6:32 PM
To: Mia, Marcia
Subject: RE: FW: Final Report of stk-14-elmorecity.ok-comp#1

Fair enough. Thank you, and Merry Christmas!!

Derek Moore
(c) 970.573.1053
(o)303.954.4982
(f)970.673.8504
dmoore@cordovaflow.com

CORDOVA FLOW CONTROLS

From: Mia, Marcia [mailto:Mia.Marcia@epa.gov]
Sent: Tuesday, December 16, 2014 3:22 PM
To: 'Derek Moore'; Johnson, Steffan
Subject: RE: FW: Final Report of stk-14-elmorecity.ok-comp#1

Yes, thank you they have been received. I don't have a schedule for when we will follow-up – folks are in and out over the next couple of weeks with the holidays, but we will do our best to keep it moving along.

Marcia Mia
AB/MAMPD/OC
202-564-7042

From: Derek Moore [mailto:dmoore@cordovaflow.com]
Sent: Monday, December 15, 2014 5:06 PM
To: Mia, Marcia
Subject: FW: FW: Final Report of stk-14-elmorecity.ok-comp#1

Marcia,

Hello, just checking to make sure you received my last e-mail and possibly get a timeframe for further review.

Thanks, and call with any questions.

Derek Moore

Derek Moore
(c) 970.573.1053
(o)303.954.4982
(f)970.673.8504
dmoore@cordovaflow.com

CORDOVA FLOW CONTROLS

From: Derek Moore [mailto:dmoore@cordovaflow.com]
Sent: Friday, December 5, 2014 3:20 PM
To: 'Mia, Marcia'
Subject: FW: FW: Final Report of stk-14-elmorecity.ok-comp#1

Marcia,

Sorry for the delay. Please see attached documents from our Third Party testing company as well as the cut sheet for Cordova's ignition system which is used on both combustors. Thanks, and call or email with any other questions and have a great weekend!!

Derek

Derek Moore
(c) 970.573.1053
(o)303.954.4982
(f)970.673.8504
dmoore@cordovaflow.com

CORDOVA
FLOW CONTROLS

From: Mike Zimmerle [mailto:mzimmerle@cordovaflow.com]
Sent: Friday, December 5, 2014 3:06 PM
To: Derek Moore
Subject: Re: FW: Final Report of stk-14-elmorecity.ok-comp#1

Cordova Flow Controls
Mike Zimmerle
Technical Development
970-415-0664 Cell

On Fri, Dec 5, 2014 at 2:45 PM, Derek Moore <dmoore@cordovaflow.com> wrote:

Can you return these files in .ZZZ form quickly?

Derek Moore
(c) 970.573.1053
(o)303.954.4982
(f)970.673.8504
dmoore@cordovaflow.com

CORDOVA
FLOW CONTROLS

From: Min Lee [mailto:mlee@airhygiene.com]
Sent: Wednesday, November 26, 2014 11:37 AM
To: Tera Gabel; sean.gabel@riatacg.com
Cc: dmoore@cordovaflow.com; Paul Little
Subject: RE: Final Report of stk-14-elmorecity.ok-comp#1

Sean,

Attached folder is the EPA Response Package,

Please read BNECU-PI36-COC-corrected action-affidavit.pdf to guide you through the package or below is the same page.

BNECU-PI36

1. Provide lab validation report.

2. All VE photos are missing date/time stamp. Please provide file metadata with missing information. If file metadata is not available, please provide a)physical date/time stamp on each photo; b)reconcile with the Method 22 log sheets; and c)provide signed affidavit that the photos were taken at the date and time noted.

3. Please provide complete chain of custody (COC) for inlet fuel samples. Report notes that "No signature relinquishing sample(s) on Chain of Custody (or date and time)." See pages 177-202 and 183-184 of the test report.

4. Please provide complete chain of custody for outlet fuel samples. Report notes that "Chain of custody is missing time collected." See pages 229-231.

5. Please provide a schematic or vendor information of the pilot flame control system and operation.

Attached Gatekeeper Ignition System

BNECU-PI48

1. Provide lab validation report

2. All VE photos are missing date/time stamp. Please provide file metadata with missing information. If file metadata is not available, please provide a)physical date/time stamp on each photo; b)reconcile with the Method 22 log sheets; and c)provide signed affidavit that the

photos were taken at the date and time noted.

3. Please provide a schematic or vendor information of the pilot flame control system and operation.

Attached Gatekeeper Ignition System

Please feel free to contact me via e-mail or phone.

Min Sum Lee, QSTI I-IV
Project Manager
Air Hygiene Inc.
mlee@airhygiene.com
Cell: (918) 565-5379
Office: (918) 307-8865

From: Tera Gabel [mailto:stakk@att.net]
Sent: Wednesday, November 19, 2014 3:25 PM
To: Min Lee; Danny Parr
Cc: dmoore@cordovaflow.com
Subject: Fwd: Final Report of stk-14-elmorecity.ok-comp#1

Gentlemen,

Please see EPA requests for information below. Please update the final report with the requested information and return, so that we can proceed with the approval process.

Thanks

Sean Gabel

Sent from my iPad

Begin forwarded message:

From: "Derek Moore" <dmoore@cordovaflow.com>
Date: November 19, 2014 at 3:03:06 PM CST

To: "Tera Gabel" <stakk@att.net>
Subject: FW: Final Report of stk-14-elmorecity.ok-comp#1

Derek Moore
(c) 970.573.1053
(o)303.954.4982
(f)970.673.8504
dmoore@cordovaflow.com

From: Mia, Marcia [mailto:Mia.Marcia@epa.gov]
Sent: Wednesday, November 19, 2014 9:02 AM
To: Johnson, Steffan; Jason Huckaby; 'dmoore@cordovaflow.com'
Subject: RE: Final Report of stk-14-elmorecity.ok-comp#1

Derek,

EPA staff were able to meet internally to discuss the manufacturer performance test that you submitted on July 28, 2014. We have the following questions, as the outcome of that review.

I believe they can be handled via response to this email, but if you would like a conference call to discuss, please let me know, and I will set something up after the Thanksgiving holiday.

BNECU-PI36

1. Provide lab validation report.
2. All VE photos are missing date/time stamp. Please provide file metadata with missing information. If file metadata is not available, please provide a)physical date/time stamp on each photo; b)reconcile with the Method 22 log sheets; and c)provide signed affidavit that the photos were taken at the date and time noted.
3. Please provide complete chain of custody (COC) for inlet fuel samples. Report notes that "No signature relinquishing sample(s) on Chain of Custody (or date and time)." See pages 177-202 and 183-184 of the test report.
4. Please provide complete chain of custody for outlet fuel samples. Report notes that "Chain of custody is missing time collected." See pages 229-231.
5. Please provide a schematic or vendor information of the pilot flame control system and operation.

BNECU-PI48

1. Provide lab validation report.

2. All VE photos are missing date/time stamp. Please provide file metadata with missing information. If file metadata is not available, please provide a)physical date/time stamp on each photo; b)reconcile with the Method 22 log sheets; and c)provide signed affidavit that the photos were taken at the date and time noted.

3. Please provide a schematic or vendor information of the pilot flame control system and operation.

Thank you for your response to these questions and issues.

Marcia Mia

AB/MAMPD/OC

202-564-7042

From: Johnson, Steffan
Sent: Wednesday, August 13, 2014 8:31 AM
To: Mia, Marcia; Jason Huckaby
Subject: FW: Final Report of stk-14-elmorecity.ok-comp#1

From: Steffan Johnson [mailto:Johnson.Steffan@epamail.epa.gov] **On Behalf Of** Rachel Agnew
Sent: Wednesday, August 13, 2014 7:53 AM
To: Johnson, Steffan
Subject: Fw: Final Report of stk-14-elmorecity.ok-comp#1

----- Forwarded by Steffan Johnson/RTP/USEPA/US on 08/13/2014 07:52 AM -----

From: **"Derek Moore"** <dmoore@cordovaflow.com>
To: **Oil_and_Gas_PT@EPA**
Date: **08/08/2014 01:11 PM**
Subject: **FW: FW: Final Report of stk-14-elmorecity.ok-comp#1**

Here are the files renamed .zzz Thanks, and sorry for the delay.

Derek Moore

Derek Moore
(c) 970.573.1053
(o)303.954.4982
(f)970.673.8504
dmoore@cordovaflow.com

From: Derek Moore [mailto:dmoore@cordovaflow.com]
Sent: Monday, July 28, 2014 11:20 AM
To: 'oil_and_gas_PT@EPA.GOV'
Subject: FW: Final Report of stk-14-elmorecity.ok-comp#1

Attached you will find a final manufacturer testing report and results for two different combustion control device models for your review.

Big Iron is seeking EPA approval that the specific combustion control device models tested have demonstrated that they were able to achieve the performance requirements of NSPS subpart OOOO and NESHAP subparts HH and HHH. Performance testing was conducted as specified in these subparts.

If you have any questions, please do not hesitate to contact me.

Derek Moore
(c) 970.573.1053
(o)303.954.4982
(f)970.673.8504
dmoore@cordovaflow.com

CORDOVA
FLOW CONTROLS

(See attached file: BNECU-PI36-Final Report for Submission.zzz)(See attached file: BNECU-PI48-Final Report for Submission.zzz)