



EcoTest

Energy Services

Emissions Test Report

Prepared for: Targa Resources

Prepared by: Erik Vogt

Test Date: December 3, 2018

Regulatory Information

Make:	Caterpillar
Model:	G3612TALE
Unit Number:	A13 East
Serial Number:	BKE00266
Regulatory Citation	40 CFR 60 JJJJ, 40 CFR 63 Subpart ZZZZ
Target Parameter(s)	NOx, CO, and HCHO

Contact Information

Test Location

Targa Resources
Midkiff Gas Plant
Reagan County, TX
31.6494N
-101.8015W

Primary Facility Contact
John Wilder
Environmental Specialist
Targa Resources
17400 E FM 2401
Midkiff, TX, 79755
432-685-7602
[REDACTED]

Test Company

Ecotest Energy Services
8351 Deerwood Forest Dr.
Fort Worth, TX 76126

Company Contact
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Introduction

Ecotest Energy Services (Ecotest) has been contracted by Targa Resources to provide emissions testing on the Caterpillar G3612TALE Spark-Ignited engine located at the Midkiff Gas Plant location in Reagan County, TX. The purpose of this testing was to demonstrate compliance with emissions limitations contained in the site air permit and 40 CFR 63 subpart ZZZZ (reference ASTM 6348A1.1) and 40 CFR 60 subpart JJJJ (reference ASTM 6348 A1.1). There are emissions limitations for the oxides of nitrogen (NO_x), carbon monoxide (CO) and formaldehyde (HCHO). The referenced test will consist of three 1 hour runs (reference ASTM 6348 1.2).

Testing for the engine occurred on December 3, 2018 and was conducted by Erik Vogt of Ecotest.

Summary of Test Results

Engine Hours 95223

Emissions Summary

Pollutant	pounds / hour		tons / year		g/BHP-hr		ppmvd at 15% Q	
	Permitted	Emitted	Permitted	Emitted	Permitted	Emitted	Permitted	Emitted
CO	N/A	0.59	N/A	2.59	0.25	0.08	N/A	13.10
NO _x	N/A	1.36	N/A	5.97	0.70	0.18	N/A	18.42
HCHO	N/A	0.46	N/A	2.04	0.10	0.06	N/A	9.62



ices
Test

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Ranger Analytics Training
EmTest Training

MKS Instrument Training

Erik Vogt
Lead Field Technician
EcoTest Energy Services, LLC.

Wayne Philpot
VP - Operations
EcoTest Energy Services, LLC.

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Energy Services

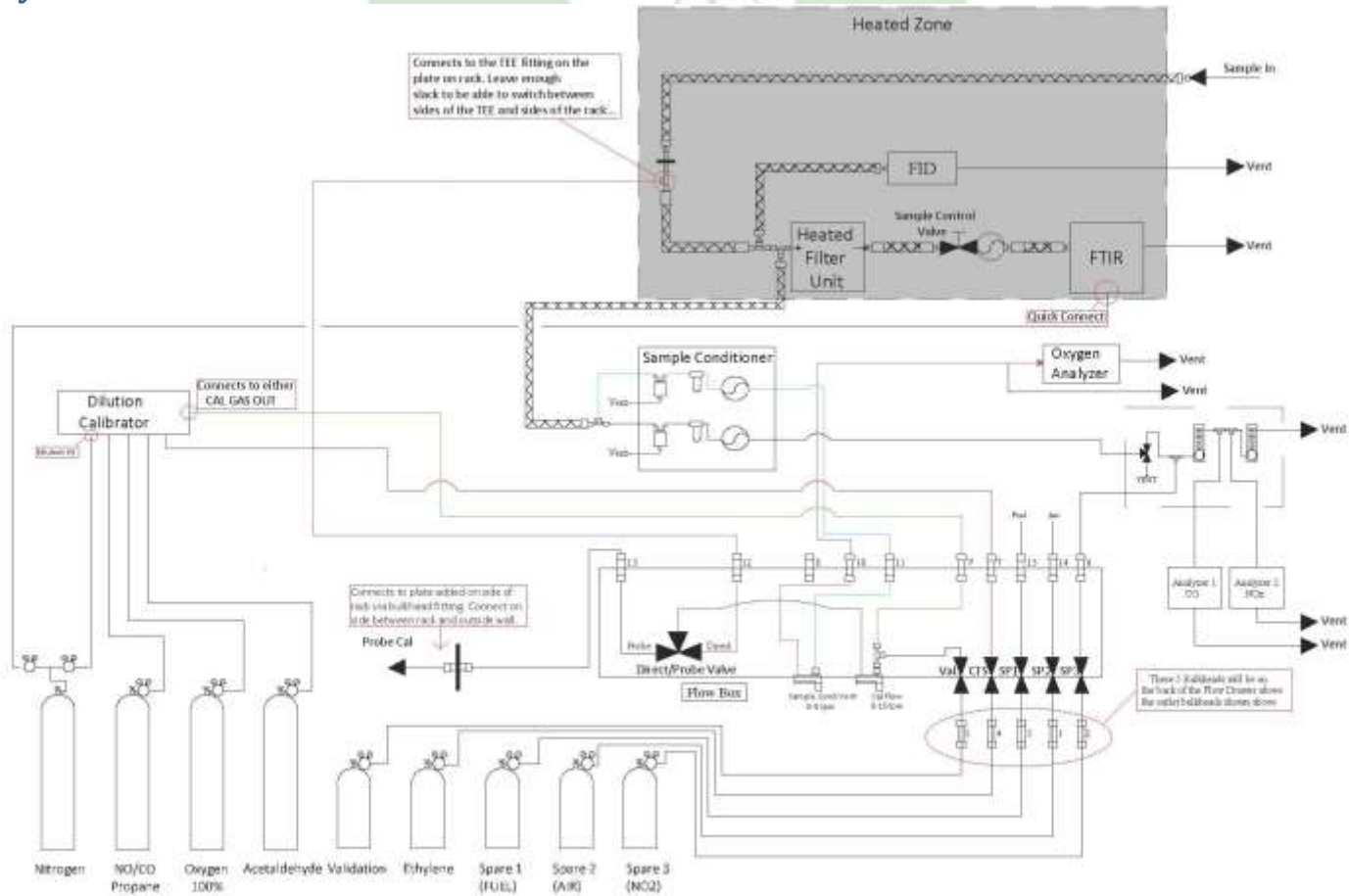




Sampling System and Test Procedures (Reference ASTM 6348 A1.3)

Parameter	U.S. EPA Reference Test Methods	Notes/Remarks
Volumetric Flow Rate	USEPA Method 19 and Fuel Flow	Oxygen, F-Factor, Fuel Flow, Gas Heating Value
Oxygen	USEPA Method 3A	Instrumental Analysis
*Nitrogen Oxides	USEPA Methods 205,320 & ASTM 6348	Instrumental Analysis
*Carbon Monoxide	USEPA Methods 205,320 & ASTM 6348	Instrumental Analysis
*Total Non- Methane Hydrocarbons (VOC)	USEPA Methods 205,320 & ASTM 6348	Instrumental Analysis
**Formaldehyde Moisture	USEPA Methods 205,320 & ASTM 6348	Instrumental Analysis
Moisture Content	USEPA Method 205	Volumetric/ Gravimetric Analysis
* USEPA Method 4 could be used if Method 205 is not performed **This measurement is only performed upon specific request or on relevant test(s)		

Sampling System Schematic



Sample and Cal Gas
Flow Diagram

Instrument Specifications

Description: Oxygen Analyzer

Manufacturer: M&C

Model: PMA-22

Serial Number: 13070024

Technology Type: paramagnetic

Range: 0-25%

Reproducibility:

analogue = < 1% of span

digital = +/-0,1 vol.% O₂

Accuracy (after calibration):

analogue signal output = +/-1% of span at range 3-100%

digital indicator = +/-0,1 vol.% O₂

Response time (90% FSD): < 3 seconds at 60 NI/hr air

Description: Multi-Gas FTIR Analyzer

Manufacturer: MKS Instruments

Model: 2030

Serial Number: 017807958

Technology Type: FTIR (Fourier Transform Infrared) spectrometry

Range: between 10ppb and 100% fullscale

Spectral Resolution: 0.5-128 1/cm

Scan Speed: 1/sec @ 0.5 1/cm

Detector Type: LN₂-cooled MCT

Description: Gas Diluter (Dilution Calibrator)

Manufacturer: Teledyne

Model: T700

Serial Number: 938

Technology Type: Mass Flow Controller

MFC's: 20LPM, 2LPM, and 200ccm

Appendix X: Emissions Source Operational Data



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[REDACTED]

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	Test Run			Average
	1st	2nd	3rd	
Test Run				
Start Time	11:46 AM	12:53 PM	1:59 PM	
End Time	12:46 PM	1:53 PM	2:59 PM	
Interval (minutes)	60	60	60	60
Ambient Conditions				
Dry Bulb / Ambient Temperature (°F)	64.7	65.0	65.6	65.1
Wet Bulb Temperature (°F)	50.1	50.5	51.4	50.7
Calculated Relative Humidity (%)	35	35	37	36
Relative Humidity (%)	35.70	35.90	36.70	36.10
Barometric Pressure ("Hg)	27.30	27.30	27.30	27.30
Elevation (feet)	2501			
Emissions Source				
Manufacturer	Caterpillar			
Model	G3612TALE			
Serial Number	BKE00266			
Unit ID	A13 East			
Manufacture/Rebuild Date	11/1/2004			
Emissions Source Type	Engine			
Emissions Source Operational Data: Engine				
Exhaust flow rate determined by:	Fuel Flow Rate			
Exhaust Flow Rate (SCFH)				N/A
Fuel flow rate determined by:	Fuel Flow Meter			
Fuel Flow Rate (SCFH)	19500	19458	19541	19500
Calculated Fuel Flow Rate (SCFH)	N/A	N/A	N/A	N/A
BSFC (BTU/BHP/hr), LHV				N/A
Calculated BSFC _{LHV} (BTU/BHP/hr)	5296	5285	5307	5296
Texas state-recommended BSFC (BTU/BHP/hr)	N/A	N/A	N/A	N/A
Rich Burn / Lean Burn	Lean Burn			
Fuel Header Pressure (PSIG)				N/A
Calculated Load (%)	98.6	98.6	98.6	98.6
Current Power (BHP)	3499	3499	3499	3499
Max Rated Power (BHP)	3550			
Max Rated Speed (RPM)	1000			
Emissions Control Equipment				
Engine Type	Spark-Ignited			

	Test Run			Average
	1st	2nd	3rd	
Spark-Ignited Engine Operational Data				
Current Speed (RPM)	953	951	947	950
Oxygen Sensor (mV)				N/A
Ignition Timing (°BTDC)				N/A
Boost Pressure (PSI)				N/A
Oil Pressure (PSIG)	66.1	65.5	66.9	66.2
Manifold Pressure (PSIA)	29.9	29.9	29.9	29.9
Manifold Temperature (°F)	125.2	125.2	125.2	125.2
Exhaust Back-Pressure ("H2O)				N/A
Exhaust Temperature (°F)				N/A
Pre-Converter Temperature (°F)				N/A
Post-Converter Temperature (°F)	837.0	837.0	838.0	837.3
Converter Pressure Drop ("H2O)	8.20			
Aspiration	Turbocharged			
Driven Equipment				
Manufacturer				
Model				
Serial Number				
Purpose	compress natural gas into pipelines			
Engine-Driven Equipment Type	Compressor			
Driven Equipment Operational Data: Compressor				
Suction Pressure (PSIG)	8.3	8.3	8.3	8.3
Suction Temperature (°F)				N/A
Discharge Pressure (PSIG)	859.0	860.0	859.0	859.3
Discharge Temperature (°F)				N/A
Capacity (MMSCFD)				N/A
Calculated Horsepower (BHP)	3324	3324	3324	3324
Compressor Type	Piston			
User-Defined Items				
Engine Hours	95223.00			95223.00
Test Run Item 2 (Units)				N/A
Test Run Item 3 (Units)				N/A
Test Run Item 4 (Units)				N/A
Test Run Item 5 (Units)				N/A
Emissions Test Item 1 (Units)				
Emissions Test Item 2 (Units)				
Emissions Test Item 3 (Units)				
Emissions Test Item 4 (Units)				
Emissions Test Item 5 (Units)				

Field Data Sheet 1

 Midkiff A13 ~~West~~ East

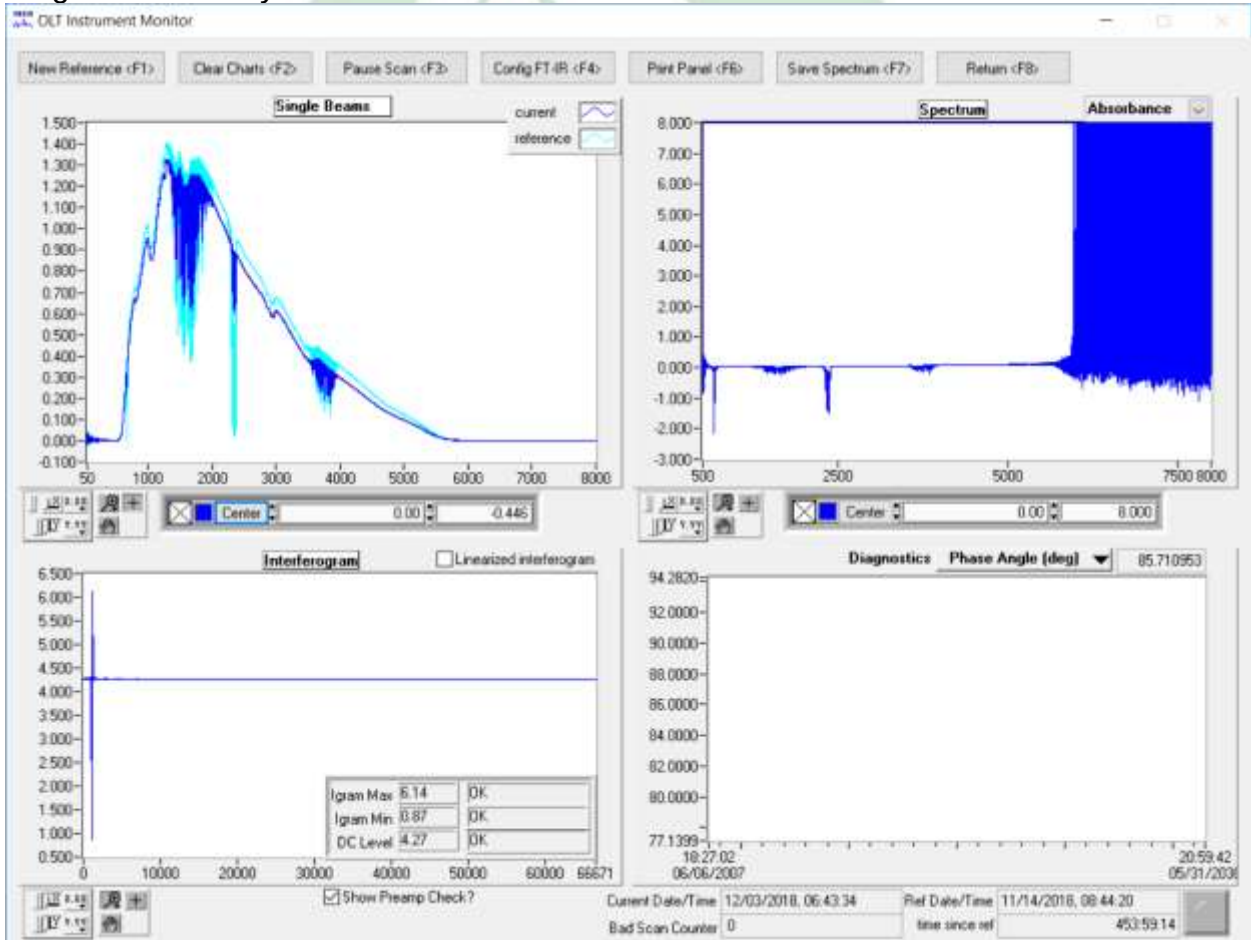
	Test Run			
	1st	2nd	3rd	4th
Ambient Conditions				
Dry Bulb Temperature (°F)	64.7	65.0	65.6	
Wet Bulb Temperature (°F)	50.1	50.5	51.4	
Relative Humidity (%)	35.7	35.9	36.7	
Barometric Pressure ("Hg)	27.30	27.30	27.30	
Elevation (feet)	2501			
Emissions Source				
Manufacturer	Caterpillar			
Model	G3612			
Serial Number	BK500266			
Unit ID	A13 West East			
Manufacture/Rebuild Date	11.1.04			
Emissions Source Type	Engine			
Emissions Source Operational Data: Engine				
Fuel flow rate determined by:	Fuel Flow			
Fuel Flow Rate (SCFH)				
BSFC (BTU/BHP/hr), LHV or HHV				
Rich Burn / Lean Burn	Lean			
Fuel Header Pressure ()				
Max Rated Power (BHP)	3550			
Max Rated Speed (RPM)	1000			
Emissions Control Equipment				
Engine Type	Spark-ignited			
Spark-Ignited Engine Operational Data				
Current Speed (RPM)	953	951	947	
Engine Hours	95223			
Ignition Timing (°BTDC)				
Boost Pressure (PSI)				
Oil Pressure (PSIG)	66.1	65.5	66.9	
Manifold Pressure ()	29.9	29.9	29.9	
Manifold Temperature (°F)	125.2	125.2	125.2	
Exhaust Back-Pressure ("H2O)				
Exhaust Temperature (°F)				
Pre-Converter Temperature (°F)				
Post-Converter Temperature (°F)	837	838	838	
Converter Pressure Drop ("H2O)				
Aspiration	Turbocharged			

Field Data Sheet 2

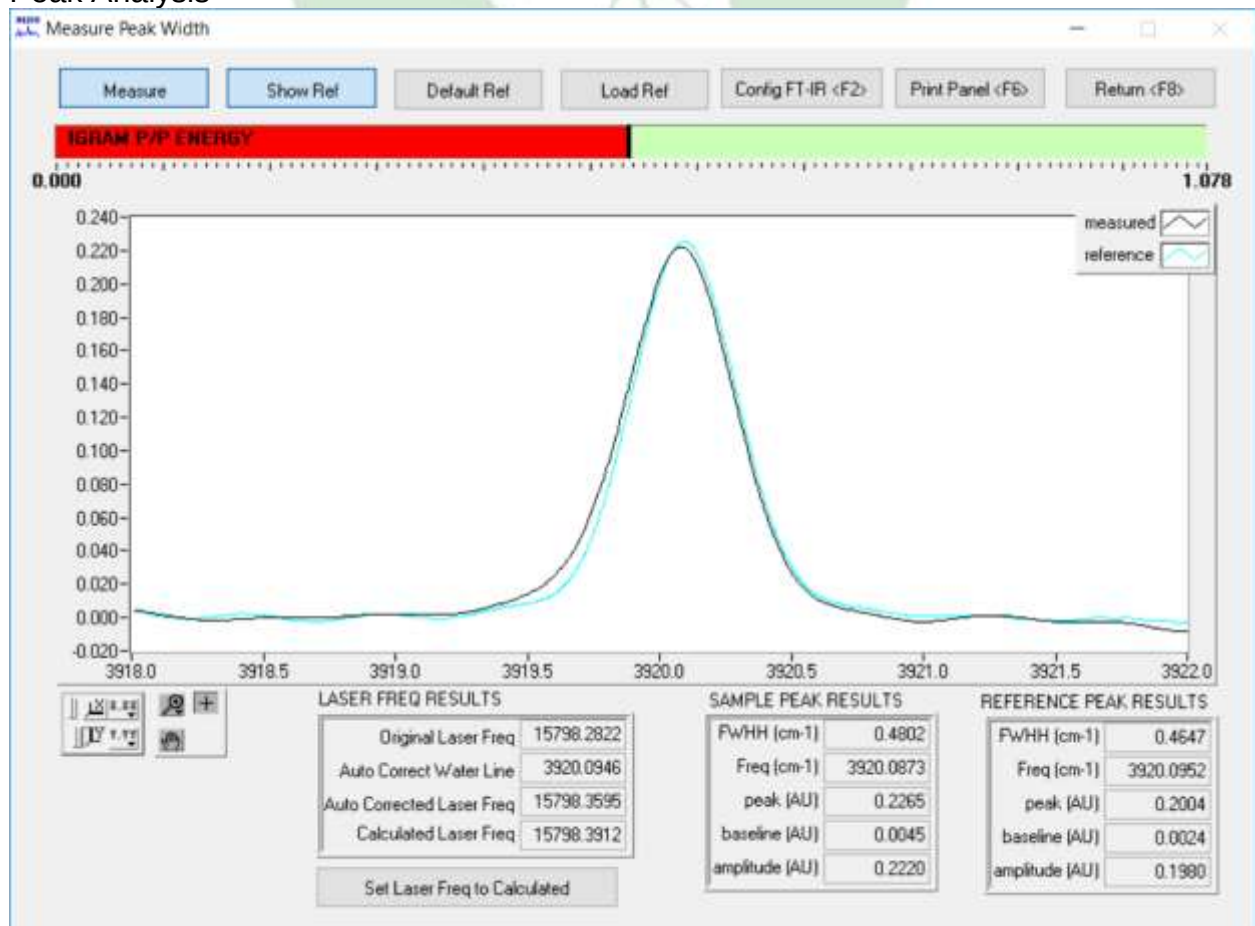
	Test Run			
	1st	2nd	3rd	4th
Turbine Engine Operational Data				
Reference PCD (PSIG)				
Gas Producer Speed, GPS (%RPM)				
Power Turbine Speed, PTS (%RPM)				
Power Turbine Speed 2, PTS2 (%RPM)				
Pressure at Compressor Discharge, PCD (PSIG)				
Temperature at Compressor Discharge, TCD (°F)				
Exhaust Gas Temperature, EGT (°F)				
Driven Equipment				
Manufacturer				
Model				
Serial Number				
Purpose				
Engine-Driven Equipment Type				
Driven Equipment Operational Data: Compressor				
Suction Pressure (PSIG)	8.3	8.3	8.3	
Suction Temperature (°F)				
Discharge Pressure (PSIG)	859	860	859	
Discharge Temperature (°F)				
Capacity (MMSCFD)				
Compressor Type	Piston			
Driven Equipment Operational Data: Generator				
Voltage (Volts)				
Current (Amps)				
Power (KW)				
Work (KW-Hr)				
User-Defined Items				

FTIR Quality Assurance Checks

Single Beam Analysis

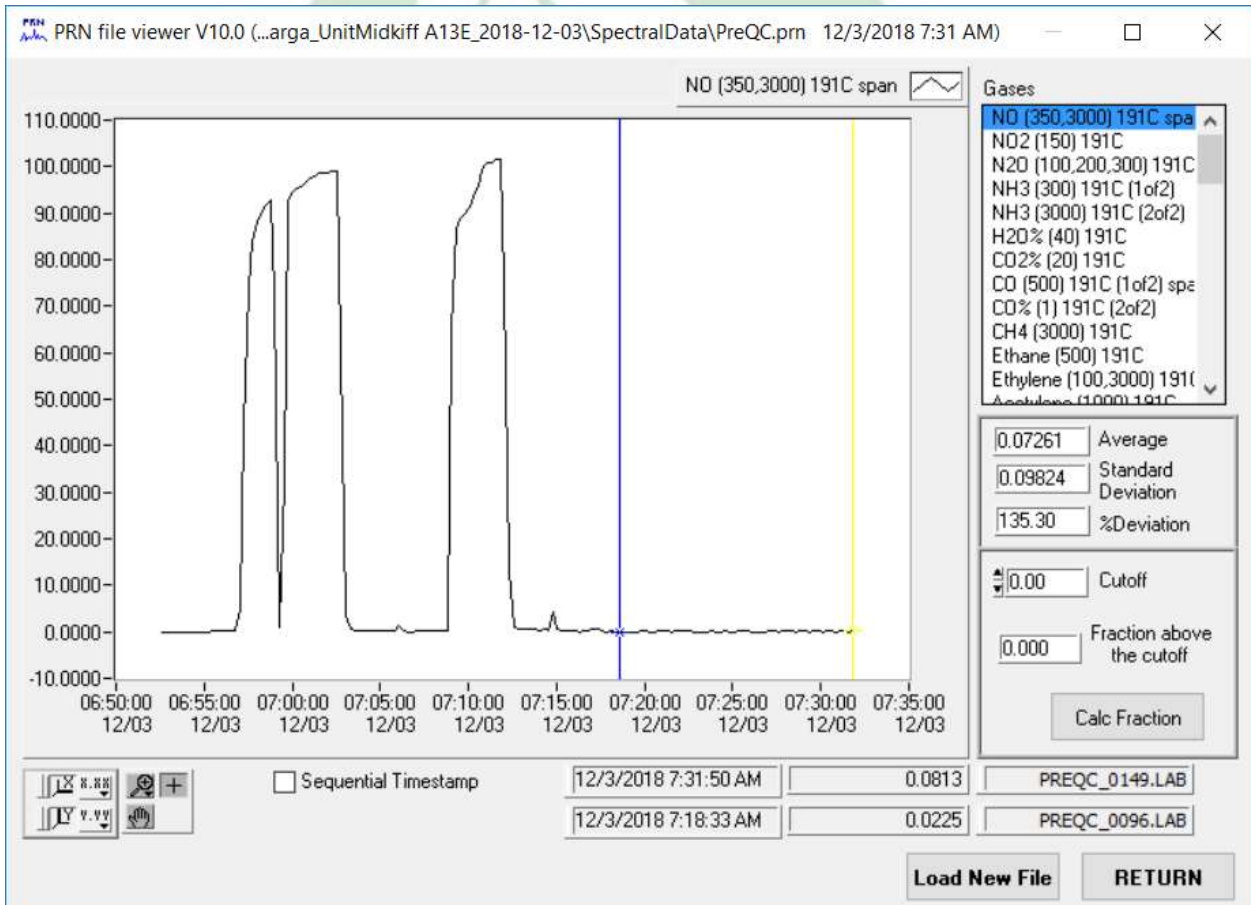


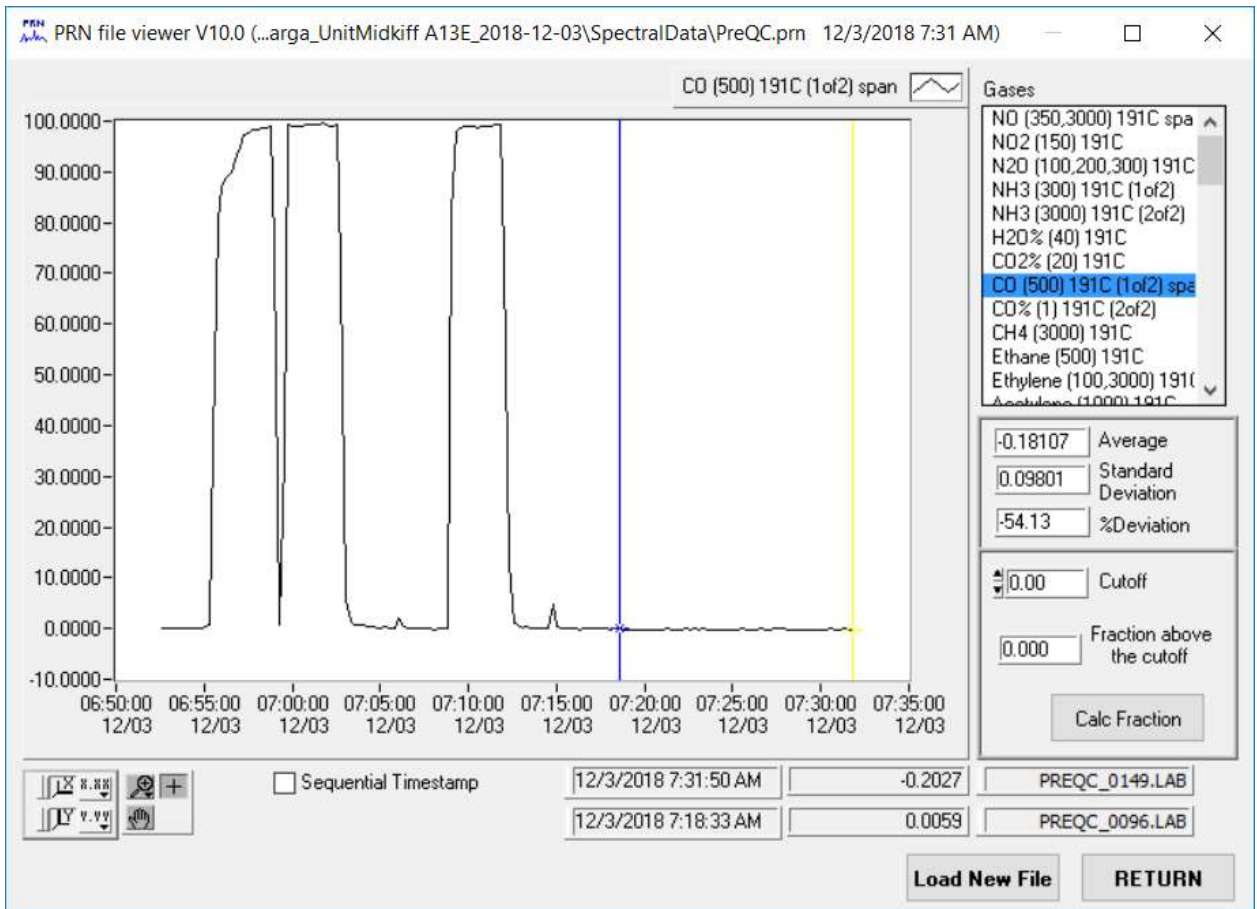
Peak Analysis

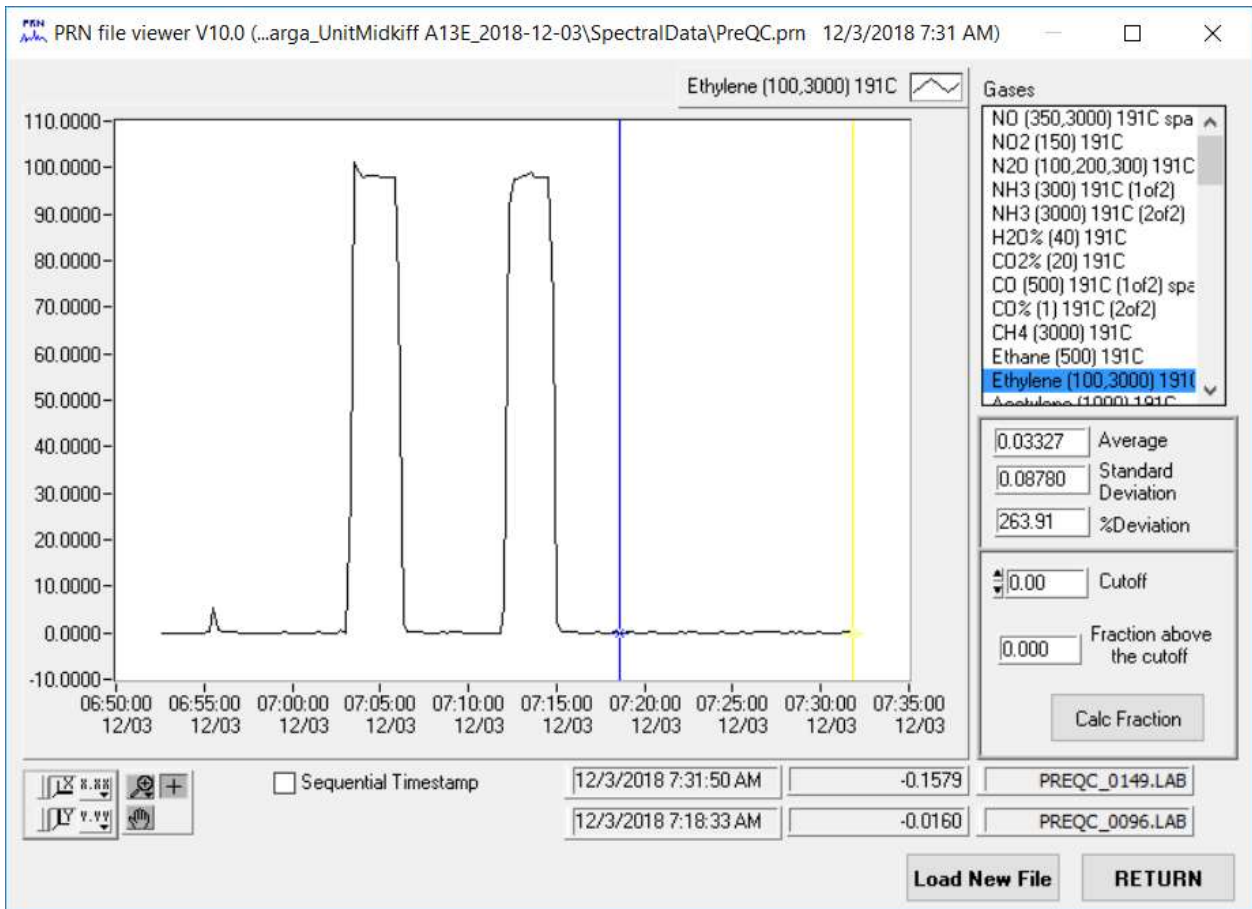


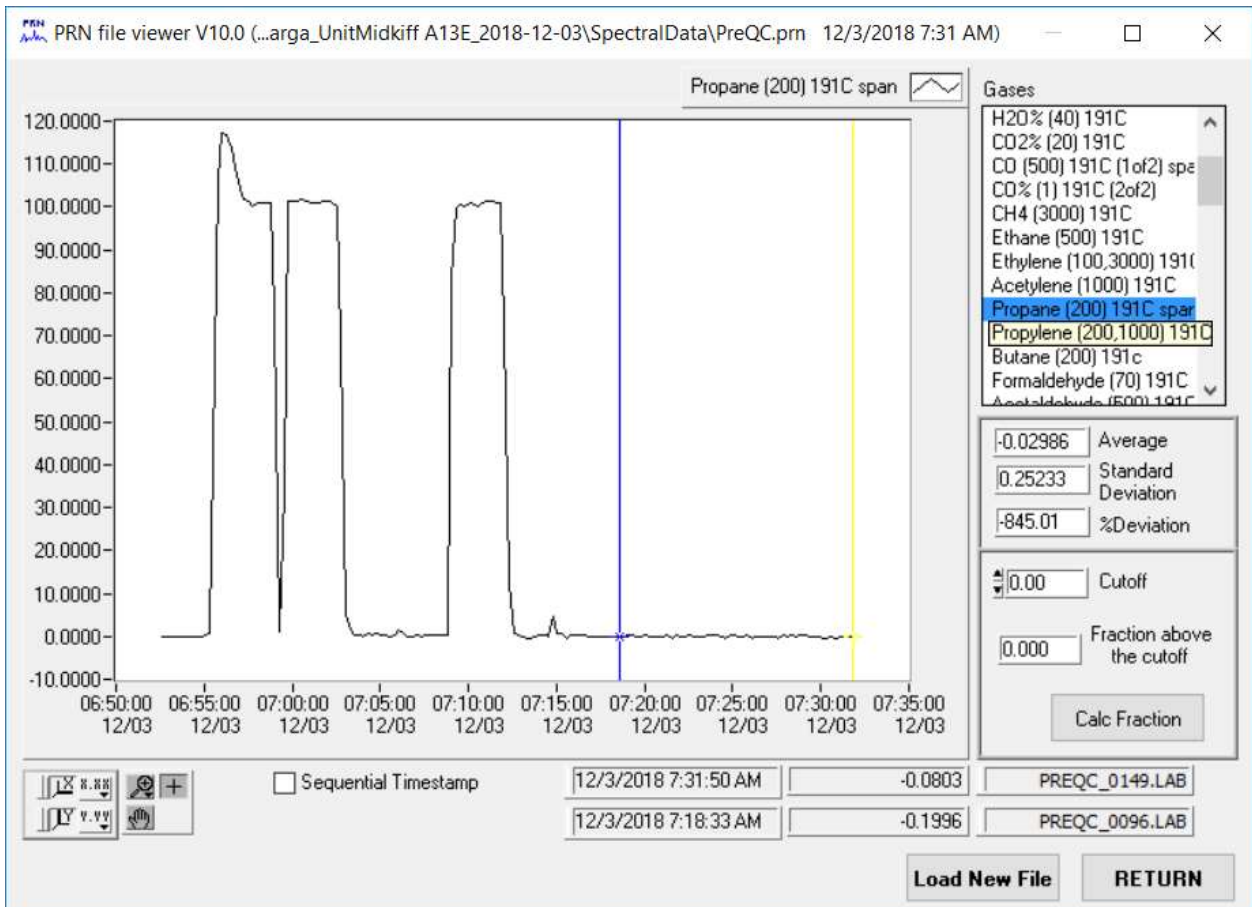
Noise Evaluation Analysis

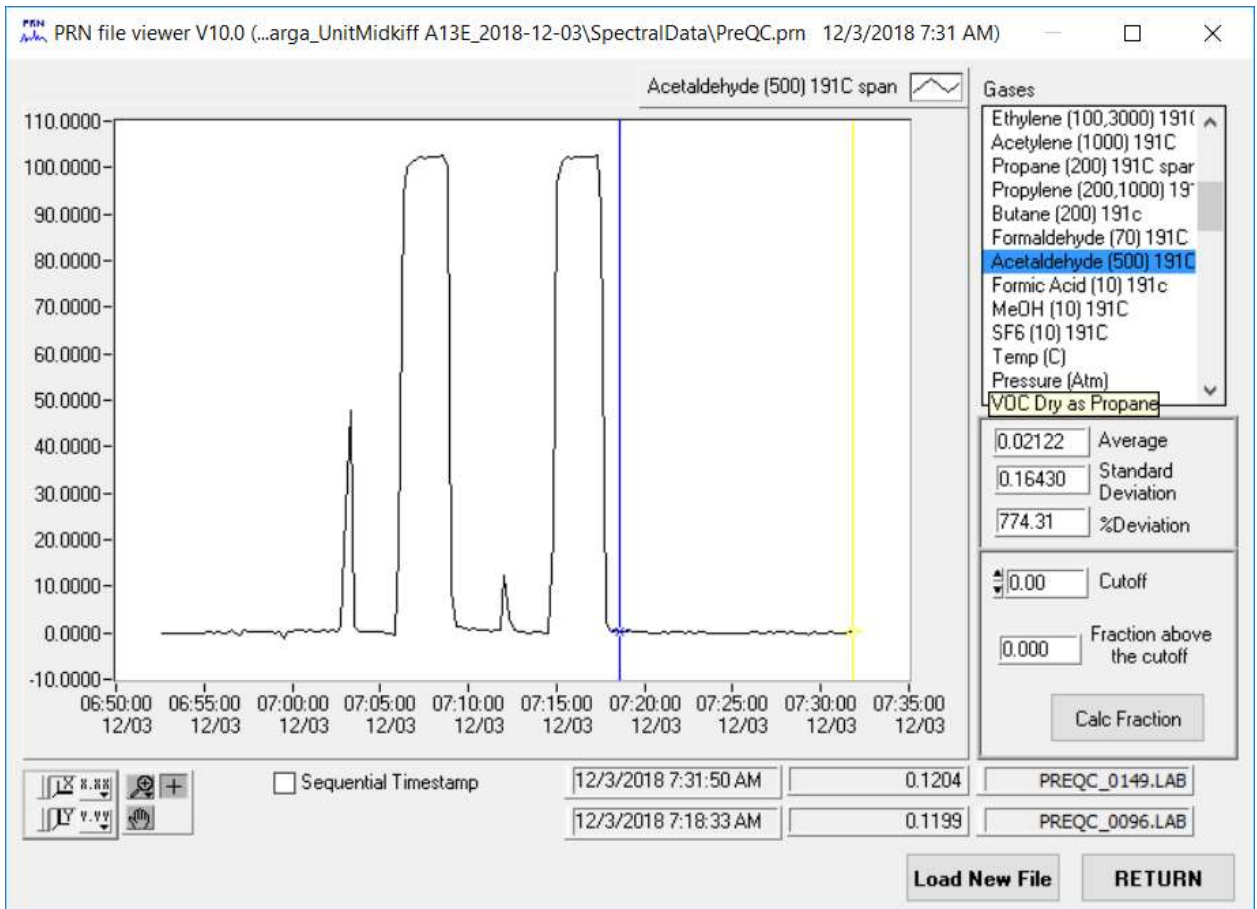
Standard Deviation Measurement











Ecotest Energy Services, LLC
 Job Safety Analysis (JSA)

 Date: 3 Nov 18 Location Name: Midkiff

 Company: Torog Emergency Response: 911

Site Review

Is there communication available on site.	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Cellular is available.</u>			
Any physical hazards (noise, temperatures, heavy loads, awkward loads, etc.).	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Proper PPE will be used.</u>			
Is the ground stable and able to support the weight of the rig.	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Ground is stable.</u>			
Is there any overhead lines (power lines, etc.).	☐ YES	☒ NO	☐ Not An Issue
Comments: <u>No overhead lines.</u>			
Are the weather conditions safe.	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Weather is clear.</u>			
If working above grade is there guardrails/protection.	☐ YES	☐ NO	☒ Not An Issue
Comments: <u>Grade is level.</u>			
Is there possible slip/ trip/ fall hazards.	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Watch where walking.</u>			
Any IH issues (H2S, NORM, benzene, lead, asbestos, etc.).	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Gas monitors will be used.</u>			
Is there mechanical/stored energy (LO/TO).	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Yes.</u>			

 Task: Stack Testing.

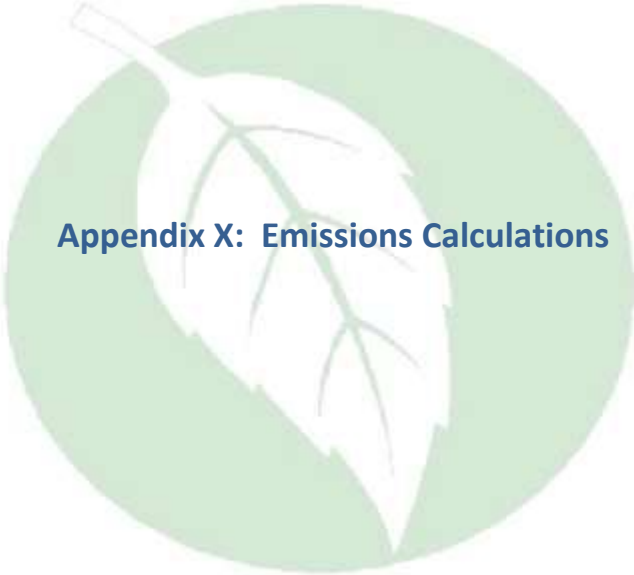
Task Review

Are the employees trained and do they understand their job assignments.	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Employees are trained.</u>			
Is the proper PPE for the task available (gloves, eye pro., hearing pro., etc.).	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Proper PPE is provided.</u>			
Is all safety gear inspected for use (safety harness, etc.).	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>Inspected before each use.</u>			
Is everyone aware of emergency procedures.	☒ YES	☐ NO	☐ Not An Issue
Comments: <u>911</u>			

Other comments/concerns:

Personnel involved in task: (SIGN/PRINT)

<u>Eric T. Vogt</u>	<u>Mason Bell</u>	<u>Bobby Wills</u>
<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>



Appendix X: Emissions Calculations

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		Test Run			Average
		1st	2nd	3rd	
Fuel					
HHV (BTU/SCF)		1053			
LHV (BTU/SCF)		950			
F-factor (DSCF/MMBTU)		8534			
Measured Concentrations (bias-corrected where applicable)					
O ₂ (%vd)		12.46	11.73	10.41	11.53
CO (ppmvd)		20.9	20.2	20.8	20.6
NOx (ppmvd)		29.0	29.8	28.1	29.0
HCHO (ppmvd)		13.960	14.069	17.842	15.290
Operating Conditions					
Engine Horsepower (BHP)		3499	3499	3499	3499
Fuel Flow Rate (SCFH)		19500	19458	19541	19500
BSFC (BTU/BHP/hr), LHV		5296	5285	5307	5296
Fuel BTU Consumption (MMBTU/hr)		20.53	20.49	20.57	20.53
Exhaust Flow Rate (SCFH)		433882	398482	349825	394063
Exhaust Flow Rate (SCFM)		7231.4	6641.4	5830.4	6567.7
Calculated Emissions					
CO	(lb/hr)	0.6589	0.5849	0.5287	0.5908
	(ton/year)	2.8859	2.5617	2.3157	2.5877
	(g/BHP-hr)	0.0854	0.0758	0.0685	0.0766
	(ppmvd at 15% O ₂)	14.6102	12.9967	11.6988	13.1019
NOx	(lb/hr)	1.5016	1.4171	1.1731	1.3640
	(ton/year)	6.5770	6.2070	5.1383	5.9741
	(g/BHP-hr)	0.1947	0.1837	0.1521	0.1768
	(ppmvd at 15% O ₂)	20.2725	19.1734	15.8046	18.4168
HCHO	(lb/hr)	0.4718	0.4367	0.4861	0.4649
	(ton/year)	2.0664	1.9126	2.1293	2.0361
	(g/BHP-hr)	0.0612	0.0566	0.0630	0.0603
	(ppmvd at 15% O ₂)	9.7588	9.0520	10.0351	9.6153

Constants			
L	385.5	SCF, 1 mole of ideal gas at EPA standard conditions, 68°F & 1 atm	
grams/lb	453.5924	grams in 1 pound	
Molecular Weight	CO	28.010	lb/lb-mole
	NO _x	46.0056	
	Propane	44.096	
	H ₂	2.016	
	NH ₃	17.0306	

Example calculations for 1st test run using a fuel analysis (EPA Method 19)

Nomenclature:

- HHV - Higher heating value calculated from fuel analysis, units of BTU/SCF, also called BTUF and F_{btu}
- LHV - Lower heating value calculated from fuel analysis, units of BTU/SCF
- Ffactor - EPA F-factor calculated from fuel analysis, units of DSCF/MMBTU
- BSFC - Brake-specific fuel consumption, units BTU/BHP/hr
- R - Fuel BTU consumption is the amount of BTUs consumed in one hour, also called heat input, units of MMBTU/hr
- Qf - Fuel flow rate, units of SCFH
- Qd - Exhaust flow rate, units of SCFH
- PercentO2 - Measured dry concentration of oxygen in engine exhaust, post-emissions control equipment, bias-corrected, units of %
- PPMVD - Measured dry concentration of pollutant (by volume) in engine exhaust, post-emissions control equipment, bias-corrected if appropriate, units of ppmvd
- MW - Molecular weight of pollutant, units of grams/mole
- L - 385.5 SCF is the volume of 1 mole of ideal gas at 68°F and 1 atm (ideal gas law)
- grams/lb - 453.5924 grams in one pound (units conversion factor)
- BHP - Engine horsepower observed during a test run, units of BHP
- Lbs/hr - Mass emission rate of pollutant
- Tons/Year - Mass emission rate of pollutant
- g/BHP-hr - Horsepower-specific mass emission rate of pollutant
- ppmAt15O2 - Measured dry concentration of pollutant (by volume) in engine exhaust adjusted to 15% oxygen, units of ppmvd

Fuel:

$$Q_f = 19500 \text{ SCFH} \quad (\text{user-entry})$$

$$BSFC = \frac{Q_f}{BHP} \times LHV = \frac{19500}{3499} \times 950 = 5296 \text{ BTU/BHP/hr}$$

$$R = \frac{Q_f}{1000000} \times HHV = \frac{19500}{1000000} \times 1053 = 20.53 \text{ MMBTU/hr}$$

Exhaust:

$$Q_d = \frac{R}{\frac{Ffactor}{20.9 - PercentO2}} = \frac{20.53}{\frac{8534}{20.9 - 12.46}} = 43382 \text{ SCFH}$$

$$= 7231.4 \text{ SCFM}$$

CO Emissions:

$$\text{CO Lbs/hr} = \frac{\text{Qd}}{1000000} \times \frac{\text{PPMVD}}{\text{L}} \times \frac{\text{MW}}{\text{L}} = \frac{433882}{1000000} \times \frac{20.9}{1000000} \times \frac{28.01}{385.5}$$

$$= 0.6589 \text{ lbs/hr}$$

$$\text{CO Tons/Year} = \frac{\text{Lbs/hr}}{2000} \times \frac{24}{365} = \frac{0.6589}{2000} \times \frac{24}{365}$$

$$= 2.8859 \text{ tons/year}$$

$$\text{CO g/BHP-hr} = \frac{\text{Lbs/hr}}{\text{BHP}} \times \frac{453.5924}{3499} = \frac{0.6589}{3499} \times \frac{453.5924}{3499}$$

$$= 0.0854 \text{ g/BHP-hr}$$

$$\text{CO ppmAt15O2} = \frac{\text{PPMVD}}{20.9 - \text{PercentO2}} \times \frac{20.9 - 15}{20.9 - 12.46} = \frac{20.9}{20.9 - 12.46} \times \frac{20.9 - 15}{20.9 - 12.46}$$

$$= 14.6102 \text{ ppmvd}$$

NOx Emissions:

$$\text{NOx Lbs/hr} = \frac{\text{Qd}}{1000000} \times \frac{\text{PPMVD}}{\text{L}} \times \frac{\text{MW}}{\text{L}} = \frac{433882}{1000000} \times \frac{29.0}{1000000} \times \frac{46.0056}{385.5}$$

$$= 1.5016 \text{ lbs/hr}$$

$$\text{NOx Tons/Year} = \frac{\text{Lbs/hr}}{2000} \times \frac{24}{365} = \frac{1.5016}{2000} \times \frac{24}{365}$$

$$= 6.5770 \text{ tons/year}$$

$$\text{NOx g/BHP-hr} = \frac{\text{Lbs/hr}}{\text{BHP}} \times \frac{453.5924}{3499} = \frac{1.5016}{3499} \times \frac{453.5924}{3499}$$

$$= 0.1947 \text{ g/BHP-hr}$$

$$\text{NOx ppmAt15O2} = \frac{\text{PPMVD}}{20.9 - \text{PercentO2}} \times \frac{20.9 - 15}{20.9 - 12.46} = \frac{20.9}{20.9 - 12.46} \times \frac{20.9 - 15}{20.9 - 12.46}$$

$$= 20.2725 \text{ ppmvd}$$

HCHO Emissions:

$$\text{HCHO Lbs/hr} = \frac{\text{Qd}}{1000000} \times \frac{\text{PPMVD}}{1} \times \frac{\text{MW}}{\text{L}} = \frac{433882}{1000000} \times \frac{14.0}{1} \times \frac{30.0261}{385.5}$$

$$= 0.4718 \text{ lbs/hr}$$

$$\text{HCHO Tons/Year} = \frac{\text{Lbs/hr}}{2000} \times \frac{24}{1} \times \frac{365}{1} = \frac{0.4718}{2000} \times \frac{24}{1} \times \frac{365}{1}$$

$$= 2.0664 \text{ tons/year}$$

$$\text{HCHO g/BHP-hr} = \frac{\text{Lbs/hr}}{\text{BHP}} \times \frac{453.5924}{1} = \frac{0.4718}{3499} \times \frac{453.5924}{1}$$

$$= 0.0612 \text{ g/BHP-hr}$$

$$\text{HCHO ppmAt15O2} = \frac{\text{PPMVD}}{20.9 - \text{PercentO2}} \times \frac{20.9 - 15}{1} = \frac{13.96}{20.9 - 12.46} \times \frac{20.9 - 15}{1}$$

$$= 9.7588 \text{ ppmvd}$$

Fuel Analysis Constants				
Miscellaneous				
L	385.5	SCF, volume of 1 mole of ideal gas at EPA standard conditions, 68°F & 1 atm		
Component		Molecular Weight MW (lb/lb-mole)	Lower Heating Value LHV (BTU/ft ³)	Higher Heating Value HHV (BTU/ft ³)
Methane	CH ₄	16.042	909.4	1010.0
Ethane	C ₂ H ₆	30.069	1618.7	1769.7
Ethene	C ₂ H ₄	28.053	1499.1	1599.8
Propane	C ₃ H ₈	44.096	2314.9	2516.2
Propene	C ₃ H ₆	42.080	2182.1	2333.0
iso-Butane	i-C ₄ H ₁₀	58.122	3000.4	3252.0
n-Butane	n-C ₄ H ₁₀	58.122	3010.8	3262.4
iso-Pentane	i-C ₅ H ₁₂	72.149	3699.0	4000.9
n-Pentane	n-C ₅ H ₁₂	72.149	3706.9	4008.7
Hexanes	C ₆ H ₁₄	86.175	4403.8	4756.0
Heptanes	C ₇ H ₁₆	100.202	5100.0	5502.5
Octanes	C ₈ H ₁₈	114.229	5796.0	6248.9
Nitrogen (diatomic)	N ₂	28.0135	0.0	0.0
Oxygen (diatomic)	O ₂	31.9988	0.0	0.0
Helium	He	4.0026	0.0	0.0
Carbon Dioxide	CO ₂	44.010	0.0	0.0
Carbon Monoxide	CO	28.010	320.5	320.5
Hydrogen (diatomic)	H ₂	2.0159	273.8	324.2
Hydrogen Sulfide	H ₂ S	34.082	586.8	673.1
Water Vapor	H ₂ O	18.0153	0.0	0.0
Carbon	C	12.0107	-	-
Hydrogen (monoatomic)	H	1.00794	-	-
Oxygen (monoatomic)	O	15.9994	-	-
Sulfur	S	32.065	-	-
Nitrogen (monoatomic)	N	14.0067	-	-

Fuel Analysis Lower Heating Value and Higher Heating Value						
Component		Mole (%)	LHV (BTU/ft ³)	HHV (BTU/ft ³)	Component LHV (BTU/ft ³)	Component HHV (BTU/ft ³)
Methane	CH ₄	88.9540	909.4	1010.0	808.9	898.4
Ethane	C ₂ H ₆	7.6090	1618.7	1769.7	123.2	134.7
Ethene	C ₂ H ₄	0.0000	1499.1	1599.8	0.0	0.0
Propane	C ₃ H ₈	0.7690	2314.9	2516.2	17.8	19.3
Propene	C ₃ H ₆	0.0000	2182.1	2333.0	0.0	0.0
iso-Butane	i-C ₄ H ₁₀	0.0030	3000.4	3252.0	0.1	0.1
n-Butane	n-C ₄ H ₁₀	0.0090	3010.8	3262.4	0.3	0.3
iso-Pentane	i-C ₅ H ₁₂	0.0000	3699.0	4000.9	0.0	0.0
n-Pentane	n-C ₅ H ₁₂	0.0000	3706.9	4008.7	0.0	0.0
Hexanes	C ₆ H ₁₄	0.0000	4403.8	4756.0	0.0	0.0
Heptanes	C ₇ H ₁₆	0.0000	5100.0	5502.5	0.0	0.0
Octanes	C ₈ H ₁₈	0.0000	5796.0	6248.9	0.0	0.0
Nitrogen (diatomic)	N ₂	2.4880	0.0	0.0	0.0	0.0
Oxygen (diatomic)	O ₂	0.0000	0.0	0.0	0.0	0.0
Helium	He	0.0000	0.0	0.0	0.0	0.0
Carbon Dioxide	CO ₂	0.1680	0.0	0.0	0.0	0.0
Carbon Monoxide	CO	0.0000	320.5	320.5	0.0	0.0
Hydrogen (diatomic)	H ₂	0.0000	273.8	324.2	0.0	0.0
Hydrogen Sulfide	H ₂ S	0.0000	586.8	673.1	0.0	0.0
Water Vapor	H ₂ O	0.0000	0.0	0.0	0.0	0.0
		Total:			Fuel LHV (BTU/ft ³):	Fuel HHV (BTU/ft ³):
		100.0000			950	1053

Notes:

1. Values in **Mole** column are user entries from laboratory fuel analysis.
2. Values in **LHV** and **HHV** columns are from **Fuel Analysis Constants** table.
3. Values in **Component LHV** column are calculated as follows: (Mole% / 100) x LHV.
4. Values in **Component HHV** column are calculated as follows: (Mole% / 100) x HHV.
5. **Fuel LHV** calculated as the total of that column.
6. **Fuel HHV** calculated as the total of that column.

Fuel Analysis Gross Calorific Value							
Component		Mole (%)	MW (lb/lb-mole)	HHV (BTU/ft ³)	Weight of Component per lb-mole of Fuel (lbs)	Weight% of Component in Total (%)	Gross Calorific Value GCV (BTU/lb)
Methane	CH ₄	88.9540	16.042	1010.0	14.3	80.7	19595.37
Ethane	C ₂ H ₆	7.6090	30.069	1769.7	2.3	12.9	2936.93
Ethene	C ₂ H ₄	0.0000	28.053	1599.8	0.0	0.0	0.00
Propane	C ₃ H ₈	0.7690	44.096	2516.2	0.3	1.9	422.02
Propene	C ₃ H ₆	0.0000	42.08	2333.0	0.0	0.0	0.00
iso-Butane	i-C ₄ H ₁₀	0.0030	58.122	3252.0	0.0	0.0	2.13
n-Butane	n-C ₄ H ₁₀	0.0090	58.122	3262.4	0.0	0.0	6.40
iso-Pentane	i-C ₅ H ₁₂	0.0000	72.149	4000.9	0.0	0.0	0.00
n-Pentane	n-C ₅ H ₁₂	0.0000	72.149	4008.7	0.0	0.0	0.00
Hexanes	C ₆ H ₁₄	0.0000	86.175	4756.0	0.0	0.0	0.00
Heptanes	C ₇ H ₁₆	0.0000	100.202	5502.5	0.0	0.0	0.00
Octanes	C ₈ H ₁₈	0.0000	114.229	6248.9	0.0	0.0	0.00
Nitrogen (diatomic)	N ₂	2.4880	28.0135	0.0	0.7	3.9	0.00
Oxygen (diatomic)	O ₂	0.0000	31.9988	0.0	0.0	0.0	0.00
Helium	He	0.0000	4.0026	0.0	0.0	0.0	0.00
Carbon Dioxide	CO ₂	0.1680	44.01	0.0	0.1	0.4	0.00
Carbon Monoxide	CO	0.0000	28.01	320.5	0.0	0.0	0.00
Hydrogen (diatomic)	H ₂	0.0000	2.0159	324.2	0.0	0.0	0.00
Hydrogen Sulfide	H ₂ S	0.0000	34.082	673.1	0.0	0.0	0.00
Water Vapor	H ₂ O	0.0000	18.0153	0.0	0.0	0.0	0.00
		Total:			Total:	Total:	Fuel GCV (BTU/lb):
		100.0000			17.7	100.0	22962.85

Notes:

1. Values in **Mole** column are user entries from laboratory fuel analysis.
2. Values in **MW** and **HHV** columns are from **Fuel Analysis Constants** table.
3. Values in **Weight of Component per lb-mole of Fuel** column are calculated as follows: (Mole% / 100) x MW.
4. Values in **Weight% of Component in Total** column are calculated as follows:
(Weight of Component per lb-mole of Fuel / total of that column) x 100.
5. Values in **Gross Calorific Value** column are calculated as follows:

$$\frac{\text{HHV} \times (\text{Weight\% of Component in Total} / 100)}{\text{MW} \times L}$$

where L is from **Fuel Analysis Constants** table.

6. **Fuel GCV** calculated as the total of that column.

Fuel Analysis Weight Percents												
Component		Mole (%)	Carbon	Hydrogen	Oxygen	Sulfur	Nitrogen					
			Monoatomic MW (lb/lb-mole)									
			12.0107	1.00794	15.9994	32.065	14.0067					
			Atoms per Molecule					Elements				
			C	H	O	S	N	Carbon	Hydrogen	Oxygen	Sulfur	Nitrogen
Methane	CH ₄	88.9540	1	4	-	-	-	10.68	3.59	-	-	-
Ethane	C ₂ H ₆	7.6090	2	6	-	-	-	1.83	0.46	-	-	-
Ethene	C ₂ H ₄	0.0000	2	4	-	-	-	0.00	0.00	-	-	-
Propane	C ₃ H ₈	0.7690	3	8	-	-	-	0.28	0.06	-	-	-
Propene	C ₃ H ₆	0.0000	3	6	-	-	-	0.00	0.00	-	-	-
iso-Butane	i-C ₄ H ₁₀	0.0030	4	10	-	-	-	0.00	0.00	-	-	-
n-Butane	n-C ₄ H ₁₀	0.0090	4	10	-	-	-	0.00	0.00	-	-	-
iso-Pentane	i-C ₅ H ₁₂	0.0000	5	12	-	-	-	0.00	0.00	-	-	-
n-Pentane	n-C ₅ H ₁₂	0.0000	5	12	-	-	-	0.00	0.00	-	-	-
Hexanes	C ₆ H ₁₄	0.0000	6	14	-	-	-	0.00	0.00	-	-	-
Heptanes	C ₇ H ₁₆	0.0000	7	16	-	-	-	0.00	0.00	-	-	-
Octanes	C ₈ H ₁₈	0.0000	8	18	-	-	-	0.00	0.00	-	-	-
Nitrogen (diatomic)	N ₂	2.4880	-	-	-	-	2	-	-	-	-	0.70
Oxygen (diatomic)	O ₂	0.0000	-	-	2	-	-	-	-	0.00	-	-
Helium	He	0.0000	-	-	-	-	-	-	-	-	-	-
Carbon Dioxide	CO ₂	0.1680	1	-	2	-	-	0.02	-	0.05	-	-
Carbon Monoxide	CO	0.0000	1	-	1	-	-	0.00	-	0.00	-	-
Hydrogen (diatomic)	H ₂	0.0000	-	2	-	-	-	-	0.00	-	-	-
Hydrogen Sulfide	H ₂ S	0.0000	-	2	-	1	-	-	0.00	-	0.00	-
Water Vapor	H ₂ O	0.0000	-	2	1	-	-	-	0.00	0.00	-	-
		Total:	Total of Element:					12.81	4.11	0.05	0.00	0.70
			Total of All Elements:					17.68				
			Weight Percent of Element:					%C	%H	%O	%S	%N
			100.0000	Weight Percent Total:					72.50	23.25	0.30	0.00
			Weight Percent Total:					100.00				

Notes:

1. Values in **Mole** column are user entries from laboratory fuel analysis.
2. **Monoatomic MW** values are from **Fuel Analysis Constants** table.
3. **Atoms per Molecule** values are from molecular formula (located in **Component** column).
4. For each component, values in **Elements** columns are calculated as follows:
 $(\text{Mole\%} / 100) \times \text{Atoms per Molecule} \times \text{Monoatomic MW}$
 For example, the Hydrogen value for Methane = $(88.9540 / 100) \times 4 \times 1.00794 = 3.59$.
5. Each **Weight Percent of Element** is calculated as follows: $(\text{Total of Element} / \text{Total of All Elements}) \times 100$.

Calculation of F-Factor from Fuel Analysis via EPA Method 19

Nomenclature:

K	-	Conversion factor, 10 ⁶ BTU/million BTU
K _{hd}	-	(3.64 SCF/lb)/%
K _c	-	(1.53 SCF/lb)/%
K _s	-	(0.57 SCF/lb)/%
K _n	-	(0.14 SCF/lb)/%
K _o	-	(0.46 SCF/lb)/%
%H	-	Concentration of hydrogen from fuel analysis, weight percent
%C	-	Concentration of carbon from fuel analysis, weight percent
%S	-	Concentration of sulfur from fuel analysis, weight percent
%N	-	Concentration of nitrogen from fuel analysis, weight percent
%O	-	Concentration of oxygen from fuel analysis, weight percent
GCV	-	Gross calorific value of fuel from fuel analysis, BTU/lb
F _d	-	O ₂ -based F-factor, dry SCF/million BTU

Weight Percent of Element from table Fuel Analysis Weight Percents:

%H	=	23.25 %
%C	=	72.50 %
%S	=	0.00 %
%N	=	3.94 %
%O	=	0.30 %

Gross Calorific Value from table Fuel Analysis Gross Calorific Value:

GCV	=	22962.85 BTU/lb
-----	---	-----------------

EPA Method 19, equation 19-13:

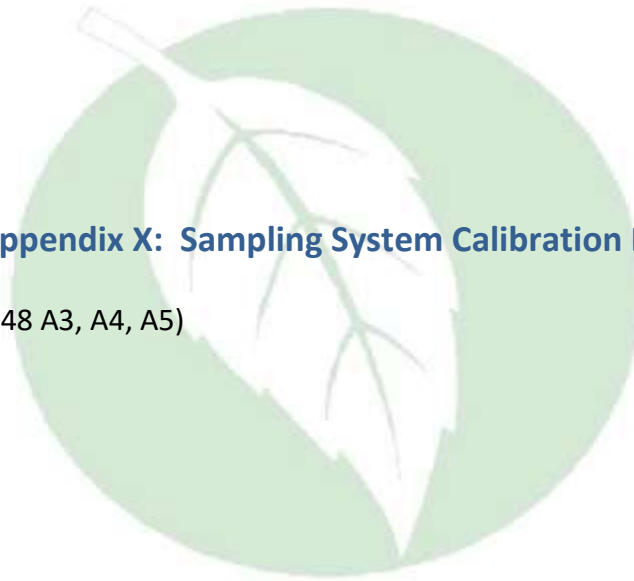
$$F_d = \frac{K \times [(K_{hd} \times \%H) + (K_c \times \%C) + (K_s \times \%S) + (K_n \times \%N) - (K_o \times \%O)]}{GCV}$$

F-factor:

$$F_d = \boxed{8534} \text{ DSCF/MMBTU}$$

Appendix X: Sampling System Calibration Data

(Reference ASTM 6348 A3, A4, A5)



EcoTest
Energy Services





Calibration, Bias, and Drift (Reference ASTM A4, A5, A6)

Post O ₂ Analyzer Calibration Summary								
Test Run	Upscale			Low			Actual Upscale Value (%)	Actual Low Value (%)
	Initial Drift Check (%)	Final Drift Check (%)	Average (%)	Initial Drift Check (%)	Final Drift Check (%)	Average (%)		
1st	5.99	6.02	6.01	0.01	0.00	0.01	6.00	0.00
2nd	6.02	6.00	6.01	0.00	0.02	0.01	6.00	0.00
3rd	6.00	6.02	6.01	0.02	0.01	0.02	6.00	0.00

Post O ₂ System Calibration, Bias, and Drift Data													
Test Run	Upscale					Low					Analyzer Response	Analyzer Response	Span (%)
	Initial Response (%)	Initial Bias (%*)	Final Response (%)	Final Bias (%*)	Drift (%*)	Initial Response (%)	Initial Bias (%*)	Final Response (%)	Final Bias (%*)	Drift (%*)	Mid Level (%)	Low Level (%)	
1st	5.99	0.1	6.02	0.2	0.2	0.01	0.1	0.00	0.0	0.1	6.00	0.00	12.00
2nd	6.02	0.2	6.00	0.0	0.2	0.00	0.0	0.02	0.2	0.2	6.00	0.00	12.00
3rd	6.00	0.0	6.02	0.2	0.2	0.02	0.2	0.01	0.1	0.1	6.00	0.00	12.00

*Percent of span

Bias Corrections

		Test Run			Average
		1st	2nd	3rd	
Post O ₂ (%)	Measured	12.47	11.74	10.41	11.54
	Corrected	12.46	11.73	10.41	11.53

Example calculation of Post O₂ for 1st test run

Nomenclature:

- C_{Gas} - Average effluent gas concentration adjusted for bias, units of ppmvd or %, "Corrected" value in above table
 C_{Avg} - Average unadjusted gas concentration indicated by analyzer, units of ppmvd or %, "Measured" value in above table
 C_{O} - Average of initial and final system calibration bias check responses for low-level calibration gas, units of ppmvd or %, from "Analyzer Calibration Summary" table
 C_{M} - Average of initial and final sytem calibration bias check responses for upscale calibration gas, units of ppmvd or %, from "Analyzer Calibration Summary" table
 C_{MA} - Concentration of upscale calibration gas, units of ppmvd or %, from "Analyzer Calibration Summary" table

Calculation:

$$\begin{aligned}
 C_{\text{Gas}} &= \frac{C_{\text{Avg}} - C_{\text{O}}}{C_{\text{M}} - C_{\text{O}}} \times C_{\text{MA}} = \frac{12.47 - 0.01}{6.01 - 0.01} \times 6.00 \\
 &= \boxed{12.46} \%
 \end{aligned}$$

Percent Recovery Calculations

	NO / CO / Propane		Ethylene		Acetaldehyde	
	Pre Run	Post Run	Pre Run	Post Run	Pre Run	Post Run
Sample File # Stack - Start						
Sample File # Stack - Finish						
Sample File # Stack & Spike - Start						
Sample File # Stack & Spike - Finish						
Cylinder Concentrations						
Carbon Monoxide	3025	3025				
Nitric Oxide	2969	2969				
Propane	3001	3001				
Acetaldehyde					1003	1003
Ethylene			1028	1028		
SF6	4.83	4.83	4.906	4.906	5.205	5.205
Stack Concentrations						
Stack CO Concentration	23.6	23.6				
Stack NO Concentration	24.41	24.41				
Stack Propane Concentration	1.49	1.49				
Stack Acetaldehyde Concentration					0.48	0.48
Stack Ethylene Concentration			3.44	3.44		
Stack SF6 Concentration	-0.0076	-0.0076				
Spiked Concentrations						
Stack + CO Concentration	299.43					
Stack + NO Concentration	301.69					
Stack + Propane Concentration	287.83					
Stack + Acetaldehyde Concentration					94.89	
Stack + Ethylene Concentration			99.76			
Stack + SF6 Concentration	0.48		0.46		0.49	
Dilution Percentage						
Dilution from SF6	10.10%	0.16%	9.38%	0.00%	9.41%	0.00%
Percent Recovery						
Carbon Monoxide	91.10%	-495.04%				
Nitric Oxide	93.33%	-521.68%				
Propane	94.56%	-31.50%				
Acetaldehyde					100.03%	
Ethylene			100.26%			

Calibrator Validation

Serial #:

Date: 12/3/2018

Validation Cal Gas: Oxygen

Concentration: 12.52%

	Reading
Check 1	12.5%
Check 2	12.5%
Check 3	12.5%
Avg	12.5%
Deviation	0.00%

Diluted Cal Gas: Oxygen

Concentration: 80.00%

Target: 12.00%

	Reading	Deviation
Check 1	12.0%	0.08%
Check 2	12.0%	0.17%
Check 3	12.0%	0.08%
Avg	12.0%	
Deviation	0.11%	

Concentration: 80.00%

Target: 6.00%

	Reading	Deviation
Check 1	6.0%	0.17%
Check 2	6.0%	0.17%
Check 3	6.0%	-0.17%
Avg	6.0%	
Deviation	0.06%	

Calibration Checks

Pre-Test Direct

Date: 12/3/2018

	Target Concentration	Actual Reading	Deviation	Response Time	Start	Stop
Ethylene	100	97.88	-2.1%		35	37
Carbon Monoxide	100	99.25	0.8%		20	22
Nitric Oxide	100	98.75	-1.3%		20	22
Propane	100	101.06	1.1%		20	22
Acetaldehyde	100	102.51	2.5%		45	47

Pre-Test System

	Target Concentration	Actual Reading	Deviation	Response Time	Start	Stop
Ethylene	100	98.06	1.9%		70	72
Carbon Monoxide	100	99.17	0.8%		58	60
Nitric Oxide	100	101.14	-1.1%		58	60
Propane	100	101.02	-1.0%		58	60
Acetaldehyde	100	102.57	-2.6%		81	83
Zero				Temperature	190.82	
Run a 2-3 Scans to Show a Good Zero				Atm. Pressure	0.9177	

Post-Test Direct

	Target Concentration	Actual Reading	Deviation	Response Time	Start	Stop
Ethylene	100	99.99	0.0%		26	28
Carbon Monoxide	100	100.4	0.4%		4	6
Nitric Oxide	100	99.52	-0.5%		10	12
Propane	100	100	0.0%		4	6
Acetaldehyde	100	103.99	4.0%		37	39
Zero				Run a 2-3 Scans to Show a Good Zero		

**TELEDYNE-API MODEL T700 RE-CALIBRATION**

Customer: EcoTest

SERIAL #: 3271

4/6/2018

RAI RGA#: 22570

22570

% FULL SCALE	20 LPM	2 LPM	200 cc
0	0.0000	0.0000	0.0000
5	1.1310	0.1012	0.0104
10	2.2180	0.2039	0.0220
15	3.2980	0.3184	0.0332
20	4.3800	0.4269	0.0443
25	5.4610	0.5323	0.0556
30	6.6420	0.6378	0.0669
35	7.6400	0.7450	0.0775
40	8.6880	0.8525	0.0891
45	9.7630	0.9603	0.0997
50	10.8200	1.0660	0.1112
55	11.9300	1.1750	0.1236
60	13.0100	1.2760	0.1344
65	14.1600	1.3920	0.1366
70	15.0900	1.4920	0.1450
75	16.1900	1.6020	0.1549
80	17.3100	1.7230	0.1787
85	18.4300	1.8260	0.1880
90	19.5500	1.9370	0.2010
95	20.7500	2.0490	0.2124
100	22.7400	2.1680	0.2233

Calibration was performed per manufacturers procedures and specifications with a Primary Standard Gilibrator
s/n 1111007 that was last factory certified against N.I.S.T. standard at 25°C on 04/02/2018.


NAME

Date:

4/6/18

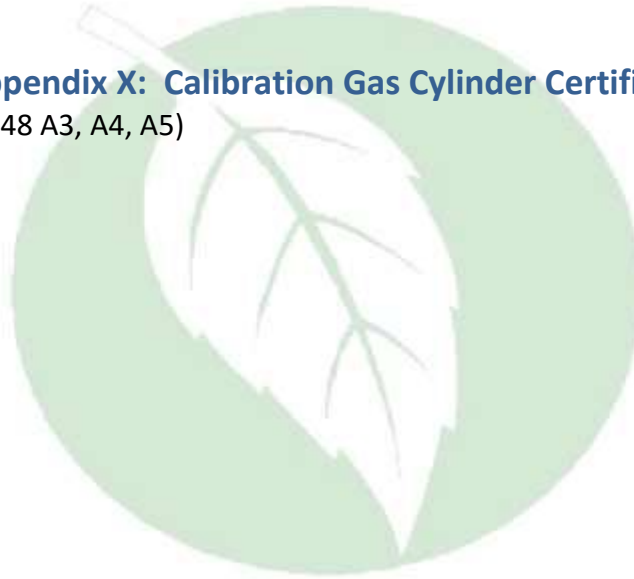
250 Avenue E, Stafford, TX 77477

www.rangeranalytics.com

Office: 281-261-0902

Appendix X: Calibration Gas Cylinder Certificates

(Reference ASTM 6348 A3, A4, A5)



EcoTest
Energy Services

[Redacted]

[Redacted]

[Redacted]

**Airgas**

an Air Liquide company

Airgas USA, LLC616 Miller Cut Off Rd
LaPorte, TX 77571
281-642-6900
Airgas.com**CERTIFICATE OF ANALYSIS**
Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	C310 AIRGAS - FORT WORTH, TX	Reference Number:	126-400955679-1
Part Number:	X03N199C15A5R90	Cylinder Volume:	144.4 CF
Cylinder Number:	CC156056	Cylinder Pressure:	2015 PSIG
Laboratory:	124 - LaPorte Mix (SAP) - TX	Valve Outlet:	350
Analysis Date:	Jul 26, 2017		
Lot Number:	126-400955679-1		

Expiration Date: Jul 26, 2020

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
SULFUR HEXAFLUORIDE	5,000 PPM	4,906 PPM	+/- 5%
ETHYLENE	1000 PPM	1028 PPM	+/- 2%
NITROGEN	Balance		

Notes:

C310 AIRGAS


Approved for Release

Page 1 of 126-400955679-1



Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI87E15A0480	Reference Number:	122-124602409-1
Cylinder Number:	CC495798	Cylinder Volume:	145.5 CF
Laboratory:	124 - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22017	Valve Outlet:	590
Gas Code:	O2.BALN	Certification Date:	Feb 07, 2017

Expiration Date: **Feb 07, 2025**

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

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

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	12.50 %	12.49 %	G1	+/- 0.4% NIST Traceable	02/07/2017
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09060230	CC263091	9.951 % OXYGEN/NITROGEN	+/- 0.3%	Nov 06, 2018

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba MPAS10 O2 41499150042	Paramagnetic	Jan 31, 2017

Triad Data Available Upon Request





Airgas Gulf Coast region
Airgas USA, LLC
666 Miller Cut-Off Road
La Porte, TX 77571
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	ECOTEST ENERGY SERVICES C141	Reference Number:	52-400857142-1
Part Number:	X02OX80C2004005	Cylinder Volume:	226.6 CF
Cylinder Number:	TW01468165	Cylinder Pressure:	2014 PSIG
Laboratory:	190 - Laporte (SAP) - TX	Valve Outlet:	296
Analysis Date:	Feb 09, 2017		
Lot Number:	52-400857142-1		

Expiration Date: Feb 09, 2025

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
NITROGEN	20.00 %	20.00 %	+/- 2%
OXYGEN	Balance		





Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X05NI99C15A51F2	Reference Number:	54-124603635-1
Cylinder Number:	ALM-064602	Cylinder Volume:	6.8 CF
Laboratory:	124 - Chicago - IL	Cylinder Pressure:	72 PSIG
Analysis Date:	Mar 16, 2017	Valve Outlet:	660
Lot Number:	54-124603635-1		

Expiration Date: Mar 16, 2020

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
SULFUR HEXAFLUORIDE	5.000 PPM	4.830 PPM	+/- 5%
CARBON MONOXIDE	3000 PPM	3025 PPM	+/- 2%
NITRIC OXIDE	3000 PPM	2969 PPM	+/- 2%
PROPANE	3000 PPM	3001 PPM	+/- 2%
NITROGEN	Balance		
Total oxides of nitrogen		2971 PPM	For Reference Only



Approved for Release

Page 1 of 54-124603635-1

**CERTIFICATE OF ANALYSIS****Grade of Product: CERTIFIED STANDARD-SPEC**

Customer: ECOTEST ENERGY SERVICES - FORT WORTH, TX
Part Number: X03NI99C15A0033
Cylinder Number: CC703912
Laboratory: 124 - LaPorte Mix (SAP) - TX
Analysis Date: Jan 22, 2018
Lot Number: 126-401097144-1

Airgas USA, LLC

616 Miller Cut Off Rd.
LaPorte, TX 77571
281-842-6900
Airgas.com

Reference Number: 126-401097144-1
Cylinder Volume: 144.5 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 350

Expiration Date: Jan 22, 2019

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

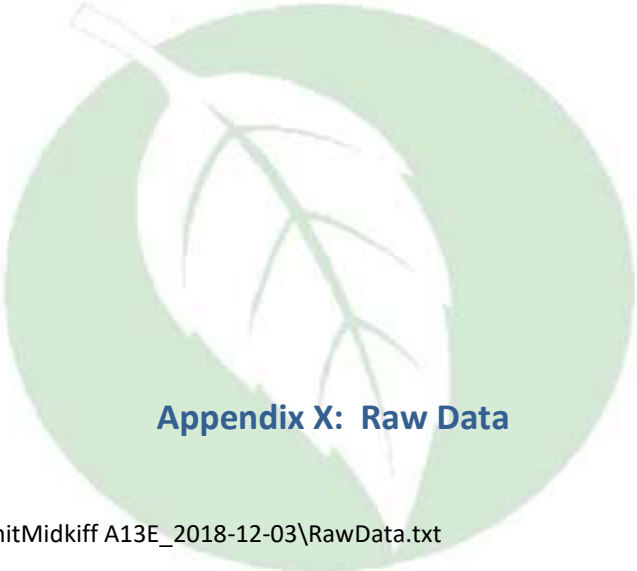
Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
SULFUR HEXAFLUORIDE	5,000 PPM	5,266 PPM	+/- 5%
ACETALDEHYDE	1000 PPM	1007 PPM	+/- 2%
NITROGEN	Balance		

Notes:

ECOTEST ENERGY SERVICES


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Appendix X: Raw Data

Raw Data Filename:

C:\EmTestData\Targa_UnitMidkiff A13E_2018-12-03\RawData.txt

(Reference ASTM 6348 A2, A3, A4, A5)

EcoTest
Energy Services



Targa_UnitMidkiff A13E_2018-12-03

EmTest Raw Data File (comma-delimited text)
Version, 1.24.6293.18335

Notes:

1. This data file was created by EmTest data acquisition and reporting program. This file contains data acquired during an emissions test. For clarity keep Notepad's word wrap off while viewing (main menu: Format | Word wrap).
2. To print an exported raw data file on letter-size paper, open the file with Notepad, and then configure Notepad via it's main menu: File | Page Setup... | Landscape | set left and right margins to 0.25 inches | OK button.

MISCELLANEOUS:

RawDataFileCreationDate, 12/3/2018
ClientCompanyName, Targa Resources
EmissionsSourceUnitID, A13 East

INSTRUMENTS:

enabled,	ID,	manufacturer,	model number,	serial number,	communications, type,	address, IP,	IP, port,	RS232, port,	RS232 settings
True,	1,	"M&C",	"PMA-22",	"13070024",	Analog 2,	192.168.254.51,	7700,	COM1,	"115200,N,8,1"
True,	2,	"MKS Instruments",	"2030",	"017807958",	MKS Toolweb 2,	localhost,	7701,	COM2,	"115200,N,8,1"
True,	3,	"Teledyne",	"T700",	"938",	None,	192.168.254.53,	7700,	COM3,	"115200,N,8,1"
False,	4,	"Vaisala",	"PTU300",	"G1620010",	None,	192.168.254.54,	7700,	COM4,	"115200,N,8,1"
False,	5,	"manufacturer 5",	"model number 5",	"serial number 5",	None,	192.168.254.56,	7700,	COM2,	"115200,N,8,1"
False,	6,	"manufacturer 6",	"model number 6",	"serial number 6",	None,	192.168.254.56,	7700,	COM2,	"115200,N,8,1"
False,	7,	"manufacturer 7",	"model number 7",	"serial number 7",	None,	192.168.254.57,	7700,	COM3,	"115200,N,8,1"
False,	8,	"manufacturer 8",	"model number 8",	"serial number 8",	None,	192.168.254.58,	7700,	COM1,	"115200,N,8,1"
True,	9,	"(Virtual Instrument)",	"(None)",	"(None)",	Derived,	(None),	(None),	COM1,	"(None)"

<end>

MISC CALIBRATION GAS CYLINDERS:

calibration,	rack,	cylinder, serial, gas, slot,	expiration date
MISC 1,	6,	89-400340433-1,	03-19-2019
MISC 2,	5,	EB0071013,	08-14-2023
MISC 3,	2,	X020x80C2004005,	08-18-2020
MISC 4,	4,	CC4787,	06-17-2019

<end>

TEST RESULTS:

*****Calibration Error Check 1*****

Raw Data:

Record, ID,	Date/Time,	Pre O2, Dry, (%),	Post O2, Dry, (%),	Pre CO, Dry, (ppm),	Post CO, Dry, (ppm),	NOx, Dry, (ppm),	VOC Dry, as Prop, (ppm),	THC Dry, as Prop, (ppm),	HCHO, Dry, (ppm),	NH3, Dry, (ppm),	CO2, Dry, (%),	Ambient, Pressure, (inHg),	Ambient, Temp, (degF),	Relative, Humidity, (%),	H2O%, (%),	CO, Wet, (ppm),	NO, Wet, (ppm),	NO2, Wet, (ppm),	Propane, Wet, (ppm),	HCHO, Wet, (ppm),	NH3, Wet, (ppm),	CO2, Wet, (%),	22, (none),	Gas, Pres, (atm),	Gas Temp (degC)
0,	12/03/2018 06:40:50 AM,	?	4.55,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
1,	12/03/2018 06:41:00 AM,	?	3.77,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
2,	12/03/2018 06:41:10 AM,	?	3.72,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
3,	12/03/2018 06:41:20 AM,	?	3.30,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
4,	12/03/2018 06:41:30 AM,	?	3.03,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
5,	12/03/2018 06:41:40 AM,	?	2.69,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
6,	12/03/2018 06:41:50 AM,	?	2.29,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
7,	12/03/2018 06:42:00 AM,	?	1.86,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
8,	12/03/2018 06:42:10 AM,	?	1.50,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
9,	12/03/2018 06:42:20 AM,	?	1.29,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
10,	12/03/2018 06:42:30 AM,	?	1.04,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
11,	12/03/2018 06:42:40 AM,	?	0.81,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
12,	12/03/2018 06:42:50 AM,	?	0.66,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
13,	12/03/2018 06:43:00 AM,	?	0.56,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
14,	12/03/2018 06:43:10 AM,	?	0.54,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
15,	12/03/2018 06:43:20 AM,	?	0.62,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
16,	12/03/2018 06:43:30 AM,	?	0.59,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
17,	12/03/2018 06:43:40 AM,	?	0.48,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
18,	12/03/2018 06:43:50 AM,	?	0.37,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
19,	12/03/2018 06:44:00 AM,	?	0.50,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
20,	12/03/2018 06:44:10 AM,	?	-0.06,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
21,	12/03/2018 06:44:20 AM,	?	-0.02,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
22,	12/03/2018 06:44:30 AM,	?	-0.05,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
23,	12/03/2018 06:44:40 AM,	?	-0.03,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
24,	12/03/2018 06:44:51 AM,	?	-0.06,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
25,	12/03/2018 06:45:01 AM,	?	-0.10,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
26,	12/03/2018 06:45:11 AM,	?	0.12,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
27,	12/03/2018 06:45:21 AM,	?	3.40,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
28,	12/03/2018 06:45:31 AM,	?	6.39,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
29,	12/03/2018 06:45:41 AM,	?	7.86,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
30,	12/03/2018 06:45:51 AM,	?	8.45,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
31,	12/03/2018 06:46:01 AM,	?	8.86,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
32,	12/03/2018 06:46:11 AM,	?	9.30,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
33,	12/03/2018 06:46:21 AM,	?	9.66,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
34,	12/03/2018 06:46:31 AM,	?	9.86,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
35,	12/03/2018 06:46:41 AM,	?	9.97,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
36,	12/03/2018 06:46:51 AM,	?	10.09,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
37,	12/03/2018 06:47:01 AM,	?	10.16,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
38,	12/03/2018 06:47:11 AM,	?	10.22,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
39,	12/03/2018 06:47:21 AM,	?	11.47,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?



```
Miscellaneous:
LoggingInterval (seconds),          10
StabilizeInterval (seconds),       30
CalibrationErrorCheckTolerance (%), 2.0
PreO2InstrumentChannelRange,       unknown
PostO2InstrumentChannelRange,      25
PreCO2InstrumentChannelRange,       unknown
PostCO2InstrumentChannelRange,      1500
NoxInstrumentChannelRange,          1000
DateTimeCompleted,                  12/3/2018 6:50:53 AM, idmAdorpj7IEZuPx02eKCL0R1yp0Hef6A1AG06Ks=
```

calibration, gas,	co2 gas, concentration,	accepted, measured, concentration,	date/time, of accepted, measured concentration,	cylinder, serial, number,	cylinder expiration date
Low Post O2, WF Post O2,	0.00 %, 6.72 %	0.00 %, 6.00 %	12/03/2018 06:44:34 AM, 12/03/2018 06:50:00 AM	zero-cylinder, X020x80C000405	01-01-2020
High Post O2,	12.00 %	11.99 %	12/03/2018 06:48:07 AM	X020x80C000405	08-18-2020

[illegible]

calibration, gas,	cal gas, final cert. concentration,	accepted, measured, concentration,	date/time, of accepted, measured concentration,	cylinder, serial, number,	cylinder expiration date
Low Post O2,	0.00 %	0.01 %	12/03/2018 11:23:40 AM,	zero-cylinder,	01-01-2099
Mid Post O2,	6.00 %	5.99 %	12/03/2018 11:25:15 AM,	X020x80C2004005,	08-18-2020

Targa_UnitMidkiff A13E_2018-12-03

ThcDryIndex,	5																								
HchDryIndex,	6																								
Nh3DryIndex,	7																								
Spare1DryIndex,	8																								
Spare2DryIndex,	-1																								
Spare3DryIndex,	-1																								
Spare4DryIndex,	-1																								
H2OIndex,	13																								
NmhcWetIndex,	-1																								
ThcWetIndex,	-1																								
CowetIndex,	14																								
NmhcIndex,	15																								
No2WetIndex,	16																								
PropaneWetIndex,	17																								
HchowetIndex,	18																								
Nh3WetIndex,	19																								
Spare1WetIndex,	-1																								
Spare2WetIndex,	-1																								
Spare3WetIndex,	-1																								
Spare4WetIndex,	-1																								
Raw Data:																									
Record ID,	Pre O2, Dry (%)	Post O2, Dry (%)	Pre CO, Dry (ppm)	Post CO, Dry (ppm)	NOX, Dry (ppm)	VOC Dry, as PPM (ppm)	THC Dry, as PPM (ppm)	HCHO, Dry (ppm)	NH3, Dry (ppm)	CO2, Dry (%)	Ambient, Pressure (inHg)	Ambient, Temp (degF)	Relative, Humidity (%)	H2O%, Wet (ppm)	CO, Wet (ppm)	NO, Wet (ppm)	NO2, Wet (ppm)	Propane, Wet (ppm)	HCHO, Wet (ppm)	NH3, Wet (ppm)	CO2, Wet (%)	22, (none)	Gas, Pres (atm)	Gas Temp (degC)	
0,	12/03/2018 11:46:05 AM,	?	12.49,	?	21.4,	29.1,	xxxxxxx,	xxxxxxx,	10.341,	xxxxxxx,	?	?	?	?	5.93,	20.1,	26.6,	0.8,	xxxxxxx,	9.727,	xxxxxxx,	?	?	0.916,	191.7
1,	12/03/2018 11:46:15 AM,	?	12.49,	?	21.4,	29.1,	xxxxxxx,	xxxxxxx,	10.341,	xxxxxxx,	?	?	?	?	5.93,	20.1,	26.6,	0.8,	xxxxxxx,	9.727,	xxxxxxx,	?	?	0.916,	191.7
2,	12/03/2018 11:46:25 AM,	?	12.47,	?	21.4,	29.1,	xxxxxxx,	xxxxxxx,	10.341,	xxxxxxx,	?	?	?	?	5.93,	20.1,	26.6,	0.8,	xxxxxxx,	9.727,	xxxxxxx,	?	?	0.916,	191.7
3,	12/03/2018 11:46:35 AM,	?	12.46,	?	21.4,	29.1,	xxxxxxx,	xxxxxxx,	10.341,	xxxxxxx,	?	?	?	?	5.93,	20.1,	26.6,	0.8,	xxxxxxx,	9.727,	xxxxxxx,	?	?	0.916,	191.7
4,	12/03/2018 11:46:45 AM,	?	12.46,	?	21.4,	29.1,	xxxxxxx,	xxxxxxx,	10.341,	xxxxxxx,	?	?	?	?	5.93,	20.1,	26.6,	0.8,	xxxxxxx,	9.727,	xxxxxxx,	?	?	0.916,	191.7
5,	12/03/2018 11:46:55 AM,	?	12.45,	?	21.6,	29.4,	xxxxxxx,	xxxxxxx,	11.441,	xxxxxxx,	?	?	?	?	6.20,	20.3,	26.8,	0.7,	xxxxxxx,	10.732,	xxxxxxx,	?	?	0.916,	191.5
6,	12/03/2018 11:47:05 AM,	?	12.46,	?	21.6,	29.4,	xxxxxxx,	xxxxxxx,	11.441,	xxxxxxx,	?	?	?	?	6.20,	20.3,	26.8,	0.7,	xxxxxxx,	10.732,	xxxxxxx,	?	?	0.916,	191.5
7,	12/03/2018 11:47:15 AM,	?	12.44,	?	21.6,	29.4,	xxxxxxx,	xxxxxxx,	11.441,	xxxxxxx,	?	?	?	?	6.20,	20.3,	26.8,	0.7,	xxxxxxx,	10.732,	xxxxxxx,	?	?	0.916,	191.5
8,	12/03/2018 11:47:25 AM,	?	12.43,	?	21.6,	29.4,	xxxxxxx,	xxxxxxx,	11.441,	xxxxxxx,	?	?	?	?	6.20,	20.3,	26.8,	0.7,	xxxxxxx,	10.732,	xxxxxxx,	?	?	0.916,	191.5
9,	12/03/2018 11:47:35 AM,	?	12.43,	?	21.3,	29.1,	xxxxxxx,	xxxxxxx,	12.110,	xxxxxxx,	?	?	?	?	6.35,	19.9,	26.6,	0.7,	xxxxxxx,	11.340,	xxxxxxx,	?	?	0.916,	191.3
10,	12/03/2018 11:47:45 AM,	?	12.43,	?	21.3,	29.1,	xxxxxxx,	xxxxxxx,	12.110,	xxxxxxx,	?	?	?	?	6.35,	19.9,	26.6,	0.7,	xxxxxxx,	11.340,	xxxxxxx,	?	?	0.916,	191.3
11,	12/03/2018 11:48:05 AM,	?	12.43,	?	21.3,	29.1,	xxxxxxx,	xxxxxxx,	12.110,	xxxxxxx,	?	?	?	?	6.35,	19.9,	26.6,	0.7,	xxxxxxx,	11.340,	xxxxxxx,	?	?	0.916,	191.3
12,	12/03/2018 11:48:15 AM,	?	12.42,	?	21.3,	29.1,	xxxxxxx,	xxxxxxx,	12.110,	xxxxxxx,	?	?	?	?	6.35,	19.9,	26.6,	0.7,	xxxxxxx,	11.340,	xxxxxxx,	?	?	0.916,	191.3
13,	12/03/2018 11:48:25 AM,	?	12.42,	?	21.3,	29.1,	xxxxxxx,	xxxxxxx,	12.110,	xxxxxxx,	?	?	?	?	6.35,	19.9,	26.6,	0.7,	xxxxxxx,	11.340,	xxxxxxx,	?	?	0.916,	191.3
14,	12/03/2018 11:48:35 AM,	?	12.43,	?	21.3,	29.1,	xxxxxxx,	xxxxxxx,	12.110,	xxxxxxx,	?	?	?	?	6.35,	19.9,	26.6,	0.7,	xxxxxxx,	11.340,	xxxxxxx,	?	?	0.916,	191.3
15,	12/03/2018 11:48:45 AM,	?	12.42,	?	21.5,	28.8,	xxxxxxx,	xxxxxxx,	12.013,	xxxxxxx,	?	?	?	?	6.43,	20.2,	26.3,	0.7,	xxxxxxx,	11.240,	xxxxxxx,	?	?	0.916,	191.3
16,	12/03/2018 11:48:55 AM,	?	12.41,	?	21.5,	28.8,	xxxxxxx,	xxxxxxx,	12.013,	xxxxxxx,	?	?	?	?	6.43,	20.2,	26.3,	0.7,	xxxxxxx,	11.240,	xxxxxxx,	?	?	0.916,	191.3
17,	12/03/2018 11:49:05 AM,	?	12.42,	?	21.5,	28.8,	xxxxxxx,	xxxxxxx,	12.013,	xxxxxxx,	?	?	?	?	6.43,	20.2,	26.3,	0.7,	xxxxxxx,	11.240,	xxxxxxx,	?	?	0.916,	191.3
18,	12/03/2018 11:49:15 AM,	?	12.41,	?	21.5,	28.8,	xxxxxxx,	xxxxxxx,	12.013,	xxxxxxx,	?	?	?	?	6.43,	20.2,	26.3,	0.7,	xxxxxxx,	11.240,	xxxxxxx,	?	?	0.916,	191.3
19,	12/03/2018 11:49:25 AM,	?	12.41,	?	21.5,	28.8,	xxxxxxx,	xxxxxxx,	12.013,	xxxxxxx,	?	?	?	?	6.43,	20.2,	26.3,	0.7,	xxxxxxx,	11.240,	xxxxxxx,	?	?	0.916,	191.3
20,	12/03/2018 11:49:35 AM,	?	12.42,	?	21.5,	28.8,	xxxxxxx,	xxxxxxx,	12.013,	xxxxxxx,	?	?	?	?	6.43,	20.2,	26.3,	0.7,	xxxxxxx,	11.240,	xxxxxxx,	?	?	0.916,	191.3
21,	12/03/2018 11:49:45 AM,	?	12.42,	?	21.5,	28.8,	xxxxxxx,	xxxxxxx,	12.013,	xxxxxxx,	?	?	?	?	6.43,	20.2,	26.3,	0.7,	xxxxxxx,	11.240,	xxxxxxx,	?	?	0.916,	191.3
22,	12/03/2018 11:49:55 AM,	?	12.42,	?	21.3,	29.3,	xxxxxxx,	xxxxxxx,	11.414,	xxxxxxx,	?	?	?	?	6.47,	19.9,	26.7,	0.7,	xxxxxxx,	10.675,	xxxxxxx,	?	?	0.916,	191.3
23,	12/03/2018 11:50:05 AM,	?	12.43,	?	21.3,	29.3,	xxxxxxx,	xxxxxxx,	11.414,	xxxxxxx,	?	?	?	?	6.47,	19.9,	26.7,	0.7,	xxxxxxx,	10.675,	xxxxxxx,	?	?	0.916,	191.3
24,	12/03/2018 11:50:15 AM,	?	12.43,	?	21.3,	29.3,	xxxxxxx,	xxxxxxx,	11.414,	xxxxxxx,	?	?	?	?	6.47,	19.9,	26.7,	0.7,	xxxxxxx,	10.675,	xxxxxxx,	?	?	0.916,	191.3
25,	12/03/2018 11:50:26 AM,	?	12.42,	?	21.3,	29.3,	xxxxxxx,	xxxxxxx,	11.414,	xxxxxxx,	?	?	?	?	6.47,	19.9,	26.7,	0.7,	xxxxxxx,	10.675,	xxxxxxx,	?	?	0.916,	191.3
26,	12/03/2018 11:50:36 AM,	?	12.43,	?	21.1,	29.6,	xxxxxxx,	xxxxxxx,	12.081,	xxxxxxx,	?	?	?	?	6.49,	19.7,	27.0,	0.6,	xxxxxxx,	11.296,	xxxxxxx,	?	?	0.916,	191.4
27,	12/03/2018 11:50:46 AM,	?	12.43,	?	21.1,	29.6,	xxxxxxx,	xxxxxxx,	12.081,	xxxxxxx,	?	?	?	?	6.49,	19.7,	27.0,	0.6,	xxxxxxx,	11.296,	xxxxxxx,	?	?	0.916,	191.4
28,	12/03/2018 11:50:56 AM,	?	12.43,	?	21.1,	29.6,	xxxxxxx,	xxxxxxx,	12.081,	xxxxxxx,	?	?	?	?	6.49,	19.7,	27.0,	0.6,	xxxxxxx,	11.296,	xxxxxxx,	?	?	0.916,	191.4
29,	12/03/2018 11:51:06 AM,	?	12.45,	?	21.1,	29.6,	xxxxxxx,	xxxxxxx,	12.081,	xxxxxxx,	?	?	?	?	6.49,	19.7,	27.0,	0.6,	xxxxxxx,	11.296,	xxxxxxx,	?	?	0.916,	191.4
30,	12/03/2018 11:51:16 AM,	?	12.45,	?	21.1,	29.6,	xxxxxxx,	xxxxxxx,	12.081,	xxxxxxx,	?	?	?	?	6.49,	19.7,	27.0,	0.6,	xxxxxxx,	11.296,	xxxxxxx,	?	?	0.916,	191.4
31,	12/03/2018 11:51:26 AM,	?	12.45,	?	21.1,	29.6,	xxxxxxx,	xxxxxxx,	12.081,	xxxxxxx,	?	?	?	?	6.49,	19.7,	27.0,	0.6,	xxxxxxx,	11.296,	xxxxxxx,	?	?	0.916,	191.4
32,	12/03/2018 11:51:36 AM,	?	12.46,	?	21.0,	28.7,	xxxxxxx,	xxxxxxx,	11.263,	xxxxxxx,	?	?	?	?	6.49,	19.6,	26.2,	0.6,	xxxxxxx,	10.532,	xxxxxxx,	?	?	0.916,	191.4
33,	12/03/2018 11:51:46 AM,	?	12.48,	?	21.0,	28.7,	xxxxxxx,	xxxxxxx,	11.263,	xxxxxxx,	?	?	?	?	6.49,	19.6,	26.2,	0.6,	xxxxxxx,	10.532,	xxxxxxx,	?	?	0.916,	191.4
34,	12/03/2018 11:51:56 AM,	?	12.46,	?	21.0,	28.7,	xxxxxxx,	xxxxxxx,	11.263,	xxxxxxx,	?	?	?	?	6.49,	19.6,	26.2,	0.6,	xxxxxxx,	10.532,	xxxxxxx,	?	?	0.916,	191.4
35,	12/03/2018 11:52:06 AM,	?	12.47,	?	21.0,	28.7,	xxxxxxx,	xxxxxxx,	11.263,	xxxxxxx,	?	?	?	?	6.49,	19.6,	26.2,	0.6,	xxxxxxx,	10.532,	xxxxxxx,	?	?	0.916,	191.4
36,	12/03/2018 11:52:16 AM,	?	12.47,	?	21.0,	28.7,	xxxxxxx,	xxxxxxx,	11.263,	xxxxxxx,	?	?	?	?	6.49,	19.6,	26.2,	0.6,	xxxxxxx,	10.532,	xxxxxxx,	?	?	0.916,	191.4
37,	12/03/2018 11:52:26 AM,	?	12.47,	?	21.0,	28.7,	xxxxxxx,	xxxxxxx,	11.263,	xxxxxxx,	?	?	?	?	6.49,	19.6,	26.2,	0.6,	xxxxxxx,	10.532,	xxxxxxx,	?	?	0.916,	191.4
38,	12/03/2018 11:52:36 AM,	?	12.46,	?	21.0,	28.7,	xxxxxxx,	xxxxxxx,	11.263,	xxxxxxx,	?	?	?	?	6.49,	19.6,	26.2,	0.6,	xxxxxxx,	10.532,	xxxxxxx,	?	?	0.916,	191.4
39,	12/03/2018 11:52:46 AM,	?	12.45,	?	21.1,	29.1,	xxxxxxx,	xxxxxxx,	11.635,	xxxxxxx,	?	?	?	?	6.49,	19.7,	26.7,	0.6,	xxxxxxx,	10.880,	xxxxxxx,	?	?	0.916,	191.4
40,	12/03/2018 11:52:56 AM,	?	12.46,	?	21.1,	29.1,	xxxxxxx,	xxxxxxx,	11.635,	xxxxxxx,	?	?	?	?	6.49,	19.7,	26.7,	0.6,	xxxxxxx,	10.880,	xxxxxxx,	?	?	0.916,	191.4
41,	12/03/2018 11:53:06 AM,	?	12.45,	?	21.1,	29.1,	xxxxxxx,	xxxxxxx,	11.635,	xxxxxxx,	?	?	?	?	6.49,	19.7,	26.7,	0.6,	xxxxxxx,	10.880,	xxxxxxx,	?	?	0.916,	191.4
42,	12/03/2018 11:53:16 AM,	?	12.45,	?	21.1,	29.1,	xxxxxxx,	xxxxxxx,	11.635,	xxxxxxx,	?	?	?	?	6.49,	19.7,	26.7,	0.6,	xxxxxxx,	10.880,	xxxxxxx,	?	?	0.916,	191.4
43,	12/03/2018 11:53:26 AM,	?	12.45,	?	21.1,	29.1,	xxxxxxx,	xxxxxxx,	11.635,	xxxxxxx,	?	?	?	?	6.49,	19.7,	26.7,	0.6,	xxxxxxx,	10.880,	xxxxxxx,	?	?	0.916,	191.4
44,	12/03/2018 11:53:36 AM,	?	12.46,	?	21.3,	29.0,	xxxxxxx,	xxxxxxx,	12.139,	xxxxxxx,	?	?	?	?	6.55,	19.9,	26.4,	0.7,	xxxxxxx,	11.344,	xxxxxxx,	?	?	0.916,	191.3
45,	12/03/2018 11:53:46 AM,	?	12.46,	?	21.3,	29.0,	xxxxxxx,	xxxxxxx,	12.139,	xxxxxxx,	?	?	?	?	6.55,	19.9,	26.4,	0.7,	xxxxxxx,	11.344,	xxxxxxx,	?	?	0.916,	191.3
46,	12/03/2018 11:53:56 AM,	?	12.46,	?	21.3,	29.0,	xxxxxxx,	xxxxxxx,	12.139,	xxxxxxx,	?	?	?	?	6.55,	19.9,	26.4,	0.7,	xxxxxxx,	11.344,	xxxxxxx,	?	?	0.916,	191.3
47,	12/03/2018 11:54:06 AM,	?	12.45,	?	21.3,	29.0,	xxxxxxx,	xxxxxxx,	12.139,	xxxxxxx,	?	?	?	?	6.55,	19.9,	26.4,	0.7,	xxxxxxx,	11.344,	xxxxxxx,	?	?	0.916,	191.3
48,	12/03/2018 11:54:16 AM,	?	12.45,	?	21.3,	29.0,	xxxxxxx,	xxxxxxx,	12.139,	xxxxxxx,	?	?	?	?	6.55,	19.9,	26.4,	0.7,	xxxxxxx,	11.344,	xxxxxxx,	?	?	0.916,	191.3
49,	12/03/2018 11:54:26 AM,	?	12.46,	?	21.4,	28.6,	xxxxxxx,	xxxxxxx,	12.357,	xxxxxxx,	?	?	?	?	6.65,	20.0,	26.1,	0.6,	xxxxxxx,	11.535,	xxxxxxx,	?	?	0.916,	191.3
50,	12/03/2018 11:54:36 AM,	?	12.46,	?	21.4,	28.6,	xxxxxxx,	xxxxxxx,	12.357,	xxxxxxx,	?	?	?	?	6.65,	20.0,	26.1,	0.6,	xxxxxxx,	11.535,	xxxxxxx,	?	?	0.916,	191.3
51,	12/03/2018 11:54:46 AM,	?	12.45,	?	21.4,	28.6,	xxxxxxx,	xxxxxxx,	12.357,	xxxxxxx,	?	?	?	?	6.65,	20.0,	26.1,	0.6,	xxxxxxx,	11.535,	xxxxxxx,	?	?	0.916,	191.3
52,	12/03/2018 11:54:56 AM,	?	12.45,	?	21.4,	28.6,	xxxxxxx,	xxxxxxx,	12.357,	xxxxxxx,	?	?	?	?	6.65,	20.0,	26.1,	0.6,	xxxxxxx,	11.535,	xxxxxxx,	?	?	0.916,	191.3
53,	12/03/2018 11:55:06 AM,	?	12.46,	?	21.4,	28.6,	xxxxxxx,	xxxxxxx,	12.357,	xxxxxxx,	?	?	?	?	6.65,	20.0,	26.1,	0.6,	xxxxxxx,	11.535,	xxxxxxx,	?	?	0.916,	191.3
54,	12/03/2018 11:55:17 AM,	?																							

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Targa_UnitMidkiff A13E_2018-12-03

265	12/03/2018	12:30:14 PM	?	12.44	?	20.5	29.5	XXXXXXXXXX	XXXXXXXXXX	13.446	XXXXXXXXXX	?	?	?	?	?	7.55	18.9	27.1	0.2	XXXXXXXXXX	12.430	XXXXXXXXXX	?	?	?	0.915	191.4
266	12/03/2018	12:30:24 PM	?	12.45	?	20.5	29.5	XXXXXXXXXX	XXXXXXXXXX	13.446	XXXXXXXXXX	?	?	?	?	?	7.55	18.9	27.1	0.2	XXXXXXXXXX	12.430	XXXXXXXXXX	?	?	?	0.915	191.4
267	12/03/2018	12:30:34 PM	?	12.45	?	20.3	29.6	XXXXXXXXXX	XXXXXXXXXX	13.782	XXXXXXXXXX	?	?	?	?	?	7.56	18.8	27.2	0.2	XXXXXXXXXX	12.740	XXXXXXXXXX	?	?	?	0.915	191.5
268	12/03/2018	12:30:44 PM	?	12.46	?	20.3	29.6	XXXXXXXXXX	XXXXXXXXXX	13.782	XXXXXXXXXX	?	?	?	?	?	7.56	18.8	27.2	0.2	XXXXXXXXXX	12.740	XXXXXXXXXX	?	?	?	0.915	191.5
269	12/03/2018	12:31:04 PM	?	12.45	?	20.3	29.6	XXXXXXXXXX	XXXXXXXXXX	13.782	XXXXXXXXXX	?	?	?	?	?	7.56	18.8	27.2	0.2	XXXXXXXXXX	12.740	XXXXXXXXXX	?	?	?	0.915	191.5
270	12/03/2018	12:31:14 PM	?	12.46	?	20.3	29.6	XXXXXXXXXX	XXXXXXXXXX	13.782	XXXXXXXXXX	?	?	?	?	?	7.56	18.8	27.2	0.2	XXXXXXXXXX	12.740	XXXXXXXXXX	?	?	?	0.915	191.5
271	12/03/2018	12:31:24 PM	?	12.44	?	20.3	29.6	XXXXXXXXXX	XXXXXXXXXX	13.782	XXXXXXXXXX	?	?	?	?	?	7.56	18.8	27.2	0.2	XXXXXXXXXX	12.740	XXXXXXXXXX	?	?	?	0.915	191.5
272	12/03/2018	12:31:34 PM	?	12.45	?	20.7	29.9	XXXXXXXXXX	XXXXXXXXXX	13.853	XXXXXXXXXX	?	?	?	?	?	7.60	19.1	27.5	0.2	XXXXXXXXXX	12.801	XXXXXXXXXX	?	?	?	0.915	191.5
273	12/03/2018	12:31:44 PM	?	12.44	?	20.7	29.9	XXXXXXXXXX	XXXXXXXXXX	13.853	XXXXXXXXXX	?	?	?	?	?	7.60	19.1	27.5	0.2	XXXXXXXXXX	12.801	XXXXXXXXXX	?	?	?	0.915	191.5
274	12/03/2018	12:31:54 PM	?	12.43	?	20.7	29.9	XXXXXXXXXX	XXXXXXXXXX	13.853	XXXXXXXXXX	?	?	?	?	?	7.60	19.1	27.5	0.2	XXXXXXXXXX	12.801	XXXXXXXXXX	?	?	?	0.915	191.5
275	12/03/2018	12:32:04 PM	?	12.43	?	20.7	29.9	XXXXXXXXXX	XXXXXXXXXX	13.853	XXXXXXXXXX	?	?	?	?	?	7.60	19.1	27.5	0.2	XXXXXXXXXX	12.801	XXXXXXXXXX	?	?	?	0.915	191.5
276	12/03/2018	12:32:15 PM	?	12.43	?	20.7	29.9	XXXXXXXXXX	XXXXXXXXXX	13.853	XXXXXXXXXX	?	?	?	?	?	7.60	19.1	27.5	0.2	XXXXXXXXXX	12.801	XXXXXXXXXX	?	?	?	0.915	191.5
277	12/03/2018	12:32:25 PM	?	12.43	?	20.7	29.9	XXXXXXXXXX	XXXXXXXXXX	13.853	XXXXXXXXXX	?	?	?	?	?	7.60	19.1	27.5	0.2	XXXXXXXXXX	12.801	XXXXXXXXXX	?	?	?	0.915	191.5
278	12/03/2018	12:32:35 PM	?	12.43	?	19.8	31.0	XXXXXXXXXX	XXXXXXXXXX	13.875	XXXXXXXXXX	?	?	?	?	?	7.68	18.3	28.4	0.2	XXXXXXXXXX	12.809	XXXXXXXXXX	?	?	?	0.915	191.5
279	12/03/2018	12:32:45 PM	?	12.44	?	19.8	31.0	XXXXXXXXXX	XXXXXXXXXX	13.875	XXXXXXXXXX	?	?	?	?	?	7.68	18.3	28.4	0.2	XXXXXXXXXX	12.809	XXXXXXXXXX	?	?	?	0.915	191.5
280	12/03/2018	12:33:05 PM	?	12.43	?	19.8	31.0	XXXXXXXXXX	XXXXXXXXXX	13.875	XXXXXXXXXX	?	?	?	?	?	7.68	18.3	28.4	0.2	XXXXXXXXXX	12.809	XXXXXXXXXX	?	?	?	0.915	191.5
281	12/03/2018	12:33:15 PM	?	12.43	?	19.8	31.0	XXXXXXXXXX	XXXXXXXXXX	13.875	XXXXXXXXXX	?	?	?	?	?	7.68	18.3	28.4	0.2	XXXXXXXXXX	12.809	XXXXXXXXXX	?	?	?	0.915	191.5
282	12/03/2018	12:33:25 PM	?	12.45	?	19.8	31.0	XXXXXXXXXX	XXXXXXXXXX	13.875	XXXXXXXXXX	?	?	?	?	?	7.68	18.3	28.4	0.2	XXXXXXXXXX	12.809	XXXXXXXXXX	?	?	?	0.915	191.5
283	12/03/2018	12:33:35 PM	?	12.44	?	20.2	30.0	XXXXXXXXXX	XXXXXXXXXX	15.634	XXXXXXXXXX	?	?	?	?	?	7.81	18.6	27.5	0.2	XXXXXXXXXX	14.413	XXXXXXXXXX	?	?	?	0.915	191.5
284	12/03/2018	12:33:45 PM	?	12.43	?	20.2	30.0	XXXXXXXXXX	XXXXXXXXXX	15.634	XXXXXXXXXX	?	?	?	?	?	7.81	18.6	27.5	0.2	XXXXXXXXXX	14.413	XXXXXXXXXX	?	?	?	0.915	191.5
285	12/03/2018	12:33:55 PM	?	12.43	?	20.2	30.0	XXXXXXXXXX	XXXXXXXXXX	15.634	XXXXXXXXXX	?	?	?	?	?	7.81	18.6	27.5	0.2	XXXXXXXXXX	14.413	XXXXXXXXXX	?	?	?	0.915	191.5
286	12/03/2018	12:34:05 PM	?	12.44	?	20.2	30.0	XXXXXXXXXX	XXXXXXXXXX	15.634	XXXXXXXXXX	?	?	?	?	?	7.81	18.6	27.5	0.2	XXXXXXXXXX	14.413	XXXXXXXXXX	?	?	?	0.915	191.5
287	12/03/2018	12:34:15 PM	?	12.45	?	20.2	30.0	XXXXXXXXXX	XXXXXXXXXX	15.634	XXXXXXXXXX	?	?	?	?	?	7.81	18.6	27.5	0.2	XXXXXXXXXX	14.413	XXXXXXXXXX	?	?	?	0.915	191.5
288	12/03/2018	12:34:25 PM	?	12.45	?	20.4	29.6	XXXXXXXXXX	XXXXXXXXXX	14.449	XXXXXXXXXX	?	?	?	?	?	7.83	18.8	27.1	0.1	XXXXXXXXXX	13.317	XXXXXXXXXX	?	?	?	0.915	191.5
289	12/03/2018	12:34:35 PM	?	12.45	?	20.4	29.6	XXXXXXXXXX	XXXXXXXXXX	14.449	XXXXXXXXXX	?	?	?	?	?	7.83	18.8	27.1	0.1	XXXXXXXXXX	13.317	XXXXXXXXXX	?	?	?	0.915	191.5
290	12/03/2018	12:34:45 PM	?	12.46	?	20.4	29.6	XXXXXXXXXX	XXXXXXXXXX	14.449	XXXXXXXXXX	?	?	?	?	?	7.83	18.8	27.1	0.1	XXXXXXXXXX	13.317	XXXXXXXXXX	?	?	?	0.915	191.5
291	12/03/2018	12:34:55 PM	?	12.45	?	20.4	29.6	XXXXXXXXXX	XXXXXXXXXX	14.449	XXXXXXXXXX	?	?	?	?	?	7.83	18.8	27.1	0.1	XXXXXXXXXX	13.317	XXXXXXXXXX	?	?	?	0.915	191.5
292	12/03/2018	12:35:05 PM	?	12.45	?	20.4	29.6	XXXXXXXXXX	XXXXXXXXXX	14.449	XXXXXXXXXX	?	?	?	?	?	7.83	18.8	27.1	0.1	XXXXXXXXXX	13.317	XXXXXXXXXX	?	?	?	0.915	191.5
293	12/03/2018	12:35:15 PM	?	12.46	?	20.4	29.6	XXXXXXXXXX	XXXXXXXXXX	14.449	XXXXXXXXXX	?	?	?	?	?	7.83	18.8	27.1	0.1	XXXXXXXXXX	13.317	XXXXXXXXXX	?	?	?	0.915	191.5
294	12/03/2018	12:35:25 PM	?	12.46	?	20.3	30.2	XXXXXXXXXX	XXXXXXXXXX	15.748	XXXXXXXXXX	?	?	?	?	?	7.87	18.7	27.7	0.2	XXXXXXXXXX	14.508	XXXXXXXXXX	?	?	?	0.915	191.5
295	12/03/2018	12:35:35 PM	?	12.45	?	20.3	30.2	XXXXXXXXXX	XXXXXXXXXX	15.748	XXXXXXXXXX	?	?	?	?	?	7.87	18.7	27.7	0.2	XXXXXXXXXX	14.508	XXXXXXXXXX	?	?	?	0.915	191.5
296	12/03/2018	12:35:45 PM	?	12.43	?	20.3	30.2	XXXXXXXXXX	XXXXXXXXXX	15.748	XXXXXXXXXX	?	?	?	?	?	7.87	18.7	27.7	0.2	XXXXXXXXXX	14.508	XXXXXXXXXX	?	?	?	0.915	191.5
297	12/03/2018	12:35:55 PM	?	12.43	?	20.3	30.2	XXXXXXXXXX	XXXXXXXXXX	15.748	XXXXXXXXXX	?	?	?	?	?	7.87	18.7	27.7	0.2	XXXXXXXXXX	14.508	XXXXXXXXXX	?	?	?	0.915	191.5
298	12/03/2018	12:36:05 PM	?	12.43	?	20.3	30.2	XXXXXXXXXX	XXXXXXXXXX	15.748	XXXXXXXXXX	?	?	?	?	?	7.87	18.7	27.7	0.2	XXXXXXXXXX	14.508	XXXXXXXXXX	?	?	?	0.915	191.5
299	12/03/2018	12:36:15 PM	?	12.43	?	20.3	30.2	XXXXXXXXXX	XXXXXXXXXX	15.748	XXXXXXXXXX	?	?	?	?	?	7.87	18.7	27.7	0.2	XXXXXXXXXX	14.508	XXXXXXXXXX	?	?	?	0.915	191.5
300	12/03/2018	12:36:25 PM	?	12.43	?	20.0	30.0	XXXXXXXXXX	XXXXXXXXXX	18.621	XXXXXXXXXX	?	?	?	?	?	8.03	18.4	27.4	0.2	XXXXXXXXXX	17.125	XXXXXXXXXX	?	?	?	0.915	191.4
301	12/03/2018	12:36:35 PM	?	12.44	?	20.0	30.0	XXXXXXXXXX	XXXXXXXXXX	18.621	XXXXXXXXXX	?	?	?	?	?	8.03	18.4	27.4	0.2	XXXXXXXXXX	17.125	XXXXXXXXXX	?	?	?	0.915	191.4
302	12/03/2018	12:36:45 PM	?	12.44	?	20.0	30.0	XXXXXXXXXX	XXXXXXXXXX	18.621	XXXXXXXXXX	?	?	?	?	?	8.03	18.4	27.4	0.2	XXXXXXXXXX	17.125	XXXXXXXXXX	?	?	?	0.915	191.4
303	12/03/2018	12:36:55 PM	?	12.44	?	20.0	30.0	XXXXXXXXXX	XXXXXXXXXX	18.621	XXXXXXXXXX	?	?	?	?	?	8.03	18.4	27.4	0.2	XXXXXXXXXX	17.125	XXXXXXXXXX	?	?	?	0.915	191.4
304	12/03/2018	12:37:05 PM	?	12.45	?	20.0	30.0	XXXXXXXXXX	XXXXXXXXXX	18.621	XXXXXXXXXX	?	?	?	?	?	8.03	18.4	27.4	0.2	XXXXXXXXXX	17.125	XXXXXXXXXX	?	?	?	0.915	191.4
305	12/03/2018	12:37:15 PM	?	12.46	?	20.0	30.0	XXXXXXXXXX	XXXXXXXXXX	18.621	XXXXXXXXXX	?	?	?	?	?	8.03	18.4	27.4	0.2	XXXXXXXXXX	17.125	XXXXXXXXXX	?	?	?	0.915	191.4
306	12/03/2018	12:37:25 PM	?	12.46	?	20.8	29.6	XXXXXXXXXX	XXXXXXXXXX	18.333	XXXXXXXXXX	?	?	?	?	?	8.12	19.1	27.0	0.2	XXXXXXXXXX	16.845	XXXXXXXXXX	?	?	?	0.915	191.4
307	12/03/2018	12:37:35 PM	?	12.46	?	20.8	29.6	XXXXXXXXXX	XXXXXXXXXX	18.333	XXXXXXXXXX	?	?	?	?	?	8.12	19.1	27.0	0.2	XXXXXXXXXX	16.845	XXXXXXXXXX	?	?	?	0.915	191.4
308	12/03/2018	12:37:45 PM	?	12.46	?	20.8	29.6	XXXXXXXXXX	XXXXXXXXXX	18.333	XXXXXXXXXX	?	?	?	?	?	8.12	19.1	27.0	0.2	XXXXXXXXXX	16.845	XXXXXXXXXX	?	?	?	0.915	191.4
309	12/03/2018	12:37:55 PM	?	12.45	?	20.8	29.6	XXXXXXXXXX	XXXXXXXXXX	18.333	XXXXXXXXXX	?	?	?	?	?	8.12	19.1	27.0	0.2	XXXXXXXXXX	16.845	XXXXXXXXXX	?	?	?	0.915	191.4
310	12/03/2018	12:38:05 PM	?	12.45	?	20.8	29.6	XXXXXXXXXX	XXXXXXXXXX	18.333	XXXXXXXXXX	?	?	?	?	?	8.12	19.1	27.0	0.2	XXXXXXXXXX	16.845	XXXXXXXXXX	?	?	?	0.915	191.4
311	12/03/2018	12:38:15 PM	?	12.45	?	20.8	29.6	XXXXXXXXXX	XXXXXXXXXX	18.333	XXXXXXXXXX	?	?	?	?	?	8.12	19.1	27.0	0.2	XXXXXXXXXX	16.845	XXXXXXXXXX	?	?	?	0.915	191.4
312	12/03/2018	12:38:25 PM	?	12.45	?	20.5	29.5	XXXXXXXXXX	XXXXXXXXXX	16.837	XXXXXXXXXX	?	?	?	?	?	8.11	18.8	26.9	0.2	XXXXXXXXXX	15.472	XXXXXXXXXX	?	?	?	0.915	191.5
313	12/03/2018	12:38:35 PM	?	12.45	?	20.5	29.5	XXXXXXXXXX	XXXXXXXXXX	16.837	XXXXXXXXXX	?	?	?	?	?	8.11	18.8	26.9	0.2	XXXXXXXXXX	15.472	XXXXXXXXXX	?	?	?	0.915	191.5
314	12/03/2018	12:38:45 PM	?	12.46	?	20.5	29.5	XXXXXXXXXX	XXXXXXXXXX	16.837	XXXXXXXXXX	?	?	?	?	?	8.11	18.8	26.9	0.2	XXXXXXXXXX	15.472	XXXXXXXXXX	?	?	?	0.915	191.5
315	12/03/2018	12:38:55 PM	?	12.46	?	20.5	29.5	XXXXXXXXXX	XXXXXXXXXX	16.837	XXXXXXXXXX	?	?	?	?	?	8.11	18.8	26.9	0.2	XXXXXXXXXX	15.472	XXXXXXXXXX	?	?	?	0.915	191.5
316	12/03/2018	12:39:05 PM	?	12.46	?	20.7	29.0	XXXXXXXXXX	XXXXXXXXXX	16.811	XXXXXXXXXX	?	?	?	?	?	8.19	19.0	26.4	0.2	XXXXXXXXXX	15.435	XXXXXXXXXX	?	?	?	0.915	191.5
317	12/03/2018	12:39:15 PM	?	12.46	?	20.7	29.0	XXXXXXXXXX	XXXXXXXXXX	16.811	XXXXXXXXXX	?	?	?	?	?	8.19	19.0	26.4	0.2	XXXXXXXXXX	15.435	XXXXXXXXXX	?	?	?	0.915	191.5
318	12/03/2018	12:39:25 PM	?	12.48	?	20.7	29.0	XXXXXXXXXX	XXXXXXXXXX	16.811	XXXXXXXXXX	?	?	?	?	?	8.1											



Targa_UnitMidkiff A13E_2018-12-03

<end> AverageMeasuredValues, 7, 12.47, 7, 20.9, 29.0, xxxxxxxx, xxxxxxxx, 13.960, xxxxxxxx, 7, 7, 7, 7, 7.49, 19.3, 26.6, 0.3, xxxxxxxx, 12.907, xxxxxxxx, 7, 7, 0.916, 191.4

Miscellaneous: 10
LoggingInterval (seconds), 60
TestRunInterval (minutes), 12/3/2018 12:46:18 PM, sDo7WvVwB/A1XHisLOTSHG3MrjhalpIrm/T/+oTptE=

*****Bias Check 2*****
TestCfgFilePathNameExt, "C:\EmTestData\Targa_UnitMidkiff A13W_2018-12-03\EmTest.xls"

Record ID	Date/Time	Pre O2 Dry (%)	Post O2 Dry (%)	Pre CO Dry (ppm)	Post CO Dry (ppm)	NOx Dry (ppm)	VOC Dry as Prop (ppm)	THC Dry as Prop (ppm)	HCHO Dry (ppm)	NH3 Dry (ppm)	CO2 Dry (%)	Ambient Pressure (InHg)	Ambient Temp (degF)	Relative Humidity (%)	H2O (%)	CO wet (ppm)	NO wet (ppm)	NO2 wet (ppm)	Propane wet (ppm)	HCHO wet (ppm)	NH3 wet (ppm)	CO2 wet (%)	22 (none)	Gas Pres (atm)	Gas Temp (degC)
0	12/03/2018 12:46:32 PM	7	12.48	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
1	12/03/2018 12:46:42 PM	7	12.52	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
2	12/03/2018 12:46:52 PM	7	12.52	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
3	12/03/2018 12:47:02 PM	7	9.84	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
4	12/03/2018 12:47:12 PM	7	8.37	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
5	12/03/2018 12:47:22 PM	7	7.81	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
6	12/03/2018 12:47:32 PM	7	7.70	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
7	12/03/2018 12:47:42 PM	7	6.97	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	12/03/2018 12:47:52 PM	7	6.66	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
9	12/03/2018 12:48:03 PM	7	6.41	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
10	12/03/2018 12:48:13 PM	7	6.46	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
11	12/03/2018 12:48:23 PM	7	6.30	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
12	12/03/2018 12:48:33 PM	7	6.05	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
13	12/03/2018 12:48:43 PM	7	5.96	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
14	12/03/2018 12:48:53 PM	7	5.86	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
15	12/03/2018 12:49:03 PM	7	5.77	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
16	12/03/2018 12:49:13 PM	7	5.47	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
17	12/03/2018 12:49:23 PM	7	5.43	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
18	12/03/2018 12:49:33 PM	7	3.94	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
19	12/03/2018 12:49:43 PM	7	3.02	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
20	12/03/2018 12:49:53 PM	7	2.06	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
21	12/03/2018 12:50:03 PM	7	1.84	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
22	12/03/2018 12:50:13 PM	7	1.18	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
23	12/03/2018 12:50:23 PM	7	1.26	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
24	12/03/2018 12:50:33 PM	7	0.80	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
25	12/03/2018 12:50:43 PM	7	0.67	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
26	12/03/2018 12:50:53 PM	7	0.29	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
27	12/03/2018 12:51:03 PM	7	0.01	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
28	12/03/2018 12:51:13 PM	7	0.18	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
29	12/03/2018 12:51:23 PM	7	0.24	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
30	12/03/2018 12:51:33 PM	7	0.14	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
31	12/03/2018 12:51:43 PM	7	0.10	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
32	12/03/2018 12:51:53 PM	7	0.01	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

Miscellaneous: 10
LoggingInterval (seconds), 30
StabilizeInterval (seconds), 5.0
BiasCheckTolerance (%), 3.0
DriftCheckTolerance (%), 12/3/2018 12:51:57 PM, qrQdAvjQD57Ydmr3kZjycFCwnauCK74S81rTwoEQag=

calibration gas	cal gas concentration	accepted measured concentration	date/time of accepted measured concentration	cylinder serial number	cylinder expiration date
Low Post O2	0.00 %	0.00 %	12/03/2018 12:51:55 PM	zero-cylinder	01-01-2099
Mid Post O2	6.00 %	6.02 %	12/03/2018 12:49:07 PM	x026x80C2004005	08-18-2020

*****Test Run 2*****
TestCfgFilePathNameExt, "C:\EmTestData\Targa_UnitMidkiff A13W_2018-12-03\EmTest.xls"

PreO2DryIndex, -1
PostO2DryIndex, -1
PreCODryIndex, -1
PostCODryIndex, 3
NOxDryIndex, 4
VOCDryIndex, 5
THCDryIndex, 6
HCHODryIndex, 7
NH3DryIndex, 8
Spare1DryIndex, -1
Spare2DryIndex, -1
Spare3DryIndex, -1
Spare4DryIndex, -1
H2OIndex, 13
NMHCWetIndex, -1
THCWetIndex, -1
COwetIndex, 14
NOwetIndex, 15
NO2WetIndex, 16
PropanewetIndex, 17
HCHOWetIndex, 18
NH3WetIndex, 19
Spare1WetIndex, -1



Raw Data:

54

Targa_UnitMidkiff A13E_2018-12-03

87	12/03/2018	01:08:23 PM	?	11.77	?	20.4	30.9	XXXXXXXXXX	XXXXXXXXXX	14.586	XXXXXXXXXX	?	?	?	6.92	19.0	28.1	0.6	XXXXXXXXXX	13.577	XXXXXXXXXX	?	?	?	0.915	191.3
88	12/03/2018	01:08:34 PM	?	11.79	?	20.4	30.9	XXXXXXXXXX	XXXXXXXXXX	14.586	XXXXXXXXXX	?	?	?	6.92	19.0	28.1	0.6	XXXXXXXXXX	13.577	XXXXXXXXXX	?	?	?	0.915	191.3
89	12/03/2018	01:08:44 PM	?	11.79	?	20.4	30.9	XXXXXXXXXX	XXXXXXXXXX	14.586	XXXXXXXXXX	?	?	?	6.92	19.0	28.1	0.6	XXXXXXXXXX	13.577	XXXXXXXXXX	?	?	?	0.915	191.3
90	12/03/2018	01:08:54 PM	?	11.79	?	20.4	30.9	XXXXXXXXXX	XXXXXXXXXX	14.586	XXXXXXXXXX	?	?	?	6.92	19.0	28.1	0.6	XXXXXXXXXX	13.577	XXXXXXXXXX	?	?	?	0.915	191.3
91	12/03/2018	01:09:04 PM	?	11.80	?	20.4	30.9	XXXXXXXXXX	XXXXXXXXXX	14.586	XXXXXXXXXX	?	?	?	6.92	19.0	28.1	0.6	XXXXXXXXXX	13.577	XXXXXXXXXX	?	?	?	0.915	191.3
92	12/03/2018	01:09:14 PM	?	11.80	?	20.4	30.9	XXXXXXXXXX	XXXXXXXXXX	14.586	XXXXXXXXXX	?	?	?	6.92	19.0	28.1	0.6	XXXXXXXXXX	13.577	XXXXXXXXXX	?	?	?	0.915	191.3
93	12/03/2018	01:09:24 PM	?	11.79	?	20.6	30.6	XXXXXXXXXX	XXXXXXXXXX	15.103	XXXXXXXXXX	?	?	?	7.06	19.1	27.8	0.6	XXXXXXXXXX	14.037	XXXXXXXXXX	?	?	?	0.915	191.2
94	12/03/2018	01:09:34 PM	?	11.79	?	20.6	30.6	XXXXXXXXXX	XXXXXXXXXX	15.103	XXXXXXXXXX	?	?	?	7.06	19.1	27.8	0.6	XXXXXXXXXX	14.037	XXXXXXXXXX	?	?	?	0.915	191.2
95	12/03/2018	01:09:44 PM	?	11.79	?	20.6	30.6	XXXXXXXXXX	XXXXXXXXXX	15.103	XXXXXXXXXX	?	?	?	7.06	19.1	27.8	0.6	XXXXXXXXXX	14.037	XXXXXXXXXX	?	?	?	0.915	191.2
96	12/03/2018	01:09:54 PM	?	11.79	?	20.6	30.6	XXXXXXXXXX	XXXXXXXXXX	15.103	XXXXXXXXXX	?	?	?	7.06	19.1	27.8	0.6	XXXXXXXXXX	14.037	XXXXXXXXXX	?	?	?	0.915	191.2
97	12/03/2018	01:10:04 PM	?	11.79	?	20.6	30.6	XXXXXXXXXX	XXXXXXXXXX	15.103	XXXXXXXXXX	?	?	?	7.06	19.1	27.8	0.6	XXXXXXXXXX	14.037	XXXXXXXXXX	?	?	?	0.915	191.2
98	12/03/2018	01:10:14 PM	?	11.80	?	20.6	30.6	XXXXXXXXXX	XXXXXXXXXX	15.103	XXXXXXXXXX	?	?	?	7.06	19.1	27.8	0.6	XXXXXXXXXX	14.037	XXXXXXXXXX	?	?	?	0.915	191.2
99	12/03/2018	01:10:24 PM	?	11.82	?	21.1	30.2	XXXXXXXXXX	XXXXXXXXXX	16.515	XXXXXXXXXX	?	?	?	7.37	19.5	27.3	0.6	XXXXXXXXXX	15.298	XXXXXXXXXX	?	?	?	0.915	191.1
100	12/03/2018	01:10:34 PM	?	11.80	?	21.1	30.2	XXXXXXXXXX	XXXXXXXXXX	16.515	XXXXXXXXXX	?	?	?	7.37	19.5	27.3	0.6	XXXXXXXXXX	15.298	XXXXXXXXXX	?	?	?	0.915	191.1
101	12/03/2018	01:10:44 PM	?	11.80	?	21.1	30.2	XXXXXXXXXX	XXXXXXXXXX	16.515	XXXXXXXXXX	?	?	?	7.37	19.5	27.3	0.6	XXXXXXXXXX	15.298	XXXXXXXXXX	?	?	?	0.915	191.1
102	12/03/2018	01:10:54 PM	?	11.79	?	21.1	30.2	XXXXXXXXXX	XXXXXXXXXX	16.515	XXXXXXXXXX	?	?	?	7.37	19.5	27.3	0.6	XXXXXXXXXX	15.298	XXXXXXXXXX	?	?	?	0.915	191.1
103	12/03/2018	01:11:04 PM	?	11.80	?	20.6	29.8	XXXXXXXXXX	XXXXXXXXXX	15.477	XXXXXXXXXX	?	?	?	7.48	19.1	27.4	0.2	XXXXXXXXXX	14.320	XXXXXXXXXX	?	?	?	0.915	191.0
104	12/03/2018	01:11:14 PM	?	11.81	?	20.6	29.8	XXXXXXXXXX	XXXXXXXXXX	15.477	XXXXXXXXXX	?	?	?	7.48	19.1	27.4	0.2	XXXXXXXXXX	14.320	XXXXXXXXXX	?	?	?	0.915	191.0
105	12/03/2018	01:11:24 PM	?	11.80	?	20.6	29.8	XXXXXXXXXX	XXXXXXXXXX	15.477	XXXXXXXXXX	?	?	?	7.48	19.1	27.4	0.2	XXXXXXXXXX	14.320	XXXXXXXXXX	?	?	?	0.915	191.0
106	12/03/2018	01:11:34 PM	?	11.80	?	20.6	29.8	XXXXXXXXXX	XXXXXXXXXX	15.477	XXXXXXXXXX	?	?	?	7.48	19.1	27.4	0.2	XXXXXXXXXX	14.320	XXXXXXXXXX	?	?	?	0.915	191.0
107	12/03/2018	01:11:44 PM	?	11.80	?	20.6	29.8	XXXXXXXXXX	XXXXXXXXXX	15.477	XXXXXXXXXX	?	?	?	7.48	19.1	27.4	0.2	XXXXXXXXXX	14.320	XXXXXXXXXX	?	?	?	0.915	191.0
108	12/03/2018	01:11:54 PM	?	11.80	?	20.6	29.8	XXXXXXXXXX	XXXXXXXXXX	15.477	XXXXXXXXXX	?	?	?	7.48	19.1	27.4	0.2	XXXXXXXXXX	14.320	XXXXXXXXXX	?	?	?	0.915	191.0
109	12/03/2018	01:12:04 PM	?	11.79	?	20.3	30.3	XXXXXXXXXX	XXXXXXXXXX	15.827	XXXXXXXXXX	?	?	?	7.61	18.8	27.8	0.2	XXXXXXXXXX	14.622	XXXXXXXXXX	?	?	?	0.915	191.1
110	12/03/2018	01:12:14 PM	?	11.79	?	20.3	30.3	XXXXXXXXXX	XXXXXXXXXX	15.827	XXXXXXXXXX	?	?	?	7.61	18.8	27.8	0.2	XXXXXXXXXX	14.622	XXXXXXXXXX	?	?	?	0.915	191.1
111	12/03/2018	01:12:24 PM	?	11.80	?	20.3	30.3	XXXXXXXXXX	XXXXXXXXXX	15.827	XXXXXXXXXX	?	?	?	7.61	18.8	27.8	0.2	XXXXXXXXXX	14.622	XXXXXXXXXX	?	?	?	0.915	191.1
112	12/03/2018	01:12:34 PM	?	11.80	?	20.3	30.3	XXXXXXXXXX	XXXXXXXXXX	15.827	XXXXXXXXXX	?	?	?	7.61	18.8	27.8	0.2	XXXXXXXXXX	14.622	XXXXXXXXXX	?	?	?	0.915	191.1
113	12/03/2018	01:12:44 PM	?	11.82	?	20.3	30.3	XXXXXXXXXX	XXXXXXXXXX	15.827	XXXXXXXXXX	?	?	?	7.61	18.8	27.8	0.2	XXXXXXXXXX	14.622	XXXXXXXXXX	?	?	?	0.915	191.1
114	12/03/2018	01:12:54 PM	?	11.82	?	20.3	30.3	XXXXXXXXXX	XXXXXXXXXX	15.827	XXXXXXXXXX	?	?	?	7.61	18.8	27.8	0.2	XXXXXXXXXX	14.622	XXXXXXXXXX	?	?	?	0.915	191.1
115	12/03/2018	01:13:04 PM	?	11.81	?	21.0	29.0	XXXXXXXXXX	XXXXXXXXXX	16.839	XXXXXXXXXX	?	?	?	7.62	19.4	26.6	0.2	XXXXXXXXXX	15.556	XXXXXXXXXX	?	?	?	0.915	191.2
116	12/03/2018	01:13:14 PM	?	11.81	?	21.0	29.0	XXXXXXXXXX	XXXXXXXXXX	16.839	XXXXXXXXXX	?	?	?	7.62	19.4	26.6	0.2	XXXXXXXXXX	15.556	XXXXXXXXXX	?	?	?	0.915	191.2
117	12/03/2018	01:13:24 PM	?	11.82	?	21.0	29.0	XXXXXXXXXX	XXXXXXXXXX	16.839	XXXXXXXXXX	?	?	?	7.62	19.4	26.6	0.2	XXXXXXXXXX	15.556	XXXXXXXXXX	?	?	?	0.915	191.2
118	12/03/2018	01:13:34 PM	?	11.82	?	21.0	29.0	XXXXXXXXXX	XXXXXXXXXX	16.839	XXXXXXXXXX	?	?	?	7.62	19.4	26.6	0.2	XXXXXXXXXX	15.556	XXXXXXXXXX	?	?	?	0.915	191.2
119	12/03/2018	01:13:44 PM	?	11.82	?	21.0	29.0	XXXXXXXXXX	XXXXXXXXXX	16.839	XXXXXXXXXX	?	?	?	7.62	19.4	26.6	0.2	XXXXXXXXXX	15.556	XXXXXXXXXX	?	?	?	0.915	191.2
120	12/03/2018	01:13:54 PM	?	11.84	?	21.0	29.0	XXXXXXXXXX	XXXXXXXXXX	16.839	XXXXXXXXXX	?	?	?	7.62	19.4	26.6	0.2	XXXXXXXXXX	15.556	XXXXXXXXXX	?	?	?	0.915	191.2
121	12/03/2018	01:13:55 PM	?	11.84	?	21.0	29.0	XXXXXXXXXX	XXXXXXXXXX	16.839	XXXXXXXXXX	?	?	?	7.62	19.4	26.6	0.2	XXXXXXXXXX	15.556	XXXXXXXXXX	?	?	?	0.915	191.2
122	12/03/2018	01:14:05 PM	?	11.85	?	21.3	28.9	XXXXXXXXXX	XXXXXXXXXX	14.897	XXXXXXXXXX	?	?	?	7.51	19.7	26.5	0.2	XXXXXXXXXX	13.778	XXXXXXXXXX	?	?	?	0.915	191.2
123	12/03/2018	01:14:15 PM	?	11.83	?	21.3	28.9	XXXXXXXXXX	XXXXXXXXXX	14.897	XXXXXXXXXX	?	?	?	7.51	19.7	26.5	0.2	XXXXXXXXXX	13.778	XXXXXXXXXX	?	?	?	0.915	191.2
124	12/03/2018	01:14:25 PM	?	11.83	?	21.3	28.9	XXXXXXXXXX	XXXXXXXXXX	14.897	XXXXXXXXXX	?	?	?	7.51	19.7	26.5	0.2	XXXXXXXXXX	13.778	XXXXXXXXXX	?	?	?	0.915	191.2
125	12/03/2018	01:14:35 PM	?	11.83	?	21.3	28.9	XXXXXXXXXX	XXXXXXXXXX	14.897	XXXXXXXXXX	?	?	?	7.51	19.7	26.5	0.2	XXXXXXXXXX	13.778	XXXXXXXXXX	?	?	?	0.915	191.2
126	12/03/2018	01:14:45 PM	?	11.85	?	21.3	28.9	XXXXXXXXXX	XXXXXXXXXX	14.897	XXXXXXXXXX	?	?	?	7.51	19.7	26.5	0.2	XXXXXXXXXX	13.778	XXXXXXXXXX	?	?	?	0.915	191.2
127	12/03/2018	01:14:55 PM	?	11.84	?	20.9	28.3	XXXXXXXXXX	XXXXXXXXXX	14.602	XXXXXXXXXX	?	?	?	7.51	19.4	26.0	0.2	XXXXXXXXXX	13.506	XXXXXXXXXX	?	?	?	0.915	191.3
128	12/03/2018	01:15:05 PM	?	11.83	?	20.9	28.3	XXXXXXXXXX	XXXXXXXXXX	14.602	XXXXXXXXXX	?	?	?	7.51	19.4	26.0	0.2	XXXXXXXXXX	13.506	XXXXXXXXXX	?	?	?	0.915	191.3
129	12/03/2018	01:15:15 PM	?	11.83	?	20.9	28.3	XXXXXXXXXX	XXXXXXXXXX	14.602	XXXXXXXXXX	?	?	?	7.51	19.4	26.0	0.2	XXXXXXXXXX	13.506	XXXXXXXXXX	?	?	?	0.915	191.3
130	12/03/2018	01:15:25 PM	?	11.82	?	20.9	28.3	XXXXXXXXXX	XXXXXXXXXX	14.602	XXXXXXXXXX	?	?	?	7.51	19.4	26.0	0.2	XXXXXXXXXX	13.506	XXXXXXXXXX	?	?	?	0.915	191.3
131	12/03/2018	01:15:35 PM	?	11.82	?	20.9	28.3	XXXXXXXXXX	XXXXXXXXXX	14.602	XXXXXXXXXX	?	?	?	7.51	19.4	26.0	0.2	XXXXXXXXXX	13.506	XXXXXXXXXX	?	?	?	0.915	191.3
132	12/03/2018	01:15:45 PM	?	11.82	?	20.8	29.0	XXXXXXXXXX	XXXXXXXXXX	14.636	XXXXXXXXXX	?	?	?	7.54	19.2	26.7	0.2	XXXXXXXXXX	13.533	XXXXXXXXXX	?	?	?	0.915	191.2
133	12/03/2018	01:15:55 PM	?	11.83	?	20.8	29.0	XXXXXXXXXX	XXXXXXXXXX	14.636	XXXXXXXXXX	?	?	?	7.54	19.2	26.7	0.2	XXXXXXXXXX	13.533	XXXXXXXXXX	?	?	?	0.915	191.2
134	12/03/2018	01:16:05 PM	?	11.82	?	20.8	29.0	XXXXXXXXXX	XXXXXXXXXX	14.636	XXXXXXXXXX	?	?	?	7.54	19.2	26.7	0.2	XXXXXXXXXX	13.533	XXXXXXXXXX	?	?	?	0.915	191.2
135	12/03/2018	01:16:15 PM	?	11.84	?	20.8	29.0	XXXXXXXXXX	XXXXXXXXXX	14.636	XXXXXXXXXX	?	?	?	7.54	19.2	26.7	0.2	XXXXXXXXXX	13.533	XXXXXXXXXX	?	?	?	0.915	191.2
136	12/03/2018	01:16:25 PM	?	11.84	?	20.8	29.0	XXXXXXXXXX	XXXXXXXXXX	14.636	XXXXXXXXXX	?	?	?	7.54	19.2	26.7	0.2	XXXXXXXXXX	13.533	XXXXXXXXXX	?	?	?	0.915	191.2
137	12/03/2018	01:16:35 PM	?	11.85	?	20.8	29.0	XXXXXXXXXX	XXXXXXXXXX	14.636	XXXXXXXXXX	?	?	?	7.54	19.2	26.7	0.2	XXXXXXXXXX	13.533	XXXXXXXXXX	?	?	?	0.915	191.2
138	12/03/2018	01:16:45 PM	?	11.85	?	20.8	29.0	XXXXXXXXXX	XXXXXXXXXX	14.636	XXXXXXXXXX	?	?	?	7.54	19.2	26.7	0.2	XXXXXXXXXX	13.533	XXXXXXXXXX	?	?	?	0.915	191.2
139	12/03/2018	01:16:55 PM	?	11.85	?	21.5	28.1	XXXXXXXXXX	XXXXXXXXXX	15.129	XXXXXXXXXX	?	?	?	7.57	19.9	25.8	0.2	XXXXXXXXXX	13.984	XXXXXXXXXX	?	?	?	0.915	191.2
140	12/03/2018	01:17:05 PM	?	11.85	?	21.5	28.1	XXXXXXXXXX	XXXXXXXXXX	15.129	XXXXXXXXXX	?	?	?	7.57	19.9	25.8	0.2	XXXXXXXXXX	13.984	XXXXXXXXXX	?	?	?	0.915	191.2
141	12/03/2018	01:17:15 PM	?	11.85	?	21.5	28.1	XXXXXXXXXX	XXXXXXXXXX	15.129	XXXXXXXXXX	?	?	?	7.57	19.9	25.8	0.2	XXXXXXXXXX	13.984	XXXXXXXXXX	?	?	?	0.915	191.2
142	12/03/2018	01:17:25 PM	?	11.86	?	21.5	28.1	XXXXXXXXXX	XXXXXXXXXX	15.129	XXXXXXXXXX	?	?	?	7.57	19.9	25.8	0.2	XXXXXXXXXX	13.984	XXXXXXXXXX	?	?	?	0.915	191.2
143	12/03/2																									

Targa UnitMidkiff A13E 2018-12-03

186	12/03/2018	01:24:37 PM	11.82	20.5	28.6	XXXXXXXXXX	XXXXXXXXXX	13.341	XXXXXXXXXX	7.34	19.0	26.4	0.2	XXXXXXXXXX	12.362	XXXXXXXXXX	0.915	191.2
187	12/03/2018	01:24:47 PM	11.81	20.5	28.6	XXXXXXXXXX	XXXXXXXXXX	13.341	XXXXXXXXXX	7.34	19.0	26.4	0.2	XXXXXXXXXX	12.362	XXXXXXXXXX	0.915	191.2
188	12/03/2018	01:24:57 PM	11.80	20.5	28.6	XXXXXXXXXX	XXXXXXXXXX	13.341	XXXXXXXXXX	7.34	19.0	26.4	0.2	XXXXXXXXXX	12.362	XXXXXXXXXX	0.915	191.2
189	12/03/2018	01:25:07 PM	11.82	20.5	28.6	XXXXXXXXXX	XXXXXXXXXX	13.341	XXXXXXXXXX	7.34	19.0	26.4	0.2	XXXXXXXXXX	12.362	XXXXXXXXXX	0.915	191.2
190	12/03/2018	01:25:17 PM	11.82	19.9	29.5	XXXXXXXXXX	XXXXXXXXXX	13.416	XXXXXXXXXX	7.29	18.5	27.1	0.2	XXXXXXXXXX	12.439	XXXXXXXXXX	0.915	191.1
191	12/03/2018	01:25:27 PM	11.82	19.9	29.5	XXXXXXXXXX	XXXXXXXXXX	13.416	XXXXXXXXXX	7.29	18.5	27.1	0.2	XXXXXXXXXX	12.439	XXXXXXXXXX	0.915	191.1
192	12/03/2018	01:25:37 PM	11.81	19.9	29.5	XXXXXXXXXX	XXXXXXXXXX	13.416	XXXXXXXXXX	7.29	18.5	27.1	0.2	XXXXXXXXXX	12.439	XXXXXXXXXX	0.915	191.1
193	12/03/2018	01:25:47 PM	11.80	19.9	29.5	XXXXXXXXXX	XXXXXXXXXX	13.416	XXXXXXXXXX	7.29	18.5	27.1	0.2	XXXXXXXXXX	12.439	XXXXXXXXXX	0.915	191.1
194	12/03/2018	01:26:07 PM	11.80	19.9	29.5	XXXXXXXXXX	XXXXXXXXXX	13.416	XXXXXXXXXX	7.29	18.5	27.1	0.2	XXXXXXXXXX	12.439	XXXXXXXXXX	0.915	191.1
195	12/03/2018	01:26:17 PM	11.80	20.0	29.5	XXXXXXXXXX	XXXXXXXXXX	13.317	XXXXXXXXXX	7.41	18.6	27.1	0.1	XXXXXXXXXX	12.330	XXXXXXXXXX	0.915	191.1
196	12/03/2018	01:26:27 PM	11.80	20.0	29.5	XXXXXXXXXX	XXXXXXXXXX	13.317	XXXXXXXXXX	7.41	18.6	27.1	0.1	XXXXXXXXXX	12.330	XXXXXXXXXX	0.915	191.1
197	12/03/2018	01:26:37 PM	11.81	20.0	29.5	XXXXXXXXXX	XXXXXXXXXX	13.317	XXXXXXXXXX	7.41	18.6	27.1	0.1	XXXXXXXXXX	12.330	XXXXXXXXXX	0.915	191.1
198	12/03/2018	01:26:47 PM	11.82	20.0	29.5	XXXXXXXXXX	XXXXXXXXXX	13.317	XXXXXXXXXX	7.41	18.6	27.1	0.1	XXXXXXXXXX	12.330	XXXXXXXXXX	0.915	191.1
199	12/03/2018	01:26:57 PM	11.82	20.0	29.5	XXXXXXXXXX	XXXXXXXXXX	13.317	XXXXXXXXXX	7.41	18.6	27.1	0.1	XXXXXXXXXX	12.330	XXXXXXXXXX	0.915	191.1
200	12/03/2018	01:27:07 PM	11.82	20.0	29.5	XXXXXXXXXX	XXXXXXXXXX	13.019	XXXXXXXXXX	7.31	19.1	27.2	0.2	XXXXXXXXXX	12.068	XXXXXXXXXX	0.915	191.2
201	12/03/2018	01:27:17 PM	11.82	20.0	29.5	XXXXXXXXXX	XXXXXXXXXX	13.019	XXXXXXXXXX	7.31	19.1	27.2	0.2	XXXXXXXXXX	12.068	XXXXXXXXXX	0.915	191.2
202	12/03/2018	01:27:28 PM	11.81	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.019	XXXXXXXXXX	7.31	19.1	27.2	0.2	XXXXXXXXXX	12.068	XXXXXXXXXX	0.915	191.2
203	12/03/2018	01:27:38 PM	11.82	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.019	XXXXXXXXXX	7.31	19.1	27.2	0.2	XXXXXXXXXX	12.068	XXXXXXXXXX	0.915	191.2
204	12/03/2018	01:27:48 PM	11.82	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.019	XXXXXXXXXX	7.31	19.1	27.2	0.2	XXXXXXXXXX	12.068	XXXXXXXXXX	0.915	191.2
205	12/03/2018	01:27:58 PM	11.82	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.019	XXXXXXXXXX	7.31	19.1	27.2	0.2	XXXXXXXXXX	12.068	XXXXXXXXXX	0.915	191.2
206	12/03/2018	01:28:08 PM	11.82	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.065	XXXXXXXXXX	7.26	19.1	27.2	0.2	XXXXXXXXXX	12.117	XXXXXXXXXX	0.915	191.3
207	12/03/2018	01:28:18 PM	11.82	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.065	XXXXXXXXXX	7.26	19.1	27.2	0.2	XXXXXXXXXX	12.117	XXXXXXXXXX	0.915	191.3
208	12/03/2018	01:28:28 PM	11.82	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.065	XXXXXXXXXX	7.26	19.1	27.2	0.2	XXXXXXXXXX	12.117	XXXXXXXXXX	0.915	191.3
209	12/03/2018	01:28:38 PM	11.82	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.065	XXXXXXXXXX	7.26	19.1	27.2	0.2	XXXXXXXXXX	12.117	XXXXXXXXXX	0.915	191.3
210	12/03/2018	01:28:48 PM	11.84	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.065	XXXXXXXXXX	7.26	19.1	27.2	0.2	XXXXXXXXXX	12.117	XXXXXXXXXX	0.915	191.3
211	12/03/2018	01:28:58 PM	11.83	20.6	29.5	XXXXXXXXXX	XXXXXXXXXX	13.065	XXXXXXXXXX	7.26	19.1	27.2	0.2	XXXXXXXXXX	12.117	XXXXXXXXXX	0.915	191.3
212	12/03/2018	01:29:08 PM	11.85	20.8	28.5	XXXXXXXXXX	XXXXXXXXXX	13.797	XXXXXXXXXX	7.78	19.2	26.1	0.2	XXXXXXXXXX	12.724	XXXXXXXXXX	0.914	191.3
213	12/03/2018	01:29:18 PM	11.85	20.8	28.5	XXXXXXXXXX	XXXXXXXXXX	13.797	XXXXXXXXXX	7.78	19.2	26.1	0.2	XXXXXXXXXX	12.724	XXXXXXXXXX	0.914	191.3
214	12/03/2018	01:29:28 PM	11.83	20.8	28.5	XXXXXXXXXX	XXXXXXXXXX	13.797	XXXXXXXXXX	7.78	19.2	26.1	0.2	XXXXXXXXXX	12.724	XXXXXXXXXX	0.914	191.3
215	12/03/2018	01:29:38 PM	11.83	20.8	28.5	XXXXXXXXXX	XXXXXXXXXX	13.797	XXXXXXXXXX	7.78	19.2	26.1	0.2	XXXXXXXXXX	12.724	XXXXXXXXXX	0.914	191.3
216	12/03/2018	01:29:48 PM	11.83	20.8	28.5	XXXXXXXXXX	XXXXXXXXXX	13.797	XXXXXXXXXX	7.78	19.2	26.1	0.2	XXXXXXXXXX	12.724	XXXXXXXXXX	0.914	191.3
217	12/03/2018	01:29:58 PM	11.83	20.3	28.9	XXXXXXXXXX	XXXXXXXXXX	13.168	XXXXXXXXXX	7.52	18.8	26.5	0.2	XXXXXXXXXX	12.177	XXXXXXXXXX	0.915	191.4
218	12/03/2018	01:30:08 PM	11.84	20.3	28.9	XXXXXXXXXX	XXXXXXXXXX	13.168	XXXXXXXXXX	7.52	18.8	26.5	0.2	XXXXXXXXXX	12.177	XXXXXXXXXX	0.915	191.4
219	12/03/2018	01:30:18 PM	11.83	20.3	28.9	XXXXXXXXXX	XXXXXXXXXX	13.168	XXXXXXXXXX	7.52	18.8	26.5	0.2	XXXXXXXXXX	12.177	XXXXXXXXXX	0.915	191.4
220	12/03/2018	01:30:28 PM	11.85	20.3	28.9	XXXXXXXXXX	XXXXXXXXXX	13.168	XXXXXXXXXX	7.52	18.8	26.5	0.2	XXXXXXXXXX	12.177	XXXXXXXXXX	0.915	191.4
221	12/03/2018	01:30:38 PM	11.84	20.3	28.9	XXXXXXXXXX	XXXXXXXXXX	13.168	XXXXXXXXXX	7.52	18.8	26.5	0.2	XXXXXXXXXX	12.177	XXXXXXXXXX	0.915	191.4
222	12/03/2018	01:30:48 PM	11.84	20.3	28.9	XXXXXXXXXX	XXXXXXXXXX	13.168	XXXXXXXXXX	7.52	18.8	26.5	0.2	XXXXXXXXXX	12.177	XXXXXXXXXX	0.915	191.4
223	12/03/2018	01:30:58 PM	11.86	20.5	28.8	XXXXXXXXXX	XXXXXXXXXX	13.301	XXXXXXXXXX	7.65	19.0	26.4	0.1	XXXXXXXXXX	12.283	XXXXXXXXXX	0.915	191.3
224	12/03/2018	01:31:08 PM	11.85	20.5	28.8	XXXXXXXXXX	XXXXXXXXXX	13.301	XXXXXXXXXX	7.65	19.0	26.4	0.1	XXXXXXXXXX	12.283	XXXXXXXXXX	0.915	191.3
225	12/03/2018	01:31:18 PM	11.84	20.5	28.8	XXXXXXXXXX	XXXXXXXXXX	13.301	XXXXXXXXXX	7.65	19.0	26.4	0.1	XXXXXXXXXX	12.283	XXXXXXXXXX	0.915	191.3
226	12/03/2018	01:31:28 PM	11.85	20.5	28.8	XXXXXXXXXX	XXXXXXXXXX	13.301	XXXXXXXXXX	7.65	19.0	26.4	0.1	XXXXXXXXXX	12.283	XXXXXXXXXX	0.915	191.3
227	12/03/2018	01:31:38 PM	11.85	20.5	28.8	XXXXXXXXXX	XXXXXXXXXX	13.301	XXXXXXXXXX	7.65	19.0	26.4	0.1	XXXXXXXXXX	12.283	XXXXXXXXXX	0.915	191.3
228	12/03/2018	01:31:48 PM	11.85	20.4	29.2	XXXXXXXXXX	XXXXXXXXXX	13.437	XXXXXXXXXX	7.50	18.9	26.8	0.2	XXXXXXXXXX	12.429	XXXXXXXXXX	0.915	191.2
229	12/03/2018	01:31:58 PM	11.85	20.4	29.2	XXXXXXXXXX	XXXXXXXXXX	13.437	XXXXXXXXXX	7.50	18.9	26.8	0.2	XXXXXXXXXX	12.429	XXXXXXXXXX	0.915	191.2
230	12/03/2018	01:32:08 PM	11.85	20.4	29.2	XXXXXXXXXX	XXXXXXXXXX	13.437	XXXXXXXXXX	7.50	18.9	26.8	0.2	XXXXXXXXXX	12.429	XXXXXXXXXX	0.915	191.2
231	12/03/2018	01:32:18 PM	11.82	20.4	29.2	XXXXXXXXXX	XXXXXXXXXX	13.437	XXXXXXXXXX	7.50	18.9	26.8	0.2	XXXXXXXXXX	12.429	XXXXXXXXXX	0.915	191.2
232	12/03/2018	01:32:28 PM	11.82	20.4	29.2	XXXXXXXXXX	XXXXXXXXXX	13.437	XXXXXXXXXX	7.50	18.9	26.8	0.2	XXXXXXXXXX	12.429	XXXXXXXXXX	0.915	191.2
233	12/03/2018	01:32:39 PM	11.81	20.4	29.2	XXXXXXXXXX	XXXXXXXXXX	13.437	XXXXXXXXXX	7.50	18.9	26.8	0.2	XXXXXXXXXX	12.429	XXXXXXXXXX	0.915	191.2
234	12/03/2018	01:32:49 PM	11.82	19.6	30.3	XXXXXXXXXX	XXXXXXXXXX	13.499	XXXXXXXXXX	7.48	18.1	27.9	0.2	XXXXXXXXXX	12.489	XXXXXXXXXX	0.915	191.2
235	12/03/2018	01:32:59 PM	11.82	19.6	30.3	XXXXXXXXXX	XXXXXXXXXX	13.499	XXXXXXXXXX	7.48	18.1	27.9	0.2	XXXXXXXXXX	12.489	XXXXXXXXXX	0.915	191.2
236	12/03/2018	01:33:09 PM	11.81	19.6	30.3	XXXXXXXXXX	XXXXXXXXXX	13.499	XXXXXXXXXX	7.48	18.1	27.9	0.2	XXXXXXXXXX	12.489	XXXXXXXXXX	0.915	191.2
237	12/03/2018	01:33:19 PM	11.81	19.6	30.3	XXXXXXXXXX	XXXXXXXXXX	13.499	XXXXXXXXXX	7.48	18.1	27.9	0.2	XXXXXXXXXX	12.489	XXXXXXXXXX	0.915	191.2
238	12/03/2018	01:33:29 PM	11.82	19.6	30.3	XXXXXXXXXX	XXXXXXXXXX	13.499	XXXXXXXXXX	7.48	18.1	27.9	0.2	XXXXXXXXXX	12.489	XXXXXXXXXX	0.915	191.2
239	12/03/2018	01:33:39 PM	11.82	19.6	30.3	XXXXXXXXXX	XXXXXXXXXX	13.499	XXXXXXXXXX	7.48	18.1	27.9	0.2	XXXXXXXXXX	12.489	XXXXXXXXXX	0.915	191.2
240	12/03/2018	01:33:49 PM	11.81	20.1	29.7	XXXXXXXXXX	XXXXXXXXXX	13.899	XXXXXXXXXX	7.49	18.6	27.3	0.2	XXXXXXXXXX	12.859	XXXXXXXXXX	0.915	191.2
241	12/03/2018	01:33:59 PM	11.80	20.1	29.7	XXXXXXXXXX	XXXXXXXXXX	13.899	XXXXXXXXXX	7.49	18.6	27.3	0.2	XXXXXXXXXX	12.859	XXXXXXXXXX	0.915	191.2
242	12/03/2018	01:34:09 PM	11.80	20.1	29.7	XXXXXXXXXX	XXXXXXXXXX	13.899	XXXXXXXXXX	7.49	18.6	27.3	0.2	XXXXXXXXXX	12.859	XXXXXXXXXX	0.915	191.2
243	12/03/2018	01:34:19 PM	11.82	20.1	29.7	XXXXXXXXXX	XXXXXXXXXX	13.899	XXXXXXXXXX	7.49	18.6	27.3	0.2	XXXXXXXXXX	12.859	XXXXXXXXXX	0.915	191.2
244	12/03/2018	01:34:29 PM	11.82	20.1	29.7	XXXXXXXXXX	XXXXXXXXXX	13.899	XXXXXXXXXX	7.49	18.6	27.3	0.2	XXXXXXXXXX	12.859	XXXXXXXXXX	0.915	191.2
245	12/03/2018	01:34:39 PM	11.80	20.1	29.5	XXXXXXXXXX	XXXXXXXXXX	13.912	XXXXXXXXXX	7.50	18.6	27.1	0.2	XXXXXXXXXX	12.868	XXXXXXXXXX	0.915	191.2
246	12/03/2018	01:34:49 PM	11.82	20.1	29.5	XXXXXXXXXX	XXXXXXXXXX	13.912	XXXXXXXXXX	7.50	18.6	27.1	0.2	XXXXXXXXXX	12.868	XXXXXXXXXX	0.915	191.2
247	12/03/2018	01:34:59 PM	11.81	20.1	29.5	XXXXXXXXXX	XXXXXXXXXX	13.912	XXXXXXXXXX	7.50	18.6	27.1	0.2	XXXXXXXXXX	12.868	XXXXXXXXXX	0.915	191.2
248	12/03/2018	01:35:09 PM	11.81	20.1	29.5	XXXXXXXXXX	XXXXXXXXXX	13.912	XXXXXXXXXX	7.50	18.6	27.1	0.2	XXXXXXXXXX	12.868	XXXXXXXXXX	0.915	191.2
249	12/03/2018	01:35:19 PM	11.80	20.1	29.5	XXXXXXXXXX	XXXXXXXXXX	13.912	XXXXXXXXXX	7.50	18.6	27.1	0.2	XXXXXXXXXX	12.868	XXXXXXXXXX	0.915	191.2
250	12/03/2018	01:35:29 PM	11.81	20.1	29.5	XXXXXXXXXX	XXXXXXXXXX	13.912	XXXXXXXXXX	7.50	18.6	27.1	0.2	XXXXXXXXXX	12.868	XXXXXXXXXX	0.915	191.2
251	12/03/2018	01:35:39 PM	11.81	19.9	30.3	XXXXXXXXXX	XXXXXXXXXX	13.558	XXXXXXXXXX	7.47	18.4	27.8	0.2	XXXXXXXXXX	12.545	XXXXXXXXXX	0.915	191.3
252	12/03/2018	01:35:49 PM	11.82	19.9	30.3	XXXXXXXXXX	XXXXXXXXXX	13.558	XXXXXXXXXX	7.47	18.4	27.8	0.2	XXXXXXXXXX	12.545	XXXXXXXXXX	0.915	191.3
253	12/03/2018	01:35:59 PM	11.82	19.9	30.3	XXXXXXXXXX	XXXXXXXXXX	13.558	XXXXXXXXXX	7.47	18.4	27.8	0.2	XXXXXXXXXX	12.545	XXXXXXXXXX	0.915	191.3
254	12/03/2018	01:36:09 PM	11.82	19.9	30.3	XXXXXXXXXX												



```
Miscellaneous: 10
LoggingInterval (seconds), 60
TestRunInterval (minutes), 60
12/3/2018 1:53:53 PM, DgI9PU+7V54IC6m5fkmqW08+m5ZFeP0boTQq77n9jcQ=
DateTimeCompleted,
```

[illegible]



Targa_UnitMidkiff A13E_2018-12-03

0, 12/03/2018 01:54:04 PM,	?	11.85,	?	20.2,	27.9,	8.4,	796.4,	14.191,	0.9,	?	?	?	?	7.49,	18.7,	25.7,	0.2,	2.8,	13.128,	0.9,	?	?	0.914,	191.3
1, 12/03/2018 01:54:14 PM,	?	11.69,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
2, 12/03/2018 01:54:24 PM,	?	9.24,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
3, 12/03/2018 01:54:34 PM,	?	8.11,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
4, 12/03/2018 01:54:44 PM,	?	7.55,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
5, 12/03/2018 01:54:54 PM,	?	7.10,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
6, 12/03/2018 01:55:05 PM,	?	6.64,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
7, 12/03/2018 01:55:15 PM,	?	6.45,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
8, 12/03/2018 01:55:25 PM,	?	6.09,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
9, 12/03/2018 01:55:35 PM,	?	6.04,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
10, 12/03/2018 01:55:45 PM,	?	5.99,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
11, 12/03/2018 01:55:55 PM,	?	4.61,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
12, 12/03/2018 01:56:05 PM,	?	4.29,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
13, 12/03/2018 01:56:15 PM,	?	2.96,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
14, 12/03/2018 01:56:25 PM,	?	2.44,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
15, 12/03/2018 01:56:35 PM,	?	1.47,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
16, 12/03/2018 01:56:45 PM,	?	1.15,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
17, 12/03/2018 01:56:55 PM,	?	0.84,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
18, 12/03/2018 01:57:05 PM,	?	0.59,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
19, 12/03/2018 01:57:15 PM,	?	0.36,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
20, 12/03/2018 01:57:25 PM,	?	0.18,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
21, 12/03/2018 01:57:35 PM,	?	0.01,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
22, 12/03/2018 01:57:45 PM,	?	-0.12,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?

Miscellaneous: 10
LoggingInterval (seconds), 30
StabilizeInterval (seconds), 5.0
BiascheckTolerance (%), 3.0
DriftcheckTolerance (%), 3.0
DateTimeCompleted, 12/3/2018 1:57:51 PM, 0R8mLi2VgTieDERcgwQBSUBA6YTJXw0GGG7FCVREM=

Summary:

calibration,	cal gas,	accepted,	date/time,	cylinder,	cylinder
gas,	final cert,	measured,	of accepted,	serial,	expiration
	concentration,	concentration,	measured concentration,	number,	date
Low Post O2,	0.00 %,	0.02 %,	12/03/2018 01:57:47 PM,	zero-cyl/2099	
Mid Post O2,	6.00 %,	6.00 %,	12/03/2018 01:55:47 PM,	x02cx80C2004005,	08-18-2020

<end>

*****Test Run 3*****

TestCfgFilePathNameExt, "c:\EmTestData\Targa_UnitMidkiff A13w_2018-12-03\EmTest.xls"

PreO2DryIndex, 1
PostO2DryIndex, 1
PreCOdryIndex, 1
PostCOdryIndex, 3
NOxDryIndex, 5
VOCdryIndex, 6
THCdryIndex, 7
HCHOdryIndex, 7
NH3dryIndex, 8
Spare1dryIndex, 8
Spare2dryIndex, 8
Spare3dryIndex, 8
Spare4dryIndex, 8
H2OIndex, 13
NmhcWetIndex, 1
ThcWetIndex, 1
COWetIndex, 1
NowetIndex, 15
No2wetIndex, 16
PropanewetIndex, 17
HchowetIndex, 18
NH3wetIndex, 19
Spare1wetIndex, 19
Spare2wetIndex, 19
Spare3wetIndex, 19
Spare4wetIndex, 19

Raw Data:

Record ID,	Date/Time,	Pre O2, Dry, (%)	Post O2, Dry, (%)	Pre CO, Dry, (ppm)	Post CO, Dry, (ppm)	NOx, Dry, (ppm)	VOC Dry, as Prop, (ppm)	THC Dry, as Prop, (ppm)	HCHO, Dry, (ppm)	NH3, Dry, (ppm)	CO2, Dry, (%)	Ambient, Pressure, (InHg)	Ambient, Temp, (degF)	Relative, Humidity, (%)	H2O%, (%)	CO, wet, (ppm)	NO, wet, (ppm)	NO2, wet, (ppm)	Propane, wet, (ppm)	HCHO, wet, (ppm)	NH3, wet, (ppm)	CO2, wet, (%)	22, (none)	Gas, Pres, (atm)	Gas Temp (degC)	
0,	12/03/2018 01:59:01 PM,	?	5.88,	?	19.3,	27.4,	xxxxxxx,	xxxxxxx,	12.167,	xxxxxxx,	?	?	?	?	5.32,	18.3,	25.4,	0.6,	xxxxxxx,	11.520,	xxxxxxx,	?	?	?	0.915,	191.2
1,	12/03/2018 01:59:11 PM,	?	6.50,	?	19.3,	27.4,	xxxxxxx,	xxxxxxx,	12.167,	xxxxxxx,	?	?	?	?	5.32,	18.3,	25.4,	0.6,	xxxxxxx,	11.520,	xxxxxxx,	?	?	?	0.915,	191.2
2,	12/03/2018 01:59:21 PM,	?	7.28,	?	19.3,	27.4,	xxxxxxx,	xxxxxxx,	12.167,	xxxxxxx,	?	?	?	?	5.32,	18.3,	25.4,	0.6,	xxxxxxx,	11.520,	xxxxxxx,	?	?	?	0.915,	191.2
3,	12/03/2018 01:59:31 PM,	?	7.88,	?	19.3,	27.4,	xxxxxxx,	xxxxxxx,	12.167,	xxxxxxx,	?	?	?	?	5.32,	18.3,	25.4,	0.6,	xxxxxxx,	11.520,	xxxxxxx,	?	?	?	0.915,	191.2
4,	12/03/2018 01:59:41 PM,	?	8.22,	?	19.3,	27.4,	xxxxxxx,	xxxxxxx,	12.167,	xxxxxxx,	?	?	?	?	5.32,	18.3,	25.4,	0.6,	xxxxxxx,	11.520,	xxxxxxx,	?	?	?	0.915,	191.2
5,	12/03/2018 01:59:51 PM,	?	8.49,	?	19.3,	27.4,	xxxxxxx,	xxxxxxx,	12.167,	xxxxxxx,	?	?	?	?	5.32,	18.3,	25.4,	0.6,	xxxxxxx,	11.520,	xxxxxxx,	?	?	?	0.915,	191.2
6,	12/03/2018 02:00:01 PM,	?	8.80,	?	20.8,	28.2,	xxxxxxx,	xxxxxxx,	11.720,	xxxxxxx,	?	?	?	?	5.72,	19.6,	26.0,	0.6,	xxxxxxx,	11.050,	xxxxxxx,	?	?	?	0.915,	191.4
7,	12/03/2018 02:00:11 PM,	?	9.08,	?	20.8,	28.2,	xxxxxxx,	xxxxxxx,	11.720,	xxxxxxx,	?	?	?	?	5.72,	19.6,	26.0,	0.6,	xxxxxxx,	11.050,	xxxxxxx,	?	?	?	0.915,	191.4
8,	12/03/2018 02:00:21 PM,	?	9.28,	?	20.8,	28.2,	xxxxxxx,	xxxxxxx,	11.720,	xxxxxxx,	?	?	?	?	5.72,	19.6,	26.0,	0.6,	xxxxxxx,	11.050,	xxxxxxx,	?	?	?	0.915,	191.4
9,	12/03/2018 02:00:31 PM,	?	9.44,	?	20.8,	28.2,	xxxxxxx,	xxxxxxx,	11.720,	xxxxxxx,	?	?	?	?	5.72,	19.6,	26.0,	0.6,	xxxxxxx,	11.050,	xxxxxxx,	?	?	?	0.915,	191.4
10,	12/03/2018 02:00:41 PM,	?	9.58,	?	20.8,	28.2,	xxxxxxx,	xxxxxxx,	11.720,	xxxxxxx,	?	?	?	?	5.72,	19.6,	26.0,	0.6,	xxxxxxx,	11.050,	xxxxxxx,	?	?	?	0.915,	191.4
11,	12/03/2018 02:00:51 PM,	?	9.70,	?	20.9,	28.7,	xxxxxxx,	xxxxxxx,	11.486,	xxxxxxx,	?	?	?	?	5.91,	19.6,	26.4,	0.6,	xxxxxxx,	10.807,	xxxxxxx,	?	?	?	0.914,	191.3
12,	12/03/2018 02:01:01 PM,	?	9.79,	?	20.9,	28.7,	xxxxxxx,	xxxxxxx,	11.486,	xxxxxxx,	?	?	?	?	5.91,	19.6,	26.4,	0.6,	xxxxxxx,	10.807,	xxxxxxx,	?	?	?	0.914,	191.3
13,	12/03/2018 02:01:11 PM,	?	9.89,	?	20.9,	28.7,	xxxxxxx,	xxxxxxx,	11.486,	xxxxxxx,	?	?	?	?	5.91,	19.6,	26.4,	0.6,	xxxxxxx,	10.807,	xxxxxxx,	?	?	?	0.914,	191.3
14,	12/03/2018 02:01:21 PM,	?	9.94,	?	20.9,	28.7,	xxxxxxx,	xxxxxxx,	11.486,	xxxxxxx,	?	?	?	?	5.91,	19.6,	26.4,	0.6,	xxxxxxx,	10.807,	xxxxxxx,	?	?	?	0.914,	191.3
15,	12/03/2018 02:01:31 PM,	?	10.01,	?	20.9,	28.7,	xxxxxxx,	xxxxxxx,	11.486,	xxxxxxx,	?	?	?	?	5.91,	19.6,	26.4,	0.6,	xxxxxxx,	10.807,	xxxxxxx,	?	?	?	0.914,	191.3
16,	12/03/2018 02:01:41 PM,	?	10.08,	?	20.9,	28.7,	xxxxxxx,	xxxxxxx,	11.486,	xxxxxxx,	?	?	?	?	5.91,	19.6,	26.4,	0.6,	xxxxxxx,	10.807,	xxxxxxx,	?	?	?	0.914,	191.3
17,	12/03/2018 02:01:51 PM,	?	10.11,	?	19.6,	29.9,	xxxxxxx,	xxxxxxx,	11.310,	xxxxxxx,	?	?	?	?	5.91,	19.6,	27.5,	0.6,	xxxxxxx,	10.625,	xxxxxxx,	?	?	?	0.915,	191.2
18,	12/03/2018 02:02:02 PM,	?	10.14,	?	19.6,	29.9,	xxxxxxx,	xxxxxxx,	11.310,	xxxxxxx,	?	?	?	?	5.91,	19.6,	27.5,	0.6,	xxxxxxx,	10.625,	xxxxxxx,	?	?	?	0.915,	191.2

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Targa_UnitMidkiff A13E_2018-12-03

214	12/03/2018	02:34:39 PM	10.50	?	20.9	27.1	XXXXXXXXXX	XXXXXXXXXX	19.293	XXXXXXXXXX	?	?	?	?	9.06	19.0	24.4	0.3	XXXXXXXXXX	17.545	XXXXXXXXXX	?	?	?	0.915	191.2
214	12/03/2018	02:34:49 PM	10.50	?	20.9	27.1	XXXXXXXXXX	XXXXXXXXXX	19.293	XXXXXXXXXX	?	?	?	?	9.06	19.0	24.4	0.3	XXXXXXXXXX	17.545	XXXXXXXXXX	?	?	?	0.915	191.2
215	12/03/2018	02:34:59 PM	10.50	?	20.9	27.1	XXXXXXXXXX	XXXXXXXXXX	19.293	XXXXXXXXXX	?	?	?	?	9.06	19.0	24.4	0.3	XXXXXXXXXX	17.545	XXXXXXXXXX	?	?	?	0.915	191.2
216	12/03/2018	02:35:09 PM	10.50	?	20.9	27.1	XXXXXXXXXX	XXXXXXXXXX	19.293	XXXXXXXXXX	?	?	?	?	9.06	19.0	24.4	0.3	XXXXXXXXXX	17.545	XXXXXXXXXX	?	?	?	0.915	191.2
217	12/03/2018	02:35:19 PM	10.50	?	20.9	27.1	XXXXXXXXXX	XXXXXXXXXX	19.293	XXXXXXXXXX	?	?	?	?	9.06	19.0	24.4	0.3	XXXXXXXXXX	17.545	XXXXXXXXXX	?	?	?	0.915	191.2
218	12/03/2018	02:35:30 PM	10.50	?	20.9	27.1	XXXXXXXXXX	XXXXXXXXXX	19.293	XXXXXXXXXX	?	?	?	?	9.06	19.0	24.4	0.3	XXXXXXXXXX	17.545	XXXXXXXXXX	?	?	?	0.915	191.2
219	12/03/2018	02:35:40 PM	10.50	?	21.0	27.3	XXXXXXXXXX	XXXXXXXXXX	19.285	XXXXXXXXXX	?	?	?	?	9.06	19.1	24.5	0.3	XXXXXXXXXX	17.537	XXXXXXXXXX	?	?	?	0.915	191.1
220	12/03/2018	02:35:50 PM	10.50	?	21.0	27.3	XXXXXXXXXX	XXXXXXXXXX	19.285	XXXXXXXXXX	?	?	?	?	9.06	19.1	24.5	0.3	XXXXXXXXXX	17.537	XXXXXXXXXX	?	?	?	0.915	191.1
221	12/03/2018	02:36:00 PM	10.50	?	21.0	27.3	XXXXXXXXXX	XXXXXXXXXX	19.285	XXXXXXXXXX	?	?	?	?	9.06	19.1	24.5	0.3	XXXXXXXXXX	17.537	XXXXXXXXXX	?	?	?	0.915	191.1
222	12/03/2018	02:36:10 PM	10.49	?	21.0	27.3	XXXXXXXXXX	XXXXXXXXXX	19.285	XXXXXXXXXX	?	?	?	?	9.06	19.1	24.5	0.3	XXXXXXXXXX	17.537	XXXXXXXXXX	?	?	?	0.915	191.1
223	12/03/2018	02:36:20 PM	10.48	?	21.0	27.3	XXXXXXXXXX	XXXXXXXXXX	19.285	XXXXXXXXXX	?	?	?	?	9.06	19.1	24.5	0.3	XXXXXXXXXX	17.537	XXXXXXXXXX	?	?	?	0.915	191.1
224	12/03/2018	02:36:30 PM	10.46	?	19.8	27.5	XXXXXXXXXX	XXXXXXXXXX	19.289	XXXXXXXXXX	?	?	?	?	9.06	18.0	26.6	0.3	XXXXXXXXXX	17.548	XXXXXXXXXX	?	?	?	0.915	191.1
225	12/03/2018	02:36:40 PM	10.46	?	19.8	27.5	XXXXXXXXXX	XXXXXXXXXX	19.289	XXXXXXXXXX	?	?	?	?	9.03	18.0	26.6	0.3	XXXXXXXXXX	17.548	XXXXXXXXXX	?	?	?	0.915	191.1
226	12/03/2018	02:36:50 PM	10.47	?	19.8	29.5	XXXXXXXXXX	XXXXXXXXXX	19.289	XXXXXXXXXX	?	?	?	?	9.03	18.0	26.6	0.3	XXXXXXXXXX	17.548	XXXXXXXXXX	?	?	?	0.915	191.1
227	12/03/2018	02:37:00 PM	10.49	?	19.8	29.5	XXXXXXXXXX	XXXXXXXXXX	19.289	XXXXXXXXXX	?	?	?	?	9.03	18.0	26.6	0.3	XXXXXXXXXX	17.548	XXXXXXXXXX	?	?	?	0.915	191.1
228	12/03/2018	02:37:10 PM	10.50	?	19.8	29.5	XXXXXXXXXX	XXXXXXXXXX	19.289	XXXXXXXXXX	?	?	?	?	9.03	18.0	26.6	0.3	XXXXXXXXXX	17.548	XXXXXXXXXX	?	?	?	0.915	191.1
229	12/03/2018	02:37:20 PM	10.50	?	19.8	29.5	XXXXXXXXXX	XXXXXXXXXX	19.289	XXXXXXXXXX	?	?	?	?	9.03	18.0	26.6	0.3	XXXXXXXXXX	17.548	XXXXXXXXXX	?	?	?	0.915	191.1
230	12/03/2018	02:37:30 PM	10.50	?	20.9	28.2	XXXXXXXXXX	XXXXXXXXXX	19.516	XXXXXXXXXX	?	?	?	?	9.09	19.0	25.4	0.2	XXXXXXXXXX	17.742	XXXXXXXXXX	?	?	?	0.915	191.0
231	12/03/2018	02:37:40 PM	10.50	?	20.9	28.2	XXXXXXXXXX	XXXXXXXXXX	19.516	XXXXXXXXXX	?	?	?	?	9.09	19.0	25.4	0.2	XXXXXXXXXX	17.742	XXXXXXXXXX	?	?	?	0.915	191.0
232	12/03/2018	02:37:50 PM	10.50	?	20.9	28.2	XXXXXXXXXX	XXXXXXXXXX	19.516	XXXXXXXXXX	?	?	?	?	9.09	19.0	25.4	0.2	XXXXXXXXXX	17.742	XXXXXXXXXX	?	?	?	0.915	191.0
233	12/03/2018	02:38:00 PM	10.50	?	20.9	28.2	XXXXXXXXXX	XXXXXXXXXX	19.516	XXXXXXXXXX	?	?	?	?	9.09	19.0	25.4	0.2	XXXXXXXXXX	17.742	XXXXXXXXXX	?	?	?	0.915	191.0
234	12/03/2018	02:38:10 PM	10.52	?	20.9	28.2	XXXXXXXXXX	XXXXXXXXXX	19.516	XXXXXXXXXX	?	?	?	?	9.09	19.0	25.4	0.2	XXXXXXXXXX	17.742	XXXXXXXXXX	?	?	?	0.915	191.0
235	12/03/2018	02:38:20 PM	10.50	?	20.9	28.2	XXXXXXXXXX	XXXXXXXXXX	19.516	XXXXXXXXXX	?	?	?	?	9.09	19.0	25.4	0.2	XXXXXXXXXX	17.742	XXXXXXXXXX	?	?	?	0.915	191.0
236	12/03/2018	02:38:30 PM	10.51	?	21.2	27.6	XXXXXXXXXX	XXXXXXXXXX	20.834	XXXXXXXXXX	?	?	?	?	9.43	19.2	24.8	0.2	XXXXXXXXXX	18.869	XXXXXXXXXX	?	?	?	0.915	191.0
237	12/03/2018	02:38:40 PM	10.51	?	21.2	27.6	XXXXXXXXXX	XXXXXXXXXX	20.834	XXXXXXXXXX	?	?	?	?	9.43	19.2	24.8	0.2	XXXXXXXXXX	18.869	XXXXXXXXXX	?	?	?	0.915	191.0
238	12/03/2018	02:38:50 PM	10.51	?	21.2	27.6	XXXXXXXXXX	XXXXXXXXXX	20.834	XXXXXXXXXX	?	?	?	?	9.43	19.2	24.8	0.2	XXXXXXXXXX	18.869	XXXXXXXXXX	?	?	?	0.915	191.0
239	12/03/2018	02:39:00 PM	10.53	?	21.2	27.6	XXXXXXXXXX	XXXXXXXXXX	20.834	XXXXXXXXXX	?	?	?	?	9.43	19.2	24.8	0.2	XXXXXXXXXX	18.869	XXXXXXXXXX	?	?	?	0.915	191.0
240	12/03/2018	02:39:10 PM	10.52	?	21.2	27.6	XXXXXXXXXX	XXXXXXXXXX	20.834	XXXXXXXXXX	?	?	?	?	9.43	19.2	24.8	0.2	XXXXXXXXXX	18.869	XXXXXXXXXX	?	?	?	0.915	191.0
241	12/03/2018	02:39:20 PM	10.50	?	21.2	27.3	XXXXXXXXXX	XXXXXXXXXX	21.063	XXXXXXXXXX	?	?	?	?	9.13	19.3	24.6	0.2	XXXXXXXXXX	19.139	XXXXXXXXXX	?	?	?	0.915	191.0
242	12/03/2018	02:39:30 PM	10.52	?	21.2	27.3	XXXXXXXXXX	XXXXXXXXXX	21.063	XXXXXXXXXX	?	?	?	?	9.13	19.3	24.6	0.2	XXXXXXXXXX	19.139	XXXXXXXXXX	?	?	?	0.915	191.0
243	12/03/2018	02:39:40 PM	10.51	?	21.2	27.3	XXXXXXXXXX	XXXXXXXXXX	21.063	XXXXXXXXXX	?	?	?	?	9.13	19.3	24.6	0.2	XXXXXXXXXX	19.139	XXXXXXXXXX	?	?	?	0.915	191.0
244	12/03/2018	02:39:50 PM	10.51	?	21.2	27.3	XXXXXXXXXX	XXXXXXXXXX	21.063	XXXXXXXXXX	?	?	?	?	9.13	19.3	24.6	0.2	XXXXXXXXXX	19.139	XXXXXXXXXX	?	?	?	0.915	191.0
245	12/03/2018	02:40:00 PM	10.50	?	21.2	27.3	XXXXXXXXXX	XXXXXXXXXX	21.063	XXXXXXXXXX	?	?	?	?	9.13	19.3	24.6	0.2	XXXXXXXXXX	19.139	XXXXXXXXXX	?	?	?	0.915	191.0
246	12/03/2018	02:40:10 PM	10.50	?	21.1	27.3	XXXXXXXXXX	XXXXXXXXXX	24.817	XXXXXXXXXX	?	?	?	?	9.40	19.1	24.5	0.3	XXXXXXXXXX	22.483	XXXXXXXXXX	?	?	?	0.915	191.2
247	12/03/2018	02:40:20 PM	10.50	?	21.1	27.3	XXXXXXXXXX	XXXXXXXXXX	24.817	XXXXXXXXXX	?	?	?	?	9.40	19.1	24.5	0.3	XXXXXXXXXX	22.483	XXXXXXXXXX	?	?	?	0.915	191.2
248	12/03/2018	02:40:30 PM	10.50	?	21.1	27.3	XXXXXXXXXX	XXXXXXXXXX	24.817	XXXXXXXXXX	?	?	?	?	9.40	19.1	24.5	0.3	XXXXXXXXXX	22.483	XXXXXXXXXX	?	?	?	0.915	191.2
249	12/03/2018	02:40:40 PM	10.50	?	21.1	27.3	XXXXXXXXXX	XXXXXXXXXX	24.817	XXXXXXXXXX	?	?	?	?	9.40	19.1	24.5	0.3	XXXXXXXXXX	22.483	XXXXXXXXXX	?	?	?	0.915	191.2
250	12/03/2018	02:40:50 PM	10.50	?	21.1	27.3	XXXXXXXXXX	XXXXXXXXXX	24.817	XXXXXXXXXX	?	?	?	?	9.40	19.1	24.5	0.3	XXXXXXXXXX	22.483	XXXXXXXXXX	?	?	?	0.915	191.2
251	12/03/2018	02:41:01 PM	10.50	?	21.1	27.3	XXXXXXXXXX	XXXXXXXXXX	24.817	XXXXXXXXXX	?	?	?	?	9.40	19.1	24.5	0.3	XXXXXXXXXX	22.483	XXXXXXXXXX	?	?	?	0.915	191.2
252	12/03/2018	02:41:11 PM	10.49	?	21.1	27.3	XXXXXXXXXX	XXXXXXXXXX	24.817	XXXXXXXXXX	?	?	?	?	9.40	19.1	24.5	0.3	XXXXXXXXXX	22.483	XXXXXXXXXX	?	?	?	0.915	191.2
253	12/03/2018	02:41:21 PM	10.50	?	20.8	27.8	XXXXXXXXXX	XXXXXXXXXX	23.463	XXXXXXXXXX	?	?	?	?	9.48	18.8	24.9	0.3	XXXXXXXXXX	21.238	XXXXXXXXXX	?	?	?	0.915	191.3
254	12/03/2018	02:41:31 PM	10.48	?	20.8	27.8	XXXXXXXXXX	XXXXXXXXXX	23.463	XXXXXXXXXX	?	?	?	?	9.48	18.8	24.9	0.3	XXXXXXXXXX	21.238	XXXXXXXXXX	?	?	?	0.915	191.3
255	12/03/2018	02:41:41 PM	10.50	?	20.8	27.8	XXXXXXXXXX	XXXXXXXXXX	23.463	XXXXXXXXXX	?	?	?	?	9.48	18.8	24.9	0.3	XXXXXXXXXX	21.238	XXXXXXXXXX	?	?	?	0.915	191.3
256	12/03/2018	02:41:51 PM	10.49	?	20.8	27.8	XXXXXXXXXX	XXXXXXXXXX	23.463	XXXXXXXXXX	?	?	?	?	9.48	18.8	24.9	0.3	XXXXXXXXXX	21.238	XXXXXXXXXX	?	?	?	0.915	191.3
257	12/03/2018	02:42:00 PM	10.49	?	20.8	27.8	XXXXXXXXXX	XXXXXXXXXX	23.463	XXXXXXXXXX	?	?	?	?	9.48	18.8	24.9	0.3	XXXXXXXXXX	21.238	XXXXXXXXXX	?	?	?	0.915	191.3
258	12/03/2018	02:42:11 PM	10.50	?	20.5	28.4	XXXXXXXXXX	XXXXXXXXXX	24.103	XXXXXXXXXX	?	?	?	?	10.08	18.5	25.3	0.3	XXXXXXXXXX	21.674	XXXXXXXXXX	?	?	?	0.915	191.3
259	12/03/2018	02:42:21 PM	10.50	?	20.5	28.4	XXXXXXXXXX	XXXXXXXXXX	24.103	XXXXXXXXXX	?	?	?	?	10.08	18.5	25.3	0.3	XXXXXXXXXX	21.674	XXXXXXXXXX	?	?	?	0.915	191.3
260	12/03/2018	02:42:31 PM	10.50	?	20.5	28.4	XXXXXXXXXX	XXXXXXXXXX	24.103	XXXXXXXXXX	?	?	?	?	10.08	18.5	25.3	0.3	XXXXXXXXXX	21.674	XXXXXXXXXX	?	?	?	0.915	191.3
261	12/03/2018	02:42:41 PM	10.50	?	20.5	28.4	XXXXXXXXXX	XXXXXXXXXX	24.103	XXXXXXXXXX	?	?	?	?	10.08	18.5	25.3	0.3	XXXXXXXXXX	21.674	XXXXXXXXXX	?	?	?	0.915	191.3
262	12/03/2018	02:42:51 PM	10.50	?	20.5	28.4	XXXXXXXXXX	XXXXXXXXXX	24.103	XXXXXXXXXX	?	?	?	?	10.08	18.5	25.3	0.3	XXXXXXXXXX	21.674	XXXXXXXXXX	?	?	?	0.915	191.3
263	12/03/2018	02:43:01 PM	10.50	?	20.7	28.4	XXXXXXXXXX	XXXXXXXXXX	27.920	XXXXXXXXXX	?	?	?	?	10.29	18.6	25.2	0.3	XXXXXXXXXX	25.047	XXXXXXXXXX	?	?	?	0.915	191.2
264	12/03/2018	02:43:11 PM	10.50	?	20.7	28.4	XXXXXXXXXX	XXXXXXXXXX	27.920	XXXXXXXXXX	?	?	?	?	10.29	18.6	25.2	0.3	XXXXXXXXXX	25.047	XXXXXXXXXX	?	?	?	0.915	191.2
265	12/03/2018	02:43:21 PM	10.51	?	20.7	28.4	XXXXXXXXXX	XXXXXXXXXX	27.920	XXXXXXXXXX	?	?	?	?	10.29	18.6	25.2	0.3	XXXXXXXXXX	25.047	XXXXXXXXXX	?	?	?	0.915	191.2
266	12/03/2018	02:43:31 PM	10.50	?	20.7	28.4	XXXXXXXXXX	XXXXXXXXXX	27.920	XXXXXXXXXX	?	?	?	?	10.29	18.6	25.2	0.3	XXXXXXXXXX	25.047	XXXXXXXXXX	?	?	?	0.915	191.2
267	12/03/2018	02:43:41 PM	10.49	?	20.7	28.4	XXXXXXXXXX	XXXXXXXXXX	27.920	XXXXXXXXXX	?	?	?	?	10.29	18.6	25.2	0.3	XXXXXXXXXX	25.047	XXXXXXXXXX	?	?	?	0.915	191.2
268	12/03/2018	02:43:51 PM	10.49	?	20.7	28.4	XXXXXXXXXX	XXXXXXXXXX	27.920	XXXXXXXXXX	?	?	?	?	10.29	18.6	25.2	0.3	XXXXXXXXXX	25.047	XXXXXXXXXX	?	?	?	0.915	191.2



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310,	12/03/2018	02:50:53	PM,	?	10.50,	?	21.2,	27.8,	xxxxxxxx,	xxxxxxxx,	21.729,	xxxxxxxx,	?	?	?	9.16,	19.2,	24.9,	0.3,	xxxxxxxx,	19.737,	xxxxxxxx,	?	?	0.914,	191.4	
311,	12/03/2018	02:51:03	PM,	?	10.51,	?	21.2,	27.8,	xxxxxxxx,	xxxxxxxx,	21.729,	xxxxxxxx,	?	?	?	9.16,	19.2,	24.9,	0.3,	xxxxxxxx,	19.737,	xxxxxxxx,	?	?	0.914,	191.4	
312,	12/03/2018	02:51:13	PM,	?	10.52,	?	21.2,	27.8,	xxxxxxxx,	xxxxxxxx,	21.729,	xxxxxxxx,	?	?	?	9.16,	19.2,	24.9,	0.3,	xxxxxxxx,	19.737,	xxxxxxxx,	?	?	0.914,	191.4	
313,	12/03/2018	02:51:23	PM,	?	10.50,	?	21.2,	27.8,	xxxxxxxx,	xxxxxxxx,	21.729,	xxxxxxxx,	?	?	?	9.16,	19.2,	24.9,	0.3,	xxxxxxxx,	19.737,	xxxxxxxx,	?	?	0.914,	191.4	
314,	12/03/2018	02:51:33	PM,	?	10.52,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	22.418,	xxxxxxxx,	?	?	?	9.19,	19.3,	24.9,	0.2,	xxxxxxxx,	20.358,	xxxxxxxx,	?	?	0.915,	191.3	
315,	12/03/2018	02:51:43	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	22.418,	xxxxxxxx,	?	?	?	9.19,	19.3,	24.9,	0.2,	xxxxxxxx,	20.358,	xxxxxxxx,	?	?	0.915,	191.3	
316,	12/03/2018	02:51:53	PM,	?	10.51,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	22.418,	xxxxxxxx,	?	?	?	9.19,	19.3,	24.9,	0.2,	xxxxxxxx,	20.358,	xxxxxxxx,	?	?	0.915,	191.3	
317,	12/03/2018	02:52:03	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	22.418,	xxxxxxxx,	?	?	?	9.19,	19.3,	24.9,	0.2,	xxxxxxxx,	20.358,	xxxxxxxx,	?	?	0.915,	191.3	
318,	12/03/2018	02:52:13	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	22.418,	xxxxxxxx,	?	?	?	9.19,	19.3,	24.9,	0.2,	xxxxxxxx,	20.358,	xxxxxxxx,	?	?	0.915,	191.3	
319,	12/03/2018	02:52:23	PM,	?	10.51,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	22.418,	xxxxxxxx,	?	?	?	9.19,	19.3,	24.9,	0.2,	xxxxxxxx,	20.358,	xxxxxxxx,	?	?	0.915,	191.3	
320,	12/03/2018	02:52:33	PM,	?	10.52,	?	21.0,	27.8,	xxxxxxxx,	xxxxxxxx,	22.760,	xxxxxxxx,	?	?	?	9.24,	19.1,	25.0,	0.2,	xxxxxxxx,	20.657,	xxxxxxxx,	?	?	0.915,	191.2	
321,	12/03/2018	02:52:43	PM,	?	10.51,	?	21.0,	27.8,	xxxxxxxx,	xxxxxxxx,	22.760,	xxxxxxxx,	?	?	?	9.24,	19.1,	25.0,	0.2,	xxxxxxxx,	20.657,	xxxxxxxx,	?	?	0.915,	191.2	
322,	12/03/2018	02:52:53	PM,	?	10.51,	?	21.0,	27.8,	xxxxxxxx,	xxxxxxxx,	22.760,	xxxxxxxx,	?	?	?	9.24,	19.1,	25.0,	0.2,	xxxxxxxx,	20.657,	xxxxxxxx,	?	?	0.915,	191.2	
323,	12/03/2018	02:53:03	PM,	?	10.50,	?	21.0,	27.8,	xxxxxxxx,	xxxxxxxx,	22.760,	xxxxxxxx,	?	?	?	9.24,	19.1,	25.0,	0.2,	xxxxxxxx,	20.657,	xxxxxxxx,	?	?	0.915,	191.2	
324,	12/03/2018	02:53:13	PM,	?	10.50,	?	21.0,	27.8,	xxxxxxxx,	xxxxxxxx,	22.760,	xxxxxxxx,	?	?	?	9.24,	19.1,	25.0,	0.2,	xxxxxxxx,	20.657,	xxxxxxxx,	?	?	0.915,	191.2	
325,	12/03/2018	02:53:23	PM,	?	10.51,	?	21.0,	27.8,	xxxxxxxx,	xxxxxxxx,	22.760,	xxxxxxxx,	?	?	?	9.24,	19.1,	25.0,	0.2,	xxxxxxxx,	20.657,	xxxxxxxx,	?	?	0.915,	191.2	
326,	12/03/2018	02:53:33	PM,	?	10.50,	?	20.9,	28.1,	xxxxxxxx,	xxxxxxxx,	22.237,	xxxxxxxx,	?	?	?	8.99,	19.0,	25.3,	0.3,	xxxxxxxx,	20.237,	xxxxxxxx,	?	?	0.915,	191.1	
327,	12/03/2018	02:53:43	PM,	?	10.52,	?	20.9,	28.1,	xxxxxxxx,	xxxxxxxx,	22.237,	xxxxxxxx,	?	?	?	8.99,	19.0,	25.3,	0.3,	xxxxxxxx,	20.237,	xxxxxxxx,	?	?	0.915,	191.1	
328,	12/03/2018	02:53:53	PM,	?	10.50,	?	20.9,	28.1,	xxxxxxxx,	xxxxxxxx,	22.237,	xxxxxxxx,	?	?	?	8.99,	19.0,	25.3,	0.3,	xxxxxxxx,	20.237,	xxxxxxxx,	?	?	0.915,	191.1	
329,	12/03/2018	02:54:03	PM,	?	10.50,	?	20.9,	28.1,	xxxxxxxx,	xxxxxxxx,	22.237,	xxxxxxxx,	?	?	?	8.99,	19.0,	25.3,	0.3,	xxxxxxxx,	20.237,	xxxxxxxx,	?	?	0.915,	191.1	
330,	12/03/2018	02:54:13	PM,	?	10.51,	?	20.9,	28.1,	xxxxxxxx,	xxxxxxxx,	22.237,	xxxxxxxx,	?	?	?	8.99,	19.0,	25.3,	0.3,	xxxxxxxx,	20.237,	xxxxxxxx,	?	?	0.915,	191.1	
331,	12/03/2018	02:54:23	PM,	?	10.50,	?	20.8,	27.8,	xxxxxxxx,	xxxxxxxx,	25.710,	xxxxxxxx,	?	?	?	9.12,	18.9,	25.0,	0.3,	xxxxxxxx,	23.365,	xxxxxxxx,	?	?	0.915,	191.0	
332,	12/03/2018	02:54:33	PM,	?	10.51,	?	20.8,	27.8,	xxxxxxxx,	xxxxxxxx,	25.710,	xxxxxxxx,	?	?	?	9.12,	18.9,	25.0,	0.3,	xxxxxxxx,	23.365,	xxxxxxxx,	?	?	0.915,	191.0	
333,	12/03/2018	02:54:43	PM,	?	10.50,	?	20.8,	27.8,	xxxxxxxx,	xxxxxxxx,	25.710,	xxxxxxxx,	?	?	?	9.12,	18.9,	25.0,	0.3,	xxxxxxxx,	23.365,	xxxxxxxx,	?	?	0.915,	191.0	
334,	12/03/2018	02:54:53	PM,	?	10.50,	?	20.8,	27.8,	xxxxxxxx,	xxxxxxxx,	25.710,	xxxxxxxx,	?	?	?	9.12,	18.9,	25.0,	0.3,	xxxxxxxx,	23.365,	xxxxxxxx,	?	?	0.915,	191.0	
335,	12/03/2018	02:55:04	PM,	?	10.50,	?	20.8,	27.8,	xxxxxxxx,	xxxxxxxx,	25.710,	xxxxxxxx,	?	?	?	9.12,	18.9,	25.0,	0.3,	xxxxxxxx,	23.365,	xxxxxxxx,	?	?	0.915,	191.0	
336,	12/03/2018	02:55:14	PM,	?	10.50,	?	20.8,	27.8,	xxxxxxxx,	xxxxxxxx,	25.710,	xxxxxxxx,	?	?	?	9.12,	18.9,	25.0,	0.3,	xxxxxxxx,	23.365,	xxxxxxxx,	?	?	0.915,	191.0	
337,	12/03/2018	02:55:24	PM,	?	10.50,	?	20.6,	28.4,	xxxxxxxx,	xxxxxxxx,	23.333,	xxxxxxxx,	?	?	?	9.08,	18.7,	25.5,	0.3,	xxxxxxxx,	21.214,	xxxxxxxx,	?	?	0.915,	191.0	
338,	12/03/2018	02:55:34	PM,	?	10.50,	?	20.6,	28.4,	xxxxxxxx,	xxxxxxxx,	23.333,	xxxxxxxx,	?	?	?	9.08,	18.7,	25.5,	0.3,	xxxxxxxx,	21.214,	xxxxxxxx,	?	?	0.915,	191.0	
339,	12/03/2018	02:55:44	PM,	?	10.50,	?	20.6,	28.4,	xxxxxxxx,	xxxxxxxx,	23.333,	xxxxxxxx,	?	?	?	9.08,	18.7,	25.5,	0.3,	xxxxxxxx,	21.214,	xxxxxxxx,	?	?	0.915,	191.0	
340,	12/03/2018	02:55:54	PM,	?	10.50,	?	20.6,	28.4,	xxxxxxxx,	xxxxxxxx,	23.333,	xxxxxxxx,	?	?	?	9.08,	18.7,	25.5,	0.3,	xxxxxxxx,	21.214,	xxxxxxxx,	?	?	0.915,	191.0	
341,	12/03/2018	02:56:04	PM,	?	10.50,	?	20.6,	28.4,	xxxxxxxx,	xxxxxxxx,	23.333,	xxxxxxxx,	?	?	?	9.08,	18.7,	25.5,	0.3,	xxxxxxxx,	21.214,	xxxxxxxx,	?	?	0.915,	191.0	
342,	12/03/2018	02:56:14	PM,	?	10.50,	?	21.1,	28.1,	xxxxxxxx,	xxxxxxxx,	22.502,	xxxxxxxx,	?	?	?	8.93,	19.2,	25.4,	0.3,	xxxxxxxx,	20.492,	xxxxxxxx,	?	?	0.915,	191.1	
343,	12/03/2018	02:56:24	PM,	?	10.50,	?	21.1,	28.1,	xxxxxxxx,	xxxxxxxx,	22.502,	xxxxxxxx,	?	?	?	8.93,	19.2,	25.4,	0.3,	xxxxxxxx,	20.492,	xxxxxxxx,	?	?	0.915,	191.1	
344,	12/03/2018	02:56:34	PM,	?	10.50,	?	21.1,	28.1,	xxxxxxxx,	xxxxxxxx,	22.502,	xxxxxxxx,	?	?	?	8.93,	19.2,	25.4,	0.3,	xxxxxxxx,	20.492,	xxxxxxxx,	?	?	0.915,	191.1	
345,	12/03/2018	02:56:44	PM,	?	10.50,	?	21.1,	28.1,	xxxxxxxx,	xxxxxxxx,	22.502,	xxxxxxxx,	?	?	?	8.93,	19.2,	25.4,	0.3,	xxxxxxxx,	20.492,	xxxxxxxx,	?	?	0.915,	191.1	
346,	12/03/2018	02:56:54	PM,	?	10.50,	?	21.1,	28.1,	xxxxxxxx,	xxxxxxxx,	22.502,	xxxxxxxx,	?	?	?	8.93,	19.2,	25.4,	0.3,	xxxxxxxx,	20.492,	xxxxxxxx,	?	?	0.915,	191.1	
347,	12/03/2018	02:57:04	PM,	?	10.50,	?	21.1,	28.1,	xxxxxxxx,	xxxxxxxx,	22.502,	xxxxxxxx,	?	?	?	8.93,	19.2,	25.4,	0.3,	xxxxxxxx,	20.492,	xxxxxxxx,	?	?	0.915,	191.1	
348,	12/03/2018	02:57:14	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	21.866,	xxxxxxxx,	?	?	?	8.75,	19.4,	25.0,	0.3,	xxxxxxxx,	19.933,	xxxxxxxx,	?	?	0.915,	191.4	
349,	12/03/2018	02:57:24	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	21.866,	xxxxxxxx,	?	?	?	8.75,	19.4,	25.0,	0.3,	xxxxxxxx,	19.933,	xxxxxxxx,	?	?	0.915,	191.4	
350,	12/03/2018	02:57:34	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	21.866,	xxxxxxxx,	?	?	?	8.75,	19.4,	25.0,	0.3,	xxxxxxxx,	19.933,	xxxxxxxx,	?	?	0.915,	191.4	
351,	12/03/2018	02:57:44	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	21.866,	xxxxxxxx,	?	?	?	8.75,	19.4,	25.0,	0.3,	xxxxxxxx,	19.933,	xxxxxxxx,	?	?	0.915,	191.4	
352,	12/03/2018	02:57:54	PM,	?	10.50,	?	21.2,	27.7,	xxxxxxxx,	xxxxxxxx,	21.866,	xxxxxxxx,	?	?	?	8.75,	19.4,	25.0,	0.3,	xxxxxxxx,	19.933,	xxxxxxxx,	?	?	0.915,	191.4	
353,	12/03/2018	02:58:04	PM,	?	10.50,	?	20.5,	28.4,	xxxxxxxx,	xxxxxxxx,	20.860,	xxxxxxxx,	?	?	?	8.67,	18.8,	25.6,	0.3,	xxxxxxxx,	19.051,	xxxxxxxx,	?	?	0.915,	191.5	
354,	12/03/2018	02:58:14	PM,	?	10.50,	?	20.5,	28.4,	xxxxxxxx,	xxxxxxxx,	20.860,	xxxxxxxx,	?	?	?	8.67,	18.8,	25.6,	0.3,	xxxxxxxx,	19.051,	xxxxxxxx,	?	?	0.915,	191.5	
355,	12/03/2018	02:58:24	PM,	?	10.49,	?	20.5,	28.4,	xxxxxxxx,	xxxxxxxx,	20.860,	xxxxxxxx,	?	?	?	8.67,	18.8,	25.6,	0.3,	xxxxxxxx,	19.051,	xxxxxxxx,	?	?	0.915,	191.5	
356,	12/03/2018	02:58:34	PM,	?	10.50,	?	20.5,	28.4,	xxxxxxxx,	xxxxxxxx,	20.860,	xxxxxxxx,	?	?	?	8.67,	18.8,	25.6,	0.3,	xxxxxxxx,	19.051,	xxxxxxxx,	?	?	0.915,	191.5	
357,	12/03/2018	02:58:44	PM,	?	10.49,	?	20.5,	28.4,	xxxxxxxx,	xxxxxxxx,	20.860,	xxxxxxxx,	?	?	?	8.67,	18.8,	25.6,	0.3,	xxxxxxxx,	19.051,	xxxxxxxx,	?	?	0.915,	191.5	
358,	12/03/2018	02:58:54	PM,	?	10.50,	?	20.5,	28.4,	xxxxxxxx,	xxxxxxxx,	20.860,	xxxxxxxx,	?	?	?	8.67,	18.8,	25.6,	0.3,	xxxxxxxx,	19.051,	xxxxxxxx,	?	?	0.915,	191.5	
359,	12/03/2018	02:59:04	PM,	?	10.49,	?	20.6,	28.3,	xxxxxxxx,	xxxxxxxx,	21.004,	xxxxxxxx,	?	?	?	8.86,	18.7,	25.5,	0.3,	xxxxxxxx,	19.143,	xxxxxxxx,	?	?	0.915,	191.3	
360,	12/03/2018	02:59:14	PM,	?	10.49,	?	20.6,	28.3,	xxxxxxxx,	xxxxxxxx,	21.004,	xxxxxxxx,	?	?	?	8.86,	18.7,	25.5,	0.3,	xxxxxxxx,	19.143,	xxxxxxxx,	?	?	0.915,	191.3	
<end>				AverageMeasuredValues,	?	10.41,	?	20.8,	28.1,	xxxxxxxx,	xxxxxxxx,	17.842,	xxxxxxxx,	?	?	?	8.16,	19.1,	25.4,	0.4,	xxxxxxxx,	16.334,	xxxxxxxx,	?	?	0.915,	191.1

Miscellaneous:
LoggingInterval (seconds), 10
TestRunInterval (minutes), 60
DateTimeCompleted, 12/3/2018 2:59:15 PM, 7Jauz7QK9293NH+ZEscKNzEk3eg+COZkLpIF2QNX=

*****Bias Check 4*****
TestCfgFilePathNameExt, "c:\EmTestData\Targa_UnitMidkiff A13w_2018-12-03\EmTest.xls"

Raw Data:

Record ID,	Date/Time,	Pre O2, Dry, (%)	Post O2, Dry, (%)	Pre CO, Dry, (ppm)	Post CO, Dry, (ppm)	NOx, Dry, (ppm)	VOC Dry, as Prop, (ppm)	THC Dry, as Prop, (ppm)	HCHO, Dry, (ppm)	NH3, Dry, (ppm)	CO2, Dry, (%)	Ambient, Pressure, (inHg)	Ambient, Temp, (degF)	Relative, Humidity, (%)	H2O%, (%)	CO, Wet, (ppm)	NO, Wet, (ppm)	NO2, Wet, (ppm)	Propane, Wet, (ppm)	HCHO, Wet, (ppm)	NH3, Wet, (ppm)	CO2, Wet, (%)	22, (none)	Gas, Pres, (atm)	Gas Temp (degC)
0,	12/03/2018 02:59:25 PM,	?	10.50,	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	
1,	12/03/2018 02:59:35 PM,		10.52,																						
2,	12/03/2018 02:59:45 PM,		10.50,																						
3,	12/03/2018 02:59:55 PM,		8.18,																						
4,	12/03/2018 03:00:05 PM,		7.12,																						
5,	12/03/2018 03:00:15 PM,		6.63,																						
6,	12/03/2018 03:00:25 PM,		6.09,																						
7,	12/03/2018 03:00:35 PM,		5.72,																						
8,	12/03/2018 03:00:45 PM,		5.50,																						
9,	12/03/2018 03:00:55 PM,		5.28,																						
10,	12/03/2018 03:01:05 PM,		5.08,																						
11,	12/03/2018 03:01:15 PM,		4.94,																						
12,	12/03/2018 03:01:25 PM,		4.83,																						
13,	12/03/2018 03:01:35 PM,		4.74,																						
14,	12/03/2018 03:01:45 PM,		6.04,																						
15,	12/03/2018 03:01:55 PM,		5.99,																						
16,	12/03/2018 03:02:06 PM,		6.04,																						
17,	12/03/2018 03:02:16 PM,		5.99,																						
18,	12/03/2018 03:02:26 PM,		5.92,																						
19,	12/03/2018 03:02:36 PM,		4.52,																						
20,	12/03/2018 03:02:46 PM,		3.25,																						
21,	12/03/2018 03:02:56 PM,		2.58,																						
22,	12/03/2018 03:03:06 PM,		2.14,																						
23,	12/03/2018 03:03:16 PM,		1.84,																						
24,	12/03/2018 03:03:26 PM,		1.59,																						
25,	12/03/2018 03:03:36 PM,		1.37,																						
26,	12/03/2018 03:03:46 PM,		0.24,																						
27,	12/03/2018 03:03:56 PM,		0.10,																						



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28, 12/03/2018 03:04:06 PM, ?, -0.03, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?
29, 12/03/2018 03:04:16 PM, ?, -0.02, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?
<end>

Miscellaneous:
LoggingInterval (seconds), 10
StabilizeInterval (seconds), 30
BiasCheckTolerance (%), 5.0
DriftCheckTolerance (%), 3.0
DateTimeCompleted, 12/3/2018 3:04:17 PM, y7CwrHh1InQCAEijNg1ld0C10FjY3GgMDCYbrTA4nEM=

Summary:

calibration, gas,	cal gas, final cert, concentration,	accepted, measured, concentration,	date/time, of accepted, measured concentration,	cylinder, serial, number,	cylinder expiration date
Low Post O2,	0.00 %,	0.01 %,	12/03/2018 03:04:13 PM,	zero-cylinder,	01-01-2099
Mid Post O2,	6.00 %,	6.02 %,	12/03/2018 03:02:10 PM,	X020X80C2004005,	08-18-2020

<end>



Erik Vogt
Lead Field Technician
EcoTest Energy Services

Training:

FTIR System Training

Ranger Analytics, 603 FM 1092, Stafford, TX 77477

Trainer(s): Kirk Wilkerson, Shane Kelley

EmTest Software Training

Ranger Analytics, 603 FM 1092, Stafford, TX 77477

Trainer(s): Anthony Bertrand

Operational & Safety Training

EcoTest Energy Services, LLC

Trainer(s): Wayne Philpot, Chris Fisher, Lance Strickland

Experience:

- 40 CFR 60 JJJJ, 40 CFR 63 ZZZZ, and state engine tests performed across multiple shale plays and basins throughout the continental United States using USEPA methods and ASTM 6348:
 - Utica Shale Play
 - Marcellus Shale Play
 - Permian Basin
 - Haynesville Shale Play
 - Barnett Shale Play
 - Eagleford Shale Play
- FTIR System maintenance, upkeep, and repairs in both shop and mobile environment

Education:

- High School Diploma, Ringgold High School, Monongahela, PA, 2008
- Certificate HVAC/R, Pittsburgh Technical Institute, Pittsburgh, PA, 2010
- Certificate – Appalachian Gas Measurement, Robert Morris University, Pittsburgh, PA, 2013
- Basic Training, AIT, 21E MOS (Heavy Equipment Operations), U.S. Army, 2008 - 2011

[REDACTED]

[REDACTED]

[REDACTED]

Ecotest Energy Services, LLC has completed the source testing as described in this report. Results apply only to the source(s) tested and operating condition(s) for the specified test date(s) and time(s) within this report. All results are intended to be considered in their entirety, and Ecotest is not responsible for use of less than the complete test report without written consent. This report shall not be reproduced in full or in part without written consent from the customer.

To the best of my knowledge and abilities, all information, facts, and test data are correct. Data presented in this report has been checked over for completeness and is accurate, error free and legible. Onsite testing was conducted in accordance with approved internal Standard Operating Procedures. Any deviations or problems are detailed in the relevant sections on the test report.

X

Wayne Philpot
V.P. Operations

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Services

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