REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS, INC.
IN GRAND PRAIRIE, TEXAS
ON JUNE 9, 2015

Submitted to:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P. O. Box 13087
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Submitted by:

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Permit Number 51907

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Prepared on:

July 9, 2015

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1.0 INTRODUCTION

On Tuesday, June 9, 2015, ECSi performed air pollution source testing of an ethylene oxide (EtO) emission-control system operated by Sterigenics, Inc. in Grand Prairie, Texas. The control system tested was a Maxon Catalytic Oxidizer, which is used to control emissions from five commercial EtO sterilizer backvents, and one aeration room. The purpose of the testing program was to evaluate continued compliance with the conditions established in the Air Quality Permit granted to Sterigenics, Inc. by the Texas Commission on Environmental Quality (TCEQ).

2.0 EQUIPMENT

The gas-sterilization system is comprised of five commercial sterilizers, all discharging through liquid-ring vacuum pumps to an Advanced Air Technologies packed-tower acid scrubber emission control device. One aeration room and five sterilization chamber backvents are all discharged to a Maxon catalytic oxidizer emission-control device. The gas-sterilization and emission-control equipment currently consists of the following:

- Three Vacudyne commercial ethylene oxide gas sterilizers, each comprised of a steam-heated sterilization chamber (30 pallet capacity), and a Dekker 3-pump oil-sealed liquid ring recirculating vacuum pump skid (two 50 hp liquid ring pumps, plus one 25 hp booster pump);

- Two Trumbo commercial ethylene oxide gas sterilizers, each comprised of a steam-heated sterilization chamber (30 pallet capacity), and a Dekker 3-pump oil-sealed liquid ring recirculating vacuum pump skid (one 50 hp liquid ring pump, plus one 25 hp booster pump);

- One 12,200 square foot aeration room, comprised of a heated aeration chamber and an exhaust system.

Sterilizer vacuum pump emissions are controlled by:

- One Advanced Air Technologies Safe Cell I emission-control system, comprised of a packed-tower chemical scrubber, equipped with a packed reaction/interface column, a scrubber fluid recirculation system (2 recirculation pumps - 1 primary and 1 backup - each @ 350 gpm and 15 hp), and two scrubber fluid reaction/storage tanks.

Aeration and backvent emissions are controlled by:

- One Maxon catalytic oxidizer, 15,000 SCFM, equipped with a prefilter, a gas-fired heater, a reactive catalyst bed, and an exhaust blower.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring for each test run was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics, Inc. was tested to evaluate compliance with the requirements specified in the TCEQ Permit. The current testing was performed to demonstrate continued compliance with the following requirement:

- Aeration and backvent emissions must be discharged to control equipment which achieves an EtO emission-reduction efficiency of at least 99.0% by weight, or an outlet EtO concentration of no greater than 1 ppmv.

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control device is required initially, and may be required periodically thereafter.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

The testing procedures outlined herein are based on USEPA source-sampling methods. EtO control efficiency and mass-emissions testing were conducted by USEPA CFR40, Part 63.365, and in accordance with TCEQ requirements. EtO emissions monitoring for each test run was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product.

Operation and documentation of process conditions was performed by personnel from Sterigenics, Inc. using existing monitoring instruments installed by the manufacturer of the equipment to be tested. In accordance with TCEQ requirements, and the procedures established in USEPA CFR40, Part 63, Subpart O, the following parameter was recorded: catalyst bed operating temperature. This data is attached to this report as Appendix J.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the catalytic oxidizer was determined by EPA Method 2C using a standard pitot tube and an inclined-oil manometer. Sampling ports were installed in accordance with EPA Method 1, and were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible, at about 3 percent.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During backvent and aeration testing, EtO emissions at the inlet and outlet of the catalytic oxidizer were determined using direct source sample injection into the GC. The mass of EtO emitted to the inlet and from the outlet was determined using the equation shown below in Section 5.9. Mass-mass control-efficiency of EtO during the backvent and aeration phases was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the backvent and aeration phases, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify inlet EtO emissions, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the emission-control device outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet, the sampling port was located in the common backvent/aeration discharge duct, upstream of the oxidizer. At the outlet of the catalytic oxidizer, sampling ports were located in the exhaust stack downstream of the catalyst bed.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately five minute intervals during the aeration-phase testing. Helium was the carrier gas for both the FID and PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 80 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were helium (99.999% pure), hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.7 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix I.

5.8 SAMPLING DURATION

Backvent testing was performed in conjunction with normal production operations, during the chamber exhaust venting which is conducted for each sterilization chamber upon conclusion of the sterilization cycle, immediately prior to and during chamber unloading. Backvent sampling duration was 15 minutes for each of the three test runs.

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing consisted of three 1-hour test runs. Each test run was performed with freshly sterilized product in the aeration chambers.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

Mass emissions of EtO during aeration were calculated using the following equation:

$$MassRate = (VolFlow)(MolWt)(ppmv\ EtO/10^6)/(MolVol)$$

Where:

MassRate	=	EtO mass flow rate, pounds per minute
VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Mass-mass control efficiency of EtO was calculated for backvent and aeration. Results of the control-efficiency testing are presented in Tables 1 and 2.

6.0 TEST SCENARIO

The backvent and aeration testing was performed during normal process load conditions. Three backvent and three aeration test runs were conducted in series to verify the performance of the emission-control device. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Backvent Phase Test Run #1 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
3) Aeration Phase Test Run #1 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
4) Backvent Phase Test Run #2 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
5) Aeration Phase Test Run #2 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
6) Backvent Phase Test Run #3 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
7) Aeration Phase Test Run #3 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
8) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix I.

8.0 TEST RESULTS

The catalytic oxidizer was found to have an average EtO control efficiency of 99.96 percent for backvent, and an average EtO control efficiency of 99.93 percent for aeration. In accordance with state and federal requirements, backvent and aeration discharge streams must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 percent by weight. The catalytic oxidizer met this requirement.

The test results are summarized in Tables 1 and 2. These tables include results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through G. Copies of field data and calculation worksheets are attached as Appendix H.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - BACKVENT OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE OPERATED BY STERIGENICS, INC. IN GRAND PRAIRIE, TEXAS ON JUNE 9, 2015

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1339	18.3	0.01	99.9454
1	1340	118	0.01	99.9915
1	1342	80.2	0.01	99.9875
1	1343	46.8	0.01	99.9786
1	1344	32.1	0.01	99.9688
1	1345	23.8	0.01	99.9580
1	1346	23.7	0.01	99.9578
1	1347	21.1	0.01	99.9526
1	1349	19.5	0.01	99.9487
1	1350	18.9	0.01	99.9471
1	1351	12.1	0.01	99.9174
1	1353	9.99	0.01	99.8999
2(4)	1528	15.9	0.01	99.9371
2	1529	96.2	0.01	99.9896
2	1531	58.7	0.01	99.9830
2	1532	40.9	0.01	99.9756
2	1533	29.0	0.01	99.9655
2	1534	25.0	0.01	99.9600
2	1535	22.6	0.01	99.9558
2	1537	21.1	0.01	99.9526
2	1538	18.4	0.01	99.9457
2	1539	19.1	0.01	99.9476
2	1541	11.8	0.01	99.9153
2	1542	11.5	0.01	99.9130
3(5)	1659	17.5	0.01	99.9429
3	1700	53.6	0.01	99.9813
3	1701	85.0	0.01	99.9882
3	1702	61.6	0.01	99.9838
3	1703	43.6	0.01	99.9771
3	1704	38.1	0.01	99.9738
3	1705	31.3	0.01	99.9681
3	1706	28.1	0.01	99.9644
3	1708	25.9	0.01	99.9614
3	1709	25.7	0.01	99.9611
3	1710	24.8	0.01	99.9597
3	1711	22.3	0.01	99.9552
TIME-WEIGHTED AVERAGE:		**34.78**	**0.0100**	**99.9586**
		NYDEQ REQUIRED CONTROL EFFICIENCY:		**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Backvent Phase Test Run #1 started at 13:39, ended at 13:54.
(4) - Backvent Phase Test Run #2 started at 15:27, ended at 15:42.
(5) - Backvent Phase Test Run #3 started at 16:57, ended at 17:12.
(6) - During backvent testing, the average recorded catalyst bed temperature was 305 deg F

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TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE OPERATED BY STERIGENICS, INC. IN GRAND PRAIRIE, TEXAS ON JUNE 9, 2015

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1357	11.2	0.01	99.9107
1	1402	10.8	0.01	99.9074
1	1407	11.8	0.01	99.9153
1	1412	11.8	0.01	99.9153
1	1417	12.7	0.01	99.9213
1	1422	12.5	0.01	99.9200
1	1427	12.9	0.01	99.9225
1	1432	12.9	0.01	99.9225
1	1437	13.4	0.01	99.9254
1	1442	14.5	0.01	99.9310
1	1447	13.4	0.01	99.9254
1	1452	14.8	0.01	99.9324
2(4)	1545	12.3	0.01	99.9187
2	1550	13.2	0.01	99.9242
2	1555	13.4	0.01	99.9254
2	1600	12.9	0.01	99.9225
2	1605	13.6	0.01	99.9265
2	1610	14.9	0.01	99.9329
2	1615	15.3	0.01	99.9346
2	1620	15.7	0.01	99.9363
2	1625	17.9	0.01	99.9441
2	1630	16.6	0.01	99.9398
2	1635	17.1	0.01	99.9415
2	1640	16.4	0.01	99.9390
3(5)	1715	21.9	0.01	99.9543
3	1720	19.5	0.01	99.9487
3	1725	19.5	0.01	99.9487
3	1730	20.2	0.01	99.9505
3	1735	17.5	0.01	99.9429
3	1740	18.2	0.01	99.9451
3	1745	20.0	0.01	99.9500
3	1750	19.6	0.01	99.9490
3	1755	19.4	0.01	99.9485
3	1800	20.3	0.01	99.9507
3	1805	20.1	0.01	99.9502
3	1810	21.0	0.01	99.9524
TIME-WEIGHTED AVERAGE:		**15.81**	**0.0100**	**99.9340**
		NYDEQ REQUIRED CONTROL EFFICIENCY:		**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 13:55, ended at 14:55.
(4) - Aeration Phase Test Run #2 started at 15:43, ended at 16:43.
(5) - Aeration Phase Test Run #3 started at 17:13, ended at 18:13.
(6) - During aeration testing, the average recorded catalyst bed temperature was 305 deg F

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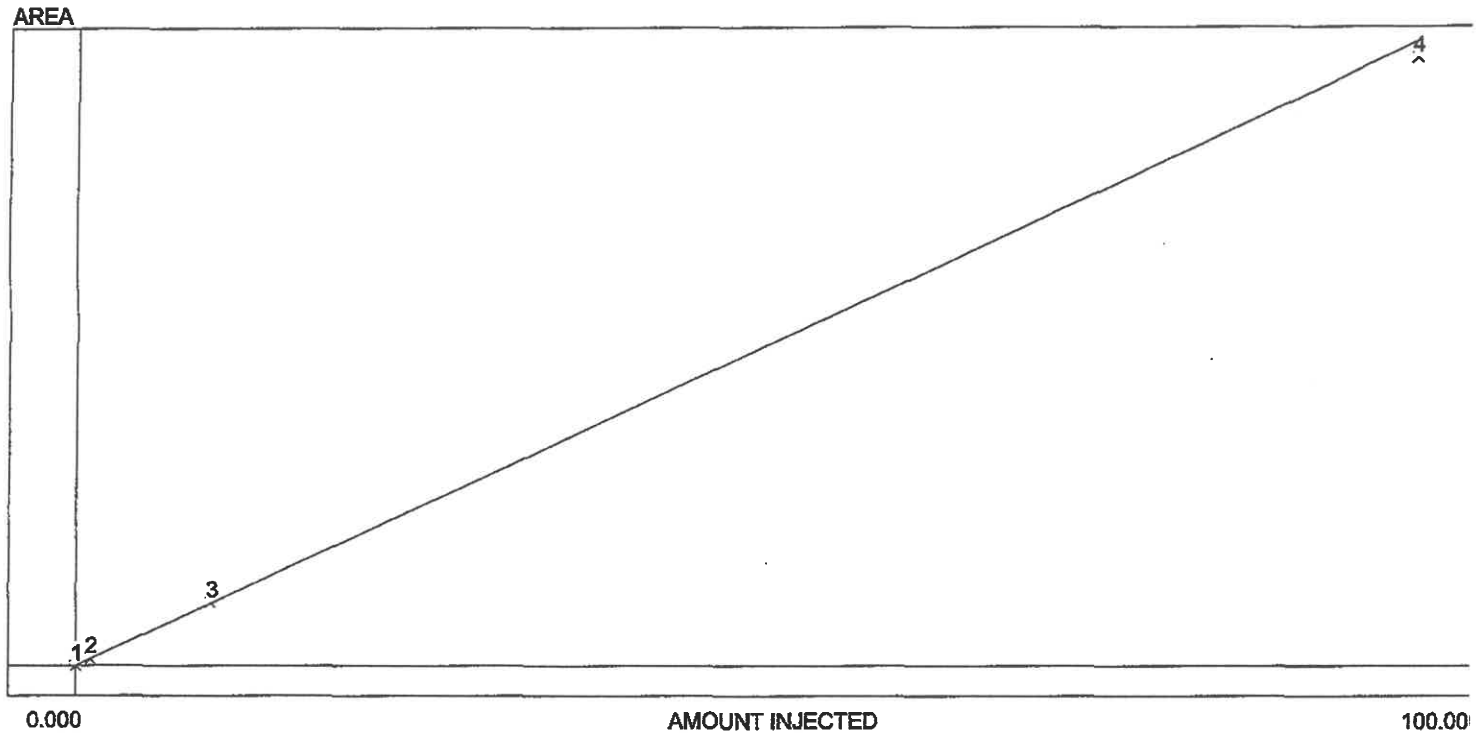
APPENDICES

APPENDIX A

Calibration Data

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.480		0.000	
	Ethylene Oxide	0.480	0.600	C:\peak359\1Ster	0.00015	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

ibration file: C:\peak359\1SterGP2015.cal

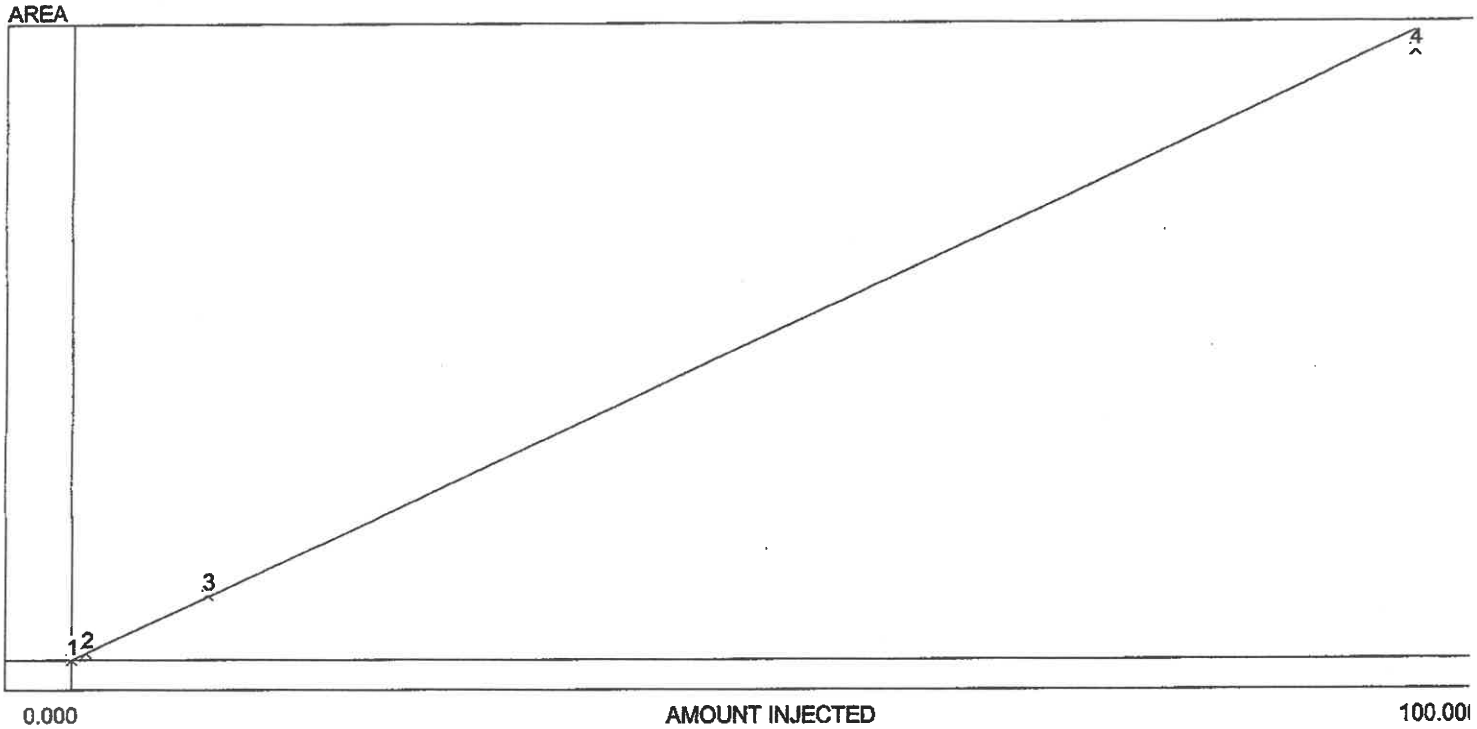


ɜ slope of curve: 0.09
ıxis intercept: 0.00
earity: 1.00
nber of levels: 4
/rel SD of CF's: 0.0/66.7
).0861X
1.0000
ɜt calibrated: Tue Jun 09 08:22:18 2015

. Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
0.096	1.100	0.087	0.096	N/A	N/A
0.880	10.100	0.087	0.880	N/A	N/A
8.380	100.000	0.084	8.380	N/A	N/A

ak	Name	Start	End	Calibration	Int.Std	Units
	Dead Vol / Air	0.000	0.350		0.000	
	Ambient H2O	0.350	0.480		0.000	
	Ethylene Oxide	0.480	0.600	C:\peak359\2Ster	0.00015	ppm
	Acetaldehyde	0.600	0.800		0.000	
	CO2	0.800	1.000		0.000	

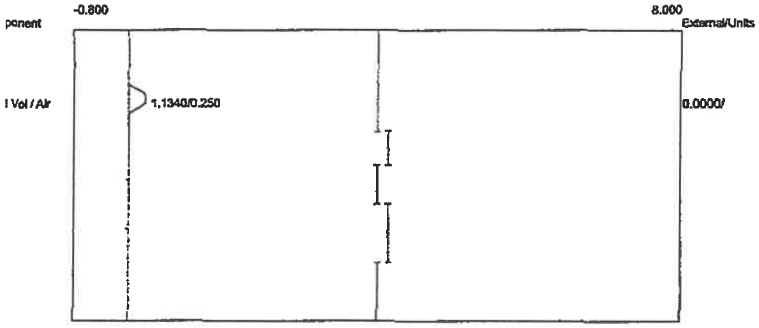
ibration file: C:\peak359\2SterGP2015.cal



| slope of curve: 1.59
xis intercept: -0.00
earity: 1.00
nber of levels: 4
rel SD of CF's: 0.8/66.8
1.5915X
1.0000
t calibrated: Tue Jun 09 08:21:39 2015

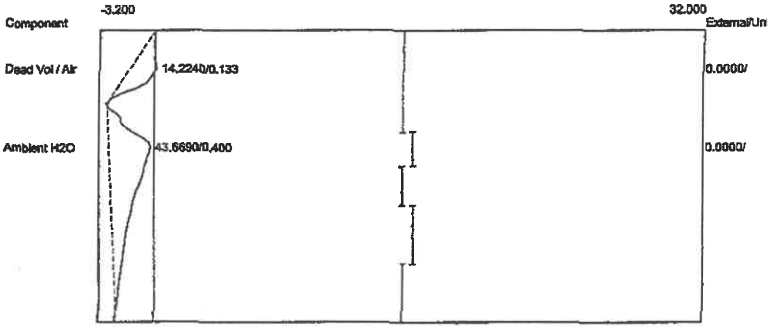
Area/ht.	Amount	CF	Current	Previous #1	Previous #2
0.000	0.000	0.000	0.000	N/A	N/A
1.750	1.100	1.591	1.750	N/A	N/A
16.600	10.100	1.644	16.600	N/A	N/A
154.000	100.000	1.540	154.000	N/A	N/A

Client: Sterigenics - Grand Prairie
Client ID: PreCal
nalysis date: 06/09/2015 07:51:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2015-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



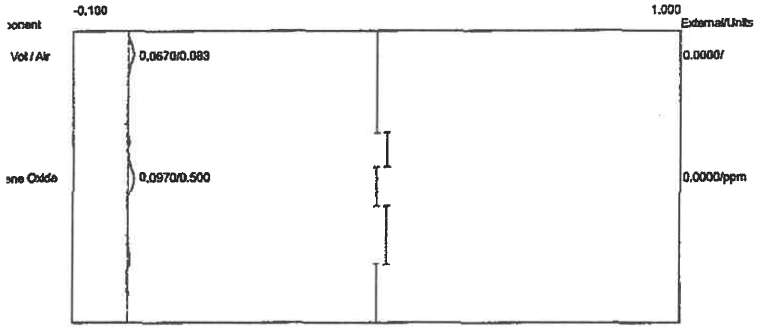
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.1340	0.0000	
		1.1340	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 07:51:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



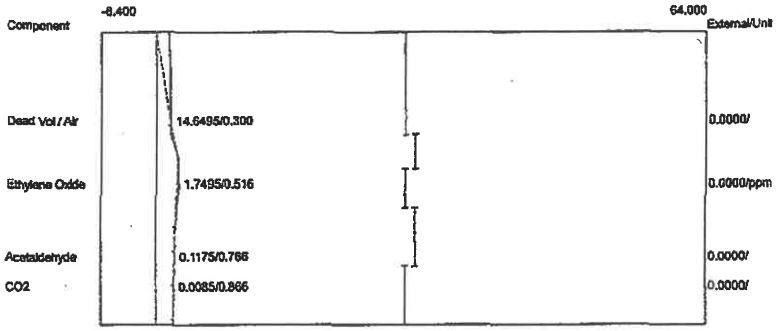
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	14.2240	0.0000	
Ambient H2O	0.400	43.6690	0.0000	
		57.8930	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
nalysis date: 06/09/2015 07:54:35
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto1-100.cpt
Data file: 1SterGP2015-C01.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



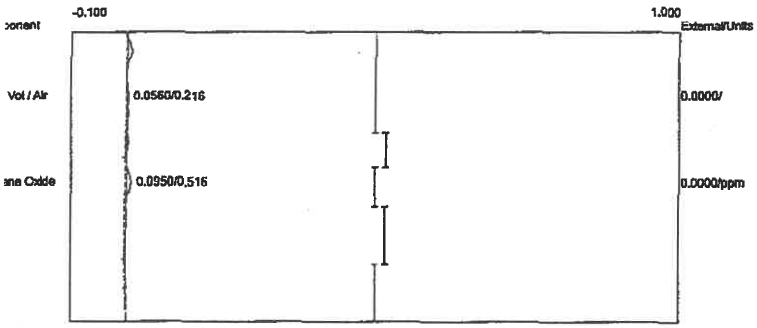
Component	Retention	Area	External	Units
ad Vol / Air	0.083	0.0670	0.0000	
ylene Oxide	0.500	0.0970	0.0000	ppm
		0.1640	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 07:54:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-C01.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



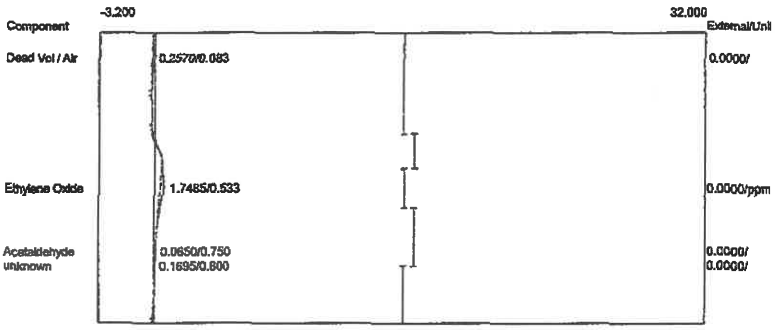
Component	Retention	Area	External	Units
Dead Vol / Air	0.300	14.6495	0.0000	
Ethylene Oxide	0.516	1.7495	0.0000	ppm
Acetaldehyde	0.766	0.1175	0.0000	
CO2	0.866	0.0085	0.0000	
		16.5250	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
nalysis date: 06/09/2015 07:55:56
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto1-100.cpt
Data file: 1SterGP2015-C02.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



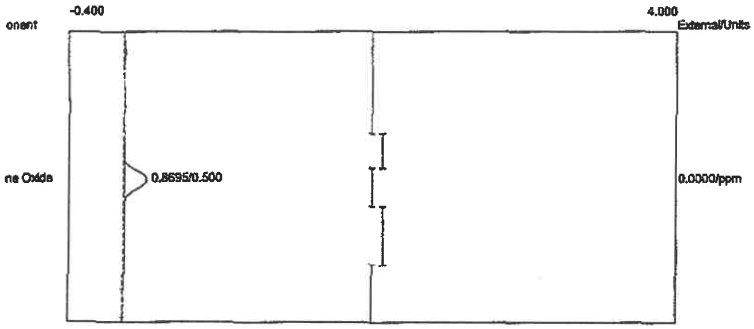
Component	Retention	Area	External	Units
ad Vol / Air	0.216	0.0560	0.0000	
ıylene Oxide	0.516	0.0950	0.0000	ppm
		0.1510	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 07:55:56
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-C02.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



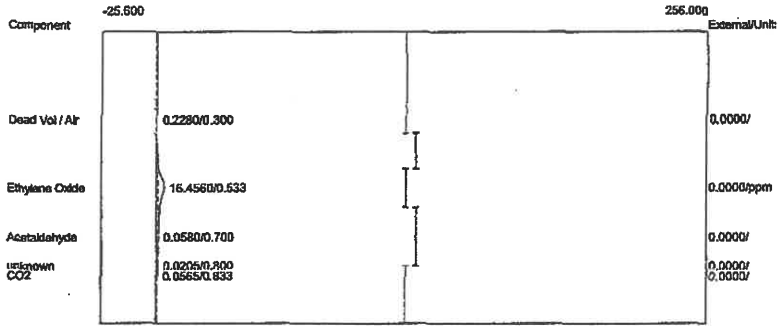
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.2570	0.0000	
Ethylene Oxide	0.533	1.7485	0.0000	ppm
Acetaldehyde	0.750	0.0650	0.0000	
		2.0705	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
ıalysis date: 06/09/2015 07:58:28
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto1-100.cpt
Data file: 1SterGP2015-C03.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



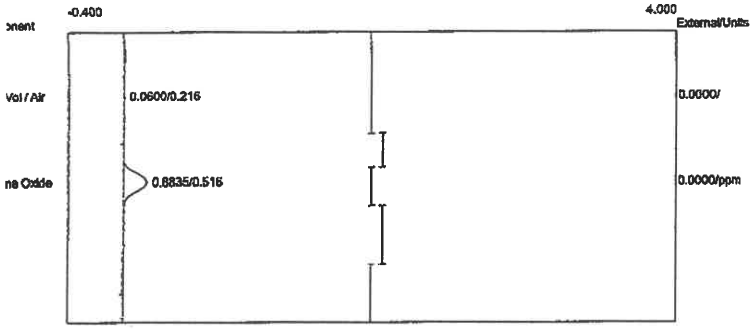
Component	Retention	Area	External	Units
yiene Oxide	0.500	0.8695	0.0000	ppm
		0.8695	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 07:58:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-C03.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



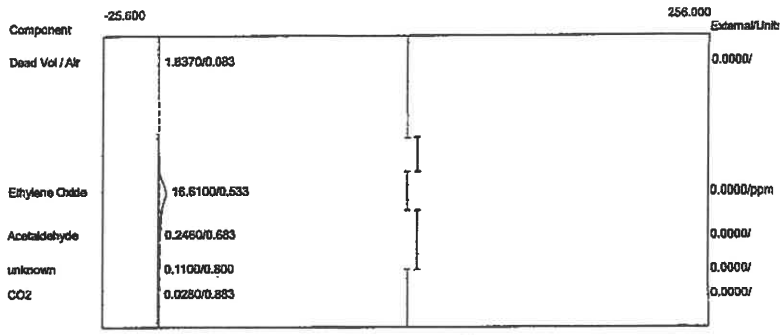
Component	Retention	Area	External	Units
Dead Vol / Air	0.300	0.2280	0.0000	
Ethylene Oxide	0.533	16.4560	0.0000	ppm
Acetaldehyde	0.700	0.0580	0.0000	
CO2	0.833	0.0565	0.0000	
		16.7985	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 07:59:50
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto1-100.cpt
Data file: 1SterGP2015-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



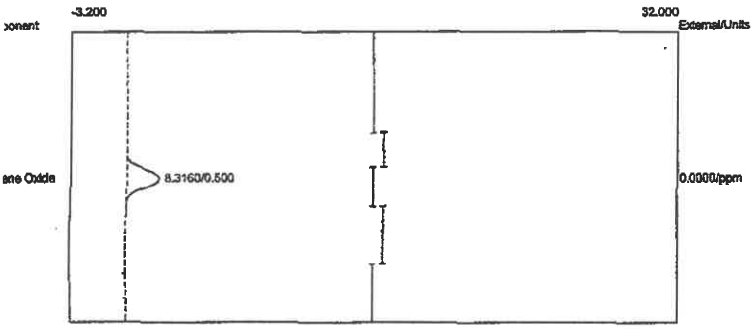
Component	Retention	Area	External	Units
ad Vol / Air	0.216	0.0600	0.0000	
ylene Oxide	0.516	0.8835	0.0000	ppm
		0.9435	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 07:59:50
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



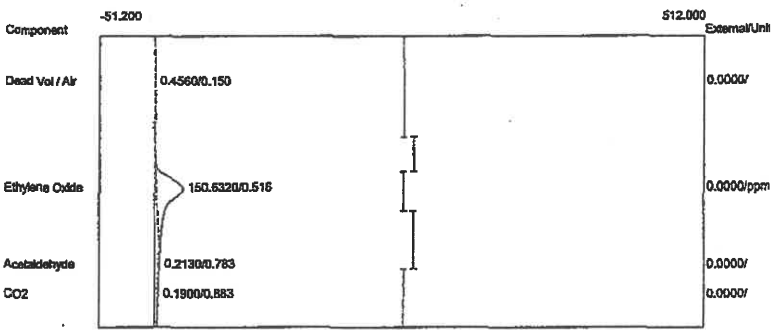
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	1.8370	0.0000	
Ethylene Oxide	0.533	16.6100	0.0000	ppm
Acetaldehyde	0.683	0.2460	0.0000	
CO2	0.883	0.0280	0.0000	
		18.7210	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
nalysis date: 06/09/2015 08:02:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
:omponents: eto1-100.cpt
Data file: 1SterGP2015-C05.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



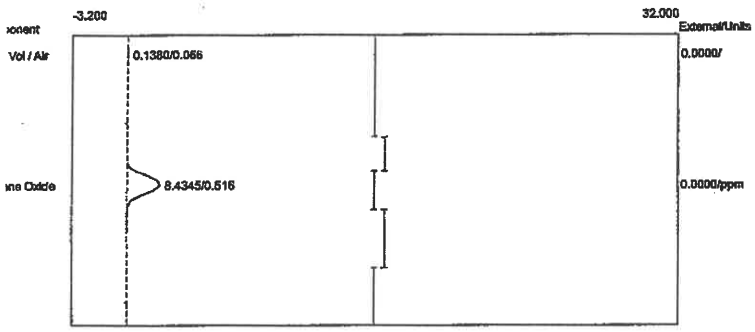
Component	Retention	Area	External	Units
ıylene Oxide	0.500	8.3160	0.0000	ppm
		8.3160	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 08:02:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-C05.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



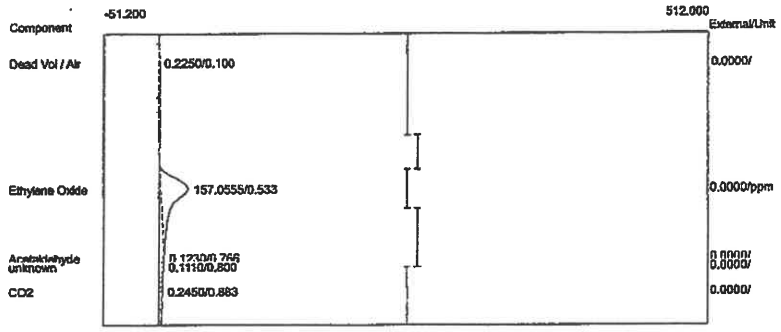
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	0.4560	0.0000	
Ethylene Oxide	0.516	150.6320	0.0000	ppm
Acetaldehyde	0.783	0.2130	0.0000	
CO2	0.883	0.1900	0.0000	
		151.4910	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
ıalysis date: 06/09/2015 08:05:19
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto1-100.cpt
Data file: 1SterGP2015-C06.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



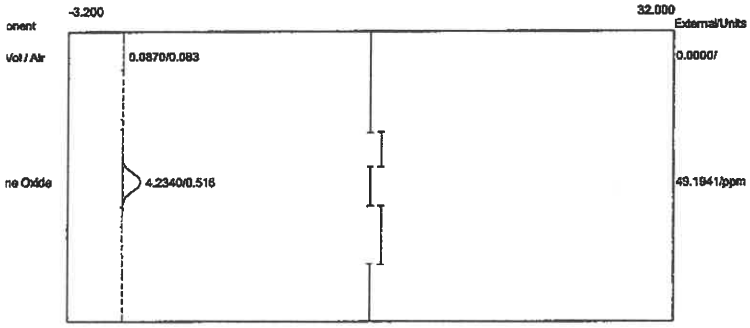
Component	Retention	Area	External	Units
ad Vol / Air	0.066	0.1380	0.0000	
ıylene Oxide	0.516	8.4345	0.0000	ppm
		8.5725	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 08:05:19
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-C06.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



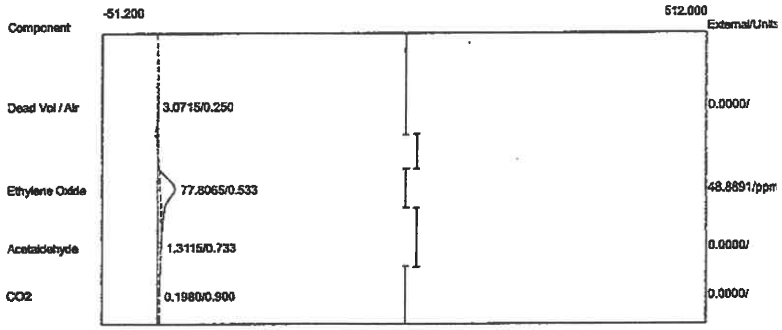
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	0.2250	0.0000	
Ethylene Oxide	0.533	157.0555	0.0000	ppm
Acetaldehyde	0.766	0.1230	0.0000	
CO2	0.883	0.2450	0.0000	
		157.6485	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
ıalysis date: 06/09/2015 08:20:46
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
omponents: eto1-100.cpt
Data file: 1SterGP2015-C07.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



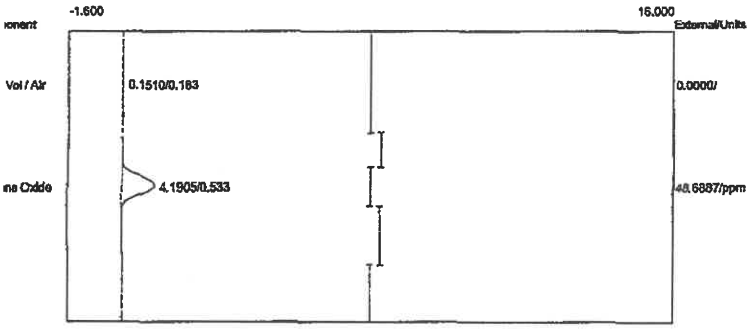
Component	Retention	Area	External	Units
ad Vol / Air	0.083	0.0870	0.0000	
ylene Oxide	0.516	4.2340	49.1941	ppm
		4.3210	49.1941	

Client: Sterigenics - Grand Prairie
Client ID: PreCal
Analysis date: 06/09/2015 08:20:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: C:\peak359\eto-100.tem
Components: eto2-100.cpt
Data file: 2SterGP2015-C07.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



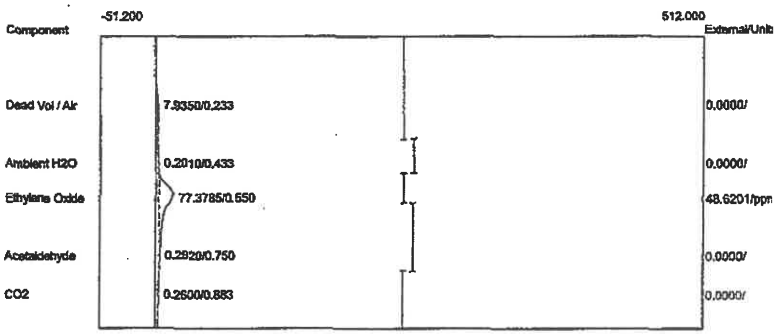
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	3.0715	0.0000	
Ethylene Oxide	0.533	77.8065	48.8891	ppm
Acetaldehyde	0.733	1.3115	0.0000	
CO2	0.900	0.1980	0.0000	
		82.3875	48.8891	

Client: Sterigenics - Grand Prairie
Client ID: PostCal
ıalysis date: 06/09/2015 17:39:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-C08.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.183	0.1510	0.0000	
ylene Oxide	0.533	4.1905	48.6887	ppm
		4.3415	48.6887	

Client: Sterigenics - Grand Prairie
Client ID: PostCal
Analysis date: 06/09/2015 17:39:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-C08.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer

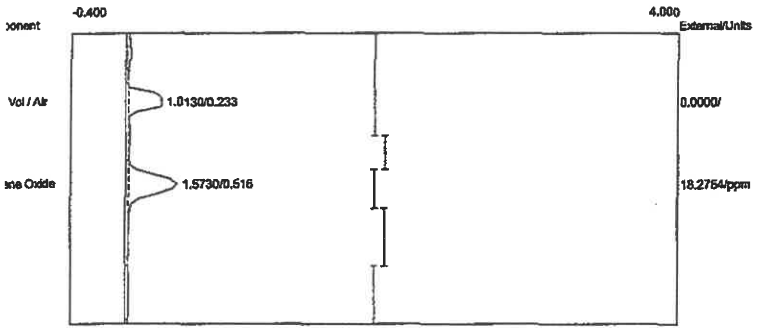


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	7.9350	0.0000	
Ambient H2O	0.433	0.2010	0.0000	
Ethylene Oxide	0.550	77.3785	48.6201	ppm
Acetaldehyde	0.750	0.2920	0.0000	
CO2	0.883	0.2600	0.0000	
		86.0665	48.6201	

APPENDIX B

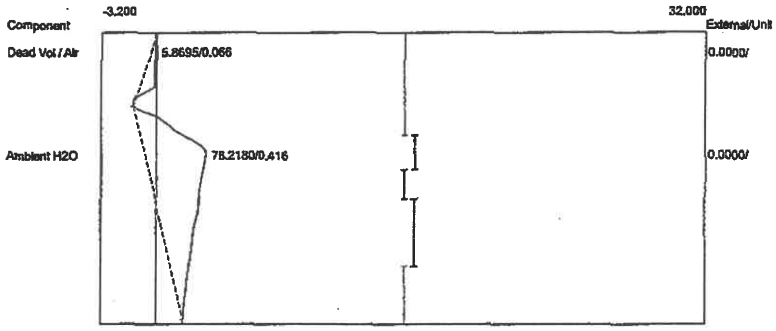
Run #1 Chromatograms - Backvent

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
nalysis date: 06/09/2015 13:39:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



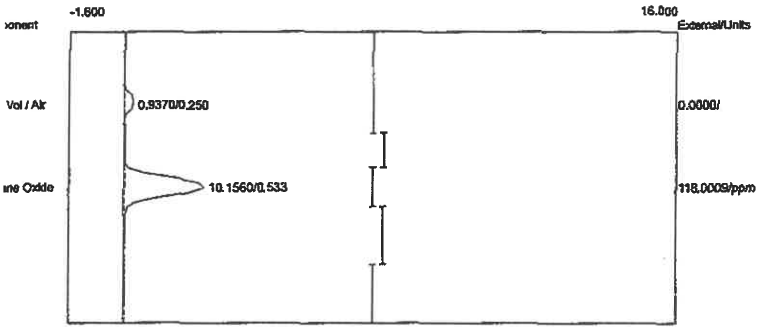
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0130	0.0000	
ıylene Oxide	0.516	1.5730	18.2764	ppm
		2.5860	18.2764	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:39:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



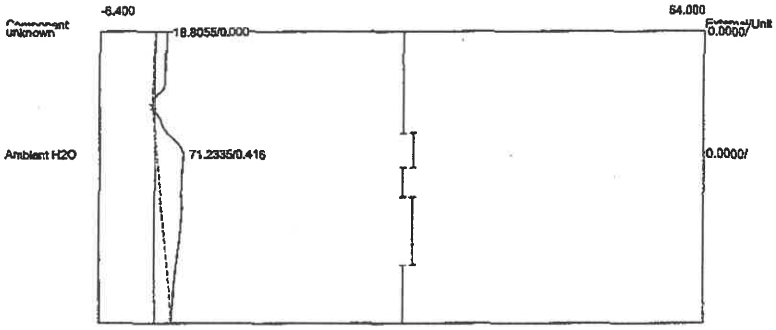
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	5.8695	0.0000	
Ambient H2O	0.416	78.2180	0.0000	
		84.0875	0.0000	

Lab name: ECCI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:40:55
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 1SterGP2015.cpt
Data file: 1SterGP2015-1B02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



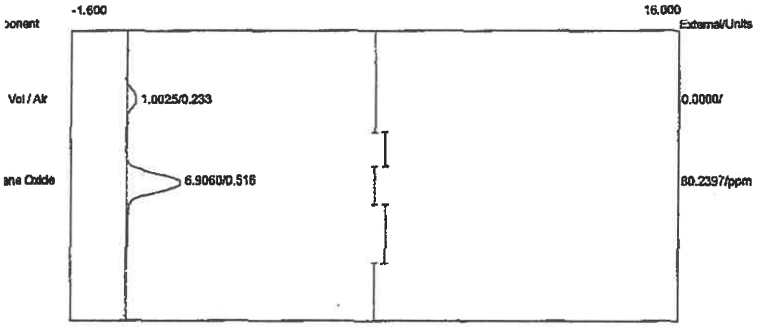
Component	Retention	Area	External	Units
ad Vol / Air	0.250	0.9370	0.0000	
ylene Oxide	0.533	10.1560	118.0009	ppm
		11.0930	118.0009	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:40:55
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



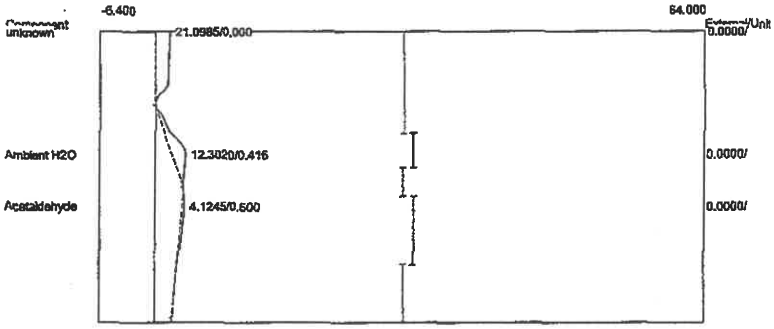
Component	Retention	Area	External	Units
Ambient H2O	0.416	71.2335	0.0000	
		71.2335	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:42:01
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 1SterGP2015.cpt
Data file: 1SterGP2015-1B03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



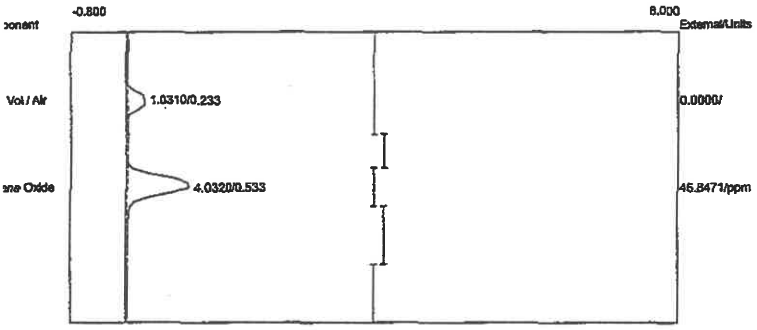
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0025	0.0000	
ylene Oxide	0.516	6.9060	80.2397	ppm
		7.9085	80.2397	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:42:01
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



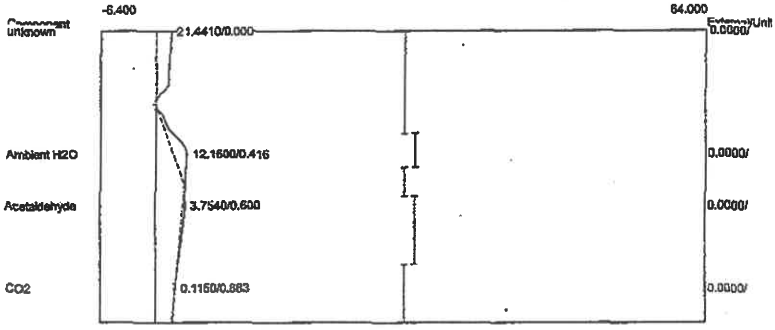
Component	Retention	Area	External	Units
Ambient H2O	0.416	12.3020	0.0000	
Acetaldehyde	0.600	4.1245	0.0000	
		16.4265	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
nalysis date: 06/09/2015 13:43:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



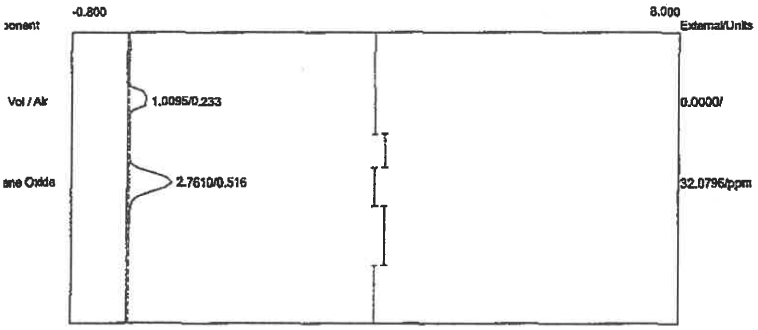
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0310	0.0000	
ylene Oxide	0.533	4.0320	46.8471	ppm
		5.0630	46.8471	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:43:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



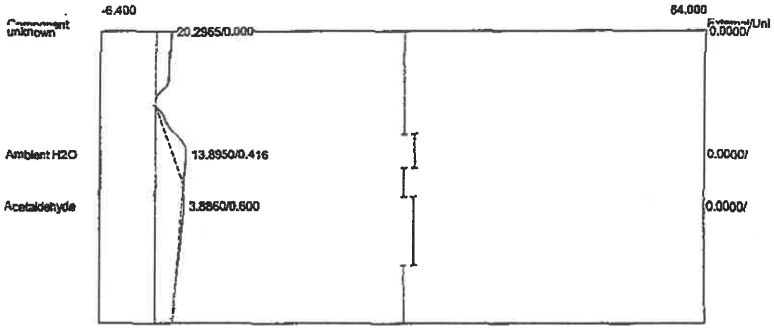
Component	Retention	Area	External	Units
Ambient H2O	0.416	12.1600	0.0000	
Acetaldehyde	0.600	3.7540	0.0000	
CO2	0.883	0.1150	0.0000	
		16.0290	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
nalysis date: 06/09/2015 13:44:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



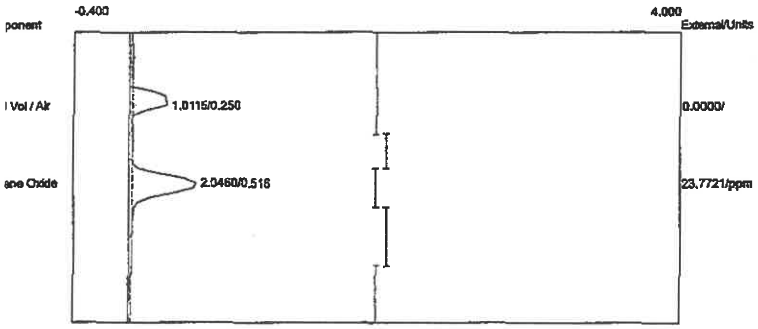
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0095	0.0000	
ıylene Oxide	0.516	2.7610	32.0796	ppm
		3.7705	32.0796	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:44:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



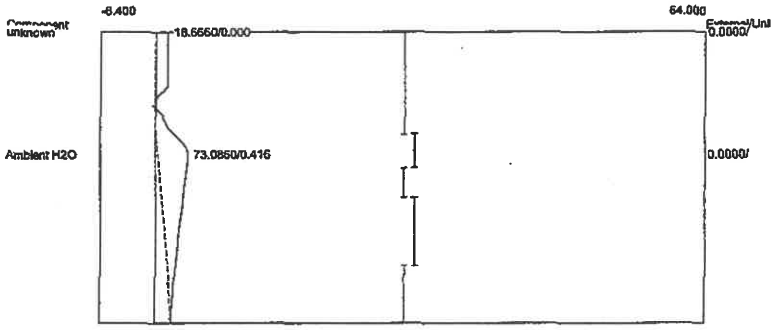
Component	Retention	Area	External	Units
Ambient H2O	0.416	13.8950	0.0000	
Acetaldehyde	0.600	3.8860	0.0000	
		17.7810	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
nalysis date: 06/09/2015 13:45:31
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



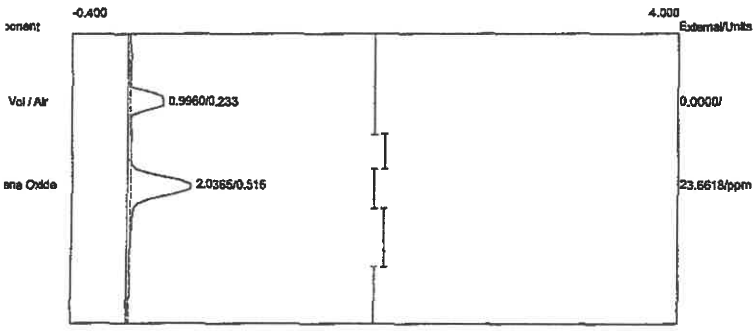
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.0115	0.0000	
ıylene Oxide	0.516	2.0460	23.7721	ppm
		3.0575	23.7721	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:45:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



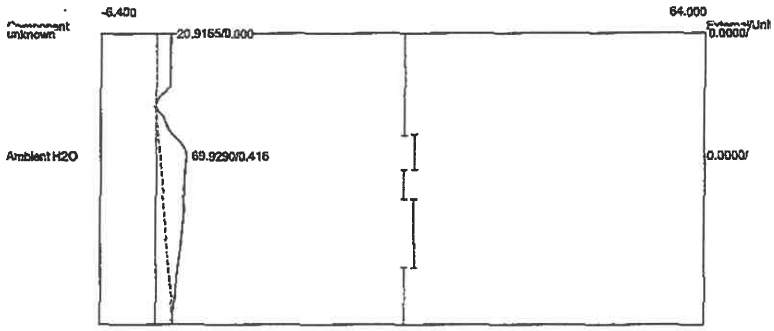
Component	Retention	Area	External	Units
Ambient H2O	0.416	73.0860	0.0000	
		73.0860	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
nalysis date: 06/09/2015 13:46:37
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 1SterGP2015.cpt
Data file: 1SterGP2015-1B07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



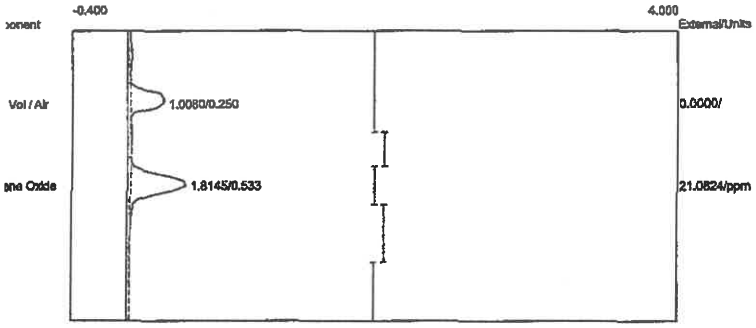
Component	Retention	Area	External	Units
ad Vol / Air	0.233	0.9960	0.0000	
ylene Oxide	0.516	2.0365	23.6618	ppm
		3.0325	23.6618	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:46:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



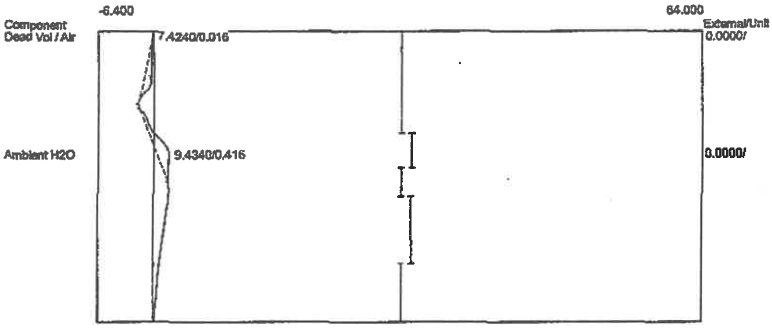
Component	Retention	Area	External	Units
Ambient H2O	0.416	69.9290	0.0000	
		69.9290	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
nalysis date: 06/09/2015 13:47:45
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



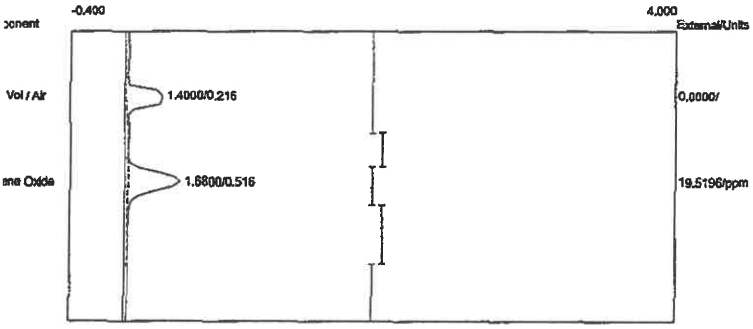
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.0080	0.0000	
ylene Oxide	0.533	1.8145	21.0824	ppm
		2.8225	21.0824	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:47:45
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



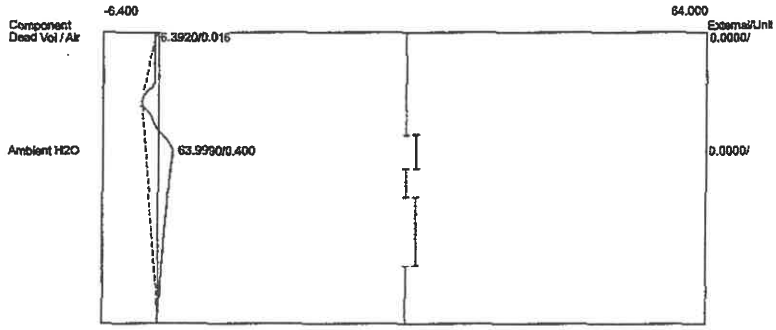
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.4240	0.0000	
Ambient H2O	0.416	9.4340	0.0000	
		16.8580	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
nalysis date: 06/09/2015 13:49:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



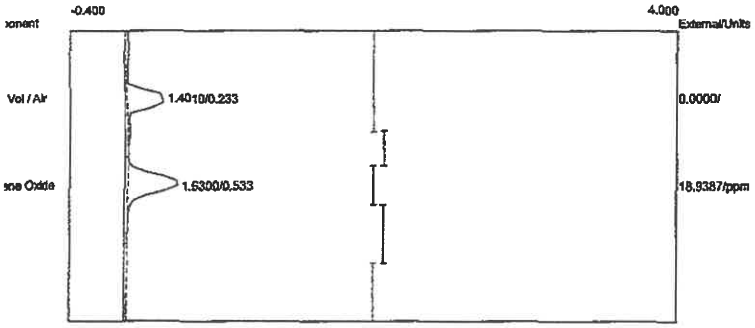
Component	Retention	Area	External	Units
ad Vol / Air	0.216	1.4000	0.0000	
ylene Oxide	0.516	1.6800	19.5196	ppm
		3.0800	19.5196	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:49:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



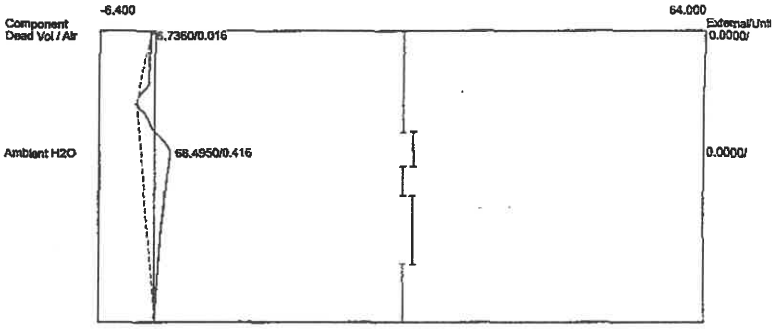
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	6.3920	0.0000	
Ambient H2O	0.400	63.9990	0.0000	
		70.3910	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
ıalysis date: 06/09/2015 13:50:35
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



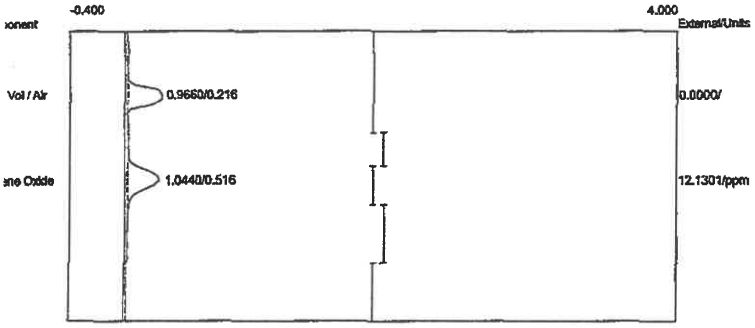
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.4010	0.0000	
ıylene Oxide	0.533	1.6300	18.9387	ppm
		3.0310	18.9387	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:50:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



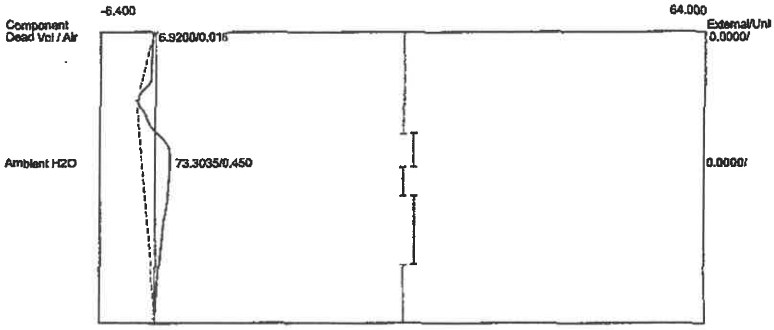
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	6.7360	0.0000	
Ambient H2O	0.416	68.4950	0.0000	
		75.2310	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:51:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 1SterGP2015.cpt
Data file: 1SterGP2015-1B11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



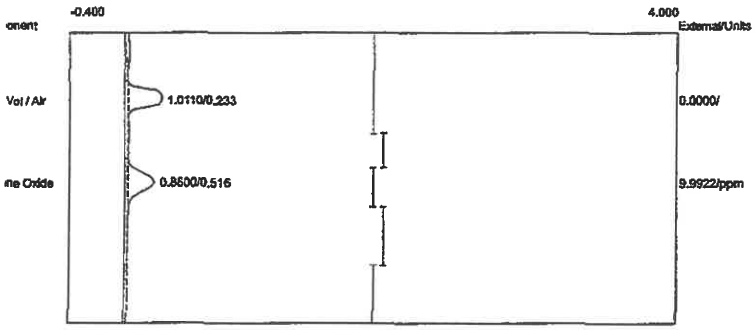
Component	Retention	Area	External	Units
ad Vol / Air	0.216	0.9660	0.0000	
ylene Oxide	0.516	1.0440	12.1301	ppm
		2.0100	12.1301	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:51:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



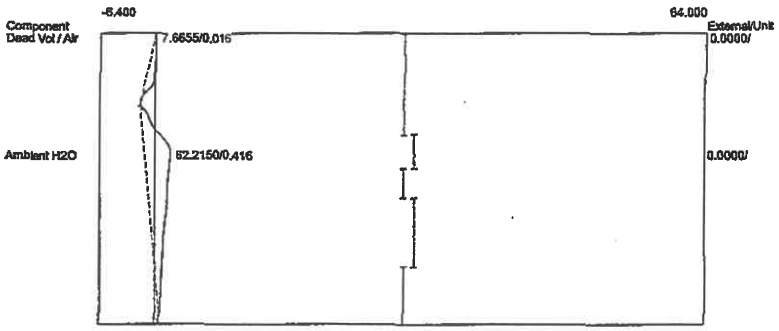
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	6.9200	0.0000	
Ambient H2O	0.450	73.3035	0.0000	
		80.2235	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
ıalysis date: 06/09/2015 13:53:29
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1B12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0110	0.0000	
ylene Oxide	0.516	0.8600	9.9922	ppm
		1.8710	9.9922	

Client: Sterigenics - Grand Prairie
Client ID: Run#1BV
Analysis date: 06/09/2015 13:53:29
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1B12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



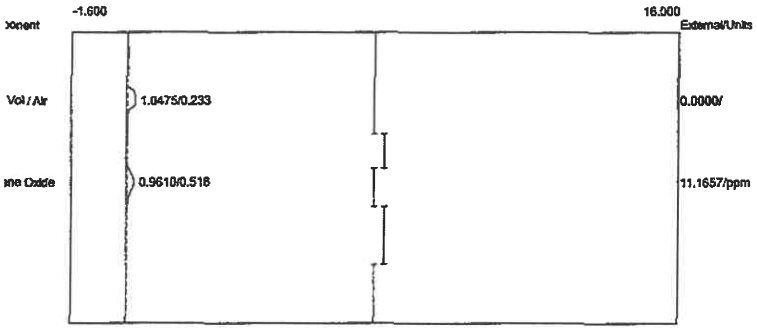
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.6655	0.0000	
Ambient H2O	0.416	62.2150	0.0000	
		69.8805	0.0000	

APPENDIX C

Run #1 Chromatograms - Aeration

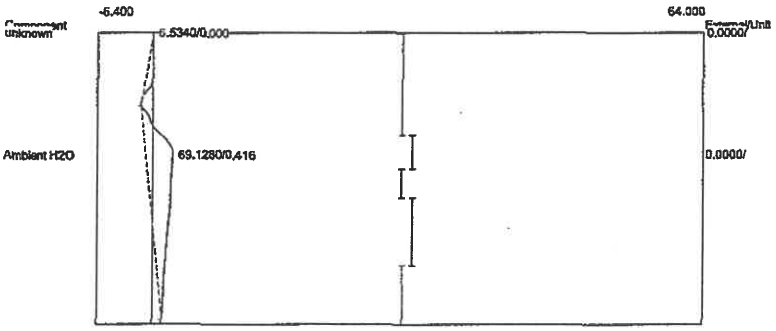
ECSi

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 13:57:13
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



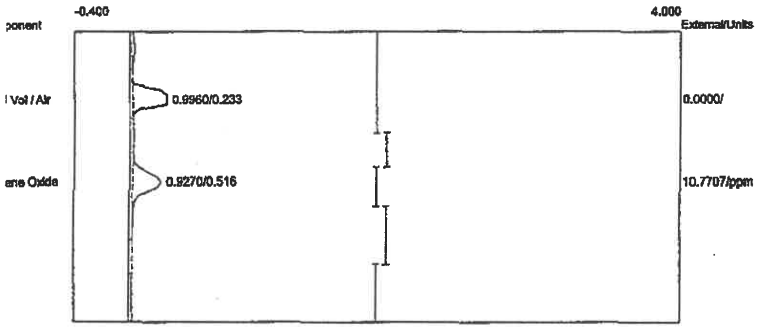
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0475	0.0000	
ylene Oxide	0.516	0.9610	11.1657	ppm
		2.0085	11.1657	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 13:57:13
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



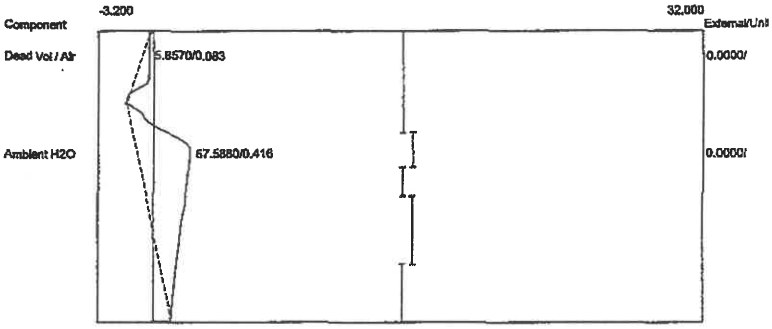
Component	Retention	Area	External	Units
Ambient H2O	0.416	69.1280	0.0000	
		69.1280	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:02:38
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



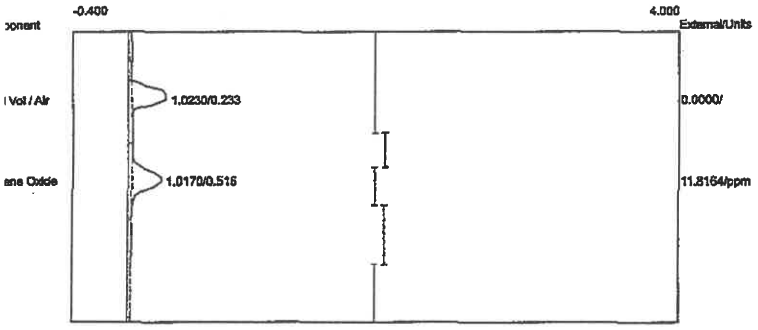
Component	Retention	Area	External	Units
ad Vol / Air	0.233	0.9960	0.0000	
ylene Oxide	0.516	0.9270	10.7707	ppm
		1.9230	10.7707	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:02:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



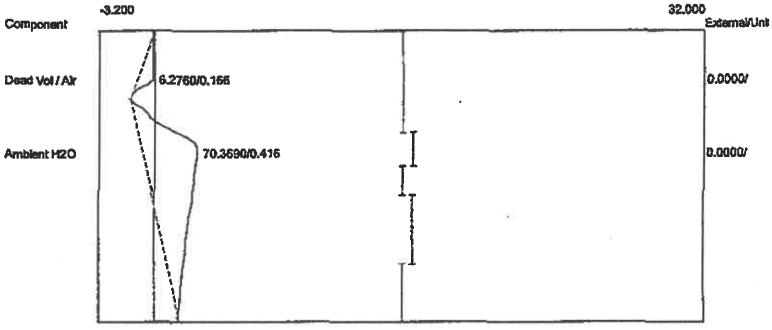
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	5.8570	0.0000	
Ambient H2O	0.416	67.5880	0.0000	
		73.4450	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:07:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



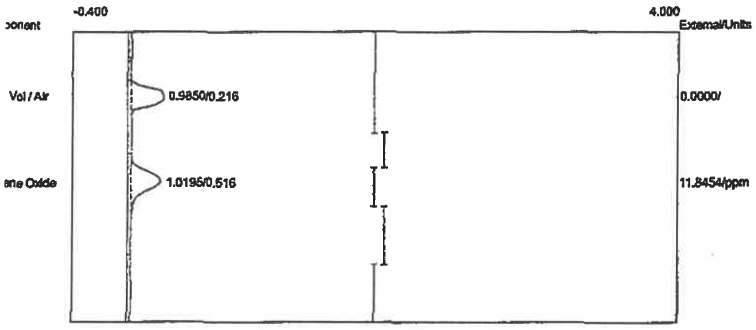
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0230	0.0000	
ylene Oxide	0.516	1.0170	11.8164	ppm
		2.0400	11.8164	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:07:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



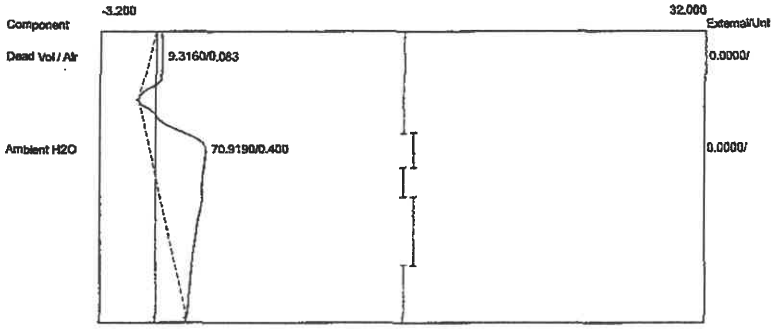
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	6.2760	0.0000	
Ambient H2O	0.416	70.3690	0.0000	
		76.6450	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:12:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



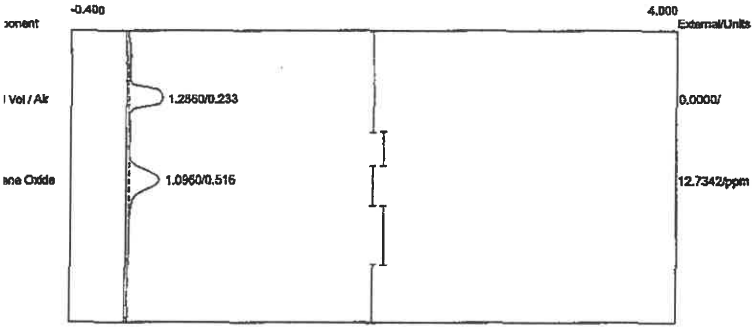
Component	Retention	Area	External	Units
ad Vol / Air	0.216	0.9850	0.0000	
ylene Oxide	0.516	1.0195	11.8454	ppm
		2.0045	11.8454	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:12:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



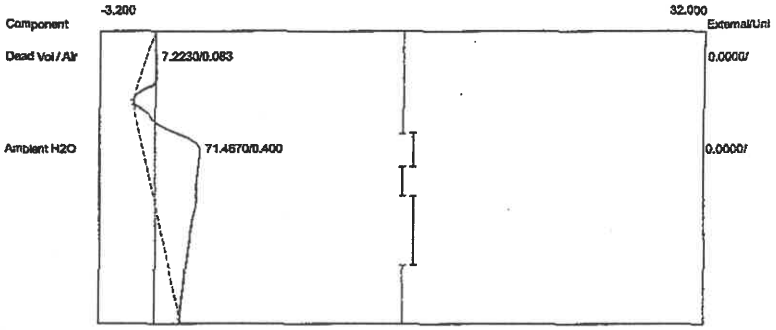
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	9.3160	0.0000	
Ambient H2O	0.400	70.9190	0.0000	
		80.2350	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:17:37
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



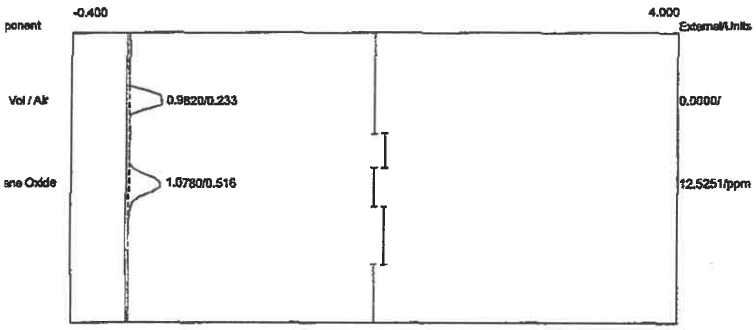
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.2860	0.0000	
ylene Oxide	0.516	1.0960	12.7342	ppm
		2.3820	12.7342	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:17:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



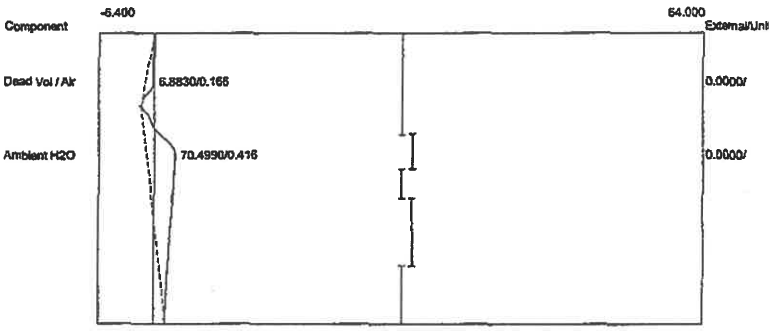
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	7.2230	0.0000	
Ambient H2O	0.400	71.4670	0.0000	
		78.6900	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:22:46
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



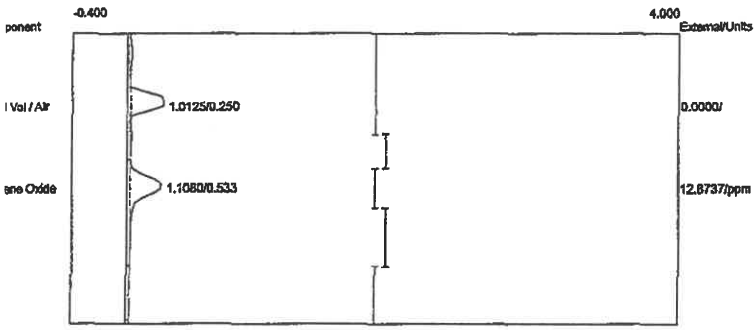
Component	Retention	Area	External	Units
ad Vol / Air	0.233	0.9820	0.0000	
ylene Oxide	0.516	1.0780	12.5251	ppm
		2.0600	12.5251	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:22:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



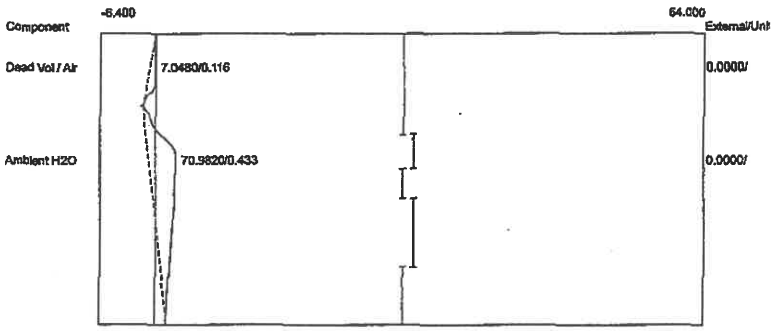
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	6.8830	0.0000	
Ambient H2O	0.416	70.4990	0.0000	
		77.3820	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:27:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



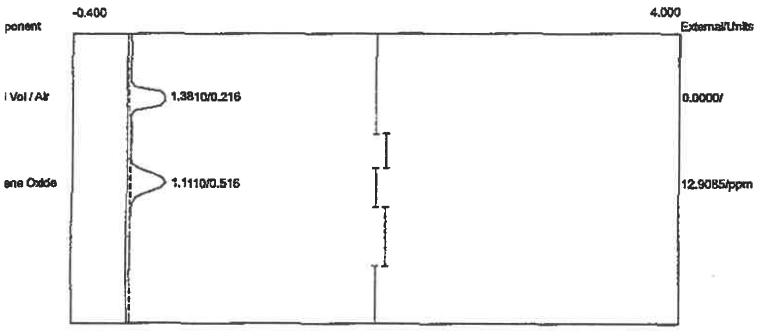
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.0125	0.0000	
ıylene Oxide	0.533	1.1080	12.8737	ppm
		2.1205	12.8737	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:27:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



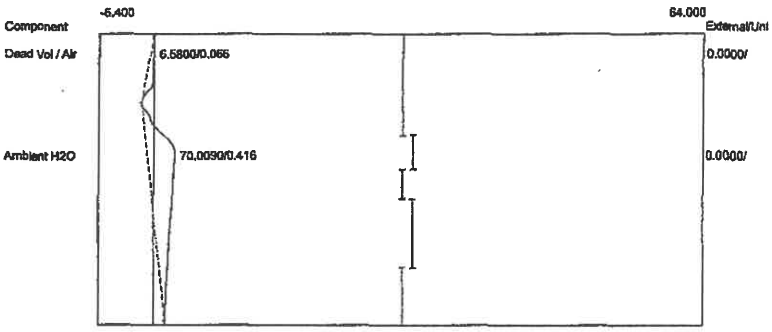
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	7.0480	0.0000	
Ambient H2O	0.433	70.9820	0.0000	
		78.0300	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:32:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
:omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



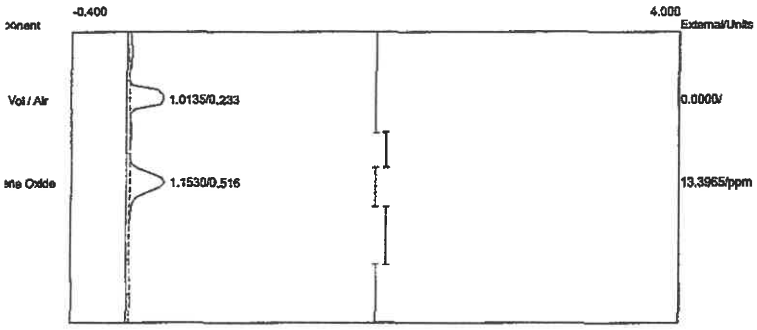
Component	Retention	Area	External	Units
ad Vol / Air	0.216	1.3810	0.0000	
ıylene Oxide	0.516	1.1110	12.9085	ppm
		2.4920	12.9085	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:32:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



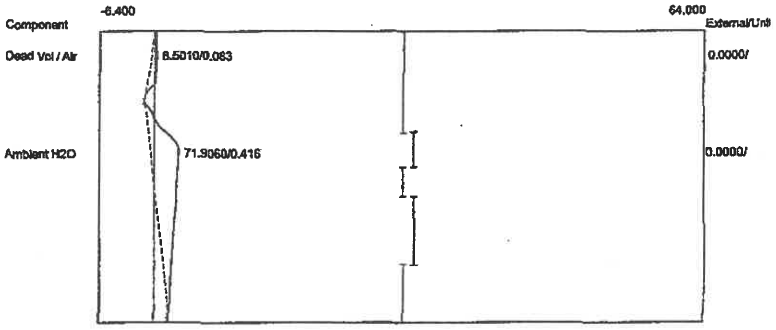
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	6.5800	0.0000	
Ambient H2O	0.416	70.0090	0.0000	
		76.5890	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:37:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-1A09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



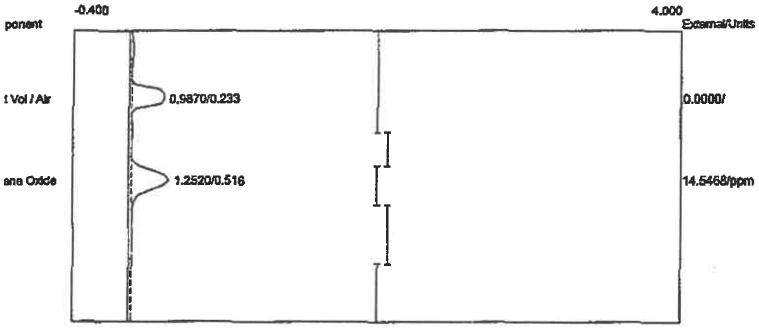
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0135	0.0000	
ylene Oxide	0.516	1.1530	13.3965	ppm
		2.1665	13.3965	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:37:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



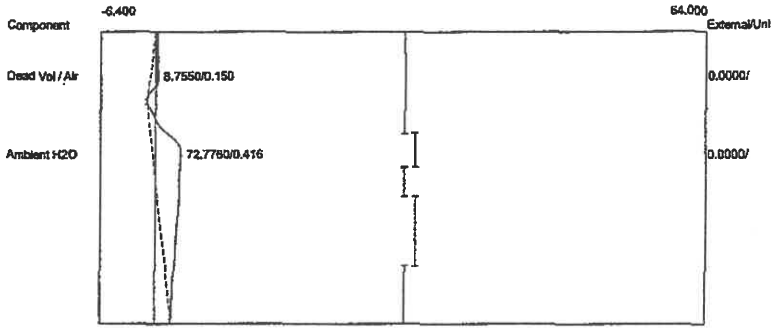
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	8.5010	0.0000	
Ambient H2O	0.416	71.9060	0.0000	
		80.4070	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:42:46
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 1SterGP2015.cpt
Data file: 1SterGP2015-1A10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



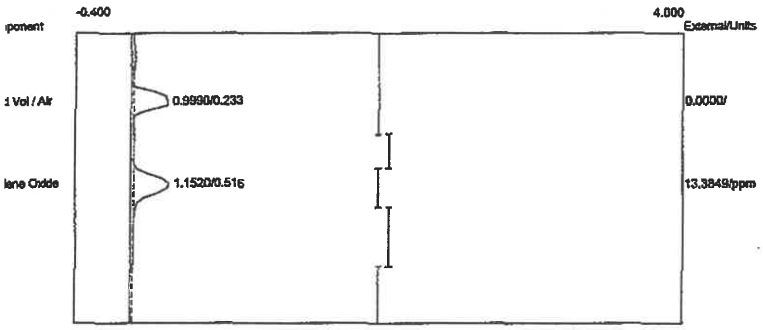
Component	Retention	Area	External	Units
ad Vol / Air	0.233	0.9870	0.0000	
ylene Oxide	0.516	1.2520	14.5468	ppm
		2.2390	14.5468	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:42:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



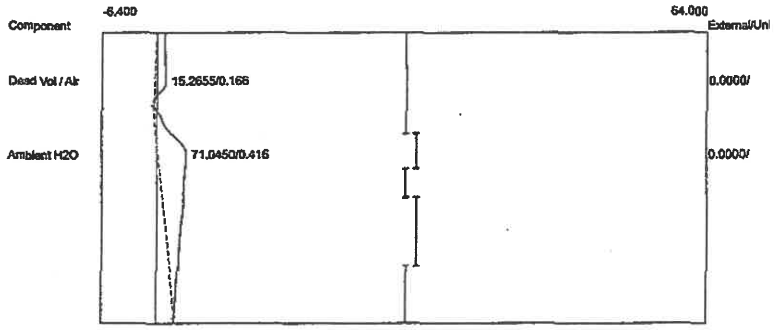
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	8.7550	0.0000	
Ambient H2O	0.416	72.7760	0.0000	
		81.5310	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:47:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 1SterGP2015.cpt
Data file: 1SterGP2015-1A11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



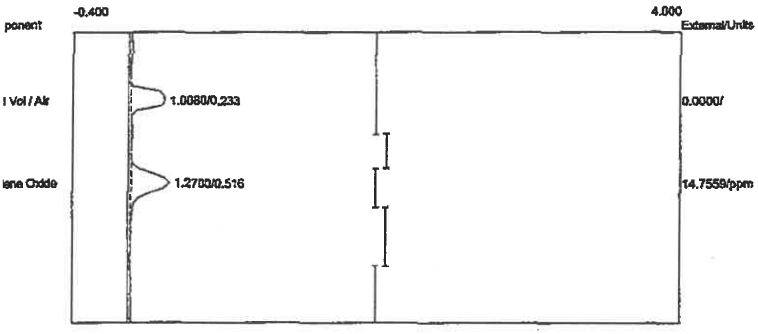
Component	Retention	Area	External	Units
ead Vol / Air	0.233	0.9990	0.0000	
ylene Oxide	0.516	1.1520	13.3849	ppm
		2.1510	13.3849	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:47:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



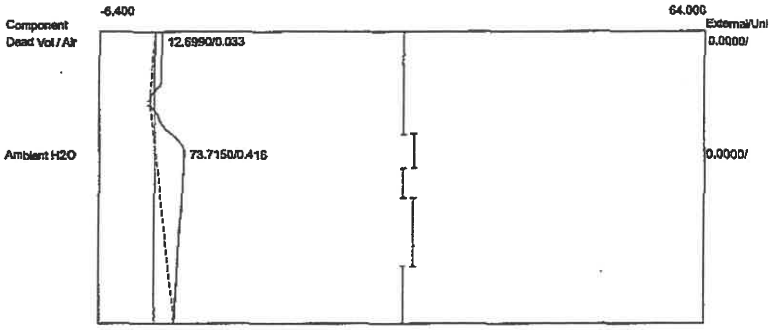
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	15.2655	0.0000	
Ambient H2O	0.416	71.0450	0.0000	
		86.3105	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
nalysis date: 06/09/2015 14:52:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 1SterGP2015.cpt
Data file: 1SterGP2015-1A12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0080	0.0000	
ylene Oxide	0.516	1.2700	14.7559	ppm
		2.2780	14.7559	

Client: Sterigenics - Grand Prairie
Client ID: Run#1Aer
Analysis date: 06/09/2015 14:52:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-1A12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



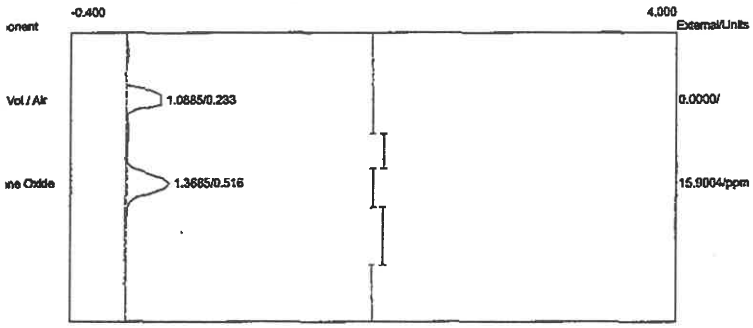
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	12.6990	0.0000	
Ambient H2O	0.416	73.7150	0.0000	
		86.4140	0.0000	

APPENDIX D

Run #2 Chromatograms - Backvent

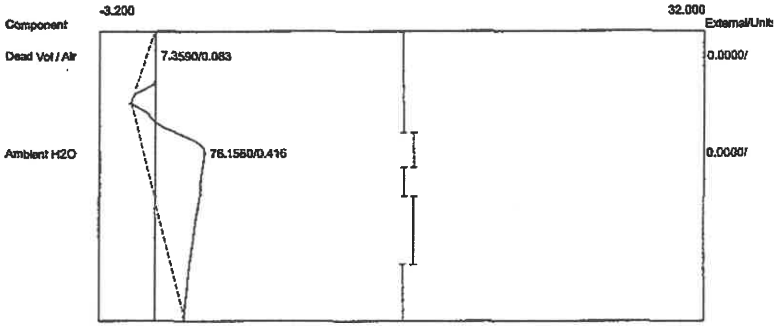
ECSi

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
ıalysis date: 06/09/2015 15:28:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



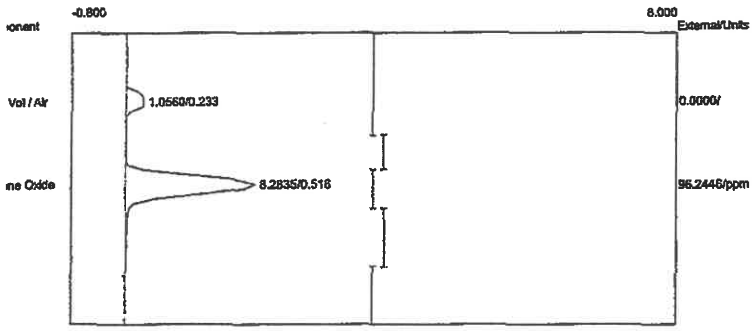
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0885	0.0000	
ylene Oxide	0.516	1.3685	15.9004	ppm
		2.4570	15.9004	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:28:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



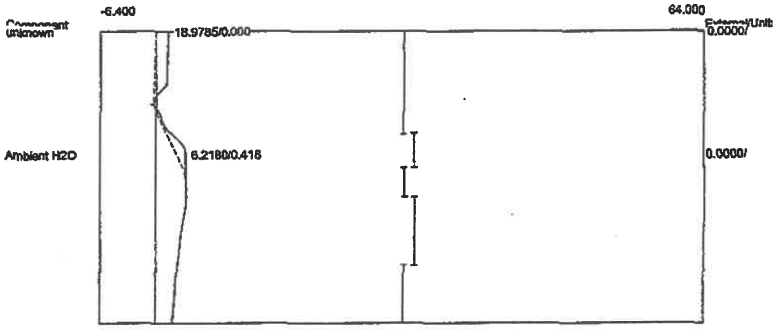
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	7.3590	0.0000	
Ambient H2O	0.416	76.1560	0.0000	
		83.5150	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
ıalysis date: 06/09/2015 15:29:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



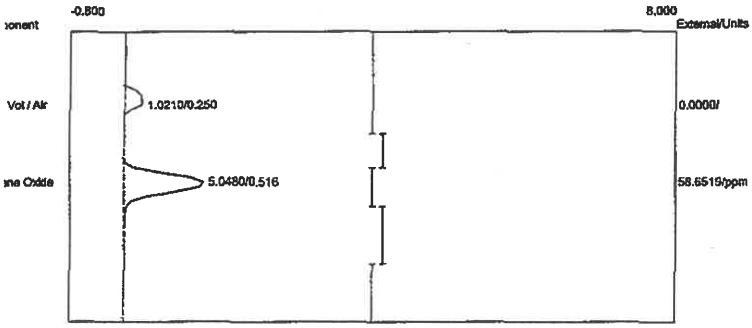
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0560	0.0000	
ıylene Oxide	0.516	8.2835	96.2446	ppm
		9.3395	96.2446	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:29:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



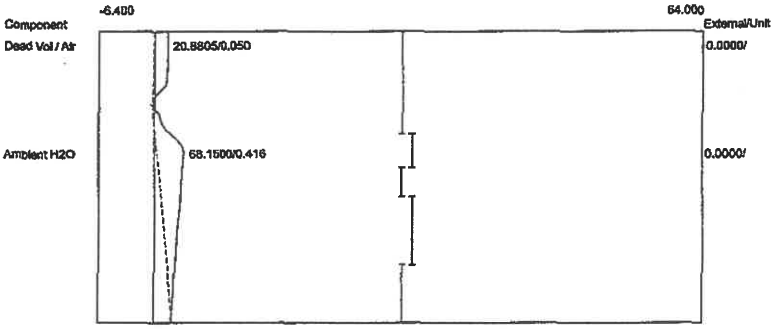
Component	Retention	Area	External	Units
Ambient H2O	0.416	6.2180	0.0000	
		6.2180	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
ıalysis date: 06/09/2015 15:31:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



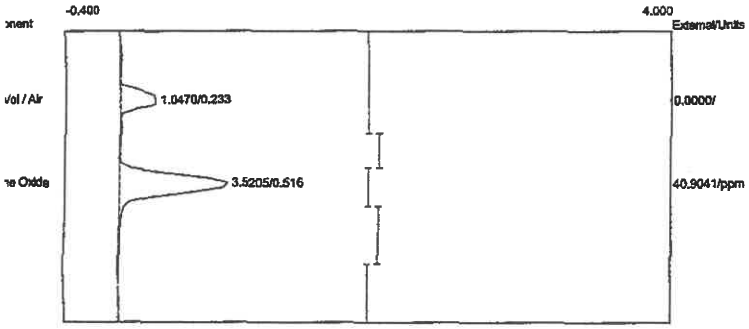
Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.0210	0.0000	
ıylene Oxide	0.516	5.0480	58.6519	ppm
		6.0690	58.6519	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:31:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



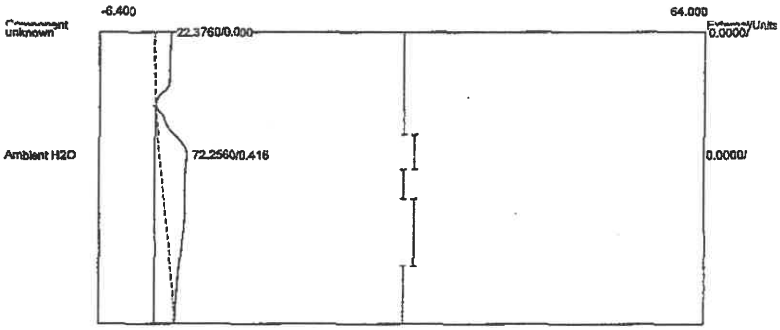
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	20.8805	0.0000	
Ambient H2O	0.416	68.1500	0.0000	
		89.0305	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
ıalysis date: 06/09/2015 15:32:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



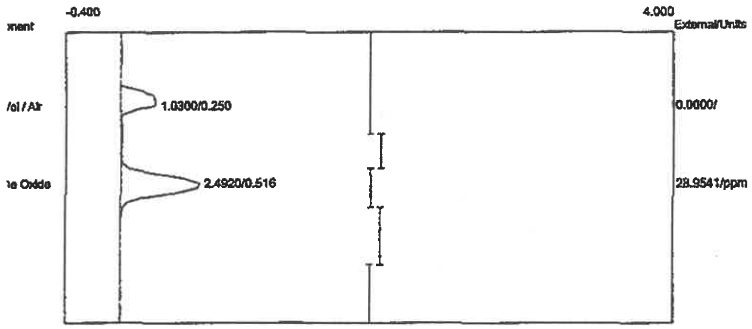
Component	Retention	Area	External	Units
ıd Vol / Air	0.233	1.0470	0.0000	
ylene Oxide	0.516	3.5205	40.9041	ppm
		4.5675	40.9041	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:32:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



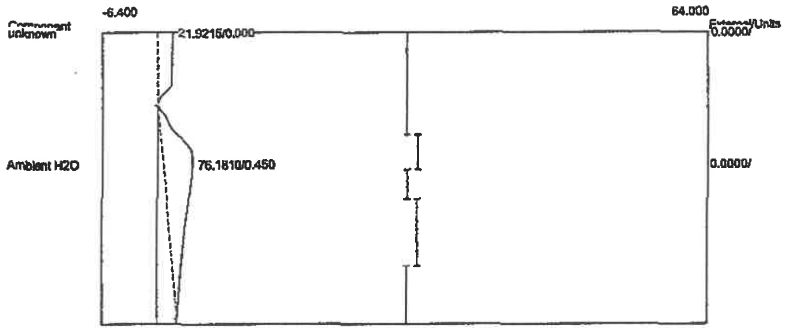
Component	Retention	Area	External	Units
Ambient H2O	0.416	72.2560	0.0000	
		72.2560	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
alysis date: 06/09/2015 15:33:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



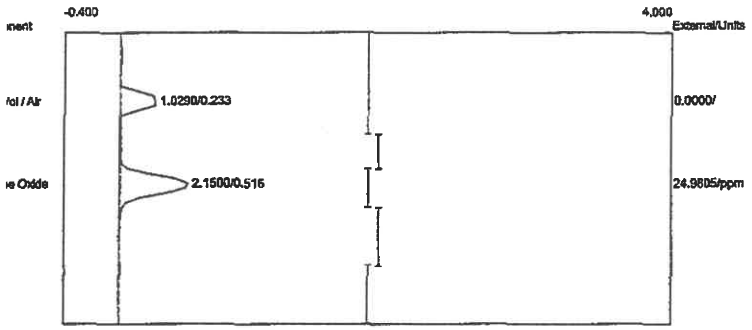
Component	Retention	Area	External	Units
id Vol / Air	0.250	1.0300	0.0000	
ylene Oxide	0.516	2.4920	28.9541	ppm
		3.5220	28.9541	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:33:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



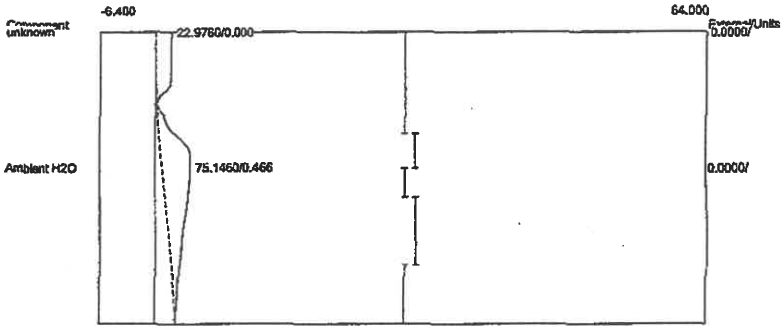
Component	Retention	Area	External	Units
Ambient H2O	0.450	76.1810	0.0000	
		76.1810	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
alysis date: 06/09/2015 15:34:37
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



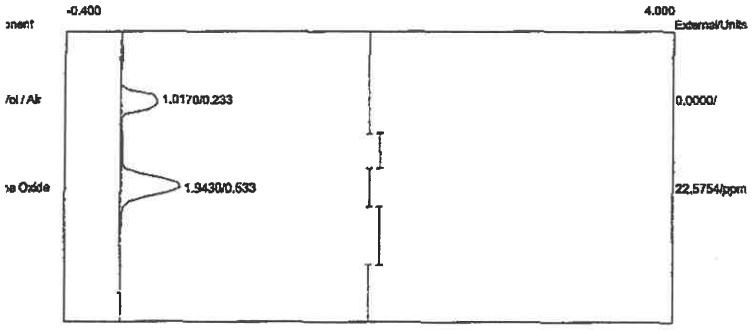
Component	Retention	Area	External	Units
id Vol / Air	0.233	1.0290	0.0000	
ylene Oxide	0.516	2.1500	24.9805	ppm
		3.1790	24.9805	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:34:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



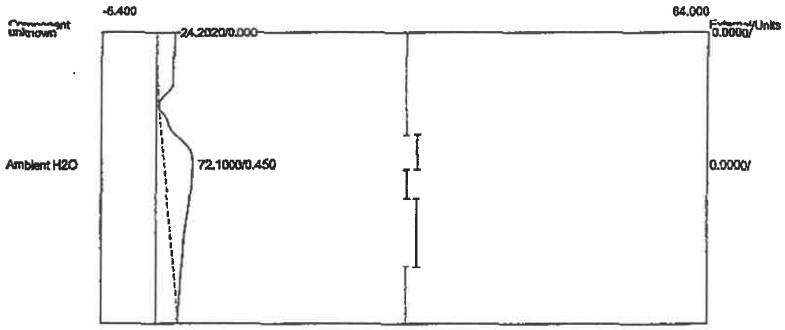
Component	Retention	Area	External	Units
Ambient H2O	0.466	75.1460	0.0000	
		75.1460	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
ıalysis date: 06/09/2015 15:35:51
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



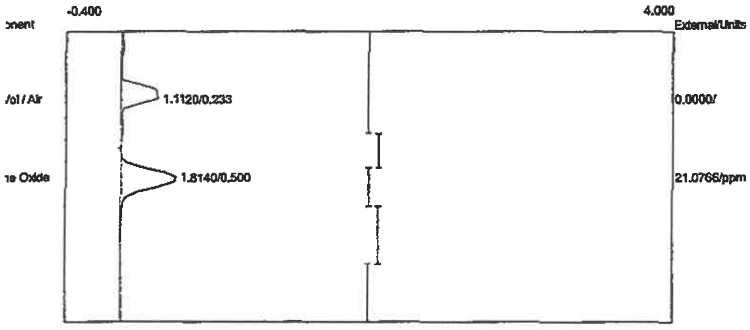
Component	Retention	Area	External	Units
ıd Vol / Air	0.233	1.0170	0.0000	
ylene Oxide	0.533	1.9430	22.5754	ppm
		2.9600	22.5754	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:35:51
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



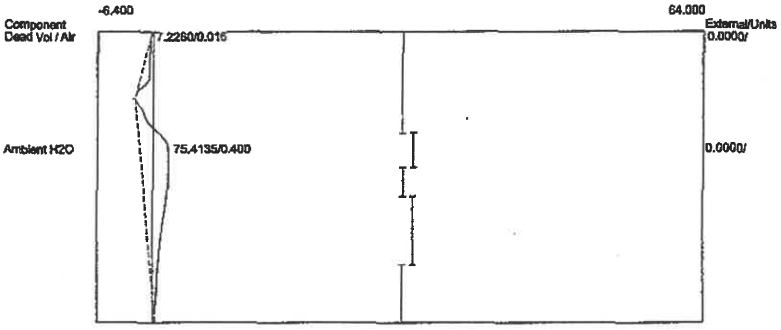
Component	Retention	Area	External	Units
Ambient H2O	0.450	72.1000	0.0000	
		72.1000	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
alysis date: 06/09/2015 15:37:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



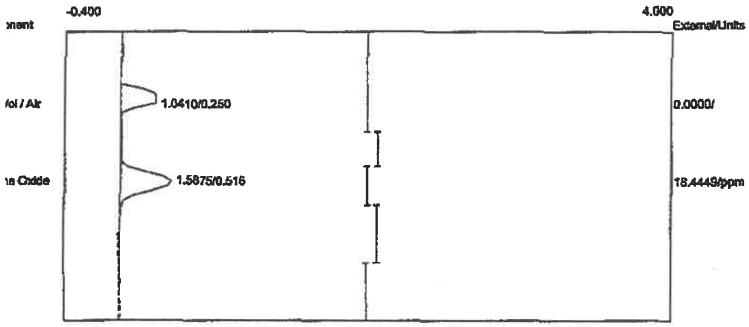
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.1120	0.0000	
ylene Oxide	0.500	1.8140	21.0766	ppm
		2.9260	21.0766	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:37:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



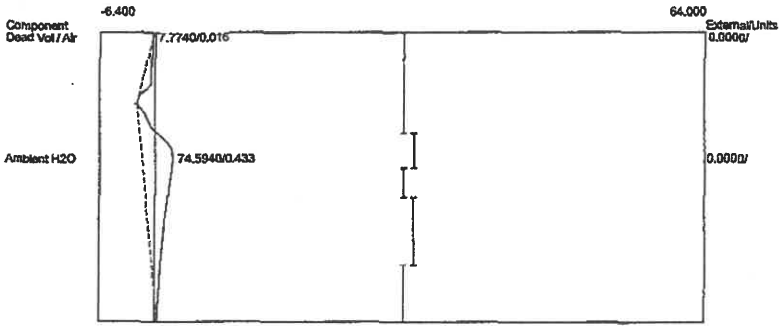
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.2260	0.0000	
Ambient H2O	0.400	75.4135	0.0000	
		82.6395	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
alysis date: 06/09/2015 15:38:19
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



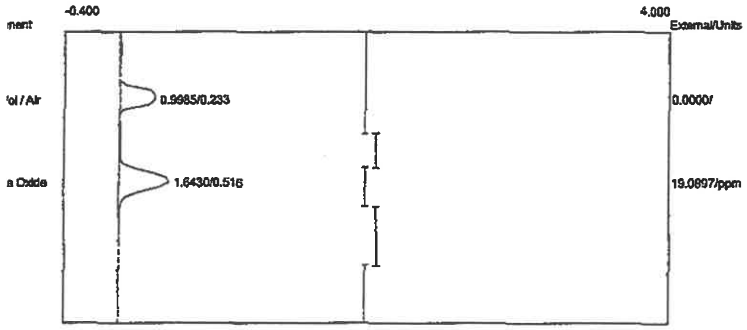
Component	Retention	Area	External	Units
d Vol / Air	0.250	1.0410	0.0000	
ylene Oxide	0.516	1.5875	18.4449	ppm
		2.6285	18.4449	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:38:19
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



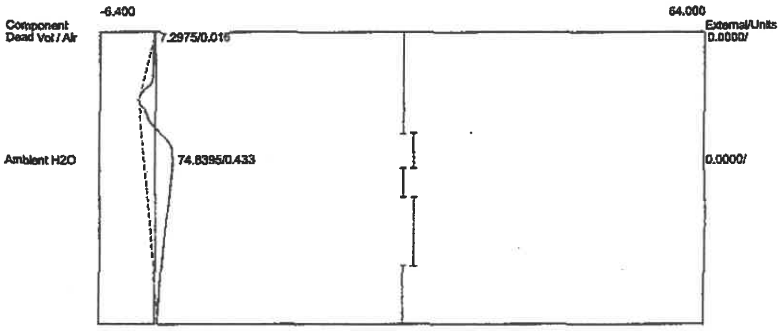
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.7740	0.0000	
Ambient H2O	0.433	74.5940	0.0000	
		82.3680	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
alysis date: 06/09/2015 15:39:33
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



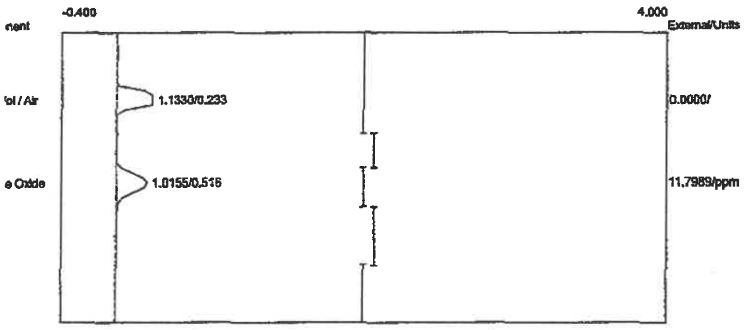
Component	Retention	Area	External	Units
d Vol / Air	0.233	0.9985	0.0000	
lene Oxide	0.516	1.6430	19.0897	ppm
		2.6415	19.0897	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:39:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



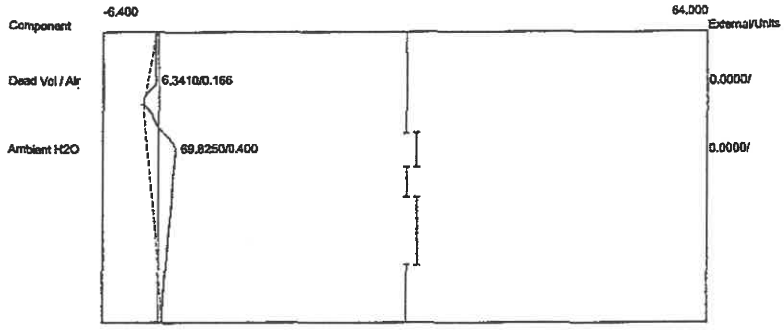
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.2975	0.0000	
Ambient H2O	0.433	74.8395	0.0000	
		82.1370	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
alysis date: 06/09/2015 15:41:01
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



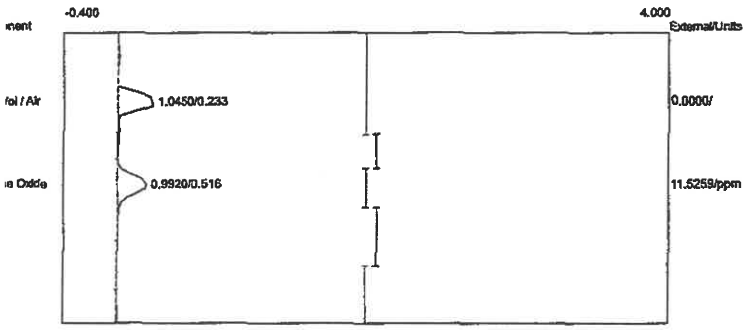
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.1330	0.0000	
/lene Oxide	0.516	1.0155	11.7989	ppm
		2.1485	11.7989	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:41:01
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



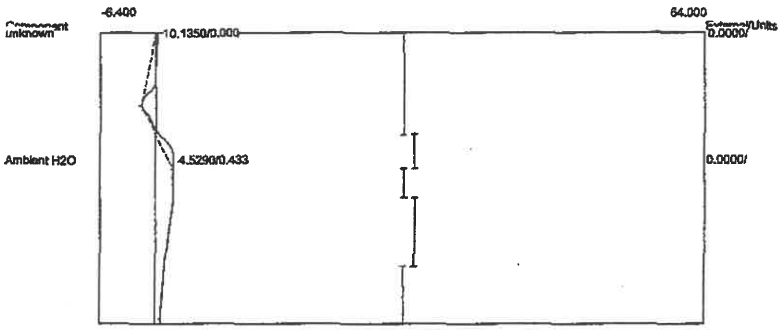
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	6.3410	0.0000	
Ambient H2O	0.400	69.8250	0.0000	
		76.1660	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
alysis date: 06/09/2015 15:42:10
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2B12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0450	0.0000	
lene Oxide	0.516	0.9920	11.5259	ppm
		2.0370	11.5259	

Client: Sterigenics - Grand Prairie
Client ID: Run#2BV
Analysis date: 06/09/2015 15:42:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2B12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



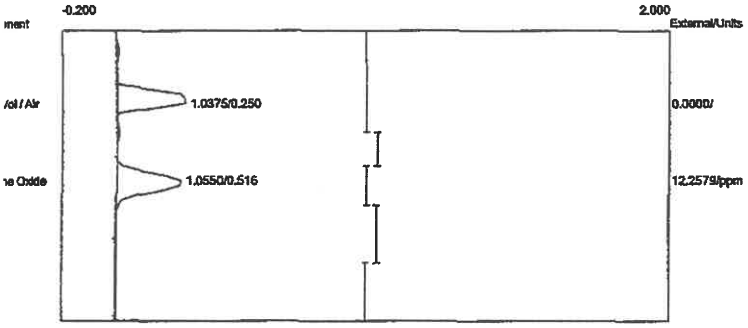
Component	Retention	Area	External	Units
Ambient H2O	0.433	4.5290	0.0000	
		4.5290	0.0000	

APPENDIX E

Run #2 Chromatograms - Aeration

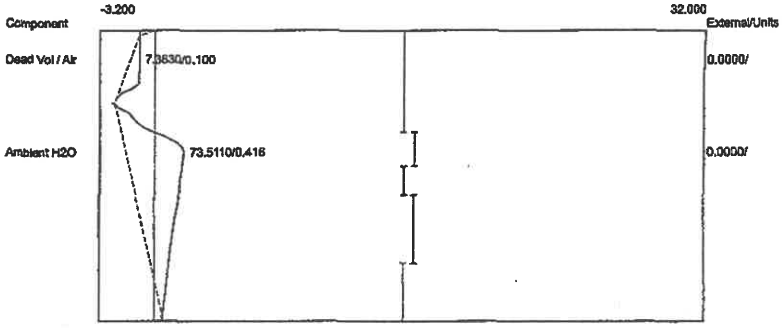
ECSi

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 15:45:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



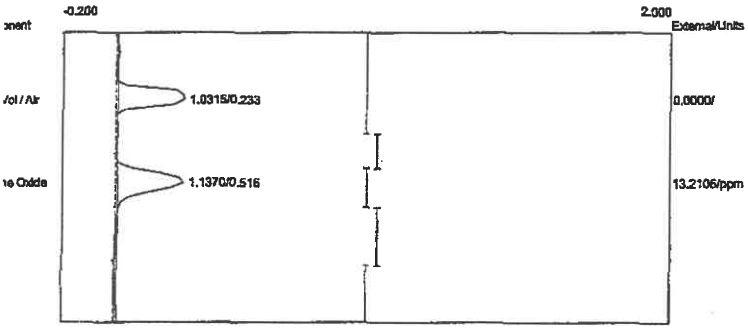
Component	Retention	Area	External	Units
d Vol / Air	0.250	1.0375	0.0000	
ylene Oxide	0.516	1.0550	12.2579	ppm
		2.0925	12.2579	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 15:45:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



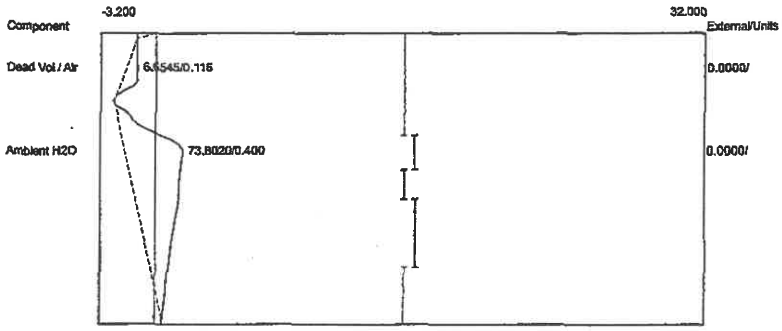
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	7.3630	0.0000	
Ambient H2O	0.416	73.5110	0.0000	
		80.8740	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 15:50:53
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



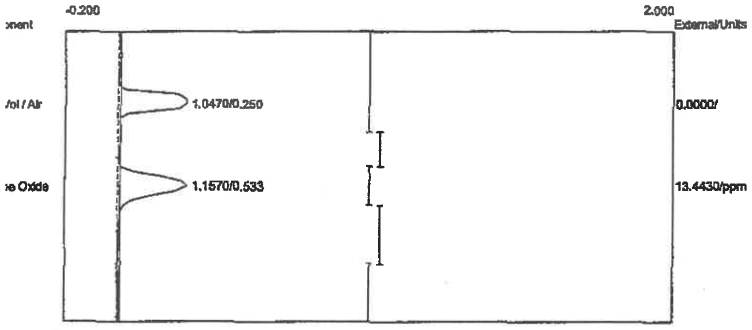
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0315	0.0000	
ylene Oxide	0.516	1.1370	13.2106	ppm
		2.1685	13.2106	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 15:50:53
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



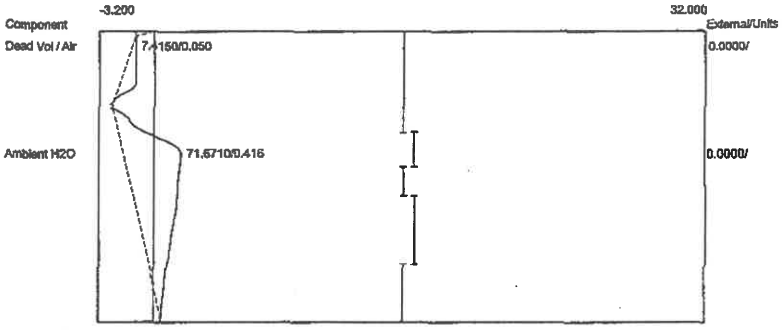
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	6.6545	0.0000	
Ambient H2O	0.400	73.8020	0.0000	
		80.4565	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
ıalysis date: 06/09/2015 15:55:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



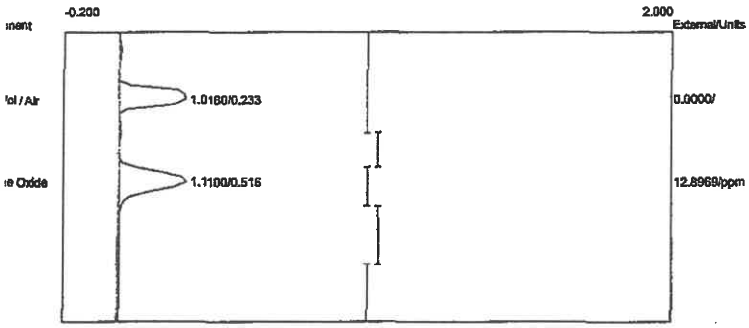
Component	Retention	Area	External	Units
ıd Vol / Air	0.250	1.0470	0.0000	
ylene Oxide	0.533	1.1570	13.4430	ppm
		2.2040	13.4430	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 15:55:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



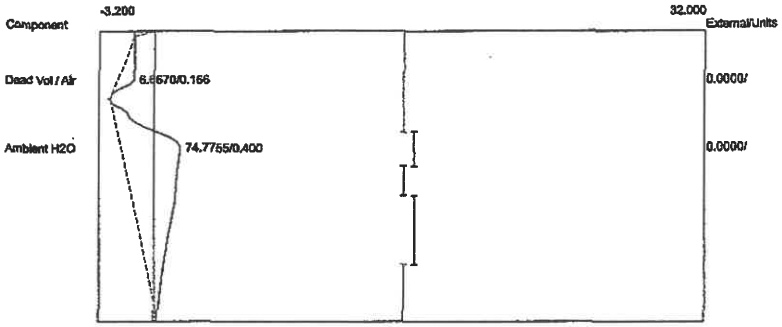
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	7.4150	0.0000	
Ambient H2O	0.416	71.6710	0.0000	
		79.0860	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:00:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



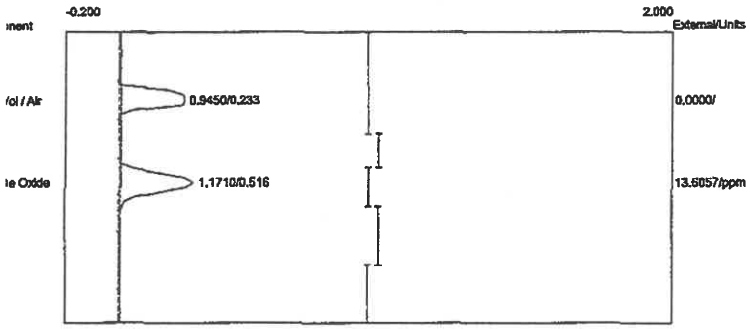
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0180	0.0000	
lene Oxide	0.516	1.1100	12.8969	ppm
		2.1280	12.8969	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:00:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



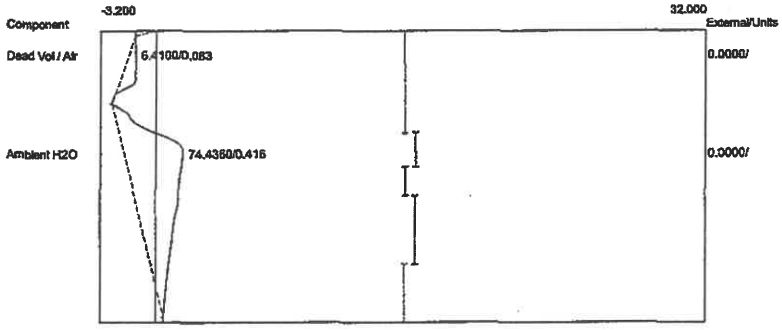
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	6.6670	0.0000	
Ambient H2O	0.400	74.7755	0.0000	
		81.4425	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:05:37
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



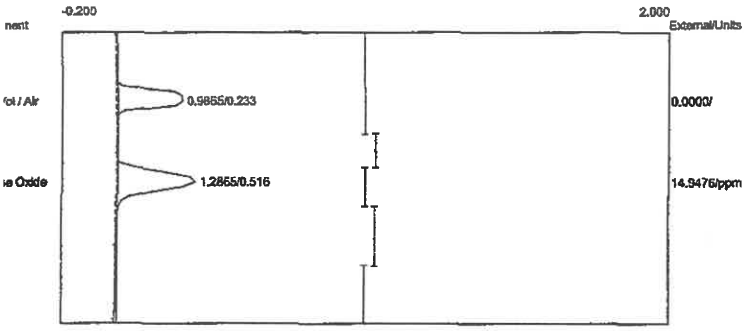
Component	Retention	Area	External	Units
d Vol / Air	0.233	0.9450	0.0000	
lene Oxide	0.516	1.1710	13.6057	ppm
		2.1160	13.6057	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:05:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



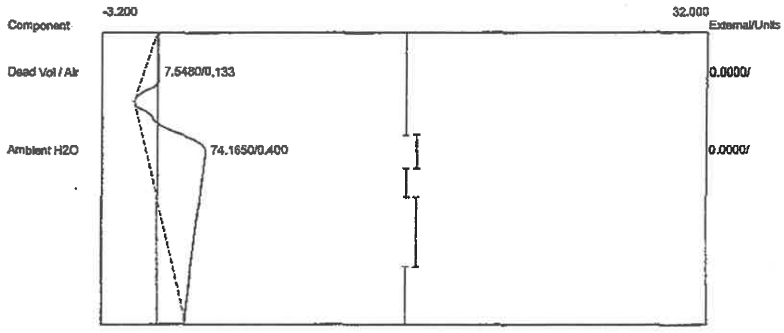
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	6.4100	0.0000	
Ambient H2O	0.416	74.4360	0.0000	
		80.8460	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:10:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



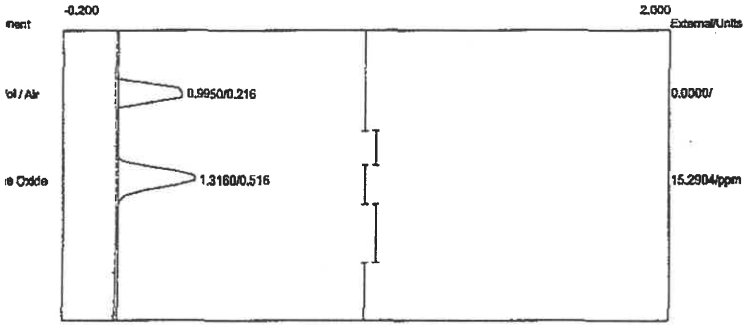
Component	Retention	Area	External	Units
d Vol / Air	0.233	0.9865	0.0000	
lene Oxide	0.516	1.2865	14.9476	ppm
		2.2730	14.9476	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:10:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



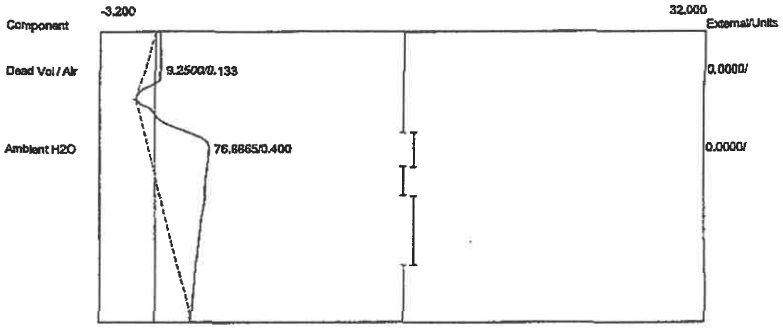
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	7.5480	0.0000	
Ambient H2O	0.400	74.1650	0.0000	
		81.7130	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:15:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



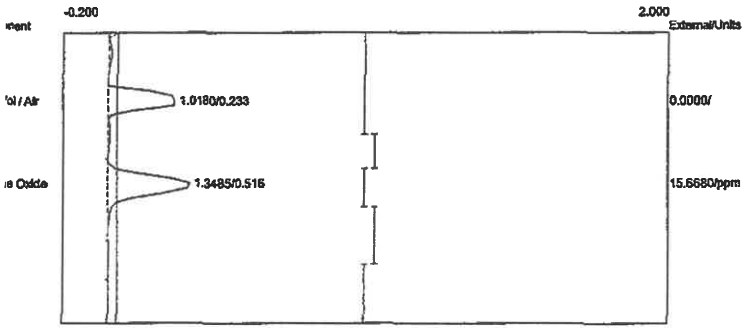
Component	Retention	Area	External	Units
d Vol / Air	0.216	0.9950	0.0000	
/lene Oxide	0.516	1.3160	15.2904	ppm
		2.3110	15.2904	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:15:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



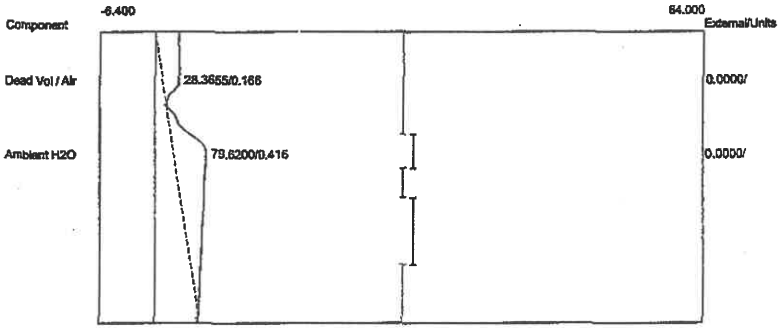
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	9.2500	0.0000	
Ambient H2O	0.400	76.8865	0.0000	
		86.1365	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:20:41
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



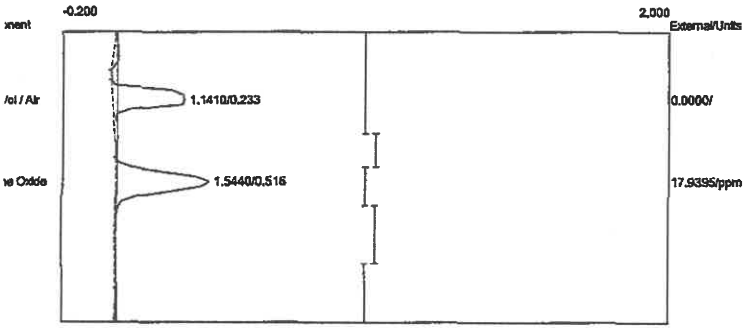
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0180	0.0000	
lene Oxide	0.516	1.3485	15.6680	ppm
		2.3665	15.6680	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:20:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



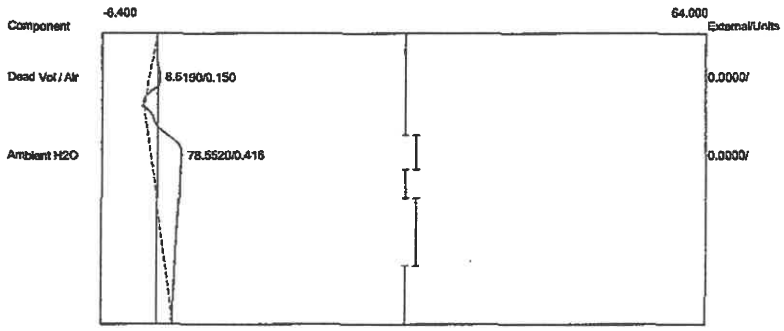
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	28.3655	0.0000	
Ambient H2O	0.416	79.6200	0.0000	
		107.9855	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:25:45
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



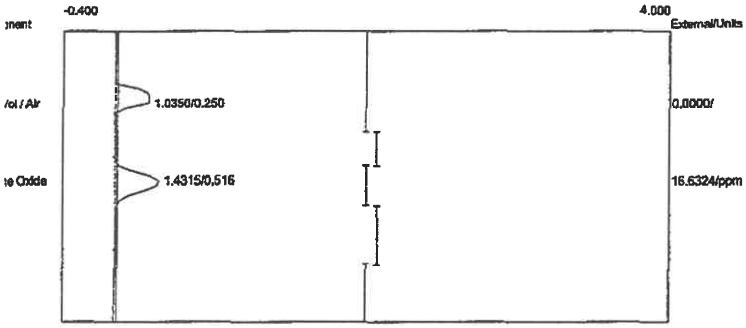
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.1410	0.0000	
ylene Oxide	0.516	1.5440	17.9395	ppm
		2.6850	17.9395	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:25:45
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



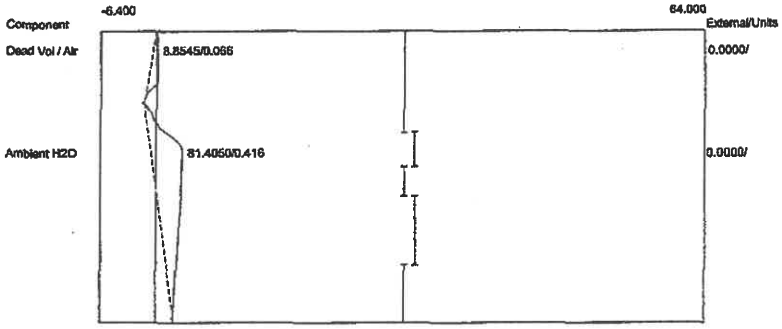
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	8.6190	0.0000	
Ambient H2O	0.416	78.5520	0.0000	
		87.1710	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:30:28
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



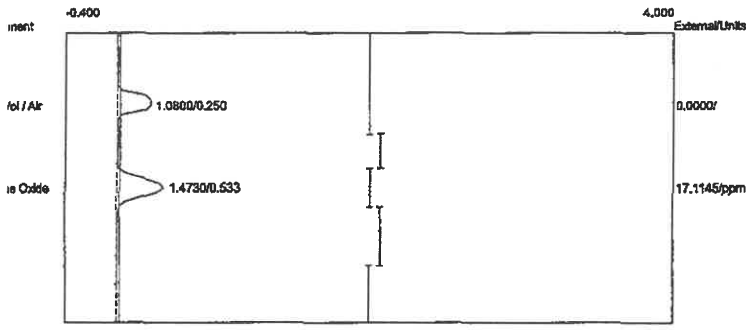
Component	Retention	Area	External	Units
d Vol / Air	0.250	1.0350	0.0000	
ylene Oxide	0.516	1.4315	16.6324	ppm
		2.4665	16.6324	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:30:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



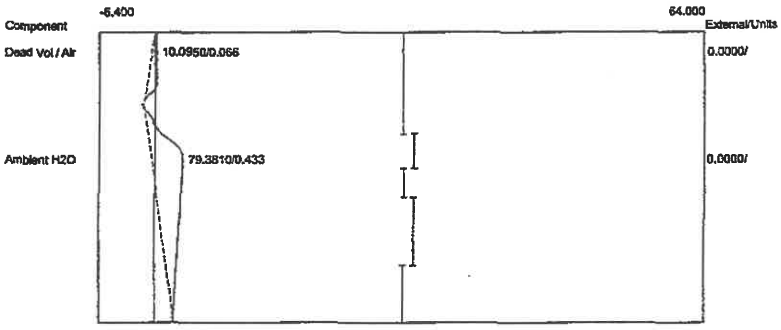
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	8.8545	0.0000	
Ambient H2O	0.416	81.4050	0.0000	
		90.2595	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:35:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



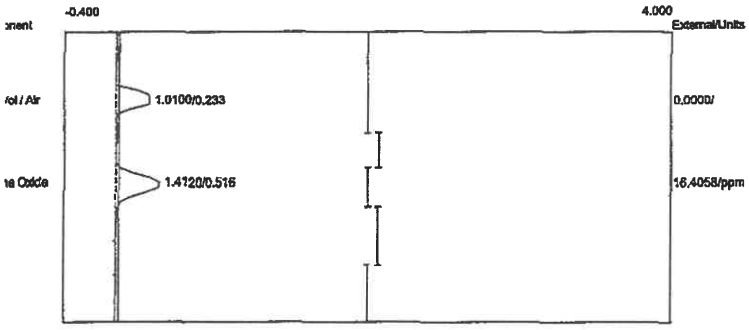
Component	Retention	Area	External	Units
d Vol / Air	0.250	1.0800	0.0000	
lene Oxide	0.533	1.4730	17.1145	ppm
		2.5530	17.1145	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:35:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



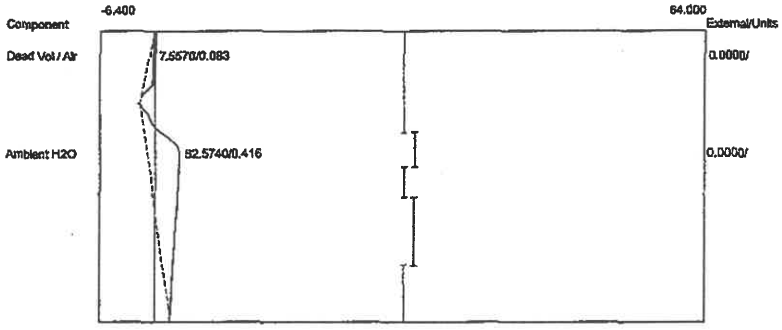
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	10.0950	0.0000	
Ambient H2O	0.433	79.3810	0.0000	
		89.4760	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
alysis date: 06/09/2015 16:40:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-2A12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0100	0.0000	
ylene Oxide	0.516	1.4120	16.4058	ppm
		2.4220	16.4058	

Client: Sterigenics - Grand Prairie
Client ID: Run#2Aer
Analysis date: 06/09/2015 16:40:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-2A12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer

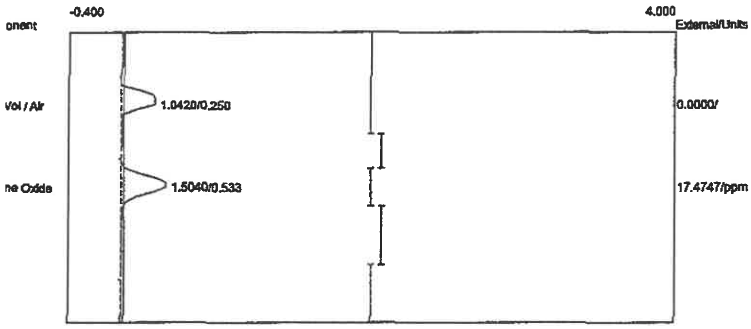


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	7.5570	0.0000	
Ambient H2O	0.416	82.5740	0.0000	
		90.1310	0.0000	

APPENDIX F

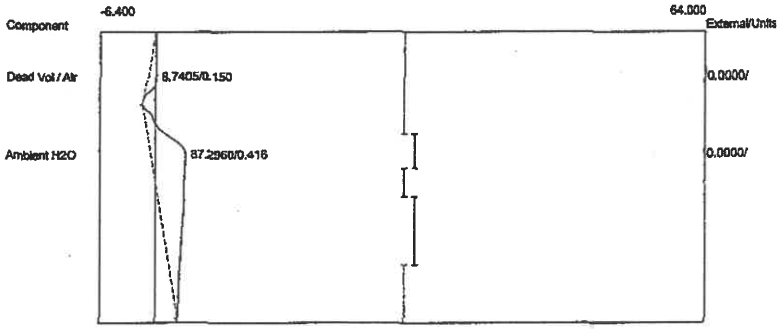
Run #3 Chromatograms - Backvent

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
ıalysis date: 06/09/2015 16:59:10
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
ad Vol / Air	0.250	1.0420	0.0000	
ylene Oxide	0.533	1.5040	17.4747	ppm
		2.5460	17.4747	

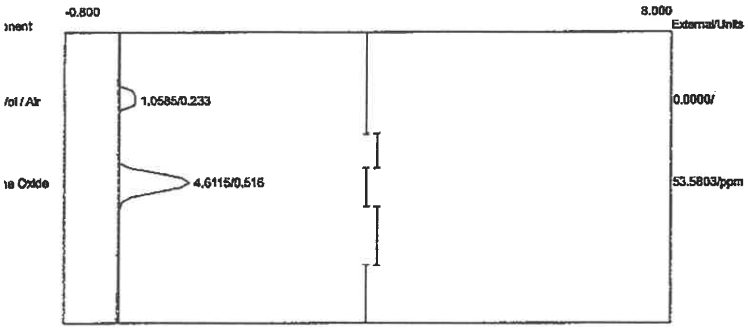
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 16:59:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.150	8.7405	0.0000	
Ambient H2O	0.416	87.2960	0.0000	
		96.0365	0.0000	

Lab name: EOC

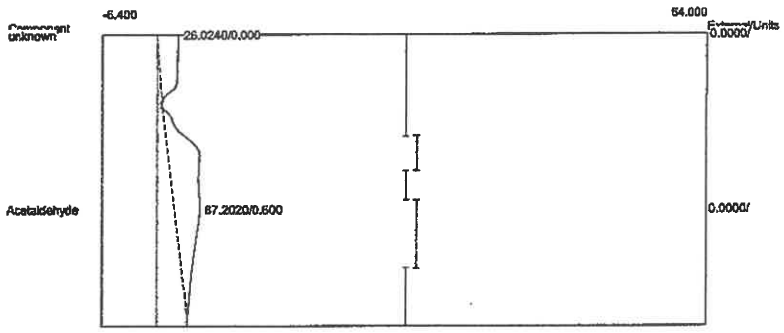
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:00:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0585	0.0000	
ylene Oxide	0.516	4.6115	53.5803	ppm
		5.6700	53.5803	

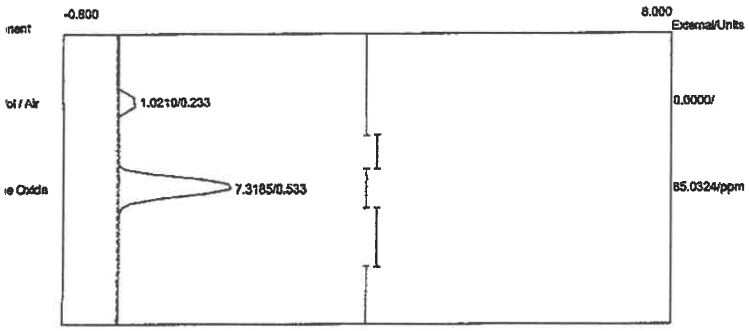
Lab name: EOC

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:00:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



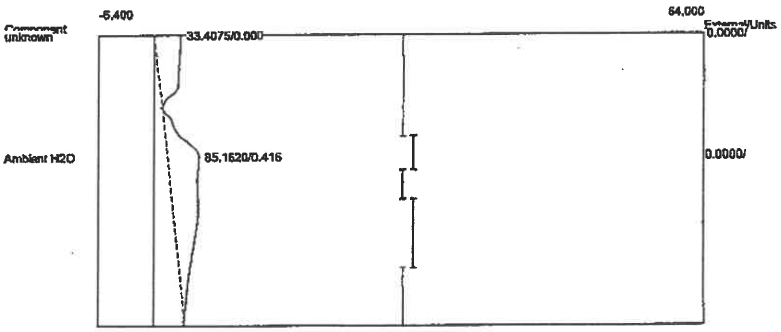
Component	Retention	Area	External	Units
Acetaldehyde	0.600	87.2020	0.0000	
		87.2020	0.0000	

Lab name: ECCI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:01:22
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



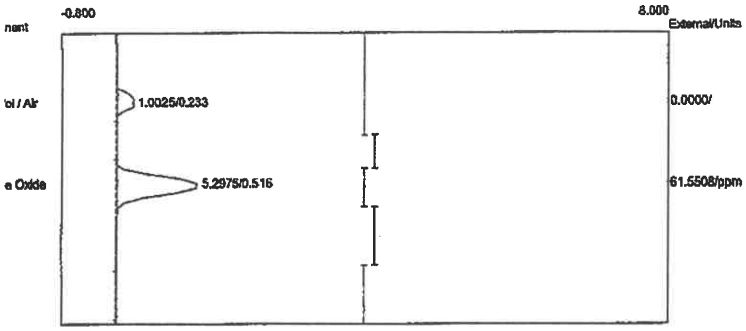
Component	Retention	Area	External	Units
id Vol / Air	0.233	1.0210	0.0000	
ylene Oxide	0.533	7.3185	85.0324	ppm
		8.3395	85.0324	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:01:22
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



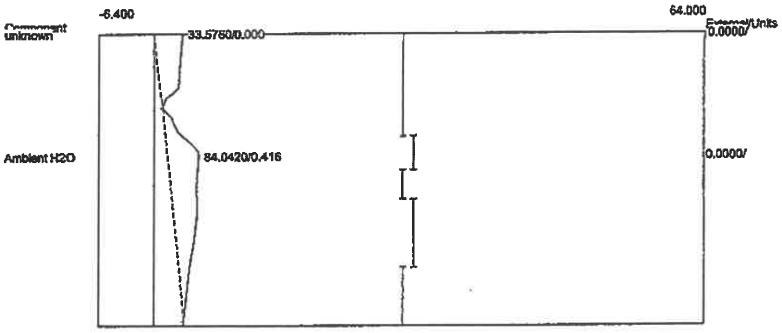
Component	Retention	Area	External	Units
Ambient H2O	0.416	85.1620	0.0000	
		85.1620	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:02:28
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



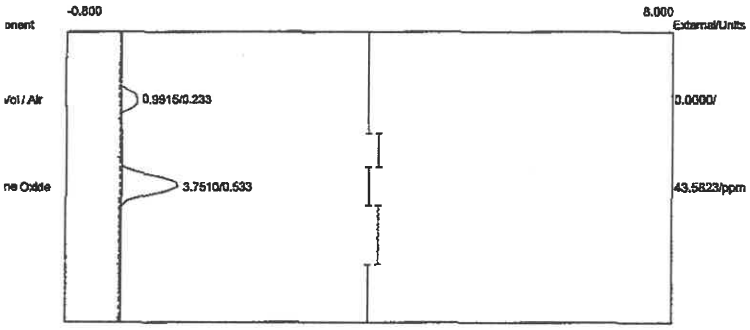
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0025	0.0000	
/lene Oxide	0.516	5.2975	61.5508	ppm
		6.3000	61.5508	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:02:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



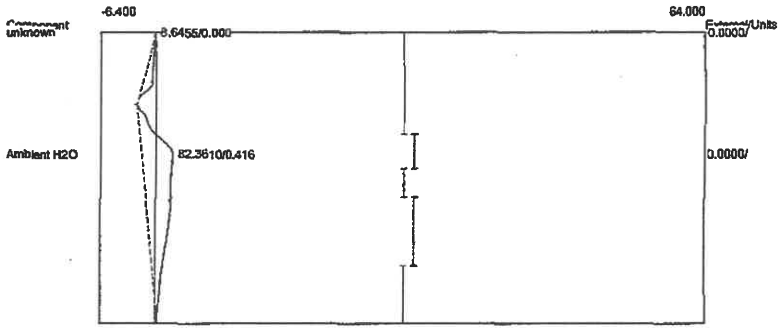
Component	Retention	Area	External	Units
Ambient H2O	0.416	84.0420	0.0000	
		84.0420	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
ıalysis date: 06/09/2015 17:03:34
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



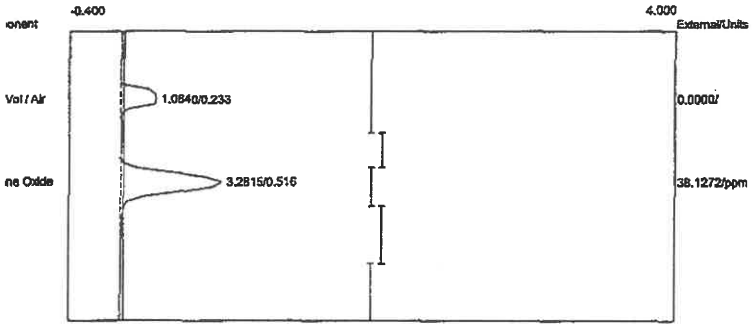
Component	Retention	Area	External	Units
ıd Vol / Air	0.233	0.9915	0.0000	
ylene Oxide	0.533	3.7510	43.5823	ppm
		4.7425	43.5823	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:03:34
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



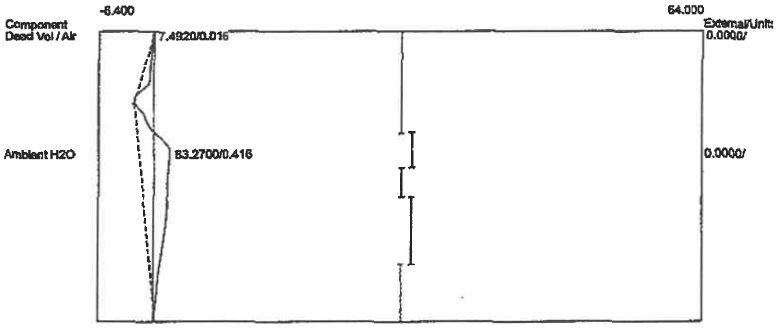
Component	Retention	Area	External	Units
Ambient H2O	0.416	82.3610	0.0000	
		82.3610	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
ıalysis date: 06/09/2015 17:04:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



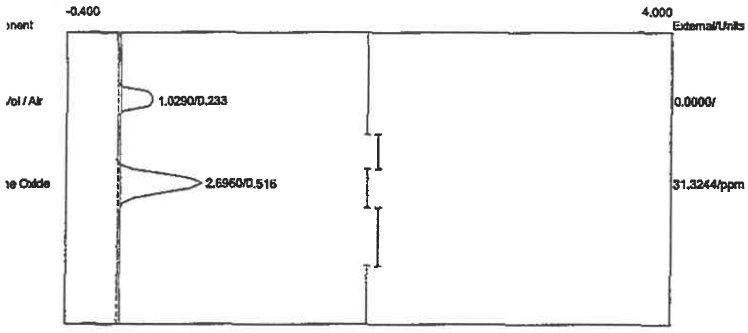
Component	Retention	Area	External	Units
ad Vol / Air	0.233	1.0840	0.0000	
ylene Oxide	0.516	3.2815	38.1272	ppm
		4.3655	38.1272	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:04:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



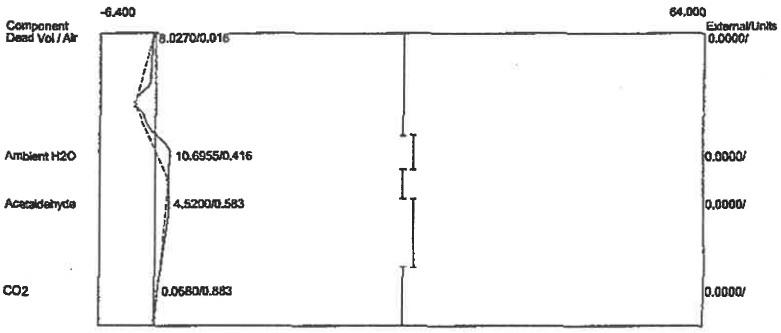
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.4920	0.0000	
Ambient H2O	0.416	83.2700	0.0000	
		90.7620	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
ıalysis date: 06/09/2015 17:05:46
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



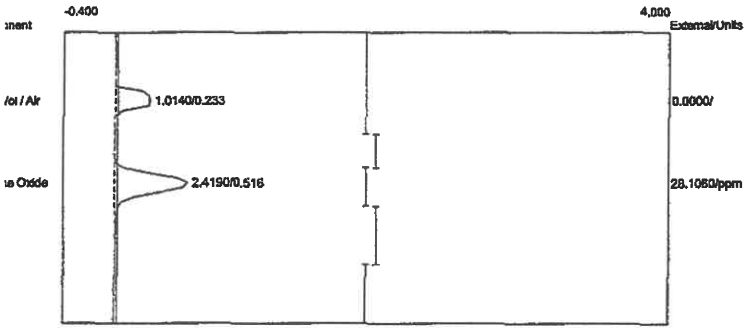
Component	Retention	Area	External	Units
ıd Vol / Air	0.233	1.0290	0.0000	
ylene Oxide	0.516	2.6960	31.3244	ppm
		3.7250	31.3244	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:05:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



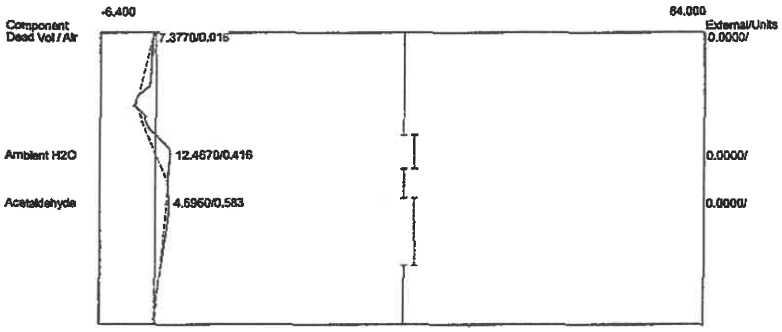
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	8.0270	0.0000	
Ambient H2O	0.416	10.6955	0.0000	
Acetaldehyde	0.583	4.5200	0.0000	
CO2	0.883	0.0680	0.0000	
		23.3105	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:06:53
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



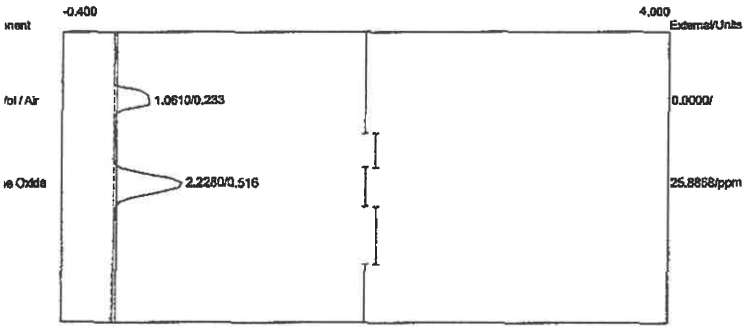
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0140	0.0000	
ylene Oxide	0.516	2.4190	28.1060	ppm
		3.4330	28.1060	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:06:53
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



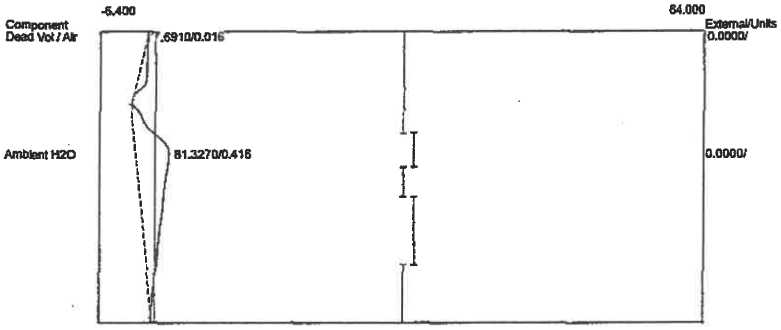
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.3770	0.0000	
Ambient H2O	0.416	12.4670	0.0000	
Acetaldehyde	0.583	4.6960	0.0000	
		24.5400	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:08:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



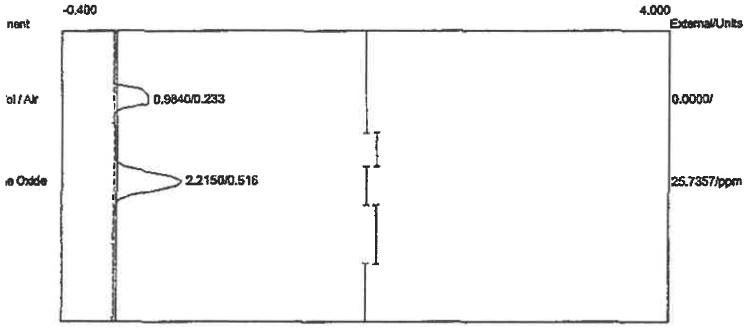
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0610	0.0000	
lene Oxide	0.516	2.2280	25.8868	ppm
		3.2890	25.8868	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:08:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



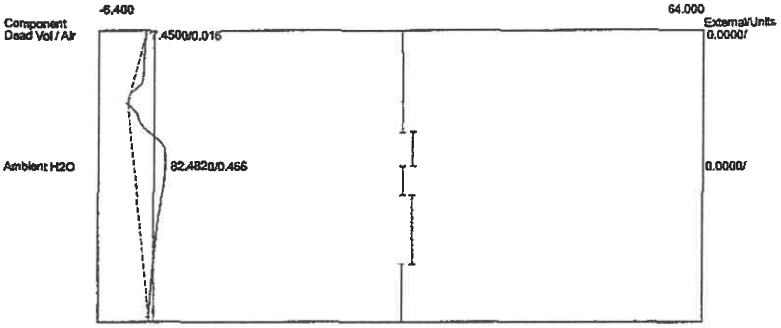
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.6910	0.0000	
Ambient H2O	0.416	81.3270	0.0000	
		89.0180	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:09:31
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



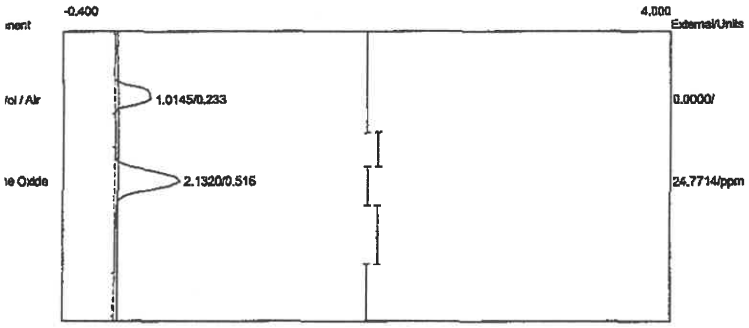
Component	Retention	Area	External	Units
d Vol / Air	0.233	0.9840	0.0000	
lene Oxide	0.516	2.2150	25.7357	ppm
		3.1990	25.7357	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:09:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



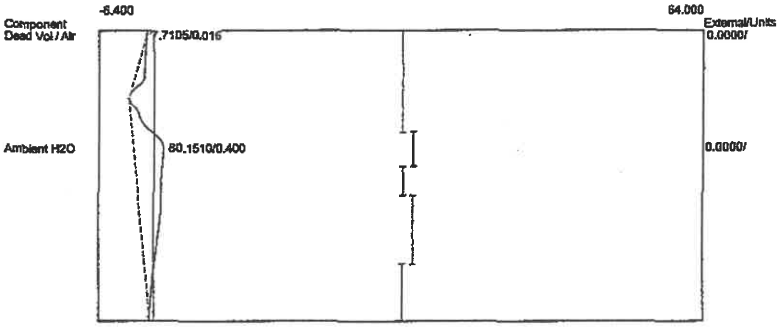
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.4500	0.0000	
Ambient H2O	0.466	82.4820	0.0000	
		89.9320	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:10:36
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



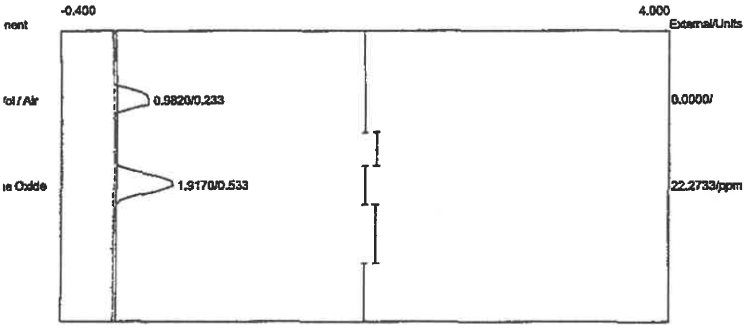
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0145	0.0000	
ylene Oxide	0.516	2.1320	24.7714	ppm
		3.1465	24.7714	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:10:36
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



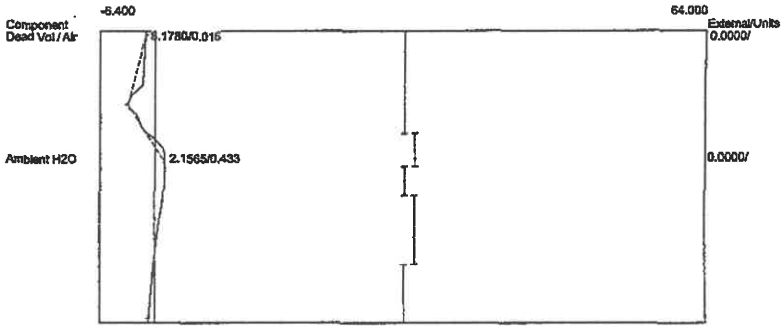
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	7.7105	0.0000	
Ambient H2O	0.400	80.1510	0.0000	
		87.8615	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:11:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3B12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
d Vol / Air	0.233	0.9820	0.0000	
lene Oxide	0.533	1.9170	22.2733	ppm
		2.8990	22.2733	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:11:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3B12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



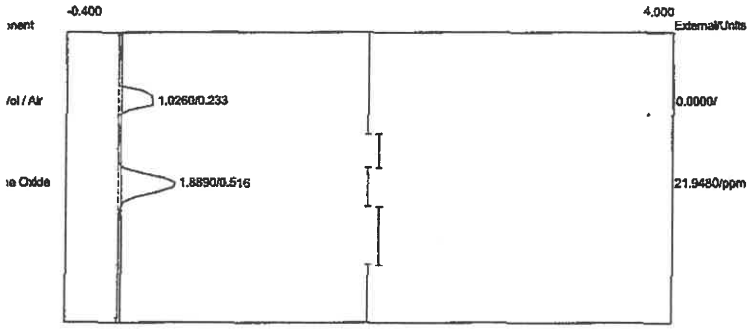
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	8.1780	0.0000	
Ambient H2O	0.433	2.1565	0.0000	
		10.3345	0.0000	

APPENDIX G

Run #3 Chromatograms - Aeration

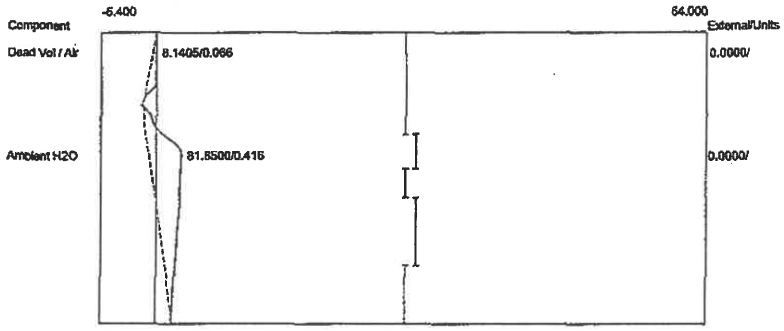
ECSi

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:15:26
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A01.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



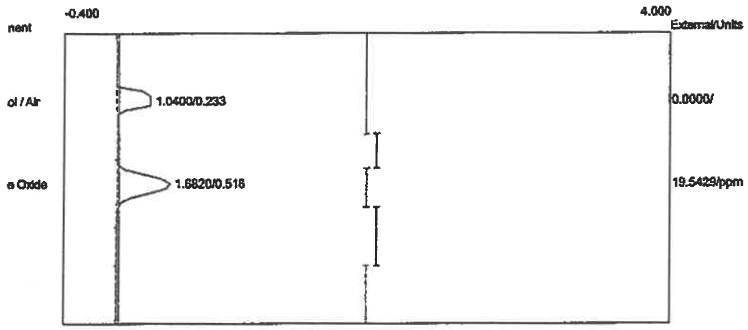
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0260	0.0000	
ylene Oxide	0.516	1.8890	21.9480	ppm
		2.9150	21.9480	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:15:26
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A01.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



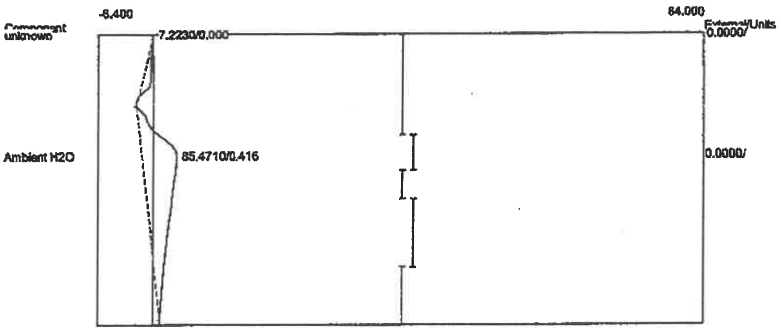
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	8.1405	0.0000	
Ambient H2O	0.416	81.8500	0.0000	
		89.9905	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:20:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A02.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



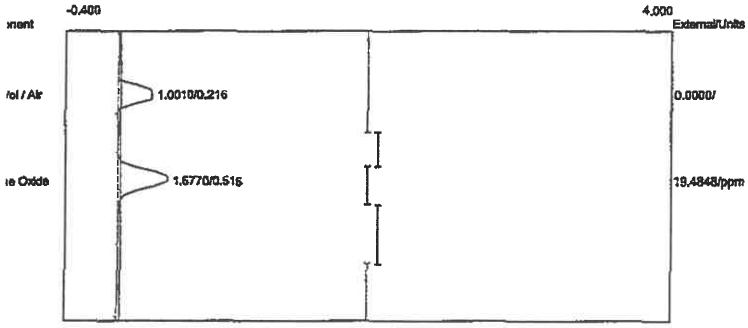
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0400	0.0000	
/lene Oxide	0.516	1.6820	19.5429	ppm
		2.7220	19.5429	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:20:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A02.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



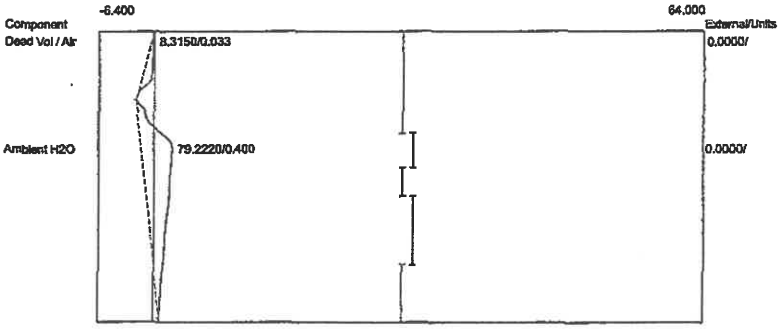
Component	Retention	Area	External	Units
Ambient H2O	0.416	85.4710	0.0000	
		85.4710	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:25:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A03.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



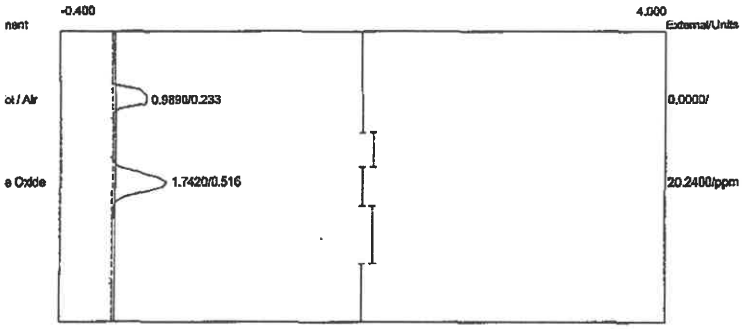
Component	Retention	Area	External	Units
d Vol / Air	0.216	1.0010	0.0000	
ylene Oxide	0.516	1.6770	19.4848	ppm
		2.6780	19.4848	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:25:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A03.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



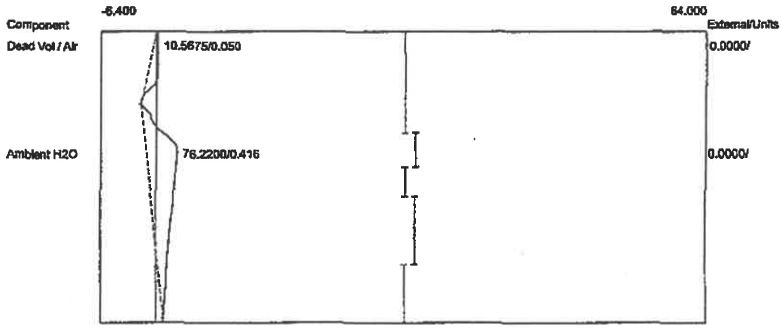
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	8.3150	0.0000	
Ambient H2O	0.400	79.2220	0.0000	
		87.5370	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:30:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A04.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



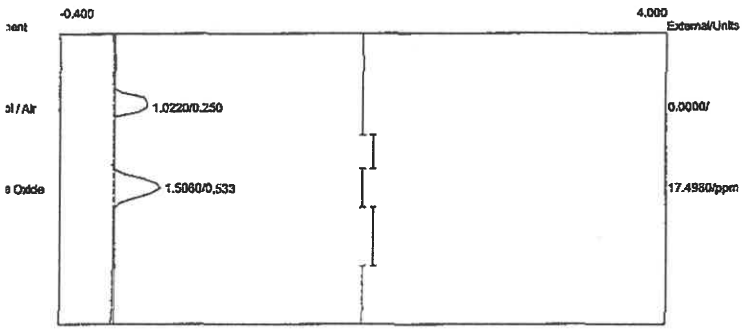
Component	Retention	Area	External	Units
d Vol / Air	0.233	0.9890	0.0000	
lene Oxide	0.516	1.7420	20.2400	ppm
		2.7310	20.2400	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:30:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A04.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



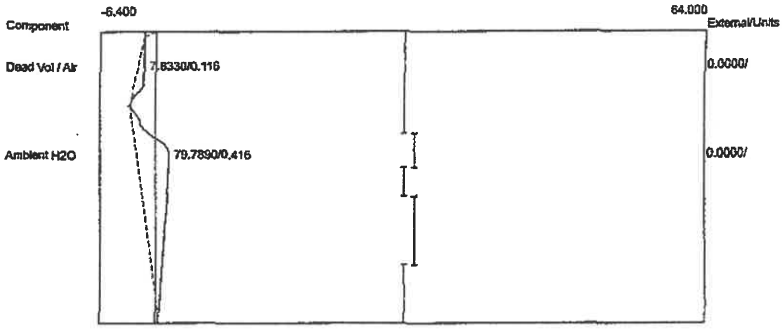
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	10.5675	0.0000	
Ambient H2O	0.416	76.2200	0.0000	
		86.7875	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:35:10
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
emp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A05.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



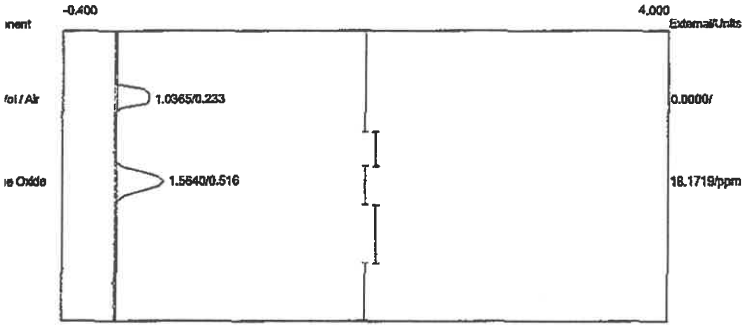
Component	Retention	Area	External	Units
d Vol / Air	0.250	1.0220	0.0000	
lene Oxide	0.533	1.5060	17.4980	ppm
		2.5280	17.4980	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:35:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A05.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



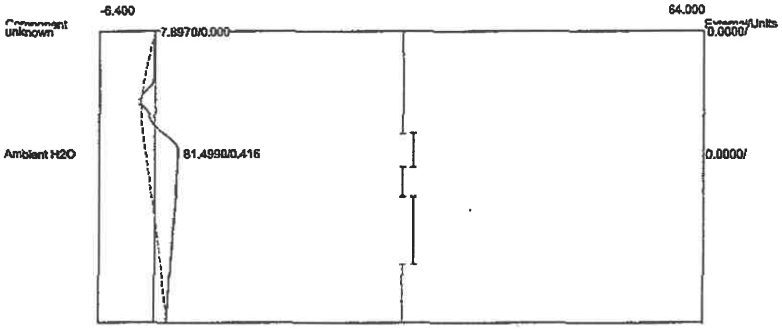
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	7.8330	0.0000	
Ambient H2O	0.416	79.7890	0.0000	
		87.6220	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:40:16
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A06.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



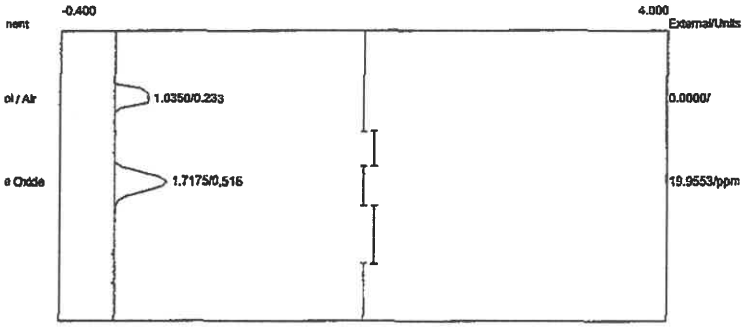
Component	Retention	Area	External	Units
id Vol / Air	0.233	1.0365	0.0000	
/lene Oxide	0.516	1.5640	18.1719	ppm
		2.6005	18.1719	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:40:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A06.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



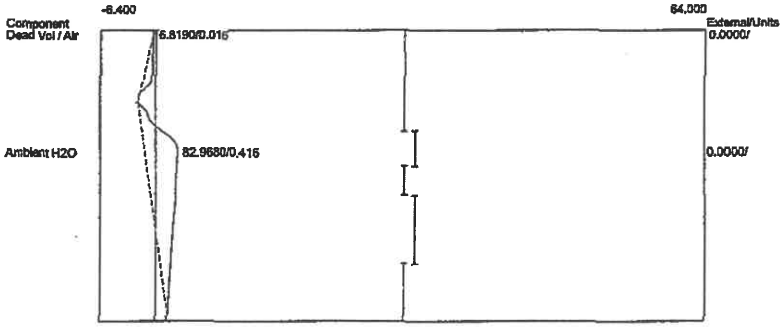
Component	Retention	Area	External	Units
Ambient H2O	0.416	81.4990	0.0000	
		81.4990	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:45:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A07.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



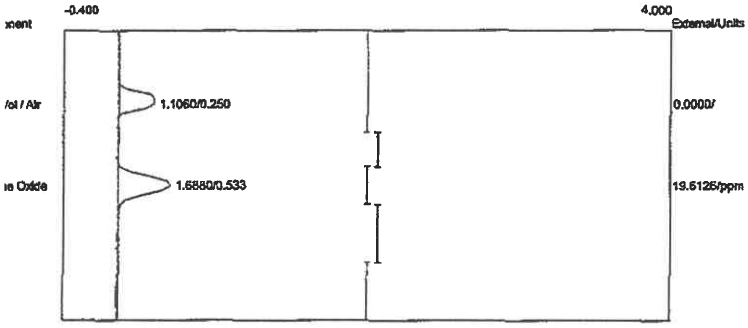
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0350	0.0000	
/lene Oxide	0.516	1.7175	19.9553	ppm
		2.7525	19.9553	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:45:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A07.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



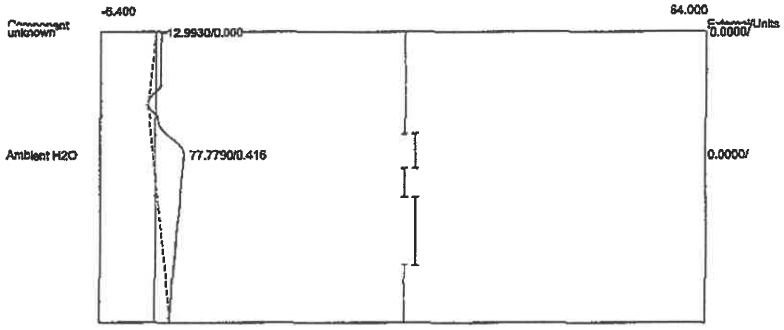
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	6.8190	0.0000	
Ambient H2O	0.416	82.9680	0.0000	
		89.7870	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:50:31
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A08.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



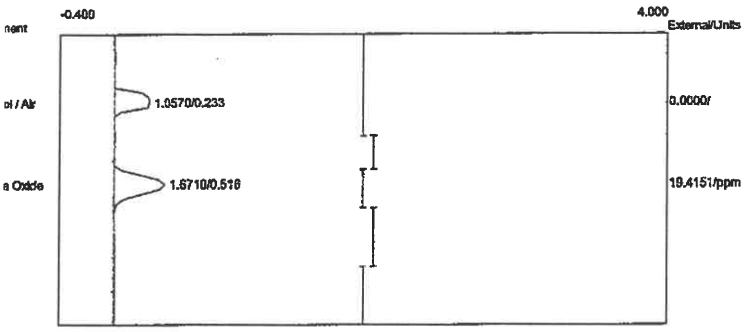
Component	Retention	Area	External	Units
id Vol / Air	0.250	1.1060	0.0000	
ylene Oxide	0.533	1.6880	19.6126	ppm
		2.7940	19.6126	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:50:31
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A08.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



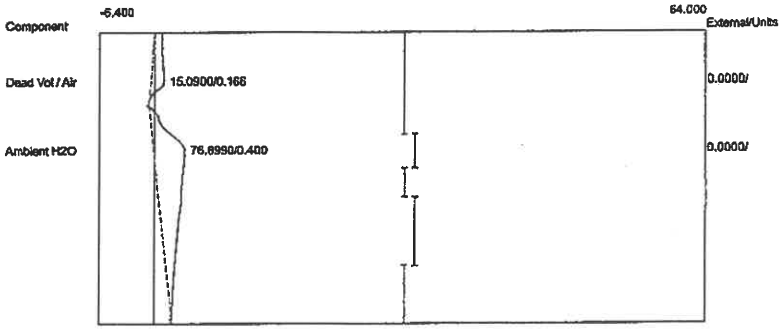
Component	Retention	Area	External	Units
Ambient H2O	0.416	77.7790	0.0000	
		77.7790	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 17:55:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
emp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A09.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



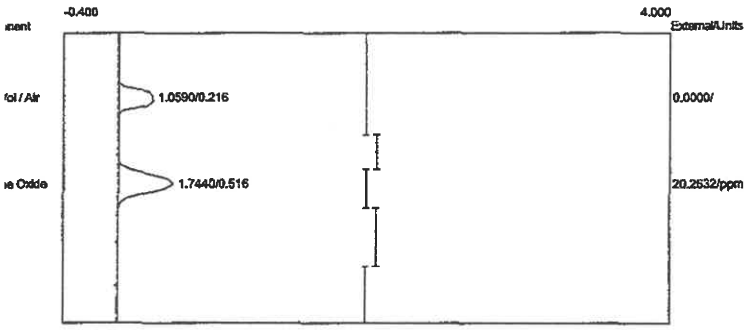
Component	Retention	Area	External	Units
d Vol / Air	0.233	1.0570	0.0000	
lene Oxide	0.516	1.6710	19.4151	ppm
		2.7280	19.4151	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 17:55:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A09.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



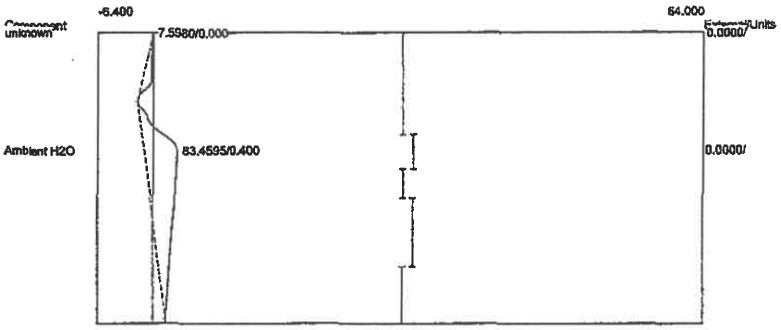
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	15.0900	0.0000	
Ambient H2O	0.400	76.8990	0.0000	
		91.9890	0.0000	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 18:00:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A10.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



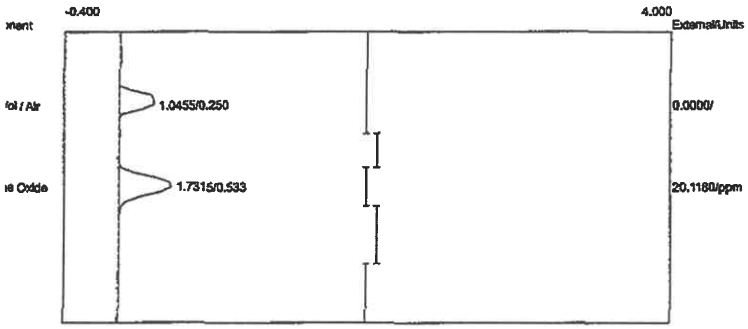
Component	Retention	Area	External	Units
d Vol / Air	0.216	1.0590	0.0000	
lene Oxide	0.516	1.7440	20.2632	ppm
		2.8030	20.2632	

Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 18:00:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A10.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



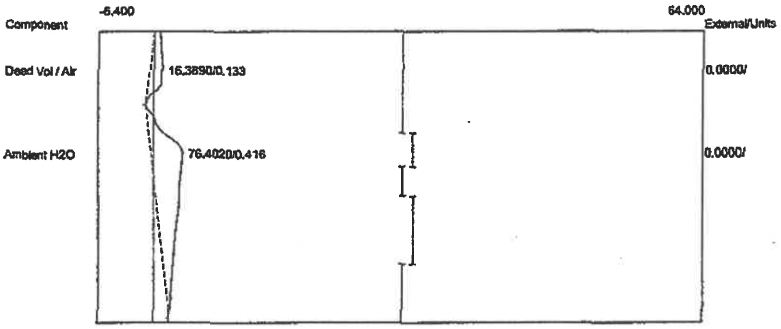
Component	Retention	Area	External	Units
Ambient H2O	0.400	83.4595	0.0000	
		83.4595	0.0000	

Lab name: ECCI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 18:05:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
omponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A11.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



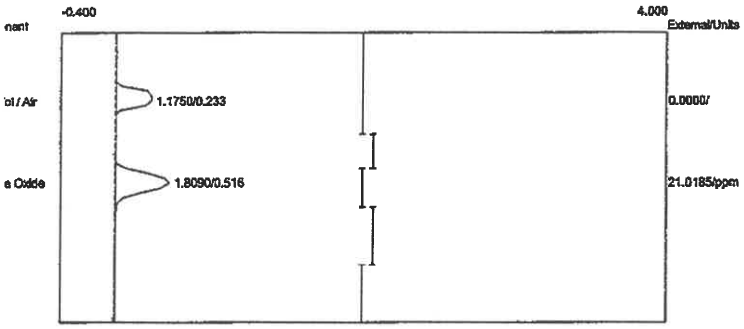
Component	Retention	Area	External	Units
d Vol / Air	0.250	1.0455	0.0000	
lene Oxide	0.533	1.7315	20.1180	ppm
		2.7770	20.1180	

Lab name: ECCI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 18:05:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A11.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



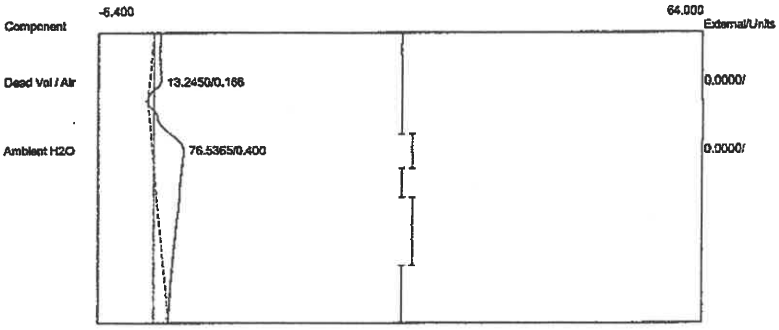
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	16.3890	0.0000	
Ambient H2O	0.416	76.4020	0.0000	
		92.7910	0.0000	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
alysis date: 06/09/2015 18:10:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
mponents: 1SterGP2015.cpt
Data file: 1SterGP2015-3A12.CHR (c:\peak359)
Sample: Oxidizer Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
d Vol / Air	0.233	1.1750	0.0000	
lene Oxide	0.516	1.8090	21.0185	ppm
		2.9840	21.0185	

Lab name: ECSI
Client: Sterigenics - Grand Prairie
Client ID: Run#3BV
Analysis date: 06/09/2015 18:10:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: 2SterGP2015.cpt
Data file: 2SterGP2015-3A12.CHR (c:\peak359)
Sample: Oxidizer Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.166	13.2450	0.0000	
Ambient H2O	0.400	76.5365	0.0000	
		89.7815	0.0000	

APPENDIX H

Field Data and Calculation Worksheets

ECSi

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - Grand Prairie, Texas
6/9/15 - Backvent Runs 1-3

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
	Run #1		
0.56	0.7483	183	0.01
0.56	0.7483	182	0.01
0.56	0.7483	180	0.01
0.56	0.7483	179	0.01
0.56	0.7483	179	0.01
0.56	0.7483	179	0.01
0.56	0.7483	179	0.01
0.56	0.7483	179	0.01
0.56	0.7483	180	0.01
0.56	0.7483	180	0.01
0.56	0.7483	181	0.01
0.56	0.7483	180	0.01
	Run #2		
0.56	0.7483	176	0.01
0.56	0.7483	175	0.01
0.56	0.7483	174	0.01
0.56	0.7483	174	0.01
0.56	0.7483	174	0.01
0.56	0.7483	174	0.01
0.56	0.7483	174	0.01
0.56	0.7483	174	0.01
0.56	0.7483	174	0.01
0.56	0.7483	173	0.01
0.56	0.7483	173	0.01
0.56	0.7483	173	0.01
	Run #3		
0.56	0.7483	168	0.01
0.56	0.7483	168	0.01
0.56	0.7483	168	0.01
0.56	0.7483	169	0.01
0.56	0.7483	169	0.01
0.56	0.7483	169	0.01
0.56	0.7483	169	0.01
0.56	0.7483	170	0.01
0.56	0.7483	170	0.01
0.56	0.7483	170	0.01
0.56	0.7483	170	0.01
0.56	0.7483	170	0.01
Average =			
0.56	0.7483	174.4	**0.0100**
	=	634	degR

mw =	28.51	
stack area =	5.585	
press =	29.30	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	55.2	ft/sec
Flow =	**14622**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.000017**	**lbs/min**
EtO Mass Flow =	**0.001003**	**lbs/hr**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - Grand Prairie, Texas
6/9/15 - Aeration Runs 1-3

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
	Run #1		
0.56	0.7483	178	0.01
0.56	0.7483	179	0.01
0.56	0.7483	179	0.01
0.56	0.7483	177	0.01
0.56	0.7483	177	0.01
0.56	0.7483	178	0.01
0.56	0.7483	178	0.01
0.56	0.7483	177	0.01
0.56	0.7483	178	0.01
0.56	0.7483	178	0.01
0.56	0.7483	176	0.01
0.56	0.7483	177	0.01
	Run #2		
0.56	0.7483	173	0.01
0.56	0.7483	172	0.01
0.56	0.7483	171	0.01
0.56	0.7483	171	0.01
0.56	0.7483	171	0.01
0.56	0.7483	170	0.01
0.56	0.7483	169	0.01
0.56	0.7483	168	0.01
0.56	0.7483	167	0.01
0.56	0.7483	166	0.01
0.56	0.7483	166	0.01
0.56	0.7483	166	0.01
	Run #3		
0.56	0.7483	171	0.01
0.56	0.7483	170	0.01
0.56	0.7483	171	0.01
0.56	0.7483	170	0.01
0.56	0.7483	169	0.01
0.56	0.7483	170	0.01
0.56	0.7483	171	0.01
0.56	0.7483	172	0.01
0.56	0.7483	172	0.01
0.56	0.7483	172	0.01
0.56	0.7483	171	0.01
0.56	0.7483	171	0.01
Average =			
0.56	0.7483	172.6	**0.0100**
	=	633	degR

mw =	28.51	
stack area =	5.585	
press =	29.30	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	55.1	ft/sec
Flow =	**14644**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.000017**	**lbs/min**
EtO Mass Flow =	**0.001004**	**lbs/hr**

ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: Sterigenics- Grand Prairie, TX

Source Tested: Catalytic Oxidizer- 15,000 CFM Date: 6/9/15

PRE CALIBRATION

Inlet (FID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
	Area Counts #1	.097	.87	8.32					
	Area Counts #2	.095	.88	8.43					
	Average Area	.096	.88	8.38					
	Audit Standard (48.8 ppmv) Result					49.2 ✓			
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
	Area Counts #1	1.75	16.5	151					
	Area Counts #2	1.75	16.6	157					
	Average Area	1.75	16.6	154					
	Audit Standard (48.8 ppmv) Result					48.9 ✓			

	Run #1	Run #2	Run #3				
Backvent start/stop:	1339/1354	1527/1542	1657/1712	P_{bar}:	29.30	EtO Usage (lbs/yr):	—
Aeration start/stop:	1355/1455	1543/1643	1713/1813	%H_2O:	3	Cycles Per Week:	—

POST CALIBRATION

Inlet (FID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (48.8 ppmv) Result					48.7 ✓			
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
	Area Counts #1								
	Area Counts #2								
	Average Area								
	Audit Standard (48.8 ppmv) Result					48.6 ✓			

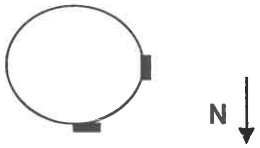
ECSi

ECSI, INC. - VELOCITY TRAVERSE DATA

Client: Sterigenics, Inc. Run #: 1 Date: 10/22/2014 Port Sketch:

Location: Grand Prairie, Texas Plant Probe Type: Std. Baro Press: 29.30

Source: Ethylene Oxide Emission Control System Outlet Stack I.D.: 32 in. DSCFM: **14,500**



	Port 1							Port 2						
Inches		Delta P				Stack	Cyclonic		Delta P				Stack	Cyclonic
From Port	Point#	Low	High	Average	Sq Root	Temp (F)	Angle	Point#	Low	High	Average	Sq Root	Temp (F)	Angle
0.6	1	0.53	0.53	0.53	0.7280	184	0	1	0.53	0.53	0.53	0.7280	184	0
2.1	2	0.54	0.54	0.54	0.7348	184	0	2	0.53	0.54	0.535	0.7314	184	0
3.7	3	0.54	0.55	0.545	0.7382	185	0	3	0.54	0.55	0.545	0.7382	184	0
5.7	4	0.55	0.56	0.555	0.7450	185	0	4	0.55	0.56	0.555	0.7450	185	0
8.0	5	0.56	0.56	0.56	0.7483	185	0	5	0.56	0.56	0.56	0.7483	185	0
11.4	6	0.59	0.6	0.595	0.7714	185	0	6	0.6	0.6	0.6	0.7746	185	0
20.6	7	0.6	0.61	0.605	0.7778	185	0	7	0.59	0.6	0.595	0.7714	185	0
24.0	8	0.56	0.57	0.565	0.7517	185	0	8	0.56	0.56	0.56	0.7483	185	0
26.3	9	0.56	0.56	0.56	0.7483	185	0	9	0.55	0.56	0.555	0.7450	186	0
28.3	10	0.55	0.56	0.555	0.7450	186	0	10	0.54	0.55	0.545	0.7382	186	0
29.9	11	0.54	0.55	0.545	0.7382	186	0	11	0.53	0.54	0.535	0.7314	186	0
31.4	12	0.53	0.54	0.535	0.7314	186	0	12	0.52	0.53	0.525	0.7246	186	0
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						
								Average Values:			0.5554	0.7451	185.1	0.0

APPENDIX I

Gas Certifications

ECSi

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 02020001310TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT DATE: 4-14-14

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE*	1.	PPM	1.10	PPM	10.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 14Apr2016

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT

DATE: 4-14-14

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10.	PPM	10.1	PPM	1.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1600 PSIG
Expiration Date: 14Apr2016

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-004
Item No.: 02020001330TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM

DATE: 4-14-14

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	100.	PPM	100.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1500 PSIG
Expiration Date: 14Apr2016

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-14-14

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference. Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 14Apr2016

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 14Apr2014

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully
BLM

DATE: 4-14-14

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 900 PSIG
Expiration Date: 14Apr2016

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	ECSi, Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Verbal- Dan	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104448	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	4/15/2014	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights. SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment
division of MESA International Technologies, Inc.
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On-line Catalog at www.mesagas.com

APPENDIX J

Process Data

STERIGENICS Grand Prairie

Pollution Systems Catalytic Oxidizer / DAILY OPERATING REPORT

ITEM	Date / Initials	AS 06 JUN 15	AS 07 Jun 15	AS 08 Jun 15	AS 09 Jun 15	AS 10 Jun 15	AS 11 Jun 15	AS 12 Jun 15
	DESCRIPTION	SAT	SUN	MON	TUE	WED	THUR	FRI
1	PT1 "W.C. >-1.0"	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
2	TE1 Deg F >300.0 F	299F	300 F	300 F	299 F	315 F	315 F	315
3	F1 % fan speed	78%	85%	88%	85%	87%	89%	89%
4	Gas Consumption Scf	NA	NA	NA	NA	NA	NA	NA

INSTRUCTIONS

Verify that the Abator Panel corresponds to the above checklist. Report any damage or deficiency to Maintenance Supervisor via Demand Work Order (On Site Request).

Corrective Action / Comments (Include Item # and action; i.e. WO# or other):

22 Jun 15

Reviewed by: _____ Date: 22 Jun 15

UNCONTROLLED

Oxidizer Operating log			Date 09 Jun 15			
Time	PT1 - "W.C."		TE1 - DEG F		F1 % fan Speed	
6:00						
7:00	-1.7		299		78%	
8:00	-1.7		300		85%	
9:00	-1.7		300		88%	
10:00	-1.7		300		85%	
11:00	-1.7		300		87%	
12:00	-1.7		301		89%	
13:00	-1.7		300		89%	
14:00	-1.7		300		90%	
15:00	-1.7		300		89%	
16:00	-1.7		300		78%	
17:00	-1.7		299		85%	
18:00						
19:00						
20:00						

09 Jun 15

NA